2014 Annual Operations, Maintenance, and Monitoring Report

Olin Niagara Falls Plant
Niagara Falls, New York

Prepared for:

OLIN CORPORATION

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ABBREVIATIONS AND ACRONYMS

Acronym	Definition
ARGC	Alundum Road – Gill Creek
BHC	Benzene hexachloride
GWTS	Groundwater Treatment System
HG	mercury
NYSDEC	New York State Department of Environmental Conservation
Olin	Olin Corporation
Order	Administrative Order on Consent
PR	Passive Relief
RW	Recovery Well
VOC	volatile organic compounds

1.0 INTRODUCTION

As required by the Administrative Order on Consent (Order) #R9-4171-94-08 between New York State Department of Environmental Conservation (NYSDEC) and Olin Corporation (Olin), Olin has implemented a Remedial Plan to address groundwater contamination at Plant 2, in Niagara Falls, New York. In accordance with the Remedial Plan, a Groundwater Treatment System (GWTS) was installed at the site in 1998 and has been operated since that time. The goals of the GWTS are to reduce the concentration of Olin-derived constituents in the site groundwater and restrict off-site migration of these constituents. The Olin-derived constituents are defined in the Remedial Plan and include aromatic compounds, benzene hexachlorides (BHCs), and mercury.

The Remedial Plan also requires periodic reporting of groundwater quality and groundwater elevation information collected during the operations of the GWTS. This Annual Operations, Maintenance, and Monitoring Report covers the period from January 1, 2014 through December 31, 2014. Olin has continued to implement the Remedial Plan as required by the Order during this reporting period.

2.0 OPERATIONS AND MAINTENANCE

The GWTS operated with a run time of approximately 88% in 2014. Table 2.1 shows the run time and down time for each month in 2014. Downtimes throughout the year were caused by:

- Inclement weather
- General equipment maintenance and repairs
- Air stripper piping replacement
- Scheduled plant maintenance shutdown (October)

Revision 7 of the GWTS Operations and Maintenance Plan was submitted to NYSDEC on August 15, 2014 and included updated Standard Operating Conditions, equipment information, and Piping and Instrumentation Diagrams. On February 5, 2014, NYSDEC approved Revision 7 (**Appendix A**).

Details of the routine maintenance tasks and troubleshooting are included for this reporting period in the weekly reports from Olin's contractor, Sevenson Environmental Services (**Appendix B**). The weekly O&M reports document recovery well (RW) flow rates, RW water elevations, other system parameters, and maintenance conducted.

3.0 GWTS PERFORMANCE

Figures 3.1 through 3.8 show the RW flow rates and water elevations throughout 2014. Flow rates and water elevations were consistent with historic values. Total monthly flows for 2014 are presented on Table 3.1.

Tables 3.2 through 3.5 show RW header concentrations and mass removal for each quarter of 2014. Table 3.6 shows the mass removed over the operational life of the GWTS. The total volume of groundwater extracted since GWTS startup is approximately 419 million gallons. Approximately 11.8 million gallons were extracted in 2014. The GWTS has extracted over 98,800 pounds of volatile organic compounds (VOCs), 425 pounds of pesticides (BHCs), and approximately 7.4 pounds of mercury from operations starting December 1997 through 2014.

Figures 3.9 through 3.11 present graphs that show the treatment system loading rates for VOCs, BHCs, and mercury over the history of operation. The VOC and BHC loading rates have remained relatively steady over the GWTS operational period while the mercury loading rate has shown an overall decreasing trend.

Figures 3.12 through 3.14 show annual mass removal compared to annual groundwater removal throughout the operations. Mercury mass removal has generally decreased over the system operations with a recent increase. BHC and aromatic VOC mass removal has been generally steady regardless of groundwater removal. Aliphatic VOC mass removal has generally increased over the system operations, but has decreased since 2012. The aliphatic mass removal appears to be influenced by the groundwater removal rate more than the other constituents.

Historically, most of the VOCs removed by the Olin treatment system are aliphatic constituents (95% overall and 95% in 2014) that originate off-site from the DuPont facility. Since the aliphatic constituents migrate to the Olin extraction wells from DuPont sources located some distance from the GWTS extraction wells, reduction of VOC mass is expected to be slow.

Tables 3.7 through 3.10 show GWTS treatment performance results. These performance data are used to optimize system performance and schedule change out of activated carbon. Based on these data, the activated carbon was replaced on June 3, 2014.

4.0 HYDRAULIC ANALYSIS

Groundwater level measurements were collected quarterly in 2014. Tables 4.1 through 4.4 present the quarterly water elevations for the monitored zones at the site. The water elevations were used to evaluate the potentiometric surface at the site.

4.1 A-ZONE

Figures 4.1 through 4.4 show the interpreted A-Zone potentiometric surface (April, June, September, and December) for each quarter of 2014. These figures show A-zone capture in the Alundum Road-Gill Creek (ARGC) area by Olin's recovery well and passive relief well system. A-zone groundwater flow is toward the passive relief wells which drain the A-zone groundwater to the B-zone for capture with B-zone groundwater. The potentiometric heads in the B-zone are below Gill Creek therefore the passive relief wells are effective in preventing groundwater flow to Gill Creek.

The yellow highlighted areas represent areas that are estimated to be dewatered as defined by the bottom elevation of the A-zone. The dewatered areas show that the A-zone is being effectively drained to the B-zone. The corresponding table shows which wells had water level elevations that were below the physical bottom of the A-zone. In cases where the A zone was dewatered, the physical bottom of the system was used in the interpreted potentiometric surface.

A new PR well (PR-14) was installed in August 2014 and several PR wells (PR-1, PR-7, PR-8, PR-9, and PR-11) were cleaned/ redeveloped to improve A-zone capture and drainage. Data from the new PR well was used in the October and December potentiometric surface figures. The details of the well installation are described in the December 11, 2014 *Well Installation Report* (AMEC, 2014).

4.2 B-ZONE

Figures 4.5 through 4.8 show B-Zone potentiometric surface maps for each quarter of 2014. The B-Zone potentiometric surface maps show hydraulic capture of the B-zone on Olin property by Olin pumping wells and Solvent pumping wells located on Olin property (PW-3B and PW-4B. The greater drawdown observed in Solvent pumping well PW-3B creates a gradient that dominates local B-zone flow on Olin property.

A new monitoring well (PN-24B) was installed in August 2014 to provide additional data north of Buffalo Avenue. Data from the new well was used in the October and December potentiometric surface figures. The details of the well installation are described in the December 11, 2014 *Well Installation Report* (AMEC, 2014).

4.3 C-ZONE

Figures 4.9 through 4.12 show C-Zone potentiometric surface maps for each quarter of 2014. The C-Zone figures generally show flow to the west toward the Olin production well but also a low at OBA-7C. The elevations and contouring are consistent with historic C-zone pot maps.

4.4 CD-ZONE

Figures 4.13 through 4.16 show CD-Zone potentiometric surface maps for each quarter of 2014. CD-zone hydraulic gradients indicate southwestward flow toward the Olin production well and OBA-8C in Plant 1.

5.0 GROUNDWATER QUALITY

Site groundwater quality is monitored annually. Samples were collected from the site monitoring wells June 28 through July 5, 2014. Table 5.1 provides the analytical results. Figures 5.1 through 5.8 show the constituent distributions for the following indicator parameters in the A and B-Zones:

- 1,2,4-Trichlorobenzene - Aromatic
- Trichloroethene – Aliphatic
- Gamma-BHC – Pesticide
- Total Mercury - Mercury

The figures show that constituent concentrations and distribution are consistent with historical site monitoring data.

6.0 CONCLUSIONS

The GWTS was operated and maintained effectively in 2014. The system runtime averaged 88% for 2014. The GWTS operations resulted in effective hydraulic capture of A-zone and B-zone groundwater as well as continued mass removal of VOCs, pesticides, and mercury. Site constituent concentrations and distribution are consistent with historical monitoring data which suggests effective control of constituent migration. Additionally, continued operation of Olin's process water production well has provided hydraulic control of the C and CD-Zones. Overall, the GWTS system is achieving the objectives established in the Order and Remedial Plan.

During a period of planned maintenance shutdown water levels were collected from both A and B-zone wells to determine changes in groundwater elevations caused by temporary cessation of Olin B-zone pumping. These data indicate the A-zone PR wells still perform their intended function even when Olin B-zone extraction wells are not operated, and the B-zone potentiometric surface remains below the physical bottom of Gill Creek.

7.0 REFERENCES

AMEC (2014). *Well Installation Report.* Kennesaw, GA. AMEC Environment & Infrastructure, Inc.

TABLES

Table 2.1: 2014 Monthly Runtime Summary

	RW-1			RW-2			RW-3			RW-4		
Month	Downtime (hours)	Runtime (hours)	Runtime %	Downtime (hours)	Runtime (hours)	Runtime %	Downtime (hours)	Runtime (hours)	Runtime %	Downtime (hours)	Runtime (hours)	Runtime %
January 2014	224.8	519.2	70%	155.8	588.2	79%	210.1	533.9	72%	160.8	583.3	78%
February 2014	99.5	572.5	85%	25.3	646.7	96%	52.7	619.3	92%	28	644.0	96%
March 2014	201.3	542.7	73%	192.2	551.8	74%	240.8	503.2	68%	129.5	614.5	83%
April 2014	75.3	644.7	90%	132.2	587.8	82%	201.1	518.9	72%	170.9	549.1	76%
May 2014	34.9	709.1	95%	33.8	710.2	95%	35.3	708.7	95%	22.1	721.9	97%
June 2014	43.8	676.2	94%	44.3	675.7	94%	49.2	670.8	93%	44.3	675.7	94%
July 2014	13	731.0	98%	34.3	709.7	95%	107.3	636.7	86%	33.8	710.2	95%
August 2014	122.8	621.2	83%	130.2	613.8	83%	136.6	607.4	82%	130.6	613.4	82%
September 2014	51.2	668.8	93%	41.5	678.5	94%	41.8	678.2	94%	41.8	678.2	94%
October 2014	172.2	571.8	77%	122.3	621.8	84%	171.3	572.8	77%	168.0	576.0	77%
November 2014	61.6	658.4	91%	56.8	663.2	92%	48.8	671.2	93%	37.5	682.5	95%
December 2014	87.5	656.5	88%	61.9	682.1	92%	79.9	664.1	89%	80.3	663.8	89%
Total	**1187.9**	**7572.1**	**86.4%**	**1030.6**	**7729.4**	**88.2%**	**1374.9**	**7385.1**	**84.3%**	**1047.5**	**7712.5**	**88.0%**

Prepared By: T. Englund 01/27/2015
Checked By: R. Yardley 01/27/2015

Table 2.1: 2014 Monthly Runtime Summary

	RW-5			PR-4			PR-12			OBA-9AR		
Month	Downtime (hours)	Runtime (hours)	Runtime %	Downtime (hours)	Runtime (hours)	Runtime %	Downtime (hours)	Runtime (hours)	Runtime %	Downtime (hours)	Runtime (hours)	Runtime %
January 2014	174.2	569.8	77%	131.2	612.8	82%	121.6	622.4	84%	188.4	555.6	75%
February 2014	28.2	643.8	96%	25.3	646.7	96%	24.3	647.7	96%	24.5	647.5	96%
March 2014	164.2	579.8	78%	165.7	578.3	78%	133.8	610.2	82%	140	604.0	81%
April 2014	170.4	549.6	76%	71.8	648.2	90%	93.0	627.0	87%	101.2	618.8	86%
May 2014	111	633.0	85%	18.6	725.4	98%	17.9	726.1	98%	19.1	724.9	97%
June 2014	44.3	675.7	94%	69.4	650.6	90%	43.9	676.1	94%	50.3	669.7	93%
July 2014	35.6	708.4	95%	15.5	728.5	98%	5.9	738.1	99%	6.3	737.7	99%
August 2014	132.7	611.3	82%	118.3	625.7	84%	85.5	658.5	89%	88.2	655.8	88%
September 2014	41.6	678.4	94%	38.9	681.1	95%	36.7	683.3	95%	37.2	682.8	95%
October 2014	189.3	554.7	75%	108.8	635.2	85%	102.5	641.5	86%	108.8	635.2	85%
November 2014	48.9	671.1	93%	40.7	679.3	94%	24.3	695.7	97%	42.3	677.7	94%
December 2014	357.8	386.2	52%	16.3	727.8	98%	8.6	735.4	99%	50.8	693.3	93%
Total	**1498.2**	**7261.8**	**82.9%**	**820.4**	**7939.6**	**90.6%**	**698.0**	**8062.0**	**92.0%**	**857.1**	**7902.9**	**90.2%**

Prepared By: T. Englund 01/27/2015
Checked By: R. Yardley 01/27/2015

Table 3.1: Summary of Total Flow and Average System Flow Rates for 2014

Period	Total Flow (gal/month)	Total Quarterly Flow (gal)	Average Flow Rate (gpm)									Flow Contribution Per Well (gal/month)							
			RW-1	RW-2	RW-3	RW-4	PR-4	RW-5	PR-12	OBA-9AR	Total	RW-1	RW-2	RW-3	RW-4	PR-4	RW-5	PR-12	OBA-9AR
January-14	872,239		1.5	3.6	0.5	0.6	2.2	5.8	4.9	0.4	19.5	65,520	160,391	21,739	26,513	98,322	260,725	220,303	18,726
February-14	878,881		1.4	3.6	1.2	0.7	2.2	7.2	4.9	0.5	21.8	57,049	144,973	46,993	29,188	90,710	291,220	197,885	20,864
March-14	687,286		2.0	1.6	1.1	0.6	1.2	5.2	3.3	0.5	15.4	87,167	70,749	49,189	26,653	51,568	229,976	149,483	22,500
1st Qtr 14		**2,438,406**																	
April-14	925,846		3.3	3.7	2.3	0.6	1.9	4.7	4.6	0.4	21.4	141,392	158,604	101,266	25,278	81,163	203,726	196,719	17,700
May-14	1,155,508		3.8	4.0	3.8	0.7	1.8	5.7	5.6	0.5	25.9	167,765	177,485	169,499	33,008	81,137	256,235	249,049	21,331
June-14	1,100,979		3.4	4.0	3.6	0.7	2.0	6.2	5.0	0.5	25.5	146,564	172,429	154,601	30,133	88,533	269,192	218,562	20,965
2ndQtr 14		**3,182,334**																	
July-14	1,227,831		3.4	4.3	3.1	0.7	2.4	8.2	4.3	0.5	26.9	151,459	193,788	138,812	30,929	105,262	366,084	217,059	24,440
August-14	1,035,492		2.5	3.9	2.6	0.7	2.1	6.4	4.4	0.6	23.2	113,638	175,381	115,450	31,542	92,111	284,024	197,290	26,057
September-14	1,151,509		2.9	4.4	3.1	0.8	2.3	7.5	4.8	0.8	26.7	127,401	189,945	133,421	35,459	97,757	323,036	209,422	35,068
3rdQtr 14		**3,414,832**																	
October-14	942,911		1.2	4.4	2.3	0.6	1.9	6.2	3.9	0.7	21.1	52,641	195,679	103,544	27,712	84,061	274,724	172,131	32,421
November-14	1,019,751		1.6	4.9	2.1	0.6	2.0	7.0	4.6	0.8	23.6	68,430	211,391	91,599	24,201	86,716	304,143	199,331	33,939
December-14	841,849		1.2	5.0	1.3	0.5	2.0	3.6	4.4	0.8	18.9	51,605	223,412	58,203	23,659	90,707	162,411	195,668	36,183
4thQtr 14		**2,804,511**																	
Maximum	**1,227,831.1**		**3.8**	**5.0**	**3.8**	**0.8**	**2.4**	**8.2**	**5.6**	**0.8**	**26.9**	**167,765.2**	**223,412.1**	**169,499.1**	**35,458.6**	**105,262.0**	**366,083.8**	**249,048.7**	**36,182.8**
Average	**986,674**		**2.3**	**3.9**	**2.2**	**0.7**	**2.0**	**6.1**	**4.6**	**0.6**	**22.5**	**102,552**	**172,852**	**98,693**	**28,690**	**87,337**	**268,791**	**201,908**	**25,849**
2014 System Total	**11,840,083**											**1,230,629**	**2,074,226**	**1,184,317**	**344,275**	**1,048,046**	**3,225,495**	**2,422,901**	**310,194**

Prepared by: T. Englund 01/27/2015
Checked by: R. Yardley 01/27/2015

Table 3.2: April 2, 2014 Recovery Well Header Concentrations and 1st Quarter 2014 Mass Removal

Well ID: / Sample Date:	Sample RW-1 4/2/2014	Sample RW-2 4/2/2014	Sample RW-3 4/2/2014	Sample RW-4 4/2/2014	Sample PR-4 4/2/2014	Sample RW-5 4/2/2014	Sample PR-12 4/2/2014	Sample OBA-9AR 4/2/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	50 U	5.0 U	1.0 U	25 U	20 U	250 U	500 U	500 U
1,1,2,2-Tetrachloroethane	50 U	12	4.9	25 U	20 U	1600	13000	2200
1,1,2-Trichloroethane	50 U	5.0 U	1.0 U	25 U	20 U	250 U	500 U	500 U
1,1-Dichloroethene	50 U	5.0 U	1.0 U	25 U	20 U	250 U	500 U	500 U
Carbon tetrachloride	50 U	5.0 U	1.0 U	25 U	20 U	250 U	620	500 U
Chloromethane (Methyl chloride)	50 U	5.0 U	1.0 U	25 U	20 U	250 U	500 U	500 U
cis-1,2-Dichloroethene	1100	380	18	550	350	5100	8500	2500
Methylene chloride (Dichloromethane)	50 U	5.0 U	1.0 U	25 U	20 U	250 U	1800	500 U
Tetrachloroethene (PCE)	3000	200	33	730	400	17000	34000	7100
trans-1,2-Dichloroethene	50 U	5.2	1.0 U	25 U	20 U	250 U	500 U	500 U
Trichloroethene (TCE)	7100	640	1.0 U	1400	590	27000	92000	51000
Vinyl Chloride	65	5.0 U	2.3	240	110	740	970	500 U
Aromatic Compounds								
1,2,4-Trichlorobenzene	2900	33	41	3300 D	3500	940	2000	4600
1,2-Dichlorobenzene	130	5.0 U	3.4	130	120	250 U	500 U	4300
1,3-Dichlorobenzene	200	11	14	980	750	250 U	500 U	770
1,4-Dichlorobenzene	100	5.0	12	860	580	270	510	4200
Benzene	77	5.0 U	1.0 U	170	130	250 U	640	500 U
Chlorobenzene	95	5.0 U	3.0	350	300	250 U	500 U	520
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	14	1.3	4.0	130	200	130	130	460
beta-BHC	2.4	1.2	1.1	10	14	8.5	15	35
delta-BHC	0.94 U	0.05 U	4.1	4.9	17	7.4	8.3	24 U
gamma-BHC (Lindane)	1.3	1.2	8.5	85	200	93	110	330
Total Metal Concentrations - SW846 7470 ug/L								
Mercury	0.13800	0.00032	0.00020 U	0.00020 U	0.00020 U	0.00020 U	0.00020 U	0.00020 U
Total Flow 1st Quarter 2014 - gallons								
Flow	209,736	376,114	117,921	82,354	240,600	781,921	567,670	62,090
Total Mass Removed 1st Quarter 2014 - pounds								
Aliphatic Compounds	**19.8**	**3.9**	**0.1**	**2.0**	**2.9**	**337.0**	**717.6**	**32.7**
Aromatic Compounds	**6.2**	**0.2**	**0.1**	**4.0**	**10.8**	**7.9**	**15.0**	**7.5**
Pesticides	**0.03**	**0.01**	**0.02**	**0.16**	**0.87**	**1.56**	**1.25**	**0.43**
Mercury	**0.00024**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**	**0.00000**

Notes:

U - constituent not detected - reporting limit shown.
D - concentration is the result of a dilution due to exceeding the calibration range.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 04/22/2014
Checked by: A. Nelson 04/22/2014

Table 3.3: June 17, 2014 Recovery Well Header Concentrations and 2nd Quarter 2014 Mass Removal

Well ID: / Sample Date:	Sample RW-1 6/17/2014	Sample RW-2 6/17/2014	Sample RW-3 6/17/2014	Sample RW-4 6/17/2014	Sample PR-4 6/17/2014	Sample RW-5 6/17/2014	Sample PR-12 6/17/2014	Sample OBA-9AR 6/17/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	100 U	1.0 U	1.0 U	20 U	20 U	250 U	500 U	250 U
1,1,2,2-Tetrachloroethane	100 U	9.7	3.9	20 U	20 U	4100	8900	1100
1,1,2-Trichloroethane	100 U	1.0 U	1.0 U	20 U	20 U	250 U	500 U	250 U
1,1-Dichloroethene	100 U	1.0	1.0 U	20 U	20 U	250 U	500 U	250 U
Carbon tetrachloride	100 U	1.0 U	1.0 U	20 U	20 U	250 U	500 U	250 U
Chloromethane (Methyl chloride)	100 U	1.0 U	1.0 U	20 U	20 U	250 U	500 U	250 U
cis-1,2-Dichloroethene	2400	98	16	610 D	160	6000	4500	1400
Methylene chloride (Dichloromethane)	750	1.0 U	1.0 U	20 U	20 U	250 U	920	250 U
Tetrachloroethene (PCE)	4400	120	35	280 D	210	27000	20000	4600
trans-1,2-Dichloroethene	100 U	1.9	1.0 U	20 U	20 U	250 U	500 U	250 U
Trichloroethene (TCE)	13000	200	34.0	270 D	240	44000	55000	27000
Vinyl Chloride	320	1.6	2.9	380 D	200	720	500 U	250 U
Aromatic Compounds								
1,2,4-Trichlorobenzene	3800	6.1	61	2200 D	2000	2000	1700	6500
1,2-Dichlorobenzene	170	1.0 U	7.3	100 D	150	250 U	500 U	6100
1,3-Dichlorobenzene	300	1.8	34	670 D	800	250 U	500 U	900
1,4-Dichlorobenzene	160	1.4	30	610 D	630	450	500 U	5300
Benzene	300	1.0 U	2.3	160 D	110	250 U	500 U	250 U
Chlorobenzene	210	1.0 U	13.0	260 D	360	250 U	500 U	450
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	19	0.39	0.5	110	190	160	85	540
beta-BHC	3	0.36	1.4	7.1	12	11	11	39
delta-BHC	0.47 U	0.05 U	8.2	4.9	19	11	6.1	24 U
gamma-BHC (Lindane)	0.89	0.37	0.85	65	190	120	72	350
Total Metal Concentrations - SW846 7470 ug/L								
Mercury	32.90000	0.25	0.72000	8.87000	0.20000 U	0.20000 U	0.20000 U	0.20000 U
Total Flow 2nd Quarter 2014 - gallons								
Flow	455,721	508,518	425,366	88,419	250,832	729,153	664,329	59,996
Total Mass Removed 2nd Quarter 2014 - pounds								
Aliphatic Compounds	**79.7**	**1.8**	**0.3**	**1.1**	**1.7**	**474.8**	**447.6**	**17.1**
Aromatic Compounds	**18.9**	**0.0**	**0.5**	**3.0**	**8.5**	**15.0**	**9.5**	**9.7**
Pesticides	**0.09**	**0.00**	**0.04**	**0.14**	**0.86**	**1.84**	**0.97**	**0.47**
Mercury	**0.12561**	**0.00107**	**0.00257**	**0.00657**	**0.00000**	**0.00000**	**0.00000**	**0.00000**

Notes:
U - constituent not detected - reporting limit shown.
D - concentration is the result of a dilution due to exceeding the calibration range.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 3.4: October 02, 2014 Recovery Well Header Concentrations and 3rd Quarter 2014 Mass Removal

Well ID: / Sample Date:	Sample RW-1 10/2/2104	Sample RW-2 10/2/2014	Sample RW-3 10/2/2014	Sample RW-4 10/2/2014	Sample PR-4 10/2/2014	Sample RW-5 10/2/2014	Sample PR-12 10/2/2014	Sample OBA-9AR 10/2/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	100 U	1.0 U	1.0 U	10 U	20 U	500 U	500 U	250 U
1,1,2,2-Tetrachloroethane	100 U	14	4.9	10 U	20 U	4700	8100	2200
1,1,2-Trichloroethane	100 U	1.0 U	1.0 U	10 U	20 U	500 U	500 U	250 U
1,1-Dichloroethene	100	1.4	1.0 U	10 U	20 U	500 U	500 U	250 U
Carbon tetrachloride	100 U	1.0 U	1.0 U	10 U	20 U	500 U	500 U	250 U
Chloromethane (Methyl chloride)	100 U	1.0 U	1.0 U	10 U	20 U	500 U	500 U	250 U
cis-1,2-Dichloroethene	3100	130	26	320	440	6100	4000	2700
Methylene chloride (Dichloromethane)	780	1.0 U	1.0 U	10 U	20 U	500 U	1000	250 U
Tetrachloroethene (PCE)	4900	150	41	250	160	27000	20000	6500
trans-1,2-Dichloroethene	100 U	1.4	1.1	10 U	20 U	500 U	500 U	250 U
Trichloroethene (TCE)	17000	200 D	43	290	220	48000	58000	41000
Vinyl Chloride	220	1.6	5.0	27	300	750	500 U	250
Aromatic Compounds								
1,2,4-Trichlorobenzene	5000	7.7	74	1900	1900	1600	1100	9100
1,2-Dichlorobenzene	240	1.0 U	12	26	180	500 U	500 U	8900
1,3-Dichlorobenzene	370	2.5	68	810	1100	500 U	500 U	1400
1,4-Dichlorobenzene	230	2.1	61	560	940	500	500 U	7700
Benzene	460	1.0 U	3.5	17	99	500 U	500 U	450
Chlorobenzene	290	1.0 U	23	120	550	500 U	500 U	740
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	19	0.43	6.4	73	140	130	72	440
beta-BHC	3.6	0.43	1.2	7.9	5.5	16	13	50
delta-BHC	1.2 U	0.047 U	4.3	2.7	9.8	12 U	4.7 U	47 U
gamma-BHC (Lindane)	1.2 U	0.41	9.8	48	110	88	59	290
Total Metal Concentrations - SW846 7470 ug/L								
Mercury	30.8	0.26	0.20 U	0.35	0.20 U	0.20 U	0.20 U	0.20 U
Total Flow 3rd Quarter 2014 - gallons								
Flow	392,497	559,113	387,683	97,929	295,130	973,144	623,772	85,565
Total Mass Removed 2nd Quarter 2014 - pounds								
Aliphatic Compounds	**85.5**	**2.3**	**0.4**	**0.7**	**2.8**	**667.3**	**433.7**	**37.7**
Aromatic Compounds	**21.7**	**0.1**	**0.8**	**2.8**	**11.8**	**17.1**	**5.7**	**20.3**
Pesticides	**0.07**	**0.01**	**0.07**	**0.11**	**0.66**	**1.91**	**0.75**	**0.56**
Mercury	**0.10128**	**0.00122**	**0.00000**	**0.00029**	**0.00000**	**0.00000**	**0.00000**	**0.00000**

Notes:

U - constituent not detected - reporting limit shown.
D - concentration is the result of a dilution due to exceeding the calibration range.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: R. Yardley 11/06/2014
Checked by: T. Englund 11/06/2014

Table 3.5: December 18, 2014 Recovery Well Header Concentrations and 4th Quarter 2014 Mass Removal

Well ID: / Sample Date:	Sample RW-1 12/18/2104	Sample RW-2 12/18/2014	Sample RW-3 12/18/2014	Sample RW-4 12/18/2014	Sample PR-4 12/18/2014	Sample RW-5 12/18/2014	Sample PR-12 12/18/2014	Sample OBA-9AR 12/18/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	50 U	2.5 U	1.0 U	20 U	20 U	500 U	500 U	20 U
1,1,2,2-Tetrachloroethane	50 U	19	1.0 U	26	20 U	6900	11000	72
1,1,2-Trichloroethane	50 U	2.5 U	1.0 U	20 U	20 U	500 U	500 U	20 U
1,1-Dichloroethene	50 U	2.5 U	1.0 U	20 U	20 U	500 U	500 U	20 U
Carbon tetrachloride	50 U	2.5 U	1.0 U	20 U	20 U	500 U	580	20 U
Chloromethane (Methyl chloride)	50 U	2.5 U	1.0 U	20 U	20 U	500 U	500 U	20 U
cis-1,2-Dichloroethene	610	190	3.3	570	880	8100	9000	93
Methylene chloride (Dichloromethane)	50 U	2.5 U	1.0 U	20 U	20 U	500 U	1500	20 U
Tetrachloroethene (PCE)	1900	200	11	830	300	33000	41000	370
trans-1,2-Dichloroethene	50 U	2.5 U	1.0 U	20 U	20 U	500 U	500 U	20 U
Trichloroethene (TCE)	4900	410	13	2400	650	76000	100000 D	2100
Vinyl Chloride	50 U	4.5	1.0 U	23	140	1100	1200	20 U
Aromatic Compounds								
1,2,4-Trichlorobenzene	6000	59	120	2800	2600	2500	2700	660
1,2-Dichlorobenzene	180	2.5 U	6.6	20	88	500 U	560	300
1,3-Dichlorobenzene	260	9.5	38	720	580	500 U	500 U	59
1,4-Dichlorobenzene	130	6.2	29	520	460	540	510	280
Benzene	59	2.5 U	1.0 U	26	72	500 U	880	20 U
Chlorobenzene	100	2.5 U	5.5	140	170	500 U	590	25
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	16	1.3	5.1	80	140	230	420	120
beta-BHC	3.3	0.72	2.0	7.8	8.2	22	64	11
delta-BHC	1.0 U	0.071	5.5	4.0	12	13	31	5 U
gamma-BHC (Lindane)	1.0 U	1.1	8.2	59	130	160	370	100
Total Metal Concentrations - SW846 7470 ug/L								
Mercury	39.1	0.43	0.20 U	0.43	1.15	0.20 U	0.20 U	0.20 U
Total Flow 4th Quarter 2014 - gallons								
Flow	172,676	630,482	253,346	75,572	261,484	741,278	567,130	102,543
Total Mass Removed 4th Quarter 2014 - pounds								
Aliphatic Compounds	**10.7**	**4.3**	**0.1**	**2.4**	**4.3**	**776.9**	**780.5**	**2.3**
Aromatic Compounds	**9.7**	**0.4**	**0.4**	**2.7**	**8.7**	**18.9**	**24.9**	**1.1**
Pesticides	**0.03**	**0.02**	**0.04**	**0.10**	**0.64**	**2.64**	**4.20**	**0.20**
Mercury	**0.05656**	**0.00227**	**0.00000**	**0.00027**	**0.00252**	**0.00000**	**0.00000**	**0.00000**

Notes:

U - constituent not detected - reporting limit shown.
D - concentration is the result of a dilution due to exceeding the calibration range.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: R. Yardley 01/12/2015
Checked by: A. Bolden 01/13/2015

Table 3.6: Constituent Mass Removal and Groundwater Extraction Summary (Dec 1997 to Present)

Quarter	Constituent Mass Removed								Total Groundwater Extracted	
	Aliphatic VOCs		Aromatic VOCs		Pesticides		Mercury			
	pounds		pounds		pounds		pounds		gallons	
Q1-98	NA		NA		NA		NA		210,000	
Q2-98	354.7		34.9578		0.15		0.16608		1,175,800	
Q3-98	580.4		16.397		4.87		0.31233		2,575,531	
Q4-98	1193.7		82.1497		5.17		0.15449		4,052,996	
1998 Total		2,129		133.50		10		0.63289		8,014,327
Q1-99	790.3		24.3354		8.47		3.51375		4,233,520	
Q2-99	1019.7		17.0826		7.10		0.15335		3,991,584	
Q3-99	1117.9		77.0616		8.74		0.10204		5,219,208	
Q4-99	1016.3		36.4233		6.83		0.02489		6,366,934	
1999 Total		3,944		154.90		31		3.79403		19,811,246
Q1-00	1247.1		72.3109		24.15		0.06115		6,757,603	
Q2-00	1411.3		106.858		10.27		0.05932		6,663,345	
Q3-00	907.8		103.288		18.67		0.05645		6,007,755	
Q4-00	1168.9		90.3489		9.61		0.01237		6,803,495	
2000 Total		4,735		372.81		63		0.18929		26,232,198
Q1-01	1316.5		90.8135		6.72		0.05640		7,379,548	
Q2-01	2596.9		113.195		11.86		0.03898		8,474,363	
Q3-01 [a]	2384.7	[a]	105.46	[a]	11.08	[a]	0.03094	[a]	7,607,539	
Q4-01	575.1		63.3279		8.37		0.05329		5,642,388	
2001 Total		6,873		372.80		38		0.17960		29,103,838
Q1-02	1266.9		53.4303		6.92		0.06152		6,580,672	
Q2-02	472.1		59.6619		6.69		0.07870		8,693,727	
Q3-02	1189.9		72.3968		6.04		0.06637		5,950,649	
Q4-02	443.8		38.5437		3.50		0.07369		5,385,584	
2002 Total		3,373		224.03		23		0.28027		26,610,632
Q1-03	879.8		44.8224		3.47		0.58368		5,151,629	
Q2-03	1726.1		162.614		5.24		0.06155		7,276,723	
Q3-03	1459.9		89.6481		0.00		0.12051		6,700,727	
Q4-03	1593.7		68.184		5.21		0.05788		6,483,046	
2003 Total		5,660		365.27		14		0.82363		25,612,125
Q1-04	1414.7		86.4896		4.85		0.03647		5,846,144	
Q2-04	1839.9		99.5038		5.77		0.05817		6,826,643	
Q3-04 [a]	1961.3	[a]	113.335	[a]	8.08	[a]	0.04811	[a]	6,494,680	
Q4-04	3609.9		83.9802		6.08		0.18456		8,127,002	
2004 Total		8,826		383.31		25		0.32732		27,294,469
Q1-05 [a]	2591.7	[a]	71.5544	[a]	4.64	[a]	0.13792	[a]	6,490,183	
Q2-05	1131.5		38.9625		3.46		0.03594		5,910,497	
Q3-05 [a]	828.9	[a]	33.114	[a]	2.81	[a]	0.04407	[a]	7,113,517	
Q4-05	833.0		50.4396		6.69		0.08576		5,271,114	
2005 Total		5,385		194.07		18		0.30369		24,785,311
Q1-06	991.4		52.2367		3.55		0.02144		5,139,061	
Q2-06	1118.8		36.7004		4.43		0.03623		8,872,651	
Q3-06	1118.9		52.538		4.22		0.01536		8,253,291	
Q4-06	1118.0		59.4582		4.88		0.04032		8,959,291	
2006 Total		4,347		200.93		17		0.11336		31,224,294
Q1-07	1347.8		61.4375		4.04		0.02170		7,250,389	
Q2-07	1658.2		36.9582		4.19		0.04413		8,203,421	
Q3-07	1307.5		82.328		5.31		0.03239		6,553,414	
Q4-07	1500.9		85.3163		7.78		0.02990		5,741,687	
2007 Total		5,815		266.04		21		0.12812		27,748,911
Q1-08	887.1		47.5786		3.33		0.05402		6,394,472	
Q2-08	1221.4		49.3187		4.23		0.00961		6,750,450	
Q3-08	1600.6		89.449		6.74		0.00833		8,159,637	
Q4-08	1928.0		110.694		7.59		0.01118		9,010,318	
2008 Total		5,637		297.04		22		0.08315		30,314,877
Q1-09	1600.7		69.9005		5.66		0.00585		7,487,247	
Q2-09	1615.2		74.4036		5.65		0.01025		6,960,098	
Q3-09	1762.8		127.808		8.18		0.00885		8,806,214	
Q4-09	1608.7		107.754		30.36		0.02216		9,730,305	
2009 Total		6,587		379.87		50		0.04711		32,983,864
Q1-10	2136.5		93.543		5.73		0.00146		8,157,833	
Q2-10	1969.3		79.81		4.28		0.00523		7,255,838	
Q3-10	1609.0		81.4295		3.76		0.04101		7,532,651	
Q4-10	1711.1		94.2708		4.85		0.02593		7,127,476	
2010 Total		7,426		349.05		19		0.07362		30,073,798
Q1-11	1560.2		53.8423		3.79		0.02017		6,732,218	
Q2-11	1729.4		111.407		4.10		0.01348		5,811,286	
Q3-11	1618.2		82.0094		5.30		0.02617		9,060,804	
Q4-11	1551.8		99.6175		5.18		0.00878		6,319,658	
2011 Total		6,460		346.88		18		0.06860		27,923,966
Q1-12	1483.9		57.354		4.10		0.00569		8,474,213	
Q2-12	1561.5		106.072		4.92		0.00880		7,582,966	
Q3-12	3464.2		146.031		7.47		0.00535		6,043,496	
Q4-12	1398.7		119.249		4.98		0.00183		5,169,991	
2012 Total		7,908		428.71		21		0.02167		27,270,666
Q1-13	1632.4		100.649		3.33		0.00106		3,486,167	
Q2-13	316.9		48.8031		1.92		0.00129		2,581,033	
Q3-13	754.8		47.8548		2.31		0.00065		2,271,761	
Q4-13	1064.1		64.5173		6.00		0.00219		3,471,228	
2013 Total		3,768		261.82		14		0.00519		11,810,189
Q1-14	1115.9		51.6107		4.33		0.00024		2,438,406	
Q2-14	1024.1		65.0017		4.41		0.13581		3,182,334	
Q3-14	1230.4		80.2663		4.13		0.10278		3,414,832	
Q4-14	1581.5		66.8357		7.86		0.06162		2,804,511	
2014 Total		4,952		263.71		21		0.30046		11,840,083
SYSTEM TOTALS		**93,824**		**4,995**		**424**		**7.4**		**418,654,795**

[a] Estimated loading based on replication of previous quarter's constituent concentrations.
Flow data are actual for each quarter

Prepared by: T. Englund 01/27/2015
Checked by: R. Yardley 02/25/2014

Table 3.7: April 2, 2014 GWTS Treatment Performance

Sample Location: / Sample Date:	Sample AIR STRIPPER INFLUENT 4/2/2014	Sample AIR STRIPPER EFFLUENT 4/2/2014	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 4/2/2014	Sample BETWEEN CARBON VESSELS 4/2/2014	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 4/2/2014	Sample SYSTEM EFFLUENT 4/2/2014	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 4/2/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L							
Aliphatic Compounds							
1,1,1-Trichloroethane	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
1,1,2,2-Tetrachloroethane	4100	250 D	93.9%	150	40.0%	92	38.7%
1,1,2-Trichloroethane	100 U	2.0	NA	1.8	10.0%	1.5	16.7%
1,1-Dichloroethene	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	160	1.0 U	99.4%	1.0 U	NA	1.0 U	NA
Chloromethane (Methyl chloride)	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
cis-1,2-Dichloroethene	3300	41	98.8%	40	2.4%	36	10.0%
Methylene chloride (Dichloromethane)	390	6.8	98.3%	4.4	35.3%	2.4	45.5%
Tetrachloroethene (PCE)	12000	41	99.7%	26	36.6%	10	61.5%
trans-1,2-Dichloroethene	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Trichloroethene (TCE)	27000 D	160	99.4%	160	0.0%	94	41.3%
Vinyl Chloride	360	1.0 U	99.7%	1.0 U	NA	1.0 U	NA
Aromatic Compounds							
1,2,4-Trichlorobenzene	480	9.2	98.1%	1.0 U	89.1%	1.0 U	NA
1,2-Dichlorobenzene	100 U	1.6	NA	1.0 U	NA	1.0 U	NA
1,3-Dichlorobenzene	140	2.1	98.5%	1.0 U	52.4%	1.0 U	NA
1,4-Dichlorobenzene	210	3.5	98.3%	1.1	68.6%	1.0 U	9.1%
Benzene	170	1.5	99.1%	1.0 U	33.3%	1.0 U	NA
Chlorobenzene	150	2.3	98.5%	1.0 U	56.5%	1.0 U	NA
Pesticide Concentrations - SW846 8081 µg/L							
alpha-BHC	100	85	15.0%	38	55.3%	9.7	74.5%
beta-BHC	10	9.7	3.0%	7.1	26.8%	2.6	63.4%
delta-BHC	6.4	6.9	NA	4.3	37.7%	1.6	62.8%
gamma-BHC (Lindane)	78	67	14.1%	32	52.2%	8.5	73.4%
Total Metal Concentrations - SW846 7470 ug/L							
Mercury	0.00254	0.00220	13.4%	0.00102	53.6%	0.00062	39.2%
Daily Flow (gallons/day)							
Flow	24,933	24,933	NA	24,933	NA	24,933	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
mg/L - milligrams per liter
NA - not applicable

Prepared by: J. Decotis 04/22/2014
Checked by: A. Nelson 04/22/2014

Table 3.8: June 17, 2014 GWTS Treatment Performance

Sample Location: / Sample Date:	Sample AIR STRIPPER INFLUENT 6/17/2014	Sample AIR STRIPPER EFFLUENT 6/17/2014	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 6/17/2014	Sample BETWEEN CARBON VESSELS 6/17/2014	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 6/17/2014	Sample SYSTEM EFFLUENT 6/17/2014	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 6/17/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L							
Aliphatic Compounds							
1,1,1-Trichloroethane	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
1,1,2,2-Tetrachloroethane	2000	120	94.0%	58	51.7%	10	82.8%
1,1,2-Trichloroethane	100 U	1.2	NA	1 U	NA	1 U	NA
1,1-Dichloroethene	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Chloromethane (Methyl chloride)	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
cis-1,2-Dichloroethene	2100	26	98.8%	17	34.6%	5.1	70.0%
Methylene chloride (Dichloromethane)	210	2.9	98.6%	1.8	37.9%	1.7	5.6%
Tetrachloroethene (PCE)	6000	30	99.5%	9.3	69.0%	1.5	83.9%
trans-1,2-Dichloroethene	100 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Trichloroethene (TCE)	16000	110	99.3%	46	58.2%	4.5	90.2%
Vinyl Chloride	250	1.0 U	NA	1.0 U	NA	1.0 U	NA
Aromatic Compounds							
1,2,4-Trichlorobenzene	250	4.8	98.1%	1.0 U	NA	1.0 U	NA
1,2-Dichlorobenzene	100 U	1 U	NA	1.0 U	NA	1.0 U	NA
1,3-Dichlorobenzene	100 U	1.4	NA	1.0 U	NA	1.0 U	NA
1,4-Dichlorobenzene	100 U	2	NA	1 U	NA	1.0 U	NA
Benzene	100 U	1 U	NA	1.0 U	NA	1.0 U	NA
Chlorobenzene	100 U	1.3	NA	1.0 U	NA	1.0 U	NA
Pesticide Concentrations - SW846 8081 µg/L							
alpha-BHC	84	41	51.2%	0.81	98.0%	0.12	85.2%
beta-BHC	11	6.7	39.1%	1.1	83.6%	0.09	91.8%
delta-BHC	8.8	5.3	39.8%	0.91	82.8%	0.047 U	NA
gamma-BHC (Lindane)	58	33	43.1%	0.6	98.2%	0.087	85.5%
Total BHCs							
Total Metal Concentrations - SW846 7470 ug/L							
Mercury	6.61	4.13000	37.5%	1.36	67.1%	0.61	55.1%
Daily Flow (gallons/day)							
Flow	35,424	35,424	NA	35,424	NA	35,424	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
mg/L - milligrams per liter
NA - not applicable

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 3.9: October 2, 2014 GWTS Treatment Performance

Sample Location: / Sample Date:	Sample AIR STRIPPER INFLUENT 10/2/2014	Sample AIR STRIPPER EFFLUENT 10/2/2014	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 10/2/2014	Sample BETWEEN CARBON VESSELS 10/2/2014	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 10/2/2014	Sample SYSTEM EFFLUENT 10/2/2014	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 10/2/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L							
Aliphatic Compounds							
1,1,1-Trichloroethane	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
1,1,2,2-Tetrachloroethane	2700	120	95.6%	100	16.7%	77	23.0%
1,1,2-Trichloroethane	200 U	1.4	NA	1.4	0.0%	1.4	0.0%
1,1-Dichloroethene	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Chloromethane (Methyl chloride)	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
cis-1,2-Dichloroethene	3000	28	99.1%	28	0.0%	28	0.0%
Methylene chloride (Dichloromethane)	200 U	2.7	NA	1.5	44.4%	1.1	26.7%
Tetrachloroethene (PCE)	8400	30	99.6%	27	10.0%	18	33.3%
trans-1,2-Dichloroethene	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Trichloroethene (TCE)	21000	120	99.4%	130	NA	110	15.4%
Vinyl Chloride	260	1.0 U	99.6%	1.0 U	NA	1.0 U	NA
Aromatic Compounds							
1,2,4-Trichlorobenzene	540	6.7	98.8%	2.2	67.2%	1.1	50.0%
1,2-Dichlorobenzene	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
1,3-Dichlorobenzene	200 U	2.2	NA	1.3	40.9%	1.0 U	23.1%
1,4-Dichlorobenzene	250	2.9	98.8%	1.8	37.9%	1.0 U	44.4%
Benzene	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Chlorobenzene	200 U	1.6	NA	1.0	37.5%	1.0 U	NA
Pesticide Concentrations - SW846 8081 µg/L							
alpha-BHC	76	20	73.7%	8.6	57.0%	5.4	37.2%
beta-BHC	9.3	7.3	21.5%	5.1	30.1%	3.2	37.3%
delta-BHC	4.7 U	4.7	0.0%	3.4	27.7%	1.8	NA
gamma-BHC (Lindane)	53	20	62.3%	11	45.0%	6.4	41.8%
Total BHCs							
Total Metal Concentrations - SW846 7470 ug/L							
Mercury	4.63	2.38000	48.6%	3.29	NA	0.91	72.3%
Daily Flow (gallons/day)							
Flow	29,088	29,088	NA	29,088	NA	29,088	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
mg/L - milligrams per liter
NA - not applicable

Prepared by: R. Yardley 10/22/2014
Checked by: T. Englund 10/22/2014

Table 3.10: December 18, 2014 GWTS Treatment Performance

Sample Location: / Sample Date:	Sample AIR STRIPPER INFLUENT 12/18/2014	Sample AIR STRIPPER EFFLUENT 12/18/2014	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 12/18/2014	Sample BETWEEN CARBON VESSELS 12/18/2014	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 12/18/2014	Sample SYSTEM EFFLUENT 12/18/2014	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 12/18/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L							
Aliphatic Compounds							
1,1,1-Trichloroethane	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
1,1,2,2-Tetrachloroethane	4100	110	97.3%	100	9.1%	92	8.0%
1,1,2-Trichloroethane	200 U	1.6	NA	1.7	NA	1.8	NA
1,1-Dichloroethene	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Chloromethane (Methyl chloride)	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
cis-1,2-Dichloroethene	3200	34	98.9%	33	2.9%	33	0.0%
Methylene chloride (Dichloromethane)	250	3.6	98.6%	2.3	36.1%	1.8	21.7%
Tetrachloroethene (PCE)	13000	41	99.7%	35	14.6%	30	14.3%
trans-1,2-Dichloroethene	200 U	1.0 U	NA	1.0 U	NA	1.0 U	NA
Trichloroethene (TCE)	33000	170	99.5%	180	NA	170	5.6%
Vinyl Chloride	370	1.0	NA	1.0 U	NA	1.0 U	NA
Aromatic Compounds							
1,2,4-Trichlorobenzene	1100	7.7	99.3%	2.7	64.9%	1.4	48.1%
1,2-Dichlorobenzene	200 U	1.1	NA	1.0 U	NA	1.0 U	NA
1,3-Dichlorobenzene	200 U	1.6	NA	1.0	37.5%	1.0 U	NA
1,4-Dichlorobenzene	200	2.3	NA	1.6	30.4%	1.1	31.3%
Benzene	200 U	1.3	NA	1.1	NA	1.0 U	NA
Chlorobenzene	200 U	1.7	NA	1.1	35.3%	1.0 U	NA
Pesticide Concentrations - SW846 8081 µg/L							
alpha-BHC	120	80	33.3%	17	78.8%	18	NA
beta-BHC	11	7.5	31.8%	8.8	NA	6.9	21.6%
delta-BHC	8.5	7.9	7.1%	5.9	25.3%	4.1	NA
gamma-BHC (Lindane)	90	65	27.8%	19	70.8%	18	5.3%
Total BHCs							
Total Metal Concentrations - SW846 7470 ug/L							
Mercury	3	2.98	0.7%	1.81	39.3%	1	44.8%
Daily Flow (gallons/day)							
Flow	19,827	19,827	NA	19,827	NA	19,827	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
mg/L - milligrams per liter
NA - not applicable

Prepared by: R. Yardley 01/12/2015
Checked by: A. Bolden 01/13/2015

Table 4.1: April 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE				
OBA-1A	562.8	571.02	2.89	568.13
OBA-2A	561.6	572.93	10.13	562.80
OBA-3A	552.6	572.50	15.35	557.15
OBA-4A	558.7	572.88	11.02	561.86
OBA-5A	558.2	572.21	7.31	564.90
OBA-6A	561.4	570.75	5.10	565.65
OBA-7A	563	573.97	6.81	567.16
OBA-8A	560.2	573.52	10.08	563.44
OBA-9A	558.3	569.75	7.80	561.95
OBA-9AR	557.9	570.68	8.05	562.63
OBA-10A	552.5	568.92	5.99	562.93
OBA-11A	559.2	573.22	12.98	560.24
OBA-14A	552.5	571.10	13.53	557.57
OBA-15A	551	573.08	15.86	557.22
OBA-16A	560.9	573.55	9.76	563.79
OBA-18A	559.9	573.85	13.17	560.68
OBA-19A	558.6	574.34	11.47	562.87
OBA-23A	561.4	570.72	7.79	562.93
OBA-24A	558.23	569.45	6.16	563.29
OBA-25A	558.44	569.47	5.13	564.34
OBA-26A	557.75	570.04	6.09	563.95
PN-1A	560.8	571.01	6.41	564.60
PN-2A	562	571.20	8.54	562.66
PN-3A	559.7	571.43	8.61	562.82
PN-4A	559.1	568.78	6.60	562.18
PN-5A	559.1	569.10	6.52	562.58
PN-6A	559.2	568.93	5.79	563.14
PN-7A	558.9	568.70	5.81	562.89
PN-8A	557.8	568.83	4.34	564.49
PN-9A	559.47	571.26	9.86	561.40
PN-10A	561.8	570.56	7.95	562.61
PN-11A	558.9	568.54	4.64	563.90
PN-13A	560.46	573.70	8.69	565.01
PN-14A	561.05	573.79	8.61	565.18
PN-15A	559.93	571.15	6.72	564.43
PN-16A	560.67	570.92	6.69	564.23
PN-17A	560.81	571.04	5.39	565.65
PN-18A	562.03	570.77	6.22	564.55
PN-19A	562.43	571.20	7.34	563.86
PN-20A	558.82	570.49	8.06	562.43
PN-21A	559.19	569.88	4.69	565.19
Gill Creek Stilling Well[1]	NA	NA	NA	562.82

Prepared by: T. Englund 05/16/2014
Checked by: J. Decotis 05/16/2014

Table 4.1: April 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A/B-ZONE[4,5]				
PR-1	561.8	572.82	8.31	564.51
PR-1-PZ	561.8	571.58	7.05	564.53
PR-2	561.7	572.72	14.39	558.33
PR-2-PZ	561.7	572.70	15.12	557.58
PR-3	558.2	572.79	15.41	557.38
PR-3-PZ	558.2	572.16	14.79	557.37
PR-4	556.7	570.21	10.04	560.17
PR-4-PZ	556.7	570.14	13.05	557.09
PR-5	559.1	570.68	12.82	557.86
PR-5-PZ	559.1	569.69	11.83	557.86
PR-6	559.7	568.70	9.91	558.79
PR-7	558.9	569.06	7.00	562.06
PR-8	559.2	568.42	5.73	562.69
PR-9	556.6	568.72	6.29	562.43
PR-10	558.9	568.44	8.16	560.28
PR-11	559.1	568.01	4.18	563.83
PR-12	558.9	569.79	12.39	557.40
PR-13	559.4	569.07	11.11	557.96
RW-1	561.2	573.69	15.71	557.98
RW-1-PZ	561.2	572.73	14.72	558.01
RW-2	557	572.49	15.09	557.40
RW-2-PZ	557	572.22	14.86	557.36
RW-3	557.1	570.09	12.62	557.47
RW-3-PZ	557.1	570.03	12.51	557.52
RW-4	557.3	569.77	11.80	557.97
RW-4-PZ	557.3	569.81	12.57	557.24
RW-5	557.3	569.79	12.32	557.47
RW-5-PZ	557.3	569.74	12.30	557.44
B-ZONE[5]				
OBA-1B	NA	570.90	9.39	561.51
OBA-2B	NA	573.07	15.76	557.31
OBA-4B	NA	573.49	14.82	558.67
OBA-5B	NA	572.70	12.94	559.76
OBA-6B	NA	570.71	5.24	565.47
OBA-7B	NA	574.47	9.76	564.71
OBA-8B	NA	573.24	14.18	559.06
OBA-11B	NA	573.29	15.78	557.51
OBA-14B	NA	571.26	14.00	557.26
OBA-16B	NA	573.47	15.67	557.80
OBA-23B	NA	570.54	12.16	558.38
OBA-24B	NA	569.28	11.43	557.85
OBA-25B	NA	569.45	11.66	557.79
OBA-26B	NA	570.04	12.13	557.91

Prepared by: T. Englund 05/16/2014
Checked by: J. Decotis 05/16/2014

Table 4.1: April 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
B-ZONE CONTINUED[5]				
PN-1B	NA	570.87	12.36	558.51
PN-2B	NA	571.01	13.53	557.48
PN-3B	NA	571.36	14.01	557.35
PN-4B	NA	568.69	11.53	557.16
PN-5B	NA	569.10	11.69	557.41
PN-6B	NA	569.07	11.70	557.37
PN-7B	NA	568.95	11.14	557.81
PN-8B	NA	568.38	11.02	557.36
PN-9B	NA	571.90	13.82	558.08
PN-10B	NA	571.63	13.38	558.25
PN-11B	NA	568.21	10.47	557.74
PN-12B	NA	570.43	12.47	557.96
PN-13B	NA	573.73	15.70	558.03
PN-14B	NA	573.76	14.41	559.35
PN-15B	NA	571.14	13.31	557.83
PN-16B	NA	570.85	9.57	561.28
PN-17B	NA	571.07	12.51	558.56
PN-18B	NA	570.83	11.81	559.02
PN-19B	NA	571.11	12.11	559.00
PN-20B	NA	570.21	12.88	557.33
PN-21B	NA	569.85	10.24	559.61
C-ZONE				
OBA-1C	NA	570.96	15.77	555.19
OBA-4C	NA	573.54	16.22	557.32
OBA-7C	NA	574.85	19.97	554.88
OBA-14C	NA	570.61	14.98	555.63
OBA-15B	NA	573.58	16.23	557.35
CD-ZONE				
OBA-2C	NA	573.12	18.02	555.10
OBA-3C	NA	573.14	17.84	555.30
OBA-5C	NA	572.46	18.08	554.38
OBA-6C	NA	570.71	15.07	555.64
OBA-8C	NA	573.81	21.86	551.95
OBA-11C	NA	573.37	16.71	556.66
Olin Production Well[2]	NA	NA	620	554.1

Prepared by: T. Englund 05/16/2014
Checked by: J. Decotis 05/16/2014

Table 4.1: April 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.

2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.

3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.

4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone potentiometric surface maps.

5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.

Prepared by: T. Englund 05/16/2014
Checked by: J. Decotis 05/16/2014

Table 4.2: June 17, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	6/17/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE				
OBA-1A	562.8	571.02	4.58	566.44
OBA-2A	561.6	572.93	Dry	561.60
OBA-3A	552.6	572.50	14.98	557.52
OBA-4A	558.7	572.88	12.88	560.00
OBA-5A	558.2	572.21	7.41	564.80
OBA-6A	561.4	570.75	5.11	565.64
OBA-7A	563	573.97	7.41	566.56
OBA-8A	560.2	573.52	11.18	562.34
OBA-9A	558.3	569.75	7.76	561.99
OBA-9AR	557.9	570.68	13.44	557.24
OBA-10A	552.5	568.92	6.11	562.81
OBA-11A	559.2	573.22	12.95	560.27
OBA-14A	552.5	571.10	13.33	557.77
OBA-15A	551	573.08	15.49	557.59
OBA-16A	560.9	573.55	10.94	562.61
OBA-18A	559.9	573.85	13.18	560.67
OBA-19A	558.6	574.34	12.98	561.36
OBA-23A	561.4	570.72	8.49	562.23
OBA-24A	558.23	569.45	6.55	562.90
OBA-25A	558.44	569.47	5.32	564.15
OBA-26A	557.75	570.04	6.32	563.72
PN-1A	560.8	571.01	NM	NM
PN-2A	562	571.20	9.09	562.11
PN-3A	559.7	571.43	9.22	562.21
PN-4A	559.1	568.78	6.97	561.81
PN-5A	559.1	569.10	6.58	562.52
PN-6A	559.2	568.93	6.11	562.82
PN-7A	558.9	568.70	5.83	562.87
PN-8A	557.8	568.83	4.58	564.25
PN-9A	559.47	571.26	10.02	561.24
PN-10A	561.8	570.56	8.81	561.75
PN-11A	558.9	568.54	4.69	563.85
PN-12A	562.33	570.54	4.93	565.61
PN-13A	560.46	573.70	8.66	565.04
PN-14A	561.05	573.79	8.48	565.31
PN-15A	559.93	571.15	7.00	564.15
PN-16A	560.67	570.92	8.03	562.89
PN-17A	560.81	571.04	5.83	565.21
PN-18A	562.03	570.77	7.72	563.05
PN-19A	562.43	571.20	7.32	563.88
PN-20A	558.82	570.49	7.92	562.57
PN-21A	559.19	569.88	4.82	565.06
Gill Creek Stilling Well[1]	NA	NA	NA	562.83

Prepared by: T. Englund 02/06/2014
Checked by: J. Decotis 02/06/2014

Table 4.2: June 17, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	6/17/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A/B-ZONE[4,5]				
PR-1	561.8	572.82	9.39	563.43
PR-1-PZ	561.8	571.58	8.08	563.50
PR-2	561.7	572.72	15.09	557.63
PR-2-PZ	561.7	572.70	15.06	557.64
PR-3	558.2	572.79	15.18	557.61
PR-3-PZ	558.2	572.16	14.52	557.64
PR-4	556.7	570.21	13.80	556.41
PR-4-PZ	556.7	570.14	13.34	556.80
PR-5	559.1	570.68	12.20	558.48
PR-5-PZ	559.1	569.69	11.81	557.88
PR-6	559.7	568.70	10.20	558.50
PR-7	558.9	569.06	7.55	561.51
PR-8	559.2	568.42	5.96	562.46
PR-9	556.6	568.72	6.57	562.15
PR-10	558.9	568.44	8.13	560.31
PR-11	559.1	568.01	4.09	563.92
PR-12	558.9	569.79	12.12	557.67
PR-13	559.4	569.07	11.23	557.84
RW-1	561.2	573.69	16.92	556.77
RW-1-PZ	561.2	572.73	15.92	556.81
RW-2	557	572.49	14.91	557.58
RW-2-PZ	557	572.22	14.62	557.60
RW-3	557.1	570.09	NM	NM
RW-3-PZ	557.1	570.03	12.38	557.65
RW-4	557.3	569.77	11.60	558.17
RW-4-PZ	557.3	569.81	12.33	557.48
RW-5	557.3	569.79	12.13	557.66
RW-5-PZ	557.3	569.74	12.12	557.62
B-ZONE[5]				
OBA-1B	NA	570.90	9.88	561.02
OBA-2B	NA	573.07	15.54	557.53
OBA-4B	NA	573.49	14.82	558.67
OBA-5B	NA	572.70	12.69	560.01
OBA-6B	NA	570.71	5.16	565.55
OBA-7B	NA	574.47	10.13	564.34
OBA-8B	NA	573.24	14.52	558.72
OBA-11B	NA	573.29	16.13	557.16
OBA-14B	NA	571.26	13.68	557.58
OBA-16B	NA	573.47	15.74	557.73
OBA-23B	NA	570.54	12.49	558.05
OBA-24B	NA	569.28	11.41	557.87
OBA-25B	NA	569.45	11.52	557.93

Prepared by: T. Englund 02/06/2014
Checked by: J. Decotis 02/06/2014

Table 4.2: June 17, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	6/17/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
B-ZONE CONTINUED[5]				
OBA-26B	NA	570.04	12.18	557.86
PN-1B	NA	570.87	13.12	557.75
PN-2B	NA	571.01	12.33	558.68
PN-3B	NA	571.36	13.79	557.57
PN-4B	NA	568.69	11.32	557.37
PN-5B	NA	569.10	11.42	557.68
PN-6B	NA	569.07	11.40	557.67
PN-7B	NA	568.95	11.09	557.86
PN-8B	NA	568.38	10.82	557.56
PN-9B	NA	571.90	13.60	558.30
PN-10B	NA	571.63	14.03	557.60
PN-11B	NA	568.21	10.42	557.79
PN-12B	NA	570.43	12.52	557.91
PN-13B	NA	573.73	15.81	557.92
PN-14B	NA	573.76	15.45	558.31
PN-15B	NA	571.14	13.31	557.83
PN-16B	NA	570.85	10.11	560.74
PN-17B	NA	571.07	13.23	557.84
PN-18B	NA	570.83	12.83	558.00
PN-19B	NA	571.11	13.21	557.90
PN-20B	NA	570.21	12.65	557.56
PN-21B	NA	569.85	10.48	559.37
C-ZONE				
OBA-1C	NA	570.96	14.78	556.18
OBA-4C	NA	573.54	15.97	557.57
OBA-7C	NA	574.85	19.45	555.40
OBA-14C	NA	570.61	NM	NM
OBA-15B	NA	573.58	16.02	557.56
CD-ZONE				
OBA-2C	NA	573.12	17.52	555.60
OBA-3C	NA	573.14	18.32	554.82
OBA-5C	NA	572.46	17.38	555.08
OBA-6C	NA	570.71	14.92	555.79
OBA-8C	NA	573.81	21.25	552.56
OBA-11C	NA	573.37	16.96	556.41
Olin Production Well[2]	NA	NA	617	554.2

Prepared by: T. Englund 02/06/2014
Checked by: J. Decotis 02/06/2014

Table 4.2: June 17, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	6/17/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.
2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.
3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.
4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone potentiometric surface maps.
5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.

Prepared by: T. Englund 02/06/2014
Checked by: J. Decotis 02/06/2014

Table 4.3: October 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE				
OBA-1A	562.33	570.67	4.61	566.06
OBA-2A	561.32	572.54	Dry	561.32
OBA-3A	552.36	572.07	15.23	556.84
OBA-4A	558.34	572.42	13.39	559.03
OBA-5A	557.72	571.72	7.58	564.14
OBA-6A	561.01	570.17	4.65	565.52
OBA-7A	562.71	573.39	8.24	565.15
OBA-8A	559.59	572.49	11.69	560.80
OBA-9A	558.01	569.24	8.35	560.89
OBA-9AR	557.28	570.22	8.83	561.39
OBA-10A	552.15	568.39	6.60	561.79
OBA-11A	558.76	572.83	13.00	559.83
OBA-14A	552.44	570.67	13.28	557.39
OBA-15A	551.06	572.59	16.18	556.41
OBA-16A	560.42	573.26	10.89	562.37
OBA-18A	559.18	573.47	13.19	560.28
OBA-19A	558.08	573.86	13.54	560.32
OBA-23A	560.94	570.19	8.80	561.39
OBA-24A	557.76	568.95	6.98	561.97
OBA-25A	558.07	569.02	5.65	563.37
OBA-26A	557.28	569.55	6.72	562.83
PN-1A	560.21	570.51	7.41	563.10
PN-2A	561.41	570.64	Dry	561.41
PN-3A	560.12	571.80	9.77	562.03
PN-4A	558.94	568.35	7.42	560.93
PN-5A	558.95	568.55	6.95	561.60
PN-6A	559.06	568.43	7.67	560.76
PN-7A	558.52	568.23	7.74	560.49
PN-8A	557.53	568.28	5.05	563.23
PN-9A	558.97	570.74	10.61	560.13
PN-10A	561.35	570.11	Dry	561.35
PN-11A	557.78	567.49	4.99	562.50
PN-12A	558.85	570.07	5.24	564.83
PN-13A	559.98	573.25	9.02	564.23
PN-14A	560.62	573.30	8.82	564.48
PN-15A	559.44	570.69	7.38	563.31
PN-16A	560.17	570.44	8.44	562.00
PN-17A	560.32	570.55	6.23	564.32
PN-18A	561.55	570.23	8.30	561.93
PN-19A	562	570.74	7.38	563.36
PN-20A	558.35	570.07	8.21	561.86
PN-21A	558.77	569.48	4.97	564.51
Gill Creek Stilling Well[1]	NA	NA	NA	562.42

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 4.3: October 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
SOLVENT A-ZONE[6]				
OW-5A	NA	573.05	Dry	Dry
OW-6A	NA	572.10	9.90	562.20
OW-20A	NA	572.62	12.08	560.54
OW-21A	NA	569.33	Dry	Dry
OW-22A	NA	570.68	12.30	558.38
A/B-ZONE[4,5]				
PR-1	561.7	572.29	9.07	563.22
PR-1-PZ	561.7	571.15	7.81	563.34
PR-2	561.17	572.21	14.95	557.26
PR-2-PZ	561.17	572.17	15.02	557.15
PR-3	557.65	572.39	15.15	557.24
PR-3-PZ	557.65	571.69	14.54	557.15
PR-4	556.58	569.66	12.98	556.68
PR-4-PZ	556.58	569.65	12.89	556.76
PR-5	558.47	570.18	12.63	557.55
PR-5-PZ	558.47	569.23	11.73	557.50
PR-6	559.35	568.28	10.41	557.87
PR-7	558.56	568.57	9.85	558.72
PR-8	558.91	567.97	10.25	557.72
PR-9	556.16	568.39	10.93	557.46
PR-10	558.38	568.16	9.03	559.13
PR-11	558.31	567.53	4.80	562.73
PR-12	558.37	569.28	12.19	557.09
PR-13	559.15	568.69	11.38	557.31
PR-14	558.59	568.60	11.00	557.60
RW-1	560.93	573.22	16.30	556.92
RW-1-PZ	560.93	572.33	15.30	557.03
RW-2	559.03	572.01	14.82	557.19
RW-2-PZ	559.03	571.76	14.60	557.16
RW-3	556.69	569.40	12.49	556.91
RW-3-PZ	556.69	569.37	12.42	556.95
RW-4	557.05	569.27	11.73	557.54
RW-4-PZ	557.05	569.33	12.36	556.97
RW-5	556.81	569.28	11.95	557.33
RW-5-PZ	556.81	569.24	12.20	557.04
B-ZONE[5]				
OBA-1B	NA	570.35	11.43	558.92
OBA-2B	NA	572.63	15.57	557.06
OBA-4B	NA	573.03	15.64	557.39
OBA-5B	NA	572.29	12.49	559.80
OBA-6B	NA	570.31	5.52	564.79
OBA-7B	NA	573.97	10.74	563.23
OBA-8B	NA	572.64	14.89	557.75

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 4.3: October 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
OBA-11B	NA	572.87	16.51	556.36
OBA-14B	NA	570.76	13.81	556.95
OBA-16B	NA	572.99	15.78	557.21
OBA-23B	NA	570.04	12.73	557.31
OBA-24B	NA	568.76	11.48	557.28
OBA-25B	NA	568.93	11.67	557.26
OBA-26B	NA	569.65	12.22	557.43
PN-1B	NA	570.32	12.83	557.49
B-ZONE CONTINUED[5]				
PN-2B	NA	570.44	13.34	557.10
PN-3B	NA	571.73	13.79	557.94
PN-4B	NA	568.46	11.33	557.13
PN-5B	NA	568.58	11.49	557.09
PN-6B	NA	568.56	11.44	557.12
PN-7B	NA	568.45	11.15	557.30
PN-8B	NA	567.85	10.79	557.06
PN-9B	NA	570.68	13.58	557.10
PN-10B	NA	571.15	13.85	557.30
PN-11B	NA	567.78	10.45	557.33
PN-12B	NA	570.00	12.54	557.46
PN-13B	NA	573.24	15.87	557.37
PN-14B	NA	573.30	11.26	562.04
PN-15B	NA	570.70	13.36	557.34
PN-16B	NA	570.36	9.97	560.39
PN-17B	NA	570.54	11.14	559.40
PN-18B	NA	570.50	12.79	557.71
PN-19B	NA	570.64	11.63	559.01
PN-20B	NA	569.70	12.63	557.07
PN-21B	NA	569.39	10.80	558.59
PN-24B	NA	570.87	13.61	557.26
SOLVENT B-ZONE[6]				
PW-3B	NA	571.21	16.35	554.86
PW-4B	NA	569.72	13.38	556.34
OW-4B	NA	570.55	13.14	557.41
OW-14B	NA	570.87	14.18	556.69
OW-15B	NA	569.78	12.31	557.47
OW-22B	NA	570.90	13.79	557.11
OW-23B	NA	569.67	12.62	557.05
OW-24B	NA	570.36	13.13	557.23
OW-25B	NA	570.90	14.27	556.63
OW-31B	NA	570.14	13.04	557.10
OW-32B	NA	569.99	12.68	557.31
OW-33B	NA	569.55	12.29	557.26
C-ZONE				

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 4.3: October 2, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/2/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
OBA-1C	NA	570.41	14.86	555.55
OBA-4C	NA	573.05	16.04	557.01
OBA-7C	NA	574.30	18.94	555.36
OBA-14C	NA	570.15	NM	NM
OBA-15B	NA	573.13	16.09	557.04
CD-ZONE				
OBA-2C	NA	572.43	17.33	555.10
OBA-3C	NA	572.67	18.08	554.59
OBA-5C	NA	572.01	16.83	555.18
OBA-6C	NA	570.35	14.36	555.99
OBA-8C	NA	573.14	20.64	552.50
OBA-11C	NA	572.94	17.43	555.51
Olin Production Well[2]	NA	NA	541	554.6

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.
2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.
3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.
4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone potentiometric surface maps.
5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.
6. Water levels were measured in Solvent wells on Olin property (with Solvent permission) and used in the creation of the October 2014 potentiometric surface maps.

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 4.4: December 18, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/18/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE				
OBA-1A	562.33	570.67	2.43	568.24
OBA-2A	561.32	572.54	9.74	562.80
OBA-3A	552.36	572.07	15.05	557.02
OBA-4A	558.34	572.42	11.04	561.38
OBA-5A	557.72	571.72	7.31	564.41
OBA-6A	561.01	570.17	4.92	565.25
OBA-7A	562.71	573.39	6.92	566.47
OBA-8A	559.59	572.49	9.74	562.75
OBA-9A	558.01	569.24	7.25	561.99
OBA-9AR	557.28	570.22	13.05	557.17
OBA-10A	552.15	568.39	6.00	562.39
OBA-11A	558.76	572.83	12.98	559.85
OBA-14A	552.44	570.67	13.41	557.26
OBA-15A	551.06	572.59	15.52	557.07
OBA-16A	560.42	573.26	9.43	563.83
OBA-18A	559.18	573.47	13.09	560.38
OBA-19A	558.08	573.86	11.14	562.72
OBA-23A	560.94	570.19	7.38	562.81
OBA-24A	557.76	568.95	6.27	562.68
OBA-25A	558.07	569.02	5.27	563.75
OBA-26A	557.28	569.55	6.32	563.23
PN-1A	560.21	570.51	6.11	564.40
PN-2A	561.41	570.64	7.80	562.84
PN-3A	560.12	571.80	NM	NM
PN-4A	558.94	568.35	5.88	562.47
PN-5A	558.95	568.55	6.31	562.24
PN-6A	559.06	568.43	7.25	561.18
PN-7A	558.52	568.23	6.66	561.57
PN-8A	557.53	568.28	3.99	564.29
PN-9A	558.97	570.74	8.90	561.84
PN-10A	561.35	570.11	8.19	561.92
PN-11A	557.78	567.49	4.41	563.08
PN-12A	558.85	570.07	4.77	565.30
PN-13A	559.98	573.25	8.50	564.75
PN-14A	560.62	573.30	8.25	565.05
PN-15A	559.44	570.69	7.04	563.65
PN-16A	560.17	570.44	6.24	564.20
PN-17A	560.32	570.55	4.87	565.68
PN-18A	561.55	570.23	5.83	564.40
PN-19A	562	570.74	6.98	563.76
PN-20A	558.35	570.07	8.58	561.49
PN-21A	558.77	569.48	4.67	564.81
Gill Creek Stilling Well[1]	NA	NA	NA	562.21

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 4.4: December 18, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/18/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A/B-ZONE[4,5]				
PR-1	561.7	572.29	7.72	564.57
PR-1-PZ	561.7	571.15	6.47	564.68
PR-2	561.17	572.21	14.14	558.07
PR-2-PZ	561.17	572.17	15.06	557.11
PR-3	557.65	572.39	15.20	557.19
PR-3-PZ	557.65	571.69	14.62	557.07
PR-4	556.58	569.66	11.62	558.04
PR-4-PZ	556.58	569.65	13.41	556.24
PR-5	558.47	570.18	12.44	557.74
PR-5-PZ	558.47	569.23	11.36	557.87
PR-6	559.35	568.28	10.55	557.73
PR-7	558.56	568.57	8.29	560.28
PR-8	558.91	567.97	9.80	558.17
PR-9	556.16	568.39	8.05	560.34
PR-10	558.38	568.16	8.70	559.46
PR-11	558.31	567.53	3.92	563.61
PR-12	558.37	569.28	12.22	557.06
PR-13	559.15	568.69	11.00	557.69
PR-14	558.59	568.60	10.95	557.65
RW-1	560.93	573.22	15.10	558.12
RW-1-PZ	560.93	572.33	14.18	558.15
RW-2	559.03	572.01	14.90	557.11
RW-2-PZ	559.03	571.76	14.71	557.05
RW-3	556.69	569.40	NM	NM
RW-3-PZ	556.69	569.37	12.42	556.95
RW-4	557.05	569.27	12.04	557.23
RW-4-PZ	557.05	569.33	12.23	557.10
RW-5	556.81	569.28	12.24	557.04
RW-5-PZ	556.81	569.24	12.22	557.02
B-ZONE[5]				
OBA-1B	NA	570.35	9.49	560.86
OBA-2B	NA	572.63	15.63	557.00
OBA-4B	NA	573.03	15.00	558.03
OBA-5B	NA	572.29	12.38	559.91
OBA-6B	NA	570.31	5.10	565.21
OBA-7B	NA	573.97	9.49	564.48
OBA-8B	NA	572.64	14.51	558.13
OBA-11B	NA	572.87	15.78	557.09
OBA-14B	NA	570.76	13.81	556.95
OBA-16B	NA	572.99	15.63	557.36
OBA-23B	NA	570.04	11.87	558.17
OBA-24B	NA	568.76	11.48	557.28
OBA-25B	NA	568.93	11.61	557.32

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 4.4: December 18, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/18/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
B-ZONE CONTINUED[5]				
OBA-26B	NA	569.65	12.18	557.47
PN-1B	NA	570.32	12.03	558.29
PN-2B	NA	570.44	13.38	557.06
PN-3B	NA	571.73	NM	NM
PN-4B	NA	568.46	11.38	557.08
PN-5B	NA	568.58	11.59	556.99
PN-6B	NA	568.56	11.47	557.09
PN-7B	NA	568.45	11.10	557.35
PN-8B	NA	567.85	10.85	557.00
PN-9B	NA	570.68	13.68	557.00
PN-10B	NA	571.15	13.10	558.05
PN-11B	NA	567.78	10.49	557.29
PN-12B	NA	570.00	12.46	557.54
PN-13B	NA	573.24	15.76	557.48
PN-14B	NA	573.30	9.13	564.17
PN-15B	NA	570.70	13.34	557.36
PN-16B	NA	570.36	8.53	561.83
PN-17B	NA	570.54	12.11	558.43
PN-18B	NA	570.50	11.90	558.60
PN-19B	NA	570.64	10.37	560.27
PN-20B	NA	569.70	12.73	556.97
PN-21B	NA	569.39	10.59	558.80
PN-24B	NA	570.87	13.53	557.34
C-ZONE				
OBA-1C	NA	570.41	14.83	555.58
OBA-4C	NA	573.05	16.08	556.97
OBA-7C	NA	574.30	20.43	553.87
OBA-14C	NA	570.15	16.11	554.04
OBA-15B	NA	573.13	16.11	557.02
CD-ZONE				
OBA-2C	NA	572.43	17.96	554.47
OBA-3C	NA	572.67	19.24	553.43
OBA-5C	NA	572.01	18.27	553.74
OBA-6C	NA	570.35	15.34	555.01
OBA-8C	NA	573.14	22.63	550.51
OBA-11C	NA	572.94	16.61	556.33
Olin Production Well[2]	NA	NA	502	554.9

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 4.4: December 18, 2014 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/18/2014	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.
2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.
3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.
4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone
5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.

Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/27/2015

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-1A 6/20/2014	Sample OBA-1B 6/20/2014	Duplicate OBA-1BD 6/20/2014	Sample OBA-2A 6/19/2014	Sample OBA-2B 6/18/2014	Sample OBA-3A 6/18/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	4.1 D	1.3
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0	1.0	1.0 U	2.5 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U
Chloromethane (Methyl chloride)	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U
cis-1,2-Dichloroethene	1.0 U	17	17	1.0 U	24 D	12
Methylene chloride (Dichloromethane)	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U
Tetrachloroethene (PCE)	1.0 U	10	11	1.0 U	36 D	14
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U
Trichloroethene (TCE)	2.3	45	51	4.1	55	16
Vinyl Chloride	1.0 U	12	12	1.0 U	2.5 U	2.5
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	180 D	2.7
1,2-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	2.7 D	30
1,3-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	6.0 D	27
1,4-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	39
Benzene	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	4.3
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	38
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.047 U	0.047 U	0.047 U	0.063 U	0.71	0.27
beta-BHC	7.1	0.047 U	0.047 U	0.063 U	0.18	0.11
delta-BHC	0.047 U	0.047 U	0.047 U	0.063 U	0.047 U	0.092
gamma-BHC (Lindane)	0.047 U	0.047 U	0.047 U	0.063 U	0.051	0.14
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	30.9	30.4	1.10	0.20 U	0.20 U

Notes:
U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-4A 6/18/2014	Sample OBA-4B 6/18/2014	Sample OBA-5A 6/20/2014	Sample OBA-5B 6/20/2014	Sample OBA-6A 6/20/2014	Sample OBA-6B 6/20/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	1.0 U	50 U	200 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	50 U	740	1.0 U	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	50 U	200 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	50 U	200 U	1.0 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	50 U	200 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	1.0 U	1.0 U	50 U	200 U	1.0 U	1.0 U
cis-1,2-Dichloroethene		13	390	1700	1.0 U	13
Methylene chloride (Dichloromethane)	1.0 U	1.0 U	50 U	200 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	7.3	1.0 U	400	11000	1.0 U	45
trans-1,2-Dichloroethene	1.0 U	1.0 U	50 U	200 U	1.0 U	1.0 U
Trichloroethene (TCE)	16	1.2	260	20000	1.0 U	22
Vinyl Chloride	1.0 U	7.600	64	200 U	1.0 U	8.0
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	1.0 U	5700	8100	1.0 U	100
1,2-Dichlorobenzene	1.0 U	1.0 U	430	1300	1.0 U	19
1,3-Dichlorobenzene	1.0 U	1.0 U	640	1100	1.0 U	13
1,4-Dichlorobenzene	1.0 U	1.0 U	460	1700	1.0 U	21
Benzene	1.0 U	1.0 U	330	5300	1.0 U	5.7
Chlorobenzene	1.0 U	3.0	540	5200	1.0 U	3.6
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.047 U	0.047 U	150	620	0.047 U	0.047 U
beta-BHC	0.047 U	0.057	4.7 U	79	0.058	0.13
delta-BHC	0.047 U	0.047 U	4.7 U	34	0.047 U	0.047 U
gamma-BHC (Lindane)	0.047 U	0.047 U	74	630	0.047 U	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	3.37

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-8A 6/19/2014	Sample OBA-8B 6/19/2014	Sample OBA-10A 6/18/2014	Sample OBA-11B 6/19/2014	Sample OBA-14A 6/18/2014	Sample OBA-14B 6/18/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	50 U	100 U	50 U	1.0 U	2.5 U
1,1,2,2-Tetrachloroethane	1.0 U	50 U	100 U	50 U	1.0 U	31
1,1,2-Trichloroethane	1.0 U	50 U	100 U	50 U	1.0 U	2.5 U
1,1-Dichloroethene	1.0 U	50 U	100 U	50 U	1.0 U	2.5 U
Carbon tetrachloride	1.0 U	50 U	100 U	50 U	1.0 U	2.5 U
Chloromethane (Methyl chloride)	1.0 U	50 U	100 U	50 U	1.0 U	2.5 U
cis-1,2-Dichloroethene	1.0 U	50 U	100 U	5700 D	1.0 U	380
Methylene chloride (Dichloromethane)	1.0 U	50 U	100 U	50 U	1.0 U	2.5 U
Tetrachloroethene (PCE)	1.9	50 U	100 U	50 U	1.0 U	290
trans-1,2-Dichloroethene	1.0 U	50 U	100 U	58 D	1.0 U	9.6
Trichloroethene (TCE)	2.5	50 U	75	34	1.0 U	380
Vinyl Chloride	1.0 U	50 U	100 U	1500 D	1.0 U	12
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	5400	4000	420	1.0 U	51
1,2-Dichlorobenzene	1.0 U	160	9900 D	50 U	1.0 U	17
1,3-Dichlorobenzene	1.0 U	260	1400 D	50 U	1.0 U	18
1,4-Dichlorobenzene	1.0 U	50 U	7700 D	50 U	1.0 U	37
Benzene	1.0 U	50 U	3300 D	50 U	1.0 U	4.9
Chlorobenzene	1.0 U	50 U	2000 D	50 U	1.0 U	17
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.061	2.1	290	6.2	0.047 U	1.0
beta-BHC	0.25	1.1	24 U	0.87	0.047 U	0.71
delta-BHC	0.047 U	0.094 U	24 U	0.24 U	0.047 U	0.29
gamma-BHC (Lindane)	0.047 U	0.094 U	180	0.24 U	0.047 U	0.59
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:
U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-15A 6/18/2014	Sample OBA-16B 6/18/2014	Sample OBA-23A 6/18/2014	Sample OBA-23B 6/18/2014	Sample OBA-24A 6/19/2014	Duplicate OBA-24AD 6/19/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	2.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	2.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,1,2-Trichloroethane	2.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,1-Dichloroethene	2.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Carbon tetrachloride	2.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	2.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	2.4	33	1.0 U	6.3	3.8	4.2
Methylene chloride (Dichloromethane)	2.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	2.0 U	110	5.2	2.5 U	3.9	4.5
trans-1,2-Dichloroethene	2.0 U	1.5	1.0 U	2.5 U	1.0 U	1.0 U
Trichloroethene (TCE)	2.0 U	160	8.1	2.5 U	26	27
Vinyl Chloride	5.5	2.1	1.0 U	2.5 U	1.0 U	1.0 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	2.0 U	120	1.0 U	350	1.0 U	1.0 U
1,2-Dichlorobenzene	78	5.8	1.0 U	13	1.0 U	1.0 U
1,3-Dichlorobenzene	150	19	1.0 U	340	1.0 U	1.0 U
1,4-Dichlorobenzene	240	8.2	1.0 U	200	1.9	1.9
Benzene	38	23	1.0 U	2.5 U	1.0 U	1.0 U
Chlorobenzene	240	9.4	1.0 U	48	8.0	8.7
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.047 U	3.5	0.047 U	1.4	0.047 U	0.047 U
beta-BHC	0.047 U	7.0	0.26	0.54	0.047 U	0.047 U
delta-BHC	0.093	0.56	0.047 U	0.047 U	0.047 U	0.047 U
gamma-BHC (Lindane)	0.047 U	3.9	0.047 U	0.047 U	0.047 U	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	1.35	2.87	0.20 U	0.20 U	0.20 U

Notes:
U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-24B 6/18/2014	Sample OBA-25A 6/19/2014	Sample OBA-25B 6/19/2014	Sample OBA-26A 6/19/2014	Sample OBA-26B 6/19/2014	Sample PN-1A 6/20/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	25 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	32	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	25 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	25 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	25 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	25 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	1600	10	24	2.2 U	3.1	3.0
Methylene chloride (Dichloromethane)	25 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	93	3.6	1.0 U	1.0 U	1.0 U	1.4
trans-1,2-Dichloroethene	31	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	2000	22	1.0 U	1.0 U	2.2	3.1
Vinyl Chloride	510	1.0 U	35	1.0 U	1.8	2.3
Aromatic Compounds						
1,2,4-Trichlorobenzene	520	1.0 U	1.0 U	1.0 U	1.0 U	3.4
1,2-Dichlorobenzene	610	1.0 U	17	1.0 U	5.1	1.0 U
1,3-Dichlorobenzene	100	1.0 U	19	1.0 U	7.1	3.2
1,4-Dichlorobenzene	480	1.0 U	41	1.0 U	13	1.7
Benzene	3500	1.0 U	2.7	1.0 U	1.0 U	1.5
Chlorobenzene	540	1.0 U	67	1.0 U	35	4.6
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	33	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
beta-BHC	5.9	0.047 U	0.047 U	0.047 U	0.047 U	0.097
delta-BHC	24	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
gamma-BHC (Lindane)	59	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	1.66	0.20 U	0.20 U	0.20 U	349

Notes:
U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-3A 6/18/2014	Sample PN-4A 6/23/2014	Sample PN-4B 6/23/2014	Sample PN-5A 6/23/2014	Sample PN-5B 6/23/2014	Sample PN-6A 6/23/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	100 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	8.6	1.0 U	5200 D	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	100 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	100 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	100 U	1.0 U
Chloromethane (Methyl chloride)	1.0 U	1.0 U	1.0 U	1.0 U	100 U	1.0 U
cis-1,2-Dichloroethene	1.0 U	1.0 U	40	1.0 U	980 D	1.0 U
Methylene chloride (Dichloromethane)	1.0 U	1.0 U	1.0 U	1.0 U	100 U	1.0 U
Tetrachloroethene (PCE)	1.3	1.0 U	55	1.0 U	5100 D	2.9
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.4	1.0 U	100 U	1.0 U
Trichloroethene (TCE)	3.0	1.0 U	68	1.0 U	5600 D	3.7
Vinyl Chloride	1.0 U	1.0 U	2.6	1.0 U	100 U	1.0 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	1.1	180	1.0 U	8300 D	1 U
1,2-Dichlorobenzene	1.0 U	1.0 U	3.6	1.0 U	710 D	4.5
1,3-Dichlorobenzene	1.0 U	1.0 U	41	1.6	630 D	120
1,4-Dichlorobenzene	1.0 U	1.0 U	25	1.0 U	430 D	180
Benzene	1.0 U	1.0 U	1.4	1.0 U	1600 D	2.5
Chlorobenzene	1.0 U	1.0 U	6.3	1.0 U	990 D	170
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.47 U	0.047 U	5.4	0.094 U	480	0.047 U
beta-BHC	5.8	0.57	1.5	2.3	47 U	0.19
delta-BHC	0.47 U	0.047 U	1.2	0.094 U	330	0.047 U
gamma-BHC (Lindane)	0.47 U	0.047 U	7.1	0.094 U	1100	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	2.01	0.20 U	0.49	0.20 U	0.20 U	0.20 U

Notes:
U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-6B 6/23/2014	Duplicate PN-6B 6/23/2014	Sample PN-7A 6/20/2014	Sample PN-7B 6/20/2014	Sample PN-11A 6/20/2014	Sample PN-11B 6/20/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	50 U	50 U	1.0 U	20 U	1.0 U	250 U
1,1,2,2-Tetrachloroethane	60	71	1.0 U	20 U	1.0 U	770
1,1,2-Trichloroethane	50 U	50 U	1.0 U	20 U	1.0 U	250 U
1,1-Dichloroethene	50 U	50 U	1.0 U	20 U	1.0 U	250 U
Carbon tetrachloride	50 U	50 U	1.0 U	20 U	1.0 U	250 U
Chloromethane (Methyl chloride)	50 U	50 U	1.0 U	20 U	1.0 U	250 U
cis-1,2-Dichloroethene	1100	1400	1.0 U	1400	3.6	1600
Methylene chloride (Dichloromethane)	50 U	50 U	1.0 U	20 U	1.0 U	250 U
Tetrachloroethene (PCE)	860	1000	18	37	1.0 U	7900
trans-1,2-Dichloroethene	50 U	50 U	1.0 U	21	1.0 U	250 U
Trichloroethene (TCE)	450	550	18	46	1.9	29000
Vinyl Chloride	280	360	1.0 U	390	3.3	470
Aromatic Compounds						
1,2,4-Trichlorobenzene	5800	7000	1.0 U	2300	4.0	6500
1,2-Dichlorobenzene	440	540	1.0 U	420	1.5	1700
1,3-Dichlorobenzene	550	620	1.0 U	450	3.7	410
1,4-Dichlorobenzene	560	620	1.0 U	290	7.5	1600
Benzene	550	700	1.0 U	3000	5.0	270
Chlorobenzene	570	680	1.0 U	740	1.9	270
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	240	190	2.4 U	130	0.27	370
beta-BHC	24 U	24 U	34	23	0.13	31
delta-BHC	50	39	2.4 U	9.4 U	0.095	24 U
gamma-BHC (Lindane)	350	290	2.4 U	160	0.68	360
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:
U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-12A 6/19/2014	Sample PN-12B 6/19/2014	Sample PN-14A 6/19/2014	Sample PN-14B 6/19/2014	Sample PN-15A 6/19/2014	Sample PN-15B 6/19/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	500 U	10 U	50 U	2.5 U	100 U
1,1,2,2-Tetrachloroethane	1.0 U	500 U	10 U	50 U	2.5 U	100 U
1,1,2-Trichloroethane	1.0 U	500 U	10 U	50 U	2.5 U	100 U
1,1-Dichloroethene	1.0 U	500 U	10 U	50 U	2.5 U	100 U
Carbon tetrachloride	1.0 U	500 U	10 U	50 U	2.5 U	100 U
Chloromethane (Methyl chloride)	1.0 U	500 U	10 U	50 U	2.5 U	100 U
cis-1,2-Dichloroethene	1.6	4600 D	10 U	50 U	2.5 U	110
Methylene chloride (Dichloromethane)	1.0 U	500 U	10 U	50 U	2.5 U	100 U
Tetrachloroethene (PCE)	3.0	26000 D	12	50 U	2.5 U	210
trans-1,2-Dichloroethene	1.0 U	500 U	10 U	50 U	2.5 U	100 U
Trichloroethene (TCE)	3.3	62000 D	11	50 U	2.5 U	620
Vinyl Chloride	1.0 U	500 U	10 U	50 U	2.5 U	100 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	6.8	16000	170	7200	7.9	16000
1,2-Dichlorobenzene	1.0 U	970 D	10 U	430	9.5	360
1,3-Dichlorobenzene	12	1700 D	10 U	1400	300	2000
1,4-Dichlorobenzene	9.6	690 D	10 U	2900	300	320
Benzene	7.4	500 U	10 U	50 U	7.4	100 U
Chlorobenzene	33	500 U	10 U	490	430	100 U
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.094 U	320	0.38	120	0.42	160
beta-BHC	1.4	60	5.6	11	0.12	32
delta-BHC	0.094 U	9.4 U	0.24 U	4.7 U	0.047 U	4.7 U
gamma-BHC (Lindane)	0.094 U	100	0.24 U	4.7 U	0.047 U	4.7 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	0.78	2.59	0.89	0.20 U	1.86

Notes:
U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

Table 5.1: June 2014 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-17A 6/18/2014	Sample PN-17B 6/18/2014	Duplicate PN-17BD 6/18/2014	Sample PN-18A 6/20/2014	Sample PN-20A 6/19/2014	Sample PN-20B 6/19/2014
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
1,1,2,2-Tetrachloroethane	1.0 U	100 U	100 U	1.0 U	1.0 U	750
1,1,2-Trichloroethane	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
1,1-Dichloroethene	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
Carbon tetrachloride	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
Chloromethane (Methyl chloride)	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
cis-1,2-Dichloroethene	1.0 U	100 U	100 U	1.0 U	1.0 U	390
Methylene chloride (Dichloromethane)	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
Tetrachloroethene (PCE)	1.0 U	100 U	100 U	5.6	6.8	13000
trans-1,2-Dichloroethene	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
Trichloroethene (TCE)	1.0 U	100 U	100 U	12	11	4900
Vinyl Chloride	1.0 U	100 U	100 U	1.0 U	1.0 U	100 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	11000	12000	1.0 U	1.0 U	210
1,2-Dichlorobenzene	2.6	1100	1200	1.0 U	1.0 U	200
1,3-Dichlorobenzene	140	1600	1700	1.0 U	1.0 U	110
1,4-Dichlorobenzene	28	1700	1900	1.0 U	1.0 U	160
Benzene	5.9	100 U	100 U	1.0 U	1.0 U	100 U
Chlorobenzene	7.8	580	630	1.0 U	1.0 U	100 U
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.047 U	12	12	2.4 U	0.047 U	0.63
beta-BHC	0.074	14	14	31	0.22	0.2
delta-BHC	0.047 U	0.47 U	0.47 U	2.4 U	0.047 U	0.13
gamma-BHC (Lindane)	0.047 U	0.47 U	0.47 U	2.4 U	0.047 U	0.27
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	125	1.03	0.83	275	0.20 U	0.20 U

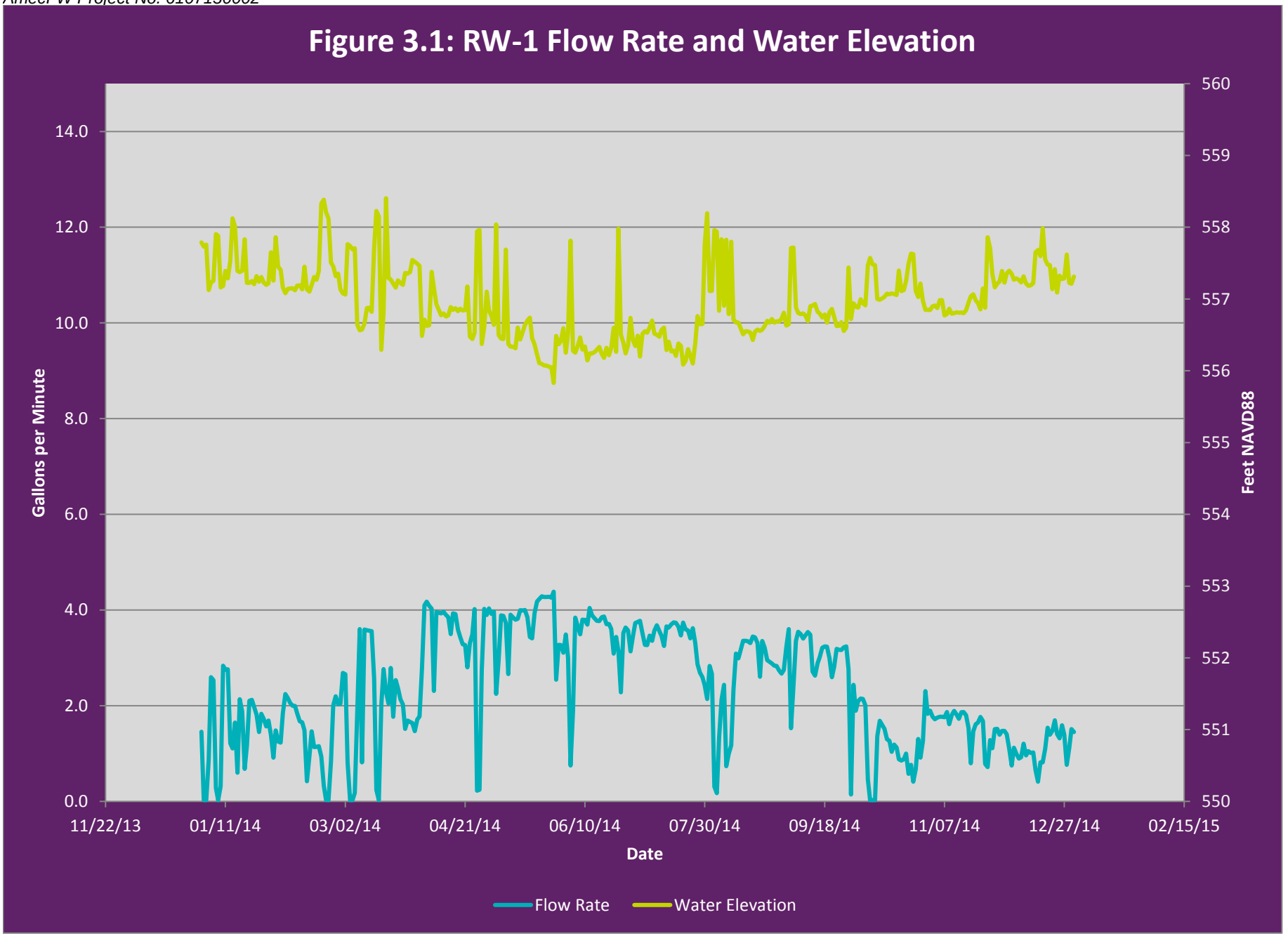
Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: J. Decotis 08/19/2014
Checked by: A. Nelson 08/22/2014

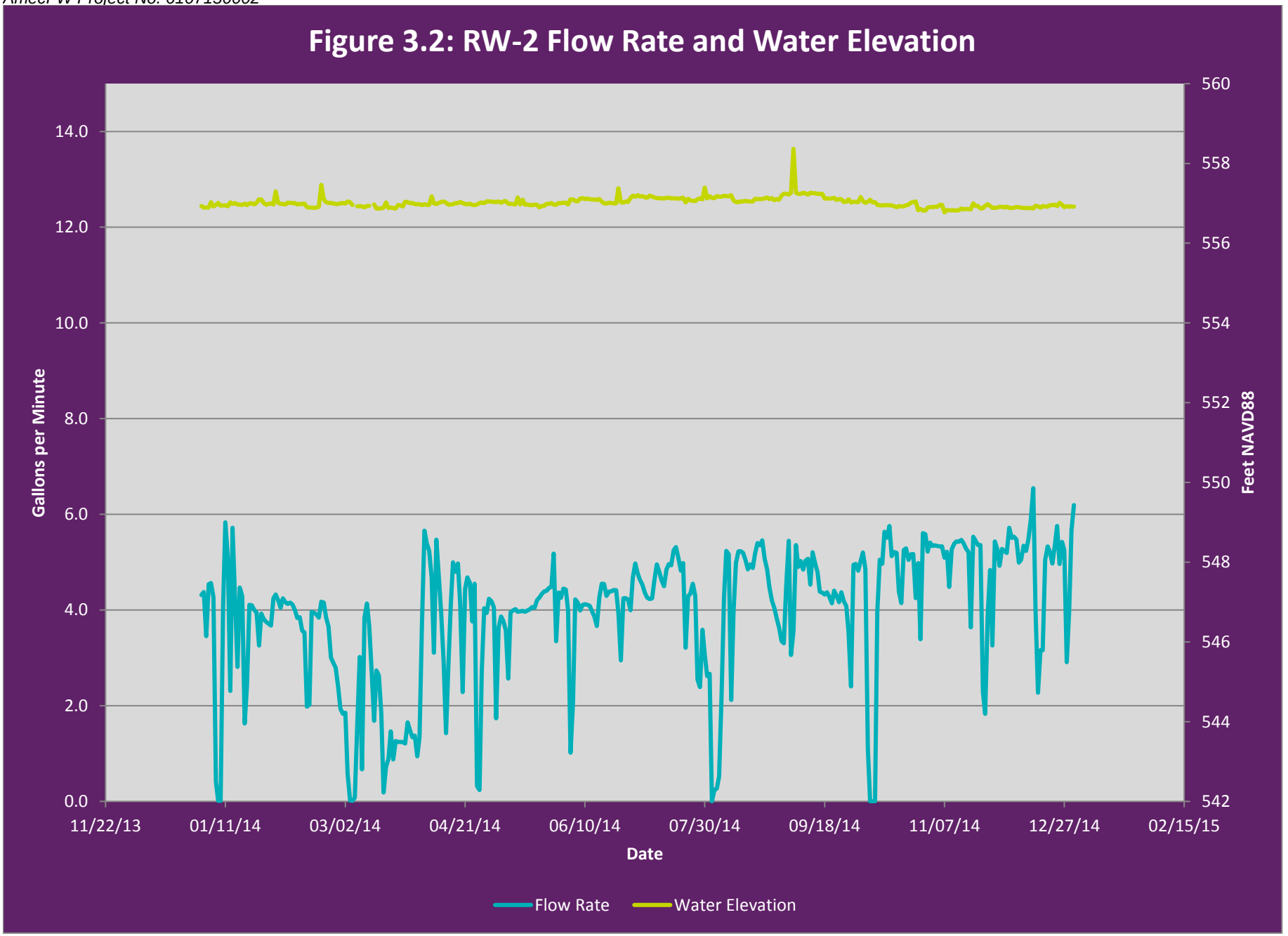
FIGURES

Figure 3.1: RW-1 Flow Rate and Water Elevation



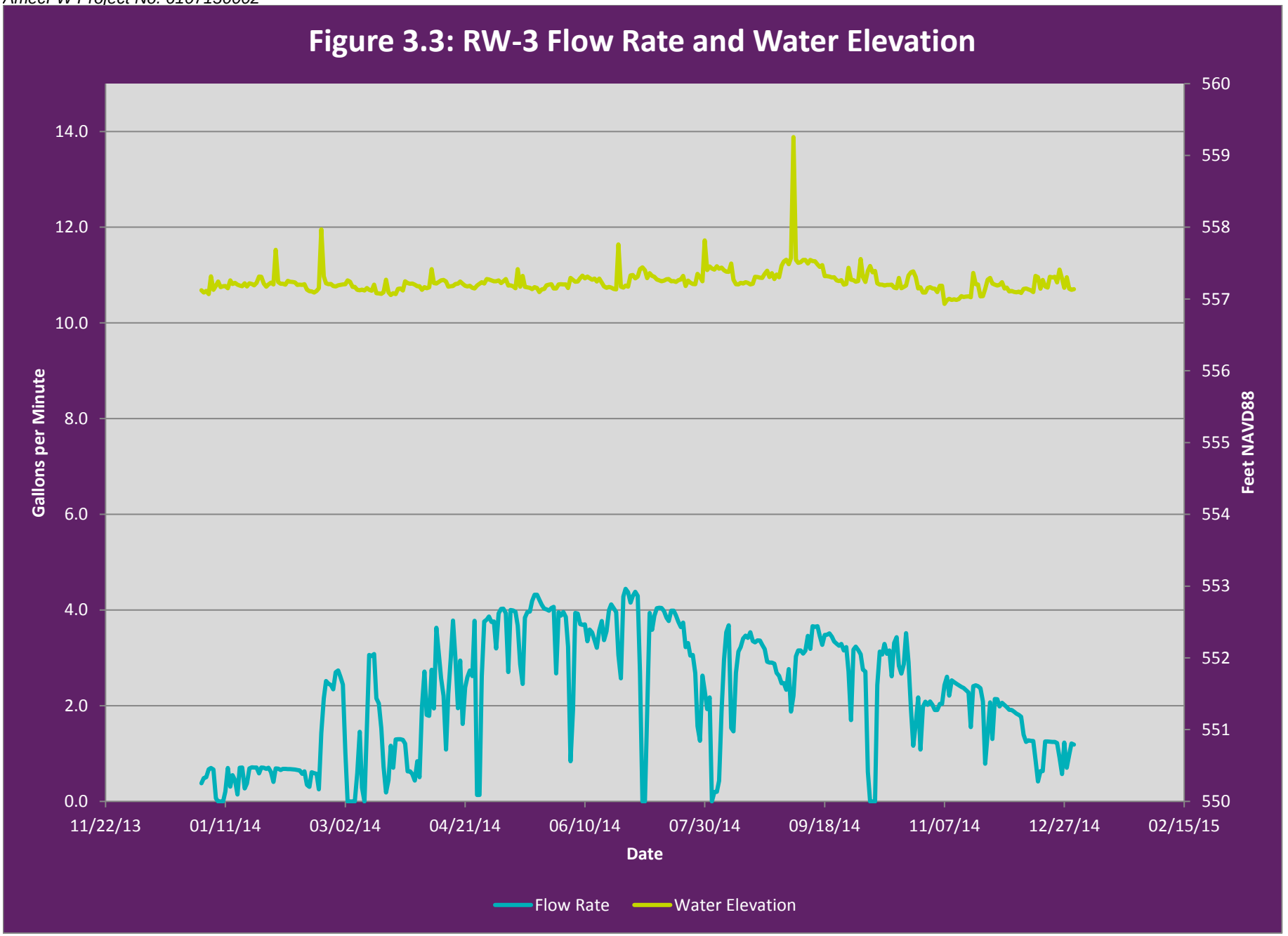
Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015

Figure 3.2: RW-2 Flow Rate and Water Elevation



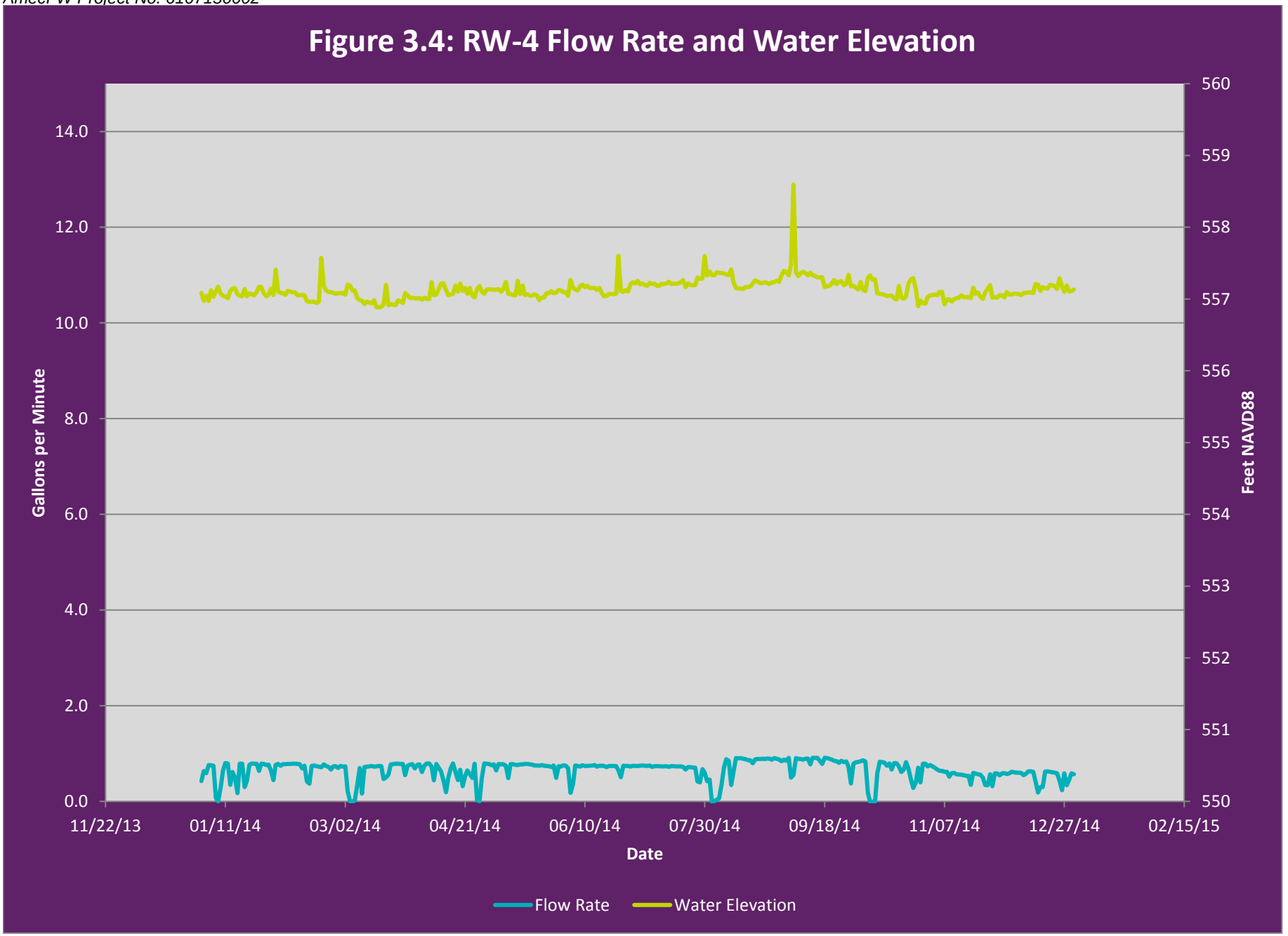
Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015

Figure 3.3: RW-3 Flow Rate and Water Elevation



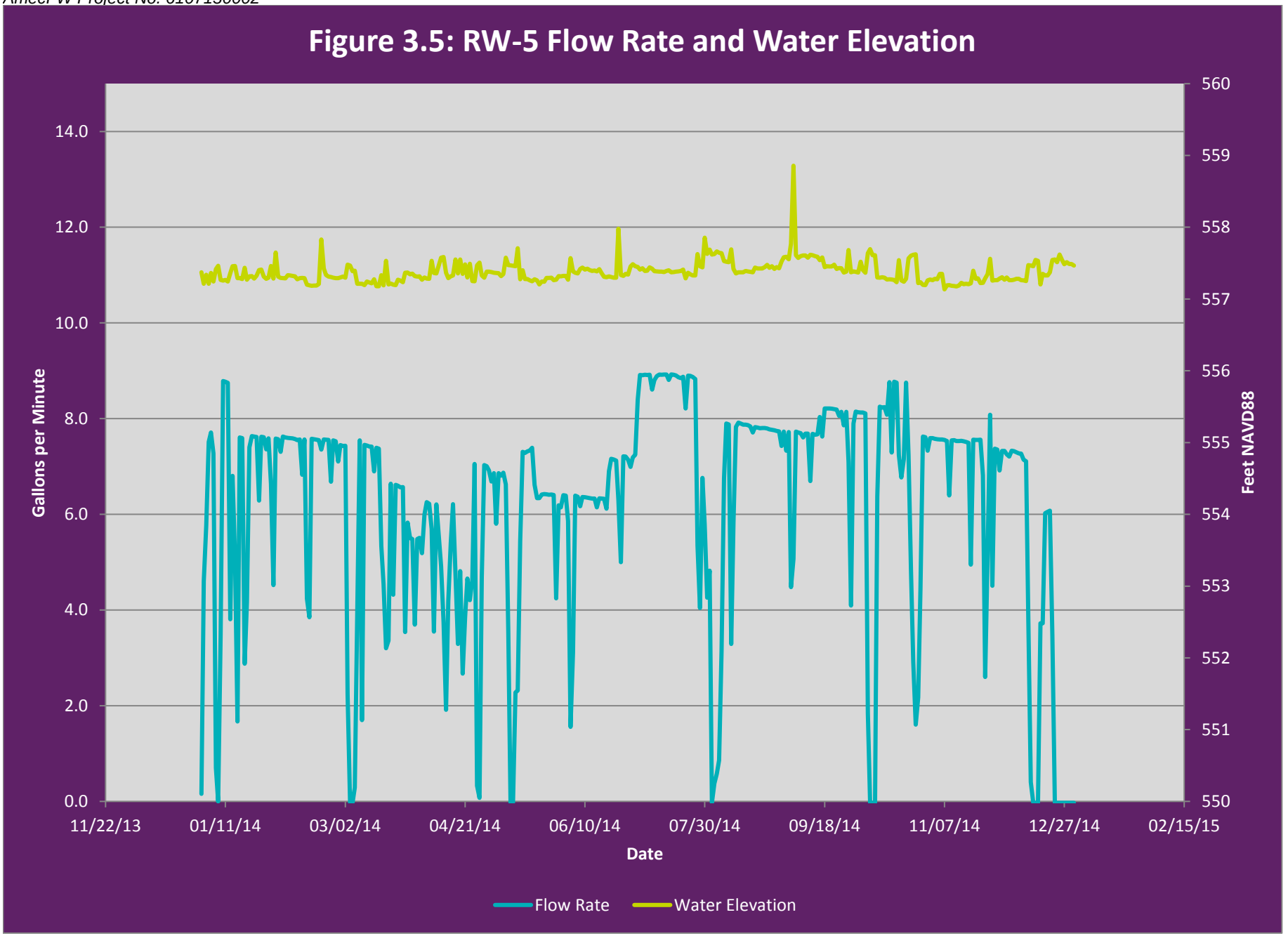
Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015

Figure 3.4: RW-4 Flow Rate and Water Elevation

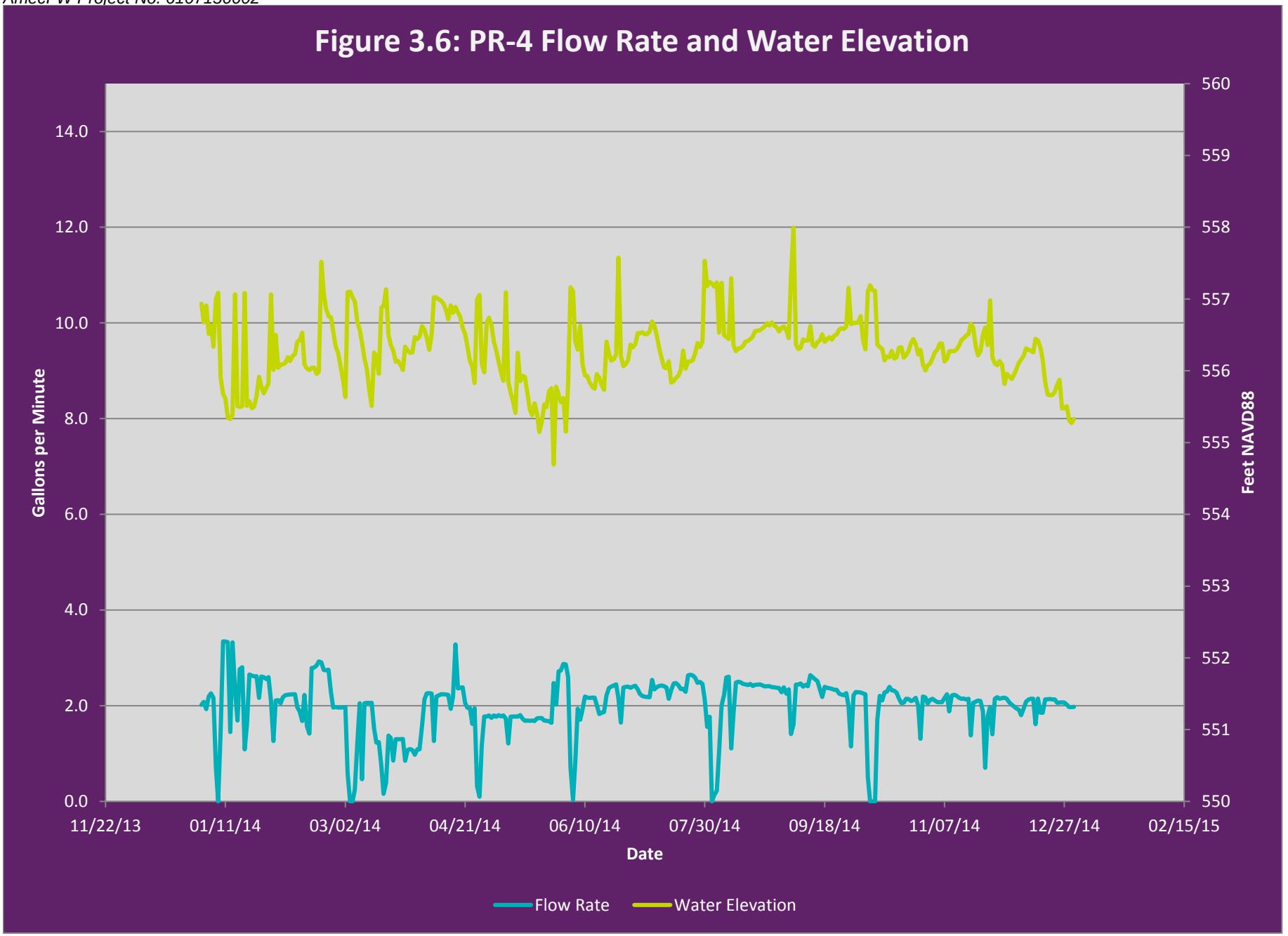


Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015

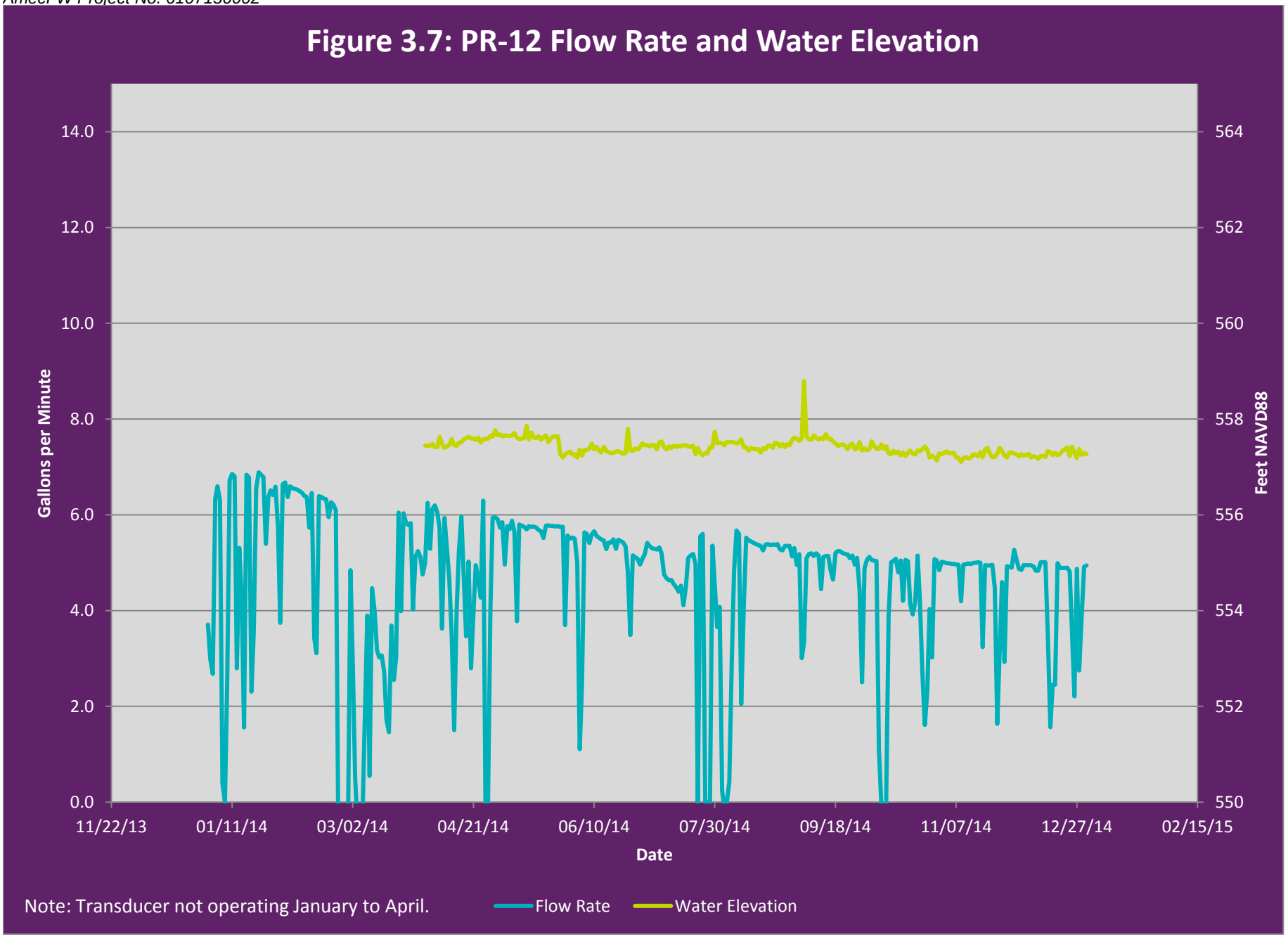
Figure 3.5: RW-5 Flow Rate and Water Elevation



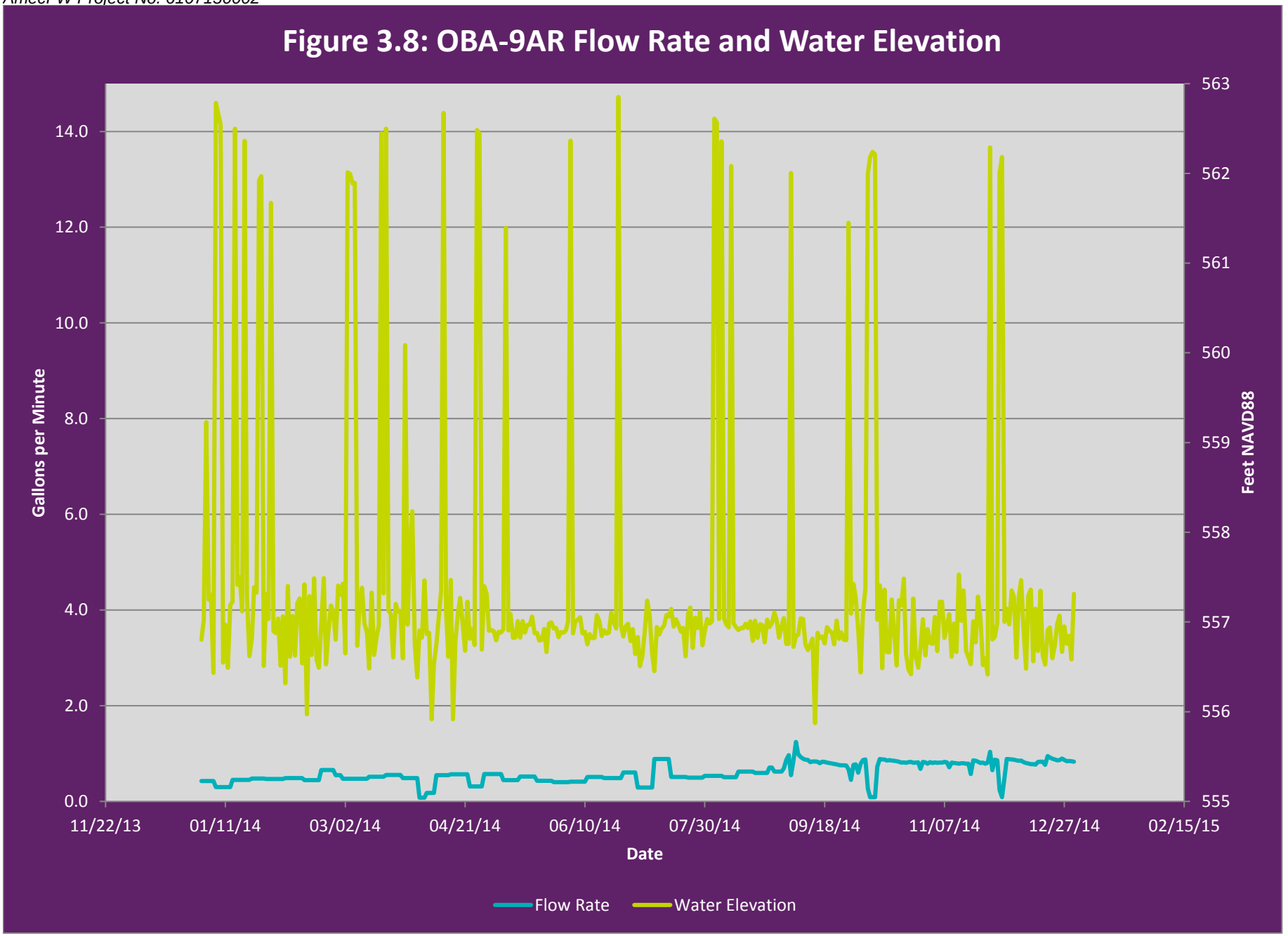
Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015



Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015

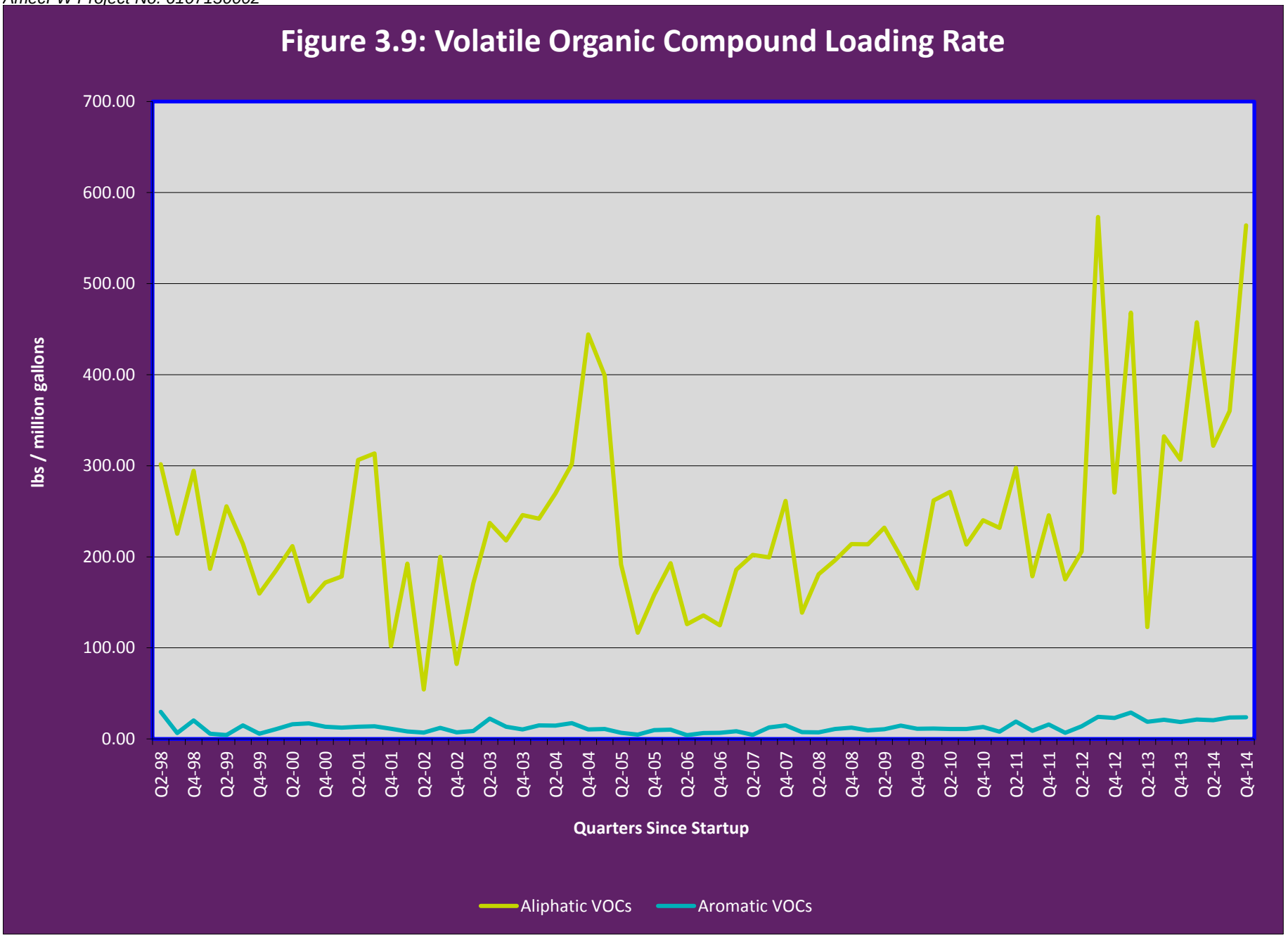


Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015

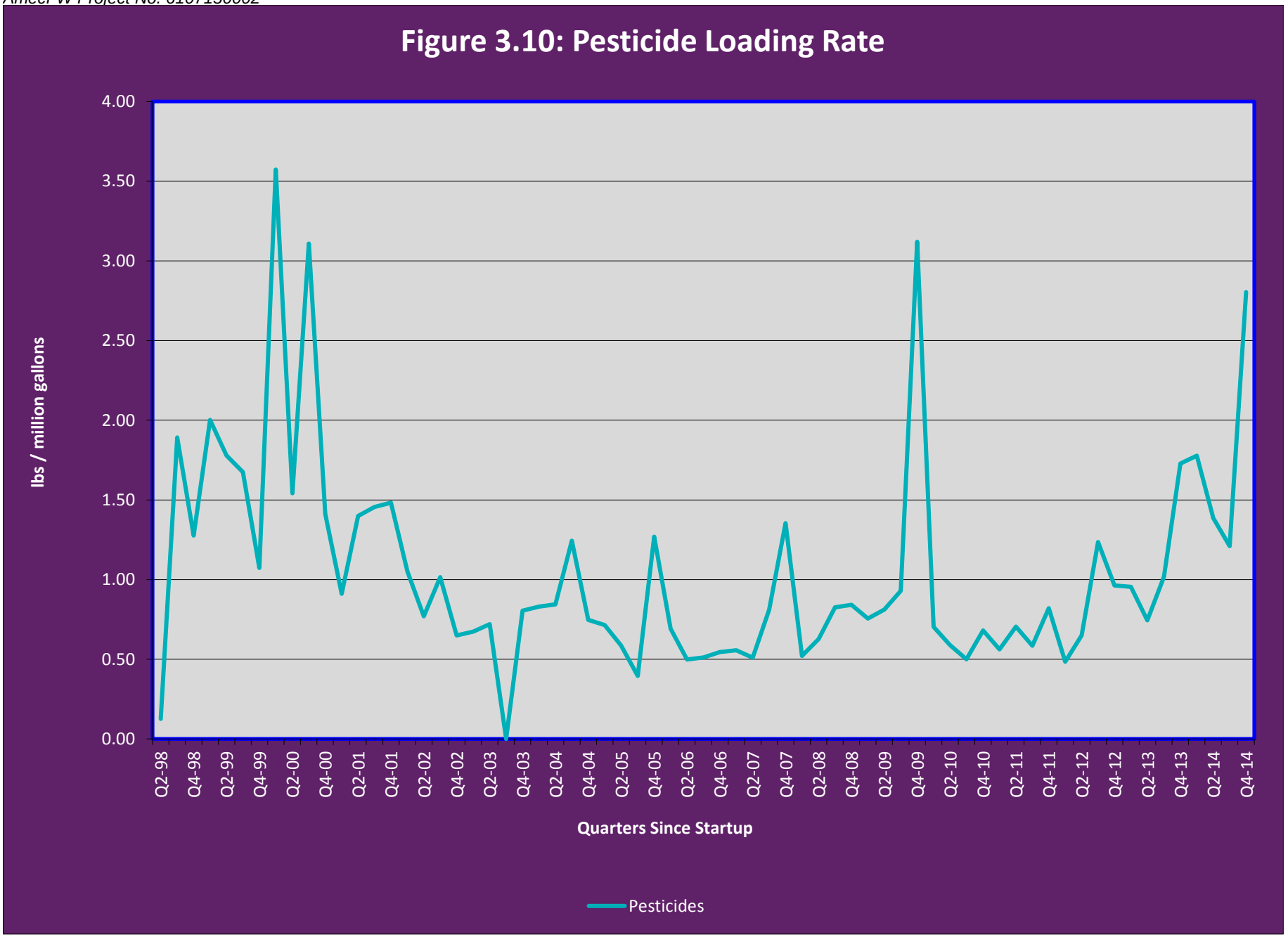


Prepared by: R. Yardley 01/15/2015
Checked by: T. Englund 02/26/2015

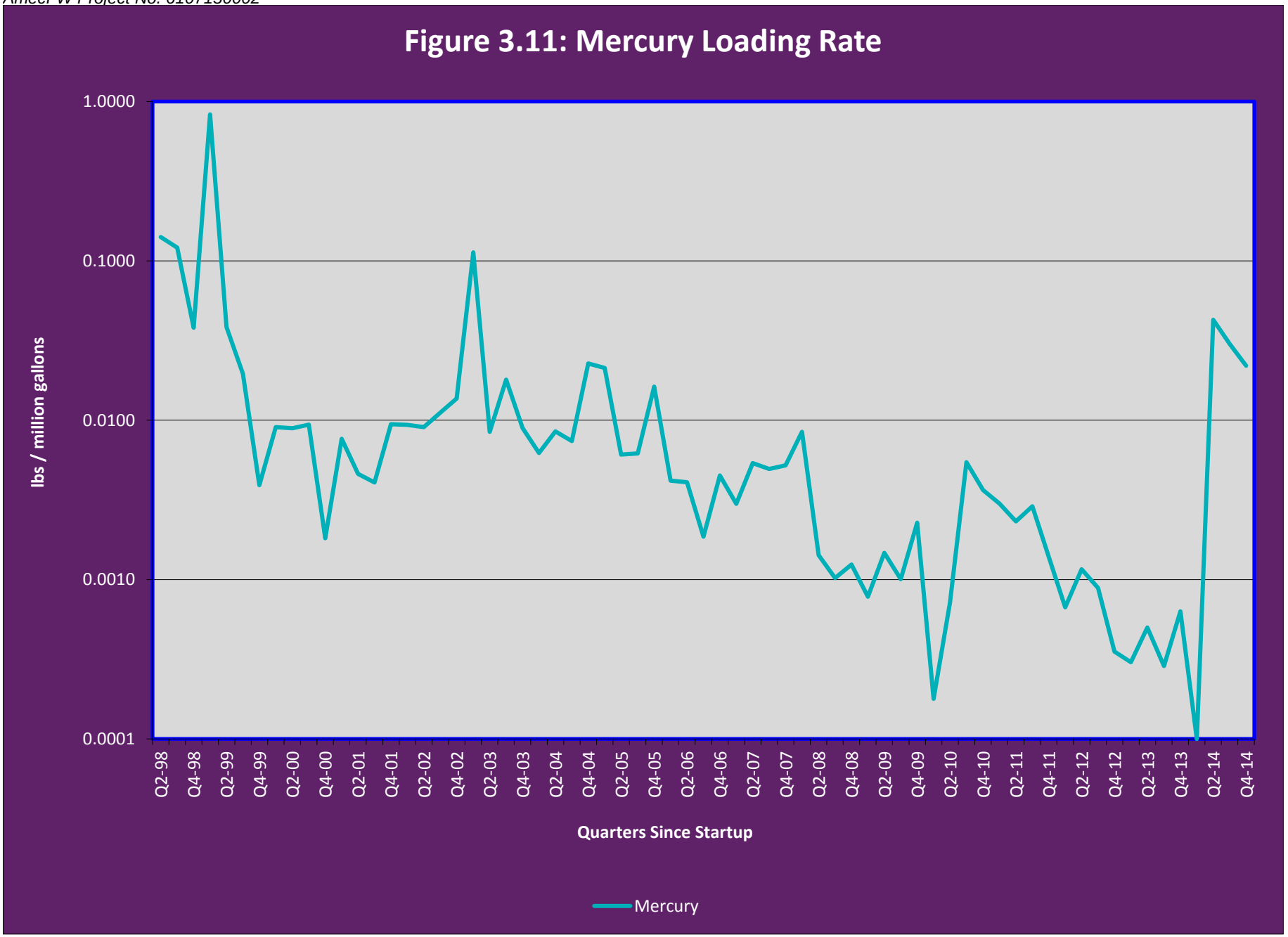
Figure 3.9: Volatile Organic Compound Loading Rate



Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/26/2015

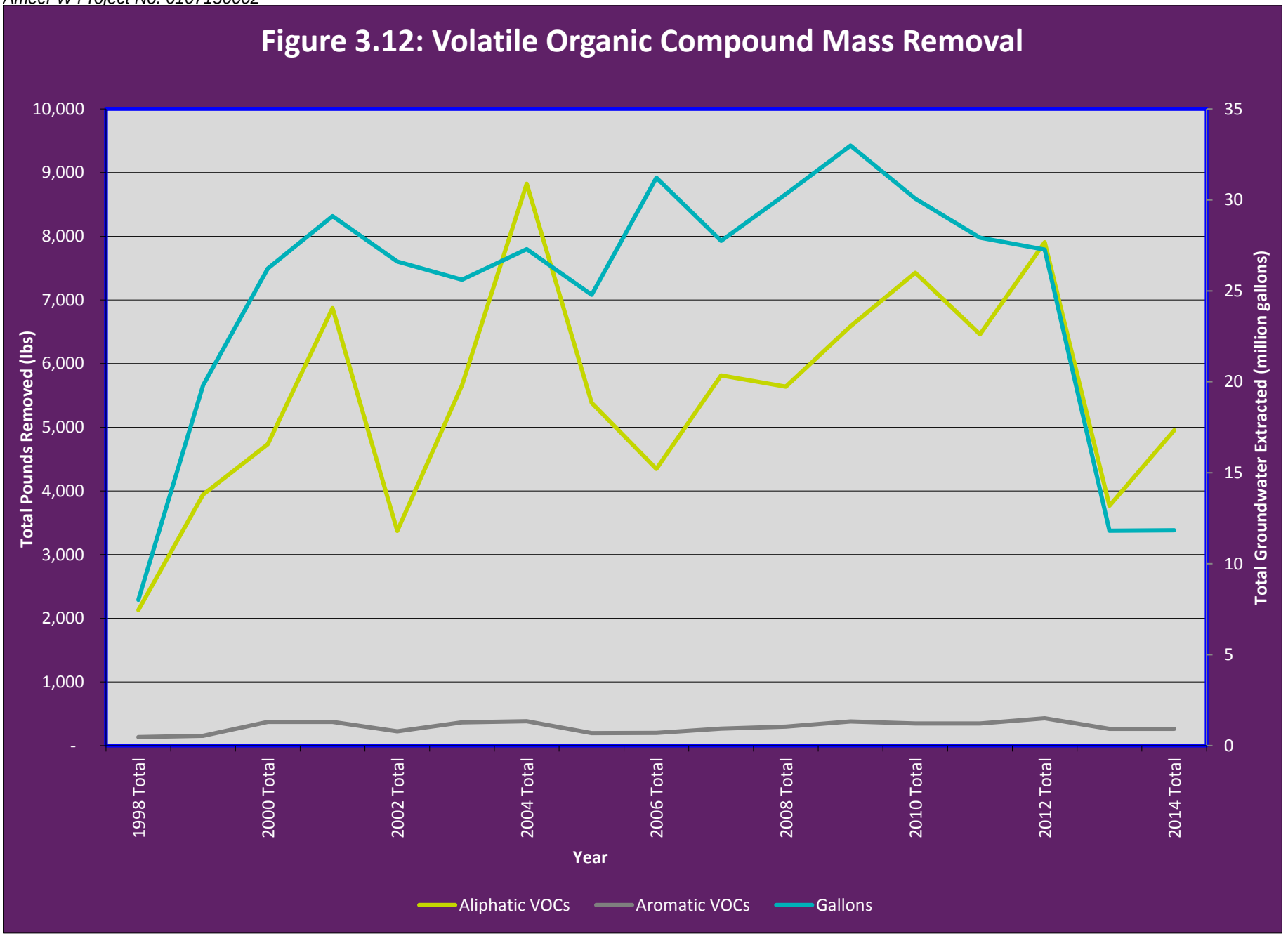


Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/26/2015

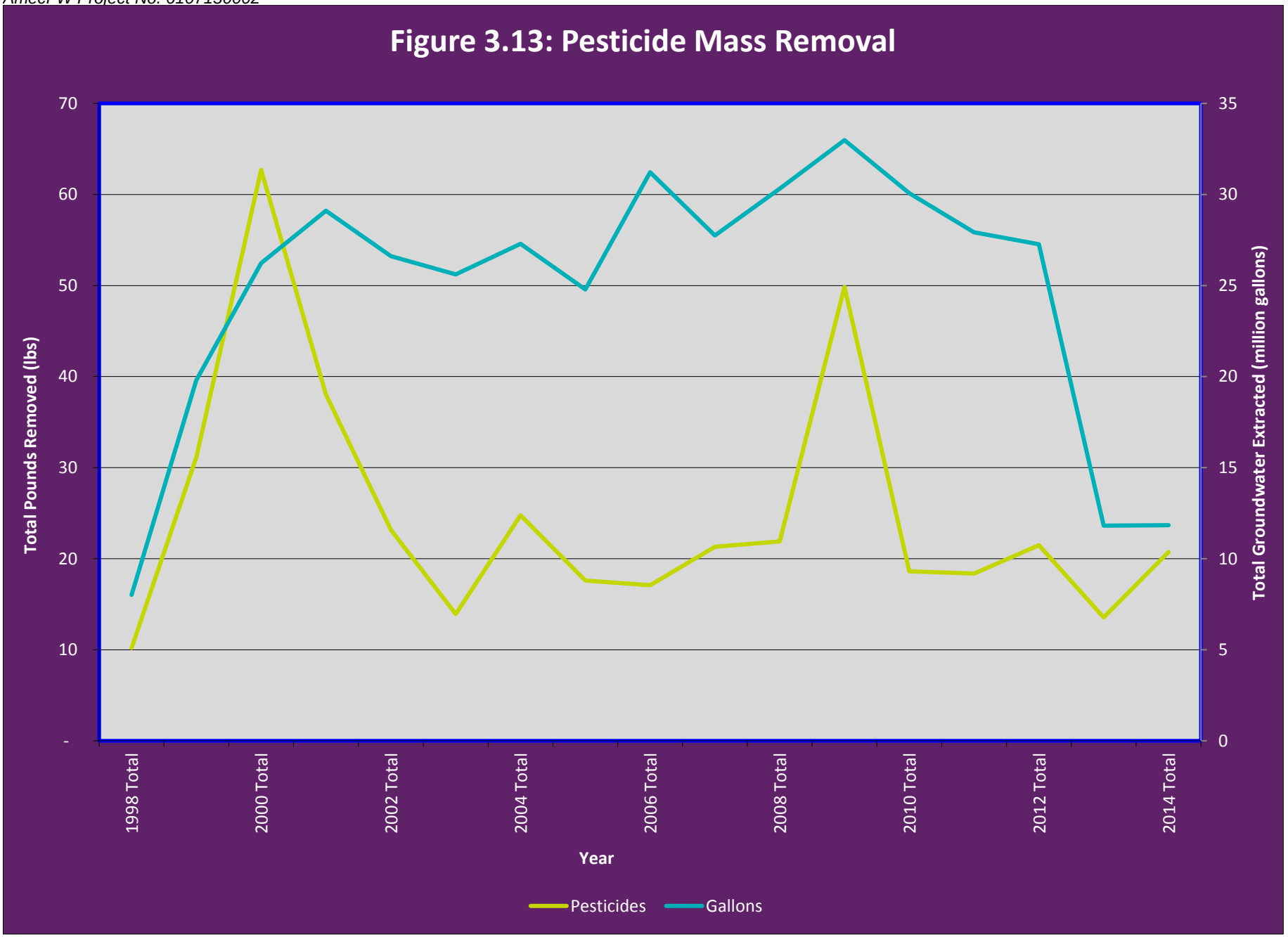


Prepared by: T. Englund 02/26/2015
Checked by: R. Yardley 02/26/2015

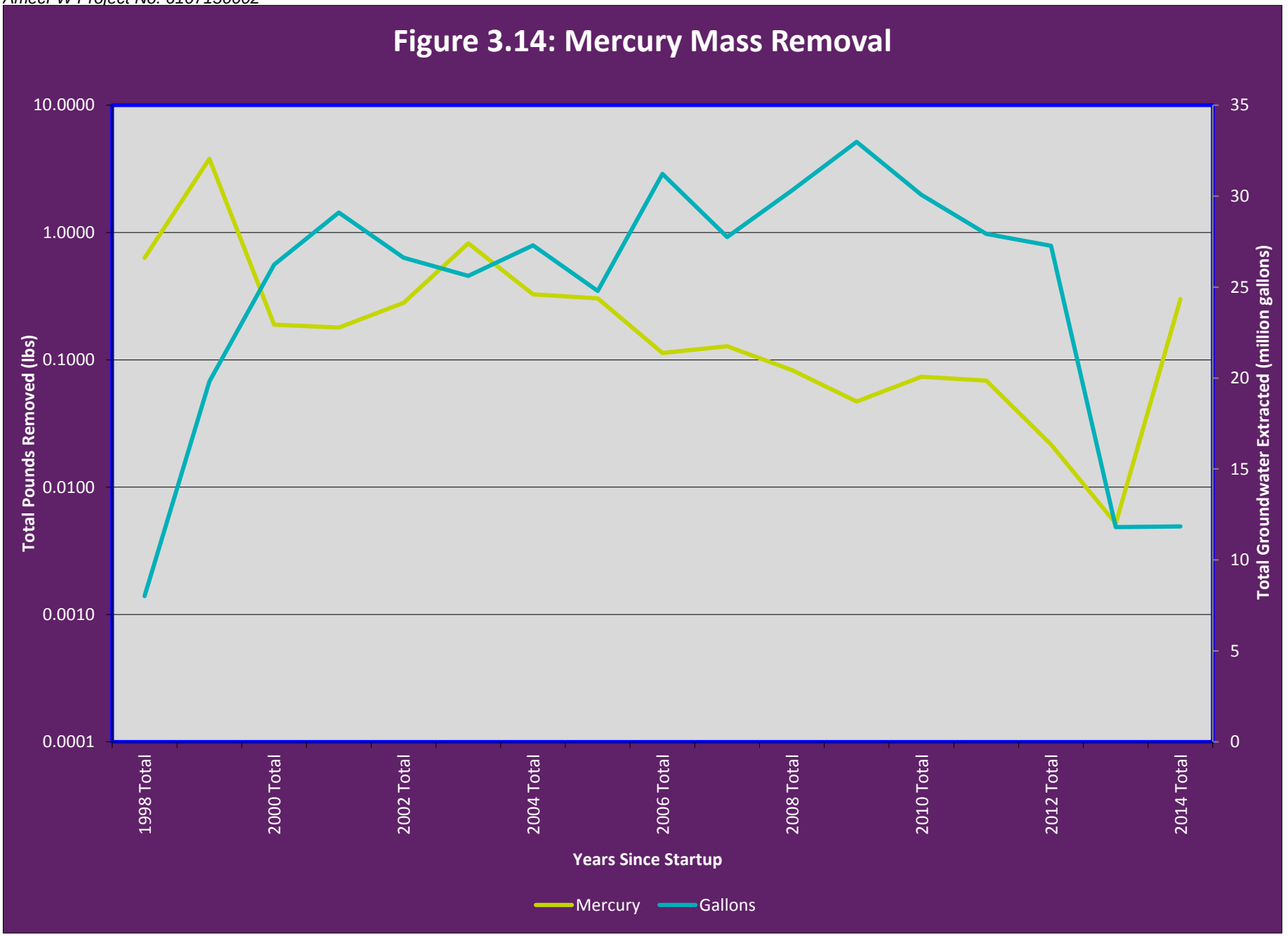
Figure 3.12: Volatile Organic Compound Mass Removal



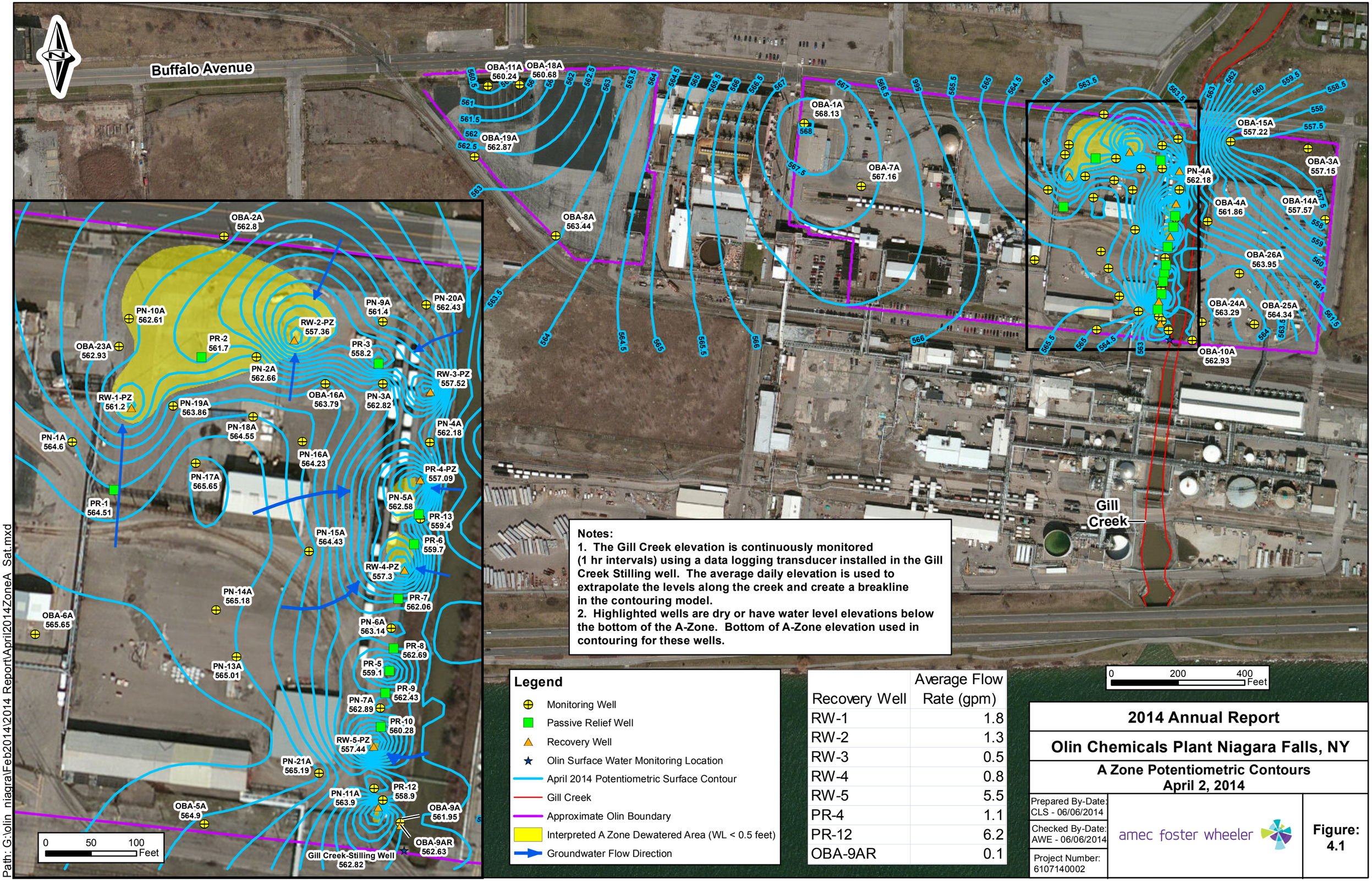
Prepared by: R. Yardley 03/11/2015
Checked by: T. Englund 03/12/2015



Prepared by: R. Yardley 03/11/2015
Checked by: T. Englund 03/12/2015



Prepared by: R. Yardley 03/11/2015
Checked by: T. Englund 03/12/2015



Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

Legend

- Monitoring Well
- Passive Relief Well
- Recovery Well
- Olin Surface Water Monitoring Location
- April 2014 Potentiometric Surface Contour
- Gill Creek
- Approximate Olin Boundary
- Interpreted A Zone Dewatered Area (WL < 0.5 feet)
- Groundwater Flow Direction

Recovery Well	Average Flow Rate (gpm)
RW-1	1.8
RW-2	1.3
RW-3	0.5
RW-4	0.8
RW-5	5.5
PR-4	1.1
PR-12	6.2
OBA-9AR	0.1

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

A Zone Potentiometric Contours April 2, 2014

Prepared By-Date: CLS - 06/06/2014

Checked By-Date: AWE - 06/06/2014

Project Number: 6107140002

amec foster wheeler

Figure: 4.1

Path: G:\olin_niagra\Feb2014\2014 Report\April2014ZoneA_Sat.mxd

Buffalo Avenue

OBA-11A 560.27
OBA-18A 560.67
OBA-19A 561.36
OBA-8A 562.341972
OBA-1A 566.44002
OBA-7A 566.56
OBA-15A 557.59
OBA-3A 557.52
OBA-4A 560
OBA-14A 557.77
OBA-26A 563.72
OBA-24A 562.9
OBA-25A 564.15
Gill Creek - Stilling Well 562.83

OBA-2A 561.60
PN-10A 561.80
OBA-23A 562.23
PR-2 561.70
PN-2A 562.11
RW-2-PZ 557.60
PR-3 558.20
PN-9A 561.24
PN-20A 562.57
OBA-16A 562.61
PN-3A 562.21
RW-3-PZ 557.65
RW-1-PZ 561.20
PN-19A 563.88
PN-18A 563.05
PN-1A 560.80
PN-16A 562.89
PN-4A 561.81
PN-17A 565.21
PR-1 563.43
PR-4-PZ 556.80
PR-13 559.40
PN-5A 562.52
PN-15A 564.15
PR-6 559.70
RW-4-PZ 557.48
PR-7 561.51
PN-14A 565.31
OBA-6A 565.64
PN-6A 562.82
PN-13A 565.04
PR-8 562.46
PR-5 559.10
PR-9 562.15
PN-7A 562.87
PN-12A 565.61
PR-10 560.44
RW-5-PZ 557.62
PN-21A 565.06
PN-11 563.92
PN-8A 564.25
PN-11A 563.85
OBA-9A 561.99
OBA-5A 564.80
PN-12 558.90
OBA-9AR 557.90
OBA-10A 562.81
Gill Creek - Stilling Well 562.83

Gill Creek

0 50 100 Feet

0 200 400 Feet

Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

Legend
- Monitoring Well
- Passive Relief Well
- Recovery Well
- Olin Surface Water Monitoring Location
- Interpreted A Zone Dewatered Area (WL < 0.5 feet))
- June 2014 Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	3.8
RW-2	4.6
RW-3	3.8
RW-4	0.7
RW-5	6.3
PR-4	1.9
PR-12	5.4
OBA-9AR	0.5

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

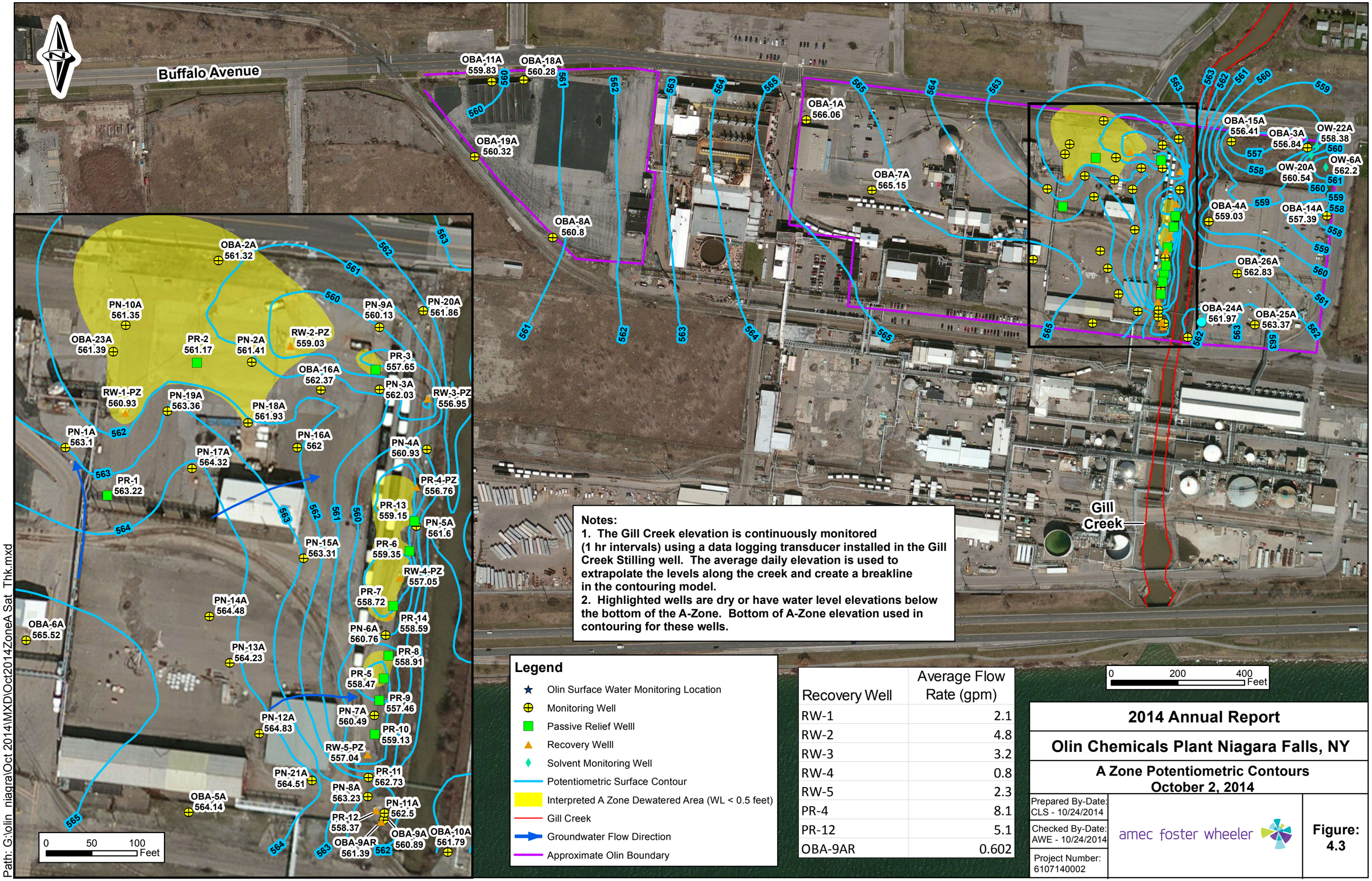
A Zone Potentiometric Contours June 17, 2014

Prepared By-Date: JRM - 08/18/2014
Checked By-Date: AWE - 08/18/2014
Project Number: 6107140002

amec foster wheeler

Figure: 4.2

Path: G:\olin_niagra\Aug 2014\MXD\June2014ZoneA_JM.mxd



Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

Legend

- Olin Surface Water Monitoring Location
- Monitoring Well
- Passive Relief Welll
- Recovery Welll
- Solvent Monitoring Well
- Potentiometric Surface Contour
- Interpreted A Zone Dewatered Area (WL < 0.5 feet)
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	2.1
RW-2	4.8
RW-3	3.2
RW-4	0.8
RW-5	2.3
PR-4	8.1
PR-12	5.1
OBA-9AR	0.602

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

A Zone Potentiometric Contours October 2, 2014

Prepared By-Date: CLS - 10/24/2014

Checked By-Date: AWE - 10/24/2014

Project Number: 6107140002

amec foster wheeler

Figure: 4.3

Path: G:\olin niagra\Oct 2014\MXD\Oct2014ZoneA Sat Thk.mxd

Buffalo Avenue

OBA-11A 559.85
OBA-18A 560.38
OBA-19A 562.72
OBA-8A 562.75
OBA-1A 568.24
OBA-7A 566.47
OBA-15A 557.07
OBA-3A 557.02
OBA-14A 557.26
OBA-4A 561.38
OBA-26A 563.23
OBA-25A 563.75

OBA-2A 562.8
PN-10A 561.92
PN-20A 561.49
PN-9A 561.84
OBA-23A 562.81
PR-2 561.17
PN-2A 562.84
RW-2-PZ 559.03
PR-3 557.65
OBA-16A 563.83
RW-3-PZ 556.95
PN-19A 563.76
PN-1A 564.4
RW-1-PZ 560.93
PN-18A 564.4
PN-16A 564.2
PN-4A 562.47
PN-17A 565.68
PR-1 564.57
PR-4-PZ 556.58
PR-13 559.15
PN-5A 562.24
PR-6 559.35
PN-15A 563.65
RW-4-PZ 557.1
PN-14A 565.05
PR-14 558.59
PR-7 560.28
OBA-6A 565.25
PN-6A 561.18
PN-13A 564.75
PR-8 558.91
PR-5 558.47
PR-9 560.34
PN-7A 561.57
PN-12A 565.3
PR-10 559.46
RW-5-PZ 557.02
PN-21A 564.81
PR-11 563.61
PN-8A 564.29
PN-11A 563.08
OBA-5A 564.41
PR-12 558.37
OBA-9A 561.99
OBA-9AR 557.28
OBA-10A 562.39

Gill Creek

Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

0 50 100 Feet

0 200 400 Feet

Legend
- Monitoring Well
- Passive Relief Well
- Recovery Well
- Interpreted A Zone Dewatered Area (WL < 0.5 feet)
- December 2014 A Zone potmap_all_Rev1_corrected
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	0.8
RW-2	3.2
RW-3	0.6
RW-4	0.3
RW-5	3.7
PR-4	1.9
PR-12	2.5
OBA-9AR	0.831

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

A Zone Potentiometric Contours December 18, 2014

Prepared By-Date: JRM - 2/23/2015
Checked By-Date: AWE - 2/23/2015
Project Number: 6107150002

amec foster wheeler

Figure: 4.4

Path: G:\olin_niagra\December 2014\mxds\A_Zone_Dewatered_v2.mxd

Buffalo Avenue

Buffalo Avenue

OBA-11B 557.51
OBA-1B 561.51
OBA-12B 558.5
OBA-13B 557.28
OBA-8B 559.06
PW-3B 555.2
PW-4B 556.71
OBA-4B 558.67
OBA-14B 557.26
OBA-24B 557.85
OBA-25B 557.79
OBA-2B 557.31
PN-20B 557.33
PN-10B 558.25
PN-9B 558.08
RW-2-PZ 557.36
OBA-23B 558.38
PN-3B 557.35
PN-2B 557.48
PN-19B 559
RW-3-PZ 557.52
RW-1-PZ 558.01
OBA-16B 557.8
PN-18B 559.02
PN-4B 557.16
PN-1B 558.51
PR-4-PZ 557.09
PN-17B 558.56
PN-5B 557.41
PN-15B 557.83
RW-4-PZ 557.24
PN-6B 557.37
PN-13B 558.03
OBA-26B 557.91
PN-12B 557.96
PN-7B 557.81
RW-5-PZ 557.44
PN-8B 557.36
PN-21B 559.61
OBA-5B 559.76
PN-11B 557.74

Gill Creek

0 50 100 Feet

0 200 400 Feet

Notes:
1. OBA-12B and OBA-13B were abandoned in December 2012 due to their locations on non-Olin properties. Average ground water elevations for OBA-12B and OBA-13B from February 2011 through November 2012 were used for contouring to estimate water elevations north of Buffalo Avenue
2: The June 2014 water elevations for the Solvent Pumping Wells, PW-3 and PW-4, were not available to Olin when the potentiometric surface was contoured. 2013 average ground water elevations were used for contouring to estimate the potential effects of Solvent pumping. The average elevations were calculated using the quarterly elevations from March 2013 through December 2013 as reported in Solvents quarterly Operation, Maintenance, and Monitoring Reports.

Legend

- Olin Monitoring Well
- Olin Monitoring Well - Abandoned
- Olin Passive Relief Well
- Olin Recovery Well
- Solvent Recovery Well
- April 2014 Potentiometric Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	1.8
RW-2	1.3
RW-3	0.5
RW-4	0.8
RW-5	5.5
PR-4	1.1
PR-12	6.2
OBA-9AR	0.1

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

B Zone Potentiometric Contours
April 2, 2014

Prepared By-Date: CLS - 06/05/2014
Checked By-Date: AWE - 06/05/2014
Project Number: 6107140002

amec foster wheeler

Figure: 4.5

Path: G:\olin_niagra\Feb2014\2014 Report\Apr14_ZoneB_Pot.mxd

Buffalo Avenue

OBA-11B 557.16
OBA-1B 561.02
OBA-12B 558.50
OBA-13B 557.28
OBA-2B 557.53
OBA-8B 558.72
OBA-4B 558.67
OBA-14B 557.58
PW-3B 555.20
PW-4B 556.71
OBA-24B 557.87
OBA-25B 557.93
PN-20B 557.56
PN-9B 558.30
PN-10B 557.60
RW-2-PZ 557.60
OBA-23B 558.05
PN-3B 557.57
PN-2B 558.68
OBA-16B 557.73
RW-3-PZ 557.65
PN-19B 557.90
RW-1-PZ 556.81
PN-18B 558.00
PN-1B 557.75
PN-4B 557.37
PN-17B 557.84
PR-4-PZ 556.80
PN-5B 557.68
PN-15B 557.83
RW-4-PZ 557.48
PN-6B 557.67
OBA-26B 557.86
PN-13B 557.92
PN-7B 557.86
PN-12B 557.91
RW-5-PZ 557.62
PN-21B 559.37
PN-8B 557.56
PN-11B 557.79
OBA-5B 560.01

Gill Creek

0 50 100 Feet

0 200 400 Feet

Notes:
1. OBA-12B and OBA-13B were abandoned in December 2012 due to their locations on non-Olin properties. Average ground water elevations for OBA-12B and OBA-13B from February 2011 through November 2012 were used for contouring to estimate water elevations north of Buffalo Avenue
2: The April 2014 water elevations for the Solvent Pumping Wells, PW-3 and PW-4, were not available to Olin when the potentiometric surface was contoured. 2013 average ground water elevations were used for contouring to estimate the potential effects of Solvent pumping. The average elevations were calculated using the quarterly elevations from March 2013 through December 2013 as reported in Solvents quarterly Operation, Maintenance, and Monitoring Reports.

Legend

- Olin Monitoring Well
- Olin Monitoring Well - Abandoned
- Olin Passive Relief Well
- Olin Recovery Well
- Solvent Recovery Well
- June 2014 Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	3.8
RW-2	4.6
RW-3	3.8
RW-4	0.7
RW-5	6.3
PR-4	1.9
PR-12	5.4

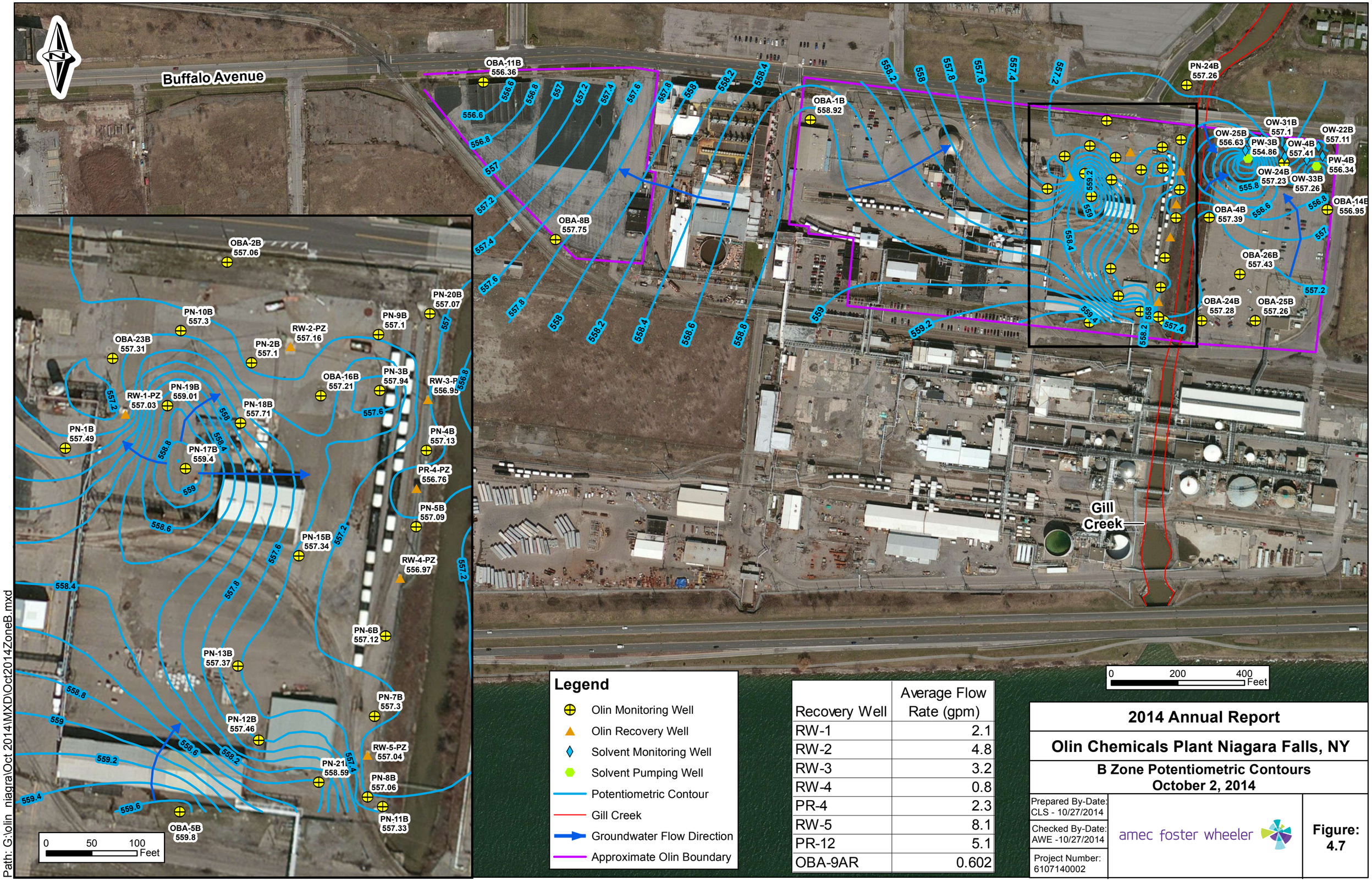
2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

B Zone Potentiometric Contours June 17, 2014

Prepared By-Date: JRM - 08/18/2014	amec foster wheeler
Checked By-Date: AWE - 08/18/2014	Figure: 4.6
Project Number: 6107140002	

Path: G:\olin_niagra\Aug 2014\MXD\June2014ZoneB_JM.mxd



Legend

- Olin Monitoring Well
- Olin Recovery Well
- Solvent Monitoring Well
- Solvent Pumping Well
- Potentiometric Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	2.1
RW-2	4.8
RW-3	3.2
RW-4	0.8
PR-4	2.3
RW-5	8.1
PR-12	5.1
OBA-9AR	0.602

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

B Zone Potentiometric Contours October 2, 2014

Prepared By-Date: CLS - 10/27/2014

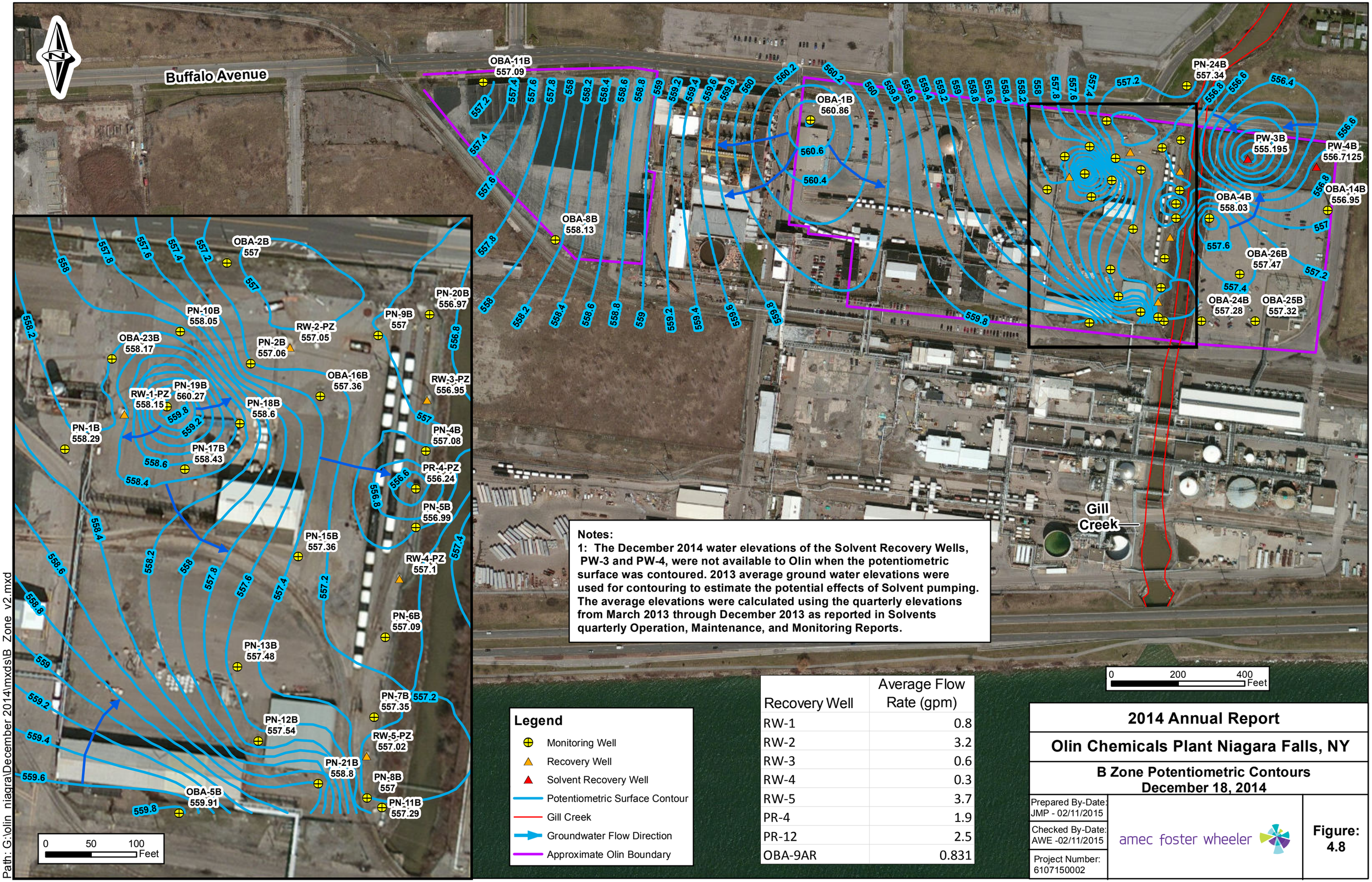
Checked By-Date: AWE -10/27/2014

Project Number: 6107140002

amec foster wheeler

Figure: 4.7

Path: G:\olin niagra\Oct 2014\MXD\Oct2014ZoneB.mxd



Notes:
1: The December 2014 water elevations of the Solvent Recovery Wells, PW-3 and PW-4, were not available to Olin when the potentiometric surface was contoured. 2013 average ground water elevations were used for contouring to estimate the potential effects of Solvent pumping. The average elevations were calculated using the quarterly elevations from March 2013 through December 2013 as reported in Solvents quarterly Operation, Maintenance, and Monitoring Reports.

Legend

- Monitoring Well
- Recovery Well
- Solvent Recovery Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	0.8
RW-2	3.2
RW-3	0.6
RW-4	0.3
RW-5	3.7
PR-4	1.9
PR-12	2.5
OBA-9AR	0.831

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

B Zone Potentiometric Contours December 18, 2014

Prepared By-Date: JMP - 02/11/2015	
Checked By-Date: AWE -02/11/2015	amec foster wheeler
Project Number: 6107150002	Figure: 4.8

Path: G:\olin_niagra\December 2014\mxds\B_Zone_v2.mxd

Buffalo Avenue

OBA-1C
555.19

OPW-1
554.1

OBA-7C
554.88

OBA-15B
557.35

OBA-4C
557.32

OBA-14C
555.63

Gill Creek

554.2
554.4
554.6
554.8
555
555.2
555.4
555.6
555.8
556
556.2
556.4
556.6
556.8
557
557.2
556.8
556.6
556.4
556.2
556
555.8

0 150 300 Feet

Legend

- Olin Monitoring Well
- Olin Production Well
- April 2014 Potentiometric Contour
- Gill Creek
- Approximate Olin Boundary
- Groundwater Flow Direction

Well	Average Flow Rate (gpm)
Olin Production Well	620

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

C Zone Potentiometric Contours
April 2, 2014

Prepared By-Date: CLS - 06/09/2014	
Checked By-Date: AWE - 06/09/2014	amec foster wheeler
Project Number: 6107140002	

Figure: 4.9

Path: G:\olin_niagra\Feb2014\2014 Report\April14_ZoneC_Pot.mxd

Buffalo Avenue

OBA-1C
556.18

OPW-1
554.20

OBA-7C
555.40

OBA-15B
557.56

OBA-4C
557.57

OBA-14C
NM

554.6 554.8 555 555.2 555.4 555.6 555.8 556 556.2 556.4 556.6 556.8 557 557.2 557.4

Gill Creek

0 150 300 Feet

Legend

- OLIN Monitoring Well Location
- OLIN Production Well Location
- June 2014 Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

NM Not Measured

Well	Average Flow Rate (gpm)
Olin Production Well	617

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2014 Annual Report

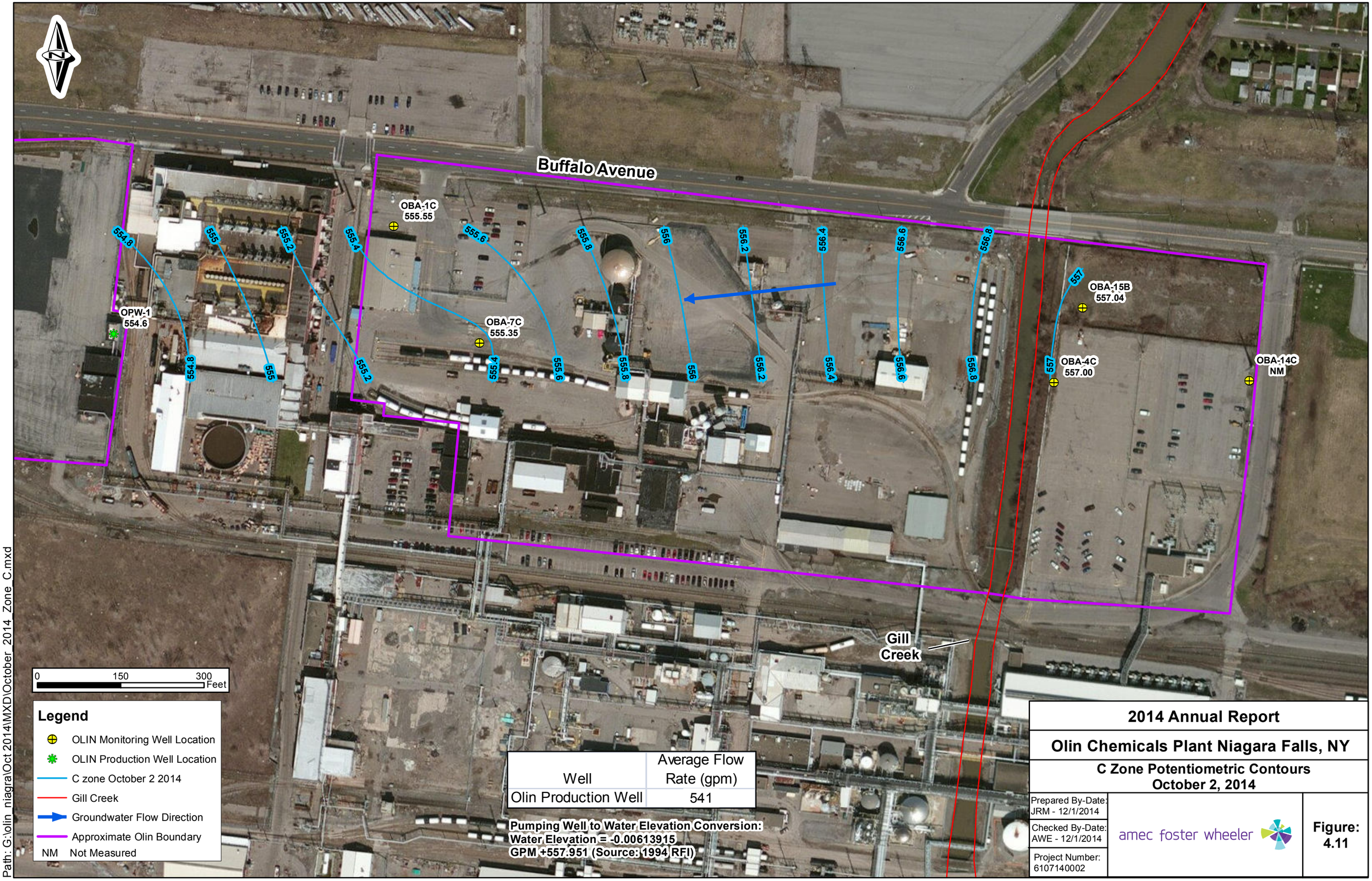
Olin Chemicals Plant Niagara Falls, NY

C Zone Potentiometric Contours June 17, 2014

Prepared By-Date: JRM - 08/20/2014	
Checked By-Date: AWE - 08/20/2014	amec foster wheeler
Project Number: 6107140002	

Figure: 4.10

Path: G:\olin_niagra\Aug 2014\MXD\June2014ZoneC_JM.mxd



Path: G:\olin_niagra\Oct 2014\MXD\October_2014_Zone_C.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

C Zone Potentiometric Contours
October 2, 2014

Prepared By-Date: JRM - 12/1/2014	amec foster wheeler	**Figure: 4.11**
Checked By-Date: AWE - 12/1/2014		
Project Number: 6107140002		

Buffalo Avenue

OBA-1C
555.58

OPW-1
554.6

OBA-7C
553.87

OBA-15B
557.02

OBA-4C
556.97

OBA-14C
554.04

Gill Creek

555 555.2 555.4 555.6 555.8 556 556.2 556.4 556.6 554.8 554.6 554.4 554.2 554 557

0 150 300 Feet

Legend

- OLIN Monitoring Well Location
- OLIN Production Well Location
- C Zone December 2014
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Olin Production Well	541

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

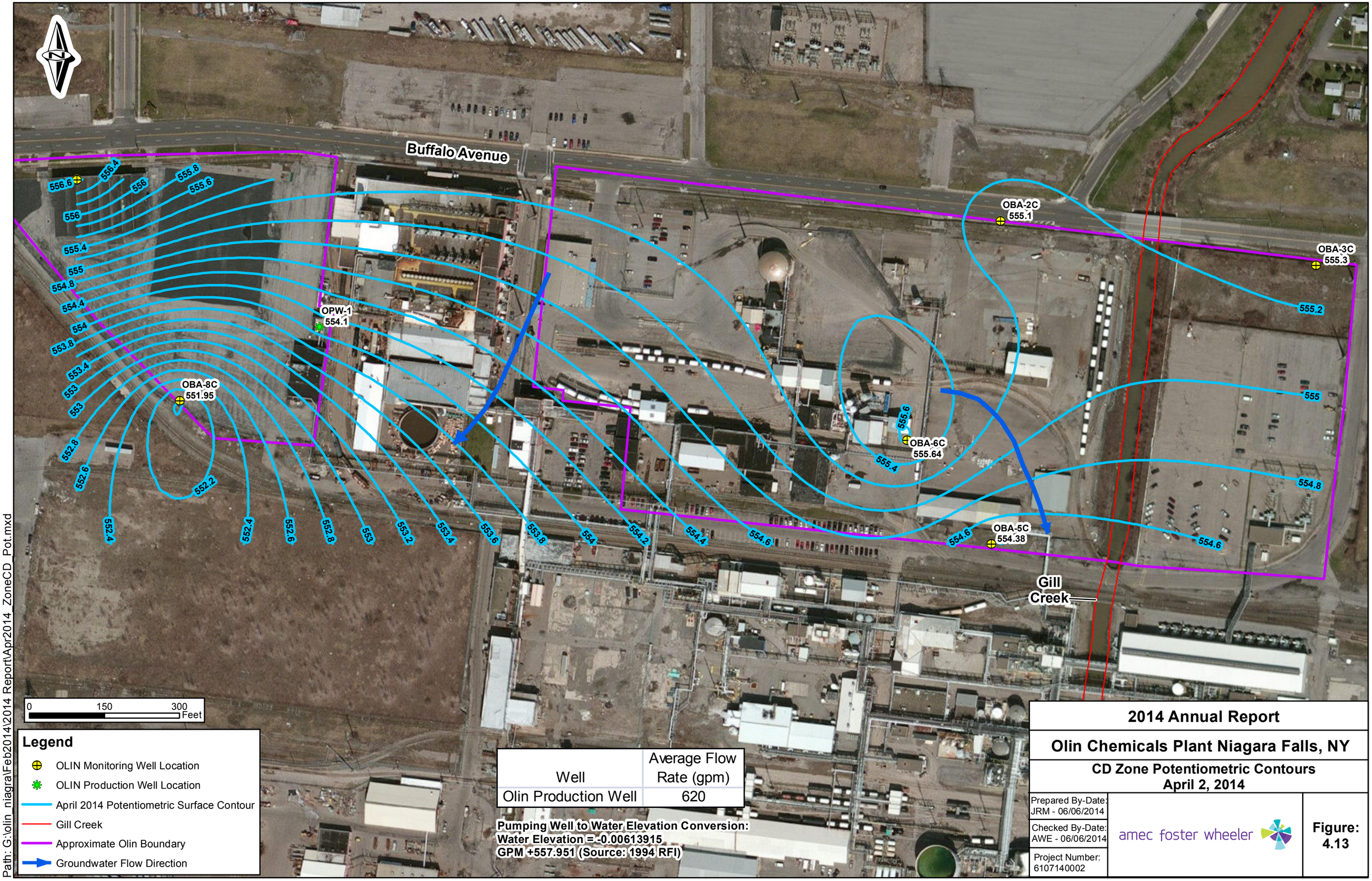
C Zone Potentiometric Contours December 18, 2014

Prepared By-Date: JMP - 02/23/2015
Checked By-Date: AWE - 02/23/2015
Project Number: 6107140002

amec foster wheeler

Figure: 4.12

Path: G:\olin_niagra\December 2014\mxds\C_Zone.mxd


Buffalo Avenue
OPW-1
554.1
OBA-2C
555.1
OBA-3C
555.3
OBA-5C
554.38
OBA-6C
555.64
OBA-8C
551.95
Gill Creek
556.6
556.4
556
555.8
555.6
556
555.4
555
554.8
554.4
554
553.8
553.4
553
553
552.8
552.6
552.4
552.2
552.4
552.6
552.8
553
553.2
553.4
553.6
553.8
554
554.2
554.4
554.6
554.6
555.4
555.6
555
555.2
554.8
554.6
0
150
300
Feet
Legend
OLIN Monitoring Well Location
OLIN Production Well Location
April 2014 Potentiometric Surface Contour
Gill Creek
Approximate Olin Boundary
Groundwater Flow Direction
Well
Average Flow Rate (gpm)
Olin Production Well
620
Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)
2014 Annual Report
Olin Chemicals Plant Niagara Falls, NY
CD Zone Potentiometric Contours
April 2, 2014
Prepared By-Date:
JRM - 06/06/2014
Checked By-Date:
AWE - 06/06/2014
Project Number:
6107140002
amec foster wheeler
Figure:
4.13
Path: G:\olin_niagra\Feb2014\2014 Report\Apr2014_ZoneCD_Pot.mxd

Buffalo Avenue

OBA-11C
556.41

OBA-2C
555.60

OBA-3C
554.82

OPW-1
554.20

OBA-8C
552.56

OBA-6C
555.79

OBA-5C
555.08

Gill Creek

556.2
556
555.8
555.6
555.4
555.2
555
554.8
554.6
554.4
554.2
554
553.8
553.6
553.4
553.2
553
552.8
552.6

0 200 400 Feet

Legend

- OLIN Monitoring Well Location
- OLIN Production Well Location
- June 2014 Potentiometric Surface Contours
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Olin Production Well	617

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

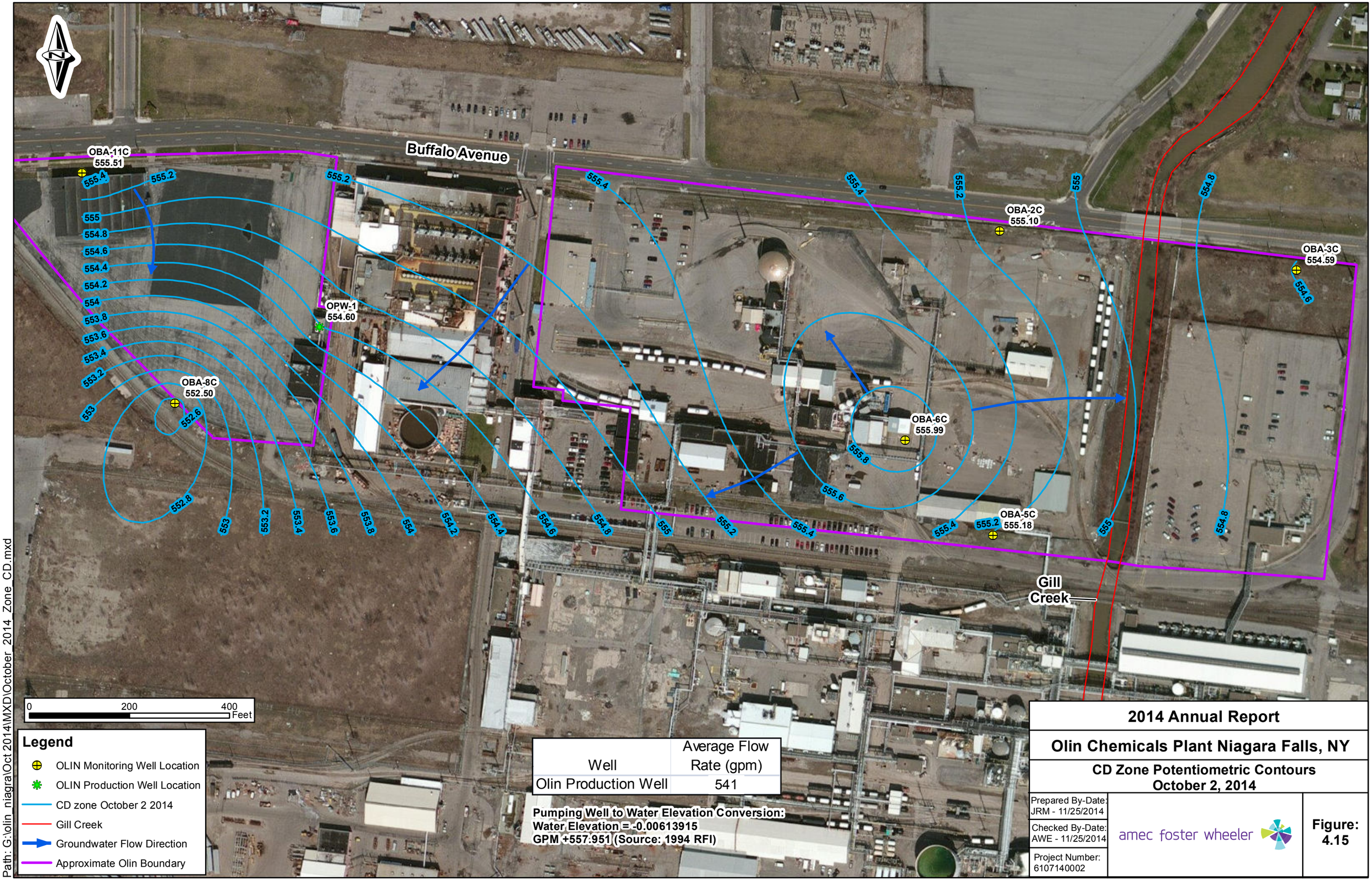
2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

CD Zone Potentiometric Contours June 17, 2014

Prepared By-Date: JRM - 08/20/2014	amec foster wheeler	Figure: 4.14
Checked By-Date: AWE - 08/20/2014		
Project Number: 6107140002		

Path: G:\olin_niagra\Aug 2014\MXD\June2014ZoneCD_JM.mxd



Legend

- OLIN Monitoring Well Location
- OLIN Production Well Location
- CD zone October 2 2014
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Olin Production Well	541

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

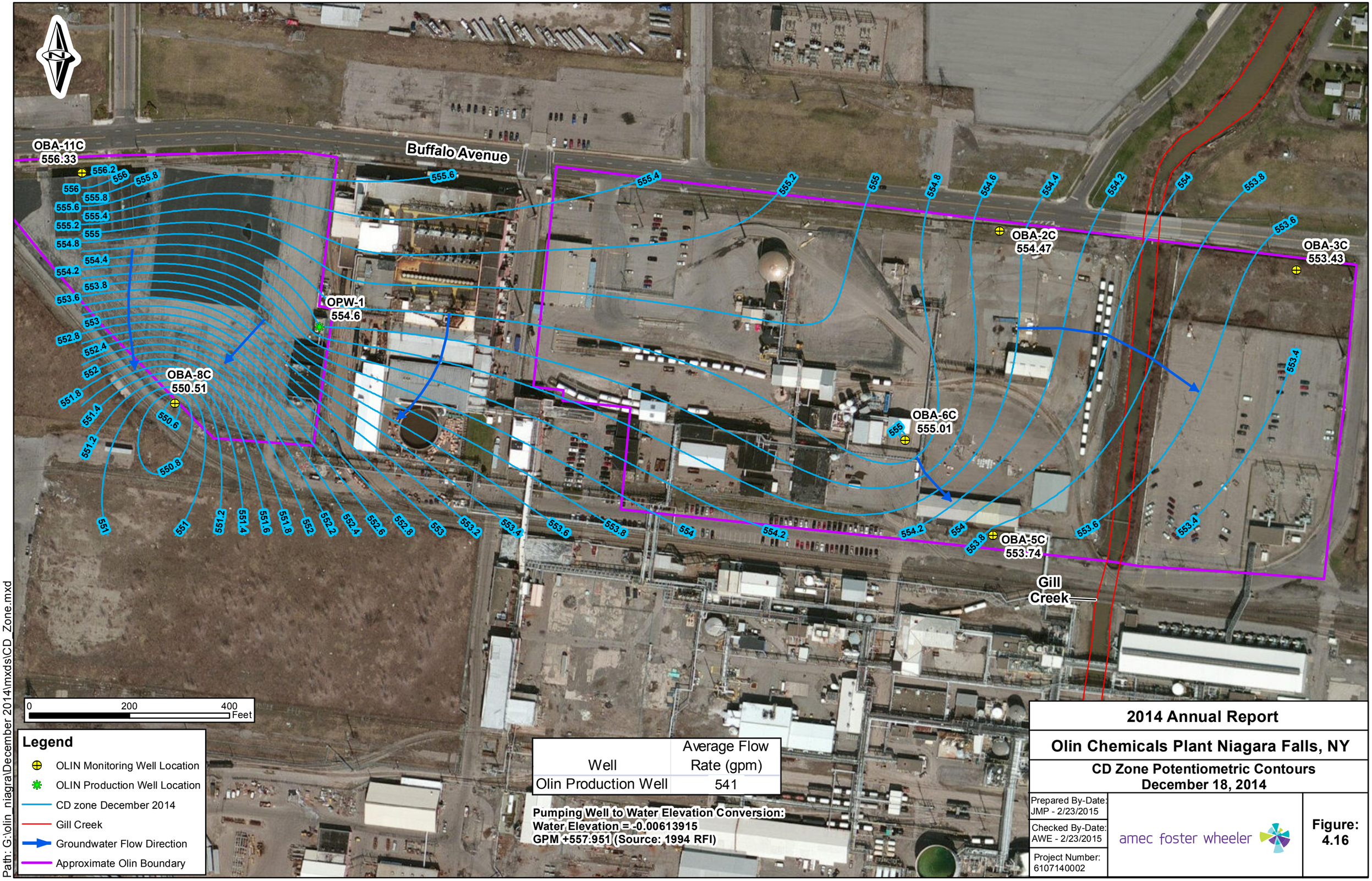
2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

CD Zone Potentiometric Contours October 2, 2014

Prepared By-Date: JRM - 11/25/2014	amec foster wheeler	Figure: 4.15
Checked By-Date: AWE - 11/25/2014		
Project Number: 6107140002		

Path: G:\olin_niagra\Oct 2014\MXD\October_2014_Zone_CD.mxd



Path: G:\olin_niagra\December 2014\mxds\CD_Zone.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

CD Zone Potentiometric Contours December 18, 2014

Prepared By-Date: JMP - 2/23/2015	amec foster wheeler	Figure: 4.16
Checked By-Date: AWE - 2/23/2015		
Project Number: 6107140002		

Buffalo Avenue

OBA-1A <1
OBA-2A <1
OBA-23A <1
PN-20A <1
OBA-15A <2
OBA-3A 2.7
PN-3A <1
PN-18A <1
PN-1A 3.4
PN-4A 1.1
PN-17A <1
PN-5A <1
OBA-4A <1
OBA-14A <1
PN-15A 7.9
OBA-8A <1
PN-14A 170
OBA-6A <1
PN-6A <1
OBA-26A <1
PN-7A <1
PN-12A 6.8
OBA-5A 5700
PN-11A 4
OBA-24A <1
OBA-25A <1
OBA-10A 4000

Legend

1,2,4-Trichlorobenzene (µg/L)

- 0.5 - 5
- 5 - 50
- 50 - 500
- 500 - 5000
- 5000 - 50000
- Flagged as Non-Detect
- Gill Creek
- Approximate Olin Boundary

0 200 400 Feet

Path: G:\olin_niagra\mxds\2014 Annual Report\A_Zone_trichlorobenzene.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

1,2,4-Trichlorobenzene Concentrations - A-Zone June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler	Figure: 5.1
Checked By-Date: AWE - 2/3/2015		
Project Number: 6107150002		

Buffalo Avenue

OBA-11B 420

OBA-8B 5400

OBA-1B <1

OBA-2B 180

PN-20B 210

OBA-23B 350

OBA-16B 120

PN-17B 11000

PN-4B 180

PN-5B 8300

OBA-4B <1

OBA-14B 51

PN-15B 16000

PN-14B 7200

OBA-6B 100

PN-6B 5800

OBA-26B <1

PN-12B 16000

PN-7B 2300

OBA-5B 8100

PN-11B 6500

OBA-24B 520

OBA-25B <1

N

0 200 400 Feet

Legend

1,2,4-Trichlorobenzene (µg/L)

- 0.5 - 5
- 5 - 50
- 50 - 500
- 500 - 5000
- 5000 - 50000
- Flagged as Non-Detect
- Gill Creek
- Approximate Olin Boundary

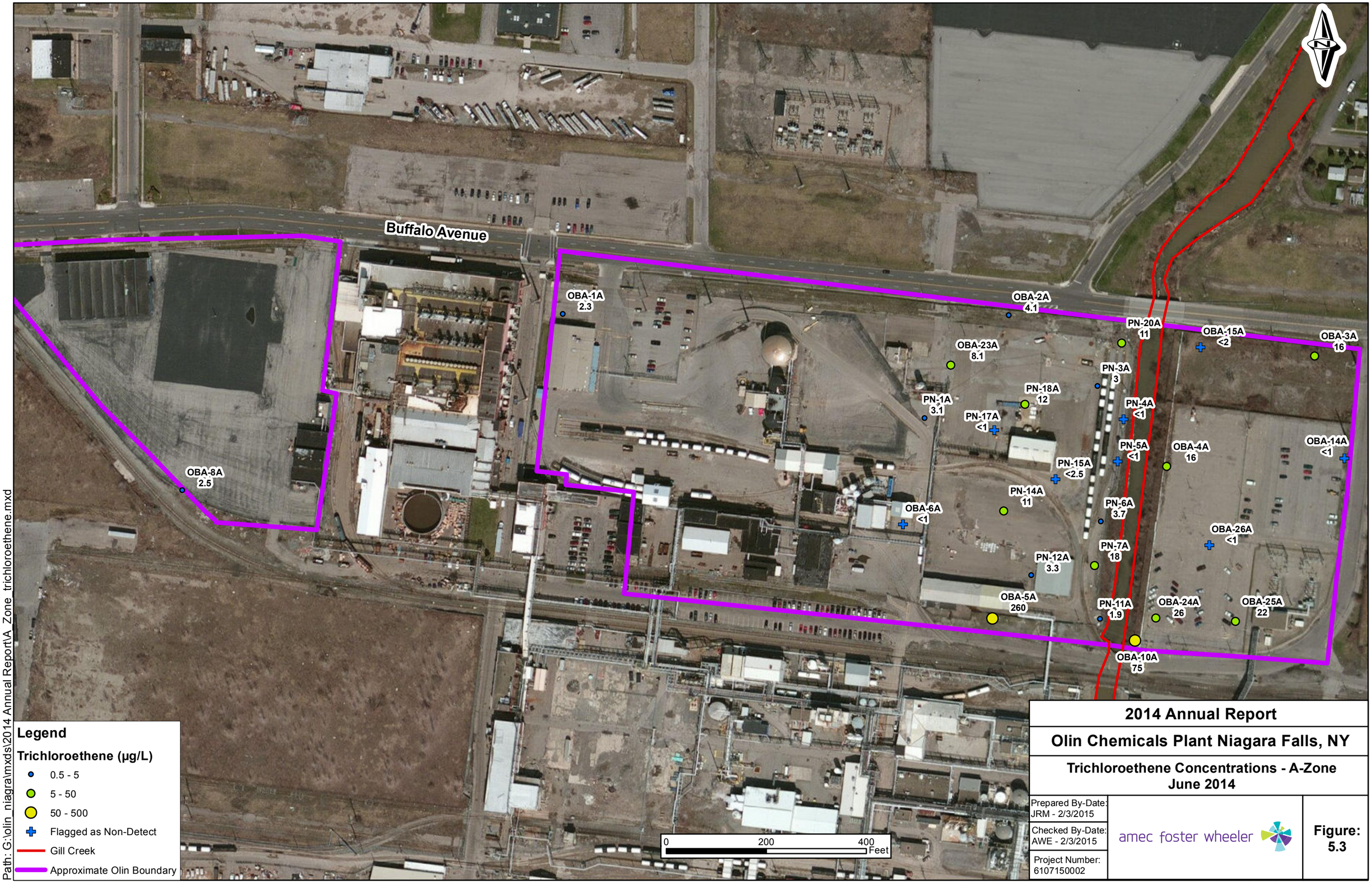
Path: G:\olin_niagra\mxds\2014 Annual Report\B_Zone_trichlorobenzene.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

1,2,4-Trichlorobenzene Concentrations - B-Zone June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler	Figure: 5.2
Checked By-Date: AWE - 2/3/2015		
Project Number: 6107150002		



Legend

Trichloroethene (µg/L)

- 0.5 - 5
- 5 - 50
- 50 - 500
- Flagged as Non-Detect
- Gill Creek
- Approximate Olin Boundary

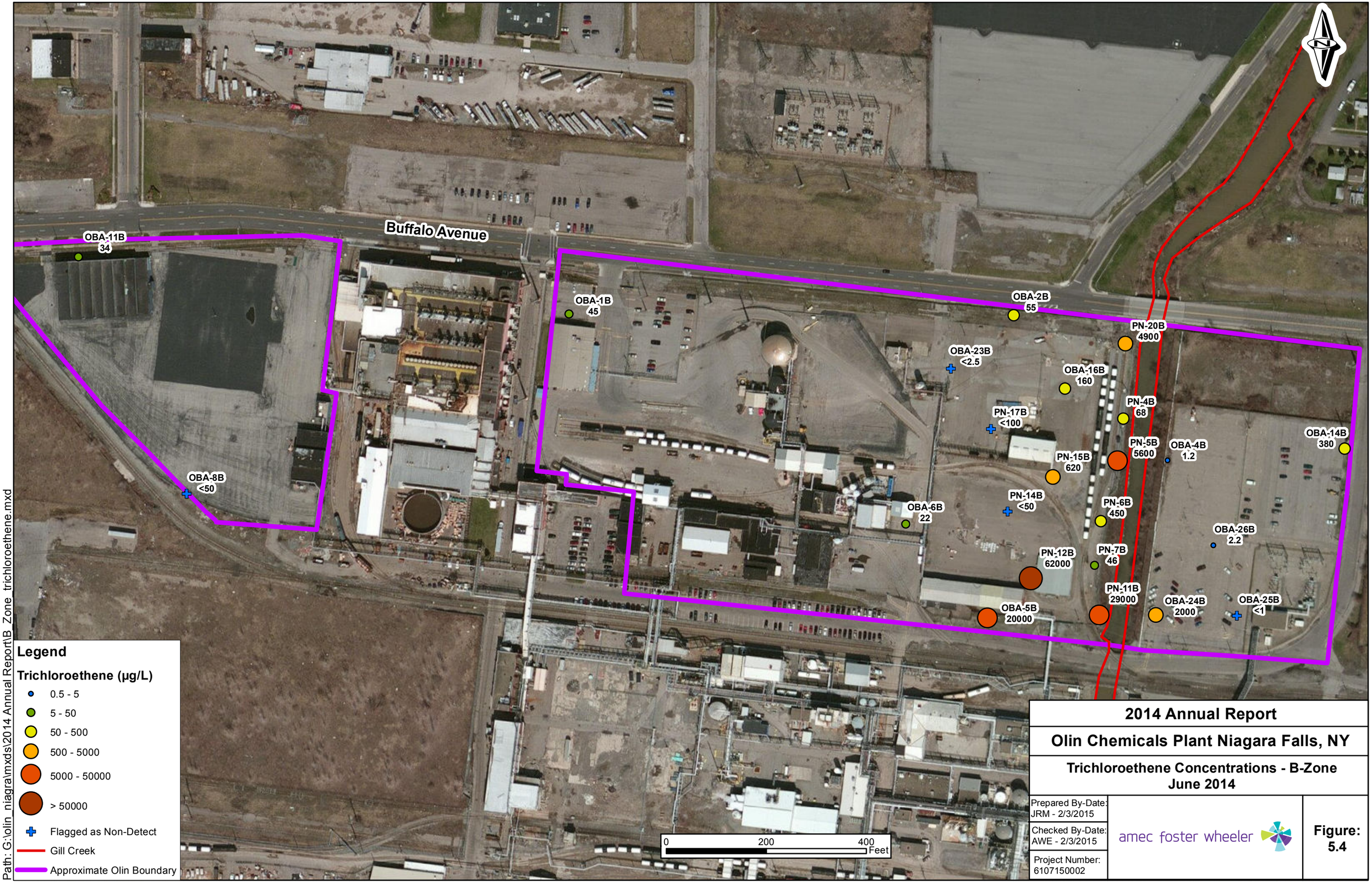
Path: G:\olin_niagara\mxds\2014 Annual Report\A_Zone_trichloroethene.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Trichloroethene Concentrations - A-Zone
June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler	**Figure: 5.3**
Checked By-Date: AWE - 2/3/2015		
Project Number: 6107150002		



Path: G:\olin_niagra\mxds\2014 Annual Report\B_Zone_trichloroethene.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Trichloroethene Concentrations - B-Zone June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler	Figure: 5.4
Checked By-Date: AWE - 2/3/2015		
Project Number: 6107150002		

Buffalo Avenue

OBA-1A <0.047
OBA-2A <0.063
PN-20A <0.047
OBA-15A <0.047
OBA-3A 0.14
OBA-23A <0.047
PN-3A <0.47
PN-18A <2.4
PN-1A <0.047
PN-4A <0.047
PN-17A <0.047
OBA-14A <0.047
PN-5A <0.094
OBA-4A <0.047
PN-15A <0.047
OBA-8A <0.047
PN-14A <0.24
OBA-6A <0.047
PN-6A <0.047
OBA-26A <0.047
PN-7A <2.4
PN-12A <0.094
OBA-5A 74
PN-11A 0.68
OBA-24A <0.047
OBA-25A <0.047
OBA-10A 180

0 200 400 Feet

Legend

Gamma BHC (µg/L)

- 0.005 - 0.05
- 0.05 - 0.5
- 0.5 - 5
- 5 - 500
- Flagged as Non-Detect
- Gill Creek
- Approximate Olin Boundary

Path: G:\olin_niagra\mxds\2014 Annual Report\A_Zone_Gamma.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Gamma-BHC Concentrations - A-Zone June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler
Checked By-Date: AWE - 2/3/2015	Figure: 5.5
Project Number: 6107150002	

Buffalo Avenue

OBA-11B <0.24
OBA-1B <0.047
OBA-2B 0.051
PN-20B 0.27
OBA-23B <0.047
OBA-16B 3.9
PN-4B 7.1
PN-17B <0.47
OBA-14B 0.59
PN-5B 1100
OBA-4B <0.047
PN-15B <4.7
OBA-8B <0.094
PN-14B <4.7
OBA-6B <0.047
PN-6B 350
OBA-26B <0.047
PN-7B 160
PN-12B 100
OBA-5B 630
PN-11B 360
OBA-24B 59
OBA-25B <0.047

0 200 400 Feet

Legend

Gamma BHC (µg/L)

- 0.005 - 0.05
- 0.05 - 0.5
- 0.5 - 5
- 5 - 500
- 500 - 5000
- Flagged as Non-Detect
- Gill Creek
- Approximate Olin Boundary

Path: G:\olin_niagra\mxds\2014 Annual Report\B_Zone_Gamma.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Gamma-BHC Concentrations - B-Zone June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler	Figure: 5.6
Checked By-Date: AWE - 2/3/2015		
Project Number: 6107150002		

Buffalo Avenue

OBA-1A <0.2
OBA-2A 1.1
OBA-23A 2.87
PN-20A <0.2
OBA-15A <0.2
OBA-3A <0.2
PN-3A 2.01
PN-18A 275
PN-1A 349
PN-17A 125
PN-4A <0.2
PN-5A <0.2
OBA-4A <0.2
OBA-14A <0.2
PN-15A <0.2
OBA-8A <0.2
PN-14A 2.59
OBA-6A <0.2
PN-6A <0.2
OBA-26A <0.2
PN-12A <0.2
PN-7A <0.2
OBA-5A <0.2
PN-11A <0.2
OBA-24A <0.2
OBA-25A 1.66
OBA-10A <0.2

N

0 200 400 Feet

Legend

Total Mercury (µg/L)

- 0.2 - 2
- 2 - 20
- 20 - 200
- 200 - 2000
- Flagged as Non-Detect
- Gill Creek
- Approximate Olin Boundary

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Total Mercury Concentrations - A-Zone June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler
Checked By-Date: AWE - 2/3/2015	**Figure: 5.7**
Project Number: 6107150002	

Path: G:\olin_niagra\mxds\2014 Annual Report\A_Zone_Mercury.mxd

Buffalo Avenue

OBA-11B <0.2
OBA-1B 30.9
OBA-2B <0.2
PN-20B <0.2
OBA-23B <0.2
OBA-16B 1.35
PN-17B 1.03
PN-4B 0.49
OBA-14B <0.2
PN-5B <0.2
OBA-4B <0.2
PN-15B 1.86
OBA-8B <0.2
PN-14B 0.89
OBA-6B 3.37
PN-6B <0.2
OBA-26B <0.2
PN-7B <0.2
PN-12B 0.78
OBA-5B <0.2
PN-11B <0.2
OBA-24B <0.2
OBA-25B <0.2

Legend

Total Mercury (µg/L)

- 0.2 - 2
- 2 - 20
- 20 - 200
- Flagged as Non-Detect
- Gill Creek
- Approximate Olin Boundary

0 200 400 Feet

Path: G:\olin_niagra\mxds\2014 Annual Report\B_Zone_Mercury.mxd

2014 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Total Mercury Concentrations - B-Zone June 2014

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler	Figure: 5.8
Checked By-Date: AWE - 2/3/2015		
Project Number: 6107150002		

APPENDIX A

NYSDEC CORRESPONDENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E, 12th Floor
625 Broadway, Albany, New York 12233-7017
Phone: (518) 402-9814 • **Fax:** (518) 402-9819
Website: www.dec.ny.gov

Joe Martens
Commissioner

November 12, 2014

Mr. Richard W. McClure
Olin Corp., Environmental Remediation Group
3855 N. Ocoee, Suite 200
Cleveland, Tennessee 37312

RE: 2013 Annual Operations, Maintenance, and Monitoring Report
Olin Chemicals, Buffalo Avenue Facility, Niagara Falls, New York
AOC Index No. R9-4171-94-08, NYSDEC Site No. 932051A and B

Dear Mr. McClure:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the above-referenced report dated April 1, 2014. The report documents Olin's monitoring, remediation, and O&M activities at the Niagara Falls plant for the period January 1 to December 31, 2013.

Data in the report indicate that the remedial goals for the site are being met. For the reporting period, Olin's groundwater treatment system removed approximately 4,030 pounds of VOCs, 14 pounds of pesticides, and 0.005 pounds of mercury. The report documents that Olin has been responsive to repair and maintenance issues as they arise, and has made modifications and upgrades to improve the reliability of the system.

The above-referenced report is approved. If you have any questions regarding this letter, please call me at (518) 402-9813.

Sincerely,

Alex G. Czuhanich
Project Manager
Remedial Section B, Remedial Bureau E
Division of Environmental Remediation

ec: A. Everett, USEPA, Region 2
G. Sutton, DEC, Region 9
B. Boyd, NYSDOH
M. Cruden, DER
D. Radtke, DER

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E, 12th Floor
625 Broadway, Albany, New York 12233-7017
Phone: (518) 402-9814 • **Fax:** (518) 402-9819
Website: www.dec.ny.gov

Joe Martens
Commissioner

February 5, 2015

Mr. Richard W. McClure
Olin Corp., Environmental Remediation Group
3855 N. Ocoee Street, Suite 200
Cleveland, Tennessee 37312

RE: Groundwater Treatment System O&M Plan, Revision 7
Olin Chemicals, Buffalo Avenue Facility, Niagara Falls, New York
AOC Index No. R9-4171-94-08, NYSDEC Site No. 932051A and B

Dear Mr. McClure:

The New York State Department of Environmental Conservation has reviewed the above-referenced O&M Plan dated August 15, 2014 (with revisions dated January 23, 2015). The document provides the operation and maintenance plan for the groundwater treatment system at Olin's Niagara Falls facility. The referenced O&M Plan is approved. If you have any questions regarding this letter, please call me at (518) 402-9813.

Sincerely,

Alex G. Czuhanich
Project Manager
Remedial Section B, Remedial Bureau E
Division of Environmental Remediation

ec: G. Sutton, NYSDEC, Region 9
A. Everett, USEPA, Region 2
M. Cruden, DER
D. Radtke, DER

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E, 12th Floor
625 Broadway, Albany, New York 12233-7017
Phone: (518) 402-9814 • **Fax:** (518) 402-9819
Website: www.dec.ny.gov

Joe Martens
Commissioner

February 5, 2015

Mr. Richard W. McClure
Olin Corp., Environmental Remediation Group
3855 N. Ocoee Street, Suite 200
Cleveland, Tennessee 37312

RE: Well Installation Report – PN-24B and PR-14
Olin Chemicals, Buffalo Avenue Facility, Niagara Falls, New York
AOC Index No. R9-4171-94-08, NYSDEC Site No. 932051A and B

Dear Mr. McClure:

The New York State Department of Environmental Conservation has reviewed the above-referenced report dated December 11, 2014. The report documents field operations for the installation of monitoring well PN-24B and passive relief well PR-14 at Olin's Niagara Falls facility. The referenced report is approved. If you have any questions regarding this letter, please call me at (518) 402-9813.

Sincerely,

Alex G. Czuhanich
Project Manager
Remedial Section B, Remedial Bureau E
Division of Environmental Remediation

ec: G. Sutton, NYSDEC, Region 9
A. Everett, USEPA, Region 2
M. Cruden, DER
D. Radtke, DER

APPENDIX B

WEEKLY O&M REPORTS

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 5	CONTRACT NO. **1107 Div 4**	DATE: 01/06/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 15**	**Max: 25**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
The issue with the acid pump in PR-4 shed has been resolved and the pump is operating now.
Chris also worked on the acid pump that was injecting into RW-1. Apparently there was an "air lock" situation in the line. Chris loosened the union fitting at the pump and reprimed it. After that, it worked fine.
Due to extremely frigid weather in the Niagara Falls area there has been a shutdown of the system. Olin staff is working on thawing the system and restarting.
This happened toward mid-week. Chris was onsite Monday morning to take the level readings below.
.

Item 121713.01: Sevenson was given a list of GW Monitoring wells that need maintenance /repair. Sevenson was on site to inspect, start repairs and order parts needed. Sevenson's fabrication shop has completed the new well covers for the flush mount wells that were damaged. They will be installed ASAP.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.3	14.87	15.80	557.08	2.63
RW-2	556.9	14.92	15.06	556.75	6.20
RW-3	557.1	12.68	12.70	556.92	0.65
PR-4	556.3	13.40	13.68	556.29	3.60
RW-4	557.0	12.52	12.54	557.19	0.70
RW-5	557.3	12.49	12.56	557.09	9.38
PR-12	564.6		12.55	564.45	6.10
OBA-9AR	556.5	13.08	13.54	556.51	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	31	20	11
	SP#3	**SP#4**	
GAC #2	19	10	9
TOTAL GAC SYSTEM	24.05	**Diff,Pr**	
FLOW RATE	55	**GPM**	
OBA-9AR TOTALIZER	922447		

PH Readings:				Acid level: 90%
RW-1	11.03			

PR-4	7.11			
PH Adj. Tanks	7.30	7.15	7.06	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 6	CONTRACT NO. **1107 Div 4**	DATE: 01/13/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 35**	**Max: 40**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Sevenson was onsite Last Friday to fix a leak in the check valve at RW-4. They also installed heaters in the hot boxes for RW-2 and RW-3. To thaw the piping out and get the system running. They cleared out the conveyance piping between OBA-9AR and PR-12 to get that well pumping again (ice buildup). A new well cover was installed at PN14B that day too.

On Monday 01/13/14 it was discovered that there was water in the secondary containment piping at RW-4. This was due to the leaking check valve at that well, which has since been repaired. Sevenson will remove the accumulated water with a small pump and close it back up this week. At the request of Rob Meyer, Sevenson also checked the secondary containment piping at PR-12 and PR-4. Both were dry.

The acid pump for RW-1 was leaking at the PVC union fitting. Sevenson re-aligned the plumbing and the pump and the leak stopped. We may need to replace the O-rings soon.

As of today, all of the frozen pumps from last week have been restarted and are functioning, along with the system.

Item 121713.01: Sevenson was given a list of GW Monitoring wells that need maintenance /repair. Sevenson was on site to continue with these repairs.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.91	15.85	557.01	2.82
RW-2	556.9	14.91	15.09	556.75	4.94
RW-3	557.2	12.65	12.90	556.92	0.71
PR-4	555.3	14.25	14.71	555.31	3.30
RW-4	557.0	12.55	12.58	557.15	0.79
RW-5	557.2	12.49	12.56	557.07	8.85
PR-12	564.4		12.50	564.42	6.77
OBA-9AR	557.4	12.66	12.81	557.44	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	45	31	14
	SP#3	**SP#4**	
GAC #2	29	19	10
TOTAL GAC SYSTEM	29.32	**Diff,Pr**	
FLOW RATE	92	**GPM**	
OBA-9AR TOTALIZER	925454		

PH Readings:				Acid level: 90%
RW-1	7.85			
PR-4	6.84			
PH Adj. Tanks	7.38	7.36	7.25	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 7	CONTRACT NO. **1107 Div 4**	DATE: 01/21/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 0**	**Max: 7**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

The PVC ¼" ball valves on the differential pressure gauges at the GAC units had frozen and cracked causing them to leak. Sevenson has temporarily replaced the leaking valves with ¼" bronze ball valves until the PVC replacements gat shipped in. (they were a special order).

Item 121713.01: Sevenson was given a list of GW Monitoring wells that need maintenance /repair. Sevenson was on site to continue with these repairs.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	14.82	15.79	557.10	2.18
RW-2	557.0	14.87	15.05	556.80	4.25
RW-3	557.2	12.60	12.64	557.00	0.70
PR-4	555.9	14.01	14.36	555.45	2.90
RW-4	557.1	12.49	12.53	557.22	0.79
RW-5	557.3	12.42	12.49	557.15	7.78
PR-12	564.4		12.48	564.52	7.55
OBA-9AR	557.4	12.66	12.81	557.44	0.70

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	34	20	14
	SP#3	**SP#4**	
GAC #2	19	10	9
TOTAL GAC SYSTEM	26.89	**Diff,Pr**	
FLOW RATE	61	**GPM**	
OBA-9AR TOTALIZER	930662		

PH Readings:				Acid level: 60%
RW-1	7.98			
PR-4	6.66			
PH Adj. Tanks	7.37	7.35	7.20	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 8	CONTRACT NO. **1107 Div 4**	DATE: 01/28/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 0**	**Max: 5**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Building 73 still has almost no heat. Only 1 of the 4 heaters is operating. This is not enough to keep the WWTP from freezing in the current climate if the system goes down. Rob has contacted Olin maintenance about this and work orders have been issued to effect repairs. However, the temporary heaters that were in previously have been removed. If the system shuts down and the stagnant water in the system freezes, it may result in expensive damages to the system components.

A flammables storage cabinet has been installed in the building.

Item 121713.01: Sevenson was given a list of GW Monitoring wells that need maintenance /repair. Sevenson was on site to continue with these repairs.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.99	15.90	556.93	1.69
RW-2	557.0	14.91	15.07	556.77	3.74
RW-3	557.3	12.52	12.55	557.09	0.70
PR-4	555.2	14.89	15.07	554.99	2.60
RW-4	556.9	12.71	12.74	557.07	0.78
RW-5	557.3	12.43	12.51	557.15	7.69
PR-12	564.4		12.45	564.51	6.82
OBA-9AR	557.4	12.70	12.83	557.47	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	35	24	11
	SP#3	**SP#4**	
GAC #2	20	10	10
TOTAL GAC SYSTEM	24.98	**Diff,Pr**	
FLOW RATE	59	**GPM**	
OBA-9AR TOTALIZER	935481		

PH Readings:				Acid level: 45%
RW-1	5.68			
PR-4	6.82			
PH Adj. Tanks	6.69	6.80	6.65	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 9	CONTRACT NO. **1107 Div 4**	DATE: 02/04/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 15**	**Max: 24**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Chris Jones was notified that the flow rate from well RW-1 was slowing down. While he was at the site this week, he pulled the pump; disassembled it and acid washed the internal parts. After re-installation it was noted that the flow rate increased from 1.2 gpm up to 2.4 gpm.

Chris was asked to check the secondary containment piping on PR-4 (dry), PR-12 (dry) and RW-4 (6" water, he evacuated it out with a bailor).

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.1	15.32	16.26	556.80	2.45
RW-2	557.2	14.81	14.98	557.04	4.74
RW-3	557.3	12.56	12.58	557.08	0.41
PR-4	554.6	15.30	16.37	554.84	2.60
RW-4	557.2	12.42	12.44	557.35	0.72
RW-5	556.8	12.70	12.76	556.76	7.99
PR-12	564.4		12.45	564.52	6.61
OBA-9AR	556.6	13.79	13.59	556.69	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	15	10
	SP#3	**SP#4**	
GAC #2	21	15	6
TOTAL GAC SYSTEM	21.01	**Diff,Pr**	
FLOW RATE	51	**GPM**	
OBA-9AR TOTALIZER	940223		

PH Readings:				Acid level: 40%
RW-1	7.01			
PR-4	6.75			
PH Adj. Tanks	7.15	7.25	7.15	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 10	CONTRACT NO. **1107 Div 4**	DATE: 02/12/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 2**	**Max: 19**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Upon arrival, the system was shut down. The reason a that the air stripper was running at about 650 cfm. Once the flow drops below 650 cfm, the stripper shuts the system down. Chris restarted the system and it ran around 800 for the rest of the day.

A beam hoist on the 3rd floor was removed by Chris and Vern from Sevenson at the request of Rob Meyer.

Secondary containment piping was also checked for liquids today during the well evaluations; RW-4 showed about 1", Chris removed it with a bailor.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

Item 021414.01: Rob Meyer called this morning and asked for us to check out the pump at RW-1, the flow has been dropping daily. Chris removed inspected and cleaned it last week, he will inspect it again today.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.97	15.90	556.99	1.86
RW-2	557.0	14.89	15.01	556.79	3.57
RW-3	557.3	12.61	12.63	556.98	0.63
PR-4	556.5	13.14	13.60	556.52	1.70
RW-4	557.1	12.49	12.51	557.20	0.78
RW-5	557.3	12.45	12.53	557.11	7.67
PR-12	564.6		12.58	564.40	7.10
OBA-9AR	556.7	13.79	13.60	556.68	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	29	19	10
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	25.90	**Diff,Pr**	
FLOW RATE	55	**GPM**	
OBA-9AR TOTALIZER	945825		

PH Readings:				Acid level: 40%
RW-1	8.85			
PR-4	7.23			
PH Adj.	6.99	7.23	7.01	

Tanks				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 11	CONTRACT NO. **1107 Div 4**	DATE: 02/19/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny, snow-melt event.	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 43**	**Max: 50**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Chris Jones was on site for Sevenson to trouble shoot the acid pump that feed acid to RW-1. It only works at a setting of +70%, any lower and it does not pump. After his inspection, a new pump head repair kit has been ordered, we will install it upon arrival. (est. 7 days). There is also a noticeable flow rate drop in the RW-1 well pump. Chris has removed, inspected and cleaned the pump then reinstalled it. He recommends the installation of a new pump, however, not until the acid feed pump to that well has been repaired. This will save on damaging the new groundwater pump. We have the RW-1 GW pump in stock.

The secondary containment piping in PR-4 was dry. Both RW-4 and PR-12 had trace amounts of water in them, not enough to trigger an interlock and not enough to remove with a bailor.

Rob Meyer had noticed that the flow rate at RW-3 was dropping and wanted us to inspect the well and piping. Chris disconnected the pump and flushed out the line, (no obstructions), then acid washed the well. After restart, the rate only increased to 0.78 gpm. He replaced the pump with a new 10 gpm pump that we had in stock and the rate increased to 6 gpm. We will keep an eye on the GW level to keep it below 557.0 without a constant on/off cycling. A new spare 10 gpm pump has been ordered to replace the backup that was installed.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

Item 021414.01: The acid pump at RW-1 will be cleaned and repaired when the repair parts arrive, following that, we will install a new ground water pump in RW-1. A new spare has been ordered.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.3	14.88	15.81	557.01	1.23
RW-2	557.0	14.89	15.03	556.80	3.83
RW-3	557.2	12.63	12.65	556.98	0.78
PR-4	556.0	13.52	13.74	556.04	2.90
RW-4	557.0	12.57	12.60	557.15	0.73
RW-5	557.3	12.45	12.52	557.08	7.65
PR-12	564.6		12.58	564.40	6.09

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	20	5
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	17.34	**Diff,Pr**	
FLOW RATE	59	**GPM**	
OBA-9AR TOTALIZER	950328		

OBA-9AR	556.7	13.77	13.60	556.68	1.10

PH Readings:				Acid level: 30%
RW-1	6.89			
PR-4	5.40			
PH Adj. Tanks	6.86	7.05	6.90	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 12	CONTRACT NO. **1107 Div 4**	DATE: 02/25/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 15**	**Max: 26**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Chris Jones replaced the groundwater pump in RW-1. The flow was down substantially and it would not respond to acid washing or disassembly and internal cleaning. A new one was ordered for spare stock.

The secondary containment piping in PR-12 and RW-1 had minimal amount of liquid in them, not even enough to get with a bailor. RW-4 was dry.

Olin, Sevenson, and Camtech met on site to discuss upcoming task of reconfiguring the PVC piping from the air stripper sump to the GAC feed pumps. A plan has been approved and the work will be done next week.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

Item 021414.01: The acid pump at RW-1 will be cleaned and repaired when the repair parts arrive,

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.5	14.72	15.67	557.23	1.99
RW-2	557.0	14.83	14.96	556.84	2.92
RW-3	557.2	12.58	12.63	556.99	2.35
PR-4	556.7	12.95	13.29	556.69	2.00
RW-4	557.1	12.45	12.47	557.26	0.75
RW-5	557.3	12.40	12.47	557.16	7.66
PR-12	564.6		12.48	564.54	6.88
OBA-9AR	556.7	13.78	13.62	556.65	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	20	10
	SP#3	**SP#4**	
GAC #2	16	10	6
TOTAL GAC SYSTEM	22.98	**Diff,Pr**	
FLOW RATE	55	**GPM**	
OBA-9AR TOTALIZER	956014		

PH Readings:				Acid level: 30%
RW-1	6.69			
PR-4	6.34			
PH Adj. Tanks	7.07	6.84	6.89	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 13	CONTRACT NO. **1107 Div 4**	DATE: 03/07/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 15**	**Max: 42**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

The system was shut down on Monday so Sevenson and CamTech could execute the re-piping task for the piping that runs from the air stripper to the GAC feed pumps. They were also asked to repair a leaking fitting on pump #1 while the system was down. The repairs were completed by Tuesday evening and the system remained off until Thursday while awaiting the PSSR review. After the review on Thursday. The operators restarted the system on Thursday evening. After a brief uptime, the elbow hat had been replaced due to leakage, separated from the pump and started leaking again. When the operators tied to switch over to pump #2 they sheared off the stem on one of the suction valves and could not open it. We later discovered that it was frozen. Sevenson was called on Friday morning and informed of the situation. They responded with Camtech on Friday morning,and repaired the elbow fitting on pump #1 and replaced the broken valve on pump #2. The system was restarted on Friday afternoon.

Other actions taken by Sevenson while the system was off include: removing and thoroughly cleaning the air stripper level switch assembly, re-priming the acid pump at PR-4, manually acid washing PR-12, adjusting the flow at OBA-9AR. It was running at 5 gpm and cycling frequently.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

Item 021414.01: The acid pump at RW-1 will be cleaned and repaired when the repair parts arrive,

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.7	15.45	16.40	556.50	3.54
RW-2	556.9	14.90	15.03	556.76	3.16
RW-3	557.1	12.68	12.73	557.00	2.75
PR-4	556.6	13.07	13.31	556.65	2.40
RW-4	557.0	12.51	12.53	557.16	0.67
RW-5	557.2	12.47	12.52	557.06	7.67
PR-12	564.6		12.47	564.54	5.30
OBA-9AR	556.7	13.78	13.62	556.65	0.90

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	35	20	15
	SP#3	**SP#4**	
GAC #2	16	9	7
TOTAL GAC SYSTEM	26.77	**Diff,Pr**	
FLOW RATE	55	**GPM**	
OBA-9AR TOTALIZER	961128		

PH Readings:				Acid level: 30%
RW-1	8.86			
PR-4	6.10			
PH Adj. Tanks	7.21	7.76	7.21	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 14	CONTRACT NO. **1107 Div 4**	DATE: 03/11/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 34**	**Max: 42**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Well RW-3 was locked out due to water in the secondary containment piping. Chris Jones bailed out the water and restarted the pump.

Other secondary containment piping results:

PR-4 had a trace. RW-4 had approximately 1 liter bailed out of it. PR-12 was dry.

We received the acid pump repair kit this week in the mail for RW-1.

RW-1 well pump went down Friday at 6:40 am; Sevenson is on site this morning to troubleshoot.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

Item 021414.01: The repair parts for the acid pump at RW-1 have arrived, Sevenson will be onsite to clean, inspect and rebuild the pump head on Monday.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.6	15.58	16.51	556.38	3.56
RW-2	556.9	14.96	15.10	556.72	4.09
RW-3	557.1	12.70	12.74	556.87	3.40
PR-4	556.1	13.50	13.65	556.08	2.10
RW-4	556.9	12.65	12.67	557.06	0.74
RW-5	557.2	12.52	12.56	557.01	7.55
PR-12	564.3		12.53	564.37	3.90
OBA-9AR	557.2	13.20	13.03	557.23	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	20	10
	SP#3	**SP#4**	
GAC #2	16	10	6
TOTAL GAC SYSTEM	23.97	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	963858		

PH Readings:				Acid level: 30%
RW-1	7.91			
PR-4	6.77			
PH Adj. Tanks	6.86	7.12	6.76	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 15	CONTRACT NO. **1107 Div 4**	DATE: 03/18/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 25**	**Max: 40**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
On Monday Sevenson was on site to R&R the RW-1 Acid pump. (See below), Also acid washed PR-12 to clean it up, this raised the flow rate from 2 gpm to 5.5 gpm.
On Tuesday, the system went down 6-8 times due to the air stripper air flow dipping below 650 SCFM. Troubleshooting efforts are underway by Olin staff, AMEC and SES to determine the reason for the pressure drops that kick the system off.
Secondary containment monitoring :
PR-12 – Trace of liquid, not enough to bail.
RW-4 - Trace of liquid, not enough to bail.
PR-4 – Dry.
On Wed 3/19, Sevenson was called out to investigate a lockout situation at RW-3, Chris discovered about 1.5 liters of water in the secondary containment piping and removed it, restarted the well pump.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

Item 021414.01: Sevenson was onsite Monday to repair and rebuild the acid pump for RW-1. The diaphragm was replaced, the suction and discharge check valves and cartridges were replaced and the oil was purged and replaced. The pump was back on line by 3:00pm.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.7	15.56	16.50	556.51	4.98
RW-2	556.8	15.00	15.18	556.66	2.25
RW-3	557.0	12.79	12.80	556.82	1.53
PR-4	556.2	14.31	14.60	556.25	2.00
RW-4	556.9	12.70	12.73	557.00	0.75
RW-5	557.2	12.56	12.60	557.00	7.03
PR-12	564.4		12.53	564.37	5.78
OBA-9AR	556.8	13.26	13.47	556.80	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	19	6
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	18.97	**Diff,Pr**	
FLOW RATE	60	**GPM**	
OBA-9AR TOTALIZER	969057		

PH Readings:				Acid level: 30%
RW-1	11.04			
PR-4	6.74			
PH Adj. Tanks	6.89	6.53	6.12	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 16	CONTRACT NO. **1107 Div 4**		DATE: 03/25/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 16**	**Max: 27**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

The team of Olin, AMEC and Sevenson, along with Carbonaire, are working on collecting data related to the air stripper system to try and figure out why the system's air flow randomly dips below 600 cfm causing the system to shut down.

Secondary containment piping inspections found no accumulation of liquids.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.95	15.91	557.01	2.16
RW-2	557.0	14.91	15.12	556.77	1.21
RW-3	557.2	12.63	12.66	556.92	1.38
PR-4	556.1	13.41	13.59	556.71	1.30
RW-4	557.0	12.59	12.61	557.12	0.77
RW-5	557.3	12.45	12.56	557.09	6.65
PR-12	564.4		12.57	564.38	5.91
OBA-9AR	556.8	13.27	13.45	556.81	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	19	11
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	22.12	**Diff,Pr**	
FLOW RATE	60	**GPM**	
OBA-9AR TOTALIZER	974643		

PH Readings:				Acid level: 80%
RW-1	6.26			
PR-4	6.71			
PH Adj. Tanks	6.51	7.13	6.92	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 17	CONTRACT NO. **1107 Div 4**	DATE: 04/01/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 38**	**Max: 55**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

The team of Olin, AMEC and Sevenson, along with Carbonaire, are working on collecting data related to the air stripper system to try and figure out why the system's air flow randomly dips below 600 cfm causing the system to shut down. This week we installed sample taps in the ductwork of the stripper at various locations to allow us to collect data regarding pressure drops across the automatic flow valve, the piping run from the blower to the stripper and from the air influent source to the exhaust stack.

We also installed a 1" PVC vent pipe in the influent water line that runs between the 2nd pH adjust tank and the air stripper. Preliminary observations indicate that this vent has helped smooth out the fluctuation in air pressure and flow thru the stripper allowing the unit to be run at a higher water flow rate while keeping the air flow above 750 scfm.

RW-3 had shut down this week briefly on an interlock caused by water in the secondary containment piping Sevenson removed the water and restarted the pump.

Sevenson also used an expandable foam product to seal the secondary containment piping for all the wells at their termination points in the WWTP building at the influent manifold. Chris also repaired the secondary containment seal at the pumping end of RW-3 in hope that it will keep any water from entering from that point.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.68	15.60	557.32	1.26
RW-2	557.0	14.88	15.05	556.82	1.45
RW-3	557.2	12.58	12.64	556.96	1.58
PR-4	556.5	13.12	13.54	556.40	1.30
RW-4	557.0	12.55	12.57	557.16	0.85
RW-5	557.4	12.36	12.43	557.17	6.53

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	32	20	12
	SP#3	**SP#4**	
GAC #2	17	10	7
TOTAL GAC SYSTEM	26.23	**Diff,Pr**	
FLOW RATE	57	**GPM**	

PR-12	557.6		12.40	557.46	4.71
OBA-9AR	556.6	13.79	13.58	556.69	0.90

OBA-9AR TOTALIZER	979544			

PH Readings:				Acid level: 70%
RW-1	6.90			
PR-4	6.71			
PH Adj. Tanks	6.99	7.19	6.91	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 18	CONTRACT NO. **1107 Div 4**	DATE: 04/08/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: rain	**RAINFALL INCHES: 0.50**	**TEMP (Deg F)**	**Min: 31**	**Max: 48**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
The system went down at approx. 2am on Tuesday morning. Chris Jones was onsite in the morning and cleaned out the level sensor in the air stripper sump and restarted the system.
The acid pump for PR-4 also needed to be restarted and primed. It is now running OK.
Rob Meter requested that Chris back wash GAC vessel #1, so he did. .
Secondary containment :
RW-4-trace
PR-12-trace
PR-4- dry
On Thurs/Friday, Chris Jones and Vern will extend the vent pipe for the stripper influent line and connect it to the pH tank exhaust duct work to keep the vent from discharging into the building.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.8	14.46	15.39	557.50	4.02
RW-2	557.4	14.50	14.67	557.15	5.06
RW-3	557.6	12.08	12.12	557.41	3.85
PR-4	557.5	12.25	12.38	557.50	2.20
RW-4	557.4	12.18	12.21	557.57	0.78
RW-5	557.7	11.98	12.05	557.56	6.33
PR-12	557.9		12.05	557.79	5.74
OBA-9AR	556.6	13.79	13.58	556.69	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	20	5
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	9.6 ****	**Diff,Pr**	
FLOW RATE	58	**GPM**	
OBA-9AR TOTALIZER	984693		

PH Readings:				Acid level: 70%
RW-1	7.86			
PR-4	7.01			
PH Adj.	7.12	7.34	7.00	

Tanks				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 19	CONTRACT NO. **1107 Div 4**	DATE: 04/14/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 42**	**Max: 58**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
On 4/11/14 Chris jones Na Vern connected the newly installed air vent to the pH adjustment tank #2 vacuum stack. This resulted in smoother air flow for the stripper.
Acid washed the pump and well at PR-12.
Secondary containment inspection:
RW-4: trace, PR-4: dry, PR-12: trace.

Item 121713.01: Ongoing repairs to monitoring and pumping wells.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.8	15.44	16.39	556.52	3.81
RW-2	557.0	14.85	14.97	556.86	3.98
RW-3	557.3	12.54	12.58	557.04	3.66
PR-4	556.8	12.92	13.11	556.85	2.20
RW-4	557.1	12.45	12.47	557.26	0.69
RW-5	557.4	12.31	12.39	557.20	6.21
PR-12	557.4		12.39	557.45	6.10
OBA-9AR	556.6	13.79	13.58	556.69	0.90

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	20	10
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	15.3 ****	**Diff,Pr**	
FLOW RATE	62	**GPM**	
OBA-9AR TOTALIZER	989439		

PH Readings:				Acid level: 10%
RW-1	6.35			
PR-4	6.82			
PH Adj. Tanks	6.55	6.97	6.58	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 20	CONTRACT NO. **1107 Div 4**	DATE: 04/22/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: .5"**	**TEMP (Deg F)**	**Min: 38**	**Max: 49**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Sevenson was on site to perform repairs on ground water and monitoring wells listed below.
Sevenson was also on site with CamTech Mechanical to perform the replacement of the "demister" in the air stripper exhaust stack.

Item 121713.01: Ongoing repairs to monitoring and pumping wells include:
OBA-6C: The well cap was located in the parking lot and re-mounted in its proper place.
OBA-11A: Top soil and grass seed was put down around the well head where the ground had settled and the well base was elevated.
OBA-15B: The broken hinge was removed and replaced with a new one.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.6	14.83	15.78	557.12	3.31
RW-2	557.0	14.43	14.61	557.27	3.65
RW-3	557.2	11.81	11.85	557.54	3.36
PR-4	556.9	12.52	13.18	557.12	2.30
RW-4	557.4	12.01	12.05	557.70	0.75
RW-5	557.4	12.25	12.31	557.11	6.89
PR-12	557.4		12.39	557.45	6.10
OBA-9AR	556.7	13.78	13.61	556.70	0.90

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	32	20	12
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	12.5 ****	**Diff,Pr**	
FLOW RATE	59	**GPM**	
OBA-9AR TOTALIZER	995977		

PH Readings:				Acid level: 5%
RW-1	8.10			
PR-4	6.71			
PH Adj. Tanks	7.02	7.45	7.56	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 21	CONTRACT NO. **1107 Div 4**	DATE: 04/28/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 41**	**Max: 55**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

The system went down over the weekend; Site staff restarted it after cleaning the level sensor unit on the air stripper. It has been getting dirty more often as of late. This fouling causes the system to shut down on a high sump alarm.

I have included this task below as something that should be done weekly to keep the shutdowns to a minimum.

Secondary containment: PR-12: Trace, RW-4: Trace, PR-4: Dry

Sevenson acid washed PR-12 and re-primed and restarted the acid pump at PR-4.

Item 121713.01: Ongoing repairs to monitoring and pumping wells include: OBA-8C, Chris Jones is researching the well manufacturer for a new lid of that type. When he finds one we will replace the damaged one.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.7	15.55	16.49	556.38	4.10
RW-2	557.0	14.87	14.99	556.81	4.06
RW-3	557.2	12.59	12.63	556.99	3.76
PR-4	556.3	13.30	13.51	556.27	1.80
RW-4	557.1	12.48	12.51	557.22	0.70
RW-5	557.3	12.39	12.44	557.13	7.18
PR-12	557.6		12.42	557.50	6.30
OBA-9AR	556.7	13.78	13.61	556.70	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	21	15	6
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	6.7 ****	**Diff,Pr**	
FLOW RATE	53	**GPM**	
OBA-9AR TOTALIZER	998680		

PH Readings:				Acid level: 85%
RW-1	7.75			
PR-4	6.96			
PH Adj. Tanks	7.62	7.70	7.59	

Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 22	CONTRACT NO. **1107 Div 4**	DATE: 05/06/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 48**	**Max: 60**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Sevenson was instructed to turn down the flow at OBA-9AR to 1 gpm, and did so.
Sevenson turned off the system briefly to remove and clean the level sensor in the air stripper sump. Then restarted the system and made sure everything was operational.
A representative from the NYSDEC was on here for a site visit.
Sevenson (Walker) met on site this afternoon with R. McClure, T. Englund, R. Meyer and J. McClare to discuss the system's operation and future issues.
Sevenson was given the go ahead to perform a media change out in the GAC filters.

Secondary containment: PR-12: Trace, RW-4: Trace, PR-4: Dry

Item 121713.01: Ongoing repairs to monitoring and pumping wells include: OBA-8C, We finally found a replacement for the well head cap at OBA-8C. I ordered it, and it should be here in a couple of days. We will do the repairs as soon as we get the part in.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 050614.01: The leak detection switch cable at PR-12 needs to be adjusted.

Item 050614.02: The wells on site need to be inspected to make sure they are all labeled and secure.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.5	15.74	16.62	556.22	3.91
RW-2	557.0	14.80	14.97	556.88	3.89
RW-3	557.2	12.51	12.55	557.05	4.09
PR-4	556.1	13.47	13.68	556.09	1.80
RW-4	557.1	12.48	12.51	557.22	0.70
RW-5	557.4	12.32	12.38	557.19	6.90
PR-12	557.7		12.38	557.62	5.30
OBA-9AR	556.7	13.76	13.59	556.71	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	15	11	4
TOTAL GAC SYSTEM	3.9 ****	**Diff,Pr**	
FLOW RATE	55	**GPM**	
OBA-9AR TOTALIZER	1005287		

PH Readings:				Acid level: 75%
RW-1	7.12			
PR-4	6.90			
PH Adj. Tanks	6.60	6.62	6.58	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 23	CONTRACT NO. **1107 Div 4**	DATE: 05/13/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: rain AM sun PM	**RAINFALL INCHES: 1" AM**	**TEMP (Deg F)**	**Min: 45**	**Max: 78**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

The pump at RW-5 was off upon arrival Tuesday morning. Chris Jones reset the starter in the MCC. He also acid washed the well while it was down, and again after it was restarted. Now it's running fine. Net week when we shut the system down to clean the air stripper level sensor, we will take apart and inspect and clean the check valve at RW-5.

Chris acid washed PR-12, cleaned the switches for the GAC feed pumps and turned off all of the portable heaters in the wellhead boxes.

The GAC and the drums have been delivered for the carbon change out task. There is a scheduling delay regarding the vac truck to evacuate the existing GAC. We have penciled in a new date of 6/4/14 for the task.

Secondary containment: RW-4: Trace, PR-4: Dry

Item 121713.01: Ongoing repairs to monitoring and pumping wells include: OBA-8C, We finally found a replacement for the well head cap at OBA-8C. I ordered it, and it should be here in a couple of days. We will do the repairs as soon as we get the part in.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 050614.01: The leak detection switch cable at PR-12 has been adjusted and put on line.

Item 050614.02: The wells on site need to be inspected to make sure they are all labeled and secure.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.9	15.31	16.20	556.60	3.82
RW-2	557.5	14.13	14.19	557.54	4.01
RW-3	557.9	11.40	11.48	557.88	4.29
PR-4	556.7	12.67	12.78	556.94	1.80
RW-4	557.6	11.78	11.70	557.93	0.79
RW-5	557.9	11.74	11.84	557.76	7.04

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	19	11	8
	SP#3	**SP#4**	
GAC #2	10	9	1
TOTAL GAC SYSTEM	5.6 ****	**Diff,Pr**	
FLOW RATE	53	**GPM**	

PR-12	557.7		12.38	557.62	5.45
OBA-9AR	556.7	13.76	13.59	556.71	1.20

OBA-9AR TOTALIZER	1009766			

PH Readings:				Acid level: 60%
RW-1	6.91			
PR-4	7.02			
PH Adj. Tanks	6.45	6.42	6.38	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 24	CONTRACT NO. **1107 Div 4**		DATE: 05/20/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 50**	**Max: 65**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73. Sevenson attended the PSR for the secondary containment Switch at PR-12. Acid washed PR-12. Tony Englund requested that the transducer at PR-12 be raised.29' next visit. OBA-8C well cap has been replaced and secured. A vapor lock situation on the acid pump for RW-1 has been corrected. Monitoring and pumping well inspections continue.

Item 121713.01: The new well cap for OBA-8c arrived, it has been installed.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 050614.02: The wells on site need to be inspected to make sure they are all labeled and secure. This has been an ongoing task. It is about 2/3 finished.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.4	15.82	16.75	556.10	4.05
RW-2	557.0	14.88	15.16	556.77	4.14
RW-3	557.2	12.61	12.67	556.92	4.52
PR-4	555.5	14.30	14.52	555.52	1.70
RW-4	557.0	12.50	12.22	557.20	0.77
RW-5	557.3	12.40	12.48	557.08	7.58
PR-12	557.7		12.43	557.60	5.89
OBA-9AR	556.7	13.76	13.59	556.71	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	12	13
	SP#3	**SP#4**	
GAC #2	10	9	1
TOTAL GAC SYSTEM	11.5 ****	**Diff,Pr**	
FLOW RATE	50	**GPM**	
OBA-9AR TOTALIZER	1014988		

PH Readings:				Acid level: 90%
RW-1	6.99			
PR-4	6.96			
PH Adj. Tanks	6.99	6.97	6.86	

Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 25	CONTRACT NO. **1107 Div 4**		DATE: 05/27/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 56**	**Max: 71**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73. The check valve for RW-5 at the header pipe had been disassembled inspected and cleaned. It was reassembled and now works fine. Well and pump at PR-12 and RW-4 were acid washed. Tony Englund sent Sevenson an update report on the wells that need maintenance. Instead of replacing the whole road box for OBA-26A, Sevenson repaired the lid at their fab shop and re-threaded the bolt holes. Well inspections should be complete by June 6.
Secondary containment piping: PR-4 : Dry, RW-4: Trace.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 050614.02: The wells on site need to be inspected to make sure they are all labeled and secure. This has been an ongoing task. Scheduled for completion 6/6/14.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.1	16.10	17.05	555.81	4.22
RW-2	556.9	14.88	15.10	556.77	4.47
RW-3	557.1	12.61	12.65	556.93	4.04
PR-4	555.5	14.01	14.21	555.58	1.70
RW-4	557.0	12.51	12.40	557.17	0.79
RW-5	557.2	12.41	12.49	557.08	6.54
PR-12	557.2		10.48	557.17	5.93
OBA-9AR	556.7	13.75	13.61	556.73	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	26	15	11
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	12.6 ****	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1019348		

PH Readings:				Acid level: 40%
RW-1	6.93			
PR-4	7.05			
PH Adj. Tanks	6.79	6.90	6.81	

Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 26	CONTRACT NO. **1107 Div 4**	DATE: 06/03/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: light rain	**RAINFALL INCHES: >.5"**	**TEMP (Deg F)**	**Min: 49**	**Max: 68**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Sevenson completed a change out of the Carbon media in the GAC polishing units in bldg. 73. The spent GAC is stored in drums in that building. Sevenson will visit the site a few more times to pump off the decanted water from the drums prior to them being ready for shipment to a disposal facility of Olin's choosing.

The well inspections have been completed, see below.

Well PR-12 has been acid washed.

Secondary Containment: RW-4, Trace. PR-4, Dry.

Sevenson is on site Friday 6/6/14 to remove and inspect the pump at PR-4. It would not start up after the GAC change out shut down. A replacement is in stock if needed.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 050614.02: The inspection of the onsite pumping and monitoring wells has been completed. All wells in need of repair and maintenance have been finished.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.7	15.46	16.40	556.46	3.12
RW-2	557.0	14.78	14.91	556.87	4.41
RW-3	557.2	12.54	12.59	557.03	3.46
PR-4	555.8	13.89	14.10	555.84	2.90
RW-4	557.1	12.41	12.47	557.21	0.78
RW-5	557.4	12.22	12.29	557.18	6.51
PR-12	557.1		12.32	557.28	5.55
OBA-9AR	556.7	13.75	13.61	556.73	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	29	10	19
	SP#3	**SP#4**	
GAC #2	10	7	3
TOTAL GAC SYSTEM	12.6 ****	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1023392		

PH Readings:				Acid level: 20%
RW-1	6.47			

PR-4	7.07			
PH Adj. Tanks	6.79	7.07	6.76	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 27	CONTRACT NO. **1107 Div 4**	DATE: 06/10/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: clear, humid	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 61**	**Max: 75**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Sevenson replaced the pump and motor at well PR-4 last Friday. A new one has been ordered to replace the spare.

The acid pump at PR-4 was repaired.

Well PR-12 has been acid washed.

Secondary Containment: RW-4, Trace. PR-4, Dry.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 061014.01: The acid tote in Building 73, that feeds the WWTS, needs to be changed out.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.3	15.89	16.78	556.03	4.73
RW-2	557.1	14.71	14.86	556.91	4.14
RW-3	557.3	12.45	12.50	557.09	3.69
PR-4	556.0	13.15	13.09	556.05	2.20
RW-4	557.2	12.39	12.24	557.30	0.76
RW-5	557.4	12.27	12.34	557.23	6.46
PR-12	557.4		12.31	557.23	5.16
OBA-9AR	556.7	13.75	13.61	556.73	0.90

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	16	11	5
	SP#3	**SP#4**	
GAC #2	15	12	3
TOTAL GAC SYSTEM	5.4 ****	**Diff,Pr**	
FLOW RATE	49	**GPM**	
OBA-9AR TOTALIZER	1027533		

PH Readings:				Acid level: 5%
RW-1	6.78			
PR-4	7.00			
PH Adj. Tanks	6.94	7.18	6.82	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 28	CONTRACT NO. **1107 Div 4**		DATE: 06/17/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: pc, humid	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 68**	**Max: 89**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Sevenson fabricated and installed pipe supports for the new vent line at the air stripper feed pipe.
The 11 drums of spent GAC from the system have been decanted of water and samples of the GAC have been collected for characterization.
The level sensor switch for the air stripper was not removed and cleaned this week at the request of Rob Meyer, as CRA was onsite sampling and they wanted the system operational during this task.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 061014.01: The acid tote in Building 73, that feeds the WWTS, needs to be changed out.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.2	15.92	16.80	556.00	4.04
RW-2	557.2	14.68	14.90	556.96	4.78
RW-3	557.3	12.48	12.53	557.12	3.71
PR-4	556.0	13.39	13.50	556.00	1.90
RW-4	557.2	12.35	12.41	557.32	0.81
RW-5	557.5	12.22	12.28	557.27	6.48
PR-12	557.2		12.25	557.27	5.11
OBA-9AR	556.7	13.78	13.62	556.73	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	18	12	6
	SP#3	**SP#4**	
GAC #2	10	7	3
TOTAL GAC SYSTEM	8.0 ****	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1032666		

PH Readings:				Acid level: 80%
RW-1	7.04			
PR-4	7.15			
PH Adj. Tanks	6.90	7.11	6.99	
Air Stripper level Sensor Cleaned? NO				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 29	CONTRACT NO. **1107 Div 4**	DATE: 06/25/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: >.5"**	**TEMP (Deg F)**	**Min: 62**	**Max: 80**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Upon Arrival on Tuesday, the system was down due to a High Level alarm at 7S sump. Chris restarted the system. RW-3 remained down due to an alarm condition in the RW-3 secondary containment piping. Chris bailed out the water and the well was restarted.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 061014.01: The acid tote in Building 73, has been changed over to a new tote.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.1	15.11	16.05	556.79	3.07
RW-2	557.0	14.80	14.96	556.84	4.28
RW-3	557.2	12.62	12.65	556.97	3.61
PR-4	556.3	13.28	13.41	556.36	2.40
RW-4	557.1	12.44	12.47	557.24	0.75
RW-5	557.3	12.32	12.39	557.15	7.43
PR-12	557.3		12.33	557.26	5.38
OBA-9AR	556.7	13.78	13.62	556.73	1.00

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	16	10	6
	SP#3	**SP#4**	
GAC #2	9	7	2
TOTAL GAC SYSTEM	8.0 ****	**Diff,Pr**	
FLOW RATE	45	**GPM**	
OBA-9AR TOTALIZER	1038280		

PH Readings:				Acid level: 100%
RW-1	7.98			
PR-4	7.04			
PH Adj. Tanks	7.66	7.78	7.51	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 31	CONTRACT NO. **1107 Div 4**		DATE: 07/08/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 62**	**Max: 79**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Sevenson was on site Sunday 7/6/14 to trouble shoot and restart the RW-3 well pump.
The pH in PR-4 is neutral, no acid was needed.
The area where birds moved into the building and made a mess was cleaned up
.RW-4 Secondary containment showed a trace of liquid, not enough to bail or trigger an alarm.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 070114.01: The new acid pump for PR-4 has arrived. We will install it next week.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.5	15.72	16.65	556.21	3.91
RW-2	557.0	14.81	14.93	556.87	4.83
RW-3	557.2	12.52	12.57	557.06	4.07
PR-4	556.1	13.46	13.67	556.10	2.30
RW-4	557.1	12.47	12.50	557.20	0.74
RW-5	557.4	12.30	12.34	557.21	9.05
PR-12	557.6		12.21	557.41	5.64
OBA-9AR	556.7	13.76	13.60	556.72	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	15	15
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	18.7 ****	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1086416		

PH Readings:				Acid level: 15%
RW-1	7.08			
PR-4	7.21			
PH Adj. Tanks	7.30	7.43	7.40	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 32	CONTRACT NO. **1107 Div 4**		DATE: 07/15/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 67**	**Max: 80**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Chris Jones installed the new acid pump at PR-4.
Chris acid washed PR-12.
RW-4 Secondary containment piping: Trace.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

Item 070114.01: The new acid pump for PR-4 has been installed and is on line. (Manual)

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.3	15.87	16.80	556.04	3.39
RW-2	557.1	14.72	14.84	556.90	3.65
RW-3	557.3	12.46	12.51	557.08	3.85
PR-4	556.0	13.18	13.54	556.06	2.00
RW-4	557.2	12.39	12.25	557.30	0.75
RW-5	557.4	12.27	12.33	557.24	9.15
PR-12	557.4		12.30	557.23	5.01
OBA-9AR	556.7	13.78	13.63	556.75	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	10	10
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	6.3 ****	**Diff,Pr**	
FLOW RATE	50	**GPM**	
OBA-9AR TOTALIZER	1055351		

PH Readings:				Acid level: 80%
RW-1	7.11			
PR-4	7.02			
PH Adj. Tanks	7.14	7.33	7.29	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 33	CONTRACT NO. **1107 Div 4**	DATE: 07/22/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 71**	**Max: 88**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Removed pump from PR-12 cleaned off the mucky buildup around the pump and screen and acid washed the unit.
M.Walker submitted estimated cost to pressure test RW-3 piping.

RW-4 Secondary containment piping: Trace.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.2	15.92	16.84	556.01	3.15
RW-2	557.2	14.70	14.89	556.95	3.02
RW-3	557.3	12.47	12.55	557.14	3.45
PR-4	556.0	13.39	13.51	556.00	2.20
RW-4	557.2	12.36	12.42	557.33	0.72
RW-5	557.5	12.23	12.30	557.27	9.30
PR-12	557.2		12.27	557.27	5.45
OBA-9AR	556.7	13.80	13.62	556.73	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	8	12
	SP#3	**SP#4**	
GAC #2	15	11	4
TOTAL GAC SYSTEM	11.1 ****	**Diff,Pr**	
FLOW RATE	50	**GPM**	
OBA-9AR TOTALIZER	1060513		

PH Readings:				Acid level: 80%
RW-1	6.81			
PR-4	6.70			
PH Adj. Tanks	7.02	7.18	7.20	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 34	CONTRACT NO. **1107 Div 4**		DATE: 07/29/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 56**	**Max: 70**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Acid washed RW-4 and PR-12.

Opened up the inspection port on the air stripper, observed some accumulation of solids in the trays. We should keep an eye on the air flow rate and the air pressure in the stripper and look for a trend indicating plugging of the trays and how best to clean them with minimal downtime. I would suggest the "Acid Magic" soak overnight followed by the use of a power washer the next morning to open up the perforations in the trays. I welcome any comments.

Mike Walker will try to set up a time next week when John Gabryelski can inspect Camtech' s testing equipment for use on the week of the 11th.

RW-4 Secondary containment piping: Trace.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.6	15.50	16.61	556.39	2.78
RW-2	557.1	14.67	14.81	556.92	3.56
RW-3	557.1	12.62	12.68	556.98	2.97
PR-4	556.4	13.12	13.55	556.40	2.30
RW-4	557.3	12.21	12.35	557.43	0.89
RW-5	557.5	12.18	12.25	557.31	7.27
PR-12	557.2		12.24	557.25	5.78
OBA-9AR	556.6	13.83	13.66	556.75	1.10

PH				Acid level: 65%

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	18	7
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	13.9 ****	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1065522		

Readings:				
RW-1	6.74			
PR-4	6.64			
PH Adj. Tanks	7.07	7.04	7.13	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 35	CONTRACT NO. **1107 Div 4**	DATE: 08/06/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 62**	**Max: 77**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Acid washed RW-4 and PR-12.

Chris Jones was on site for a couple of days troubleshooting the air stripper. Sevenson performed maintenance on the air stripper trays by using an acid based cleaner and a power washer to remove scale from the trays that was plugging the air holes and causing pressure to build and flow rates to drop. Since the cleaning, the air flow rate has been around 800 SCFM, which is an improvement and within the required range.

During his inspection, Chris also noted that the GAC vessels need to be backwashed.

The acid tote for the system needed to be changed, and had been changed on or about 8/8/14, thank you.

Rob Meyer had noticed that there was a small crack in a PVC fitting on the acid pump that feeds acid into RW-2 for pH control. The pump has been shut down and he is checking to see if Olin has staff available to make the repair.

RW-4 Secondary containment piping: Trace.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.0	15.18	16.10	556.75	2.44
RW-2	557.1	14.62	14.75	556.95	3.70
RW-3	557.3	12.35	12.42	557.13	3.31
PR-4	556.5	13.21	13.58	556.50	2.60
RW-4	557.3	12.20	12.31	557.45	0.71
RW-5	557.5	12.19	12.29	557.31	7.05
PR-12	557.3		12.20	557.39	5.29
OBA-9AR	556.5	13.70	13.58	556.50	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	35	19	16
	SP#3	**SP#4**	
GAC #2	15	9	6
TOTAL GAC SYSTEM	21.1 ****	**Diff,Pr**	
FLOW RATE	59	**GPM**	
OBA-9AR TOTALIZER	1071666		

PH Readings:				Acid level: 5%
RW-1	6.59			
PR-4	6.66			
PH Adj. Tanks	7.34	7.42	6.99	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 36	CONTRACT NO. **1107 Div 4**		DATE: 08/12/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 68**	**Max: 80**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Sevenson and Camtech were on site this week to perform the Hydro-Static test on the pipe between RW-3 and the influent manifold. The piping was tested at both 120 psi and 60 psi, both tests showed no leakage in the pipe between the manifold and the well box.

The next step may be to somehow test the secondary containment piping to see if somehow ground water is getting in to the piping via a crack in the outer piping. I am discussing with Camtech how best to do this, if possible.

The system went down on Monday evening due to the air stripper sump's high level switch not triggering. That switch gets cleaned and inspected every week as part of weekly maintenance. Chris was on site Tuesday to clean and inspect the switch and restart the system. He thinks maybe the RW-3 testing broke loose some sludge or material that mucked up the switch and caused the shutdown. System fully operational on Tuesday.

Acid washed PR-12.

RW-4 Secondary containment piping: Trace.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.7	15.57	16.50	556.44	3.53
RW-2	557.1	14.67	14.79	556.91	4.97
RW-3	557.3	12.39	12.43	557.10	3.04
PR-4	556.3	13.22	13.63	556.51	2.50
RW-4	557.2	12.27	12.35	557.38	0.96
RW-5	557.4	12.24	12.30	557.52	8.07
PR-12	557.3		12.25	557.34	6.40
OBA-9AR	556.7	13.58	13.30	556.75	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	15	15
	SP#3	**SP#4**	
GAC #2	15	9	6
TOTAL GAC SYSTEM	17.8 ****	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1076051		

PH Readings:				Acid level: 30%
RW-1	7.11			
PR-4	6.40			
PH Adj. Tanks	7.50	7.46	7.47	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 37	CONTRACT NO. **1107 Div 4**		DATE: 08/19/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 63**	**Max: 76**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Chris jones reported that the system ran well this week.
Inspection notes include: Acid washed wells PR-12 and RW-4.
RW-4 secondary containment piping had 1 liter of water in it, most likely built up over time. C. Jones removed it with a disposable bailer.
Rob M. is off next week, we requested that he give George our e-mail addresses in case any issues should arise.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.5	15.72	16.68	556.20	3.25
RW-2	557.0	14.81	14.91	556.87	4.84
RW-3	557.2	12.51	12.56	557.06	3.40
PR-4	556.1	13.46	13.67	556.11	2.50
RW-4	557.1	12.46	12.51	557.20	0.87
RW-5	557.4	12.31	12.35	557.21	7.91
PR-12	557.6		12.21	557.42	6.53
OBA-9AR	556.7	13.76	13.60	556.72	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	15	15
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	15.2 ****	**Diff,Pr**	
FLOW RATE	56	**GPM**	
OBA-9AR TOTALIZER	1082345		

PH Readings:				Acid level: 25%
RW-1	6.59			
PR-4	6.26			
PH Adj. Tanks	7.28	7.20	7.26	

Air Stripper level Sensor Cleaned? YES

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 38	CONTRACT NO. **1107 Div 4**	DATE: 08/25/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 67**	**Max: 83**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Inspection notes include: Acid washed well PR-12
RW-4 secondary containment piping 250 ml of water in it, C. Jones removed it with a disposable bailer.
PN1A was supposed to be checked for floating product with a bailer. The piezometer is 1.50", our standard bailer will not fit. We ordered smaller diameter bailers for this task; they will be in on Friday. We will then check PN1A, remove and containerize any product and report our findings to the team.
Overall, the system was running fine.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.6	15.50	16.59	556.40	2.89
RW-2	557.1	14.69	14.80	556.90	4.91
RW-3	557.1	12.62	12.65	556.98	2.90
PR-4	556.4	13.11	13.39	556.40	2.40
RW-4	557.3	12.21	12.27	557.42	0.93
RW-5	557.5	12.18	12.22	557.31	7.91
PR-12	557.2		12.24	557.25	5.75
OBA-9AR	556.6	13.83	13.65	556.75	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	15	10
	SP#3	**SP#4**	
GAC #2	16	5	11
TOTAL GAC SYSTEM	13.4 ****	**Diff,Pr**	
FLOW RATE	50	**GPM**	
OBA-9AR TOTALIZER	1087478		

PH Readings:				Acid level: 80%
RW-1	6.82			
PR-4	6.34			
PH Adj. Tanks	7.01	7.08	7.14	

Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 39	CONTRACT NO. **1107 Div 4**		DATE: 09/02/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 61**	**Max: 79**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Inspection notes include: Acid washed well PR-12 and RW-3.

RW-4 secondary containment piping, just a trace amount.

PN1A: Last Friday, Chris Jones bailed the top part of the water column. There was a light sheen floating on top of fairly clear water. He then pumped out the water from the bottom of the column; this water was black, seemingly from solids building up at the bottom of the well.
He performed the same routine on the following Tuesday (9/2/14), and found the same results. Tony has suggested we continue monitoring this well, at least for another week during our inspections.

Carbon beds could use a back washing.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.7	15.57	16.52	556.45	3.60
RW-2	557.1	14.67	14.78	556.92	5.00
RW-3	557.3	12.40	12.44	557.10	2.68
PR-4	556.3	13.21	13.59	556.52	2.40
RW-4	557.2	12.26	12.29	557.40	0.92
RW-5	557.4	12.24	12.31	557.53	7.85
PR-12	557.3		12.25	557.35	5.65
OBA-9AR	556.7	13.58	13.30	556.75	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	35	19	16
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	22.9 ****	**Diff,Pr**	
FLOW RATE	51	**GPM**	
OBA-9AR TOTALIZER	1094023		

PH Readings:				Acid level: 5%
RW-1	6.84			

PR-4	6.40			
PH Adj. Tanks	7.15	7.12	7.22	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 40	CONTRACT NO. **1107 Div 4**	DATE: 09/09/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 62**	**Max: 76**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Inspection notes include: Acid washed well PR-12 and RW-3.

RW-4 secondary containment piping, just a trace amount.

PN1A: This well had a very light sheen on top of the water column.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.8	15.55	16.49	556.55	3.36
RW-2	557.2	14.49	14.58	557.05	5.12
RW-3	557.5	12.21	12.26	557.30	3.18
PR-4	556.9	13.25	13.41	556.44	2.40
RW-4	557.3	12.11	12.15	557.52	0.91
RW-5	557.6	12.06	12.12	557.43	7.82
PR-12	557.4		12.07	557.54	5.89
OBA-9AR	556.7	13.57	13.33	556.74	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	10	10
	SP#3	**SP#4**	
GAC #2	10	9	1
TOTAL GAC SYSTEM	10.5 ****	**Diff,Pr**	
FLOW RATE	46	**GPM**	
OBA-9AR TOTALIZER	1101887		

PH Readings:				Acid level: 50%
RW-1	7.01			
PR-4	6.34			
PH Adj. Tanks	7.41	7.38	7.42	

Air Stripper level Sensor Cleaned? YES

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 41	CONTRACT NO. **1107 Div 4**	DATE: 09/16/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: mostly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 47**	**Max: 68**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

The air stripper was running at an average of 710 CFM. Chris shut it down and coated the trays with "Acid Magic" solution, let it sit and work its way into the perforations while he cleaned the level sensor. Then for another 30 minutes after that. He turned the blower on for about 10 minutes before he started the well pumps. When everything was on line, the air flow was now at 785 CFM. The pressure in the GAC units nearly doubled, he backwashed them immediately. After that the system ran smoothly in all aspects.

Inspection notes include:
Acid washed well PR-12
RW-4 secondary containment piping, bailed out approx. 500 ml of water
PN1A: This well had a very light sheen on top of the water column. Chris will use a peristaltic pump to purge the well on Friday , 9/19/14.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.8	15.57	16.53	556.57	3.21
RW-2	557.2	14.50	14.61	557.07	4.67
RW-3	557.5	12.24	12.29	557.31	3.65
PR-4	556.3	13.40	13.51	556.32	2.50
RW-4	557.4	12.19	12.25	557.59	0.90
RW-5	557.7	12.06	12.11	557.40	9.34
PR-12	557.4		12.17	557.54	5.65
OBA-9AR	556.7	13.60	13.35	556.74	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	19	1
	SP#3	**SP#4**	
GAC #2	15	9	6
TOTAL GAC SYSTEM	8.5 ****	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1109124		

PH Readings:				Acid level: 5%
RW-1	7.13			
PR-4	6.79			
PH Adj. Tanks	7.23	7.18	7.26	
Air Stripper level Sensor Cleaned? YES				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 42	CONTRACT NO. **1107 Div 4**	DATE: 09/24/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 43**	**Max: 71**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Chris Jones was onsite this week to escort and assist surveyors in their well surveying tasks at the request of Olin.

Inspection notes include:
Acid washed well PR-12 and RW-4
RW-4 secondary containment piping: Trace

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.6	15.81	16.74	556.36	3.20
RW-2	557.1	14.61	14.78	556.89	4.13
RW-3	557.3	12.50	12.55	557.05	3.27
PR-4	556.5	13.12	13.30	556.56	2.30
RW-4	557.2	12.28	12.36	557.36	0.84
RW-5	557.4	12.22	12.28	557.24	8.24
PR-12	557.5		12.20	557.38	5.53
OBA-9AR	556.7	13.60	13.35	556.74	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	21	11	10
	SP#3	**SP#4**	
GAC #2	10	6	4
TOTAL GAC SYSTEM	11.4 ****	**Diff,Pr**	
FLOW RATE	48	**GPM**	
OBA-9AR TOTALIZER	1116828		

PH Readings:				Acid level: 70%
RW-1	6.77			
PR-4	6.93			
PH Adj. Tanks	7.31	7.22	7.16	

Air Stripper level Sensor Cleaned? YES

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 43	CONTRACT NO. **1107 Div 4**	DATE: 09/30/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 49**	**Max: 69**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Monday the acid tote in building 73 went dry. The acid pump for RW1 was left running with no acid. The tote was changed. Chris released the vapor lock from pump and for a short time acid was being pumped out to well. He noticed after a while the pH was increasing again in RW1, went out to well and no acid was getting to well. He again released vapor lock and acid was going out to well. This happened several times throughout the day. I'm wondering if the acid pump is shot. We did change the membrane and oil in it not too long ago. Rob Meyer email us Thursday am and let us know he slowed the flow rate of RW-1 down to about 2 gpm and the pH was holding at 6.5

The acid drum in PR4 shed needs to be changed out.

RW4 secondary containment – I bailed approximately 500 mL

Acid washed PR12

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.7	15.57	16.50	556.44	2.87
RW-2	557.1	14.67	14.79	556.91	4.83
RW-3	557.3	12.39	12.43	557.10	3.15
PR-4	556.3	13.22	13.63	556.51	2.40
RW-4	557.2	12.27	12.35	557.38	0.89
RW-5	557.4	12.24	12.30	557.52	8.78
PR-12	557.3		12.25	557.34	5.67
OBA-9AR	556.7	13.58	13.30	556.75	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	20	10
	SP#3	**SP#4**	
GAC #2	15	9	6
TOTAL GAC SYSTEM	16.5 ****	**Diff,Pr**	
FLOW RATE	51	**GPM**	
OBA-9AR TOTALIZER	1123122		

PH Readings:				Acid level: 70%
RW-1	9.89			
PR-4	7.34			
PH Adj. Tanks	8.02	7.56	7.62	
Air Stripper level Sensor Cleaned? no				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 44	CONTRACT NO. **1107 Div 4**	DATE: 10/10/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 41**	**Max: 55**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Other Notes and Observations:

The acid drum in PR4 shed needs to be changed out.

RW4 secondary containment – I bailed approximately 500 mL.

Acid washed PR12.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.0	14.99	15.93	556.76	1.79
RW-2	557.0	14.69	14.81	556.32	5.12
RW-3	557.3	12.48	12.55	557.08	3.13
PR-4	556.5	13.02	13.42	556.55	2.20
RW-4	557.2	12.31	12.37	557.33	0.73
RW-5	557.4	12.35	12.41	557.19	8.39
PR-12	557.4		12.29	557.31	6.20
OBA-9AR	556.7	13.60	13.32	556.73	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	31	20	11
	SP#3	**SP#4**	
GAC #2	16	5	11
TOTAL GAC SYSTEM	18.6 ****	**Diff,Pr**	
FLOW RATE	50	**GPM**	
OBA-9AR TOTALIZER	1127359		

PH Readings:				Acid level: 40%
RW-1	6.43			
PR-4	7.12			
PH Adj. Tanks	6.99	7.08	6.99	
Air Stripper level Sensor Cleaned? no				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 45	CONTRACT NO. **1107 Div 4**		DATE: 10/14/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 61**	**Max: 75**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
The acid drum in PR4 shed needs to be changed out.
RW4 secondary containment – Trace of liquid.
Acid washed PR12.
Pulled the pump at RW-3for inspection. Acid washed the pump, (it was already relatively clean).
Inspected and tested the space heaters in well boxes at RW-1, RW-2 and PR-12. They are all in working condition, ready for winter.
Pulled the pump in RW-1 as the flow has been trending downward in the last couple of weeks. After an acid wash of the pump, the flow did not improved much. We may need to change out the pump in the next couple of weeks; we have a spare in stock now for that eventuality.
Took some supplemental water level measurements at the request of Tony Englund.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.0	15.20	16.11	556.75	1.56
RW-2	557.1	14.62	14.76	556.97	5.19
RW-3	557.3	12.37	12.41	557.12	3.45
PR-4	556.5	13.20	13.51	556.51	2.40
RW-4	557.3	12.20	12.32	557.46	0.78
RW-5	557.5	12.20	12.28	557.32	8.11
PR-12	557.3		12.22	557.38	6.34
OBA-9AR	556.5	13.70	13.58	556.50	1.10

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	20	10
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	15.4 ****	**Diff,Pr**	
FLOW RATE	56	**GPM**	
OBA-9AR TOTALIZER	1131597		

PH Readings:				Acid level: 20%

RW-1	6.71			
PR-4	7.14			
PH Adj. Tanks	7.23	7.13	7.02	
Air Stripper level Sensor Cleaned? yes				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 46	CONTRACT NO. **1107 Div 4**	DATE: 10/21/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 45**	**Max: 60**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
RW4 secondary containment – Trace of liquid.
Acid washed PR12 and PR-4. The flow at PR-4 has dropped from 2.4 gpm to 2.2 gpm, Chris manually added acid in hopes of increasing the flow slightly.
Chris replaced the pump at RW-1 on Friday due to decreasing flow rate. Upon inspection , it needed replacement. A new back up has been ordered.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.0	15.19	16.15	556.74	1.32
RW-2	557.0	14.68	14.81	556.33	5.31
RW-3	557.3	12.46	12.50	557.09	3.19
PR-4	556.5	13.04	13.39	556.56	2.20
RW-4	557.2	12.32	12.39	557.36	0.83
RW-5	557.4	12.37	12.43	557.21	8.19
PR-12	557.4		12.27	557.33	6.58
OBA-9AR	556.7	13.67	13.35	556.75	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	32	20	12
	SP#3	**SP#4**	
GAC #2	17	11	6
TOTAL GAC SYSTEM	15.9 ****	**Diff,Pr**	
FLOW RATE	53	**GPM**	
OBA-9AR TOTALIZER	1138790		

PH Readings:				Acid level: 10%
RW-1	6.24			
PR-4	7.19			
PH Adj. Tanks	7.20	7.13	7.38	

Air Stripper level Sensor Cleaned? yes				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 47	CONTRACT NO. **1107 Div 4**	DATE: 10/28/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 55**	**Max: 70**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Other notes and observations:

After shutting down the system for the weekly level sensor cleaning and maintenance, Sevenson opened up the inspection ports on the air stripper and sprayed dilute HCl on the trays. Then let the acid sit and soak in for 1 hour, then turned on the air only for 20 min. before turning on the wells. The air flow rose from 660 cfm to over 800 after the cleaning.

Acid washed PR-12

RW-4 had a trace of water in the secondary containment piping. No action was taken.

Rob Meyer noticed some irregularities in the pumping cycle at RW-1 and made some valve adjustments.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.92	15.81	556.86	4.17
RW-2	556.9	14.85	15.07	556.66	5.50
RW-3	557.2	12.58	12.62	556.98	2.50
PR-4	556.3	13.36	13.67	556.28	2.20
RW-4	557.0	12.51	12.41	557.13	0.74
RW-5	557.3	12.42	12.49	557.08	6.68
PR-12	557.4		12.48	557.15	5.53
OBA-9AR	557.1	12.81	12.95	557.09	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	9.3 ****	**Diff,Pr**	
FLOW RATE	55	**GPM**	
OBA-9AR TOTALIZER	1145538		

PH Readings:				Acid level: 80%
RW-1	6.27			
PR-4	7.10			

PH Adj. Tanks	8.05	7.73	7.64	
Air Stripper level Sensor Cleaned? yes				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 49	CONTRACT NO. **1107 Div 4**	DATE: 11/11/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: Sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 55**	**Max: 64**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
Checked RW-4 Secondary containment piping: trace
Acid washed PR-12

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	556.8	14.86	16.18	556.52	1.68
RW-2	556.8	14.86	15.90	556.64	5.42
RW-3	557.0	12.81	12.79	556.79	2.46
PR-4	56.3	13.29	13.51	556.30	2.2
RW-4	557.0	12.48	12.38	557.16	0.58
RW-5	557.1	12.48	12.25	557.02	1.65
PR-12	557.4	---	12.42	557.15	6.17
OBA-9AR	556.3	13.83	12.99	556.58	1.30

CARBON VESSEL PRESSURE READINGS				
	SP#1	**SP#2**	**dP**	
GAC #1	27	16		
	SP#3	**SP#4**		
GAC #2	14	9		
TOTAL GAC SYSTEM	16.5	**Diff,Pr**		
FLOW RATE	44	**GPM**		
OBA-9AR TOTALIZER	1159026	1.3		

PH Readings:				Acid level: 80%
RW-1	7.40			
PR-4	7.17			
PH Adj. Tanks	7.84	7.73	7.62	
Air Stripper level Sensor Cleaned? Yes				

Vern

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 50	CONTRACT NO. **1107 Div 4**	DATE: 11/17/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast light snow	**RAINFALL INCHES: < .10**	**TEMP (Deg F)**	**Min: 15**	**Max: 34**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
Checked RW-4 Secondary containment piping: Approx 500 ml.
Acid washed PR-12.
Turned on portable heaters in RW-1, RW-2 and PR-12.
Primed the acid pump in the PR-4 shed.
Released vapor lock in the acid pump for RW-1.
Did not clean the level switch in the air stripper this week. Rob had just got the system back on line and we were struggling with the pH, so we thought it best to leave the system running.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.1	14.72	15.80	556.85	1.20
RW-2	556.9	14.81	14.96	556.69	5.72
RW-3	557.1	12.75	12.79	556.84	2.44
PR-4	556.7	12.92	13.18	556.70	2.2
RW-4	557.1	12.49	12.43	557.18	0.50
RW-5	557.2	12.43	12.50	557.08	7.60
PR-12	557.4	---	12.48	557.18	6.25
OBA-9AR	557.1	12.05	12.96	557.09	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	19	6
	SP#3	**SP#4**	
GAC #2	19	15	4
TOTAL GAC SYSTEM	11.8	**Diff,Pr**	
FLOW RATE	51	**GPM**	
OBA-9AR TOTALIZER	1164622		

PH Readings:				Acid level: 90%
RW-1	6.98			
PR-4	7.04			

PH Adj. Tanks	7.12	7.30	6.98	
Air Stripper level Sensor Cleaned? no				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 51	CONTRACT NO. **1107 Div 4**	DATE: 11/25/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 33**	**Max: 39**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
The connecting fitting on RW-1 pump came loose and the hose disconnected inside the well. Sevenson reattached the hose fitting to the pump. Now it is working fine.
Checked RW-4 Secondary containment piping: Trace of liquid (water)
Acid washed PR-12.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.1	14.95	16.01	556.82	2.52
RW-2	556.9	14.84	15.02	556.77	5.00
RW-3	557.3	12.46	12.51	557.10	2.16
PR-4	556.4	13.05	13.37	556.39	2.1
RW-4	557.1	12.53	12.49	557.20	0.64
RW-5	557.2	12.43	12.50	557.08	8.62
PR-12	557.3	---	12.43	557.22	6.14
OBA-9AR	557.1	12.15	12.93	557.13	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	15	10
	SP#3	**SP#4**	
GAC #2	14	6	8
TOTAL GAC SYSTEM	22.8	**Diff,Pr**	
FLOW RATE	53	**GPM**	
OBA-9AR TOTALIZER	1172527		

PH Readings:				Acid level: 50%
RW-1	6.59			
PR-4	7.03			
PH Adj. Tanks	8.16	7.52	7.42	
Air Stripper level Sensor Cleaned? Yes				

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 52	CONTRACT NO. **1107 Div 4**	DATE: 12/02/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: overcast	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 22**	**Max: 31**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Other notes and observations:

Arrived on site Tuesday, the pH in RW-1 was at 9. Inspected the acid pump and the pH probe, both checked out OK. Suspect that there is a plume of high pH liquid underground that has found its way to RW-1. Chris added acid to the well itself to knock down the pH and normalize things; however the pH eventually started to increase again to 9.5.

Chris also dialed up the acid injection pump. After a couple of hours, the pH started to drop and then stabilize at about 7.25. Rob Meyer said that he would monitor this and notify of any changes.

We received a "heads up" email from Rob Meyer this week regarding high air flow activity in the air stripper. There seemed to be no mechanical cause for the increases flow readings on the meter. The blower RPM and the motor speed was apparently unchanged. (Judging by the sound of the unit, and valve positions). The readings were monitored and eventually stabilized by days end.

We received a call on Thurs. 12/4/14 that RW-1 was operating, but there was no flow on the meter. Chris Jones went to the site to inspect it. When he got there, RW-1 was operating at 0.9 gpm. He opened the control valve on the manifold and the flow went up to 2.5 gpm, and then steadily dropped. He then shut it down and removed the pump for inspection and cleaning. After reinstallation, the pump ran at 4.5 gpm wide open. He adjusted the flow to 2.5 gpm and the corresponding acid pump to match that flow to control the pH. Possible cause for the flow drop may have been solids clogging in the piping to the manifold. RW-1 was operating fine upon departure from site.

Checked RW-4 Secondary containment piping: Approx. 250 ml
Acid washed PR-12 and RW-4.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.0	15.20	16.18	556.77	1.45
RW-2	557.0	14.70	14.94	556.39	5.20
RW-3	557.3	12.47	12.54	557.11	1.99
PR-4	556.5	13.06	13.44	556.50	2.2
RW-4	557.2	12.33	12.39	557.38	0.60
RW-5	557.4	12.39	12.45	557.22	7.44
PR-12	557.4	---	12.30	557.35	6.58
OBA-9AR	556.8	13.70	13.36	556.75	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	29	15	14
	SP#3	**SP#4**	
GAC #2	15	7	8
TOTAL GAC SYSTEM	19.7	**Diff,Pr**	
FLOW RATE	44	**GPM**	
OBA-9AR TOTALIZER	1177314		

PH Readings:				Acid level: 80%
RW-1	7.23			
PR-4	6.78			
PH Adj. Tanks	7.19	7.01	7.11	
Air Stripper level Sensor Cleaned? Yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 53	CONTRACT NO. **1107 Div 4**	DATE: 12/09/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 36**	**Max: 40**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
The flow rate on RW-1 is inconsistent. The issue seems to be generating from the flow control valve. Chris has contacted Rob Meyer about either Olin Maintenance or Sevenson replacing the valve. There is discussion about the best type of valve to use for this application.

Checked RW-4 Secondary containment piping: Approx. Trace of Liquid.
Acid washed RW-1, PR-12 and RW-4.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.93	15.85	556.89	2.13
RW-2	556.9	14.83	15.02	556.69	5.11
RW-3	557.2	12.58	12.61	557.01	1.67
PR-4	556.3	13.38	13.60	556.31	2.1
RW-4	557.0	12.52	12.55	557.15	0.71
RW-5	557.3	12.43	12.46	557.10	7.05
PR-12	557.4	---	12.48	557.17	5.48
OBA-9AR	557.0	12.81	12.96	557.11	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	23	12	11
	SP#3	**SP#4**	
GAC #2	15	5	10
TOTAL GAC SYSTEM	17.7	**Diff,Pr**	
FLOW RATE	47	**GPM**	
OBA-9AR TOTALIZER	1184606		

PH Readings:				Acid level: 40%
RW-1	7.89			
PR-4	4.89			
PH Adj. Tanks	7.23	7.56	7.65	

Air Stripper level Sensor Cleaned? Yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 54	CONTRACT NO. **1107 Div 4**	DATE: 12/16/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: rain, overcast	**RAINFALL INCHES: <1”**	**TEMP (Deg F)**	**Min: 34**	**Max: 43**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Other notes and observations:

Rob Meyer and Chris Jones continued to troubleshoot the pump at RW-5, eventually replacing it on Tuesday. It is now pumping; however there is a small internal leak near the pitless connector, spraying some water back into the well. We are investigating the cause and the remedy for this leak. I the meantime the well is pumping fine at the desired flow.

On Tuesday night, the system went down multiple times due to low air flow alarms. . Olin staff cleaned the sight glass and the level switch of sediment and got the system running , there was a restart issue with RW-1. On Thursday morning an Olin operator restarted RW-1, Rob balanced flow and monitored the pH . It seems to be running fine now.

Chris Jones is also on site Thursday to repair the well box at OBA25B, as requested. He will also clean and seal the air stripper intake louvers with silicone to seal it against the weather.

Chris Acid washed RW-4 and PR-12,

RW-4 Secondary containment was about 500 ml. of water.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.92	15.81	556.82	1.87
RW-2	556.9	14.84	15.05	556.65	6.11
RW-3	557.2	12.55	12.59	557.03	1.71
PR-4	556.3	13.40	13.54	556.38	2.1
RW-4	557.0	12.47	12.44	557.18	0.83
RW-5	557.3	12.38	12.46	557.08	8.91
PR-12	557.4	---	12.46	557.15	5.89
OBA-9AR	557.0	12.79	12.95	557.13	1.40

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	15	10	5
	SP#3	**SP#4**	
GAC #2	11	10	1
TOTAL GAC SYSTEM	9.8	**Diff,Pr**	
FLOW RATE	42	**GPM**	
OBA-9AR TOTALIZER	119068		

PH Readings:				Acid level: 10%
RW-1	8.56			
PR-4	7.13			
PH Adj. Tanks	7.02	7.58	7.77	
Air Stripper level Sensor Cleaned? Yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 55	CONTRACT NO. **1107 Div 4**		DATE: 12/23/14	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 38**	**Max: 47**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Other notes and observations:

The newly installed pump at RW-5 stopped pumping on Monday 12/22/14. Rob and Chris are troubleshooting the well pump. The lines were flushed and the electric power seems OK. They have set up for a crane to assist in the removal of the pump for next Tuesday. They will then inspect the pump itself and also the well to see if there is a major buildup of sediments that could be inhibiting flow and tripping out the motor. Rick McClure has been notified about the potential down time of the well. Tony Englund has been notified and is going to check on the depth of the well as installed vs. the sounded depth today.

Chris acid washed PR-12.

A trace of water was measured in the secondary containment piping at RW-4.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.1	14.90	15.84	556.84	1.72
RW-2	556.9	14.82	15.11	556.69	5.12
RW-3	557.2	12.54	12.59	557.01	1.68
PR-4	556.3	13.42	13.51	556.40	2.2
RW-4	557.1	12.48	12.50	557.22	0.73
RW-5					
PR-12	557.3	---	12.48	557.17	5.67
OBA-9AR	557.0	12.80	12.97	557.15	1.40

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	15	10
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	11.3	**Diff,Pr**	
FLOW RATE	43	**GPM**	
OBA-9AR TOTALIZER	1198675		

PH Readings:				Acid level: 50%
RW-1	7.12			

PR-4	7.37			
PH Adj. Tanks	7.12	7.77	7.60	
Air Stripper level Sensor Cleaned? Yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 56	CONTRACT NO. **1107 Div 4**	DATE: 12/30/14		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 21**	**Max: 25**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Other notes and observations:

Troubleshooting continued on the well pump at RW-5. Sevenson pulled the pump and asked Olin electricians to replace the leads due to some visual damage that was apparent. The pump was reinstalled and ran strong; however there seems to be a leak in the pitless adapter that connects the pump to the conveyance piping. This adapter is inside the well at about 5' below ground surface (bgs). Water seems to be leaking at this connection and flowing back into the well. Not pumping to the WWT building. Chris and Rob Meyer have scheduled a small crane to be available on Monday 1/5/15 to pull the pump again and continue working the problems out. Sevenson has also scheduled for a "down the well" camera to be available on Monday to take a good look at the situation while the adapter is in use, and see where the leak is and why.

Chris acid washed PR-12 and RW-4.

A trace of water was measured in the secondary containment piping at RW-4.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	14.75	15.64	556.95	1.47
RW-2	557.0	14.74	14.98	556.77	6.17
RW-3	557.2	12.59	12.64	556.99	1.19
PR-4	555.4	14.06	14.21	555.39	2.1
RW-4	557.1	12.39	12.30	557.25	0.60
RW-5					
PR-12	557.4	---	12.31	557.25	6.35
OBA-9AR	557.0	12.81	12.96	557.11	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	26	15	11
	SP#3	**SP#4**	
GAC #2	15	8	7
TOTAL GAC SYSTEM	17.0	**Diff,Pr**	
FLOW RATE	41	**GPM**	
OBA-9AR TOTALIZER	1205922		

PH Readings:				Acid level: 90%
RW-1	8.09			
PR-4	7.56			
PH Adj. Tanks	7.56	7.80	7.64	
Air Stripper level Sensor Cleaned? No				

Chris Jones