

Summary of City of Flint (City) Actions In Response to the EPA Emergency Administrative Order Updated: June 30, 2016

Chapters 52, 57, 59a & 59b: Weekly Conference Call Regarding Flint Water Plant Operations June 30, 2016.

EPA Order Due Date: Weekly

MDEQ (NAME) and the Flint Water Treatment Plant staff met today to review and discuss the summary of water quality and corrosion control parameters reported on the City's June operation report completed to date, a summary of water quality parameters collected in the distribution system, and some other matters pertaining to operation of the city's water supply. Included with this submission are the daily worksheets for the phosphoric acid and sodium hypochlorite feed systems documenting the City's oversight of this corrosion control treatment.

The following observations were noted:

- The supplemental phosphate dosage was consistent and ranged between 2.19 and 2.27 milligrams per liter (mg/l). However, the phosphate residual measured at the point of entry on June 22nd indicated only 1.33 mg/l entering the distribution system even though 1.22 mg/l were detected in the incoming water and a dosage of 2.21 mg/l was being applied. The City may want to review the laboratory sheets to determine if any data entry errors exist.
- All but one of the phosphate residuals at the 10 weekly distribution system sites were above the minimum of 3.1 mg/l, ranging between 3.12 and 3.52 mg/l. The one weekly site remaining below 3.1 mg/l was at MLK Boulevard, where the phosphate residual was 2.91 mg/l. This site has historically reported the lowest (but acceptable) residuals for both phosphate and chlorine. In response to low residuals at this site in previous weeks, the City has responded by stating, "*It should be noted that water quality indicators have been problematic at the site.*"
- Results of the monitoring at 15 additional sites that are conducted quarterly also reported phosphate residuals below the minimum level of 3.1 mg/l at 8 of the 15 sites, ranging from as low as 1.86 to 3.05 mg/l. The City was advised to flush taps/hydrants/piping in the vicinity of these sites and resample all of them with low phosphate residuals. At this point, the only site that has been resampled was MLK Boulevard, where the phosphate residual improved from 2.91 to 2.96 mg/l. Other sites will be retested in the next few days. However, it is difficult to remedy this situation with limitations placed on flushing distribution pipes.
- All pH measurements were greater than 7.0 at the Enhanced Water Quality Monitoring (EWQM) sites and the Point of Entry (Control Station #2) to the system. The pH levels ranged from 7.43 to 7.53 in the water received from Great Lakes Water Authority (GLWA) and from 7.27 to 7.57 at the 25 distribution system sites.
- Iron levels were not reported at EWQM sites. Plant tap iron concentrations ranged from 0.02 to 0.03 mg/l in the last week.
- There were no lead results reported from the EWQM sites last week.
- The chlorine feed at Control Station #2 has been available since June 10th, and has been dosing ~0.3 mg/l to the water received from GLWA.

- The City is continuing their plans for installation of a caustic soda feed system for pH adjustment, although recent monitoring has shown increasing pH levels in the distribution system without applying any chemicals.
- The City continues to work with NAME to prepare an up-to-date disinfection byproducts monitoring plan.
- The Flint WTP is assessing the laboratory equipment and staff training necessary to initiate additional corrosion control monitoring as recommended by NAME.

In addition to the above comments and observations, NAME submitted the following information that summarizes the discussions that took place while he was visiting the Flint Water Treatment Plant:

1. **Vent screen replacement at the Cedar Street Reservoir (with Name)** – Name and I went to the Cedar Street Reservoir and looked at the vent screens. The reservoir is constructed in two sections. The original 10 million gallon (MG) section had all new screens; however, the cover plates on several vents were missing one or two bolts. NAME was advised that the bolts should be replaced or, as a minimum, the holes should be caulked to prevent the potential entrance of contaminants. The screens on the newer 10 MG section were not replaced; however, NAME was advised that one of them definitely needs to be, since it has developed a small tear. All screens should be routinely inspected for integrity.
2. **Revised monthly operation report (MOR) to include incoming chlorine residual (at CS-2), chlorine dosage at CS-2, and plant tap chlorine residual (with Name and Name)** – NAME has revised the MOR, and it looks satisfactory. The incoming and plant tap free chlorine residuals were already being shown on the MOR (columns 22 and 27, respectively). The mg/l chlorine applied at CS-2 has been added as column 18. The calculated dosage has been very steady at 0.3 mg/l, + or – 0.02 mg/l. It would therefore be expected that the plant tap free chlorine residual would be approximately 0.3 mg/l higher than that measured at CS-2; however, the difference has only been about 0.1 mg/l. We met with NAME in the lab to see if there were any sample technique or analysis issues that would explain the apparent discrepancy. NAME indicated that grab samples are collected at CS-2 and are carried into the lab for analysis using a Hach SL 1000 colorimeter, and that the same instrument is used for the plant tap sample (therefore, the discrepancy is apparently not due to different analytical equipment). I have not had time to research this lab instrument to see if it has any operational issues that need to be accounted for. If sample collection is not the issue, another possibility is that the dosage calculation needs to be adjusted (due to inaccurate inputs for NaOCl strength or incoming GLWA flow). Another possibility is that, due to the large-diameter yard and in-plant piping, there is a decline in chlorine residual by the time water reaches the plant tap. NAME and I discussed the possibility of monitoring chlorine residual closer to the point where the in-plant piping tees off from the yard piping. There is a location just after the plant piping enters the basement wall. The pipe at this location is already tapped with a corporation stop. It is possible that this location can be fitted with a sample tap for grab or continuous monitoring.
3. **Discussion about phosphate residuals in the distribution system, and whether to increase phosphate dosage at this time (Name by telephone, Name, Name, and Name)** – The weekly monitoring from June 21 showed phosphate residuals below the minimum of 3.1 mg/l at one routine location (Site Name, 2.91 mg/l), and in eight of the expanded quarterly sites. Name requested that we wait for the June 26 weekly results to be compiled to see whether ongoing flushing has restored the residuals, or whether

the feed rate should be increased. The updated results were provided to me during the meeting and indicated slight (up to 0.20 mg/l) increases in residual at most locations, or very slight (up to 0.09 mg/l) decreases at a few locations. The only significant change was at the West Side Reservoir, which increased by 0.44 mg/l (from 3.19 mg/l to 3.63 mg/l). This tends to indicate that reservoir management is a significant factor. (Site Name) was up slightly to 2.96 mg/l, but was still below the target residual. We discussed distribution system practices (specifically flushing) with Name and Name to see whether additional distribution efforts might improve the residual near (Site Name). They are of the opinion that there is a hydraulic issue near that sample location that is causing (or at least contributing to) the situation. There is a gate valve at the intersection of Pasadena and Iriquois which is frozen, and they suspect it is in the closed position. They feel that fixing that valve (scheduled for the week of July 11) will alter the flow patterns and bring fresher water to that area. Since all other sampling locations are above the target phosphate residual, it is possible we could wait for the valve repair to be completed and evaluate the improvement (if any). Samples could also be collected from some of the expanded sites to see whether residuals were raised above the target as a result of the recent flushing.

4. **Consumer Confidence Report (Name by phone)** – I assisted NAME with drafting the CCR. There are a few information gaps she needs to address. It is still her belief that she can get the CCR posted to the City's web site by July 1 and issue a press release indicating its availability, with direct mail delivery at a later date. She is aware that arrangement does not meet the direct mail delivery requirements, but it is an effort in keeping the public informed.

NAME
Saginaw Bay District
Office of Drinking Water and Municipal Assistance
989-xxx-xxxx

24hr Feed Rates of NaOCL

Date: <u>6-13-16</u>						Location of NaOCL		
	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00								
1:00								
2:00								
3:00								
4:00								
5:00								
6:00								
7:00								
8:00								
9:00								
10:00								
11:00	60	15.6	.29	38	60			BE
12:00	55	14.9	.29	20	100			BE
13:00	55	13.9	.30	20	100			BE
14:00	55	13.5	.29	37	60			BE
15:00	55	13.8	.29	39	60	1,980		BE
16:00	50	12.7	.29	37	60	1980		BE
17:00	45	11.3	.29	33	60			BE
18:00	40 35	10.1	.29	30	60			BE
19:00	45	10.7	.30	30	60			BE
20:00	45	10.4	.31	30	60			BE
21:00	50	11.9	.30	35	60			BE
22:00	55	13.4	.30	37	60			BE
23:00	55	14.1	.28	39	60	1980		BE
ml/min average :		51.15				Total gallons NaOCL Used:		
MGD average :		12.79						
PPM average :		0.29				Days of NaOCL on Hand:		
(Train Shed + CS2)								

24hr Feed Rates of NaOCL

Date: 6-14-16						Location of NaOCL			
	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator	
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand			
0:00	57	14.4	.29	40	60		1980	MW	
1:00	55	14.6	.27	40	60			MW	
2:00	60	14.7	.29	43	60			MW	
3:00	65	15.0	.31	46	60			MW	
4:00	65	15.0	.31	46	60			MW	
5:00	65	15.1	.31	46	60			MW	
6:00	65	15.2	.31	46	60			MW	
7:00	65	15.4	.30	46	60		1980	MW	
8:00	60	14.5	.29	46	60		1980	MW	
9:00	60	14.7	.3	46	60			MW	
10:00	60	14.0	.31	44	60			MW	
11:00	60	14.1	.29	44	60			MW	
12:00	60	14.1	.29	44	60			MW	
13:00	58	13.7	.3	43	60			MW	
14:00	60	14.1	.29	44	60			MW	
15:00	60	14.0	.31	44	60		1980	MW	
16:00	55	12.8	.31	40	60		1980	BE	
17:00	53	12.7	.30	38	60			BE	
18:00	53	12.7	.30	38	60			BE	
19:00	53	12.8	.30	38	60			BE	
20:00	51	12.5	.29	36	60			BE	
21:00	56	13.3	.30	41	60			BE	
22:00	58	13.7	.30	43	60			BE	
23:00	60	14.5	.30	44	60		1980	BE	
ml/min average :				58.91		Total gallons NaOCL Used:			
MGD average :				14.07					
PPM average :				0.29		Days of NaOCL on Hand:			
(Train Shed + CS2)									
Notes:									

24hr Feed Rates of NaOCL

Date: 6-15-16						Location of NaOCL		
	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	65	15.4	.30	47	60		1980	MW
1:00	65	15.4	.30	47	60			MW
2:00	65	15.5	.30	47	60			MW
3:00	65	15.4	.30	47	60			MW
4:00	65	15.4	.30	47	60			MW
5:00	65	15.4	.30	47	60			MW
6:00	57	13.9	.29	42	60			MW
7:00	57	13.6	.30	42	60		1980	MW
8:00	55	13.7	.28	42	60		1980	TB
9:00	60	13.6	.32	42	60			AG
10:00	52	13.0	.29	37	60			TB
11:00	52	13.1	.29	37	60			DS
12:00	51	13.1	.28	37	60			TB
13:00	52	13.2	.29	37	60			DS
14:00	51	13.1	.28	37	60			TB
15:00	52	13.2	.29	37	60		1980	AS
16:00	46	12.2	.28	34	60		1980	EF
17:00	47	12.2	.28	34	60			EF
18:00	51	13.0	.29	37	60			EF
19:00	54	13.2	.30	39	60			EF
20:00	55	13.5	.30	40	60			EF
21:00	57	14.1	.29	42	60			EF
22:00	57	14.1	.29	42	60			EF
23:00	65	15.1	.31	47	60		1980	EF
ml/min average : 56.70						Total gallons NaOCL Used:		
MGD average : 13.31								
PPM average : .30						Days of NaOCL on Hand:		
						(Train Shed + CS2)		
Notes:								

24hr Feed Rates of NaOCL

Date: 6-16-16						Location of NaOCL		
	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	65	15.4	.31	47	60		1980	MW
1:00	65	15.4	.31	47	60			MW
2:00	62	14.7	.30	44	60			MW
3:00	62	14.8	.30	44	60			MW
4:00	62	14.7	.30	44	60			MW
5:00	62	14.7	.30	44	60			MW
6:00	62	14.4	.31	44	60			MW
7:00	62	14.5	.31	44	60		1980	MW
8:00	54	13.2	.30	37	60		1980	MS
9:00	54	13.3	.30	37	60			DS
10:00	54	13.3	.30	37	60			DS
11:00	54	13.2	.30	37	60			DS
12:00	52	12.5	.30	35	60			DS
13:00	54 45 ^{AG-16}	12.2	.30	35 36 ^{AG-16}	60			AG
14:00	51	12.3	.31	36	60			AG
15:00	49	11.7	.30	34	60		1980	AG
16:00	47	11.5	.30	34	60		1980	TB
17:00	47	11.9	.29	34	60			TB
18:00	47	11.8	.29	34	60			TB
19:00	47	11.7	.29	34	60			TB
20:00	47	11.5	.30	34	60			TB
21:00	47	11.5	.30	34	60			TB
22:00	47	11.5	.30	34	60			TB
23:00	48	11.6	.30	34	60		1980	TB
ml/min average :		54		Total gallons NaOCL Used:				
MGD average :		13.05		Days of NaOCL on Hand:				
PPM average :		.30		(Train Shed + CS2)				
Notes:								

24hr Feed Rates of NaOCL

Date: 6-17-16						Location of NaOCL		Operator
NaOCL		CS 2	NaO CL	Pump Setting		CS 2	Train Shed	
ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand			
0:00	48	11.7	.30	34	60		1980	BE
1:00	51	12.3	.30	35	60			BE
2:00	49	12.17	.28	35	60			de
3:00	56	13.3	.31	40	60			BE
4:00	56	13.3	.31	40	60			BE
5:00	60	14.4	.30	42	60			BE
6:00	60	14.7	.30	42	60			BE
7:00	58	14.2	.30	42	60		1980	BE
8:00	58	14.1	.30	42	60		1980	TB
9:00	56	13.7	.30	40	60			AG
10:00	50	11.3	.31	34	60			AG
11:00	44	10.2	.30	30	60			DS
12:00	44	10.2	.30	30	60			AB
13:00	43	10.0	.30	^{AG 6-17-16} 30 29	60			AB
14:00	43	10.0	.30	29	60			AB
15:00	43	10.0	.30	29	60		1980	DS
16:00	41	10.2	.28	^{TB 6-17-16} 29 31	60		1980	TB
17:00	43	10.0	.31	31	60			TB
18:00	42	10.0	.29	31	60			TB
19:00	42	9.9	.29	31	60			TB
20:00	42	9.9	.29	31	60			TB
21:00	42	9.9	.29	31	60			TB
22:00	42	10.4	.28	31	60			TB
23:00	51	12.4	.28	36	60		1980	TB
ml/min average :		48				Total gallons NaOCL Used:		
MGD average :		11.61						
PPM average :		.29				Days of NaOCL on Hand:		
(Train Shed + CS2)								
Notes:								

24hr Feed Rates of NaOCL

Date: 6-18-16						Location of NaOCL		
15.2%	NaOCL	CS 2	NaOCL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	60	14.4	.29	44	60		1980	BE
1:00	62	14.8	.29	44	60			BE
2:00	62	14.7	.29	44	60			BE
3:00	68	15.9	.30	50	60			BE
4:00	70	16.5	.29	51	60			BE
5:00	78 ⁷⁶	18.0	.29	55	60			BE
6:00	76	18.1	.29	55	60			BE
7:00	72	17.0	.29	52	60		1980	BE
8:00	71	16.7	.29	52	60		1980	TB
9:00	72	16.7	.30	52	60			TB
10:00	72	16.9	.29	52	60			TB
11:00	70	16.4	.30	52	60			TB
12:00	72	15.1	.33	52	60			TB
13:00	61	14.9	.28	45	60			TB
14:00	63	14.9	.29	45	60			TB
15:00	63	14.9	.29	45	60		1980	TB
16:00	63	14.9	.29	45	60		1980	TB
17:00	63	14.9	.29	45	60			SB
18:00	63	14.9	.29	45	60			SB
19:00	63	14.9	.29	45	60			SB
20:00	62	14.9	.29	45	60			SB
21:00	63	14.8	.30	45	60			SB
22:00	60	14.1 ^{13.9}	.30	45	60			SB
23:00	60	15.8	.26	45	60		1980	SB
JUST INCREASED								
ml/min average : 66			TO 50 FLOW WENT TO		Total gallons NaOCL Used:			
MGD average : 15.6								
PPM average : .29			15.8		Days of NaOCL on Hand:			
(Train Shed + CS2)								
Notes:								

24hr Feed Rates of NaOCL

Date: 6/19/16						Location of NaOCL		
15.2%	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	67	17.0	.27	50	60		1980	TB
1:00	70	17.0	.28	51	60			TB
2:00	69	17.0	.28	51	60			TB
3:00	69	17.5	.27	51	60			TB
4:00	72	17.7	.28	52	60			TB
5:00	69	15.6	.31	50	60			TB
6:00	61	14.4	.29	44	60			TB
7:00	60	14.0	.30	44	60		1980	TB
8:00	56	13.5	.29	41	60		1980	BE
9:00	56	13.2	.29	41	60			BE
10:00	56	13.2	.29	41	60			BE
11:00	58	13.3	.30	42	60			BE
12:00	56	13.1	.30	41	60			BE
13:00	56	13.0	.30	41	60			BE
14:00	58	13.2	.29	42	60			BE
15:00	58	13.2	.29	42	60		1980	BE
16:00	58	13.4	.30	42	60		1980	BE
17:00	57	13.3	.30	42	60			BE
18:00	59	13.6	.30	43	60			BE
19:00	60	13.7	.30	43	60			BE
20:00	57	13.3	.30	42	60			BE
21:00	58	13.2	.31	42	60			BE
22:00	55	12.6	.30	40	60			BE
23:00	68	13.5 13.5	.29	49	60		1980	BE
ml/min average :		60.958		Total gallons NaOCL Used:				
MGD average :		14.404						
PPM average :		.292		Days of NaOCL on Hand:				
(Train Shed + CS2)								
Notes:								

24hr Feed Rates of NaOCL

Date: 6-20-16						Location of NaOCL		Operator
BE 6-20-16 150 150	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	
		ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand	
						mw 6-20-16		
0:00	78	18.4	.29	57	60	225	1980	MW
1:00	78	18.6	.29	57	60			MW
2:00	78	18.6	.29	57	60			MW
3:00	78	18.7	.29	57	60			MW
4:00	79	18.8	.29	57	60			MW
5:00	79	18.8	.29	57	60			MW
6:00	68	15.3	.31	48	60			MW
7:00	68	15.2	.31	48	60	2 ^{BE} 11-20-16	1980	MW
8:00	65	14.9	.30	47	60		1980	BE
9:00	65	14.2	.32	47	60			BE
10:00	56	13.3	.29	40	60			BE
11:00	55	13.2	.29	40	60			BE
12:00	56	13.5	.29	40	60			BE
13:00	58	13.6	.30	42	60			BE
14:00	52	12.0	.30	38	60			BE
15:00	52	12.0	.30	38	60		1980	BE
16:00	50	11.6	.29	37	60		1980	BE
17:00	50	11.4	.30	37	60			BE
18:00	50	11.7	.29	37	60			BE
19:00	40	9.3	.29	30	60			BE
20:00	40	9.2	.30	30	60			BE
21:00	55	13.2	.29	41	60			BE
22:00	55	13.3	.28	41	60			BE
23:00	78	18.3	.29	58	60	55	1980	BE

ml/min average :	61.79	Total gallons NaOCL Used:	—
MGD average :	14.46	Days of NaOCL on Hand:	1980 ^{mw 6-20-16} gals
PPM average :	.29	(Train Shed + CS2)	

Notes:

24hr Feed Rates of NaOCL

Date: 6-21-16						Location of NaOCL		
.150	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	76	18.4	.28	58	60		1980	MW
1:00	81	19.7	.28	61	60			MW
2:00	81	19.5	.28	61	60			MW
3:00	82	19.4	.29	61	60			MW
4:00	79	19.5	.28	61	60			MW
5:00	80	18.4	.30	61	60			MW
6:00	69	16.0	.29	49	60			MW
7:00	58 59 ^{MW}	13.0	.28	44	60		1980	MW
8:00	51	12.3	.28	38	60		1980	RF
9:00	50	12.1	.28	38	60			SM
10:00	49	11.6	.29	38	60			RF
11:00	49	11.5	.29	38	60			SM
12:00	49	11.5	.29	38	60			SM
13:00	50	11.5	.30	38	60			done
14:00	49	11.6	.29	38	60			MW
15:00	49	11.6	.29	38	60		1980	RF
16:00	48	11.4	.29	38	60		1980	RF
17:00	48	11.4	.29	38	60			RF
18:00	48	11.6	.29	38	60			RF
19:00	49	11.5	.29	38	60			RF
20:00	48	11.4	.29	38	60			RF
21:00	48	11.4	.29	38	60			RF
22:00	58	13.0	.31	45	60			RF
23:00	58	13.2	.30	45	60	165	1840	RF
ml/min average : 58.62				Total gallons NaOCL Used:				
MGD average : 13.85								
PPM average : .28				Days of NaOCL on Hand:				
(Train Shed + CS2)								
Notes:								

24hr Feed Rates of NaOCL

Date: 6-22-16						Location of NaOCL		
.151	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	78	18.3	.29	61	60	165	1840	MW
1:00	79	18.2	.30	61	60			MW
2:00	79	18.5	.29	61	60			MW
3:00	79	18.3	.29	61	60			MW
4:00	78	18.4	.29	61	60			MW
5:00	79	18.6	.29	61	60			MW
6:00	79	18.7	.29	61	60			MW
7:00	51	12.1	.29	40	60	157	1840	MW
8:00	49	12.9	.26	40	60	155	1840	RF
9:00	52	12.0	.30	42	60			TB
10:00	54	12.4	.30	42	60			SM
11:00	52	12.5	.29	42	60			RF
12:00	52	11.7	.31	42	60			SM
13:00	51	11.8	.30	41	60			SM
14:00	53	12.2	.30	41	60			SM
15:00	52	12.4	.29	41	60	149	1840	SM
16:00	50	11.4	.30	38	60	148	1840	ET
17:00	48	11.2	.30	38	60			ET
18:00	44	10.1	.30	35	60			ET
19:00	44	10.1	.30	35	60			ET
20:00	44	10.0	.30	35	60			ET
21:00	45	10.3	.30	35	60			ET
22:00	44	10.5	.29	35	60			ET
23:00	70	16.7	.29	57	60	144	1840	ET
ml/min average : 58.58						Total gallons NaOCL Used: 21 gal		
MGD average : 13.72								
PPM average : .29						Days of NaOCL on Hand: 94 days		
(Train Shed + CS2)								
Notes:								

24hr Feed Rates of NaOCL

Date: 6-23-16

Location of NaOCL

	NaOCL	CS 2	NaOCL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	78	18.0	.30	63	60	143	1840	MW
1:00	78	18.1	.30	63	60			MW
2:00	79	18.2	.30	63	60			MW
3:00	79	17.9	.30	63	60			MW
4:00	79	18.0	.30	63	60			MW
5:00	79	17.9	.30	63	60			MW
6:00	78	17.7	.30	63	60			MW
7:00	56	12.7	.30	44	60	135	1840	MW
8:00	55	12.6	.30	44	60	134	1840	RF
9:00	51	12.4	.28	44	60			SM
10:00	55	13.2	.29	45	60			done
11:00	57	13.2	.30	45	60			RF
12:00	55	13.3	.28	45	60			SM
13:00	57	13.6	.29	46	60	134	1700	RF
14:00	57	13.6	.29	46	60			RF
15:00	58	12.7	.31	46	60	127	1840	SM
16:00	48	11.6	.29	39	60	126	1840	RF
17:00	49	11.5	.30	39	60			RF
18:00	49	11.5	.30	39	60			RF
19:00	48	11.1	.30	39	60			RF
20:00	48	11.1	.30	39	60			RF
21:00	56	13.4	.29	46	60			RF
22:00	60	14.7	.29	51	60			RF
23:00	73	16.3	.31	57	60	121	1840	RF

ml/min average : 61.75		Total gallons NaOCL Used: 22941
MGD average : 13.63		
PPM average : .296		Days of NaOCL on Hand: 89 days

(Train Shed + CS2)

Notes:

msd
13.1

24hr Feed Rates of NaOCL

Date: 6-24-16						Location of NaOCL		
<div style="text-align: right; font-size: small;"> (141) 151 </div>	NaOCL	CS 2	NaOCL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	74	16.9	.30	60	60	120	1940 1840	BE
1:00	74	17.3	.29	60	60		1840	BE
2:00	74	17.0	.30	60	60			BE
3:00	74	17.0	.30	60	60			BE
4:00	74	17.2	.30	61	60			BE
5:00	74	17.1	.30	61	60			BE
6:00	70	16.4	.29	59	60		⁶⁻²⁴⁻¹⁶ BE 1840	BE
7:00	55	12.7	.30	46	60	112	1940	BE
8:00	57	13.1	.30	46	60	112	1940	RF
9:00	55	12.4	.28	45	60			JM
10:00	54	12.5	.27	45	60			RF
11:00	58	13.1	.28	47	60			JM
12:00	57	13.0	.28	47	60			RF
13:00	57	13.0	.28	47	60			JM
14:00	56	13.0	.28	47	60			JM
15:00	57	13.2	.28	47	60	105	1940	RF
16:00	58	13.8	.28	48	60	104	1840	RF
17:00	58	13.6	.28	48	60			RF
18:00	59	13.5	.28	48	60			RF
19:00	61	13.6	.29	49	60			RF
20:00	62	14.0	.29	51	60			RF
21:00	62	13.6	.30	51	60			RF
22:00	62	14.1	.29	51	60			RF
23:00	64	15.3	.28	57	60	98	1840	RF

%13.8

%14.1

ml/min average :	62.83	Total gallons NaOCL Used:	22 gal
MGD average :	14.43		
PPM average :	.28	Days of NaOCL on Hand:	88 DAYS

(Train Shed + CS2)

Notes:

24hr Feed Rates of NaOCL

Date: 6-25-16

Location of NaOCL

	NaOCL	CS 2	NaOCL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	70	16.3	.30	59	60	97	1840	BE
1:00	75	17.1	.28	61	60			BE
2:00	77	17.4	.29	63	60			BE
3:00	77	17.0	.29	64	60			BE
4:00	77	16.9	.30	63	60			BE
5:00	72	16.0	.29	60	60			BE
6:00	64	13.9	.30	53	60	89	1840	BE
7:00	58	12.4	.30	49	60	88	1840	BE
8:00	58	12.1	.31	49	60	87	1840	TB
9:00	54	11.5	.31	48	60			TB
10:00	54	11.5	.30	46	60			TB
11:00	55	11.5	.31	35	80			TB
12:00	53	11.5	.30	34	80			TB
13:00	51	10.8	.30	32	80			TB
14:00	49	10.8	.29	31	80	TB 6/25/16		TB
15:00	55	12.0	.29	34	80	82	1840	TB
16:00	55	12.3	.29	34	80	81	1840	ET
17:00	55	12.1	.29	34	80	161	1760	ET
18:00	55	12.1	.29	34	80			ET
19:00	54	11.9	.29	34	80			ET
20:00	54	11.7	.30	34	80			ET
21:00	54	11.9	.29	34	80			ET
22:00	54	11.7	.30	34	80			ET
23:00	65	13.9	.30	40	80	158	1760	ET

ml/min average : 58		Total gallons NaOCL Used: 19 gal
MGD average : 13.17		
PPM average : .29		Days of NaOCL on Hand: 101 days
(Train Shed + CS2)		

Notes:

24hr Feed Rates of NaOCL

Date: 6-26-16						Location of NaOCL		
.141	NaOCL	CS 2	NaOCL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	72	14.0	.33	40	80	156	1760	MW
1:00	69	15.2	.29	58	60			MW
2:00	69	15.2	.29	58	60			MW
3:00	69	15.4	.29	58	60			MW
4:00	69	15.3	.29	58	60			MW
5:00	69	15.4	.29	58	60			MW
6:00	66	14.5	.29	55	60			MW
7:00	67	14.4	.30	55	60	148	1760	MW
8:00	67	15.0	.29	55	60	147	1760	BE
9:00	62	14.4	.28	53	60			BE
10:00	64	14.4	.29	54	60			BE
11:00	62	14.0	.29	52	60			BE
12:00	60	13.6	.29	51	60			BE
13:00	58	12.7	.30	99	60			BE
14:00	60 ⁵⁴	11.6	.30	45	60			BE
15:00	54	11.7	.30	45	60	141	1760	BE
16:00	54	12.1	.29	46	60	140	1760	BE
17:00	58	12.6	.30	49	60			BE
18:00	58	12.4	.30	49	60			BE
19:00	58	12.4	.30	49	60			BE
20:00	52	11.2	.30	44	60			BE
21:00	52	11.3	.30	44	60			BE
22:00	52	11.1	.30	44	60			BE
23:00	58	13.5	.28	51	60	134	1760	BE
ml/min average : 61.37						Total gallons NaOCL Used: 22		
MGD average : 13.47								
PPM average : .29						Days of NaOCL on Hand: 86		
(Train Shed + CS2)								
Notes:								

24hr Feed Rates of NaOCL

Date: 6-27-16

Location of NaOCL

	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
14.1%	66	13.8	.31	55	60	133	1760	EG
	63	13.5	.30	53	60			EG
	63	13.8	.30	53	60			EG
	63	13.7	.30	53	60			EG
	64	14.2	.29	53	60			EG
	64	13.6	.31	53	60			EG
	60	12.9	.30	50	60			EG
	60	12.9	.30	50	60	126	1760	EG
	60	13.1	.29	50	60	125	1760	RF
	60	11.6	.33	50	60			RF
18.2	57	11.4	.35	48	60			RF
	41	11.0	.31	35	60			RF
	40	11.9	.28	34	60			RF
	41	12.1	.28	35	60			JM
	43	12.3	.29	36	60			JM
	46	12.4	.31	38	60	120	1760	RF
	44	12.8	.29	38	60	119	1760	EG
	44	12.4	.30	38	60			EG
	45	12.3	.31	38	60			EG
	45	12.6	.30	38	60			EG
	44	13.0	.28	38	60			EG
	50	14.2	.30	42	60			EG
	56	15.6	.30	48	60			EG
	58	16.1	.30	50	60	114	1760	EG

ml/min average : 53.2

Total gallons NaOCL Used: 19

MGD average : 13.05

PPM average : .30

Days of NaOCL on Hand: 92

(Train Shed + CS2)

Notes:

24hr Feed Rates of NaOCL

Date: 6-28-16						Location of NaOCL		
,182	NaOCL	CS 2	NaO CL	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	Speed	Stroke	Gallons on Hand		
0:00	66	18.4	.30	56	60	113	1760	ET
1:00	66	19.1	.29	56	60			ET
2:00	66	19.3	.29	56	60			ET
3:00	66	19.4	.29	56	60			ET
4:00	66	19.4	.29	56	60			ET
5:00	68	19.7	.29	57	60			ET
6:00	68	19.3	.30	57	60			ET
7:00	46	12.5	.31	36	60	105	1760	ET
8:00	41	11.9	.29	36	60	105	1760	RF
9:00	42	11.7	.30	36	60			JM
10:00	41	11.7	.29	36	60			JM
11:00	41	11.5	.30	36	60			JM
12:00	42	11.7	.30	36	60			JM
13:00	43	12.1	.29	36	60			TB
14:00	43	12.2	.29	36	60			RF
15:00	45	12.3	.30	36	60	97	1760	RF
16:00	45	10.8	.35	36	60	100	1760	TB
17:00	43	12.2	.29	36	60			TB
18:00	44	12.2	.30	36	60			TB
19:00	43	12.2	.29	36	60			TB
20:00	44	12.3	.30	36	60			TB
21:00	43	12.6	.28	36	60			TB
22:00	43	12.6	.28	36	60			TB
23:00	54	15.5	.29	46	60	6/28/16 TB 89 94	1760	TB
ml/min average : 50				Total gallons NaOCL Used: 19gal				
MGD average : 14.2								
PPM average : .29				Days of NaOCL on Hand: 97 days				
(Train Shed + CS2)								
Notes:								

24hr Flow Paced Record of Ortho-Phosphate Used

Date: 6-22-16						Location of PO ₄			
	PO ₄	CS 2	PO ₄	Pump Setting		CS 2	Train Shed	Operator	
	ml/min	MGD	PPM	MA \ MA EXT	Stroke	Gallons on Hand			
0:00	90	18.3	2.21	10.0	38	80	172	798	MW
1:00	90	18.2	2.22	10.1	38	80			MW
2:00	90	18.5	2.18	10.2	39	80			MW
3:00	90	18.3	2.21	10.0	38	80			MW
4:00	90	18.4	2.19	10.1	38	80			MW
5:00	90	18.6	2.17	10.2	39	80			MW
6:00	95	18.7	2.28	10.3	39	80			MW
7:00	60	12.1	2.22	8.1	26	80	162	798	MW
8:00	65	12.9	2.30	8.3	27	80	161	798	SM
9:00	60	12.0	2.24	8.1	25	80			JB
10:00	61	12.4	2.21	8.1	26	80			SM
11:00	62	12.5	2.23	8.2	24	80			JM
12:00	58	11.7	2.22	8.1	26	80			RF
13:00	60	11.7	2.28	8.0	26	80			RF
14:00	61	12.2	2.24	8.1	26	80			SM
15:00	61	12.4	2.21	8.1	26	80	154	798	SM
16:00	55	11.4	2.17	7.5	24	80	153	798	SM
17:00	55	11.2	2.20	7.5	25	80			SM
18:00	50	10.1	2.23	7.4	21	80			SM
19:00	50	10.1	2.23	7.4	21	80			SM
20:00	50	10.0	2.25	7.4	21	80			SM
21:00	50	10.3	2.18	7.4	20	80			SM
22:00	50	10.5	2.13	7.4	22	80			SM
23:00	80	16.7	2.15	9.6	35		147	798	SM
ml/min average :		67.62				Total gallons PO ₄ Used: 25 gal			
MGD average :		13.71							
PPM average :		2.21				Days of PO ₄ on Hand: 37 days			
(Train Shed + CS2)									
Notes:									

24hr Flow Paced Record of Ortho-Phosphate Used

Date: 6-23-16

Location of PO₄

	PO ₄	CS 2	PO ₄	Pump Setting		CS 2	Train Shed	Operator	
	ml/min	MGD	PPM	MA \ MA EXT	Stroke	Gallons on Hand			
0:00	90	18.0	2.24	9.9	37	80	146	798	MW
1:00	90	18.1	2.23	10	37	80			MW
2:00	90	18.2	2.23	10	38	80			MW
3:00	88	17.9	2.20	9.9	37	80			MW
4:00	88	18.0	2.19	9.9	37	80			MW
5:00	90	17.9	2.25	9.9	38	80			MW
6:00	85	17.7	2.15	9.8	36	80			MW
7:00	65	12.7	2.30	8.3	27	80	136	798	MW
8:00	61	12.6	2.17	8.2	26	80	136	798	RF
9:00	61	12.4	2.24	8.1	26	80			SM
10:00	60	13.2 623 RF	2.06	8.3	28	80			done
11:00	62	13.2	2.11	8.5	28	80			RF
12:00	64	13.3	2.16	8.4	28	80			SM
13:00	69	13.6	2.28	8.6	29	80	130		RF
14:00	68	13.6	2.24	8.6	29	80	270	658	RF
15:00	61	12.7	2.16	8.3	27	80	269	658	SM
16:00	60	11.6	2.32	7.9	24	80	267	658	RF
17:00	55	11.5	2.15	7.9	24	80			RF
18:00	55	11.5	2.15	7.9	25	80			RF
19:00	55	11.1	2.23	7.7	23	80			RF
20:00	55	11.1	2.23	7.8	23	80			RF
21:00	65	13.4	2.20	8.5	28	80			RF
22:00	70	14.7	2.14	8.8	30	80			RF
23:00	80	16.3	2.20	9.4	34	80	260	658	RF

mgd
13.1

ml/min average : 70.29

Total gallons PO₄ Used: 26 gal

MGD average : 14.34

PPM average : 2.20

Days of PO₄ on Hand: 35.30

(Train Shed + CS2)

Notes:

24hr Flow Paced Record of Ortho-Phosphate Used

Date: <u>6-24-16</u>							Location of PO ₄		
	PO ₄	CS 2	PO ₄	Pump Setting		CS 2	Train Shed	Operator	
	ml/min	MGD	PPM	MA \ MA EXT	Stroke	Gallons on Hand			
0:00	82	16.9	2.18	9.6	35	80	259	658	BE
1:00	82	17.3	2.13	9.8	36	80			BE
2:00	80	17.0	2.11	9.7	35	80			BE
3:00	82	17.0	2.17	9.8	36	80			BE
4:00	82	17.2	2.14	9.7	36	80			BE
5:00	82	17.1	2.15	9.6	36	80			BE
6:00	80	16.4	2.19	9.5	34	80			BE
7:00	60	12.7	2.12	8.1	26	80	250	658	BE
8:00	62	13.1	2.12	8.3	27	80	249	658	RF
9:00	62	12.4	2.25	8.2	27	80			Jm
10:00	60	12.5	2.15	8.2	26	80			RF
11:00	66	13.1	2.26	8.3	27	80			Jm
12:00	63	13.0	2.17	8.3	27	80			RF
13:00	64	13.0	2.25	8.3	27	80			Jm
14:00	64	13.0	2.25	8.3	27	80			Jm
15:00	62	13.2	2.11	8.3	27	80	237	658	RF
16:00	70	13.8	2.27	8.6	29	80	235	658	EF
17:00	76	13.6	2.32	8.6	29	80			EF
18:00	65	13.5	2.16	8.6	28	80			EF
19:00	65	13.6	2.16	8.4	28	80			EF
20:00	70	14.0	2.25	8.5	29	80			EF
21:00	65	13.6	2.16	8.4	27	80			EF
22:00	70	14.1	2.23	8.5	28	80			EF
23:00	80	15.3	2.35	9.2	33	80	230	658	EF
ml/min average : <u>70.33</u>						Total gallons PO ₄ Used: <u>29</u>			
MGD average : <u>14.43</u>									
PPM average : <u>2.19</u>						Days of PO ₄ on Hand: <u>30 1/2 days</u>			
(Train Shed + CS2)									
Notes:									

24hr Flow Paced Record of Ortho-Phosphate Used

Date: <u>6-25-16</u>						Location of PO ₄			
	PO ₄	CS 2	PO ₄	Pump Setting		CS 2	Train Shed	Operator	
	ml/min	MGD	PPM	MA \ MA EXT	Stroke	Gallons on Hand			
0:00	80	16.3	2.20	9.4	34	80	235	658	BE
1:00	85	17.1	2.23	9.7	35	80			BE
2:00	87	17.4	2.25	9.8	36	80			BE
3:00	85	17.0	2.25	9.7	36	80			BE
4:00	82	16.9	2.18	9.6	35	80			BE
5:00	75	16.0	2.10	9.2	33	80			BE
6:00	62	13.9	2.18	8.7	29	80			BE
7:00	60	12.4	2.17	8.1	26	80	224	658	BE
8:00	60	12.1	2.22	8.1	26	80	223	658	TB
9:00	60	11.5	2.34	7.9	24	80			TB
10:00	55	11.5	2.15	7.9	24	80			TB
11:00	55	11.5	2.15	7.8	24	80			TB
12:00	55	11.5	2.15	7.9	24	80			TB
13:00	55	10.8	2.28	7.6	23	80			TB
14:00	55	10.8	2.28	7.7	23	80			TB
15:00	60	12.0	2.24	8.1	26	80	216	658	TB
16:00	62	12.3	2.26	8.2	26	80	215	658	BE
17:00	60	12.1	2.23	8.2	26	80			BE
18:00	60	12.1	2.23	8.2	26	80			BE
19:00	60	11.9	2.26	8.0	25	80			BE
20:00	60	11.7	2.30	8.0	25	80			BE
21:00	60	11.9	2.24	8.0	23	80			BE
22:00	60	11.7	2.30	8.0	23	80			BE
23:00	70	13.9	2.27	8.6	25	80	209	658	BE

ml/min average : 65.12		Total gallons PO ₄ Used: 26 gal
MGD average : 13.17		
PPM average : 2.22		Days of PO ₄ on Hand: 33 days
(Train Shed + CS2)		

Notes:

24hr Flow Paced Record of Ortho-Phosphate Used

Date: 6-26-16						Location of PO ₄		Operator	
	PO ₄	CS 2	PO ₄	Pump Setting		CS 2	Train Shed	Operator	
	ml/min	MGD	PPM	MA \ MA EXT	Stroke	Gallons on Hand			
0:00	70	14.0	2.24	8.6	29	80	207	658	MW
1:00	75	15.2	2.21	9.0	31	80			MW
2:00	75	15.2	2.21	9.0	31	80			MW
3:00	80	15.4	2.33	9.2	33	80			MW
4:00	80	15.3	2.35	9.1	32	80			MW
5:00	80	15.4	2.33	9.1	33	80			MW
6:00	70	14.5	2.17	8.8	30	80			MW
7:00	70	14.4	2.18	8.9	31	80	199	658	MW
8:00	75	15.0	2.24	9.0	31	80	198	658	BE
9:00	72	14.4	2.24 2.24	8.8	30	80			BE
10:00	72	14.4	2.24	8.7	29	80			BE
11:00	70	14.0	2.24	8.7	29	80			BE
12:00	70	13.6	2.31	8.6	29	80			BE
13:00	62	12.7	2.19	8.2	27	80			BE
14:00	58	11.6	2.24	7.9	24	80			BE
15:00	60	11.7	2.30	8.0	25	80	190	658	BE
16:00	60	12.1	2.23	8.0	26	80			ET
17:00	60	12.6	2.14	8.1	26	80			ET
18:00	60	12.4	2.17	8.1	26	80			ET
19:00	60	12.4	2.17	8.1	27	80			ET
20:00	55	11.2	2.20	7.8	24	80			ET
21:00	55	11.3	2.20	7.8	25	80			ET
22:00	55	11.1	2.22	7.7	26	80			ET
23:00	65	13.5	2.16	8.5	28	80	183	658	ET
ml/min average :		67.04				Total gallons PO ₄ Used:		24	
MGD average :		13.47							
PPM average :		2.23				Days of PO ₄ on Hand:		35	
(Train Shed + CS2)									
Notes:									

24hr Flow Paced Record of Ortho-Phosphate Used

Date: 6-27-16						Location of PO ₄		
	PO ₄	CS 2	PO ₄	Pump Setting		CS 2	Train Shed	Operator
	ml/min	MGD	PPM	MA \ MA EXT	Stroke	Gallons on Hand		
0:00	70	13.8	2.28	8.6 / 29	80	182	658	EF
1:00	65	13.5	2.16	8.5 / 27	80			EF
2:00	70	13.8	2.28	8.6 / 28	80			EF
3:00	70	13.7	2.29	8.6 / 29	80			EF
4:00	70	14.2	2.23	8.7 / 29	80			EF
5:00	70	13.6	2.32	8.4 / 27	80			EF
6:00	65	12.9	2.26	8.7 / 28	80			EF
7:00	65	12.9	2.26	8.7 / 27	80	175	658	EF
8:00	63	13.1	2.16	8.4 / 28	80	175	658	RF
9:00	53	11.6	2.05	7.9 / 24	80			RF
10:00	60	11.4	2.36	7.8 / 24	80			RF
11:00	60	11.0	2.45	7.8 / 24	80			RF
12:00	60	11.9	2.26	8.0 / 25	80			RF
13:00	62	12.1	2.30	9.0 / 25	80			JM
14:00	64	12.3	2.34	8.1 / 26	80			JM
15:00	64	12.4	2.32	8.2 / 26	80	169	658	JM
16:00	65	12.8	2.30	8.3 / 27	80	168	658	EF
17:00	65	12.4	2.36	8.3 / 28	80			EF
18:00	65	12.3	2.37	8.2 / 26	80			EF
19:00	65	12.4	2.32	8.3 / 27	80			EF
20:00	65	13.0	2.25	8.3 / 27	80			EF
21:00	70	14.2	2.23	8.7 / 29	80			EF
22:00	80	15.6	2.31	9.2 / 33	80			EF
23:00	80	16.1	2.23	9.3 / 33	80	159	658	EF

ml/min average : 66.08	Total gallons PO ₄ Used: 23
MGD average : 13.05	
PPM average : 2.27	Days of PO ₄ on Hand: 28.6

(Train Shed + CS2)

Notes:

24hr Flow Paced Record of Ortho-Phosphate Used

Date: 6-28-16		Location of PO ₄						
PO ₄	CS 2	PO ₄	Pump Setting		CS 2	Train Shed	Operator	
ml/min	MGD	PPM	MA \ MA EXT	Stroke	Gallons on Hand			
0:00	90	18.4	2.20	10 38	80	158 181 ⁶⁻²⁸⁻¹⁶	658	EF
1:00	95	19.1	2.23	10.3 39	80			EF
2:00	95	19.3	2.21	10.5 40	80			EF
3:00	100	19.4	2.31	10.8 41	80			EF
4:00	100	19.4	2.31	10.8 41	80			EF
5:00	100	19.7	2.28	10.6 41	80			EF
6:00	100	19.3	2.33	10.3 40	80			EF
7:00	60	12.5	2.15	8.1 26	80	147	658	EF
8:00	60	11.9	2.26	8.0 25	80	147	658	RF
9:00	58	11.7	2.23	8.0 25	80			JM
10:00	56	11.7	2.15	7.9 24	80			JM
11:00	59	11.5	2.31	7.9 24	80			JM
12:00	55	11.7	2.11	8.0 25	80			JM
13:00	60	12.1	2.22	8.0 25	80			TB
14:00	61	12.2	2.24	8.1 26	80	6-28-16 7		RF
15:00	61	12.3	2.22	8.1 26	80	140	658	RF
16:00	50	10.8	2.08	7.4 23	80	139	658	TB
17:00	60	12.2	2.21	8.1 25	80			TB
18:00	60	12.2	2.21	8.1 26	80			TB
19:00	60	12.2	2.21	8.1 26	80	136		TB
20:00	60	12.3	2.19	8.1 26	80	265	532	TB
21:00	60	12.6	2.14	8.2 27	80			TB
22:00	60	12.6	2.14	8.2 26	80			TB
23:00	75	15.5	2.17	9.2 33	80	256	532	TB
ml/min average :		70		Total gallons PO ₄ Used:		31 gal		
MGD average :		14.2		Days of PO ₄ on Hand:		30		
PPM average :		2.21		(Train Shed + CS2)				
Notes:								