
To: Nevada Division of Environmental Protection
Nevada Environmental Response Trust

Cc: Nevada Environmental Response Trust Stakeholders

From: Ryan Sullivan, Vice President Service and O&M

Date: February 20, 2020

Subject: NERT – GWETS Operation Monthly Report – January 2020

At the request of the Nevada Environmental Response Trust (Trust), Envirogen Technologies, Inc. (ETI) is providing this summary of the groundwater extraction and treatment system (GWETS) operation and performance during January 2020.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS and ion exchange (IX) system normally in January 2020. Flow from PC-119, PC-120, PC-121, and PC-133 was routed to the IX system, bypassing all flow meters associated with the FBR plant. The flow rate to the IX system averaged approximately 184 gallons per minute (gpm). The flow rate to the FBR plant averaged approximately 1,050 gpm during January 2020. At the end of the month, the GW-11 Pond volume was at 46.1 million gallons (MG), which would allow 11.4 days of available additional storage in the event of an emergency FBR plant shutdown with continued well field pumping. The water volume stored in the GW-11 Pond increased by 1.3 MG from the end of December 2019 as a result of required backwashing of the GAC vessels. Figure 1 in this report depicts the actual GW-11 pond volumes and additional storage available.

The influent perchlorate concentration to the IX system averaged 0.33 mg/L for the month. The influent perchlorate concentration to the FBR plant averaged 73 mg/L for the month, with a maximum concentration of 120 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of December 2019 averaged 235 mg/l, with a maximum concentration of 250 mg/l. Fluctuations in the influent perchlorate concentrations are due to the changes in the AP-5 treatment feed rate and not a result of groundwater changes. Treatment of AP-5 material ceased on January 8, 2020 and will resume in small batches as necessary to support the sediment dewatering activities.

Enhanced Operational Metrics

Tables 1 and 2 provide a summary of the current GWETS operational metrics data for flow rates, perchlorate and chromium concentrations, and mass removal. These tables also include data associated with the AP-5 decant liquids. Figure 2 graphically presents historical perchlorate and chromium mass flux information. Attachment A provides a summary of the NPDES permit analytes with numerical discharge limits.

Operational Issues

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

1. GW-11

There were no operational issues with GW-11 in the month of January.

2. Biological Plant

Treatment of AP-5 water through the FBR Biological plant continued in the month of January maintaining a flow rate of 9.0 gpm until January 8th, 2020 when the flow was reduced to 0.0 gpm due to the cessation of AP-5 source flow.

There were influent / effluent diversions during the reporting period generally associated with maintenance activities as well as extraction well short-term shutdown events. Below is a description of the events that occurred:

Diversion Events / Well Shutdowns

- Partial Effluent Diversion in which both Effluent pipeline valves are open for the purposes of reducing the final Effluent tank level occurred on January 3, 2020 from 9:50am to 9:56am and 11:26am to 11:37am due to increased flow testing. Approximately 6,800 gallons of effluent were diverted to GW-11.
- Partial Effluent Diversions occurred on January 4, 2020 from 8:13am to 8:19am, 9:18am to 9:24am, 1:58pm to 2:13pm, 4:55pm to 5:02pm, and 8:01pm to 8:08pm due to increased flow testing. Approximately 16,400 gallons of effluent were diverted to GW-11.
- Influent diversion to GW-11 occurred on January 4, 2020 from 5:30am to 6:52am due to a power outage caused by a tripped circuit breaker at the P-1302(a) pump. The breaker was reengaged and the plant brought back online. The breaker was subject to increased monitoring and troubleshooting at this time. Approx. 85,000 gallons of water was diverted to GW-11.
- Influent diversion to GW-11 occurred on January 6, 2020 from 5:30am to 5:39am due to a power outage caused by a tripped breaker at the P-1302(a) pump. The backup pump (P-1302b) was brought online while troubleshooting the root cause which indicated that an internal failure of the Variable Frequency Drive (VFD) of P-1302(a) was the cause. Replacement parts were ordered. Approximately 10,000 gallons of water were diverted to GW-11.
- Well Shutdown of IWF extraction well I-G occurred on January 11, 2020 from 4:20pm to January 12, 2020 at 2:18pm due to a motor and pump malfunction. The well pump was pulled and both the motor and the pump were replaced.
- Influent diversion to GW-11 occurred on January 13, 2020 from 2:44am to 3:27am due to further complications from the damaged electrical breaker and VFD for P-1302(a). Both the breaker and the VFD were replaced. A total of approximately 50,000 gallons of water were diverted to GW-11.
- Influent diversion to GW-11 on January 18, 2020 from 11:58am to 1:22pm due to a malfunctioning diversion valve at the South GAC vessel. The GAC vessel was isolated and removed from service until the valve was replaced. A total of approximately 28,000 gallons of water were diverted to GW-

11.

- Partial Effluent diversion to GW-11 occurred on January 26, 2020 from 2:16pm to 2:26pm due to excessive flow while draining the Sand Filter for maintenance activities. Approximately 14,000 gallons of effluent were diverted to GW-11.
- Partial Effluent diversion to GW-11 occurred on January 27, 2020 from 11:28am to 11:36am due to excessive flow while draining the Sand Filter for maintenance activities. Approximately 12,000 gallons of effluent were diverted to GW-11.
- Effluent diversion to GW-11 occurred on January 30, 2020 from 4:05am to 4:42am as a precautionary measure due to concerns of effluent quality. Adjustments were made to process and the effluent was returned to the wash. A total of approximately 39,000 gallons of effluent were diverted to GW-11.
- Partial Effluent and full Effluent diversions to GW-11 occurred on January 30, 2020 between 4:23pm and 6:37pm due to troubleshooting efforts following a malfunction at the effluent pig launcher. The effluent was returned to the wash following the troubleshooting efforts. A total of approximately 64,000 gallons of effluent were diverted to GW-11.

3. Spills

There were no reportable spills in the month of January.

4. Maintenance

- Major maintenance performed by ETI in the month included:
 - I. Replaced the drawdown column on the DAF Polymer system.
 - II. Replaced the clamping pressure switch on the on the east filter press.
 - III. Reset the breaker on the main power to MCC 1.
 - IV. Installed the upsized P-1001 pump at GWTP.
 - V. Replaced the pump, motor, and piping to the E2-1.
 - VI. Replaced the flow meter at well E2-2.
 - VII. Installed a new mechanical seal and impeller on P-1701A Sand Filter reject pump.
 - VIII. Replaced the motor, pump, and fittings on extraction well I-G.
 - IX. Installed a booster pump on the T-601 tank for additional flow.
 - X. Replaced the Backwash valve on the South GAC vessel.
 - XI. Took the North DAF offline to repair the rakes.
 - XII. Cut the opening on the P1320(A) enclosure door to accommodate the new VFD.
 - XIII. Installed the new VFD for P1302(A).

- Preventative Maintenance completed or being performed by ETI in the month included:
 - I. Took the North DAF offline to complete the semi-annual maintenance. This included pressure washing the vessel, re-adjusting the flex coupling of the recycle motor and pump, and a full inspection.
 - II. Took the sand filter offline for the annual maintenance. The unit was drained, flushed and inspected. The reject weirs were drained of solids, new screens were installed on the reject weirs.

- III. Flushed the ORP probes.
- IV. The oil was changed on the Vertical Turbine pump at LS2.
- V. The sump pits were flushed of solids and the pumps were inspected.
- VI. Both tanks of the dry polymer system were drained, flushed, and tested for service.
- VII. The filters were cleaned on the external A/C units of the LS3 MCC's.
- VIII. The discharge fittings of P-1b at GWTP was cleared of debris.

GWETS Upgrades and Facility Projects

Unit 4 Chromium Water Treatment Plant – Envirogen received comments regarding the deliverable documents that were submitted to the Trust in July 2019 for this project. The revised documents dealing with the Controls Specification, Process Drawings, and Mechanical Details were re-submitted to the Trust in September. Envirogen is awaiting further direction from the Trust regarding this matter.

GWETS Extension – A revised equipment proposal was submitted to the Trust for the TIMET system in October, along with draft work authorizations for the GWETS Extension and O&M services. Envirogen participated in an introductory conference call in December with the Trust and Arcadis, and received the modified Work Authorization to move forward on the engineering and equipment supply portion of the project. The signed Work Authorization was returned to the Trust on January 28, 2020. The O&M Work Authorization for the GWETS Extension will be revised and finalized over the coming months.

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 Groundwater Extraction and Treatment System Monthly Stakeholder Metrics				
Location ID	Average Flow Rate (gpm)	Perchlorate (mg/L) ^{6 7}	Chromium (TR) (mg/L) ^{6 7}	Chromium(VI) (mg/L) ^{6 7}
SWF Total Extraction ¹	756 ⁵	7.4	0.0026	0.0022
AWF Total Extraction ¹	472 ⁵	61	0.15	0.15
IWF Total Extraction ¹	61 ⁵	437	6.6	6.7
AP Area Total Extraction ¹	11.0 ⁵	545	0.096	0.097
GWTP Effluent ²	67	457	0.31	ND
GW-11 Influent ¹	0.12	42	0.07	0.033
FBR Influent ^{2 3}	1,050	73	0.166	0.152
T-205 Effluent (AP-5 Wash Water) ^{3 4 8}	2.1	4,801	NA	NA

Notes:

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

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

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

3: AP-5 Wash Water perchlorate data is also included in the GW-11 Effluent/ FBR Influent totals.

4: Flow weighted average concentration based on mass flow meter readings.

5: Sum of daily average flow for individual wells.

6: All concentrations reported are monthly flow weighted averages.

7: ND analytical values are treated as zero values in the flow weighted average calculations.

8: AP-5 sediment mixing and solids washing activities were completed on January 4, 2020. The average flow rate and monthly flow weighted perchlorate concentration are based on the entire month of January.

Nevada Environmental Response Trust Groundwater Extraction and Treatment System Monthly Stakeholder Metrics			
Location ID	Perchlorate (lbs/month) ³	Chromium (TR) (lbs/month) ³	Chromium (VI) (lbs/month) ³
SWF Total Extraction	2,084	0.72	0.61
AWF Total Extraction	10,778	27	27
IWF Total Extraction	10,000	151	154
AP Area Total Extraction	2,230	0.39	0.40
GWTP Effluent	11,444	7.9	ND
GW-11 Influent	1.9	0.003	0.0015
FBR Influent ¹	28,542	65	59.4
T-205 Effluent (AP-5 Wash Water) ^{1 2 4}	3,723	NA	NA

Notes:

TR = Total Recoverable; NA = Not Analyzed.

1: AP-5 Wash Water perchlorate data is also included in the GW-11 Effluent/ FBR Influent totals.

2: AP-5 Wash Water concentrations and mass flux are estimates based on mass flow meter readings.

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

4: AP-5 sediment mixing and solids washing activities were completed on January 4, 2020.

Figures

Operational Metrics

Figure 1 - GW-11 Pond Volume Through 1/31/2020

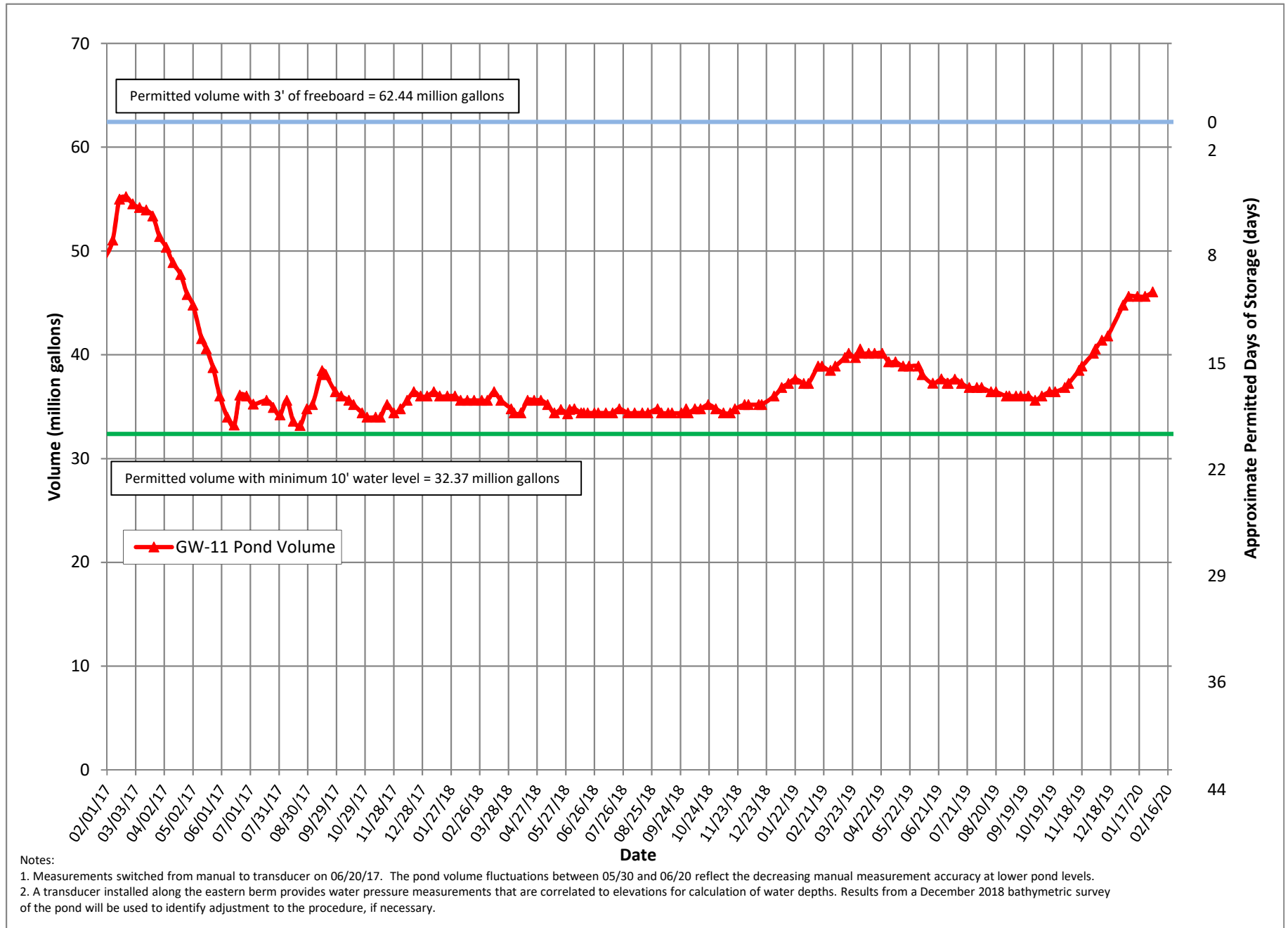
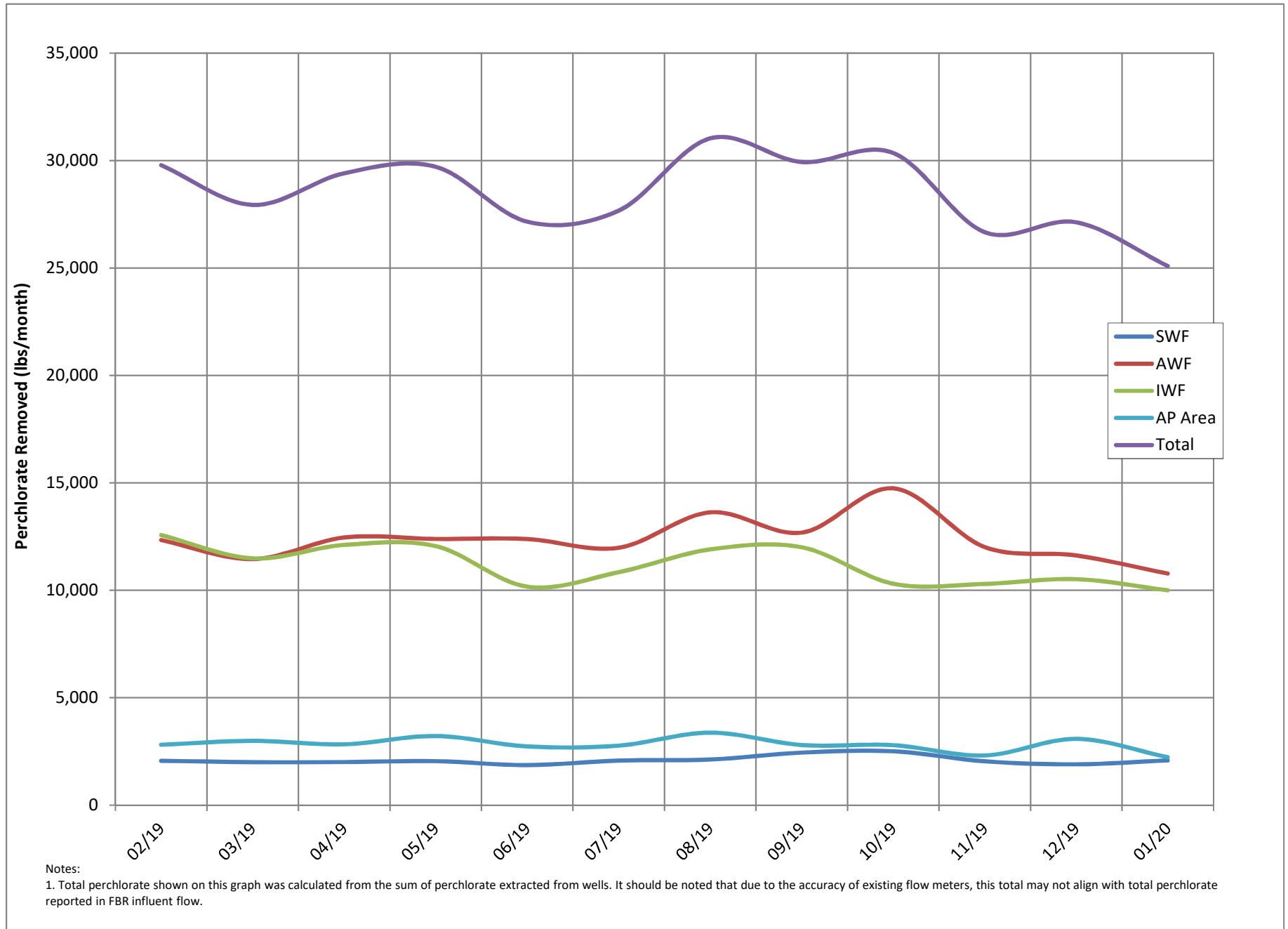


Figure 2 - Historical Perchlorate Mass Removed From Environment



Attachment A

NPDES Tracking Sheet (Prepared by Ramboll)

Treated Effluent at Outfall 001																						
Continuous		Daily Samples, composited weekly				Weekly Grab Samples										Weekly, collected separately			Quarterly			
Flow Rate		Perchlorate				pH		Hexavalent Chromium	Total Chromium	Manganese	Total Iron	Total Inorganic Nitrogen (TIN)	Total Suspended Solids (TSS)		Total Ammonia as N		Total Phosphorus as P		BOD ₅ (inhibited)			Total Dissolved Solids (TDS)
30-Day Avg. (MGD)	Daily Maximum (MGD)	30-Day Avg. (µg/L)		30-Day Avg. (lbs/day)		Daily Min. (S.U.)	Daily Max. (S.U.)	Daily Max. (µg/L)	Daily Max. (µg/L)	Daily Max. (µg/L)	Daily Max. (µg/L)	Daily Max. (mg/L)	Daily Average (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)	Daily Max. (mg/L)
2.52	2.88	18		0.38		6.5	9.0	10	100	5,000	10,000	20	135	2,839	20*		10*		25	40	525	8,000
December 2019	1.72	1.84	1.3	0.018		6.51	6.78	ND (<0.25)	16	320	200	17	16	230	160		2.9		1.2	2.0	17	
January 2020 (month to date)	1.82	1.89	4.7	0.071		6.60	6.87	1.1	19	290	540	0.85	5.0	76	6		3.3		1.3	2.1	21	NA
February 2020 (month to date)	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA	NA	NA	NA

Daily Grab Sample Dates	Composite Sample Date	µg/L	lbs/day	Sample Date	S.U.	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	Sample Date	mg/L	lbs/day	Sample Date	mg/L		
12/1 - 12/7	12/7/2019	ND (<2.5)	1.3	0.017	12/2/2019	6.55	ND (<0.25)	ND (<2.5)	250	58	11	5.4	80	--	11	162	--	0.14	2.1	12/6/2019	ND (<2.0)	1.0	15
12/8 - 12/14	12/14/2019	ND (<2.5)	1.3	0.018	12/9/2019	6.78	ND (<0.25)	ND (<2.5)	300	75	14	1.2	18	--	14	206	--	0.13	1.9	12/11/2019	ND (<2.0)	1.0	15
12/15 - 12/21	12/21/2019	ND (<2.5)	1.3	0.018	12/16/2019	6.51	ND (<0.25)	16	320	200	17	52	750	--	17	245	--	0.23	3.3	12/18/2019	ND (<2.0)	1.0	14
12/22 - 12/28	12/28/2019	ND (<2.5)	1.3	0.018	12/23/2019	6.68	ND (<0.25)	2.6	230	ND (<50)	9.6	8.2	117	--	9.6	137	--	0.23	3.3	12/23/2019	2.0	28	
12/29 - 1/4	1/4/2020	4.4	4.4	0.063	12/30/2019	6.63	ND (<0.25)	4.6	300	63	4.5	14	196	--	4.5	63	--	0.27	3.8	12/30/2019	ND (<2.0)	1.0	14
1/5 - 1/11	1/11/2020	12	12	0.18	1/6/2020	6.60	ND (<0.25)	2.7	290	58	0.85	4.9	70	--	0.85	12	--	0.22	3.1	1/8/2020	ND (<2.0)	1.0	15
1/12 - 1/18	1/18/2020	ND (<2.5)	1.3	0.019	1/13/2020	6.63	ND (<0.25)	19	210	66	ND (<0.50)	3.2	49	--	0.25	3.8	ND (<0.025)	0.013	0.19	1/15/2020	ND (<2.0)	1.0	16
1/19 - 1/25	1/25/2020	ND (<2.5)	1.3	0.019	1/20/2020	6.87	ND (<0.25)	5.8	210	140	ND (<0.50)	9.2	142	--	0.16	2.5	--	0.12	1.9	1/22/2020	2.1	32	
1/26 - 2/1	2/1/2020	ND (<2.5)	1.3	0.020	1/27/2020	6.76	1.1	ND (<2.5)	200	540	ND (<0.50)	2.7	42	--	0.35	5.4	--	0.51	7.9	1/29/2020	ND (<2.0)	1.0	NA
					2/3/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2/5/2020	NA	NA	

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

** Additional samples were collected and analyzed for ammonia during this week and results were included in the 30-day average loading calculation.

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)

J = Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

-- = Analyte detected; see column adjacent to right

* Total phosphorus discharge limitation of 10 lbs/day applies between March 1 and October 31; Ammonia discharge limitation of 20 lbs/day applies between April 1 and September 30; no limits apply the rest of the year.

Last Updated: February 7, 2020

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			
1.02		Lift Station 1 Lift Pump A	Running			
1.03		Lift Station 1 Lift Pump B	Standby			
1.04		Area in and around Lift Station 1	Running		3	Ran new wire to the spare IX pump.
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	Standby			
2.03		Lift Station 3 Lift Pump B	Running			
2.04		Area in and around Lift Station 3	Running			
3		Lift Station 2 and Transmission Pipelines				
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	Replaced the .5 hp motor, pump, and fittings on I-G. a new flow meter was installed on E2-2. E2-1 was replaced with a new .5 hp motor, pump and discharge hose.
4.02		Ferrous Sulfate Feed System	Running			
4.03		Polymer Feed System	Running			
4.04		Clarifier	In operation			
4.05		Filter Press	Running		2	The press hydraulic system was rebuilt along with the press pump. New oil was added and the system is in good working order.
4.06		GWTP Effluent Tank	In operation		1	The pump was replaced with a 7.5 hp pump and motor.
4.07		Interceptor Booster Pump A	Running			
4.08		Interceptor Booster Pump B	Standby			
4.09		Area In And Around GWTP	Running			
5		Equalization Area and GW-11 Pond				
5.01	PID10A	Pond GW-11	In operation		3	A new pump was installed on the SE corner
5.02	PID10A	Pond Water Pump - P101A	Running			
5.03	PID10A	Pond Water Pump - P101B	Standby			
5.04	PID10A	Equalization Tanks	In operation			

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

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 - Minor repairs that in no way alter the performance of the plant

Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
5.05	PID10A	Area in and Around EQ	In operation		2	The pressure gauge was replaced on the feed side of the GAC's.
5.06	PID10A	Raw Water Feed Pump - P102A				
5.07	PID10A	Raw Water Feed Pump - P102B				
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		2	A new backwash valve was installed.
6		First Stage FBRs A, 1 & 2				
6.01	PID14	FBR A				
6.02	PID14	Separator Tank - 1401				
6.03	PID14	Media Return Pump - P 1401			3	Replaced and rebuilt the pump.
6.04	PID14	P1401A				
6.05	PID01A	P1401B			3	A new seal water line was installed on the mechanical seal.
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	The trunnions were replaced on the pump.
6.10	PID01A	First Stage FBR Pump - P1011	Standby			
6.11	PID01A	First Stage FBR Pump - P1012				
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		3	A new pump head was installed on the pump.
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	Running			
7.02	PID01B	FBR 4	Running			

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 3 = Moderate - Work needs to be performed, but plant can still operate with redundancy that is in place
 4 = Low - Minor repairs that in no way alter the performance of the plant

Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
7.03	PID02B	First Stage Separator Tank - T2012	Running			
7.04	PID01B	Media Return Pump - P2012	Running			
7.05	PID01B	First Stage FBR Pump - P1013	Running			
7.06	PID01B	First Stage FRB Pump - P1014	Running			
7.07	PID01B	First Stage FBR Pump - P102A	Running			
7.08	PID07A	FBR 3 pH Feed Pump - P713	Running			
7.09	PID07A	FBR 4 pH Feed Pump - P714	Running			
7.10	PID07A	FBR 3 Nutrient (Urea) Feed Pump - P723				
7.11	PID07A	FBR 4 Nutrient (Urea) Feed Pump - P 724	Off			
7.12	PID15	FBR 3 Nutrient (Phos Acid) Feed Pump - P1523	Running			
7.13	PID15	FBR 4 Nutrient (Phos Acid) Feed Pump - P1524	Running			
7.14	PID07B	FBR 3 Electron Donor Assembly Pump - P733	Running			
7.15	PID07B	FBR 4 Electron Donor Assembly Pump - P734	Running			
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			
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	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	Running			
9.08	PID07A	FBR 7 pH Feed Pump - P717	Off			

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 3 = Moderate - Work needs to be performed, but plant can still operate with redundancy that is in place
 4 = Low - Minor repairs that in no way alter the performance of the plant

Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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	Running			
9.13	PID07B	FBR 8 Electron Donor Assembly Pump - P738	Running			
10		Aeration and DAF System				
10.01	PID04	Aeration Tank	In operation			
10.02	PID04	Aeration Blower - B401	Running			
10.03	PID04	Bio filter	In operation			
10.04	PID04	Nutrient Solution	Running			
10.05	PID04	Bio filter Sump				
10.06	PID04	Nutrient Pump - P401	Running			
10.07	PID04	Bio filter Sump Pump - P402A	Standby			
10.09	PID04	Bio filter 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		2	The vessel was taken offline to perform the semi-annual maintenance along with other repairs.
10.15	PID05	DAF Pressure Pump - P551	Running		2	The flex coupling was replaced and the pump was re-aligned.
10.16	PID05	DAF Float Pump - P552	Running			
10.17	PID05	Screw Conveyer Drive	Standby			
10.18	PID05	Skimmer Drive	Running		2	The chain assembly jumped the sprocket, and broke a link. The system was reattached to the sprocket and the damaged links and rollers were replaced.
11		Pumping System (Old Effluent)				
11.01	PID06	Effluent Tank 601	In operation		3	A new booster pump was installed to assist with flow.
11.02	PID06	Effluent Pump - P601	Running			
11.03	PID06	Effluent Pump - P602	Standby			
12		Sand Filter System				
12.01	PID17	Sand Filter			1	The sand filter was taken offline to conduct the annual maintenance. The system was drained and flushed. The reject weirs were cleared of debris, new screens installed on the tops of the reject weirs, and the sand bed was cleaned.
12.02	PID17	Filter Reject Tank	In operation			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
12.03	PID17	Filter Reject Pump - P1701A	Standby		2	The mechanical seal and impeller were replaced on the pump.
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		1	Installed a new VFD on the system.
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				
14.07	PID09	West Press	Standby			
14.08	PID09	East Press	Running		2	All new switches were installed on the press system. The pressure was re-adjusted and the system is back online.
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	In operation		3	The tank was flushed and set back up for Ferric from ACH.
24	PID07B	Polymer Systems - DAF	In operation		4	A new drawdown column was installed.

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25	PID09	<i>Polymer System - Solids Dewatering (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)</i>	In operation		2	A new pump and motor were reinstalled on the transfer pump end. The system was tested and ready for use.
Utility Systems						
26		Compressed Air System				
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			
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	<i>Oxygen System</i>	In operation			
28		<i>GWETS Plant Controls/ Siemens Controls</i>	In operation			
29		<i>Well Control System/ Allen Bradley Controls</i>	In operation			
30		<i>MCC FBR Pad</i>	In operation			
31		<i>MCC in D-1</i>	In operation			
32		<i>MCC in EQ area</i>	In operation			
Miscellaneous Systems						
33		<i>Operations Office/Network</i>	In operation			
34		<i>Laboratory Analyzers</i>	In operation			
35		<i>Security Systems</i>	In operation			
Shelf Spares						
		<i>Media Return Pump Rebuild Kit</i>	In stock			
		<i>pH Feed Pump</i>	In stock			
		<i>Nutrient Feed Pump</i>	In stock			
		<i>Electron Donor Feed Pump</i>	In stock			
		<i>Phosphoric Acid Feed Pump</i>	In stock			
		<i>Interceptor Well Pumps (4 each)</i>	In stock			
		<i>Seep Well Pump (1 each, same as Athens so total of 2)</i>	In stock			
		<i>Athens Road Well Pump (1 each, same as Seep so total of 2)</i>	In stock			

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