TETRA TECH

MEMO

DRAFT

To:	Nevada Division of Environmental Protection Nevada Environmental Response Trust
Cc:	Nevada Environmental Response Trust Stakeholders
From:	Frank Johns/Tt
Date:	September 18, 2014
Subject:	NERT – GWETS Operation Monthly Report – August 2014

Tetra Tech is providing this monthly report to provide a summary of GWETS operation during August 2014 and oversight tasks performed by Tetra Tech.

Summary of GWETS Operation

The groundwater extraction and treatment system (GWETS) operated normally with one operational issue in August. High suspended solids content, primarily insects and some algae, in the water from GW-11 was causing frequent plugging of the bag filters and increased the backwash frequency for the GAC. The problem reached a point by August 6 that Envirogen Technologies, Inc. (ETI) bypassed GW-11 by directing the flow from the well fields to the equalization tanks. ETI has been evaluating automatic cleaning filters to replace the bag filters to resolve the problem in the future. The Trust is working with ETI on this project and anticipates submitting a work plan and project budget to NDEP by September 30.

The flow rate to the plant was approximately 900 to 930 gpm during the month. GW-11 was being used as an equalization pond through August 6, and then the ground water was being pumped directly to the equalization tanks. At the end of the month, the GW-11 volume was 41.4 MG, equal to 14.6 days of available storage in event of an emergency. The influent perchlorate concentration from GW-11 in the first week of the month and the equalization tank in the remainder of the month to the FBR plant ranged from approximately 115 to 125 ug/L, with no difference once GW-11 was taken out of service since concentrations in the pond had stabilized. Concentration data from a composite sample created from samples collected at each of the four corners of GW-11 on July 28, 2014, is provided in Attachment A

There were zero exceedances at the GWETS Outfall for perchlorate or any other constituent in excess of the NPDES permitted numerical discharge limits (Attachment B, prepared by ENVIRON).

Operational Metrics

At the direction of the Trust, Tetra Tech is currently developing an enhanced program to track over 80 key GWETS operational metrics. Upon implementation of this program, these metrics will be inclusive to the GWETS Monthly Reports. Tetra Tech received budgetary approval from the Trust in early September and will be putting together a schedule to implement the work plan. A reporting table for these metrics is being prepared and a draft will be submitted to NDEP and the Trust for their concurrence in September. The metrics that do not require modification for the system to collect will be reported beginning with the September GWETS operation monthly report.

Operational Issues

In addition to plant repairs conducted by ETI 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. The issue with insects and algae from GW-11 causing plugging of the bag filters ahead of the GAC units increased. ETI has proposed replacing the bag filters with a self-cleaning strainer. The proposal was submitted to the Trust in late August.

2. Major maintenance being performed or completed in the month included:
    - Installed new check valves at Lift Station #1.
    - Upgraded software for the Siemens SCADA system. PLC that is in the MCC on the FBR pad was removed for reprogramming. It is a redundant system to the PLC in the control room and will be re-installed in September.
    - Rebuilt P1401A pump and seal.
    - Performing maintenance on MCCs. Replaced grounding for MCC power supplies. Missing ground had resulted in surges that impacted instrumentation. Remainder of MCC maintenance to be completed during a planned shutdown in September.
    - Rehabilitating FBR 5. Work will continue into September.

GWETS Upgrades and Facility Projects

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

1. 2013 Optimization
   Construction for PC-150 and ART-7B is set to begin in September with startup of wells in October. Another round of flow optimization for the IWF will be initiated in September. Capture zone analyses for the IWF and AWF will be performed in November with a final report expected in January 2015.

2. AP-5 Closure
   Tetra Tech has continued development of a work plan for closure of the pond. Tetra Tech has been in discussion with the Trust, NDEP, and ETI on various aspects of the project. This will be a long-term project that will directly impact GWETS operations across multiple levels once implemented. Tetra Tech anticipates final project work plan submittal and budgetary approval by the end of September.

3. Enhanced Operational Metrics
   Tetra Tech submitted a proposal for the modifications required to implement the enhanced operational metrics in August. The budget for this work was approved. A schedule for completion is being prepared and will be submitted by mid-September.

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. Tetra Tech verified data recorded in the form in regard to operating status of equipment when on-site on August 5, 2014. The shelf spares were checked against the

form and all were in stock in the warehouse. During regular site visits in the future, Tetra Tech field personnel will continue to verify the entries in the form, including both the operating status and the presence of the required shelf spares. The equipment tracking form submitted to Tetra Tech on August 28, 2014, is attached (Attachment C).

GWETS Security

ETI continues to staff the GWETS using a single shift and follows the security procedure in the SOP dated April 30, 2014. During weekly calls, ETI notifies Tetra Tech of any issues with GWETS security. On August 21, ETI notified Tetra Tech that the front gate was not shutting all the way. The gate was being chained when the plant was not manned until it was repaired the next week.

Tetra Tech Activities

Tetra Tech conducted weekly calls with ETI to review operation of the GWETS on August 7, 15, and 21. A call was not held on August 28, but ETI responded to an email from Tetra Tech with requested information. Becki Dano, CEM, of Tetra Tech, performed visits to the GWETS on August 5 and 14. She was on vacation the last two weeks of August.

Summary

Upon review of available and relevant information, Tt concurs with the management of the GWETS at this time. No additional involvement from either the Trust or Tetra Tech is recommended at this time.

Attachment A

GW-11 Sample Data

GW-11 Analytical Results for Sample Collected July 25, 2014

Analyte	Result (mg/L)
Ammonia as N	0.59
Calcium	350
Chlorate	230
Chloride	1800
Iron	0.058
Nitrate as N	7.1
Perchlorate	110
pH (SU)	8.37
Total Phosphorus	0.53
Sulfate	1600
TDS	6000
Total Chromium	0.041
TSS	25

Attachment B

NPDES Tracking Sheet (Prepared by ENVIRON)

	Continuous		Daily samples, composited weekly		Weekly samples									Weekly samples, collected separately			Quarterly sample	
	Flow Rate		Perchlorate		pH	Hexavalent Chromium	Total Chromium	Total Suspended Solids (TSS)		Total Iron		Total Ammonia as N	Total Phosphorus as P	BOD_5 (inhibited)			Manganese	
	30-Day Avg. (MGD)	Daily Maximum (MGD)	30-Day Avg. (ug/L)	30-Day Avg. (lbs/day)	30-Day Avg. (S.U.)	Daily Max. (mg/L)	Daily Max. (mg/L)	30-Day Avg. (mg/L)	30-Day Avg. (lbs/day)	30-Day Avg. (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)	30-Day Avg. (mg/L)	30-Day Avg. (lbs/day)
	1.45	1.75	**18**	**0.22**	**6.5 to 9.0**	**0.01**	**0.1**	**135**	**1,634**	**10**	**121.03**	**40**	**20**	**25**	**40**	**254**	**5**	**60.52**
December 2013	1.30	1.34	1.3	0.014	6.98	0.00013	0.014	20	220	3.6	39	1.8	1.7	2.5	3.8	27		
January 2014	1.34	1.37	1.3	0.014	6.91	0.0013	0.036	28	320	4.2	47	5.3	3.3	4.2	5.2	47	0.57	6.5
February 2014	1.37	1.44	1.3	0.014	7.08	0.00013	0.020	19	220	2.9	33	10	3.2	5.2	9.9	58		
March 2014	1.38	1.48	1.3	0.014	6.98	0.00048	0.012	25	260	5.2	55	6	2.3	2.6	3.7	30		
April 2014	1.07	1.46	1.3	0.012	6.63	0.00029	0.028	17	170	3.8	37	2.2	1.9	4.3	6.3	44	0.15	1.6
May 2014	1.37	1.48	1.3	0.014	6.81	0.0013	0.012	19	220	3.3	38	8	3.1	3.1	3.4	35		
June 2014	1.31	1.37	1.3	0.014	6.69	0.00013	0.017	17	170	3.3	35	5	2.0	2.4	5.4	26		
July 2014	1.11	1.40	1.3	0.012	6.88	0.00013	0.020	32	290	6.7	61	2.2	3.2	4.3	5.4	40	0.24	2.0
August 2014 (month-to-date)	1.26	1.60	1.3	0.013	6.79	0.00013	0.034	20	210	3.9	41	1.9	2.0	3.8	5.7	39		

Daily Grab Sample Dates	Composite Sample Date		ug/L	lbs/day	Sample Date	S.U.	mg/L	mg/L	mg/L	lbs/day	mg/L	lbs/day		mg/L	lbs/day	mg/L	lbs/day	Sample Date	mg/L	lbs/day	mg/L	lbs/day
12/1 - 12/7	12/7/2013	ND (<2.5)	1.3	0.014	12/2/2013	7.11	ND (<0.00025)	0.0031	39	430	4.2	46	ND (<0.10)	0.05	0.5	0.053	0.58	12/5/2013	1.4	15		
12/8 - 12/14	12/14/2013	ND (<2.5)	1.3	0.013	12/9/2013	6.65	ND (<0.00025)	0.014	15	160	3.7	40	ND (<0.10)	0.05	0.5	0.089	0.95	12/11/2013	2.1	22		
12/15 - 12/21	12/21/2013	ND (<2.5)	1.3	0.014	12/16/2013	7.08	ND (<0.00025)	0.014	12	130	3.2	35	ND (<0.10)	0.05	0.5	0.15	1.6	12/18/2013	3.1	34		
12/22 - 12/28	12/28/2013	ND (<2.5)	1.3	0.014	12/23/2013	7.22	ND (<0.00025)	0.010	19	210	3.7	40	--	0.46	5.0	0.28	3.1	12/23/2013	3.8	41		
12/29 - 1/4	1/4/2014	ND (<2.5)	1.3	0.014	12/30/2013	6.85	ND (<0.00025)	0.0075	14	150	3.3	36	--	0.23	2.5	0.21	2.3	12/30/2013	1.9	21		
1/5 - 1/11	1/11/2014	ND (<2.5)	1.3	0.014	1/6/2014	6.91	ND (<0.00025)	0.015	21	230	3.7	41	--	0.17	1.9	0.26	2.9	1/8/2014	2.3	26		
1/12 - 1/18	1/18/2014	ND (<2.5)	1.3	0.014	1/13/2014	7.31	ND (<0.00025)	0.0082	16	180	3.5	40	--	0.25	2.8	0.21	2.4	1/15/2014	4.5	51	0.57	6.5
1/19 - 1/25	1/25/2014	ND (<2.5)	1.3	0.014	1/20/2014	6.72	0.0013	0.036	60	680	5.8	65	--	0.97	11	0.42	4.7	1/22/2014	4.6	52		
1/26 - 2/1	2/1/2014	ND (<2.5)	1.3	0.014	1/27/2014	6.69	ND (<0.00025)	0.0098	15	170	3.8	43	--	0.48	5.4	0.28	3.1	1/29/2014	5.2	58		
2/2 - 2/8	2/8/2014	ND (<2.5)	1.3	0.014	2/3/2014	6.91	ND (<0.00025)	0.020	23	260	4.0	45	--	0.33	3.7	0.13	1.5	2/5/2014	4.6	52		
2/9 - 2/15	2/15/2014	ND (<2.5)	1.3	0.014	2/10/2014	6.98	ND (<0.00025)	0.0047	22	250	3.0	34	--	0.94	11	0.33	3.7	2/12/2014	2.6	29		
2/16 - 2/22	2/22/2014	ND (<2.5)	1.3	0.015	2/17/2014	7.25	ND (<0.00025)	0.0052	22	260	4.2	49	--	1.5	17	0.27	3.1	2/19/2014	9.9	110		
2/23 - 3/1	3/1/2014	ND (<2.5)	1.3	0.015	2/24/2014	7.18	ND (<0.00025)	0.0043	10	120	0.30	3.5	--	0.58	6.8	0.39	4.6	2/26/2014	3.7	43		
3/2 - 3/8	3/8/2014	ND (<2.5)	1.3	0.013	3/3/2014	6.91	ND (<0.00025)	0.0064	16	170	3.8	41	--	0.43	4.6	0.20	2.1	3/5/2014	2.4	26		
3/9 - 3/15	3/15/2014	ND (<2.5)	1.3	0.015	3/10/2014	7.36	ND (<0.00025)	0.0051	54	630	9.8	114	--	1.6	19	0.28	3.3	3/12/2014	3.4	40		
3/16 - 3/22	3/22/2014	ND (<2.5)	1.3	0.015	3/17/2014	6.87	ND (<0.00025)	0.0023	13	150	3.0	36	--	0.19	2.3	0.18	2.1	3/19/2014	1.0	12		
3/23 - 3/29	3/29/2014	ND (<2.5)	1.3	0.015	3/24/2014	6.72	0.00048	0.0059	12	140	3.6	42	--	0.33	3.9	0.18	2.1	3/26/2014	3.7	44		
3/30 - 4/5	4/5/2014	ND (<2.5)	1.3	0.0090	3/31/2014	7.04	ND (<0.00025)	0.012	30	220	5.9	42	ND (<0.10)	0.05	0.36	0.26	1.9	4/4/2014[1]	NS	NS		
4/6 - 4/12	4/12/2014	ND (<2.5)	1.3	0.0056	4/11/2014	6.61	0.00029	0.0096	15	70	3.4	15	ND (<0.10)	0.05	0.23	0.16	0.7	4/11/2014	3.4	15		
4/13 - 4/19	4/19/2014	ND (<2.5)	1.3	0.015	4/14/2014	6.66	ND (<0.00025)	0.028	20	230	4.4	52	ND (<0.10)	0.05	0.59	0.22	2.6	4/16/2014	6.3	74	0.15	1.6
4/20 - 4/26	4/26/2014	ND (<2.5)	1.3	0.014	4/21/2014	6.62	ND (<0.00025)	0.012	15	170	3.5	40	--	0.51	5.9	0.20	2.3	4/23/2014	2.5	29		
4/27 - 5/3	5/3/2014	ND (<2.5)	1.3	0.014	4/28/2014	6.62	ND (<0.00025)	0.012	17	200	3.7	43	--	0.18	2.1	0.16	1.9	4/30/2014	4.9	57		
5/4 - 5/10	5/10/2014	ND (<2.5)	1.3	0.014	5/5/2014	6.77	ND (<0.00025)	0.0074	13	150	2.7	31	--	0.49	5.6	0.14	1.6	5/7/2014	2.8	32		
5/11 - 5/17	5/17/2014	ND (<2.5)	1.3	0.014	5/12/2014	6.62	0.0013	0.0083	26	290	3.9	44	--	1.1	12	0.39	4.4	5/14/2014	3.0	34		
5/18 - 5/24	5/24/2014	ND (<2.5)	1.3	0.014	5/19/2014	7.06	ND (<0.00025)	0.012	15	170	3.3	37	--	0.99	11	0.31	3.5	5/21/2014	3.4	38		
5/25 - 5/31	5/31/2014	ND (<2.5)	1.3	0.014	5/27/2014	6.77	ND (<0.00025)	0.012	23	270	3.4	39	--	0.12	1.4	0.25	2.9	5/28/2014[2]	NS	NS		
6/1 - 6/7	6/7/2014	ND (<2.5)	1.3	0.014	6/2/2014	6.85	ND (<0.00025)	0.010	18	200	3.1	34	--	1.3	14	0.52	5.6	6/4/2014	2.3	25		
6/8 - 6/14	6/14/2014	ND (<2.5)	1.3	0.014	6/9/2014	6.69	ND (<0.00025)	0.0091	13	140	3.0	33	--	0.11	1.2	0.040	0.43	6/11/2014	1.2	13		
6/15 - 6/21	6/21/2014	ND (<2.5)	1.3	0.014	6/16/2014	6.69	ND (<0.00025)	0.016	13	140	3.7	41	--	0.57	6.3	0.16	1.8	6/18/2014	0.86	10		
6/22 - 6/28	6/28/2014	ND (<2.5)	1.3	0.013	6/23/2014	6.71	ND (<0.00025)	0.0062	10	110	2.0	21	--	0.11	1.2	0.070	0.75	6/25/2014	5.4	58		
6/29 - 7/5[3]	7/5/2014	ND (<2.5)	1.3	0.012	6/30/2014[3]	6.50	ND (<0.00025)	0.017	29	280	4.8	47	ND (<0.10)	0.05	0.49	0.16	1.6	7/2/2014[3]	4.5	44		
7/6 - 7/12[3]	7/12/2014	ND (<2.5)	1.3	0.012	7/8/2014[3]	6.77	ND (<0.00025)	0.0089	20	200	3.2	31	--	0.41	4.0	0.23	2.3	7/9/2014[3]	3.4	33	0.24	2.0
7/13 - 7/19	7/19/2014	ND (<2.5)	1.3	0.010	7/15/2014	6.85	ND (<0.00025)	0.020	34	280	8.3	69	ND (<0.10)	0.05	0.41	0.35	2.9	7/16/2014	4.5	37		
7/20 - 7/26	7/26/2014	ND (<2.5)	1.3	0.012	7/21/2014	7.25	ND (<0.00025)	0.020	50	470	9.2	87	--	0.22	2.1	0.56	5.3	7/23/2014	3.7	35		
7/27 - 8/2	8/2/2014	ND (<2.5)	1.3	0.012	7/28/2014	6.65	ND (<0.00025)	0.014	23	220	6.1	57	--	0.25	2.3	0.25	2.3	7/30/2014	5.4	51		
8/3 - 8/9	8/9/2014	ND (<2.5)	1.3	0.013	8/4/2014	6.84	ND (<0.00025)	0.034	21	210	4.5	46	--	0.23	2.3	0.16	1.6	8/6/2014	5.7	58		
8/10 - 8/16	8/16/2014	NA	NA	NA	8/11/2014	6.65	ND (<0.00025)	0.012	25	270	4.4	48	ND (<0.10)	0.05	0.54	0.18	2.0	8/13/2014	1.8	20		
8/17 - 8/23	8/17/2014	NA	NA	NA	8/18/2014	6.87	ND (<0.00025)	0.0064	14	150	2.9	31	--	0.26	2.8	0.22	2.4	8/20/2014	NA	NA		
					8/25/2014	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA					

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

[1] During this time period, treated effluent was diverted to GW-11 rather than discharged to the Las Vegas Wash. As a result, the weekly BOD_5 (inhibited) sample for the week of March 31, 2014 was not collected.

[2] The effluent BOD_5 (inhibited) sample for the week of May 26, 2014 was invalidated due to a power outage at the laboratory

[3] On several days during this period, the effluent flow meter was not working properly. Mass loading values (lbs/day) were calculated using influent flow values in place of effluent flow values.

NA = Not Available To Date
NS = No Sample
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
Last Updated: August 29, 2014

Attachment C

Equipment Tracking Form

Sub-System	P&ID	Description	Status[1]	Checked	Notes
		Main Plant Equipment			
1		**Seep Wells and Lift Station 1**			
1.01		*Seep Well Field, 9 wells*	Running	X	All 9 wells in operation
1.02		*Lift Station 1 Lift Pump A*	Running	X	
1.03		*Lift Station 1 Lift Pump B*	Standby	X	
2		**Athens Road Wells and Lift Station** 3			
2.01		*Athens Road Well Field, 9 wells*	Running	X	All 9 wells in operation
2.02		*Lift Station 3 Lift Pump A*	Running	X	
2.03		*Lift Station 3 Lift Pump B*	Standby	X	
3		**Lift Station *2* and Transmission Piplines**			
3.01		*Influent Pipline*	In operation	X	
3.02		*Effluent Pipeline*	Running	X	
3.03		*Lift Station 2 Lift Pump A*	Running	X	
3.04		*Lift Station 2 Lift Pump B*	Standby	X	
4		**Interceptor Wells and Cr Treatment Plant**			
4.01		*IWF Well Field, 30 wells*	Running	X	All 30 wells in operation
4.02		*Ferrous Sulfate Feed System*	Running	X	
4.03		*Polymer Feed System*	Running	X	
4.04		*Clarifier*	In operation	X	
4.05		*Filter Press*	Running	X	
4.06		*GWTP Effluent Tank*	In operation	X	
4.07		*Interceptor Booster Pump A*	Standby	X	
4.08		*Interceptor Booster Pump B*	Running	X	
5		**Equalization Area and GW-11 Pond**			
5.01	PID10A	*Pond GW-11*	In operation	X	
5.02	PID10A	*Pond Water Pump - P101A*	Running	X	
5.03	PID10A	*Pond Water Pump - P101B*	Standby	X	
5.04	PID10A	*Equalization Tanks*	In operation	X	
5.05	PID10A	*Raw Water Feed Pump - P102A*	Running	X	
5.06	PID10A	*Raw Water Feed Pump - P102B*	Standby	X	Bearings need to be replaced in the motor
5.07	PID10B	*Carbon Absorber - LGAC 201A*	Running	X	
5.08	PID10B	*Carbon Absorber - LGAC 201B*	Running	X	New shipping date for valves. Moved to 8-29-14
5.09	PID10B	*Carbon Absorber - LGAC 201C*	Standby	X	

[1]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

Sub-System	P&ID	Description	Status[1]	Checked	Notes
		Main Plant Equipment			
6		**First Stage FBRs A, 1** *& 2*			
6.01	PID14	*FBR A*	Running	X	
6.02	PID14	*Separator Tank - 1401*	Running	X	
6.03	PID14	*Media Return Pump - P 1401*	Running	X	
6.04	PID14	*P1401A*	Running	X	
6.05	PID01A	*P1401B*	Maintenance	X	New seal and reconditioned pump completed and online.
6.06	PID01A	*FBR 1*	Running	X	
6.07	PID02A	*FBR 2*	Running	X	
6.08	PID01A	*First Stage Separator Tank - T2011*	Running	X	
6.09	PID01A	*Media Return Pump - P2011*	Running	X	
6.10	PID01A	*First Stage FBR Pump - P1011*	Standby	X	
6.11	PID01A	*First Stage FBR Pump - P1012*	Running	X	
6.12	PID01A	*First Stage FRB Pump - P101A*	Running	X	
6.13	PID07A	*FBR A pH Feed Pump - P71A*	Standby	X	
6.14	PID07A	*FBR 1 pH Feed Pump - P711*	Standby	X	
6.15	PID07A	*FBR 2 pH Feed Pump - P712*	Standby	X	
6.16	PID07A	*FBR A Nutrient (Urea) Feed Pump - P72A*	Off	X	
6.17	PID07A	*FBR 1 Nutrient (Urea) Feed Pump - P721*	Off	X	
6.18	PID07A	*FBR 2 Nutrient (Urea) Feed Pump - P722*	Off	X	
6.19	PID15	*FBR A Nutrient (Phos Acid) Feed Pump - P1520A*	Running	X	
6.20	PID15	*FBR 1 Nutrient (Phos Acid) Feed Pump - P1521*	Running	X	
6.21	PID15	*FBR 2 Nutrient (Phos Acid) Feed Pump - P1522*	Running	X	
6.22	PID07B	*FBR A Electron Donor Assembly Pump - P73A*	Running	X	
6.23	PID07B	*FBR 1 Electron Donor Assembly Pump - P731*	Running	X	
6.24	PID07B	*FBR 2 Electron Donor Assembly Pump - P732*	Running	X	

[1]Status Codes
Running - Unit is in operation
Standby - Spare or duplicate, not currently in operation
Maintenance - Out of service for maintenance
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Sub-System	P&ID	Description	Status[1]	Checked	Notes
		Main Plant Equipment			
7		**First Stage FBRs 3** *& 4*			
7.01	PID01B	*FBR 3*	Off	X	
7.02	PID01B	*FBR 4*	Off	X	
7.03	PID02B	*First Stage Separator Tank - T2012*	Off	X	
7.04	PID01B	*Media Return Pump - P2012*	Off	X	
7.05	PID01B	*First Stage FBR Pump - P1013*	Off	X	
7.06	PID01B	*First Stage FRB Pump - P1014*	Off	X	
7.07	PID01B	*First Stage FBR Pump - P102A*	Off	X	
7.08	PID07A	*FBR 3 pH Feed Pump - P713*	Off	X	
7.09	PID07A	*FBR 4 pH Feed Pump - P714*	Off	X	
7.10	PID07A	*FBR 3 Nutrient (Urea) Feed Pump - P723*	Off	X	
7.11	PID07A	*FBR 4 Nutrient (Urea) Feed Pump - P 724*	Off	X	
7.12	PID15	*FBR 3 Nutrient (Phos Acid) Feed Pump - P1523*	Off	X	
7.13	PID15	*FBR 4 Nutrient (Phos Acid) Feed Pump - P1524*	Off	X	
7.14	PID07B	*FBR 3 Electron Donor Assembly Pump - P733*	Off	X	
7.15	PID07B	*FBR 4 Electron Donor Assembly Pump - P734*	Off	X	
8		**Second Stage FBRs 5** & 6			
8.01	PID03A	*FBR 5*	Off	X	Rehabing FBR
8.02	PID03A	*FBR 6*	Off	X	
8.03	PID03C	*Second Stage Separator Tank - T3011*	Off	X	
8.04	PID03A	*Media Return Pump - P3011*	Off	X	
8.05	PID03A	*Second Stage FBR Pump - P3015*	Off	X	
8.06	PID03A	*Second Stage FBR Pump - P3016*	Off	X	
8.07	PID03A	*Second Stage FBR Pump - P301A*	Off	X	
8.08	PID07A	*FBR 5 pH Feed Pump - P715*	Off	X	
8.09	PID07A	*FBR 6 pH Feed Pump - P716*	Off	X	
8.10	PID07A	*FBR 5 Nutrient (Urea) Feed Pump - P725*	Off	X	
8.11	PID07A	*FBR 6 Nutrient (Urea) Feed Pump - P726*	Off	X	
8.12	PID07B	*FBR 5 Electron Donor Assembly Pump - P735*	Off	X	
8.13	PID07B	*FBR 6 Electron Donor Assembly Pump - P736*	Off	X	

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Sub-System	P&ID	Description	Status[1]	Checked	Notes
		Main Plant Equipment			
9		**Second Stage FBRs 7** & 8			
9.01	PID03B	*FBR 7*	Running	X	
9.02	PID03B	*FBR 8*	Running	X	
9.03	PID03D	*Second Stage Separator Tank - T3012*	Running	X	
9.04	PID03B	*Media Return Pump - P3012*	Running	X	
9.05	PID03B	*Second Stage FBR Pump - P3017*	Standby	X	
9.06	PID03B	*Second Stage FBR Pump - P3018*	Running	X	
9.07	PID03B	*Second Stage FBR Pump - P302A*	Running	X	
9.08	PID07A	*FBR 7 pH Feed Pump - P717*	Standby	X	
9.09	PID07A	*FBR 8 pH Feed Pump - P718*	Standby	X	
9.10	PID07A	*FBR 7 Nutrient (Urea) Feed Pump - P727*	Off	X	
9.11	PID07A	*FBR 8 Nutrient (Urea) Feed Pump - P728*	Off	X	
9.12	PID07B	*FBR 7 Electron Donor Assembly Pump - P737*	Running	X	
9.13	PID07B	*FBR 8 Electron Donor Assembly Pump - P738*	Running	X	
10		**Aeration and DAF System**			
10.01	PID04	*Aeration Tank*	In operation	X	
10.02	PID04	*Aeration Blower - B401*	Running	X	
10.03	PID04	*Biofilter*	In operation	X	
10.04	PID04	*Nutrient Solution*	Running	X	
10.05	PID04	*Biofilter Sump*	Running	X	
10.06	PID04	*Nutrient Pump - P401*	Running	X	
10.07	PID04	*Biofilter Sump Pump - P402A*	Standby	X	
10.08	PID04	*Biofilter Sump Pump - P402B*	Off	X	Only one pump in place
10.09	PID04	*Biofilter Blower*	Running	X	
10.10	PID05	*DAF Pressure Tanks*	In operation	X	
10.11	PID05	*DAF Vessel - D501*	Running	X	
10.12	PID05	*DAF Pressure Pump - P501*	Running	X	
10.13	PID05	*DAF Float Pump - P502*	Running	X	
10.14	PID05	*DAF Vessel - D551*	Running	X	
10.15	PID05	*DAF Pressure Pump - P551*	Running	X	
10.16	PID05	*DAF Float Pump - P552*	Running	X	
10.17	PID05	*Screw Conveyer Drive*	Standby	X	
10.18	PID05	*Skimmer Drive*	Running	X	

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Sub-System	P&ID	Description	Status[1]	Checked	Notes
		Main Plant Equipment			
11		**Pumping System (Old Effluent)**			
11.01	PID06	*Effluent Tank 601*	In operation	X	
11.02	PID06	*Effluent Pump - P601*	Maintenance	X	Mechanical seal being rebuilt
11.03	PID06	*Effluent Pump - P602*	Running	X	
12		**Sand Filter System**			
12.01	PID17	*Sand Filter*	Running	X	
12.02	PID17	*Filter Reject Tank*	In operation	X	
12.03	PID17	*Filter Reject Pump - P1701A*	Running	X	Impellers ordered
12.04	PID17	*Filter Reject Pump - P1701B*	Running	X	
13		**Effluent Tank and Pumping**			
13.01	PID10C	*UV Effluent Tank*	Running	X	
13.02	PID10C	*Effluent Booster Pump - P1302A*	Running	X	
13.03	PID10C	*Effluent Booster Pump - P1302B*	Standby	X	
14		**Solids Collection and Pressing System**			
14.01	PID16	*Sludge Storage Tank*	In operation	X	
14.02	PID16	*Solids Storage Effluent Pump - P1601*	Running	X	
14.03	PID16	*Solids Cond. Tank*	In operation	X	
14.04	PID09	*Sludge Mixer*	Running	X	
14.05	PID09	*Filter Press Pump - P901*	Running	X	
14.06	PID09	*Filter Press Pump - P902*	Standby	X	
14.07	PID09	*West Press*	Off	X	
14.08	PID09	*East Press*	Running	X	
14.09	PID09	*Filtrate Tank*	In operation	X	
14.10	PID09	*Filtrate Tank Effluent (recycle) Pump - P903*	Running	X	

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Sub-System	P&ID	Description	Status[1]	Checked	Notes
		Main Plant Equipment			
		Chemical Systems			
15		**Electron Donor System**			
15.01	PID07B	*Electron Donor Tank*	In operation	X	
15.02	PID07B	*Booster Pump P739A*	Running	X	
15.03	PID07B	*Booster Pump P739B*	Standby	X	
17	PID07C	**Micro Nutrient System**	In operation	X	
18	PID07C	**Hydrogen Peroxide System**	In operation	X	
19	PID07C	**De-Foam System**	In operation	X	
20	PID15	**Nutrient (Phosphoric Acid) System** (Tank only - pumps included in FBRs)	In operation	X	
21	PID07A	**Nutrient (Urea) System** (Tank only - pumps included in FBRs)	In operation	X	
22	PID07A	**pH System** (Tank and effluent pH feed pump only - other pumps included in FBRs)	In operation	X	
23	PID07C	**Ferric Chloride System**	In operation	X	
24	PID07B	**Polymer Systems - DAF**	In operation	X	
25	PID09	**Polymer System - Solids Dewatering** (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)	In operation	X	

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		Main Plant Equipment			
		Utility Systems			
26		**Compressed Air System**			
26.01	PID08	*West Compressor*	Running	X	
26.02	PID08	*East Compressor*	Maintenance	X	
26.03	PID08	*O2 Compressor*	Running	X	
26.04	PID08	*Compressed Air Receiver Tank*	In operation	X	
26.05	PID08	*Air Dryer*	Running	X	
26.06	PID08	*Oil Removal Filter*	In operation	X	
26.07	PID08	*Particulate Filter*	In operation	X	
27	PID16	**Oxygen System**	In operation	X	
28		**GWETS Plant Controls/ Siemens Controls**	In operation	X	Computer in MCC on the FBR pad is not in service.
29		**Well Control System/ Allen Bradley Controls**	In operation	X	
30		**MCC FBR Pad**	In operation	X	
31		**MCC in D-1**	In operation	X	
32		**MCC in EQ area**	In operation	X	
		Miscellanous Systems			
33		**Operations Office/Network**	In operation	X	
34		**Laboratory Analyzers**	In operation	X	
35		**Security Systems**	In operation	X	
		Shelf Spares			
		Media Return Pump Rebuid Kit	In stock	X	
		pH Feed Pump	In stock	X	
		Nutrient Feed Pump	In stock	X	
		Electron Donor Feed Pump	In stock	X	
		Phosphoric Acid Feed Pump	In stock	X	
		Interceptor Well Pumps (4 each)	In stock	X	
		Seep Well Pump (1 each, same as Athens so total of 2)	In stock	X	
		Athens Road Well Pump (1 each, same as Seep so total of 2)	In stock	X	

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