Bunker Hill Central Treatment Plant

Daily log June 2018

				AERATION BASIN					CLARIFIER						CLARIFIER TROUGH -for- DISCHARGE 006									RECYCLE SG		LIME SLURRY			SLUDGE PUMP		POND PUMP		SLUDGE GUN TEST		LINED POND
		INFLUENT KT			a.m.		p.m.		a.m.		p.m.				pH a.m.		pH p.m.		Turbidity		Est	DO	1/wk					Injection Valve	Est.	600gpm					ESTIMATED
DATE	Operators	GPM	pH	SET	pH1	grab	pH1	grab	pH2	grab	pH2	grab	TURB	TEMP	Mtr	grab	Mtr	grab	Meter	Grab	Flow	PPM	TEMP	SG	GPM	SG	%solid	Closed/Open	pump #	min	ON	OFF	10' Out	20' Out	Elevation (mg)
6/1	GC			8.5	8.5	8.7	8.6	8.5	8.3	8.4	8.3	8.4	0.61	56	8.3	8.2	8.3	8.2	0.90	0.53	2.57			1.054	400	1.078	12.0	272/32	3	180					2269.0 (1.0mg)
6/2	GC			8.5	8.5	8.5	8.5	8.4	8.2	8.3	8.0	8.2	0.70	57	8.2	8.0	8.1	8.0	0.90	0.87	2.48			1.047	400	1.080	12.3	290/30	3	150			22"	10"	2269.0
6/3	SB			8.5	8.5	8.5	8.5	8.4	8.0	8.2	8.0	8.2	0.90	56	8.1	8.2	8.0	8.1	0.90	0.79	2.54			1.048	400	1.078	12.0	285/30	3	150			23"	12"	2269.0
6/4	GF,SB	1830	2.65	8.5	8.7	8.6	9.3	9.3	8.1	8.0	7.9	8.0	0.80	58	8.0	7.9	8.1	8.2	0.90	0.90	2.54			1.050	400	1.078	12.0	280/30	3	150	#3 04:30	13:30			2269.0
6/5	GF,SB,GC			8.5	8.5	8.5	8.5	8.5	7.9	8.2	7.7	8.0	0.87	59	8.0	8.0	8.0	8.1	0.90	1.03	2.64			1.048	400	1.078	12.0	300/28	3	120	#3 05:30	9:30			2268.8
6/6	GF,SB,GC			8.5	8.5	8.5	8.6	8.5	7.9	7.9	7.8	7.9	0.95	58	8.0	7.9	7.9	7.9	0.90	1.03	2.61	7.20	16.80	1.060	400	1.077	11.9	203/42	3	150					2268.5 (0.75mg)
6/7	GF,SB,GC	1010	2.49	8.5	8.5	8.4	8.6	8.5	7.8	8.1	7.7	7.9	0.74	56	8.0	8.0	7.7	7.7	0.90	0.66	1.76			1.048	400	1.074	11.4	234/30	3	65					2268.5
6/8	GF,GC			8.5	8.6	8.5	8.5	8.5	7.7	7.8	8.0	7.9	0.75	57	7.9	7.6	7.8	7.8	0.90	0.92	1.42			1.046	400	1.076	11.6	265/35	3	60					2268.5
6/9	GC,GC			8.5	8.5	8.5	8.5	8.4	7.5	7.9	7.6	7.8	0.90	58	7.8	7.7	7.8	7.7	0.90	0.85	1.69			1.055	400	1.077	11.9	180/48	3	180					2268.5
6/10	SB			8.5	8.5	8.4	8.5	8.4	7.7	8.0	7.6	8.0	0.80	56	8.0	7.7	7.9	7.7	0.90	0.78	2.25			1.046	400	1.078	12.0	334/48	3	90					2268.5
6/11	GF,SB	1000	2.53	8.5	8.5	8.4	8.5	8.5	7.8	7.8	7.6	7.8	0.75	56	8.0	7.8	7.6	7.8	0.90	0.85	2.25			1.052	400	1.077	11.9	250/45	3	60					2268.5
6/12	GF,SB,GC			8.5	8.4	8.3	8.5	8.4	7.6	7.8	7.8	7.9	0.80	49	7.8	7.8	7.4	7.6	0.90	0.74	1.38			1.047	400	1.078	12.0	270/45	3	60					2268.5
6/13	GF,SB,GC			8.5	8.5	8.4	8.5	8.5	7.7	7.9	7.6	7.9	0.55	50	7.7	7.7	7.8	7.7	0.90	0.60	1.38	9.10	7.40	1.050	400	1.076	11.7	278/45	3	150					2268.5
6/14	GF,SB,GC	1760	2.78	**8.4**	8.4	8.5	8.4	8.4	7.7	8.1	7.7	8.0	0.87	52	7.9	7.9	7.9	7.7	0.90	0.65	2.25			1.055	400	1.076	11.7	187/48	3	120					2268.5
6/15	GF,GC			**8.4**	8.5	8.5	8.4	8.4	8.0	8.1	7.9	8.0	0.70	55	8.0	7.9	8.0	7.8	0.90	0.70	2.46			1.052	400	1.078	12.0	190/48	3	120					2268.5
6/16	GC			**8.4**	8.5	8.5	8.4	8.5	7.9	8.0	7.9	7.9	0.62	54	8.1	8.0	8.1	8.0	0.90	0.71	2.46			1.055	400	1.078	12.0	184/48	3	120					2268.5
6/17	SB			**8.4**	8.4	8.5	8.4	8.5	7.8	8.1	8.0	8.1	0.64	54	8.1	8.1	8.3	8.2	0.90	0.60	2.46			1.055	400	1.077	11.9	184/48	3	120					2268.5
6/18	GF,SB	1725	2.83	**8.4**	8.4	8.4	8.4	8.4	8.0	8.1	8.0	8.2	0.70	55	8.0	7.9	8.2	8.2	0.90	0.80	2.46			1.055	400	1.078	12.0	185/48	3	120					2268.5
6/19	GF,SB,GC			**8.4**	8.4	8.4	8.4	8.3	8.0	7.9	7.9	7.8	0.65	55	8.0	7.8	8.2	7.6	0.90	0.70	2.41			1.067	400	1.078	12.0	190/48	3	180					2268.5
6/20	GF,SB,GC			**8.4**	8.4	8.4	8.4	8.4	8.0	7.9	8.0	8.0	0.58	56	7.9	7.8	8.0	7.9	0.90	0.68	2.38	8.00	5.90	1.065	400	1.076	11.7	156/50	3	180			21"	12"	2268.5
6/21	GF,SB,GC	1700	2.90	**8.4**	8.4	8.3	8.4	8.4	7.9	7.9	8.0	8.2	0.80	57	7.9	7.9	7.9	8.0	0.90	0.80	2.38			1.056	400	1.077	11.9	161/50	3	120					2268.5
6/22	GF,GC			**8.4**	8.4	8.4	8.5	8.5	7.9	7.9	8.0	7.9	0.70	58	7.9	7.8	7.9	7.6	0.90	0.70	2.38			1.056	400	1.076	11.7	162/50	3	120					2268.5
6/23	GC			**8.5**	8.5	8.5	8.5	8.5	7.9	7.9	7.8	7.8	0.72	58	8.0	7.6	7.9	7.7	0.90	0.67	2.38			1.043	400	1.077	11.9	285/47	3	30					2268.5
6/24	SB			**8.4**	8.5	8.5	8.5	8.5	7.9	7.7	7.9	7.8	0.74	57	7.9	7.8	7.7	7.8	0.90	0.66	1.08			1.045	400	1.078	12.0	308/47	3	30					2268.5
6/25	GF,SB	830	2.50	**8.4**	8.5	8.5			7.8	7.8			0.60	57	7.9	7.8			0.90	0.75	1.08			1.046	400	1.078	12.0	302/47	3	60					2268.5
6/26	GF,SB,GC			**8.4**																					400				3						
6/27	GF,SB,GC			**8.4**																					400				3						
6/28	GF,SB,GC			**8.4**																					400				3						
6/29	GF,GC			**8.4**																					400				3						
6/30	GC			**8.4**																					400				3						
Averages:				8.45	8.48	8.45	8.51	8.48	7.86	7.98	7.86	7.98	0.74	56	7.96	7.86	7.93	7.87	PPM	*c		8.10		1.05						115					
Notes:																														2885					
																														1,731,000	Gallons				

05-31-18 11:30 Reduced the operating pH set point to 8.50 from 8.60, approved by Wood management (CTP Process Engineer).
06-01-18 07:00 Recalibrated Aeration pH probe to grab samples. 8.54 to 8.72
06-04-18 04:30-13:30 KT flow of 1830 gpm to the lined storage pond, activated #3 lined pond pump.
06-05-18 05:30-09:30 KT flow of 1830 gpm to the lined storage pond, activated #3 lined pond pump.
06-05-18 Removed lime slurry system #2 from service, activated lime slurry system #1.
06-06-18 12:00 KT flow decreased to approximately 800 gpm as the mine pool pump may have been removed from service. Operators have had no communications with the mine personnel.
06-06-18 09:00 Placed #2 lime slurry loop into service as the primary lime loop. Flushed #1 loop and placed it into standby mode.
06-08-18 14:30 KT flow increased to approximately 1800 gpm from 1010 gpm.
06-10-18 01:00 KT flow decreased to approximately 1000 gpm from 1800 gpm.
06-13-18 11:00 KT flow increased to approximately 1725 from 1000 gpm as the mine pool pump was activated.
06-22-18 10:30 KT flow decreased from approximately 1700 gpm to 750 gpm.

NPDES DISCHARGE POINT 006
CENTRAL TREATMENT PLANT
MONTH: Jun-18

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	FLOW	TSS		LOADING
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1	0.003	0.054	0.153	3.28	0.004	0.09	2.19	47.0	6.90	2.57	8.0	171.6	77.8
2		0.052		3.17		0.08		45.3		2.48		165.6	75.1
3		0.053		3.24		0.09		46.4		2.54		169.6	76.9
4	0.003	0.053	0.268	5.68	0.008	0.18	7.72	164	6.90	2.54	2.0	42.39	19.2
5		0.055		5.90		0.18		170		2.64		44.03	20.0
6	0.003	0.054	0.275	5.98	0.008	0.18	6.68	145	6.90	2.61	1.2	26.09	11.8
7		0.037		4.03		0.12		97.9		1.76		17.58	7.97
8	0.003	0.030	0.355	4.19	0.007	0.09	3.81	45.0	6.90	1.42	1.4	16.53	7.50
9		0.035		5.01		0.10		53.7		1.69		19.74	8.95
10		0.047		6.66		0.14		71.4		2.25		26.3	11.9
11	0.003	0.047	0.424	7.97	0.009	0.17	8.00	150.4	6.80	2.25	1.4	26.3	11.9
12		0.029		4.88		0.10		92.1		1.38		16.1	7.3
13	0.003	0.029	0.600	6.91	0.009	0.10	3.72	42.8	6.70	1.38	2.2	25	11
14		0.047		11.24		0.17		69.7		2.25		41	19
15	0.003	0.051	0.361	7.41	0.009	0.18	5.28	108.4	6.70	2.46	2.0	41.1	18.6
16		0.051		7.41		0.18		108.4		2.46		41.1	18.6
17		0.051		7.41		0.18		108.4		2.46		41.1	18.6
18	0.003	0.051	0.212	4.35	0.005	0.11	8.96	183.9	6.90	2.46	2.2	45.2	20.5
19		0.050		4.26		0.11		180.2		2.41		44.2	20.07
20	0.003	0.050	0.243	4.82	0.007	0.13	8.62	170.9	6.90	2.38	2.0	39.7	18.0
21		0.050		4.82		0.13		170.9		2.38		39.7	18.0
22										2.38			
23										2.38			
24										1.08			
25										1.08			
26													
27													
28													
29													
30													
Total	0.023	0.975	2.891	118.624	0.067	2.802	54.980	2271.774	61.600	53.657	22.400	1100.215	498.964
Sample Events	9	21	9	21	9	21	9	21	9	25	9	21	21
Daily Average	0.003	0.046	0.321	5.65	0.007	0.133	6.1	108	6.84	2.15	2.49	52.4	23.76
Lab Detection Limit	**0.0025**		**0.003**		**0.0008**		**0.0017**		**0.01**		**0.080**		

MIN	0.003	0.029	0.153	3.166	0.004	0.085	2.190	42.840	6.700	1.080	1.200	16.123	7.312
MAX	0.003	0.055	0.600	11.241	0.009	0.185	8.960	183.937	6.900	2.638	8.000	171.573	77.811

Notes:
(X mg/L) * (1 kg/10^6 mg) * (2.205 lbs/kg) * (3.785 L/gal) * (10^6 gal/Mgal) * (Y Mgal/day) = (X) * (Y) * (8.345) in lbs/day
(X lbs/day) * (1 kg/2.205 lbs) = (X) / (2.205) in kg/day

KELLOGG TUNNEL DISCHARGE
CENTRAL TREATMENT PLANT
MONTH: 5/16-1/2018
Data from SVL

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	006 FLOW	TSS		
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1		0.00		0		0.00		0		2.57		0	0
2		0.00		0		0.00		0		2.48		0	0
3		0.00		0		0.00		0		2.54		0	0
4	0.571	12.10	170	3,603	0.371	7.86	97	2,054	2.80	2.54	142	3,010	1,365
5		12.57		3,742		8.17		2,133		2.64		3,126	1,418
6		12.41		3,696		8.07		2,106		2.61		3,087	1,400
7	0.650	9.52	227	3,326	0.642	9.41	48	708	2.70	1.76	32	468.9	212.7
8		7.68		2,680		7.58		570		1.42		378	171
9		9.17		3,201		9.05		681		1.69		451	205
10		12.19		4,257		12.04		906		2.25		600	272
11										2.25			
12										1.38			
13										1.38			
14										2.25			
15										2.46			
16										2.46			
17										2.46			
18										2.46			
19										2.41			
20										2.38			
21										2.38			
22										2.38			
23										2.38			
24										1.08			
25										1.08			
26													
27													
28													
29													
30													
Total	1.22	76	397	24506	1.01	62	145	9159	5.5	53.7	174	11121	5043
Sample Events	8	30	8	30	8	30	8	30	8	30	8	30	30
Daily Average	0.153	2.5	49.6	817	0.127	2.07	18.2	305	0.69	1.79	22	371	168

Notes:
(X mg/L) * (1 kg/10^6 mg) * (2.205 lbs/kg) * (3.785 L/gal) * (10^6 gal/Mgal) * (Y Mgal/day) = (X) * (Y) * (8.345) lbs/day
(X lbs/day) * (1 kg/2.205 lbs) = (X) / (2.205) kg/day

JANUARY 2018 - DECEMBER 2018 BHCTP LIME USAGE AFW/WOOD

	Silo A						Silo B						Total	
Month	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Net Tons	Tons/Day
Jan 1 - Jan 31	11.70	13.30	-1.6	-8.6	72.20	63.6	16.30	16.30	0.0	0.0	0.00	0.0	63.6	2.05
Feb 1-Feb 28	13.30	15.50	-2.2	-11.9	40.50	28.6	16.30	13.80	2.5	13.5	42.10	55.6	84.2	3.01
Mar 1 - Mar 31	15.30	15.30	0.0	0.0	0.00	0.0	13.80	10.00	3.8	20.5	81.00	101.5	101.5	3.27
April 1 - April 30	15.30	15.30	0.0	0.0	0.00	0.0	10.00	13.00	-3.0	-16.2	150.70	134.5	134.5	4.48
May 1 - May 31	15.30	17.00	-1.7	-9.2	41.50	32.3	13.00	7.50	5.5	29.6	333.50	363.1	395.5	12.76
June 1 - June 30	17.00	17.00	0.0	0.0	0.00	0.0	7.50	13.70	-6.2	-44.9	152.00	107.1	107.1	4.28
				Silo A	**112.70**					**Silo B**	**273.80**		63.6	
						Tdl Tons Purchased		**386.50**					**Average**	**4.98**

NOTES:
08-22-17 Slaker B (Silo B) removed from service, Slake A (Silo A) placed into service - Six Month Rotation- Lime loop #2 off, Lime loop #1 on
Six Month Rotation - January 1, 2018 A= 11.7 B = 16.3
01-23-18 Lime loop #1 removed from service, lime loop #2 placed into service. #1 lime loop discharge pipe found leaking, will be replaced asap.
01-24-18 Lime loop #1 repaired and placed into service as the primary lime slurry injection system. Lime loop #2 was also repaired.
02-12-18 Slaker A (Silo A) removed from service, Slake B (Silo B) placed into service - Six Month Rotation- Lime loop #1 off, Lime loop #2 on
Six Month Rotation - February 11, 2018 A= 15.0 B = 16.3

	Silo A	**Silo B**	
	17.0	**13.7**	**FT**
6.20 Tons per foot =	**125.8**	**101.4**	**Tons**
30% Contingency	**-37.7**	**-30.4**	**FT**
Available Tons	**88.1**	**71.0**	
Past 7 days usage	**4.8**	**4.8**	**Tons/day**
			Days of usage remaining not including 30% contingency
Days remaining	**18.5**	**14.9**	**33.5**

Lime Daily Use - 7 Days

	Silo A						**Silo B**						Total	
	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Net Tons	Tons/Day
06/19-06/25	17.00	17.00	0.0	0.0	0.00	0.0	13.00	13.70	-0.7	-3.8	37.00	33.2	33.2	4.75

Lime Silo A Depth Readings

Date	**Prior**	**After**	**Tons Received**	**Tons/ft**
1/8/2018	9.9	14.4	33.70	7.49
1/29/2018	8.8	13.8	38.50	7.70
2/14/2018	9.4	15.0	40.50	7.23
1 Month Average:				**7.47**

Flocculant Received

10/19/2017	2200 lbs
12/12/2017	4400 lbs
3/19/2018	4400 lbs
6/5/2018	4400 lbs

Lime Silo B Depth Readings

Date	**Prior**	**After**	**Tons Received**	**Tons/ft**
2/26/2018	8.5	14.5	42.10	7.02
3/7/2018	9.8	16.4	42.50	6.44
3/19/2018	10.0	16.4	38.50	6.02
4/2/2018	9.0	14.2	35.20	6.77
4/11/2018	10.3	15.9	38.50	6.88
4/20/2018	10.1	15.7	38.50	6.88
4/30/2018	7.9	13.5	38.50	6.88
5/4/2018	8.5	13.5	38.50	7.70
5/8/2018	9.0	13.5	38.50	8.56
5/10/2018	5.2	7.7	31.10	12.44
5/11/2018	5.0	9.1	39.50	9.63
5/15/2018	3.5	10.3	38.50	5.66
5/16/2018	7.0	12.0	38.50	7.70
5/17/2018	10.7	17.0	41.50	6.59
5/18/2018	12.5	17.0	33.00	7.33
5/23/2018	7.0	12.5	38.50	7.00
5/26/2018	10.5	16.0	37.40	6.80
6/1/2018	7.5	12.8	38.50	7.26
6/7/2018	8.5	13.3	37.50	7.81
6/13/2018	10.5	16.5	39.00	6.50
6/22/2018	10.5	15.5	37.00	7.40
1 Month Average:				**7.24**