
To: Nevada Division of Environmental Protection
Nevada Environmental Response Trust

Cc: Nevada Environmental Response Trust Stakeholders

From: Michael Del Vecchio, Director Engineering and Project Management

Date: May 20, 2023

Subject: NERT – GWETS Operation Monthly Report – April 2023

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 April 2022.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS and ion exchange (IX) system normally in April 2023. Flow from PC-118, PC-119, PC-120, PC-121, and PC-133 were routed to the IX system, bypassing all flow meters associated with the FBR plant for the month of April. The flow rate to the IX system averaged approximately 261 gallons per minute (gpm). The flow rate to the FBR plant averaged approximately 917 gpm during April. At the end of the month, the filled GW-11 Pond volume was at 45.2 million gallons (MG), which would allow 12.0 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 since the end of March 2023; 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 0.89 mg/L for the month. The influent perchlorate concentration to the FBR plant averaged 51 mg/L for the month, with a maximum concentration of 55 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of March 2023 averaged 54 mg/L, with a maximum concentration of 57 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. 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 April.

2. Biological Plant

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

- Influent diversion occurred on April 3, 2023 from 8:12am to 10:15am due to maintenance efforts on the FBR 4 feed valve. Maintenance was completed and the plant was brought back online. Approximately 120,000 gallons of water were added to GW-11.
- Extraction well field intermittent shutdowns of the IWF occurred on April 4, 2023 from 8:15am to 2:46pm due to electrical maintenance activities at the well control boxes. Maintenance was completed for the day and the well field was brought back online.
- Extraction well field intermittent shutdowns of the IWF occurred on April 5, 2023 from 8:51am to 12:21pm due to electrical maintenance activities at the well control boxes. Maintenance was completed for the day and the well field was brought back online.
- Extraction well field intermittent shutdowns of the IWF occurred on April 6, 2023 from 11:26am to 2:11pm due to electrical maintenance activities at the well control boxes. Maintenance was completed for the day and the well field was brought back online.
- Extraction well shutdown of the AWF well ART-9 occurred on April 6, 2023 from 8:22pm to April 7, 2023 at 12:06pm due to a malfunctioning electric pump motor connection. The electrical connection was replaced and the well was brought back online.
- Extraction well shutdown of the IWF well I-D occurred on April 12, 2023 from 12:43pm to April 13, 2023 at 7:23am due to a malfunctioning electric switch. The switch was replaced and the well was brought back online.
- Extraction well field shutdown of the SWF occurred on April 17, 2023 from 9:15am to 9:46am due to malfunctioning communication signaling. The communication signal was reestablished and the well field was brought back online.
- Extraction wellfield shutdown of the IWF occurred on April 25, 2023 from 10:36am to 10:48am due to a malfunctioning electric breaker at the T-205 tank. The breaker was repaired and the well field was brought back online.
- Effluent diversion occurred on April 27, 2023 from 9:59pm to April 28, 2023 at 1:04am as a precautionary measure due to the presence of perchlorate in the effluent. Adjustments were made to the process, the effluent was retested and confirmed in compliance, and the effluent was returned to the outfall. Approximately 99,000 gallons of water were added to GW-11.

3. IX Treatment Plant

During the month of February 2022, flooding conditions were observed adjacent to the SWF as a result of the City of Henderson's (CoH's) use of inactive Birding Ponds 10 through 13. The discharge to these ponds resulted in an increase in groundwater elevation adjacent to the SWF by approximately 5 feet. This increase in groundwater elevation caused flooding adjacent to the SWF extraction wells and within four extraction well vaults. ETI temporarily increased the pumping rate of extraction wells PC-120 and PC-121 to reduce flooding with the well vaults. Additionally, the concentration of perchlorate in shallow groundwater increased resulting in increased loading to the IX treatment plant. The CoH ceased discharging water to Birding Ponds 10 through 13 in February 2022. The groundwater elevation adjacent to the SWF is no longer elevated but perchlorate concentrations are still elevated, although decreasing, in shallow groundwater adjacent to wells PC-118, PC-119, PC-120, and PC-121.

4. Spills

There were no reportable spills in the Month of April.

5. Maintenance

- Major maintenance performed by ETI in the reporting month included:
 - I. Changed out motor on P-502 Sludge pump.
 - II. Installed lighting for polymer tank area.
 - III. Installed new air receiving tank for compressor system.
 - IV. Replaced electrical "pig tail" connection for extraction well ART-9 motor.
 - V. Changed isolation valve for Hydrogen Peroxide tote.
 - VI. Set up temporary A/C in the D-1 MCC room.
 - VII. Installed a water line from the thickener to the polymer tank.
 - VIII. Replaced the 5 hp motor for extraction well ART-8A.
 - IX. Replaced Separator 1 Level Control Valve actuator.

- Preventative maintenance performed by ETI in the reporting month included:
 - I. Greased the turbine pumps at Lift Station 1.
 - II. Completed monthly rotating equipment inspection.
 - III. Inspected and cleaned out HMI cabinets at the Lift Stations.
 - IV. Completed monthly fire cabinet inspection.
 - V. Completed Fire Extinguisher inspection (performed by Johnson controls).
 - VI. Inspected containments on and off site for cracks or possible leaks.
 - VII. Flushed and calibrated the ORP probes on all FBR pump skids.
 - VIII. Tested alarms and auto dialer.
 - IX. Inspected straps and slings for quality. Damaged equipment was replaced.

Attachment B contains a summary of all maintenance activities completed during the reporting period.

Facility Projects

1. Treatment System Extension (TSE) – Envirogen has delivered all of the contracted equipment for the GWETS extension. TSE construction and system start-up is being facilitated by Arcadis through terms with the Trust and began in December 2021. System startup began in April 2023. Treatment of impacted TIMET groundwater expected to begin in May 2023. ETI will incorporate a summary of the treatment operations once the system becomes operational.

2. Facility Repair/Replacement Items – Envirogen and the Trust have finalized a list of facility items to be addressed in connection with Amendment 8 to the O&M Agreement. All work with the exception of repainting the ethanol tank and replacement of the DAF have been completed. Specific details on in-progress items are provided below:
 - I. (WA 23-03) Dissolved Air Floatation (DAF) Vessel replacement–
 1. DAF work authorization to be signed by ETI in May 2023.
 - II. (WA 23-01) Coating of Ethanol Tank
 1. Procurement complete.
 2. Coating application anticipated in May 2023.

3. Improved Biological Treatment Plant Efficiency – Consistent with Attachment D to the December 2021 GWETS Operation Monthly Report, Envirogen plans to take five FBRs out of service and maintain them in working condition should they be needed in the future. This action will reduce the use of electricity and water and still maintain sufficient treatment capacity to address current groundwater extracted from the IWF, AWF, and the SWF as well as groundwater to be extracted as part of the Unit 4 Source Area In-Situ Bioremediation Treatability Study. FBR A was placed into Offline mode on April 13, 2022. The electrical and mechanical components of the pump skid were inspected and removed when applicable. The removal of the sand media is complete. Final inspection of all internal components is also complete. The remaining FBRs scheduled to be taken out of service will be addressed in the 4th quarter of 2023.

4. GWETS Pipeline Realignment – ETI was made aware of at least three locations approximately 1.75 miles from the site which will require the modification of the influent and effluent pipelines due to conflicts with ongoing development in the area. The Trust has authorized Tetra Tech to engage with the required property owners to design and build the new sections of pipeline. ETI continues to work with both Tetra Tech and the Trust to verify plans are acceptable and plant downtime is kept to a minimum during the construction efforts. In December, the first pipeline realignment project immediately north of Galleria Drive was completed. The second pipeline realignment located further north of Galleria Drive was determined to be unnecessary as the vertical separation between the GWETS pipelines and the stormwater culvert under construction did not place an unacceptable load on the pipelines at this location. The third pipeline realignment is located in the vicinity to Pabco Road and Galleria Road and is expected to be completed in 3rd quarter of 2023. ETI is currently supporting the Trust as required on this project while the Trust finalizes project design with the property owners.

5. Water Reuse – Consistent with the Trust's efforts to reduce its water consumption and acknowledgment of best management practices, accelerated by the Basic Water Company (BWC) bankruptcy filing, the Trust is actively pursuing multiple options to become independent of the BWC water distribution system. To that end, it is the objective of the Trust to replace the water currently distributed by BWC through implementation of a water filtration system to allow for reuse of the GWETS effluent. The filtered effluent can only be used within treatment operations. Equipment integration is expected to begin in early June 2023.

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	Chromium (TR) (mg/L) ⁴	Chromium(VI) (mg/L) ⁴
SWF Total Extraction ¹	728 ³	7.0	0.0012	0.0023
AWF Total Extraction ¹	438 ³	49	0.11	0.11
IWF Total Extraction ¹	48 ³	324	5.5	5.8
AP Area Total Extraction ¹	9.1 ³	587	0.21	0.20
GWTP Effluent ²	59	377	1.3	0.00011
GW-11 Influent ¹	0.23	25	0.061	0.058
FBR Influent ²	917	51	0.16	0.051

Notes:

ND = Not detected above laboratory method detection limit (Cr(VI) = 0.25 ug/L).

TR = Total Recoverable.

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

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

3: Sum of daily average flow for individual wells.

4: All concentrations reported are monthly flow weighted averages.

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	1,520	0.26	0.49
AWF Total Extraction	7,669	18	18
IWF Total Extraction	5,675	96	102
AP Area Total Extraction	1,932	0.68	0.66
GWTP Effluent	8,066	27	0.0024
GW-11 Influent	2.1	0.0051	0.0049
FBR Influent ¹	16,758	54	17

Notes:

TR = Total Recoverable.

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 04/30/2023

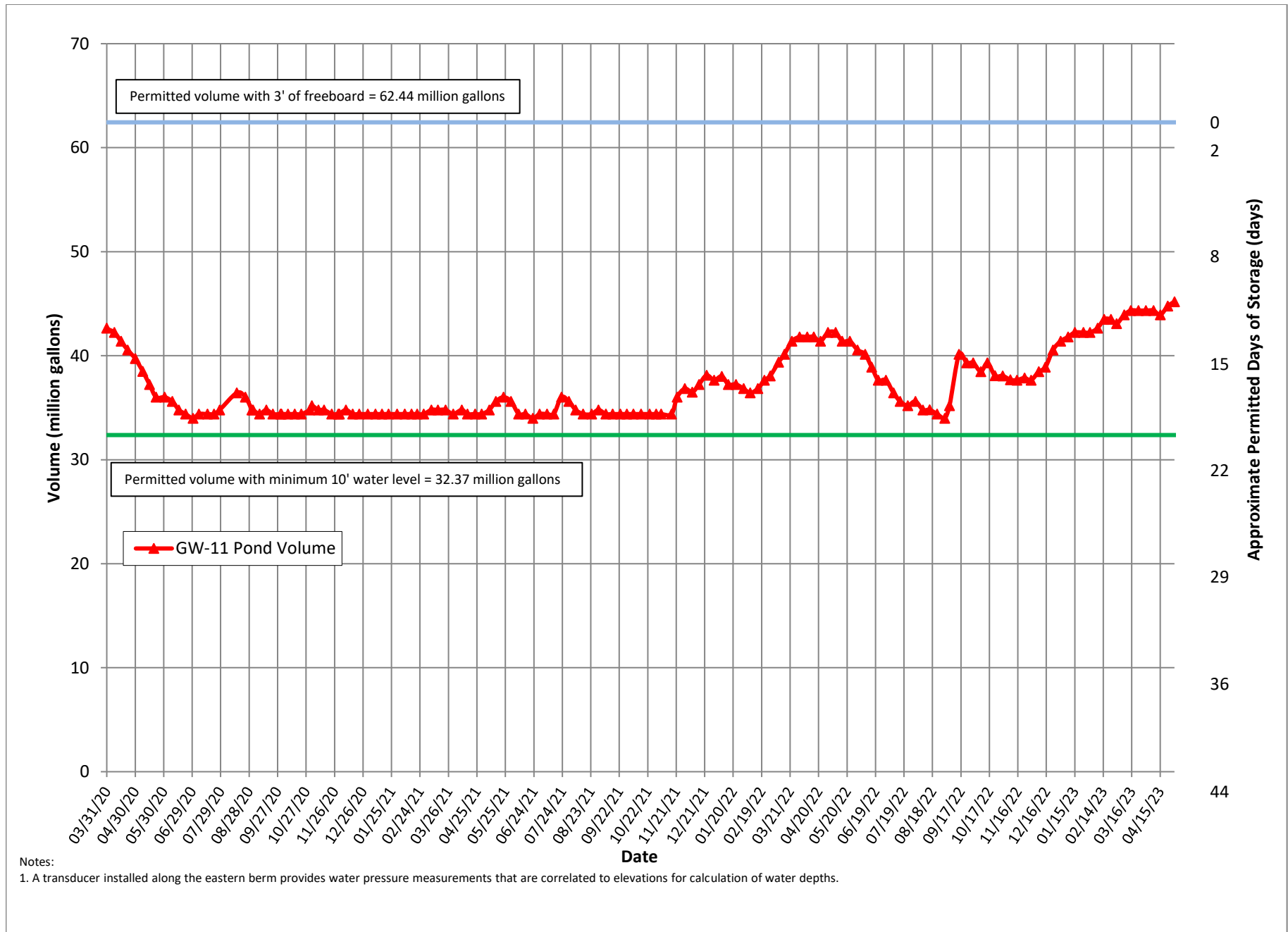
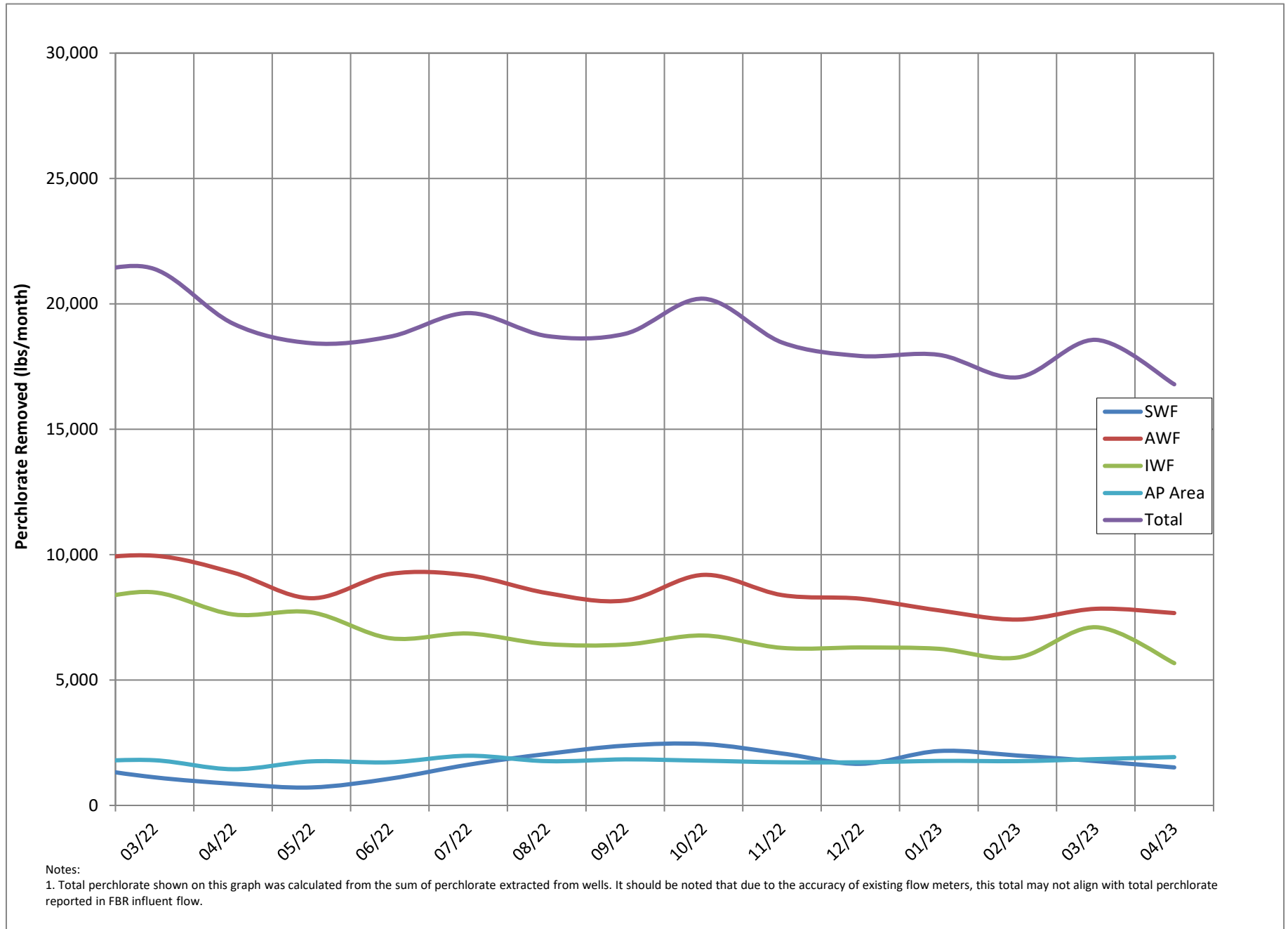


Figure 2 - Historical Perchlorate Mass Removed From Environment



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. (mg/L)	Daily Average (mg/L)	30-Day Avg. (lbs/day)	30-Day Avg. (lbs/day)	30-Day Avg. (mg/L)	Daily Max. (mg/L)	30-Day Avg. (lbs/day)
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			
January 2023	1.70	1.76	ND (<1.6)	0.011	6.6	6.9	ND (<0.150)	26	390	1,100	0.96	13	190	1.9	5.1	ND (<5.0)	ND (<5.0)	36	3,900		
February 2023	1.69	1.75	1.1	0.015	6.8	7.1	ND (<0.150)	41	340	1,300	1.3	22	310	4.2	7.2	ND (<5.0)	ND (<5.0)	35			
March 2023	1.67	1.78	2.3	0.033	7.1	7.4	ND (<0.150)	13	320	1,100	1.3	20	270	3.6	5.6	ND (<5.0)	ND (<5.0)	35			
April 2023 (month to date)	1.63	1.75	1.8	0.025	6.8	7.1	ND (<0.150)	35	390	940	0.82	18	240	2.5	4.6	5.6	15	78			
May 2023 (month to date)	1.64	1.65	NA	NA	NA	NA	ND (<0.150)	NA	NA	NA	NA	NA	NA	NA	NA	ND (<5.0)	ND (<5.0)	34			

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			
1/1 - 1/7	1/7/2023	ND (<1.6)	0.8	0.011	1/4/2023	6.6	ND (<0.150)	10	340	830	0.87	ND(<10)	5	70	--	0.090	1.3	--	0.43	6.0	1/4/2023	ND (<5.0)	2.5	35
1/8 - 1/14	1/14/2023	ND (<1.6)	0.8	0.011	1/11/2023	6.8	ND (<0.150)	22	280	690	0.80	--	10	142	--	0.044	0.63	--	0.30	4.3	1/11/2023	ND (<5.0)	2.5	36
1/15 - 1/21	1/21/2023	ND (<1.6)	0.8	0.012	1/18/2023	6.8	ND (<0.150)	15	350	1100	0.80	--	19	275	--	0.16	2.3	--	0.40	5.8	1/18/2023	ND (<5.0)	2.5	36
1/22 - 1/28	1/28/2023	ND (<1.6)	0.8	0.012	1/25/2023	6.9	ND (<0.150)	26	390	760	0.96	--	19	277	--	0.24	3.5	--	0.31	4.5	1/25/2023	ND (<5.0)	2.5	36
1/29 - 2/4	2/4/2023	ND (<1.6)	0.8	0.011	2/1/2023	7.1	ND (<0.150)	7.6	340	620	0.80	--	20	281	--	0.16	2.3	--	0.32	4.5	2/1/2023	ND (<5.0)	2.5	35
2/5 - 2/11	2/11/2023	ND (<1.6)	0.8	0.011	2/8/2023	6.8	ND (<0.150)	41	290	1100	0.87	--	24	349	--	0.19	2.8	--	0.31	4.5	2/8/2023	ND (<5.0)	2.5	36
2/12 - 2/18	2/18/2023	2.0	2.0	0.027	2/15/2023	6.8	ND (<0.150)	3.8	280	970	0.75	--	20	282	--	0.15	2.1	--	0.49	6.9	2/15/2023	ND (<5.0)	2.5	35
2/19 - 2/25	2/25/2023	ND (<1.6)	0.8	0.011	2/22/2023	7.0	ND (<0.150)	25	260	1300	1.3	--	24	335	--	0.69	9.6	--	0.91	12.7	2/22/2023	ND (<5.0)	2.5	35
2/26 - 3/4	3/4/2023	ND (<1.6)	0.8	0.012	3/1/2023	7.2	ND (<0.150)	13	320	1100	0.22	--	12	174	--	0.20	2.9	--	0.49	7.1	3/1/2023	ND (<5.0)	2.5	36
3/5 - 3/11	3/11/2023	ND (<1.6)	0.8	0.011	3/8/2023	7.1	ND (<0.150)	9.5	300	620	1.0	--	14	196	--	0.23	3.2	--	0.30	4.2	3/8/2023	ND (<5.0)	2.5	35
3/12 - 3/18	3/18/2023	ND (<1.6)	0.8	0.011	3/15/2023	7.2	ND (<0.150)	11	290	860	1.3	--	22	284	--	0.33	4.3	--	0.40	5.2	3/15/2023	ND (<5.0)	2.5	32
3/19 - 3/25	3/25/2023	ND (<1.6)	0.8	0.011	3/22/2023	7.1	ND (<0.150)	5.3	240	710	0.71	--	21	298	--	0.18	2.6	--	0.33	4.7	3/22/2023	ND (<5.0)	2.5	35
3/26 - 4/1	4/1/2023	8.4	8.4	0.120	3/29/2023	7.4	ND (<0.150)**	4.8	260	620	1.1	--	29	413	--	0.35	5.0	--	0.49	7.0	3/29/2023	ND (<5.0)	2.5	36
4/2 - 4/8	4/8/2023	ND (<1.6)	0.8	0.011	4/5/2023	6.8	ND (<0.150)	0.87	260	210	0.79	--	16	223	--	0.16	2.2	--	0.32	4.5	4/5/2023	ND (<5.0)	2.5	35
4/9 - 4/15	4/15/2023	ND (<1.6)	0.8	0.011	4/12/2023	7.0	ND (<0.150)	35	390	540	0.75	--	19	268	--	0.17	2.4	--	0.31	4.4	4/12/2023	ND (<5.0)	2.5	35
4/16 - 4/22	4/22/2023	3.9	3.9	0.053	4/19/2023	6.8	ND (<0.150)	6.6	260	370	0.82	--	18	237	--	0.21	2.8	--	0.30	4.0	4/19/2023	ND (<5.0)	2.5	33
4/23 - 4/29	4/29/2023	NA	NA	NA	4/26/2023	7.1	ND (<0.150)	6.9	290	940	0.82	--	NA	NA	--	0.18	2.5	--	0.41	5.7	4/26/2023	15	15	208
4/30 - 5/6	5/6/2023	NA	NA	NA	5/3/2023	7.0	ND (<0.150)	NA	NA	NA	NA	--	NA	NA	--	0.34	4.6	--	NA	NA	5/3/2023	ND (<5.0)	2.5	34

Note: Analytical responsibilities are performed by Eurofins Environment Testing (Eurofins) in Phoenix, Arizona, and hexavalent chromium is analyzed by Pace Analytical (Pace) in Las Vegas, Nevada, unless otherwise indicated.

* Additional samples were collected this week.

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)

NS = Not Sampled or Not Analyzed

-- = 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.

**Pace Hexavalent Chromium sample taken 03/31/2023; original sample taken 03/29/2023 (L1599378) went over hold time and needed resampling.

Last Updated: May 12, 2023

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		2	Re-wired the radio on the HMI cabinet.
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		2	Contractor calibrated flowmeters and installed new HMI.
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			
4.02		Ferrous Sulfate Feed System	Running			
4.03		Polymer Feed System	Running		4	Installed water line for polymer tank.
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			
4.09		Area In And Around GWTP	Running			
5		Equalization Area and GW-11 Pond				
5.01	PID10A	Pond GW-11	In operation			
5.02	PID10A	Pond Water Pump - P101A	Running			
5.03	PID10A	Pond Water Pump - P101B	Standby			
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				
5.07	PID10A	Raw Water Feed Pump - P102B				
5.08	PID10A	F-101 Filters	Running			
5.09	PID10B	Carbon Absorber - LGAC 201A				
5.10	PID10B	Carbon Absorber - LGAC 201B				
5.11	PID10B	Carbon Absorber - LGAC 201C				
6		First Stage FBRs A, 1 & 2				
6.01	PID14	FBR A				EQUIPMENT OFFLINE
6.02	PID14	Separator Tank - 1401				EQUIPMENT OFFLINE
6.03	PID14	Media Return Pump - P 1401				EQUIPMENT OFFLINE
6.04	PID14	P1401A				EQUIPMENT OFFLINE
6.05	PID01A	P1401B				EQUIPMENT OFFLINE
6.06	PID01A	FBR 1	Running			
6.07	PID02A	FBR 2	Running			
6.08	PID01A	First Stage Separator Tank - T2011	Running		4	Level Control Valve was replaced and returned to auto.
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				
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			Equipment offline
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		2	Changed acuator and positioner on control valve.
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			

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
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			
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		2	Replaced leaking valves.
10		Aeration and DAF System				
10.01	PID04	Aeration Tank	In operation			
10.02	PID04	Aeration Blower - B401	Running		4	Changed out the filter.
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			
10.15	PID05	DAF Pressure Pump - P551	Running			
10.16	PID05	DAF Float Pump - P552	Running			
10.17	PID05	Screw Conveyer Drive	Standby			
10.18	PID05	Skimmer Drive	Running			
11		Pumping System (Old Effluent)				
11.01	PID06	Effluent Tank 601	In operation			
11.02	PID06	Effluent Pump - P601	Running			
11.03	PID06	Effluent Pump - P602				
12		Sand Filter System				
12.01	PID17	Sand Filter			3	Replaced #3 airlift.
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	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			

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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
14.03	PID16	Solids Cond. Tank	In operation		4	Installed sludge transfer system for new Treatment System Extension plant.
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			
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			
24	PID07B	Polymer Systems - DAF	In operation			
25	PID09	Polymer System - Solids Dewatering (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)	In operation			
Utility Systems						
26	Compressed Air System					
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			
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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