
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: September 29, 2020

Subject: NERT – GWETS Operation Monthly Report – August 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 August 2020.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS and ion exchange (IX) system normally in August 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 182 gallons per minute (gpm). The flow rate to the FBR plant averaged approximately 1,040 gpm during August 2020. At the end of the month, the GW-11 Pond volume was at 34.8 million gallons (MG), which would allow 19.2 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 from the end of August was the same as at the end of July 2020. 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 0.28 mg/L for the month. The influent perchlorate concentration to the FBR plant averaged 59 mg/L for the month, with a maximum concentration of 64 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of July 2020 averaged 66 mg/L, with a maximum concentration of 95 mg/L.

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 August.

2. Biological Plant

There were influent / effluent diversions during the reporting period generally associated with GW-11 pond level maintenance as well as extraction well short-term shutdown events. Below is a description of the events that occurred:

Diversion Events / Well Shutdowns

- Effluent diversion to GW-11 occurred on August 1, 2020 from 11:50pm to August 2, 2020 at 5:37am due to low GW-11 pond level. Approximately 329,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 2, 2020 from 11:30pm to August 3, 2020 at 5:37am due to low GW-11 pond level. Approximately 404,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 3, 2020 from 11:30pm to August 4, 2020 at 5:32am due to low GW-11 pond level. Approximately 399,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 4, 2020 from 11:28pm to August 5, 2020 at 5:32am due to low GW-11 pond level. Approximately 401,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 5, 2020 from 11:40am to 1:43pm due to low GW-11 pond level. Approximately 365,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 6, 2019 from 10:46am to 1:15pm as a precautionary measure due to concerns of effluent quality. Adjustments were made to the plant, effluent samples were tested in the lab, and the effluent was returned to the wash at 1:15 pm. Approximately 146,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 6, 2020 from 11:49pm to August 7, 2020 at 5:30am due to low GW-11 pond level. Approximately 355,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 7, 2020 from 11:31pm to August 8, 2020 at 5:10am due to low GW-11 pond level. Approximately 352,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 8, 2020 from 11:33pm to August 9, 2020 at 5:10am due to low GW-11 pond level. Approximately 378,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 10, 2020 from 12:01am to 5:34am due to low GW-11 pond level. Approximately 371,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 10, 2020 from 11:30pm to August 11, 2020 at 5:33am due to low GW-11 pond level. Approximately 399,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 11, 2020 from 11:30pm to August 12, 2020 at 5:35am due to low GW-11 pond level. Approximately 386,000 gallons of water were diverted to

GW-11.

- Influent diversion to GW-11 occurred on August 12, 2020 from 5:03pm to 6:02pm due to air compressor malfunctions. Maintenance activities were conducted on the air compressors and the plant was brought back online. Approximately 217,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on August 19, 2020 from 9:14am to 9:54am due to maintenance efforts associated with repairs to the effluent GW-11 diversion valve. Approximately 43,000 gallons of effluent were diverted to GW-11.
- Influent diversion to GW-11 occurred on August 23, 2020 from 3:09am to 5:30am as a precautionary measure due to a malfunctioning level control valve. Maintenance activities were conducted on the valve and the plant was brought back online. Approximately 214,000 gallons of water were diverted to GW-11.
- Influent diversion to GW-11 occurred on August 25, 2020 from 8:49am to 12:25pm due to maintenance activities on the front stage feed valves. Approximately 122,000 gallons of water were diverted to GW-11.

3. Spills

There were no reportable spills in the month of August.

4. Maintenance

- Major maintenance performed by ETI in the month included:
 - I. Pulled wire for the new H2S monitor system.
 - II. Replaced the communication card for the FBR-3 feed valve.
 - III. Replaced the air filter for the supply line to the FBR 3 and 4 feed valves.
 - IV. Removed the west compressor and put in the 40 hp Kaeser in its place.
 - V. Replaced the ferric drawdown column and replaced the pump.
 - VI. Pulled new wire on the North Turbine pump at Lift Station 1.
 - VII. Repaired the bound links on the North DAF skimmer system.
 - VIII. Replaced the pressure switch on the discharge line for FBR 6.
 - IX. Replaced the bed height pump on FBR A.
 - X. Installed a new pump for the DAF turbidity meter system.
- Preventative Maintenance completed or being performed by ETI in the month included:
 - I. Inspected and cleaned out the combo valves.
 - II. Replaced stickers on the ethanol tank.
 - III. Changed the oil on the air compressors.
 - IV. Replaced the tubing on the ferric line.
 - V. Flushed the piping on the ferric lines.
 - VI. Cleaned the air filters on the external A/C's at Lift Station 3.
 - VII. Flushed the pH and ORP probes.
 - VIII. Flushed out the D-1 area sump pit.
 - IX. Replaced the battery and flushed the fuel lines on the backup generator at Lift Station 3.

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. The Trust has advised Envirogen that this project is on hold pending finalization and approval of the forthcoming Unit 4 Source Area In-Situ Bioremediation Work Plan.

GWETS Extension –The signed Work Authorization for engineering and fabrication of the GWETS Extension was returned to the Trust on January 28, 2020. Orders have been placed for the major equipment for the GWETS Extension with deliveries expected during the third and fourth quarters of 2020. Envirogen is currently awaiting Trust comment on the O&M Work Authorization proposal for the GWETS Extension.

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) ^{4 5}	Chromium (TR) (mg/L) ^{4 5}	Chromium(VI) (mg/L) ^{4 5}
SWF Total Extraction ¹	746 ³	7.5	0.0026	0.0027
AWF Total Extraction ¹	462 ³	62	0.14	0.15
IWF Total Extraction ¹	60 ³	404	6.4	6.7
AP Area Total Extraction ¹	10.7 ³	605	0.143	0.138
GWTP Effluent ²	62	430	0.54	ND
GW-11 Influent ¹	0.26	51	0.07	0.025
FBR Influent ²	1,040	59	0.099	0.103

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: Sum of daily average flow for individual wells.
- 4: All concentrations reported are monthly flow weighted averages.
- 5: ND analytical values are treated as zero values in the flow weighted average calculations.

Nevada Environmental Response Trust Groundwater Extraction and Treatment System Monthly Stakeholder Metrics			
Location ID	Perchlorate (lbs/month) ¹	Chromium (TR) (lbs/month) ¹	Chromium (VI) (lbs/month) ¹
SWF Total Extraction	2,077	0.72	0.76
AWF Total Extraction	10,655	24	26
IWF Total Extraction	8,992	142	148
AP Area Total Extraction	2,408	0.57	0.55
GWTP Effluent	9,988	13	ND
GW-11 Influent	4.9	0.006	0.0024
FBR Influent ¹	23,012	38	40.1

Notes:

TR = Total Recoverable; NA = Not Analyzed.

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

Figures

Operational Metrics

Figure 1 - GW-11 Pond Volume Through 8/31/2020

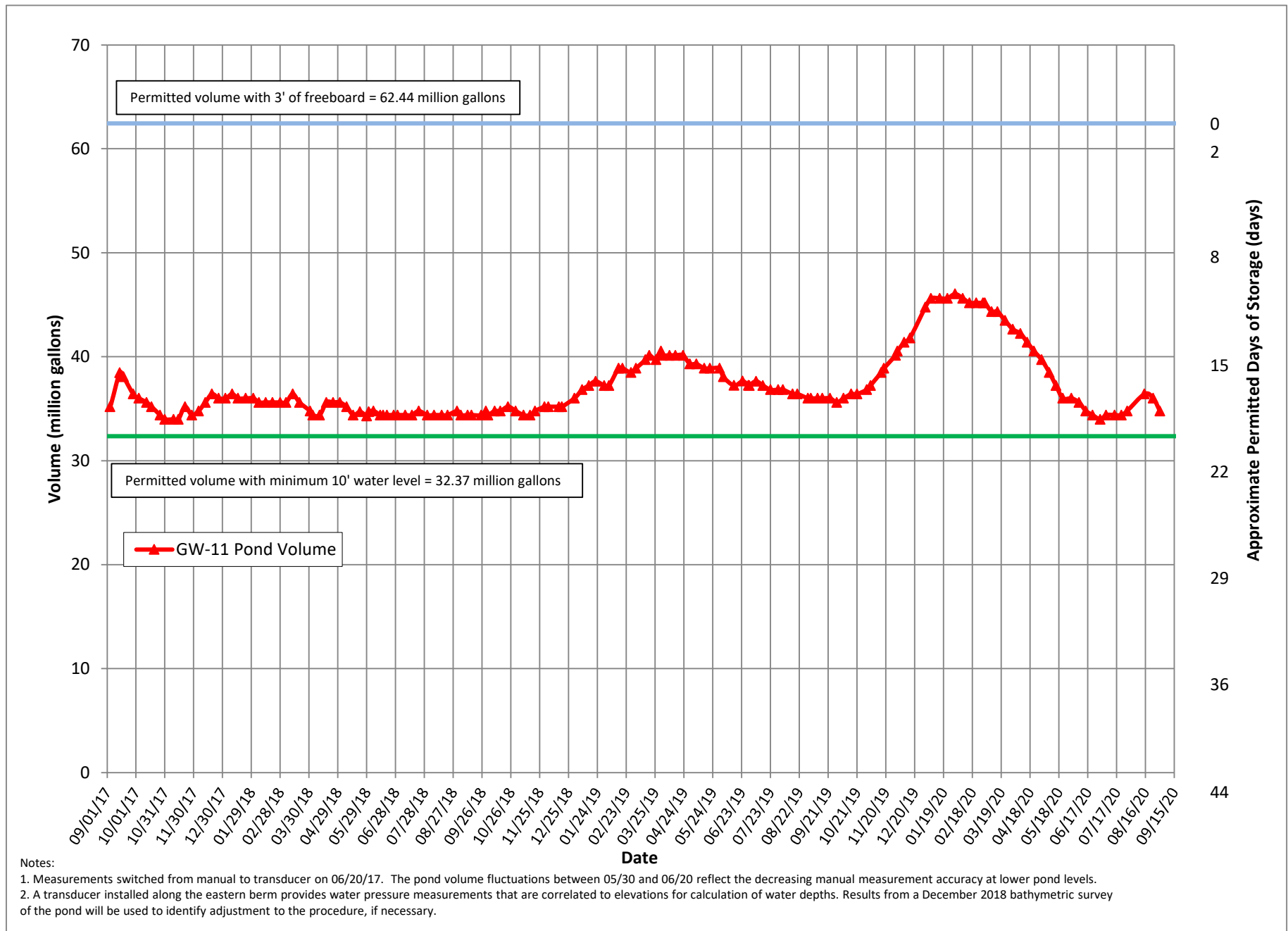
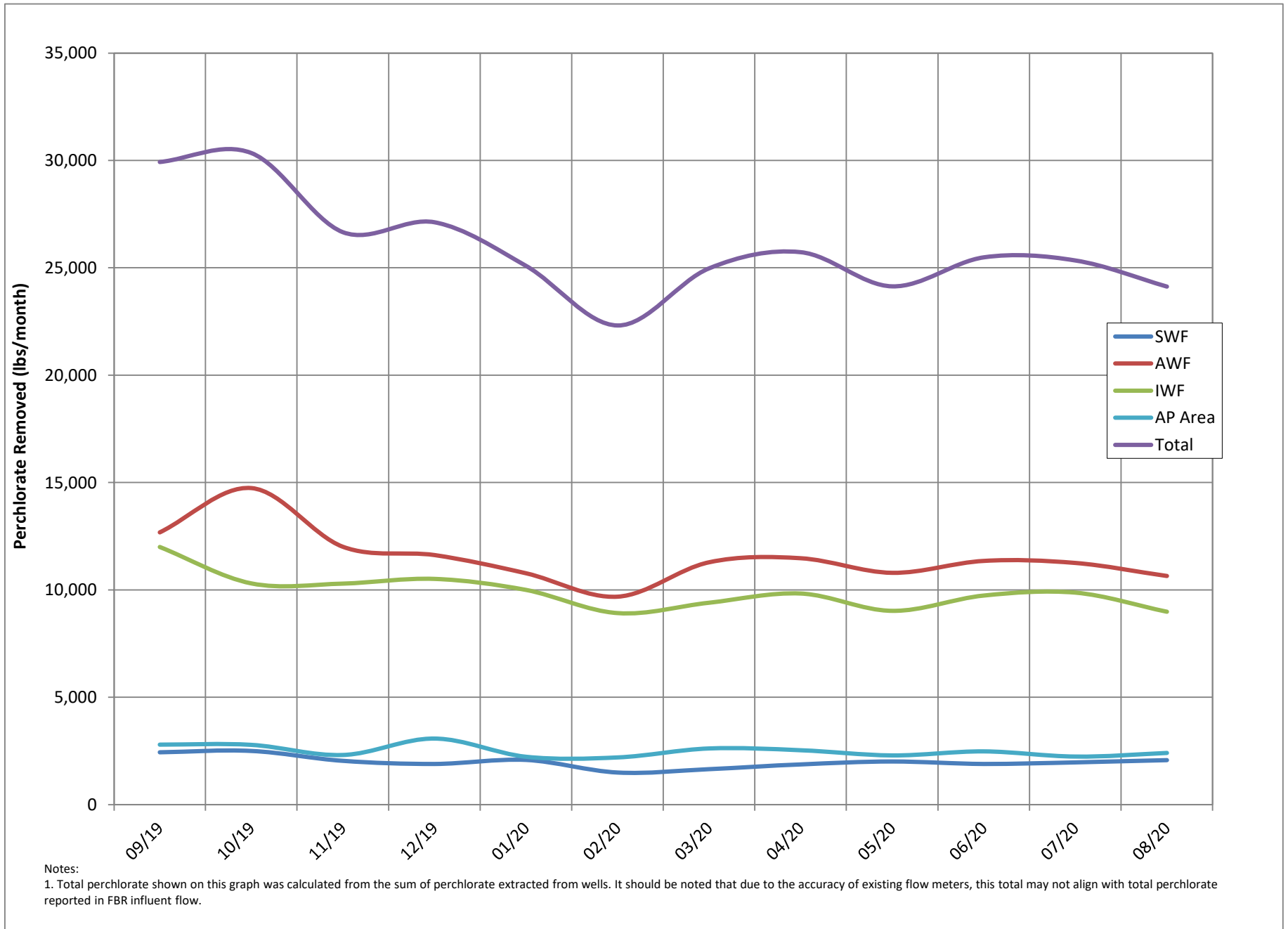


Figure 2 - Historical Perchlorate Mass Removed From Environment



Attachment A

NPDES Tracking Sheet (Prepared by Ramboll)

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		2	Installed the rebuilt motor and pulled new wire.
1.03		Lift Station 1 Lift Pump B	Standby			
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	Standby			
2.03		Lift Station 3 Lift Pump B	Running		2	Pulled and replaced the mechanical seal on the turbine.
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		3	Replaced the flowmeter on I-AB
4.02		Ferrous Sulfate Feed System	Running		3	Replaced the check ball at the injection point of the feed system.
4.03		Polymer Feed System	Running			
4.04		Clarifier	In operation			
4.05		Filter Press	Running		2	Fluid was added to the tank and the o-ring material was changed on the front clothes.
4.06		GWTP Effluent Tank	In operation			
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	Replaced the wiring that was frayed on the pond corner pumps.
5.02	PID10A	Pond Water Pump - P101A	Running			
5.03	PID10A	Pond Water Pump - P101B	Standby			
5.04	PID10A	Equalization Tanks	In operation			
5.05	PID10A	Area in and Around EQ	In operation		2	The actuator and valve were replaced on the outfall diversion valve.

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Criticality Codes

1 = Critical - Cannot continue with operation until repairs made
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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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			
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				
6.04	PID14	P1401A				
6.05	PID01A	P1401B				
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			1	The pump is offline while a new overload is received and installed.
6.12	PID01A	First Stage FRB Pump - P101A	Running			
6.13	PID07A	FBR A pH Feed Pump - P71A	Off			
6.14	PID07A	FBR 1 pH Feed Pump - P711	Off			
6.15	PID07A	FBR 2 pH Feed Pump - P712	Off			
6.16	PID07A	FBR A Nutrient (Urea) Feed Pump - P72A	Off			
6.17	PID07A	FBR 1 Nutrient (Urea) Feed Pump - P721	Off			
6.18	PID07A	FBR 2 Nutrient (Urea) Feed Pump - P722	Off			
6.19	PID15	FBR A Nutrient (Phos Acid) Feed Pump - P1520A	Running			
6.20	PID15	FBR 1 Nutrient (Phos Acid) Feed Pump - P1521	Running			
6.21	PID15	FBR 2 Nutrient (Phos Acid) Feed Pump - P1522	Running			
6.22	PID07B	FBR A Electron Donor Assembly Pump - P73A	Running			
6.23	PID07B	FBR 1 Electron Donor Assembly Pump - P731	Running			
6.24	PID07B	FBR 2 Electron Donor Assembly Pump - P732	Running			
7		First Stage FBRs 3 & 4				
7.01	PID01B	FBR 3	Running		2	The I/P signal communication was replaced.
7.02	PID01B	FBR 4	Running			
7.03	PID02B	First Stage Separator Tank - T2012	Running			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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		1	The FBR was taken offline while the pressure switch was installed.
8.02	PID03A	FBR 6	Running			
8.03	PID03C	Second Stage Separator Tank - T3011	Running			
8.04	PID03A	Media Return Pump - P3011	Running		2	The motor was replaced on the pump.
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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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 repair the skimmer system that bound up.
10.15	PID05	DAF Pressure Pump - P551	Running			
10.16	PID05	DAF Float Pump - P552	Running		2	The 2hp motor was replaced.
10.17	PID05	Screw Conveyer Drive	Standby			
10.18	PID05	Skimmer Drive	Running			
11		Pumping System (Old Effluent)				
11.01	PID06	Effluent Tank 601	In operation			
11.02	PID06	Effluent Pump - P601	Running			
11.03	PID06	Effluent Pump - P602	Standby			
12		Sand Filter System				
12.01	PID17	Sand Filter				
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
13.03	PID10C	<i>Effluent Booster Pump - P1302B</i>	Standby		4	The pressure gauge was leaking at the stem. The gauge was removed and the ports was plugged. There is another gauge on the line.
13.04	PID10C	<i>Area Around Effluent and North D-1</i>	Running			
14		Solids Collection and Pressing System				
14.01	PID16	<i>Sludge Storage Tank</i>	In operation			
14.02	PID16	<i>Solids Storage Effluent Pump - P1601</i>	Running			
14.03	PID16	<i>Solids Cond. Tank</i>	In operation			
14.04	PID09	<i>Sludge Mixer</i>	Running			
14.05	PID09	<i>Filter Press Pump - P901</i>	Running		1	The press is offline while waiting for parts to repair the power control switch.
14.06	PID09	<i>Filter Press Pump - P902</i>				
14.07	PID09	<i>West Press</i>	Standby			
14.08	PID09	<i>East Press</i>	Running			
14.09	PID09	<i>Filtrate Tank</i>	In operation			
14.10	PID09	<i>Filtrate Tank Effluent (recycle) Pump - P903</i>	Running			
		Chemical Systems				
15		Electron Donor System				
15.01	PID07B	<i>Electron Donor Tank</i>	In operation			
15.02	PID07B	<i>Booster Pump P739A</i>	Running			
15.03	PID07B	<i>Booster Pump P739B</i>	Standby			
17	PID07C	<i>Micro Nutrient System</i>	In operation			
18	PID07C	<i>Hydrogen Peroxide System</i>	In operation			
19	PID07C	<i>De-Foam System</i>	In operation			
20	PID15	<i>Nutrient (Phosphoric Acid) System (Tank only - pumps included in FBRs)</i>	In operation			
21	PID07A	<i>Nutrient (Urea) System (Tank only - pumps included in FBRs)</i>	In operation			
22	PID07A	<i>pH System (Tank and effluent pH feed pump only - other pumps included in FBRs)</i>	In operation			
23	PID07C	<i>Ferric Chloride</i>	In operation		3	New tubing and pump head were installed on the system. The line was also flushed forward to clear the solids in the line.
24	PID07B	<i>Polymer Systems - DAF</i>	In operation		3	The east pump was replaced.
25	PID09	<i>Polymer System - Solids Dewatering (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)</i>	In operation			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
Utility Systems						
26		Compressed Air System				
26.01	PID08	West Compressor	Running		2	The Ingersoll-Rand was removed and the 40 hp Kaeser was put in its place.
26.02	PID08	East Compressor	Running			
26.03	PID08	O2 Compressor	Running			
26.04	PID08	Compressed Air Receiver Tank	In operation			
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			
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			

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