
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, 2022

Subject: NERT – GWETS Operation Monthly Report – April 2022

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 2022. Flow from 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 262 gallons per minute (gpm). The flow rate to the FBR plant averaged approximately 957 gpm during April 2022. At the end of the month, the available GW-11 Pond volume was at 42.23 million gallons (MG), which would allow 14.0 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 2022; 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 1.5 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 82 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of March 2022 averaged 50 mg/L, with a maximum concentration of 57 mg/L.

During February, flooding conditions occurred adjacent to the SWF as a result of the City of Henderson's (CoH) use of inactive Birding Ponds 10 through 13. ETI responded to ensure minimal impact to ongoing operations. Additional details are provided in Section 3 of this report.

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 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

- Interceptor Well Field (IWF) shutdown occurred from April 11, 2022 from 10:24am to April 11, 2022 at 10:37am due to a maintenance activities replacing a power supply module at the GWTP. Maintenance was completed and the wells were brought back online.
- Influent diversion occurred on April 19, 2022 from 10:13am to 11:28am to allow for the disk filter pilot project to be installed. Approximately 75,000 gallons of water were added to GW-11.

3. IX Treatment Plant

During the month of February, 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. To minimize the usage of resin, ETI routed water from extraction well PC-118 back to the FBRs for treatment. The CoH ceased discharging water to Birding Ponds 10 through 13 in February and ETI anticipates that conditions will return to normal within the next three months.

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. Took FBR A offline and began draining the tanks of water and sand.
 - II. Rebuilt the bed height pump for FBR 1.
 - III. Replaced worn valves on T-205.
 - IV. Cleaned the effluent line from GWTP to the EQ area.
 - V. Replaced the flowmeter on E1-1.
 - VI. Installed new static mixers on the DAF polymer system.
 - VII. Replaced the oil fill plug for the air compressor in the D-1 building.
 - VIII. Replaced the electrical connections on ART-1A.
 - IX. Installed round mirrors on the blind corners around the plant.

- Preventative maintenance performed by ETI in the reporting month included:
 - I. Replaced the worn drawdown column for the DAF Polymer system.
 - II. Changed the oil on the LS2 turbines.
 - III. Inspected and tightened the flex couplings on the FBR recycle pumps that were in standby.
 - IV. Greased the aeration tank blower.
 - V. Cleared the solids from the ISEP sump pit.
 - VI. Tightened all connections on the GWTP PLC.
 - VII. Cleaned and flushed the pH and ORP lines.

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

Facility Projects

1. Chromium Treatment Subsystem – Envirogen received a Work Authorization for this scope in February 2022. The 90 percent design for the Chromium Treatment Subsystem was submitted to NDEP on March 18, 2022. NDEP requested submittal of the 100 percent design on March 29, 2022. Envirogen finalized the 100 percent design package for submittal in May 2022. With a number of supply chain delays, Envirogen is currently targeting July 2022 to complete the modifications required to treat groundwater extracted as part of the Unit 4 Source Area In-Situ Bioremediation Treatability Study as well as the flow currently routed to the existing Chromium Treatment Plant (i.e. GWTP) from the IWF and AP Area wells. Currently Envirogen procurement is complete and some preliminary work on existing equipment has begun at the site.
2. 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. ETI will incorporate a summary of the treatment operations once the system becomes operational (anticipated to occur in 4Q 2022).
3. 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. Attachment C contains a status summary prepared by the Trust of all agreed upon items. Specific details on in-progress items are provided below:

- I. (WA 21-02) East Air Compressor - Complete
- II. (WA 21-03) Wiring at Lift Station 3
 1. 90% of the work in field is complete, awaiting AC units (a long lead item). Anticipating a May 2022 completion.
- III. (WA 21-04) Motor Control Center at Lift Station 1
 1. Work started, but delayed due to flooding at the SWF, also impacting Lift Station 1. MCC & major equipment has been delivered.
- IV. (WA 21-05) Replacement of Safety Shower System
 1. Installation in progress, estimated completion Q2 2022.
- V. (WA 21-06) Influent Pipeline Combination Valves
 1. Work started, but delayed due to flooding at the SWF (couldn't turn off well field with the elevated groundwater levels).
- VI. (WA 21-07) Replacement of all pH and ORP probes.
 1. Authorization received from the Trust. Delayed due to supply chain issues.
- VII. (WA 21-08) Wiring IWF wells
 1. New wire has been installed at the wells, awaiting new starters to be delivered. Due to supply chain issues, some of the required electrical items are delayed. Expected delivery in the June timeframe. Getting ready to run the new power line from the D-1 Building but this will need to be coordinated with system shutdown.
- VIII. (WA 21-09) Siemens controls upgrade
 1. Spare parts being received. Due to supply chain delays the HMI for the on-pad system is delayed.
- IX. (WA 22-01) DAF Pilot
 1. Pilot was delivered late April and is currently in start-up and adjustment. The Pilot is scheduled to run until mid-June.
 - a. Forward flow to the pilot began 4-21-22 at approx. 35 gpm.
 - b. Pilot effluent pump failed and was replaced 4-28-22.
- X. (WA 22-02) Sludge Pump and Bins
 1. Equipment is on order and starting to arrive onsite.
- XI. (WA 22-03) Influent and Effluent Pump Motors
 1. Equipment is on order. Deliveries have begun.
- XII. (WA 22-04) FBR Skid Upgrades
 1. Equipment is on order. Deliveries have begun.
- XIII. (WA 22-05) Large Valve Upgrades
 1. Equipment is on order. Deliveries have begun
- XIV. (WA 22-07) LS2 Pump Replacement
 1. Equipment is on order. Awaiting delivery

4. 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. Envirogen has begun this process by taking FBR A out of service. FBR A was placed into Offline mode on April 13, 2022 at approximately 11:00am. The electrical and mechanical components of the pump skid were inspected and removed when applicable. The removal of the sand media is underway and is approximately 75% complete. Final inspection of all internal components will be completed when media removal is complete.
5. GWETS Effluent Reuse Pilot – A work authorization was finalized in April to procure and evaluate the performance of a membrane filtration system to produce GWETS utility water directly from plant effluent. The system is expected to arrive in May.

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	740 ³	3.2	ND	0.00077
AWF Total Extraction ¹	485 ³	53	0.14	0.14
IWF Total Extraction ¹	54 ³	388	5.8	5.3
AP Area Total Extraction ¹	7.5 ³	534	0.17	0.16
GWTP Effluent ²	61	286	0.23	ND
GW-11 Influent ¹	0.20	49	0.32	0.0064
FBR Influent ²	957	59	0.13	0.12

Notes:

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

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.

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	867	ND	0.21
AWF Total Extraction	9,287	24	25
IWF Total Extraction	7,620	115	104
AP Area Total Extraction	1,442	0.46	0.42
GWTP Effluent	6,303	5.1	ND
GW-11 Influent	3.52	0.023	0.00046
FBR Influent ¹	20,334	44	40

Notes:

ND = Not detected above laboratory method detection limit.

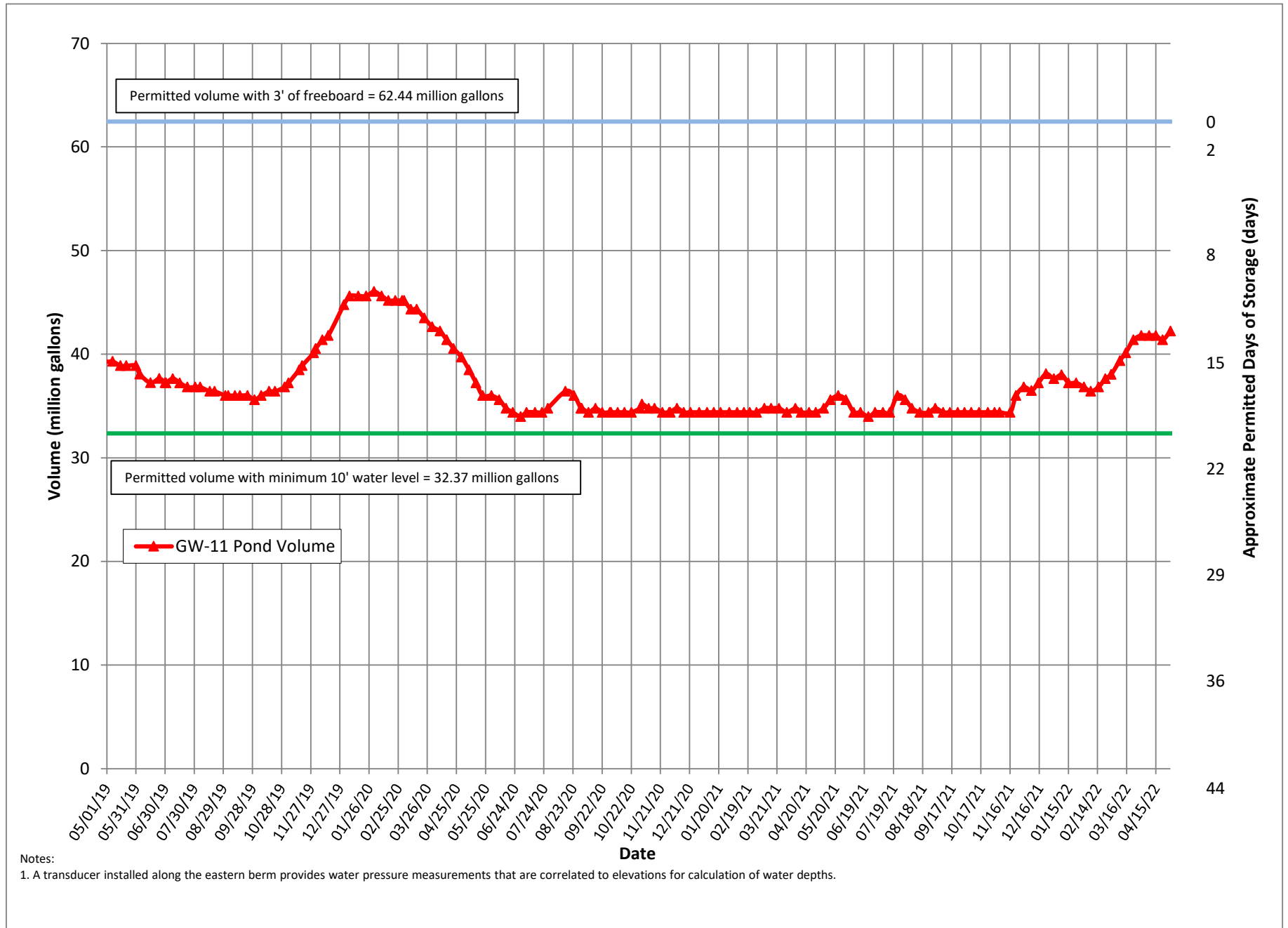
TR = Total Recoverable.

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

Figures

Operational Metrics

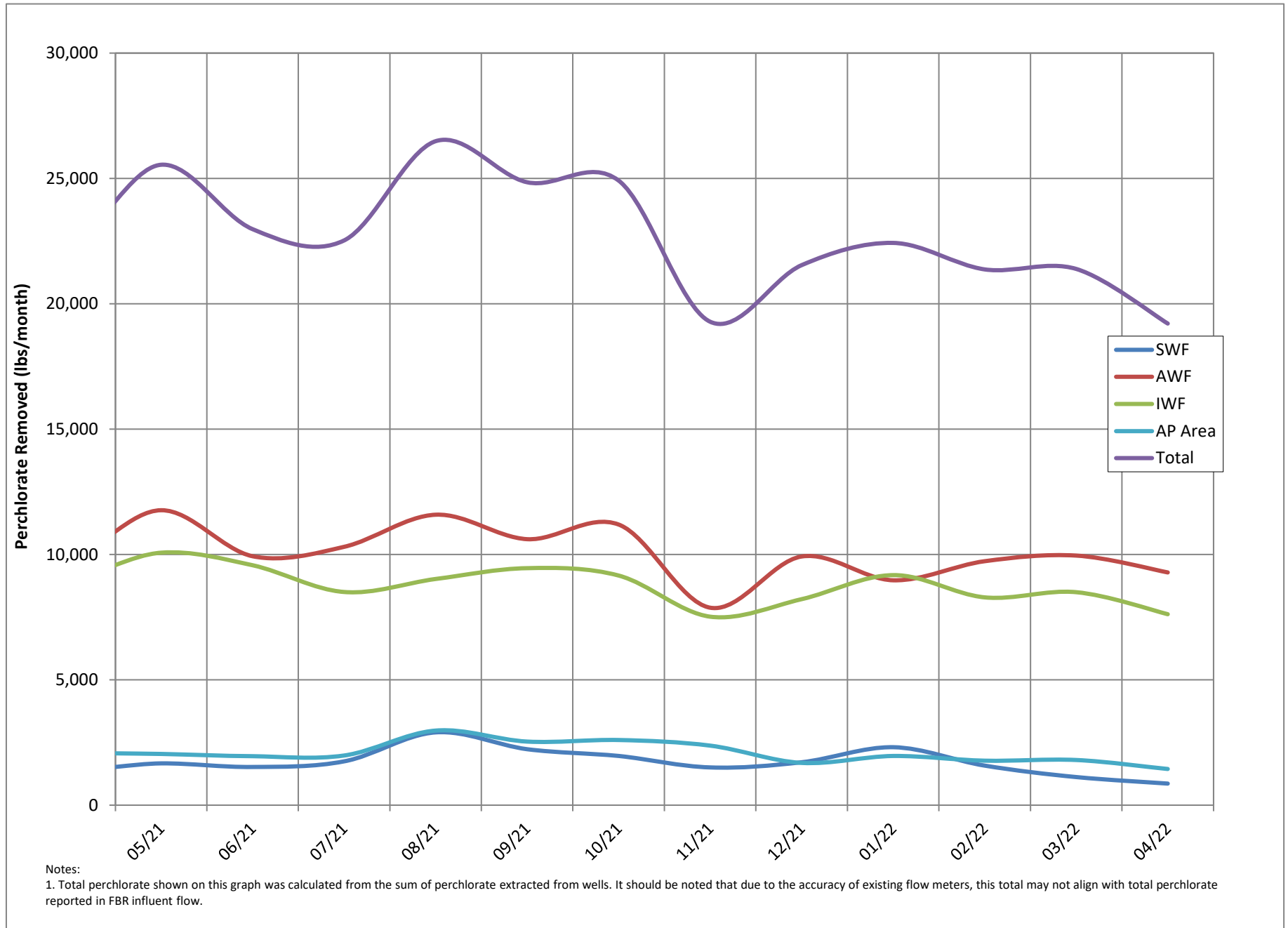
Figure 1 - GW-11 Pond Volume Through 04/30/2022



Notes:

1. A transducer installed along the eastern berm provides water pressure measurements that are correlated to elevations for calculation of water depths.

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 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	
January 2022	1.85	1.92	0.7	0.011	7.0	7.4	ND (<0.50)	12	61	1,100	0.88	10	150	2.0	7	ND (<5.0)	ND (<5.0)	39	
February 2022	1.77	1.95	2.2	0.033	6.8	7.5	ND (<0.50)	7.4	78	1,200	1.6	17	240	2.6	6.1	ND (<5.0)	ND (<5.0)	38	3,800
March 2022	1.70	1.84	2.7	0.038	6.5	7.2	ND (<0.50)	2.1	170	1,200	2.9	12	170	1.5	8	ND (<5.0)	ND (<5.0)	35	
April 2022	1.72	1.82	1.3	0.020	7.1	7.2	ND (<0.50)	14	200	590	2.5	8	120	1.7	3.5	ND (<5.0)	ND (<5.0)	36	
May 2022 (month to date)	1.64	1.67	NA	NA	7.3	7.3	ND (<0.50)	3.7	150	660	1.8	5	69	1.5	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			
1/2 - 1/8	1/8/2022	ND (<0.31)	0.16	0.0024	1/3/2022	7.0	ND (<0.50)	4.8	11	910	0.35	14	220	--	0.13	2.0	--	0.47	7.4	1/5/2022	ND (<5.0)	2.5	39	
1/9 - 1/15	1/15/2022	0.61 J	0.61	0.0094	1/10/2022	7.4	ND (<0.50)	2.2	38	600	0.41	ND(<10)	5	78	--	0.18	2.8	--	0.25	3.9	1/12/2022	ND (<5.0)	2.5	38
1/16 - 1/22	1/22/2022	0.52 J	0.52	0.0081	1/17/2022	7.2	ND (<0.50)	12	55	1,100	0.64	19	301	--	0.16	2.5	--	0.73	12	1/19/2022	ND (<5.0)	2.5	39	
1/23 - 1/29	1/29/2022	1.5	1.5	0.023	1/24/2022	7.0	ND (<0.50)	1.4	61	530	0.63	ND(<10)	5	78	--	0.10	1.6	--	0.34	5.3	1/26/2022	ND (<5.0)	2.5	39
1/30 - 2/5	2/5/2022	3.8	3.8	0.059	1/31/2022	7.2	ND (<0.50)	3.1	56	720	0.88	ND(<10)	5	78	--	0.084	1.3	--	0.41	6.4	2/2/2022	ND (<5.0)	2.5	40
2/6 - 2/12	2/12/2022	ND (<0.31)	0.16	0.0024	2/7/2022	7.5	ND (<0.50)	4.2	3.0	69	730	1.6	16	249	--	0.17	2.7	--	0.38	5.9	2/9/2022	ND (<5.0)	2.5	41
2/13 - 2/19	2/19/2022	3.9	3.9	0.056	2/14/2022	6.8	ND (<0.50)	2.1	69	840	0.94	13	191	--	0.25	3.7	--	0.40	5.9	2/16/2022	ND (<5.0)	2.5	36	
2/20 - 2/26	2/26/2022	0.91 J	0.91	0.013	2/22/2022	7.3	ND (<0.50)	2.5	65	1,000	1.4	21	302	--	0.18	2.6	--	0.42	6.0	2/23/2022	ND (<5.0)	2.5	36	
2/27 - 3/5	3/5/2022	ND (<0.31)	0.16	0.0021	2/28/2022	7.2	ND (<0.50)	7.4	78	1,200	1.6	16	222	--	0.10	1.4	--	0.46	6.4	3/2/2022	ND (<5.0)	2.5	34	
3/6 - 3/12	3/12/2022	7.4	7.4	0.099	3/7/2022	7.2	ND (<0.50)	1.1	85	1,200	1.9	14	191	--	0.23	3.1	--	1.2	16	3/9/2022	ND (<5.0)	2.5	32	
3/13 - 3/19	3/19/2022	ND (<0.31)	0.16	0.0022	3/14/2022	6.5	ND (<0.50)	1.1	50	860	1.1	13	173	--	0.076	1.0	--	0.43*	5.7	3/16/2022	ND (<5.0)	2.5	37	
3/20 - 3/26	3/26/2022	1.6	1.6	0.024	3/21/2022	7.1	ND (<0.50)	1.8	170	660	2.9	ND(<10)	5	74	--	0.053	0.79	--	0.40	5.9	3/23/2022	ND (<5.0)	2.5	37
3/27 - 4/2	4/2/2022	4.3	4.3	0.064	3/28/2022	6.7	ND (<0.50)	2.1	160	820	2.5	15	230	--	0.074	1.1	--	0.45	6.9	3/30/2022	ND (<5.0)	2.5	36	
4/3 - 4/9	4/9/2022	4.3	4.3	0.064	4/4/2022	7.1	ND (<0.50)	1.2	190	590	2.4	ND(<10)	5	76	--	0.099	1.5	--	0.29	4.4	4/6/2022	ND (<5.0)	2.5	38
4/10 - 4/16	4/16/2022	ND (<0.31)	0.16	0.0022	4/11/2022	7.2	ND (<0.50)	1.5	180	540	2.5	10	147	--	0.078	1.1	--	0.25	3.7	4/13/2022	ND (<5.0)	2.5	36	
4/17 - 4/23	4/23/2022	ND (<0.31)	0.16	0.0022	4/18/2022	7.2	ND (<0.50)	14	200	520	0.52	ND(<10)	5	73	--	0.12	1.7	--	0.16	2.3	4/20/2022	ND (<5.0)	2.5	35
4/24 - 4/30	4/30/2022	0.71	0.71	0.0098	4/25/2022	7.1	ND (<0.50)	3.0	140	370	1.9	12	167	--	0.17	2.4	NA	NA	NA	4/27/2022	ND (<5.0)	2.5	34	
5/1 - 5/7	5/7/2022	NA	NA	NA	5/2/2022	7.3	ND (<0.50)	3.7	150	660	1.8	ND(<10)	5	69	--	0.11	1.5	NA	NA	NA	5/4/2022	NA	NA	NA
					5/9/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5/11/2022	NA	NA	NA

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

-- = 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: May 13, 2022

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		Athens Road Wells and Lift Station 3				
2.01		Athens Road Well Field, 9 wells	Running		2	Installed a new electrical connection on ART-1A
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			
4.02		Ferrous Sulfate Feed System	Running			
4.03		Polymer Feed System	Running		3	Replaced the check valve on the injection 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			
4.09		Area In And Around GWTP	Running		1	Jet the EFF pipeline from the GWTP to the EQ. Replaced the power supply for the PLC.
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			

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
5.09	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			1	The FBR is draining and the sand is being removed and put into dewatering bags.
6.02	PID14	Separator Tank - 1401			1	The separator has been drained.
6.03	PID14	Media Return Pump - P 1401				
6.04	PID14	P1401A				
6.05	PID01A	P1401B				
6.06	PID01A	FBR 1	Running		3	The bed height pump was replaced.
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				
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			
7.02	PID01B	FBR 4	Running			
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			

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
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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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			
10		Aeration and DAF System				

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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	Installed a new tap for the pilot feed.
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		2	Reconnected the electrical after the contractors finished their work.
11.03	PID06	Effluent Pump - P602				
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			
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
14.05	PID09	Filter Press Pump - P901	Running			
14.06	PID09	Filter Press Pump - P902				
14.07	PID09	West Press	Standby		4	The press is back in service.
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		2	New static mixers were installed on the discharge of the pumps.
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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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Attachment C

Facility Repair/Replacement Project Status

GWETS AMENDMENT 8 REPAIR/REPLACEMENT STATUS

PREPARED BY NEVADA ENVIRONMENTAL RESPONSE TRUST

ITEM	RESOLUTION	WORK AUTHORIZATION	STATUS AS OF 4/30/22	
1	Dissolved Air Floatation (DAF) Vessels	ETI to pilot an alternate technology (AquaDisk filters) and make a recommendation	ETI WA 22-01 \$58,203 <i>Executed 1/13/22</i>	Work has started, ordered parts and services. Tentative date of delivery 4/19/22 & operational by 4/22/22. Pilot should be completed by the end of May.
2	DAF Pump Skid Rebuild	On-hold pending outcome of DAF pilot and evaluation of plant hydraulics	N/A	N/A
3	Main Influent Pipeline Air/Vacuum Release Valves	ETI to replace valves and valve boxes as required	ETI WA 21-06 \$40,535 <i>Executed 12/21</i>	Work started but delayed due to seeping groundwater conditions at the Seep Well Field caused by the City's use of numerous previously unused infiltration ponds.
4	In-kind Replacement of GWTP	GWTP replacement not required due to design/build of Chromium Treatment Subsystem	N/A	N/A
5	Wiring at Lift Station #3 (controls)	ETI to replace wiring as required	ETI WA 21-03 \$60,035 <i>Executed 11/21</i>	90% of the work in field is complete, awaiting AC units (a long lead item). Anticipating a May 2022 completion.
6	Wiring at Lift Station #1 (wells)	Project on hold due to potential modification of the SWF with ROD or due to Cadence Sports Park. NERT will authorize interim repairs if necessary.	N/A	N/A
7	Motor Control Center at Lift Station #1	ETI to replace as required	ETI WA 21-04 \$186,315 <i>Executed 12/21</i>	Work started, but delayed due to City flooding the seep area, also impacting Lift Station 1. MCC & major equipment has been delivered.
8	IWF Wiring	ETI to replace as required	ETI WA 21-08 \$436,481 <i>Executed 12/21</i>	New wire has been installed at the wells, awaiting new starters to be delivered. Expected delivery is May. Getting ready to run the new power line from the D-1 Building.
9	FBR Skid Equipment Replacements	ETI to replace what is immediately required in lieu of complete replacements	ETI WA 22-04 \$142,061 <i>Executed 2/4/22</i>	Equipment is on order and starting to arrive onsite.
10	Influent / Effluent Pump Motors	ETI to procure additional motors for more frequent rotation	ETI WA 22-03 \$31,800 <i>Executed 2/4/22</i>	Equipment is on order, awaiting delivery.
11	Overhaul Lift Station #2 West Wet Well Turbine	ETI to overhaul as required	ETI WA 22-07 \$97,304 <i>Executed 3/7/22</i>	Equipment is on order, awaiting delivery.

GWETS AMENDMENT 8 REPAIR/REPLACEMENT STATUS

PREPARED BY NEVADA ENVIRONMENTAL RESPONSE TRUST

ITEM		RESOLUTION	WORK AUTHORIZATION	STATUS AS OF 4/30/22
12	Replacement of Safety Showers	ETI to replace safety shower system in batches over ~2 years	ETI WA 21-05 \$131,899 <i>Executed 11/21</i>	6 of the 11 showers have been installed, the 3rd phase is set to be completed in May/June.
13	East Air Compressor	ETI to replace as required	ETI WA 21-02 \$29,784 <i>Executed 10/21</i>	Compressor installed. Project complete.
14	pH and ORP Probes	ETI to replace certain probes as required throughout FBR plant	ETI WA 21-07 \$108,893 <i>Executed 11/21</i>	Procurement and installation planning underway. Estimated completion by June 2022
15	Exterior Shell of Ethanol Storage Tank	ETI to repair as required	-	Submittal of draft Work Authorization for Trust review by 6/30/22.
16	FBR Containment Pad Concrete	ETI to monitor status of affected areas. NERT will authorize interim repairs if necessary.	N/A	N/A
17	Siemens Control System Repairs	Spare parts and software updates to be procured in lieu of a complete system replacement.	ETI WA 21-09 \$103,061 <i>Executed 11/21</i>	Procurement and installation planning underway. Spare parts currently arriving. Work expected to be completed by 6/30.
18	Sludge Pump and Sludge Bins	ETI to replace as required	ETI WA 22-02 \$102,183 <i>Executed 2/7/22</i>	Equipment is on order and starting to arrive onsite.
19	Lift Station Repairs	ETI to replace as required	ETI WA 22-05 \$20,738 <i>Executed 2/4/22</i>	Equipment has arrived onsite and to be installed in May/June.
20	D-1 Asbestos Evaluation	NERT to complete an asbestos survey	TT WA 21-12 \$7,400 <i>Executed 11/21</i>	Survey complete. Report complete and forwarded to ETI.