
To: Nevada Division of Environmental Protection
Nevada Environmental Response Trust

Cc: Nevada Environmental Response Trust Stakeholders

From: Jeff Lambeth, Director of Operations

Date: October 20, 2016

Subject: NERT – GWETS Operation Monthly Report – October 2016

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 October 2016.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS normally in October 2016, with the exception of lift station down times associated with pump upgrades. The average effluent flow rate was 860 gallons per minute (gpm) during October 2016. At the end of the month, the GW-11 Pond volume was at 38.0 million gallons (MG), which would allow 16.9 days of available additional storage in the event of an emergency plant shutdown with continued well field pumping. The water volume stored in the GW-11 Pond decreased approximately 10.2 MG from the end of September 2016. Figure 1 in this report depicts the actual and projected GW-11 pond volumes and additional storage available.

The influent perchlorate concentration to the FBR plant averaged 86 mg/L for the month, with a maximum concentration of 110 mg/L. In comparison, the influent perchlorate concentration for the month of September 2016 averaged 78 mg/l, with a maximum concentration of 87 mg/l.

Analytical data indicate that the permitted effluent discharges at GWETS Outfall 001 were within the NPDES permitted numerical discharge limits (Please see Attachment A, prepared by Ramboll Environ).

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.

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

- During the month of October 2016, ETI equalized flow from the well fields using the TK-101 tanks. When flow was reduced as a result of lift station shutdowns, ETI also removed water from GW-11 to maintain a steady flow into the FBRs. This process limited the amount of backwashing required to maintain the GAC vessels operational. As a result, the water level in GW-11 was significantly reduced during the reporting period.

2. Biological Plant

There were no significant plant interruptions. There was one unplanned diversion into GW-11 for the month of October. Below is a description of the short duration event that occurred:

- Diversion to GW-11 on October 31st at 7:00 pm. A total volume of approximately 223,200 gallons of water was diverted back to GW-11. Discharge to the Las Vegas Wash (LVW) resumed at 11:02 pm. The plant was bypassed for precautionary measures. Loss of data communication to the Lift Stations caused the flow from those lift stations to drop in turn increasing the perchlorate load to the FBR plant. The FBR plant effluent was diverted to GW-11 until samples could be collected and run on the in-house Ion Chromatograph (IC) to ensure the plant was in compliance before the water was returned to the LVW. Loss of data was determined to be a loose connection at the radio communication switch box (Etawave Model #Xeta9-E) located in the control room. The connections were tightened and communication was reestablished and is operating properly. Maintenance procedures have been updated to include inspection of this communication switch box.

3. Spills

At 10:47 AM PDT on October 15th, 2016, while the Envirogen operator was conducting morning rounds at Lift Station 2, a spray was discovered coming from the newly installed lift station turbine pump seal water line. The operator immediately shut down the pump and started the other lift station turbine pump. Envirogen informed the Trust of the spill.

Two days prior, this pump had been installed as part of the Lift Station Upgrade program. The pump had been checked at the factory, by inspection upon installation at the Lift Station and prior to its use.

- In response to this spill and to minimize their reoccurrence, preventive measures that were undertaken included:
 1. All of the compression fittings and tubing for the pump seal water, which failed, were replaced and re-inspected.
 2. Pump was brought back online and the pump and seal water are functioning normally

Future secondary containment improvements will include the construction of a curb around the containment pad to increase its holding capacity.

4. Maintenance

- Major maintenance performed by ETI in the month included:
 - I. The Allen Bradley PLC. This PLC is located in the control room had an issue sending information over to the Hach software data management program in the operations trailer. An outside contractor was called in and identified and repaired the system to normal operations.
 - II. Interceptor Well I-S. ETI pulled the well and replaced the 1/2 hp motor (Franklin Electric Model # 2345229404). Also replaced the 3 amp fuses and returned to normal service. Pump was still in good working order and did not require any service. The pump was reinstalled and put back into service

- III. FIT-622. Effluent Water Flow Transmitter was replaced by ETI with a new Mag Meter and changed PLC logic to match with Mag Meter range and signal.
 - IV. GWTP AC-1 Air Compressor. The compressor went down due to a faulty contactor. A new part has been ordered. The backup compressor was put online to maintain plant air supply.
 - V. Interceptor Well I-F. The motor was frozen and kept tripping the fuse. ETI replaced the existing motor with a new 3/4 Hp motor (Franklin Electric Model # 2345229404), reinstalled the pump and motor, and put the unit back into service.
 - VI. Lift Station 2 upgrade. ETI installed a new control panel for the LS-2 main Turbine Pumps in order to run with variable frequency drives (VFDs) on level set point.
 - VII. Lift Station 3 upgrade. ETI installed a new control panel for the LS-3 main Turbine Pumps in order to run with variable frequency drives (VFDs) on level set point. ETI also installed new control panels for ART Wells to control by both Level and Flow PID control set points.
 - VIII. The south DAF (D-501). This unit was taken offline to remove debris that clogged the suction piping on the sludge box. The piping was removed and the solids were transferred to T-1603 sludge holding tank. The sludge pump was replaced with the shelf spare pump.
 - IX. ART-7 Sample Port. The pipe used for collecting samples for ART-7 had a small leak at an aging pipe fitting. The well was taken down to replace the damaged piping. All water was captured and put back into the wet well.
 - X. Lift Station 2 Vertical Turbine Pump: Raphael Construction replaced the seal water line for the new 100 Hp turbine at Lift Station 2 after the seal water tubing supplied by the manufacturer failed. New stainless steel tubing was installed.
- Preventative Maintenance completed or being performed by ETI in the month included:
 - I. Sequence Test-Test all Alarms. Tested all signals related to the auto plant shutdown.
 - II. PH and ORP online analyzers. ETI Calibrated and Standardized all instruments with buffer solutions.
 - III. All safety inspections were complete including slings, extension cords, safety harnesses, site security, eyewash stations, and fire extinguishers.
 - IV. All of the airlifts were removed and inspected on the sand filter. No faults were found.
 - V. All of the chemical injection pumps were inspected for proper operation. These pumps include the ethanol booster pumps, peroxide, micro nutrient, ferrous sulfate, phosphoric acid, and the ferric chloride. All of the pumps are in good working order. Spare pumps are on the shelf.

GWETS Upgrades and Facility Projects

The following is a summary of the initiatives in-progress during the reporting period at the direction of the Trust:

1. AP-5 Solids Removal

Tetra Tech continued to move forward with the construction of the three large tanks associated with the AP-5 Solids Removal project.

2. Lift Station #2 & #3

ETI completed project implementation during the period and the systems have been installed and are running.

3. Lift Station #1 upgrades

ETI continued the process of implementing infrastructure improvements at Lift Station 1 and the addition of an Ion Exchange system was approved by NERT. During the reporting period, ETI was in the procurement phase of the project and preliminary site work will begin in November. Currently the project is scheduled to be complete by December 31, 2016.

4. IWF well modifications

A proposal for the IWF is being prepared to address the Trust's desire to improve the flow meter accuracy and installation of VFDs on the extraction pumps. This proposal was submitted by ETI Engineering and is currently under review by the Trust.

5. Spill containment enhancements

A proposal for secondary containment modifications has been assembled by ETI Engineering and is currently under review by the Trust.

ECT Audit Findings

ETI has been addressing the recommendations provided in the Independent Audit of the GWETS performed by ECT. Table 3 summarizes the status of the ECT Audit findings. Progress is reported in the Status column. Updates from the prior reporting period appear in bold, underlined text.

Equipment Availability Tracking

ETI operators continue to update the equipment tracking form on a weekly basis at a minimum, or whenever there is a change in the status of key equipment. During regular site visits, Tetra Tech field personnel verify the entries on the form, including both the operating status and confirmation of the inventory of required shelf spares. The equipment tracking form is included as Attachment B.

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 ²	426 ¹	11	ND	0.00031
AWF Total Extraction ²	102 ¹	128	0.32	0.32
IWF Total Extraction ²	60 ¹	621	7.9	7.9
GWTP Effluent ³	66	706	0.41	ND
GW-11 Influent ²	172	57	0.88	0.33
GW-11 Effluent/ FBR Influent ³	860	86	0.036	0.024

Notes:

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

1: Sum of daily average flow for individual wells.

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

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

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	1,752	ND	0.00
AWF Total Extraction	4,876	12	12
IWF Total Extraction	14,002	177	178
GWTP Effluent	17,464	10	ND
GW-11 Influent	3,656	56	0.33
GW-11 Effluent/FBR Influent	27,655	11	7.7

Notes:

TR = Total Recoverable.

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

Table 3 - Status of ECT Audit Recommendations

LS #1 and Seep Field			
Number	Ranking	Issue Description	Status
1	Priority A	<p>Lift Station #1 should be evaluated for repair and upgrade.</p> <p>a. A high priority should be placed on abandoning and replacement of the flexible hoses and the aging parallel piping at Lift Station #1.</p> <p>b. Lift Station #1 should be re-evaluated to assure that the designs, and the materials of construction, are consistent with the current and future facility needs in full recognition that this operation is likely to continue for a significant period of time.</p>	<p><u>In Process</u></p> <p>a. As part of the LS1/IX Upgrade, these hoses will be replaced with hard pipe manifold system. The upgrade is currently in progress and this should be completed in 12/31/16.</p> <p>b. The materials of construction have been evaluated and items that need upgrade will be replaced as part of the LS1/IX upgrade. The upgrade is currently in progress and this should be completed in 12/31/16.</p>
2	Priority A	<p>The SWF vaults should be sealed using commercially available sealants used in Industry and wastewater treatment to prevent exfiltration.</p>	<p><u>Completed.</u> ETI inspected all Seep Well Field vaults and sealed all vault penetrations with recommended foam.</p>
3	Priority A	<p>The SWF well fields should be inspected and aging wells replaced as practicable. Much of the above grade plumbing is old and unreliable. Also, some of the wells cycle on and off fairly rapidly. This would indicate that the groundwater has been lowered or more likely, the well screens have become fouled, limiting the flow into the well.</p> <p>The local hydrogeology around the rapidly dewatering wells should be analyzed and the wells should be replaced if it is determined that they have become fouled.</p>	<p><u>In Process</u></p> <p>Removal of above grade piping at LS-1 will be completed as part of the IX Treatment System installation to be completed by 12/31/16. Aquifer evaluation of the SWF is currently ongoing as part of the COP. If necessary, well maintenance activities will be performed to improve well yield.</p>
4	Priority A	<p>The Audit Team recommends that ETI consider using a screening process capable of managing a higher solids content to address issues including the Boatmen bug spawns.</p>	<p><u>Closed -</u> This issue occurs twice per year in spring and fall for a few weeks each time. ETI feels this is not necessary in light of future plans for the GW-11 pond, and this issue would be mitigated by those plans. Based on ETI's research, this is a common problem in ponds in the area.</p>
5	Priority A	<p>The auditors observed an area where crystals of unknown nature have formed at PC-99 R2/R3. NERT should sample the observed crystals and analyze their composition at the earliest opportunity. The R3 well enclosure had standing water and crystals formed both inside and outside of the well vault. The Audit Team also noted a damp area extending from the R3 vault to about 10 to 15 feet from the enclosure. The Audit Team did not collect samples from the damp area or of the observed crystals. While it is possible that the observed crystals are not perchlorate but rather salts resulting from the extremely hard water in the area, with no data available, caution should be observed.</p>	<p><u>In Process</u></p> <p>Crystals were hard water calcium from a leaking flange gasket. This area was cleaned and a new gasket was installed.</p> <p><u>NERT collected a soil sample immediately below the salt crystals previously observed on November 18, 2016 for laboratory analysis. During the sampling event NERT discovered that the salt crystals</u></p>

			<u>were no longer present on the side of the well vault. Salt crystals in this area tend to be transient in nature. The analytical results are currently pending.</u>
6	Priority B	A detailed inspection of the SWF underground piping should be performed to estimate the remaining useful life.	<u>In Process</u> Removal of above grade piping at LS-1 will be completed as part of the IX Treatment System installation to be completed by 12/31/16. As part of the RI/FS NERT will re-evaluate the SWF and its conveyance piping.
7	Priority B	All abandoned equipment should be removed from the operating areas of the operation. To be further examined by the Trust.	<u>Ongoing</u> Abandoned equipment will be removed as various upgrades occur throughout the plant.
8	Priority B	The access doors at the SWF vaults should be replaced with doors that have modern safety latches and are physically manageable in order to make inspection access easier for the operating staff.	<u>Closed</u> ETI does not believe that modifications are necessary to operate the doors. Our staff believe they can safely operate the doors.
9	Priority B	Concurrent with plans to expand the loading of perchlorate to the FBRs, the capacity of the solids handling systems in general, and the DAFs specifically, should be evaluated for upgrade.	<u>Closed</u> Completed, both of the DAFs have recently been rehabilitated. The DAF design is more than adequate for the solids generated a full plant load.
10	Priority B	The remaining Penn Valley Double Disc Pumps should be replaced with air-driven double diaphragm pumps as they fail. There should be a review of the need for additional process air to operate the new pumps.	<u>In Process</u> Currently ETI is in progress with the pump replacements. Two of the 4 pumps have been replaced with air-driven diaphragm pumps, the remaining 2 Penn Valley Double Disc Pumps will be replaced as they fail.
11	Priority C	A hydraulic analysis should be performed from the discharge port of the variable frequency pumps to the discharge point at the Las Vegas Wash to identify (and eliminate) the areas of highest flow loss.	<u>Complete</u> NERT has completed a pipeline flow evaluation and is planning infrastructure upgrades in 2017 to address this issue.
12	Priority C	As the submersible pumps reach the end of their useful life, they should be replaced with more appropriate technology, such as vertical turbine pumps, for increased reliability and ease of service.	<u>Complete</u> Vertical turbine pumps were installed as part of the upgrade project for both LS-3 and LS-2.

Job Cal (Maintenance Management Program) and Data Control			
Number	Ranking	Issue Description	Status
1	Priority A	Incorporate all contractor supplied maintenance into the JobCal system.	<u>Complete</u> All contractor supplied maintenance activities are being logged in the JobCal computer maintenance management system.
2	Priority B	Improve detail captured in JobCal to include actual level of effort expended in repairs.	<u>Complete</u> ETI has worked with the staff to improve the capture of information and detail that is logged into the JobCal computer maintenance management system.
3	Priority B	Streamline the management of water quality data to assure accountability.	<u>Complete</u> NERT has established a new data transfer protocol that streamlines the management of water quality data amongst the NERT team members. External accessibility will be improved with the implementation of GWETS/NET
Operations Monitoring			
Number	Ranking	Issue Description	Status
1		Complete conversion of All SCADA systems to a single system – presumably the Siemens system.	<u>In Process</u> The existing Chromium Treatment Plant control system will be replaced when this plant is upgraded or replaced.
2		Incorporate online access and back-up to allow ETI experts to remotely observe and control operations.	<u>In Process</u> GWETS/NET will provide remote access to operational data by NERT and ETI.
Facilities Maintenance			
Number	Ranking	Issue Description	Status
1	Priority A	Infrared electrical surveys should continue to document any potential degradation of electrical and mechanical connections over time and use.	<u>Complete</u> The initial plant survey was completed and actions where needed was taken. The next survey has been incorporated into Job Cal as a re-occurring (PM) event, and is scheduled again for December 2016.
2	Priority A	The electrical grounding within the plant should also be reassessed to make sure that no ground faults are present.	<u>Complete</u> ETI brought in a certified electrician who identified motor skids that were not properly grounded. Since then ETI has installed grounding where it was missing. Based on the site electrical drawings, all known discrepancies have been addressed.
3	Priority A	Limit the length of wiring run from the VFD to the motor/pump units to a maximum of 150 feet.	<u>Complete</u> Any VFD systems to be installed will have a limited cable run, less than 150 feet or based on manufacturers

			<i>recommendations.</i>
4	Priority A	The motor bearings in motor units operated with VFDs should be lubricated utilizing conductive grease to prevent electrical arcing within the motor bearings even if a ground fault occurs.	<u>Complete</u> <i>ETI is currently using conductive grease. The use of conductive grease is currently being logged into Job Cal.</i>
5	Priority A	Utilize full Asset Management Capabilities of Job Cal. As per above,	<u>Complete</u> <i>ETI has further leveraged Job Cal and will continue to expand its use in facility operations.</i>
6	Priority A	Incorporate age of equipment and expected serviceable life for all major equipment.	<u>Complete</u> <i>ETI has further leveraged Job Cal and will continue to expand its use in facility operations.</i>
7	Priority A	Incorporate all contractor supplied maintenance into the JobCal system.	<u>Complete</u> <i>ETI has further leveraged Job Cal and will continue to expand its use in facility operations.</i>
8	Priority B	Improve detail captured in JobCal to include actual level of effort expended in repairs.	<u>Complete</u> <i>ETI has further leveraged Job Cal and will continue to expand its use in facility operations.</i>
Training			
Number	Ranking	Issue Description	Status
1	Priority B	Improved documentation of operator training is recommended. The operators have been taught how to operate the equipment but the documentation and supporting information for training provided and received was lacking – unlike the other training provided on-site.	<u>In Progress</u> <i>ETI is continuing to improve new employee training and documentation of said program. The training program and the appropriate documentation will be complete by April 2017.</i>
HazWaste and Recycling			
Number	Ranking	Issue Description	Status
1	Priority B	Install a can puncturer and develop a program to handle aerosol cans to assure that the waste cans are "RCRA empty" at atmospheric pressure.	<u>Complete</u> <i>Complete and on-site.</i>
2	Priority B	Containers storing used oil should be labeled correctly and be moved to a location where they are protected from the elements.	<u>Complete</u>
3	Priority C	As a good management practice for CESQGs obtain an EPA identification number.	<u>Completed by NERT.</u>
4	Priority C	As a good management practice for CESQGs develop and maintain a waste manifest tracking log to manage all of the shipping and receiving manifests for all waste shipments.	<u>Completed by NERT</u>
5		Continue to manage universal waste per the universal waste requirements.	<u>Complete and Ongoing</u>
6	Priority C	Develop a more concise chemical inventory with annual capacities and usages for all applicable chemicals.	<u>In Progress</u> <i>All chemicals are inventoried each month. Usage of each chemical is logged into the HACH Wims Data Management</i>

			<u>software.</u>
7	Priority C	An applicability study should be completed to determine if the facility is subject to TRI Form R reporting.	<u>Closed</u> After review, ETI does not see the need for this study and is in complete compliance with all reporting currently required.

Notes:

Changes in activity status from the prior month are displayed in the Status column with **bold, underlined font.**

Figures

Operational Metrics

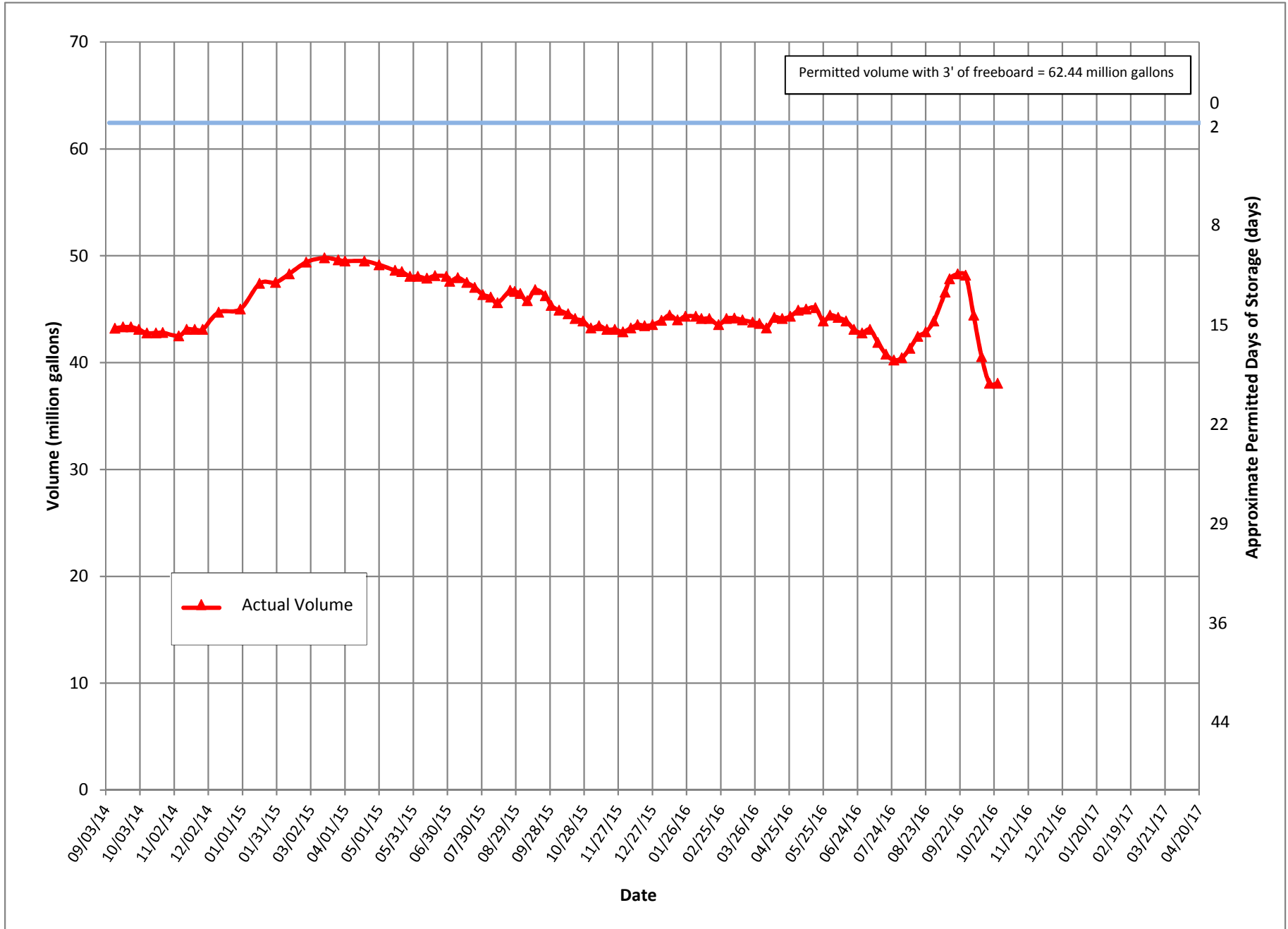
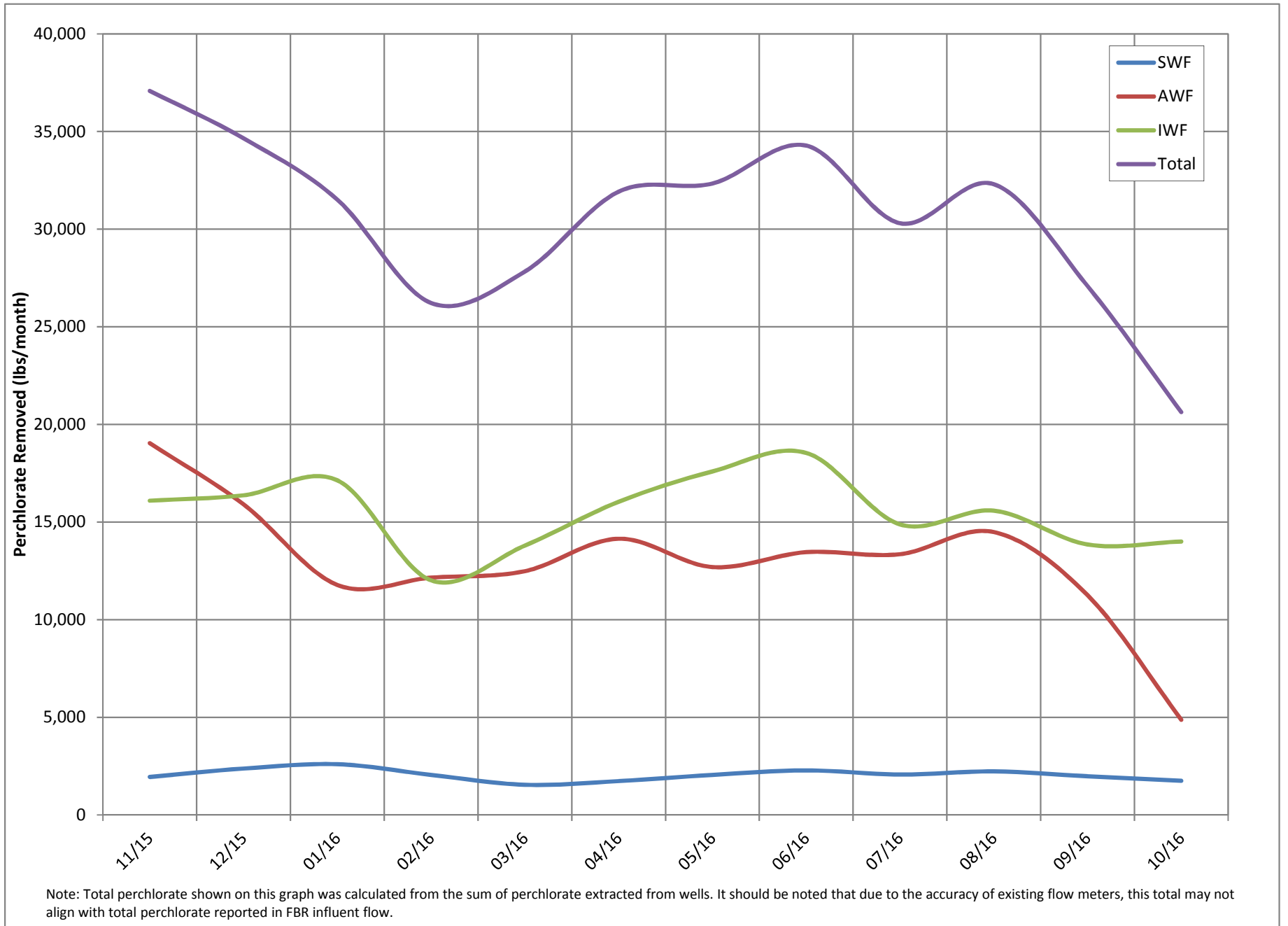


Figure 2 - Historical Perchlorate Mass Flux



Attachment A

NPDES Tracking Sheet (Prepared by ENVIRON)

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			
2.02		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	Replaced two combo valves and replaced old hardware that was worn on the flanges
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		3	Continued troubleshooting on the loss of signal on the new Rosemount flowmeter installed. Waiting for vendor to diagnose problem.
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			
4.04		Clarifier	In operation			
4.05		Filter Press	Running			
4.06		GWTP Effluent Tank	In operation			
4.07		Interceptor Booster Pump A	Running		2	Installed new pump and piping to achieve higher flow
4.08		Interceptor Booster Pump B	Standby			
4.09		Area In And Around GWTP	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		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		3	New seal received. Tentative plan in place. Pump still operational.
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	Standby			
5.07	PID10A	Raw Water Feed Pump - P102B	Running			
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			

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 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
6		First Stage FBRs A, 1 & 2				
6.01	PID14	FBR A	Running			
6.02	PID14	Separator Tank - 1401	Running		3	Built new stand and flush line for the bed height pump
6.03	PID14	Media Return Pump - P 1401	Running			
6.04	PID14	P1401A	Running			
6.05	PID01A	P1401B	Standby			
6.06	PID01A	FBR 1	Running			
6.07	PID02A	FBR 2	Running			
6.08	PID01A	First Stage Separator Tank - T2011	Running			
6.09	PID01A	Media Return Pump - P2011	Running			
6.10	PID01A	First Stage FBR Pump - P1011	Standby			
6.11	PID01A	First Stage FBR Pump - P1012	Running			
6.12	PID01A	First Stage FRB Pump - P101A	Running			
6.13	PID07A	FBR A pH Feed Pump - P71A	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			

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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 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		First Stage FBRs 3 & 4				
7.01	PID01B	FBR 3	Off			
7.02	PID01B	FBR 4	Off			
7.03	PID02B	First Stage Separator Tank - T2012	Off			
7.04	PID01B	Media Return Pump - P2012	Off			
7.05	PID01B	First Stage FBR Pump - P1013	Off			
7.06	PID01B	First Stage FRB Pump - P1014	Off			
7.07	PID01B	First Stage FBR Pump - P102A	Off			
7.08	PID07A	FBR 3 pH Feed Pump - P713	Off			
7.09	PID07A	FBR 4 pH Feed Pump - P714	Off			
7.10	PID07A	FBR 3 Nutrient (Urea) Feed Pump - P723	Off			
7.11	PID07A	FBR 4 Nutrient (Urea) Feed Pump - P 724	Off			
7.12	PID15	FBR 3 Nutrient (Phos Acid) Feed Pump - P1523	Off			
7.13	PID15	FBR 4 Nutrient (Phos Acid) Feed Pump - P1524	Off			
7.14	PID07B	FBR 3 Electron Donor Assembly Pump - P733	Off			
7.15	PID07B	FBR 4 Electron Donor Assembly Pump - P734	Off			
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
9		Second Stage FBRs 7 & 8				
9.01	PID03B	FBR 7	Off		4	Laterals removed from the FBR
9.02	PID03B	FBR 8	Off			
9.03	PID03D	Second Stage Separator Tank - T3012	Off			
9.04	PID03B	Media Return Pump - P3012	Off			
9.05	PID03B	Second Stage FBR Pump - P3017	Off			
9.06	PID03B	Second Stage FBR Pump - P3018	Off			
9.07	PID03B	Second Stage FBR Pump - P302A	Off			
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	Off			
9.13	PID07B	FBR 8 Electron Donor Assembly Pump - P738	Off			
10		Aeration and DAF System				
10.01	PID04	Aeration Tank	In operation			
10.02	PID04	Aeration Blower - B401	Running			
10.03	PID04	Biofilter	In operation			
10.04	PID04	Nutrient Solution	Running			
10.05	PID04	Biofilter Sump	Running			
10.06	PID04	Nutrient Pump - P401	Running			
10.07	PID04	Biofilter Sump Pump - P402A	Standby			
10.09	PID04	Biofilter Blower	Running			
10.10	PID05	DAF Pressure Tanks	In operation			
10.11	PID05	DAF Vessel - D501	Running			
10.12	PID05	DAF Pressure Pump - P501	Running			
10.13	PID05	DAF Float Pump - P502	Running		3	Re-aligned shaft on the drive system for the sludge pump
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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	Running		2	Unclogged reject line from airlifts 1 and 3
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			
14.05	PID09	Filter Press Pump - P901	Running			
14.06	PID09	Filter Press Pump - P902	Running			
14.07	PID09	West Press	Standby			
14.08	PID09	East Press	Running			
14.09	PID09	Filtrate Tank	In operation			
14.10	PID09	Filtrate Tank Effluent (recycle) Pump - P903	Running			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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 System	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		2	IR inspecting oil leak on air end
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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			New trunnions and discs ordered for 2" and 3" pumps
		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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