

Measurement of Produced Water Air Emissions
from Crude Oil and Natural Gas Operations

Appendix C: Detailed Facility Data and Individual Facility Emission Estimates

May 2020

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Notes:

1. Red circles denote flux chamber sample and co-located water sample locations.
2. Green circles denote field water quality samples only.
3. Aerial photos were not taken on the sample day. Pond fill status at time of sampling is not represented on aerial photo.

Region 3 Site No. 4

Coordinates (Lat/Long)

34.83004, -120.32386

Sample Locations (Test Date 11/1/2017)

Site Plan



Legend:

Flux Chamber Sample

Water Quality Screening Sample



Water Quality Data/Emission Estimates

Date		11/1/2017					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
						(ug/l)					Flux (ug/m ² -min)								
1	Non-Aqueous	10:15	703				540,000	74	720	590	2,100	352,461	591	6,818	8,746	12,241	1,319		325
Total																	0	325	
Actual Emissions										PTE									
Loc. #	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane							
(ug/min)						(ug/min)													
1	0	0	0	0	0		114,595,249	192,051	2,216,766	2,843,715	3,979,903	428,730							
Total	0	0	0	0	0		114,595,249	192,051	2,216,766	2,843,715	3,979,903	428,730							
Total (lb/y)	0	0	0	0	0		132,797	223	2,569	3,295	4,612	497							

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
East	70	21.3	25	7.6	1,750	163
West	70	21.3	25	7.6	1,750	163

Region 3 Site No. 5



Coordinates (Lat/Long)

34.84257, -120.34104

Sample Locations (Test Date 11/1/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		Liquid Phase					Gas Phase					Areas						
11/1/2017		Oil	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions	PTE				
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Flux (ug/m ² -min)					(m ²)						
1	Congeaed Oil	8:15	701	20.4	6.58	2,620	11	8	5	7	12	532	3	ND	ND	ND	1,615	743
2	Oil/Aqueous	8:40	702	21.0	6.63	2,390	12	9	6	7	13	14	3.12	ND	ND	ND	803.45	
												Total	0	743				
Actual Emissions						PTE												
Loc. #	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane						
	(ug/min)						(ug/min)											
1							395,179	1,889				1,200,384						
2							10,208	2,318				597,082						
Total	0	0	0	0	0	0	405,387	4,207	0	0	0	1,797,467						
Total (lb/y)	0	0	0	0	0	0	470	5	ND	ND	ND	2,083						

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
East	80	24.4	50	15.2	4,000	372
West	80	24.4	50	15.2	4,000	372

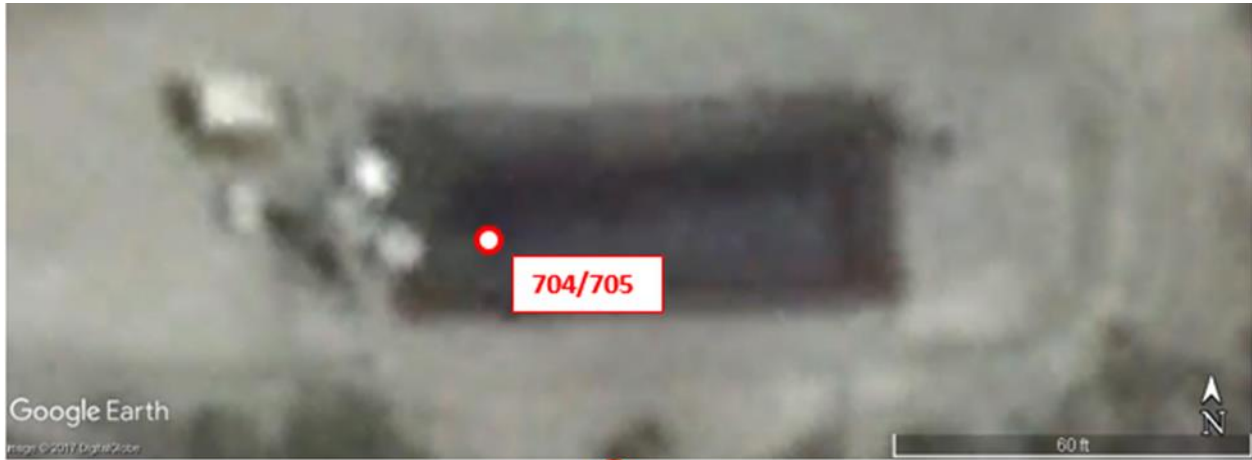
Region 3 Site No. 6



Coordinates (Lat/Long)

34.8529, -120.519

Sample Locations (Test Date 11/1/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		11/1/2017					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
							Flux (ug/m ² -min)												
1		12:15	704/705	23.2	7.09	7,430	34	185	37	165	110	12,725	28	35	69	85	981		151
Total																	0	151	
Actual Emissions										PTE									
Loc. #	TNMHC	Benze ne	EthylBen zene	Toluene	Total Xylen es	Methane	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane							
							Flux (ug/min)												
1							1,920,887	4,186	5,258	10,448	12,832	148,129							
Total	0	0	0	0	0	0	1,920,887	4,186	5,258	10,448	12,832	148,129							
Total (lb/y)	0	0	0	0	0	0	2,226	5	6	12	15	172							

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
	65	19.8	25	7.6	1,625	151

Region 3 Site No. 8



Coordinates (Lat/Long)

34.8907, -120.4057

Sample Locations (Test Date 11/1/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		Liquid Phase					Gas Phase						Areas						
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
							Flux (ug/m ² -min)												
1	Round Sump	13:15	706	Non-aqueous		23,200	460,000	160	1000	1300	2100	2,025,985	4,814	11,642	22,069	33,252	5,051		26
2	Rectangular Sump	14:40	707	24.8	8.15		17	240	46	180	140	366	22.37	3.15	17.06	8.87	67.69		
Total																	0	26	

Loc. #	Actual Emissions					PTE											
	TNMHC	Benzene	EthylBenzene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane						
												Flux (ug/min)					
1						52,693,597	125,201	302,797	573,989	864,853	131,373						
2																	
Total	0	0	0	0	0	52,693,597	125,201	302,797	573,989	864,853	131,373						
Total (lb/y)	0	0	0	0	0	61,063	145	351	665	1,002	152						

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
East	7	2.1		0.0	38	4
West	23	7.0	10.5	3.2	242	22

Region 3 Site No. 9



Coordinates (Lat/Long)

34.9308, -120.4082

Sample Locations (Test Date 11/1/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		11/1/2017					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil	Benzene	EthylBen zene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions	PTE
							(mg/l)		(ug/l)				Flux (ug/m ² -min)					(m ²)	
1	Large Tank	16:00	708	19.1	8.43	3,610	37	1	3	3	13	232	1	ND	ND	ND	108		195
2	Small Tank	16:50	709	16.8	7.87	558	20	ND	1	1	2	371	0.84	ND	ND	ND	47.02		22
Total																	0	217	
Actual Emissions										PTE									
Loc. #	TNMHC	Benze ne	EthylBen zene	Toluene	Total Xylen es	Methane	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane							
	(ug/min)						(ug/min)												
1							45,239	152				21,128							
2							8,276	19				1,048							
Total	0	0	0	0	0		53,515	171	0	0	0	22,177							
Total (lb/y)	0	0	0	0	0		62	0	ND	ND	ND	26							

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
Large	70	21.3	30	9.1	2,100	195
Small	20	6.1	12	3.7	240	22

Region 4 Site No. 1



Coordinates (Lat/Long)

34.190318, -119.15672

Sample Locations (Test Date 8/2/2018)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		8/2/2018					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
1	Surge Tank	9:15	401/402	35.4	7.24	10,700	23	1650	1900	280	915	1,712	137.51	169	22.9	75	47		46
																	Total	0	46
Actual Emissions							PTE												
Loc. #	TNMHC	Benzene	EthylBenzene (ug/min)	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene (ug/min)	Toluene	Total Xylenes	Methane							
1							79,538	6,387	7,846	1,066	3,464	2,161							
Total	0	0	0	0	0		79,538	6,387	7,846	1,066	3,464	2,161							
Total (lb/y)	0	0	0	0	0		92	7	9	1	4	3							

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
Sump	50	15.2	10	3.0	500	46

Region 5 Site No. 1



Coordinates (Lat/Long)

35.3845, -119.6770

Sample Locations (Test Date 11/12/2017)

Site Plan





Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Sample Locations (Test Date 4/11/2018)

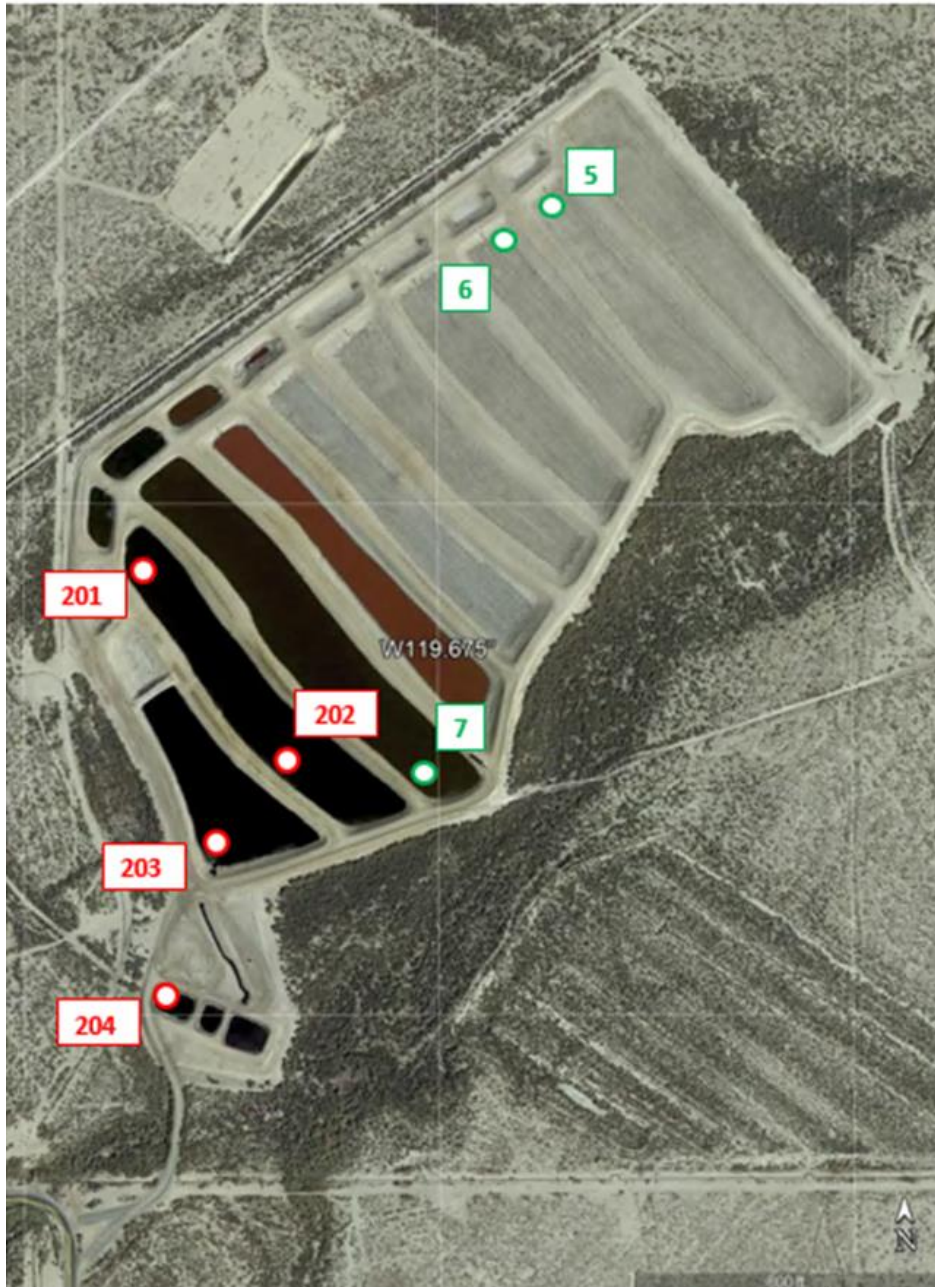
Site Plan





Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Sample Locations (Test Date 7/31/2018)

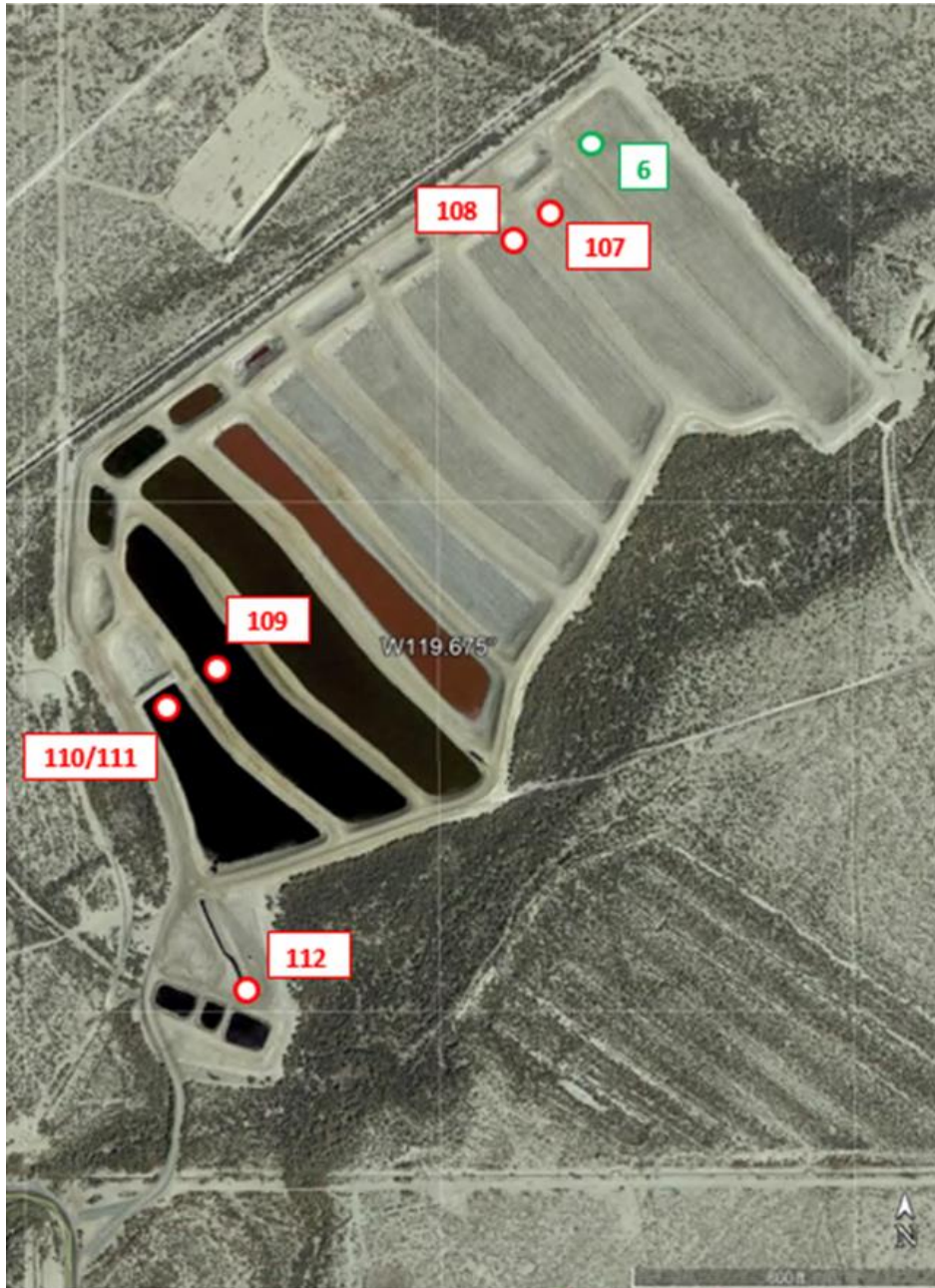
Site Plan





Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Sample Locations (Test Date 10/3/2018)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

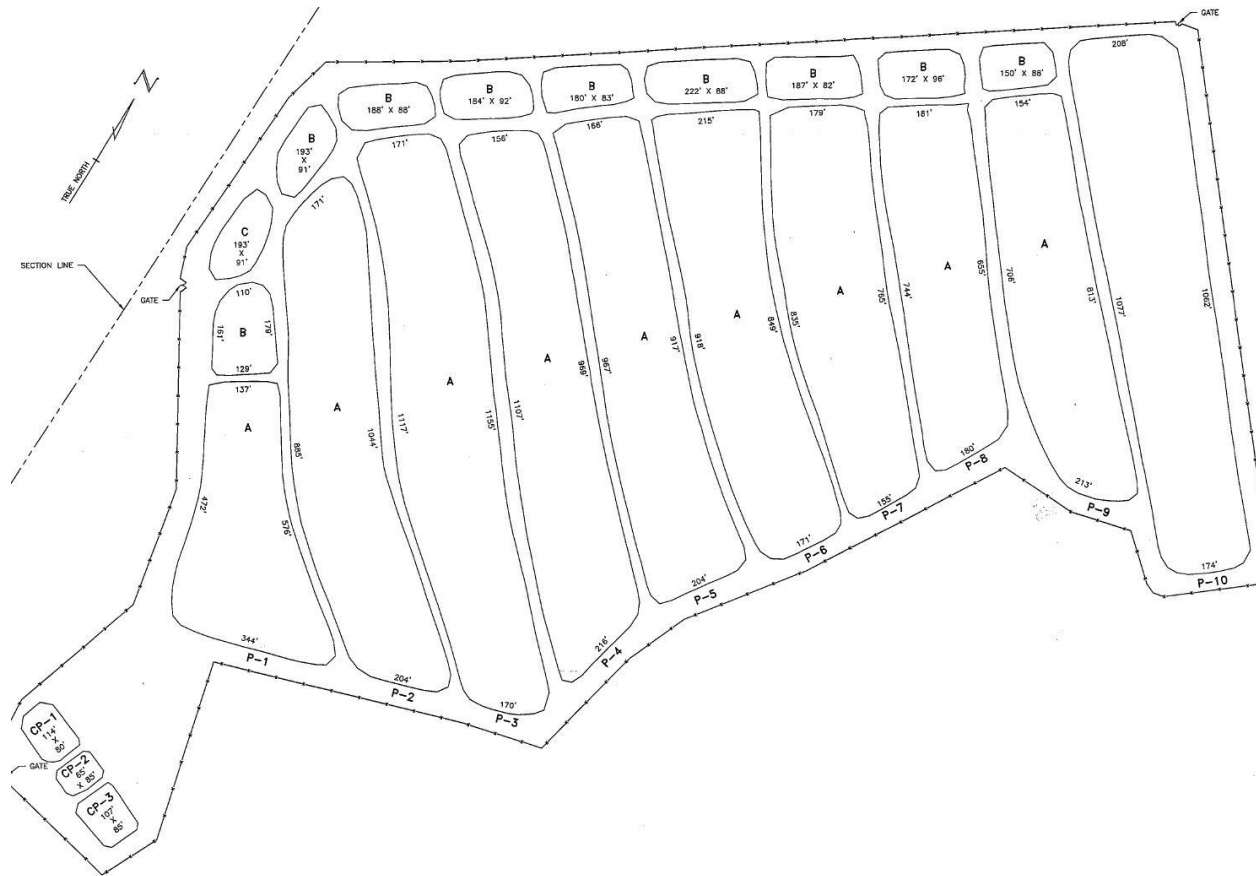
Water Quality Data/Emission Estimates

Date												Liquid Phase					Gas Phase					Areas														
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m³)	PTE																	
Actual Emissions						PTE						Flux (ug/m²-min)																								
Loc. #	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m³)	PTE																
Date: 10/12/2017																																				
1	CP-3 Out Cr	12:10	604	22.3	7.25	28,500	8	830	96	960	510	10,632	681.54	63.49	679.60	354.02	16,545	1,103	1,103																	
2	P-1A	13:00	605/606	20.7	7.76	28,200	6	370	38	430	225	639	99.21	5.55	101.68	30.77	2,812	80,368	160,736																	
3	CP-1	14:05	607	24.7	7.03	26,800	30	870	98	1,100	610	6,237	426.53	44.35	469.73	252.73	12,927	1,103	1,103																	
4	P-9B	11:45		19.7	8.56	30,500																														
Total																		82,573	162,942																	
Date: 4/11/2018																																				
1	P-3	10:50	205	24.5	8.62	29,800	4	13	17	1	9	22	2.14	2.07	ND	0.39	54.89	19,382	129,522																	
2	P-2 Back	11:10	206/207	23.9	8.29	28,000	19	185	220	19	105	246	23.37	24.36	1.80	9.98	24.86	15,607	15,607																	
3	P-2 Front	12:15	208	21.9	8.30	28,100	4	180	210	19	110	137	23.94	24.46	1.71	10.00	310.65	15,607	15,607																	
4	CP-1	13:00	209	33.1	7.38	27,700	28	1,300	1,300	80	590	8,390	466.03	723.27	61.23	321.06	244.43	2,205	2,205																	
5	p_3	12:05		25.4	8.64	29,700																														
Total																		52,802	162,942																	
Date: 7/31/2018																																				
1	P-2A In	8:25	201	27.6	8.53	31,200	5	27	34	10	58	92	5.03	6.47	1.40	8.50	5,647.02	34,719	73,960																	
2	P-2A Out	9:05	202	28.0	8.46	30,800	3	28	35	9	54	64	4.40	5.45	1.26	7.68	3,571.94	34,719	73,960																	
3	P-1A In	10:10	203	34.5	7.76	26,700	14	480	510	190	1,200	4,451	213.07	238.56	93.27	532.04	10,523.57	12,816	12,816																	
4	CP-1	11:05	204	38.9	7.34	25,400	16	840	960	370	2,200	3,425	167.10	208.86	77.91	485.61	7,775.51	2,205	2,205																	
5	P-9	8:00		25.0	9.03	44,800																														
6	P-8	8:05		25.0	9.03	41,500																														
7	P-3	8:50		27.1	8.81	38,200																														
Total																		84,460	162,942																	
Date: 10/3/2018																																				
1	P9	13:55	107	24.8	8.96	38,700	1	0.3	1	0.1	1	ND	0.21	0.10	ND	ND	1484.06	27,559	49,307																	
2	P8	14:05	108	23.2	8.46	24,500	3	5	16	1	8	31	0.57	1.19	ND	0.45	147.94	27,559	49,307																	
3	P2	14:55	109	23.5	8.12	24,500	8	59	92	10	63	31	12.12	19.54	1.62	10.71	3898.83	27,559	49,307																	
4	P1	15:10	110/111	24.7	8.09	25,800	4	190	235	34	215	365	34.47	49.51	4.91	34.72	4593.11	12,816	12,816																	
5	CP-3-out	15:55	112	26.9	7.43	27,600	BRK	1,500	1,600	170	1,000	6,457	616.38	851.36	109.57	658.22	7744.00	2,205	2,205																	
6	P10	13:40		26.3	8.95	33,700																														
Total																		97,699	162,942																	
Date: 10/3/2018																																				
1			5,904	2,692		40,899,450			10,563	4,817									73,174,310																	
2			845,249	15,815	32,679				1,512,258	28,295	58,466								21,942	7,294,371																
3			845,249	334,101	538,558	44,540	295,233	107,448,399	1,512,258	597,750	963,549	79,687	528,208	192,238,828																						
4			4,674,194	441,723	634,573	62,892	444,967	58864952.37	4,674,194	441,723	634,573	62,892	444,967	58864952.4																						
5			14,239,510	1,359,311	1,877,508	241,641	1,451,372	17077865.87	14,239,510	1,359,311	1,877,508	241,641	1,451,372	17077865.9																						
Total																		20,604,202	2,156,855	3,086,011	349,072	2,204,035	228,367,723	21,938,220	2,437,642	3,538,915	384,220	2,446,689	348,650,327							
Date: 10/3/2018																																				
1			23,877	2,499	3,576	405	2,554	264,640	25,423	2,825	4,101	445	2,835	404,027																						

Pond Data

Pond Data							
Surface		Length		Width		Area	
		(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
CP- 1		114	34.7	80	24.4	9,120	847
CP- 2		85	25.9	65	19.8	5,525	513
CP- 3		107	32.6	85	25.9	9,095	845
P- 1	A	500	152.4	200	61.0	100,000	9,289
P- 1	B	170	51.8	120	36.6	20,400	1,895
P- 1	C	193	58.8	91	27.7	17,563	1,631
P- 2	A	950	289.5	190	57.9	180,500	16,767
P- 2	B	193	58.8	91	27.7	17,563	1,631
P- 3	A	1,130	344.4	170	51.8	192,100	17,845
P- 3	B	188	57.3	88	26.8	16,544	1,537
P- 4	A	1,030	313.9	170	51.8	175,100	16,266
P- 4	B	184	56.1	92	28.0	16,928	1,573
P- 5	A	940	286.5	180	54.9	169,200	15,718
P- 5	B	180	54.9	83	25.3	14,940	1,388
P- 6	A	885	269.7	180	54.9	159,300	14,798
P- 6	B	222	67.7	88	26.8	19,536	1,815
P- 7	A	800	243.8	165	50.3	132,000	12,262
P- 7	B	187	57.0	82	25.0	15,334	1,424
P- 8	A	700	213.3	180	54.9	126,000	11,705
P- 8	B	172	52.4	96	29.3	16,512	1,534
P- 9	A	750	228.6	180	54.9	135,000	12,541
P- 9	B	150	45.7	88	26.8	13,200	1,226
P- 10		1,070	326.1	180	54.9	192,600	17,891
					Totals		162,942

Nomenclature and Dimensions



Region 5 Site No. 1B



Coordinates (Lat/Long)

35.3862, -119.6545

Sample Locations (Test Date 10/12/2017)

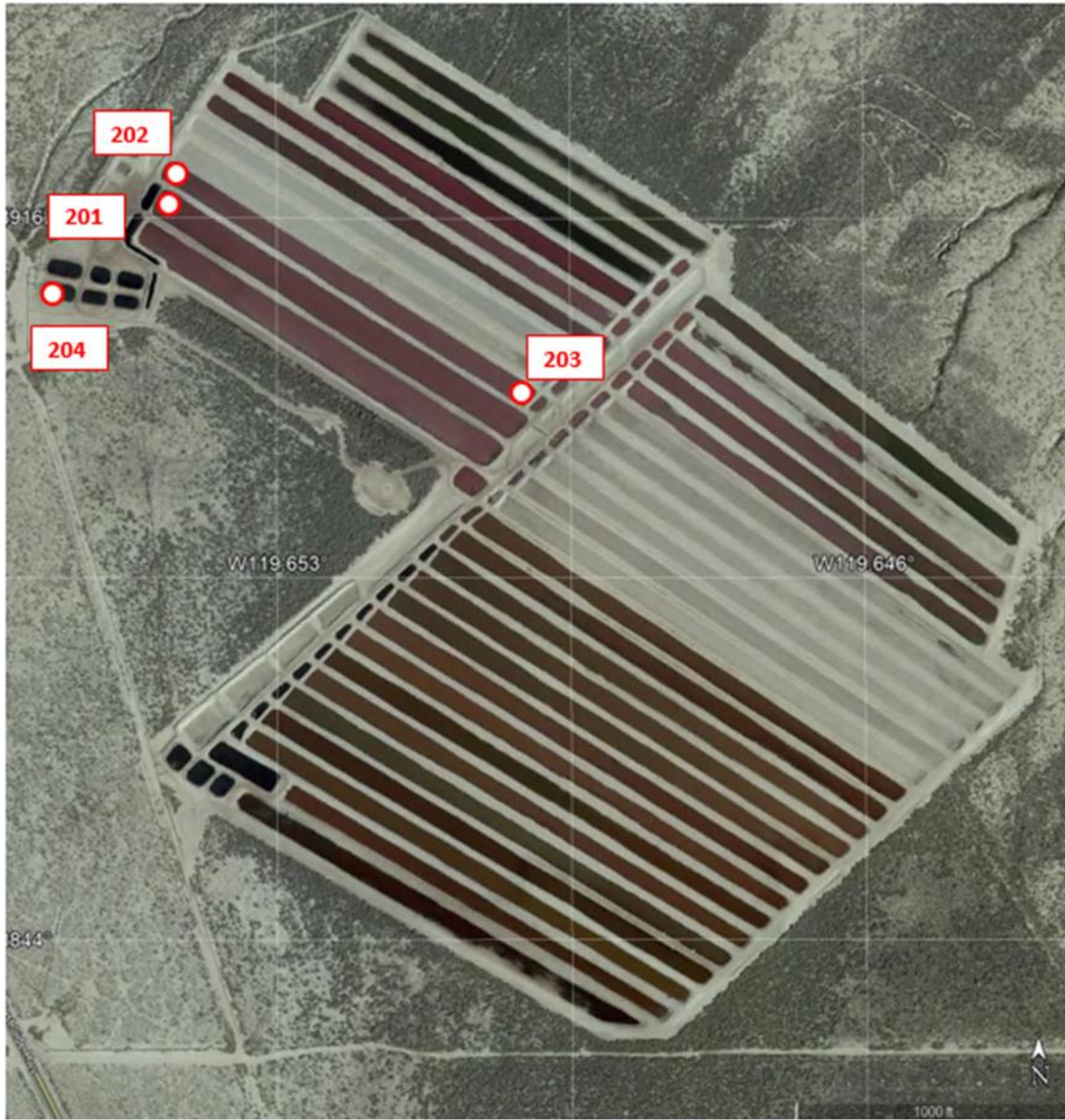
Site Plan





Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Sample Locations (Test Date 4/11/2018)



Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Sample Locations (Test Date 7/31/2018)
Site Plan

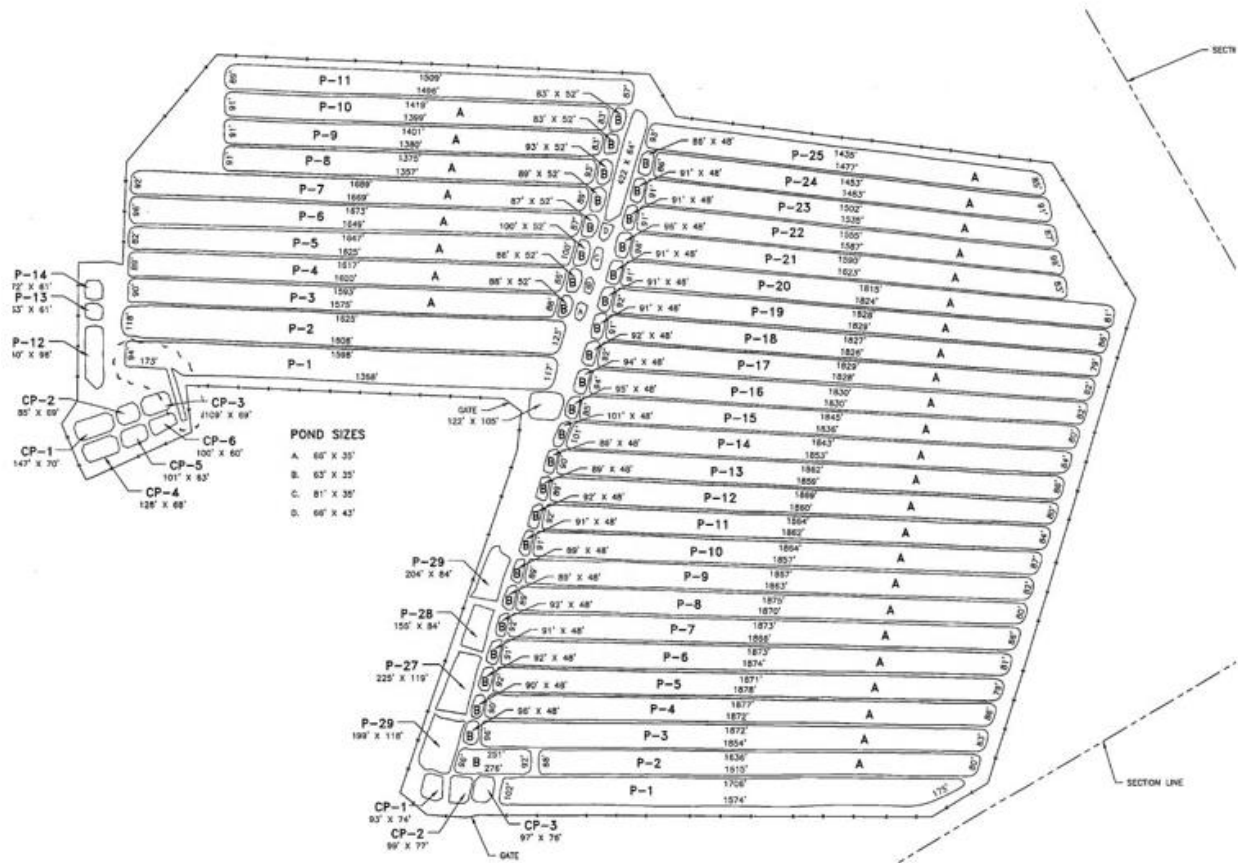


Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date										Liquid Phase					Gas Phase					Areas																	
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (ug/l)	EthylBenzene (ug/l)	Toluene (ug/l)	Total Xylenes (ug/l)	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ³)	PTE																		
										Flux (ug/m ² -min)																											
10/12/2017										55	4.9	10	19.0	23.0	1,772	8.22	ND	7.52	4.03	217.11	30,359	30,359															
2	Pond P-8A	9:40	602	30.0	8.03	14,600	43	2.4	4.7	9.2	12.0	382	2.05	1.49	3.10	3.34	48.49	69,274	138,547																		
3	Pond CP-1	10:50	603	52.6	7.56	10,100	62	6.0	12	22.0	28.0	5,612	6.31	11.07	16.68	24.73	261.17	5,568	5,568																		
4	Pond P-6A	9:15		41.9	8.00	14,000																															
5	Pond P-7A	9:20		15.2	8.15	15,200																															
6	Pond P-8A	9:25		30.0	8.40	13,400																															
7	Pond P-9A	9:30		20.0	8.13	13,700																															
Total																	105,201	174,475																			
Actual Emissions										PTE																											
Loc. #	(ug/min)						(ug/min)						(ug/min)																								
1	53,794,595	249,647		228,162	122,371	6,591,244	53,794,595	249,647		228,162	122,371	6,591,244	53,794,595	249,647		228,162	122,371	6,591,244	53,794,595	249,647																	
2	26,446,286	141,771	103,511	215,015	231,347	3,359,236	52,892,571	283,542	207,021	430,029	462,694	6,718,473	52,892,571	283,542	207,021	430,029	462,694	6,718,473	52,892,571	283,542																	
3	31,246,701	35,122	61,656	92,901	137,681	1,454,207	31,246,701	35,122	61,656	92,901	137,681	1,454,207	31,246,701	35,122	61,656	92,901	137,681	1,454,207	31,246,701	35,122																	
Total																	111,487,582	426,540	165,166	536,078	491,400	11,404,687	137,933,867	568,311	268,677	751,092	722,747	14,763,924	137,933,867	568,311	268,677	751,092	722,747	14,763,924			
Total (lb/y)																	129,195	494	191	621	569	13,216	159,842	659	311	870	838	17,109	159,842	659	311	870	838	17,109	159,842	659	311
4/11/2018										Liquid Phase					Gas Phase					Areas																	
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (ug/l)	EthylBenzene (ug/l)	Toluene (ug/l)	Total Xylenes (ug/l)	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ³)	PTE																		
										Flux (ug/m ² -min)																											
7:55										11	0.3	1	0.4	2.4	68	0.29	0.26	ND	0.11	70.89	18,767	56,302															
2	P-3	8:05	202	30.9	8.12	12,200	16	0.5	2.2	0.5	3.0	226	0.48	1.06	0.17	1.06	206.25	18,767	56,302																		
3	P-3 end	8:55	203	24.9	8.24	12,300	16	0.3	2	0.4	2.7	71	0.96	0.91	0.20	1.12	28.80	18,767	56,302																		
4	CP-4	9:25	204	58.3	7.21	11,600	38	1	5	1.1	6.5	12,681	5.07	8.40	2.19	12.02	7,984.00	5,568	5,568																		
Total																	61,870	174,475																			
Actual Emissions										PTE																											
Loc. #	(ug/min)						(ug/min)						(ug/min)																								
1	1,283,812	5,378	4,894		2,028	1,330,464	3,851,437	16,133	14,682		6,085	3,991,391	1,283,812	5,378	4,894		2,028	1,330,464	3,851,437	16,133																	
2	4,248,045	8,951	19,973	3,270	19,720	3,908,237	12,747,136	26,852	59,919	9,810	59,161	11,724,710	4,248,045	8,951	19,973	3,270	19,720	3,908,237	12,747,136	26,852																	
3	1,324,472	17,952	17,086	3,775	21,070	540,501	3,973,417	53,855	51,257	11,325	63,210	1,621,509	1,324,472	17,952	17,086	3,775	21,070	540,501	3,973,417	53,855																	
4	70,609,721	28,224	46,770	12,177	66,902	44455429.05	70,609,721	28,224	46,770	12,177	66,902	44455429.05	70,609,721	28,224	46,770	12,177	66,902	44455429.05	70,609,721	28,224																	
Total																	77,467,051	60,504	88,722	19,222	109,721	50,234,630	91,181,712	125,063	172,627	33,312	195,358	61,793,033	77,467,051	60,504	88,722	19,222	109,721	50,234,630			
Total (lb/y)																	89,771	70	103	22	127	58,214	105,664	145	200	39	226	71,608	89,771	70	103	22	127	58,214	105,664	145	
7/31/2018										Liquid Phase					Gas Phase					Areas																	
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (ug/l)	EthylBenzene (ug/l)	Toluene (ug/l)	Total Xylenes (ug/l)	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ³)	PTE																		
										Flux (ug/m ² -min)																											
1	P-15 in	12:20	205	38.2	7.98	18,400	48	0.4	75	0.2	1.3	230	ND	6.51	ND	ND	54.89	29,079	84,453																		
2	P-2 in	13:10	206/207	38.2	8.15	13,000	25	0.3	1.1	ND	ND	72	0.27	0.34	0.38	0.59	24.86	29,079	84,453																		
3	CP-1 in	14:10	208	63.0	7.41	11,600	60	0.8	4	0.7	4.5	1,636	ND	ND	ND	ND	310.65	3,545	3,545																		
4	CP-1 in	15:20	209	No Aqueous Phase			660,000	ND		39	0.9	2.4	47,028	26.76	2267.27	58.75	188.38	244.43	2,023	2,023																	
5	P-14 in	12:10		38.9	8.16	18,100																															
6	P-13 in	12:15		33.1	8.32	18,800																															
7	P-3 in	12:55		39.6	7.98	12,400																															
Total																	63,726	174,475																			
Actual Emissions										PTE																											
Loc. #	(ug/min)						(ug/min)						(ug/min)																								
1	6,675,610		189,227			1,596,219	19,387,706		549,563		4,635,834	6,675,610		189,227			1,596,219	19,387,706	549,563																		
2	2,091,570	7,818	9,809	11,184	17,157	722,951	6,074,463	22,705	28,487	32,482	49,827	2,091,570	7,818	9,809	11,184	17,157	722,951	6,074,463	22,705																		
3	5,797,809					1,101,189	5,797,809				1,101,189	5,797,809					1,101,189	5,797,809																			
4	95,148,413	54,132	4,587,217	118,859	381,146	494539,8459	95,148,413	54,132	4,587,217	118,859	381,146	494539,8459	95,148,413	54,132	4,587,217	118,859	381,146	494539,8459	95,148,413																		
Total																	109,714,401	61,949	4,786,252	130,044	398,302	3,914,899	126,409,391	76,836	5,165,267	151,341	430,973	8,331,201	109,714,401	61,949	4,786,252	130,044	398,302				
Total (lb/y)																	127,141	72	5,546	151	462	4,537	146,487	89	5,986	175	499	9,654	127,141	72	5,546	151	462	4,537			

Nomenclature and Dimensions



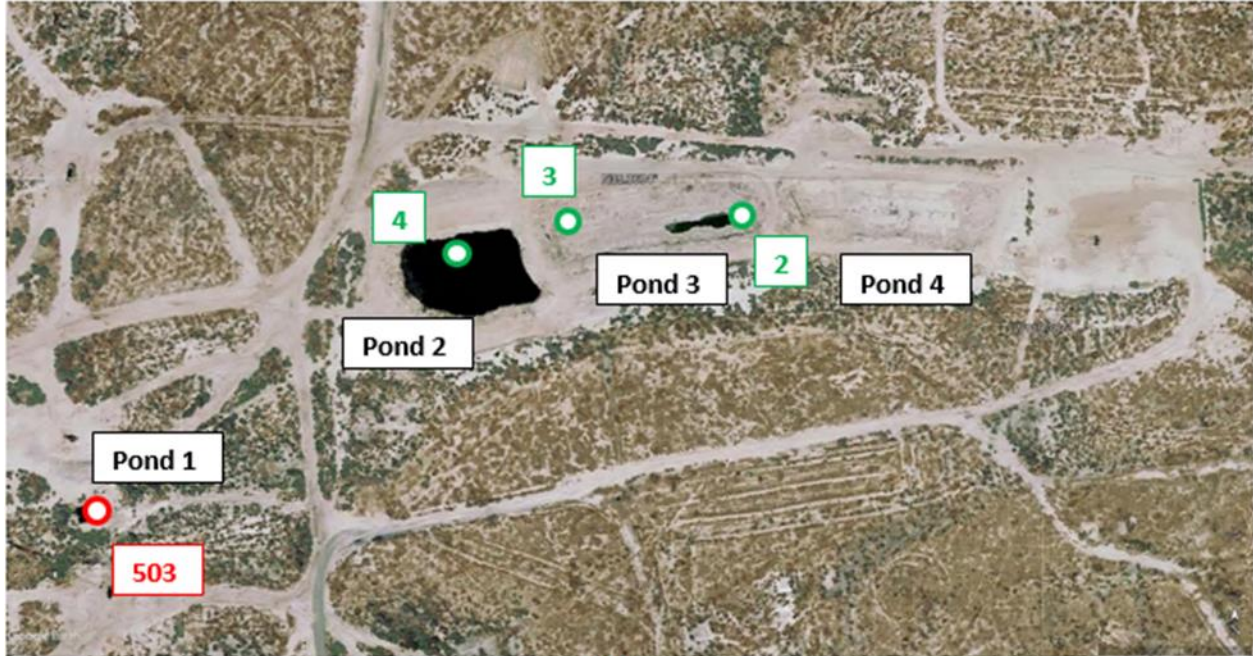
Region 5 Site No. 2



Coordinates (Lat/Long)

35.0603, -119.387

Sample Locations (Test Date 10/11/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date							Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (ug/l)	EthylBenzene (ug/l)	Toluene (ug/l)	Total Xylenes (ug/l)	TNMHC	Benzene	EthylBenzene Flux (ug/m ² -min)	Toluene	Total Xylenes	Methane	Actual Emissions (m ³)	PTE
1		11:30	503	27.5	7.34	11,400	13	13	12	3.6	24	333	1	1	ND	1	208		4,180
2	Pond 3	11:10		18.2	8.53	11,900													
3	Pond 3	11:20		24.2	8.18	11,500													
4	Pond 2	11:25		20.8	8.69	12,400													
Total																	0	4,180	

Actual Emissions							PTE					
Loc. #	TNMHC (ug/min)	Benzene (ug/min)	EthylBenzene (ug/min)	Toluene (ug/min)	Total Xylenes (ug/min)	Methane (ug/min)	TNMHC (ug/min)	Benzene (ug/min)	EthylBenzene (ug/min)	Toluene (ug/min)	Total Xylenes (ug/min)	Methane (ug/min)
1	0	0	0	0	0	0	1,392,035	2,916	2,868	0	3,865	869,391
Total	0	0	0	0	0	0	1,392,035	2,916	2,868	0	3,865	869,391
Total (lb/y)	0	0	0	0	0	0	1,613	3	3	ND	4	1,007

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
1	45	13.7	21	6.4	945	88
2	140	42.7	95	29.0	13,300	1,235
3	270	82.3	65	19.8	17,550	1,630
4	220	67.1	60	18.3	13,200	1,226
Total						4,180

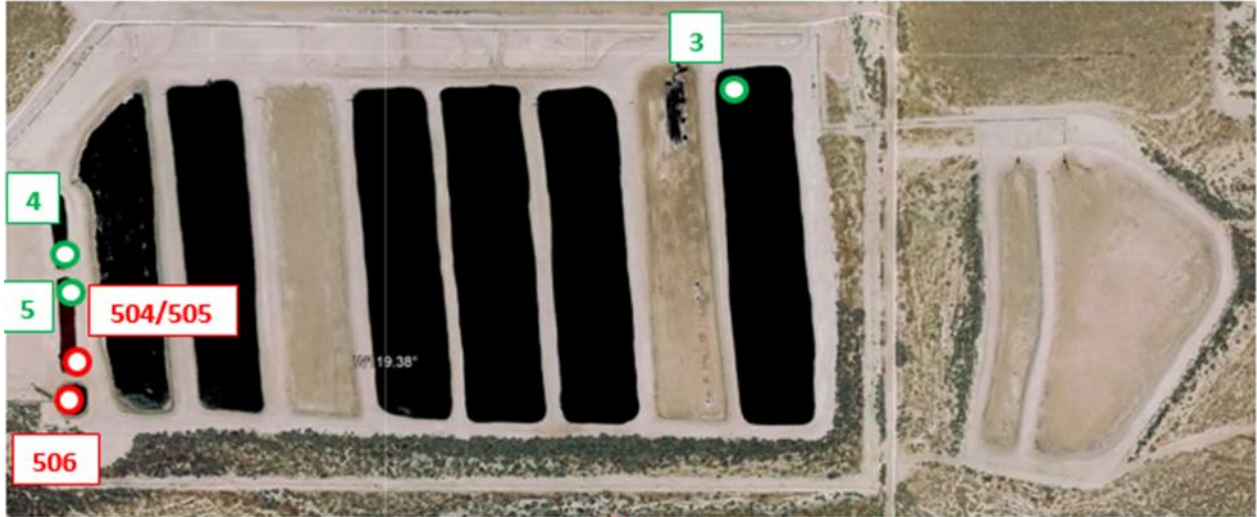
Region 5 Site No. 3

Coordinates (Lat/Long)

35.0626, -119.374

Sample Locations (Test Date 10/11/2017)

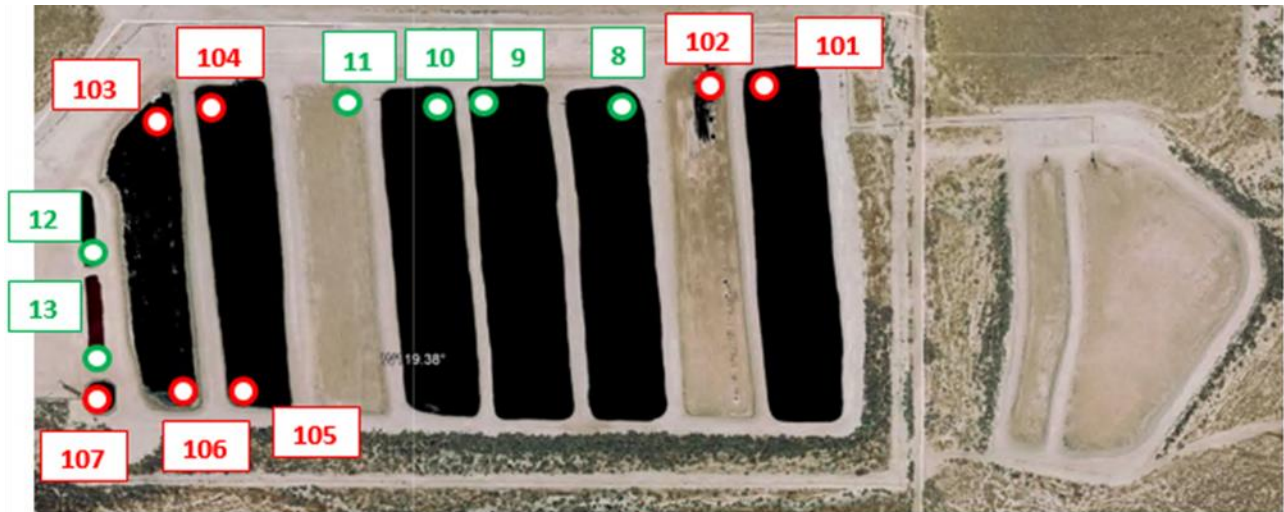
Site Plan



Legend: Flux Chamber Sample (red circle)
Water Quality Screening Sample (green circle)

Sample Locations (Test Date 4/10/2018)

Site Plan





Legend: Flux Chamber Sample (red circle)
Water Quality Screening Sample (green circle)

Sample Locations (Test Date 8/1/2018)

Site Plan





Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Sample Locations (Test Date 10/3/2018)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

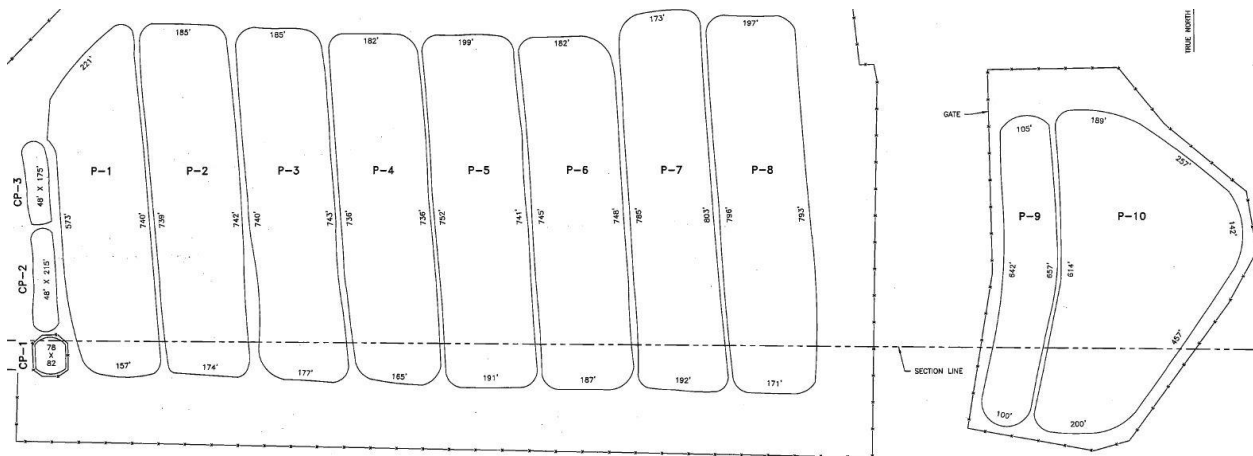
Water Quality Data/Emission Estimates

Date												Liquid Phase					Gas Phase					Areas			
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBen zene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions (m³)	PTE						
10/11/2017																									
1	CP-2	13:30	504/505	40.4	7.40	13,500	22	12.0	11	8.9	11.5	1,874	16.66	12.22	9.49	6.45	1,873.48	52,418	62,902						
2	CP-1	14:25	506	38.2	7.33	13,500	47	12.0	12.0	9.2	11.0	999	2.22	1.51	1.75	1.47	400.00	52,418	62,902						
3	Pond P-8	13:10		20.8	8.10	17,500																			
4	Pond CP-2 Oil	14:05		30.0	7.92	16,200																			
5	Pond CP-3 in	14:10		31.0	7.84	13,700																			
Total																		104,836	125,803						
Actual Emissions												PTE													
Loc. #	TNMHC	Benzene	EthylBen zene (ug/min)	Toluene	Total Xylenes	Methane	TNMHC (ug/min)	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane													
1	98,244,044	873,485	640,548	338,046	98,203,674	20,967,492	117,892,853	1,048,182	768,657	405,655	117,844,649														
2	52,360,803	116,529	78,950	91,671	77,075		62,832,964	139,635	94,739	110,005	92,490	25,160,630													
Total												150,604,848	990,014	719,497	91,671	415,120	119,171,066	180,725,817	1,188,017	863,397	110,005	498,144	143,005,279		
Total (lb/y)												174,526	1,147	834	106	481	138,099	209,431	1,377	1,001	127	577	165,719		
Date												Liquid Phase					Gas Phase					Areas			
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBen zene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions (m³)	PTE						
4/10/2018																									
1	P-8	7:52	101	20.2	7.96	14,800	9	1.6	1	1.1	2.3	45	0.44	0.12	ND	0.11	ND	14,500	20,578						
2	P-7	7:55	102	22.8	7.99	14,200	8	6.0	3.3	4.5	6.5	88	0.95	0.35	0.26	0.41	14	14,500	20,578						
3	P-1 Front	9:00	103	21.1	8.25	15,300	5	0.3	0	0.3	0.5	61	0.54	0.20	ND	ND	14	14,500	20,578						
4	P-2 Front	9:05	104	23.7	8.23	16,000	6	1	0	0.1	0.7	8	0.54	0.88	ND	ND	17	14,500	20,578						
5	P-2 Back	10:10	105	24.1	8.19	16,000	6	0	ND	ND	0	4	0.62	0.23	ND	0.14	24	14,500	20,578						
6	P-1 Back	10:15	106	22.1	8.21	15,100	3	0	0	0	0	ND	0.66	ND	ND	ND	ND	14,500	20,578						
7	CP-1	11:15	107	36.1	7.48	12,900	29	10	7	11	14	503	3.11	1.38	1.54	1.48	112	2,333	2,333						
8	P-6	7:35		18.5	8.25	15,800																			
9	P-5	8:40		23.7	7.89	15,400																			
10	P-4	8:45		20.7	8.03	15,000																			
11	P-3	8:50		20.7	8.31	16,200																			
12	CP-3	9:50		25.5	7.89	14,100																			
13	CP-2	9:55		37.0	7.30	13,000																			
Total																		89,333	125,803						
Actual Emissions												PTE													
Loc. #	TNMHC	Benzene	EthylBen zene (ug/min)	Toluene	Total Xylenes	Methane	TNMHC (ug/min)	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane													
1	647,050	6,408	1,807	1,662	1,662	196,307	918,292	9,094	2,564	2,359	2,359	278,599													
2	1,272,390	13,769	5,064	3,815	5,872	196,307	1,805,773	19,542	7,187	5,414	8,334	278,599													
3	889,914	7,808	2,827	2,462	2,462	246,277	1,262,964	11,081	4,013	3,405	3,405	349,515													
4	122,486	7,875	12,743	2,024	349,784	81,783	12,806	4,733	2,873	496,413															
5	57,626	9,023	3,335	2,024	349,784	81,783	12,806	4,733	2,873	496,413															
6	9,570						13,582																		
7	1,174,087	7,250	3,217	3,598	3,455	260,161	1,174,087	7,250	3,217	3,598	345,482	260,161													
Total												4,163,552	61,703	28,994	7,413	13,014	1,052,529	5,416,731	84,529	39,799	9,012	17,021	1,384,688		
Total (lb/y)												4,825	72	34	9	15	1,220	6,277	98	46	10	20	1,605		
Date												Liquid Phase					Gas Phase					Areas			
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBen zene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions (m³)	PTE						
8/1/2018																									
1	P-7 in	12:00	306	37.0	8.01	17,700	26	0.3	0	2.6	1.8	279	1.08	1.02	1.11	1.33	19.69	14,500	20,578						
2	P-6 in	12:00	307	29.5	8.51	16,900	22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38.65	14,500	20,578					
3	P-3 in	13:00	308	30.0	8.25	19,300	30	0.6	0	0.1	1.4	7	ND	0.18	ND	ND	ND	68.18	14,500	20,578					
4	P-4 in	13:20	309	30.9	8.05	19,400	25	ND	0	ND	0.4	6	0.20	0.12	ND	ND	130.95	14,500	20,578						
5	P-1 in	14:00	310	30.3	8.26	18,100	22	1	0	0	1	68	0.23	ND	ND	ND	107.82	14,500	20,578						
6	P-2 in	14:15	311/312	33.7	8.35	21,500	26	0	0	0	1	13	0.28	ND	ND	ND	246.89	14,500	20,578						
7	CP-2 in	15:05	313	49.1	7.65	17,100	24	7	6	9	9	659	ND	ND	ND	ND	1,005.54	2,333	2,333						
8	P-5 in	11:55		28.3	8.05	18,700																			
Total																		89,333	125,803						
Actual Emissions												PTE													
Loc. #	TNMHC	Benzene	EthylBen zene (ug/min)	Toluene	Total Xylenes	Methane	TNMHC (ug/min)	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane													
1	4,046,564	15,727	14,751	16,022	19,252	285,538	5,742,876	22,320	20,935	22,739	27,322	405,235													
2	745	101	20.4	8.15	18,100		154,171		3,736		1,402,126														
3	108,633		2,623			988,675					2,694,612														
4	90,569	2,945	1,723			1,898,828	128,535	4,179	2,446		2,218,661														
5	986,729	3,302				1,563,320	1,400,364	4,686			5,080,633														
6	186,512	4,080				3,579,932	264,697	5,790			2,346,047														
7	1,536,994					2,346,047	1,536,994																		
Total												6,956,000	26,053	19,107	16,022	19,252	10,662,340	9,227,637	36,974	27,116	22,739	27,322	14,148,515		
Total (lb/y)												8,061	30	22	19	22	12,356	10,693	43	31	26	32	16,396		
Date												Liquid Phase					Gas Phase					Areas			
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBen zene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions (m³)	PTE						
10/3/2018																									
1	P4	7:45	101	20.4	8.15	18,100	2	0.3	0	ND	1.1	56	0.16	0.19	ND	ND	59.82	50,146	61,735						
2	P3	8:00	102	21.3	8.10	20,800	7	1.6	1.2	1.4	2.2	27	0.40	0.18	0.12	0.14	91.08	50,146	61,735						
3	CP2	8:45	103	35.5	7.60	16,900	11	7.0	5	6.8	7.3	431	2.43	1.55	1.28	ND	67.94	2,333	2,333						
4	P5	7:30		21.3	8.16	19,700																			
5	P2	7:35		20.4	8.10	35,800																			
6																									
7																									
Total																		102,626	125,803						
Actual Emissions												PTE													
Loc. #	TNMHC	Benzene	EthylBen zene (ug/min)	Toluene	Total Xylenes	Methane	TNMHC (ug/min)	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane													
1	2,803,536	7,792	9,489			2,999,532	3,451,415	9,993	11,682		3,692,704														
2	1,335,266	20,116	8,949	6,191	6,828	4,567,188	1,643,837	24,765	11,017	7,622	8,405	5,622,635													
3	1,005,298	5,661	3,623	2,990		158,509	1,005,298	5,661	3,623	2,990		158,509													
Total												5,144,100	33,969	22,061	9,181	6,828	7,725,228	6,100,550	40,018	26,322	10,612	8,405	9,473,847		
Total (lb/y)												5,961	39	26	11	8	8,952	7,070	46	31	12	10	10,979		

Pond Data

Pond Data							
Surface	Length		Width		Area		
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)	
CP- 1	82	25.0	78	23.8	6,396	594	
CP- 2	215	65.5	48	14.6	10,320	959	
CP- 3	175	53.3	48	14.6	8,400	780	
P- 1	700	213.3	170	51.8	119,000	11,054	
P- 2	740	225.5	180	54.9	133,200	12,373	
P- 3	740	225.5	180	54.9	133,200	12,373	
P- 4	735	224.0	170	51.8	124,950	11,607	
P- 5	745	227.1	195	59.4	145,275	13,495	
P- 6	745	227.1	185	56.4	137,825	12,803	
P- 7	795	242.3	180	54.9	143,100	13,293	
P- 8	795	242.3	180	54.9	143,100	13,293	
P- 9	650	198.1	100	30.5	65,000	6,038	
P- 10	615	187.4	300	91.4	184,500	17,139	
Totals						125,803	

Nomenclature and Dimensions



Region 5 Site No. 4

Coordinates (Lat/Long)

35.14196, -119.4290

Sample Locations (Test Date 10/11/2017)

Site Plan



Legend: Flux Chamber Sample (red circle) Water Quality Screening Sample (green circle)

Sample Locations (Test Date 4/10/2018)

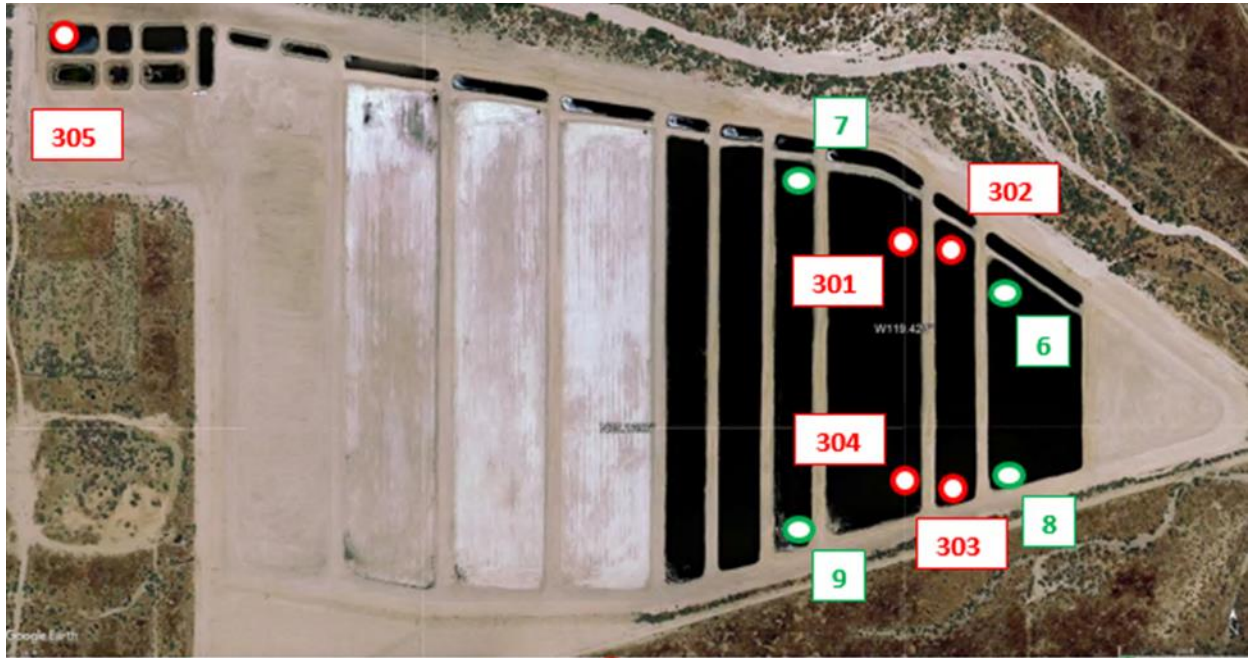
Site Plan



Legend: Flux Chamber Sample (red circle) Water Quality Screening Sample (green circle)

Sample Locations (Test Date 8/1/2017)

Site Plan



Legend: Flux Chamber Sample Water Quality Screening Sample

Sample Locations (Test Date 10/3/2018)

Site Plan

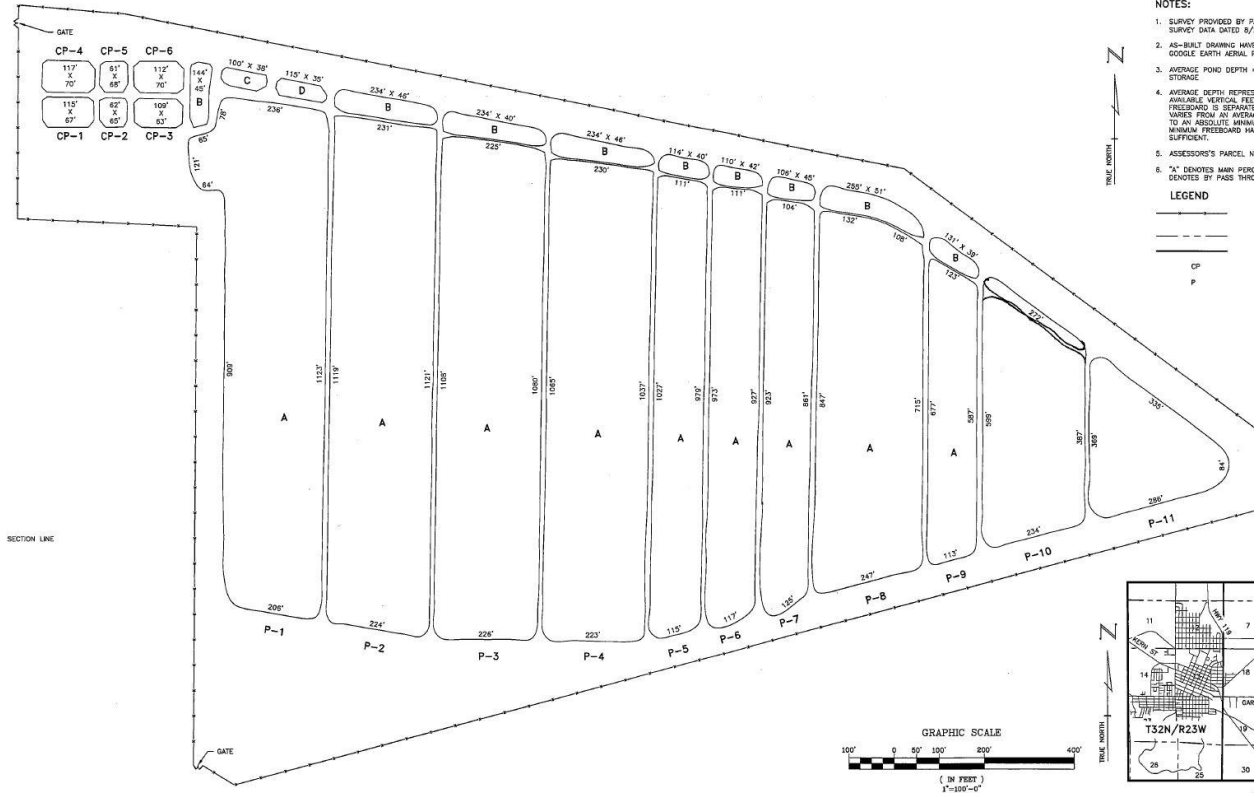


Legend: Flux Chamber Sample Water Quality Screening Sample

Pond Data

Pond Data		Length		Width		Area	
Surface		(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
CP- 1		115	35.1	67	20.4	7,705	716
CP- 2		62	18.9	65	19.8	4,030	374
CP- 3		109	33.2	63	19.2	6,867	638
CP- 4		117	35.7	70	21.3	8,190	761
CP- 5		61	18.6	65	19.8	3,965	368
CP- 6		112	34.1	70	21.3	7,840	728
P- 1	A	1,123	342.3	220	67.1	247,060	22,950
P- 1	B	144	43.9	45	13.7	6,480	602
P- 1	C	100	30.5	38	11.6	3,800	353
P- 1	D	115	35.1	35	10.7	4,025	374
P- 2	A	1,120	341.4	226	68.9	253,120	23,513
P- 2	B	234	71.3	45	13.7	10,530	978
P- 3	A	1,090	332.2	225	68.6	245,250	22,782
P- 3	B	234	71.3	40	12.2	9,360	869
P- 4	A	1,045	318.5	225	68.6	235,125	21,842
P- 4	B	234	71.3	46	14.0	10,764	1,000
P- 5	A	1,000	304.8	113	34.4	113,000	10,497
P- 5	B	114	34.7	40	12.2	4,560	424
P- 6	A	950	289.5	115	35.1	109,250	10,149
P- 6	B	110	33.5	42	12.8	4,620	429
P- 7	A	900	274.3	115	35.1	103,500	9,615
P- 7	B	106	32.3	45	13.7	4,770	443
P- 8	A	775	236.2	250	76.2	193,750	17,998
P- 8	B	255	77.7	51	15.5	13,005	1,208
P- 9	A	640	195.1	110	33.5	70,400	6,540
P- 9	B	131	39.9	39	11.9	5,109	475
P- 10	A	500	152.4	225	68.6	112,500	10,451
P- 10	B	272	82.9	20	6.1	5,440	505
P- 11	A	290	88.4	200	61.0	58,000	5,388
					Totals		172,970

Nomenclature and Dimensions



Region 5 Site No. 5



Coordinates (Lat/Long)

36.1662, -120.412

Sample Locations (Test Date 10/10/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		Liquid Phase					Gas Phase					Areas							
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (ug/l)	EthylBenzene (ug/l)	Toluene (ug/l)	Total Xylenes (ug/l)	TNMHC (ug/m ² -min)	Benzene (ug/m ² -min)	EthylBenzene (ug/m ² -min)	Toluene (ug/m ² -min)	Total Xylenes (ug/m ² -min)	Methane (ug/m ² -min)	Actual Emissions (m ²)	PTE
1		11:00	401/402	25.7	7.78	9,010	29	1.6	0.4	0.3	0.4	15	0	ND	2	ND	47		13,722
2		12:05	403/404	47.3	6.89	9,500	62	7.8	1.9	1.5	0.9	116	2.49	0.43	0.28	0.06	203.57		13,722
3	Pond 4	10:35		26.3	7.60	9,650													
4	Pond 8	10:45		22.3	7.96	8,610													
Total																	0	27,443	

Actual Emissions						PTE						
Loc. #	TNMHC (ug/min)	Benzene (ug/min)	EthylBenzene (ug/min)	Toluene (ug/min)	Total Xylenes (ug/min)	Methane (ug/min)	TNMHC (ug/min)	Benzene (ug/min)	EthylBenzene (ug/min)	Toluene (ug/min)	Total Xylenes (ug/min)	Methane (ug/min)
1	0	0					211,123	5,985		29,380		638,371
2							1,591,468	34,148	5,832	3,816	797	2,793,296
Total	0	0	0	0	0	0	1,802,591	40,133	5,832	33,196	797	3,431,667
Total (lb/y)	0	0	0	0	0	0	2,089	47	ND	ND	ND	3,977

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
2	435	132.6	115	35.1	50,025	4,647
3	210	64.0	150	45.7	31,500	2,926
4	260	79.2	165	50.3	42,900	3,985
5	220	67.1	100	30.5	22,000	2,044
6	250	76.2	170	51.8	42,500	3,948
7	300	91.4	230	70.1	69,000	6,410
8	250	76.2	150	45.7	37,500	3,484
Total						27,443

Region 5 Site No. 6

Coordinates (Lat/Long)

36.212, -120.395

Sample Locations (Test Date 10/10/2017)

Site Plan



Legend:

Flux Chamber Sample
Water Quality Screening Sample



Water Quality Data/Emission Estimates

Date		10/10/2017					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
							Flux (ug/m ² -min)												
1	Pond 1 In	15:07	405/406	46.2	6.50	4,130	15	2.0	3.6	1.4	15.0	174	1.1	1.0	0.3	4	950		3,950
2	Pond 7 Out	16:10	407/408	39.0	7.00	4,130	1,798	1.1	1.4	0.6	6.7	6,653	2.58	8.65	1.48	26.04	109.29		3,950
3	Pond 2	14:40		46.8	6.60	4,360													
4	Pond 4	14:45		25.9	7.46	4,310													
Total																	0	7,901	

Actual Emissions						PTE						
Loc. #	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane
(ug/min)						(ug/min)						
1	0	0					685,583	4,479		1,337		3,751,950
2							26,281,695	10,199	34,166	5,857	102,881	431,739
Total	0	0	0	0	0	0	26,967,279	14,678	34,166	7,194	102,881	4,183,689
Total (lb/)	0	0	0	0	0	0	31,251	17	ND	ND	ND	4,848

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
1	100	30.5	60	18.3	6,000	557
2	160	48.8	130	39.6	20,800	1,932
3	170	51.8	65	19.8	11,050	1,026
4	175	53.3	140	42.7	24,500	2,276
5	130	39.6	60	18.3	7,800	725
6	150	45.7	70	21.3	10,500	975
7	80	24.4	55	16.8	4,400	409
Total						7,901

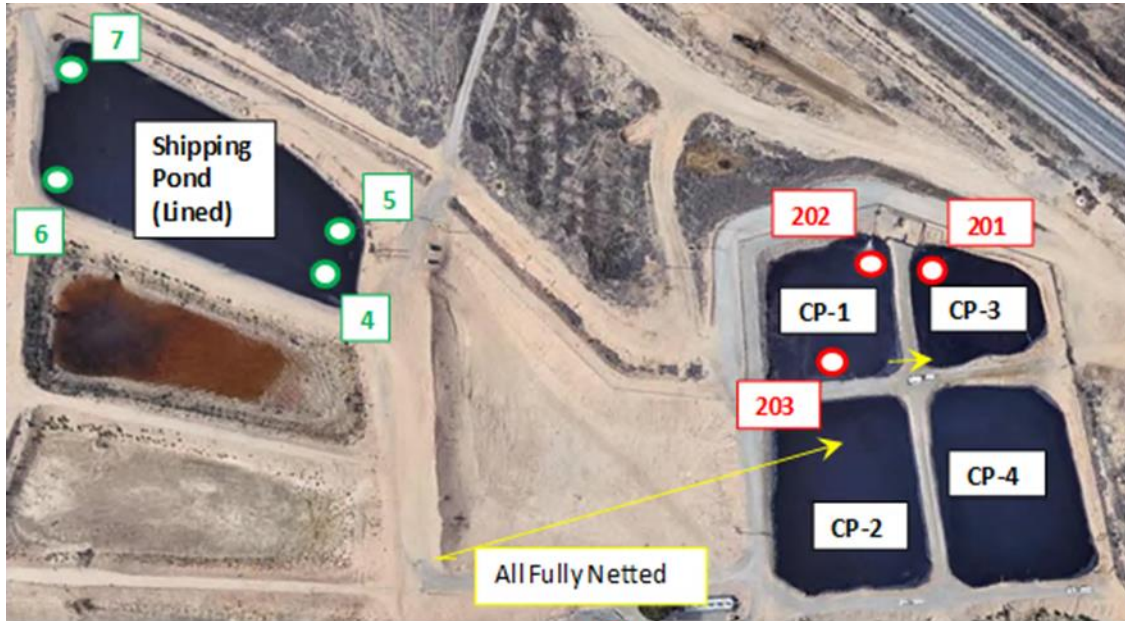
Region 5 Site No. 7



Coordinates (Lat/Long)

35.4632, -119.06

Sample Locations (Test Date 9/27/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

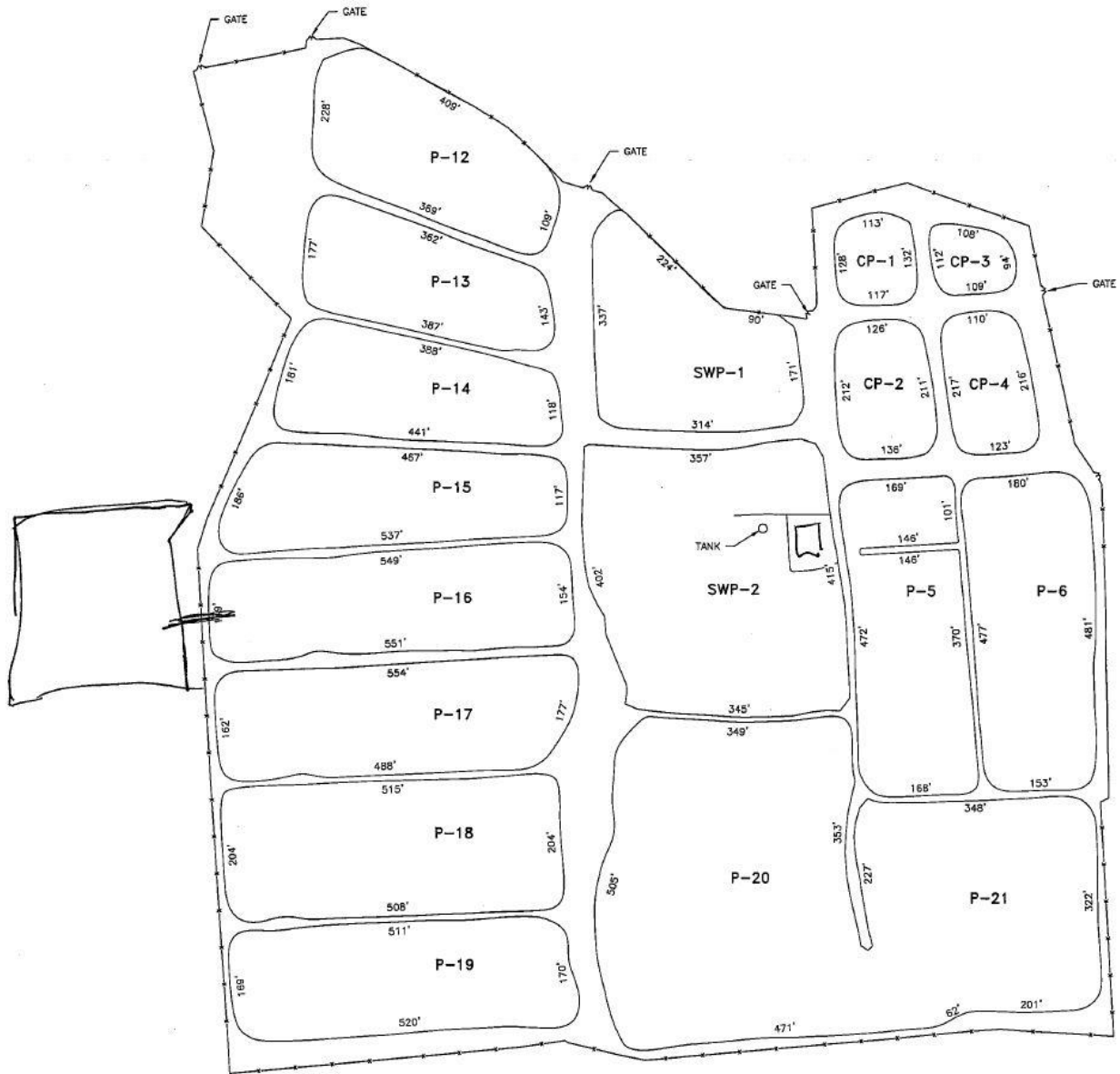
Water Quality Data/Emission Estimates

Date		Liquid Phase					Gas Phase					Areas							
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions	PTE
							(mg/l)	(ug/l)	(ug/min)	(ug/m ³ -min)	(m ²)	(m ²)							
1	in situ Flux Chamber	8:55	201	37.0	7.54	412	180	0.48	0.96	1.1	6.3	568	0.9	0.3	0.4	2	1,169		4,333
2	in situ Flux Chamber, Inlet	10:00	202	29.2	7.82	358	9	0.19	0.53	0.32	ND	298	0.09	0.06	0.04	ND	47.26		4,333
3	in situ Flux Chamber	10:55	203	28.9	7.84	358	8	0	0.39	0.23	ND	19	0.11	ND	ND	ND	46.77		4,333
4	Shipping Pond In	8:24		36.5	7.62	437													
5		8:29		33.0	7.74	451													
6		8:36		32.5	7.74	447													
7	Shipping Pond Out	8:38		32.6	7.73	461													
Total																	0	12,998	
Actual Emissions										PTE									
Loc. #	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane							
	(ug/min)						(ug/min)												
1							2,459,792	3,896	1,170	1,798	7,595	5,066,883							
2							1,292,171	398	250	153		204,766							
3							80,510	463				202,633							
Total	0	0	0	0	0	0	3,832,473	4,758	1,420	1,951	7,595	5,474,281							
Total (lb/)	0	0	0	0	0	0	4,441	6	2	2	9	6,344							

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
CP-1	130	39.6	115	35.1	14,950	1,389
CP-2	212	64.6	131	39.9	27,772	2,580
CP-3	103	31.4	109	33.2	11,227	1,043
CP-4	217	66.1	116	35.4	25,172	2,338
Shipping Pond P-12	380	115.8	160	48.8	60,800	5,648
					Total	12,998

Nomenclature



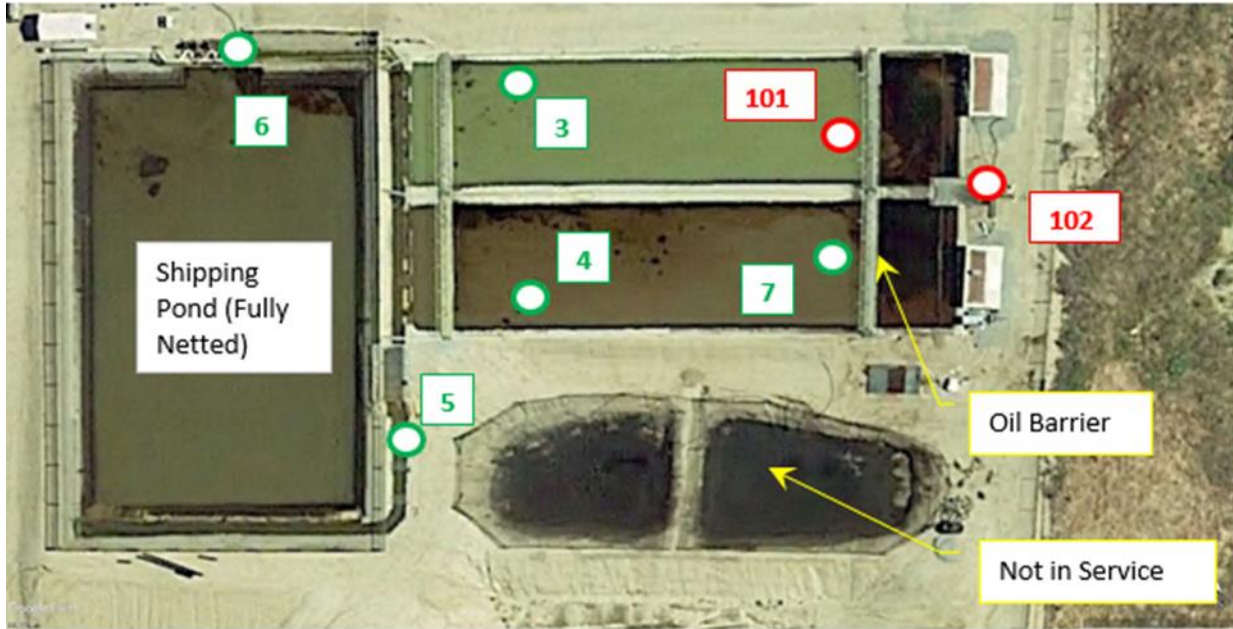
Region 5 Site No. 8

Coordinates (Lat/Long)



35.3553, -118.86

Sample Locations (Test Date 9/26/2017)

Site Plan



Legend:

Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

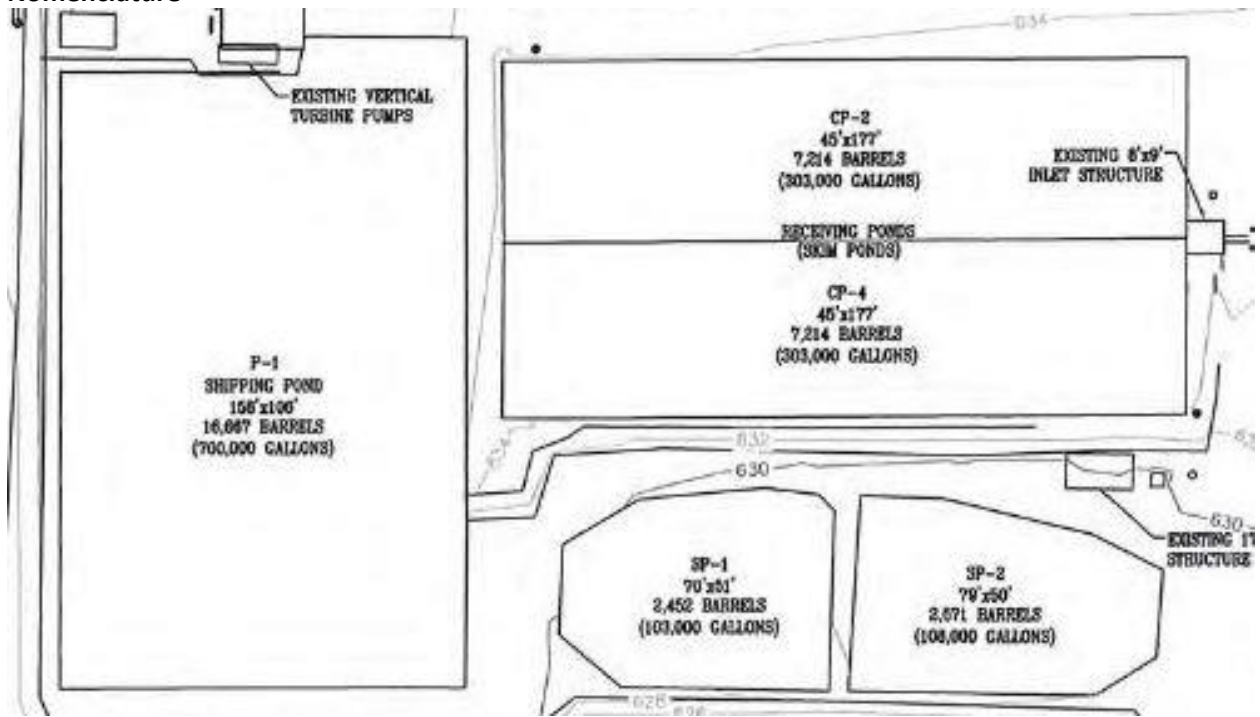
Date		9/26/2017		Liquid Phase							Gas Phase					Areas				
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg)	Oil	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions	PTE	
							(mg/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/m ² -min)	(ug/m ² -min)	(ug/m ² -min)	(m ²)	(m ²)				
1	Aqueous Flux Chamber	8:40	101	20.0	7.88	4,070	9	2.2	ND	0.36	1.2	34	0.2	ND	0.04	ND	53		1,500	
2	Inlet Oil Film Flux Chamber	9:33	102	25.6	7.38	5,110	41	290		34	110	150	11,944	68.04	29.25	49.24	113.19	685.29		1,500
3		8:25		19.6	7.95	4,100														
4		8:36		23.0	7.51	3,560														
5		9:05		22.9	7.60	3,540														
6	Site Outlet (to Site 9)	9:09		21.8	7.72	3,700														
7		9:15		23.6	7.42	3,530														
Total																	0	3,000		

Loc. #	Actual Emissions						PTE															
	TNMHC	Benzene	EthylBenzene	Toluene	Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Xylenes	Methane										
												(ug/min)	(ug/min)									
1							50,478	325		63		79,028										
2							17,919,587	102,081	43,888	73,868	169,816	1,028,101										
Total												0	0	0	0	0	17,970,065	102,407	43,888	73,931	169,816	1,107,129
Total (lb/y)												0	0	0	0	0	20,824	119	51	86	197	1,283

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
Inlet Structure	9	2.7	8	2.4	72	7
Receiving Pond CP-2 Oil	22	6.7	45	13.7	990	92
Receiving Pond CP-4 Oil	22	6.7	45	13.7	990	92
Receiving Pond CP-2	150	45.7	45	13.7	6,750	627
Receiving Pond CP-4	150	45.7	45	13.7	6,750	627
Shipping Pond P-1	158	48.2	106	32.3	16,748	1,556
Total					3,000	

Nomenclature



Region 5 Site No. 9



Coordinates (Lat/Long)

35.391, -118.823

Sample Locations (Test Date 9/26/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		Liquid Phase					Gas Phase					Areas							
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	ility (mg)	Oil	Benzene	EthylBen	Toluene	Total	TNMHC	Benzene	EthylBen	Toluene	Total	Methane	Actual	PTE
							(mg/l)	(ug/l)				Flux (ug/m ² -min)					(m ²)		
1	Aqueous Flux Chamber	12:25	103	24.6	7.88	3,860	7	ND	ND	ND	ND	8	0.1	ND	ND	ND	48		2,279
2	Ex Situ Flux Chamber	13:30	104/105	26.6	7.97	3,840	9	ND	ND	ND	ND	35	0.13	ND	ND	0.02	49.48		2,279
3		11:55		24.5	6.99	4,880													
4		11:58		24.0	6.96	3,850													
5		12:03		24.0	7.82	3,800													
6		12:05		23.8	7.87	3,850													
7	CP-2 Outlet	12:10		23.2	7.87	3,850													
8		12:12		23.8	7.92	3,950													
9		12:15		24.3	7.94	3,970													
10		12:19		24.3	7.94	3,930													
11		12:37		24.0	7.89	3,920													
																	Total	0	4,559

Loc. #	Actual Emissions					PTE					
	TNMHC	Benzene	EthylBen	Toluene	Total	TNMHC	Benzene	EthylBen	Toluene	Total	
	(ug/min)					(ug/min)					
1						17,643	231			109,411	
2						79,370	301			112,777	
Total	0	0	0	0	0	97,013	533	0	0	48	222,188
Total (lb/y)	0	0	0	0	0	112	1	ND	ND	0	257

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
CP-1	175	53.3	85	25.9	14,875	1,382
CP-2	180	54.9	90	27.4	16,200	1,505
CP-3	225	68.6	80	24.4	18,000	1,672
					Total	4,559

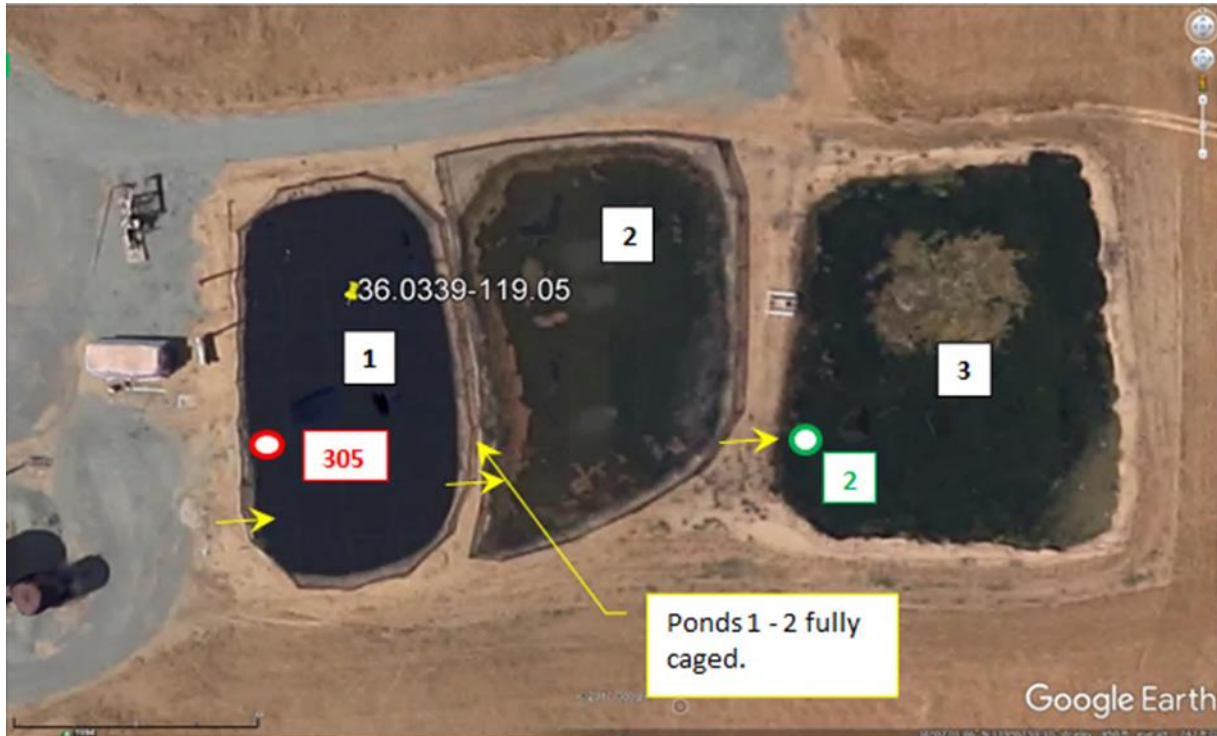
Region 5 Site No. 10

Coordinates (Lat/Long)

36.0339, -119.05

Sample Locations (Test Date 9/28/2017)

Site Plan



Legend:

Flux Chamber Sample

Water Quality Screening Sample



Water Quality Data/Emission Estimates

Date		Liquid Phase						Gas Phase						Areas					
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	ility (mg)	Oil	Benzene	EthylBen zene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions	PTE
							(mg/l)	(ug/l)				Flux (ug/m ² -min)						(m ²)	
1	<i>in situ</i> Flux Ch	12:45	305/306	28.5	8.12	205	59	ND	ND	0.11	ND	223	0.10	ND	0.4	ND	48		2,097
2	Pond 2 Discha	12:35		23.9	8.16	222													
Total																	0	2,097	
Loc. #	Actual Emissions						PTE												
	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane							
1	0	0					468,625	204		912		100,660							
Total	0	0	0	0	0		468,625	204	0	912	0	100,660							
Total (lb/y)	0	0	0	0	0		543	0	ND	1	ND	117							

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
1	105	32.0	60	18.3	6,300	585
2	105	32.0	65	19.8	6,825	634
3	105	32.0	90	27.4	9,450	878
Total					20,575	2,097

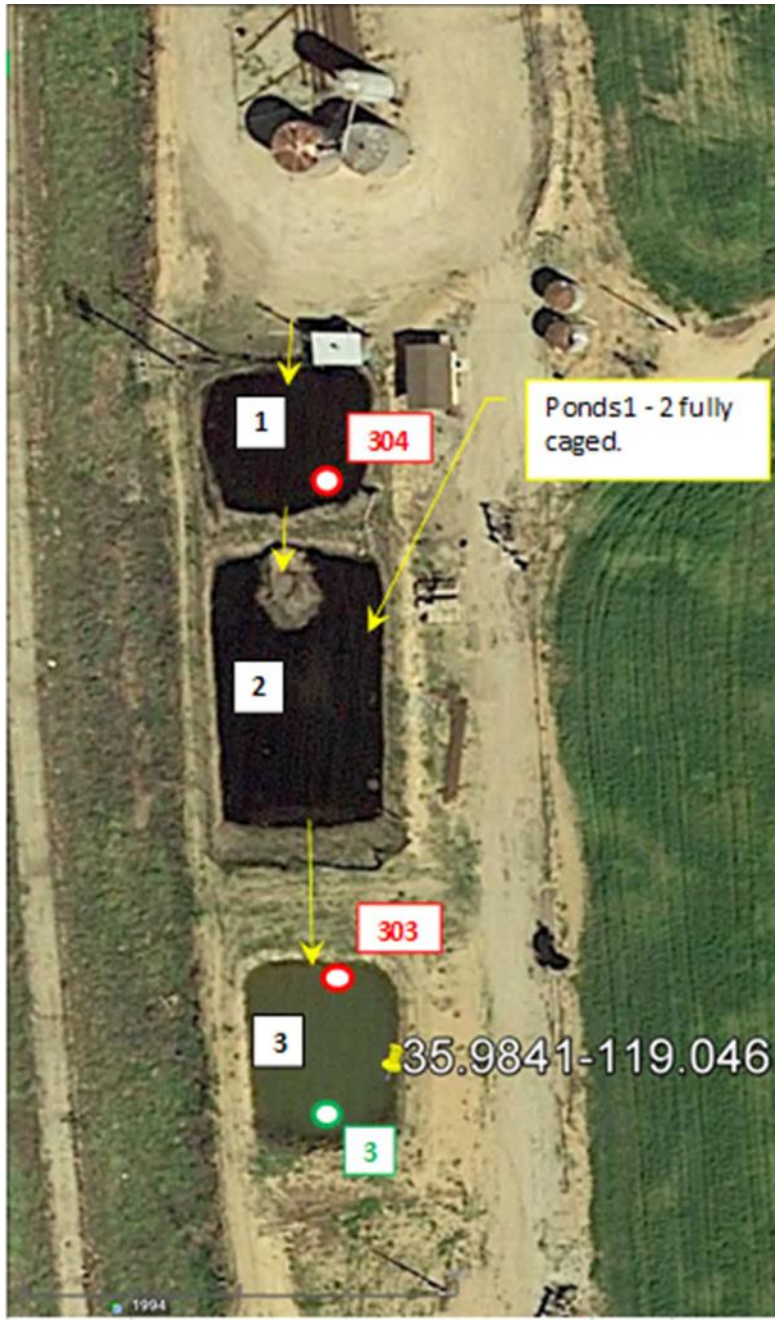
Region 5 Site No. 11



Coordinates (Lat/Long)

35.9841, -119.046

Sample Locations (Test Date 9/28/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		Liquid Phase						Gas Phase						Areas					
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Clarity (mg)	Oil	Benzene	EthylBen zene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions	PTE
							(mg/l)	(ug/l)					Flux (ug/m ² -min)						(m ²)
1	<i>in situ</i> Flux Chamber	10:30	303	23.0	9.16	403	3	0.1	ND	ND	ND	ND	0.1	ND	ND	ND	ND	47	0
2	<i>in situ</i> Flux Chamber	11:30	304	<i>non aqueous</i>			1,200	ND	ND	ND	0.4	232	0.06	ND	0.05	ND	48.00		831
3		10:10		22.7	9.19	402													
Total																		0	831

Loc. #	Actual Emissions						PTE					
	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane
(ug/min)						(ug/min)						
1									0			0
2							193,251	47		40		39,907
Total	0	0	0	0	0		193,251	47	0	40	0	39,907
Total (lb/y)	0	0	0	0	0		224	0	ND	0	0	46

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
1	43	13.1	50	15.2	2,150	200
2	86	26.2	50	15.2	4,300	399
3	50	15.2	50	15.2	2,500	232
Total						831

Region 5 Site No. 12

Coordinates (Lat/Long)

35.4914, -119.088

Sample Locations (Test Date 9/27/2017)

Site Plan



Legend: Flux Chamber Sample (Red Circle) Water Quality Screening Sample (Green Circle)

Water Quality Data/Emission Estimates

Date		Liquid Phase					Gas Phase					Areas								
Loc. #	Location	Time	Sample ID	Temp (°C)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (µg/l)	EthylBen zene (µg/l)	Toluene (µg/l)	Total Xylenes (µg/l)	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	Actual Emissions (m ³)	PTE	
																	Flux (µg/m ² -min)			
1	#1 air Flux Chambers	12:47	204	33.0	7.63	440	11	0.36	ND	0.25	ND	38	0.3	ND	0.31	0	279		23,538	
2	#1 air Flux Chambers	14:00	205	41.2	6.49	345	4	0.27	0.9	0.61	3	70	0.34	0.69	0.48	1.955	3,990.40		23,538	
3	#1 air Flux Chambers	14:55	206/207	36.8	6.67	346	3	0.34	0.925	0.62	2.9	72	0.32	0.83	0.56	2.31	3994.09		23,538	
4	Koro River Water	12:27		22.6	8.32	105														
5	Reservoir Out	12:32		31.6	6.95	175														
6		12:37		30.8	7.01	175														
7		12:40		32.6	6.90	176														
8		13:40		35.0	6.44	350														
9		13:47		35.5	6.87	213														
																	Total	0	70,553	
Actual Emissions																	PTE			
Loc. #	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBen zene	Toluene	Total Xylenes	Methane								
						Flux (µg/min)														
1	0	0					882,654	5,888		3,066	1,094	6,553,105								
2							1,645,449	8,068	36,281	11,380	45,977	93,844,883								
3							1,682,883	7,566	19,524	13,302	54,267	93,931,695								
Total	0	0	0	0	0		4,210,986	21,523	35,806	27,348	101,338	194,326,683								
Total (lb/y)	0	0	0	0	0		4,880	25	41	32	117	225,195								

Pond Data

	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
Surface	350	106.7	130	39.6	45,500	4,227
Reservoir	1,020	310.9	700	213.3	714,000	66,326
					Total	70,553

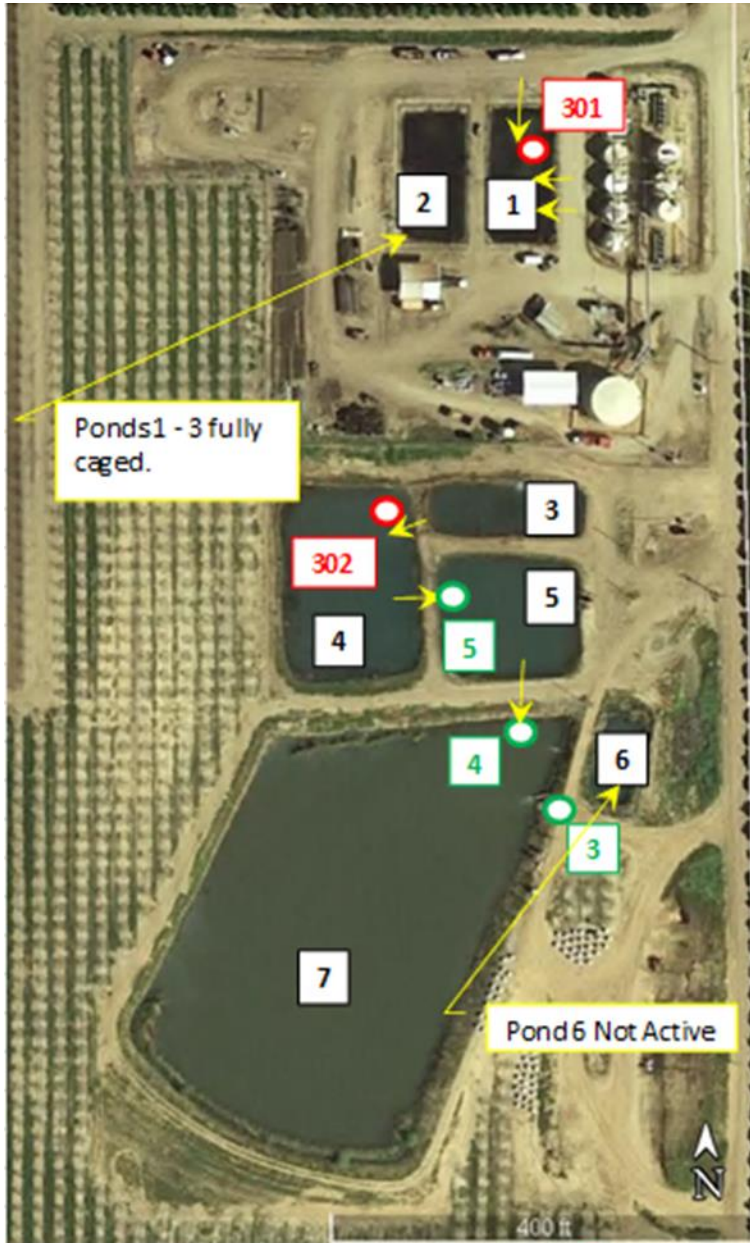
Region 5 Site No. 13



Coordinates (Lat/Long)

35.75418, -119.059621

Sample Locations (Test Date 9/28/2017)

Site Plan



Legend: Flux Chamber Sample 
Water Quality Screening Sample 

Water Quality Data/Emission Estimates

Date		Liquid Phase					Gas Phase					Areas							
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Oil (mg/l)	Benzene	EthylBenzene	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ³)	PTE	
						Flux (ug/m ² -min)													
1	<i>in situ</i> Flux Chamber	7:55	301	35.8	8.43	340	8	0.18	0.23	1.6	2	4	0.2	ND	0.26	0.26	246.40		7,870
2	<i>in situ</i> Flux Chamber	9:00	302	33.8	8.28	340	7	0.11	0.15	0.91	1.3	3	0.15	ND	0.13	0.14	244.43		7,870
3	Compliance Point	8:30		28.4	7.97	344													
4	Pond 5 Discharge	8:35		34.1	8.03	334													
5	Pond 4 Discharge	8:45		34.0	8.22	346													
Total																	0	15,741	

Actual Emissions						PTE						
Loc. #	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane
(ug/min)						(ug/min)						
1							31,476	1,489		2,028	2,043	1,939,277
2							22,110	1,162		990	1,114	1,923,778
Total							53,586	2,652	0	3,018	3,157	3,863,055
Total (lb/y)							62	3	ND	3	4	4,477

Pond Data

Surface	Length		Width		Area	
	(ft)	(m)	(ft)	(m)	(ft ²)	(m ²)
1	120	36.6	60	18.3	7,200	669
2	120	36.6	60	18.3	7,200	669
3	150	45.7	50	15.2	7,500	697
4	180	54.9	130	39.6	23,400	2,174
5	130	39.6	115	35.1	14,950	1,389
6	80	24.4	40	12.2	3,200	297
7	400	121.9	265	80.8	106,000	9,847
Total						15,741

Northern Gas Wells N3

Coordinates (Lat/Long)

39.1205243, -121.8287615

Sample Locations (Test Date 1/18/2018)

Site Plan



Note: Sample taken from pressure discharge of water separator and tested in external tub.

Water Quality Data/Emission Estimates

Date		1/18/2018					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	Actual Emissions (m ³)	PTE
							Flux (ug/m ³ -min)					Flux (ug/m ³ -min)							
1	Flux Chamber in Tub	13:30	805/806	13.1	7.06	19,400	6	7.55	5.2	5.25	6.25	168	0.61	0	0.2	0	1,821		7
Total																	0	7	
Actual Emissions											PTE								
Loc. #	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane							
(ug/min)						(ug/min)													
1							1,223	4	3	2	1	13,283							
Total	0	0	0	0	0	0	1,223	4	3	2	1	13,283							
Total (lb/y)	0	0	0	0	0	0	1	0	0	0	0	15							

Process Dimensions

Surface	Dia		Area	
	(ft)	(m)	(ft ²)	(m ²)
Tank Interior	10	3.0	79	7

Northern Gas Wells N5

Coordinates (Lat/Long)

39.179035, -121.871446

Sample Locations (Test Date 1/18/2018)

Site Plan



Note: Sample taken from pressure discharge of water separator and tested in external tub.

Water Quality Data/Emission Estimates

Date		1/18/2018					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (ug/l)	EthylBenzene (ug/l)	Toluene (ug/l)	Total Xylenes (ug/l)	TNMHC	Benzene	EthylBenzene Flux (ug/m ² -min)	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
1	Flux Chamber in Tub	12:10	804	12.3	7.61	14,700	6	92	10	26	26	293	3.75	0.77	0.22	0.48	9,864.37		7
																	Total	0	7
Actual Emissions										PTE									
Loc. #	TNMHC	Benzen e (ug/min)	EthylBenze ne (ug/min)	Toluene	Total Xylenes	Methane	TNMHC (ug/min)	Benzene (ug/min)	EthylBenzene (ug/min)	Toluene (ug/min)	Total Xylenes (ug/min)	Methane							
1	0	0					2,140	27	6	2	3	71,969							
Total	0	0	0	0	0		2,140	27	6	2	3	71,969							
Total (lb/y)	0	0	0	0	0		2	0	0	0	0	83							

Process Dimensions

Surface	Dia		Area	
	(ft)	(m)	(ft ²)	(m ²)
Tank Interior	10	3.0	79	7

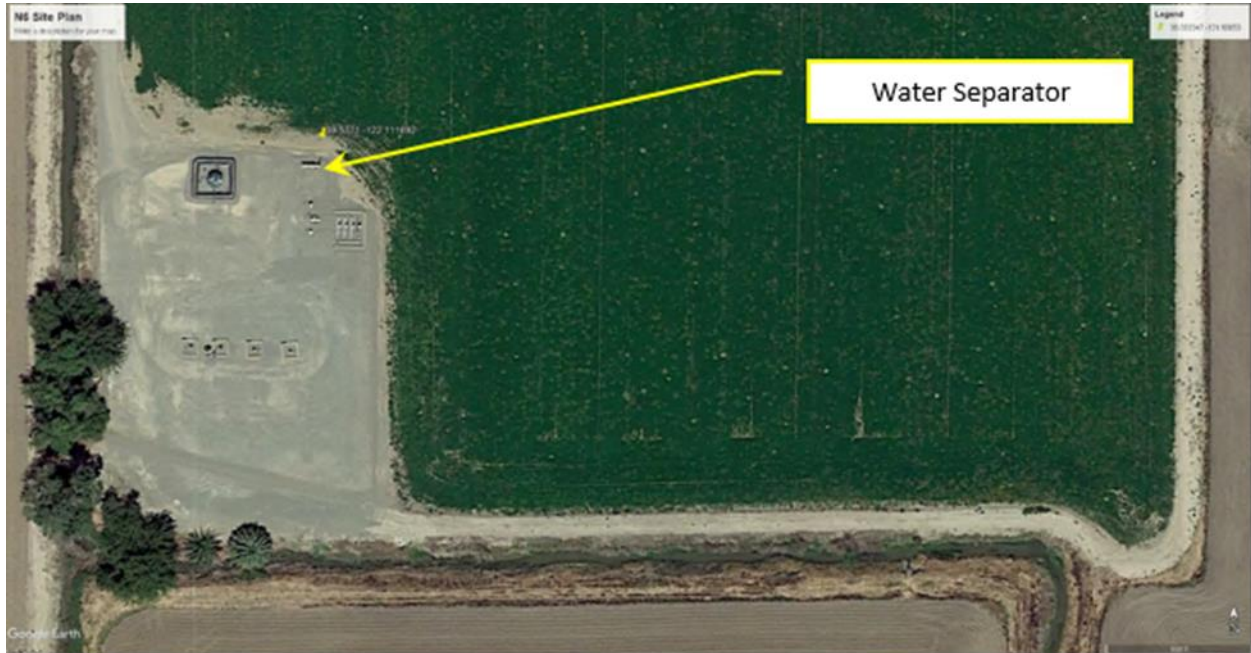
Northern Gas Wells N6

Coordinates (Lat/Long)

39.5771, -122.111692

Sample Locations (Test Date 1/18/2018)

Site Plan



Note: Sample taken from pressure discharge of water separator and tested in external tub.

Water Quality Data/Emission Estimates

Date		1/18/2018					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene Flux (ug/m ² -min)	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
1	Flux Chamber in Tub	9:55	803	11.2	7.50	15,000	10	55	13	23	21	726	4.68	1.95	1.23	2.30	33,226.34		7
Total																	0	7	
Actual Emissions										PTE									
Loc. #	TNMHC	Benzen e (ug/min)	EthylBenze ne (ug/min)	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene (ug/min)	Toluene	Total Xylenes	Methane							
1	0	0					5,295	34	14	9	17	242,415							
Total	0	0	0	0	0		5,295	34	14	9	17	242,415							
Total (lb/y)	0	0	0	0	0		6	0	0	0	0	281							

Process Dimensions

Surface	Dia		Area	
	(ft)	(m)	(ft ²)	(m ²)
Tank Interior	10	3.0	79	7

Northern Gas Wells N8

Coordinates (Lat/Long)

39.539575, -122.089059

Sample Locations (Test Date 1/18/2018)

Site Plan



Note: Sample taken from pressure discharge of water separator and tested in external tub.

Water Quality Data/Emission Estimates

Date		1/18/2018					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene (mg/l)	EthylBenzene (ug/l)	Toluene (ug/l)	Total Xylenes	TNMHC	Benzene	EthylBenzene Flux (ug/m ² -min)	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
1	Flux Chamber in Tub	7:40	801	10.9	7.15	16,100	14	220	23	150	71	422	5.96	3.49	0.54	1.49	5,918.52		7
Total																	0	7	
Actual Emissions							PTE												
Loc. #	TNMHC	Benzen e	EthylBenze ne	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene	Toluene	Total Xylenes	Methane							
	(ug/min)						(ug/min)												
1							3,077	43	25	4	11	43,181							
Total	0	0	0	0	0	0	3,077	43	25	4	11	43,181							
Total (lb/y)	0	0	0	0	0	0	4	0	0	0	0	50							

Process Dimensions

Surface	Dia		Area	
	(ft)	(m)	(ft ²)	(m ²)
Tank Interior	10	3.0	79	7

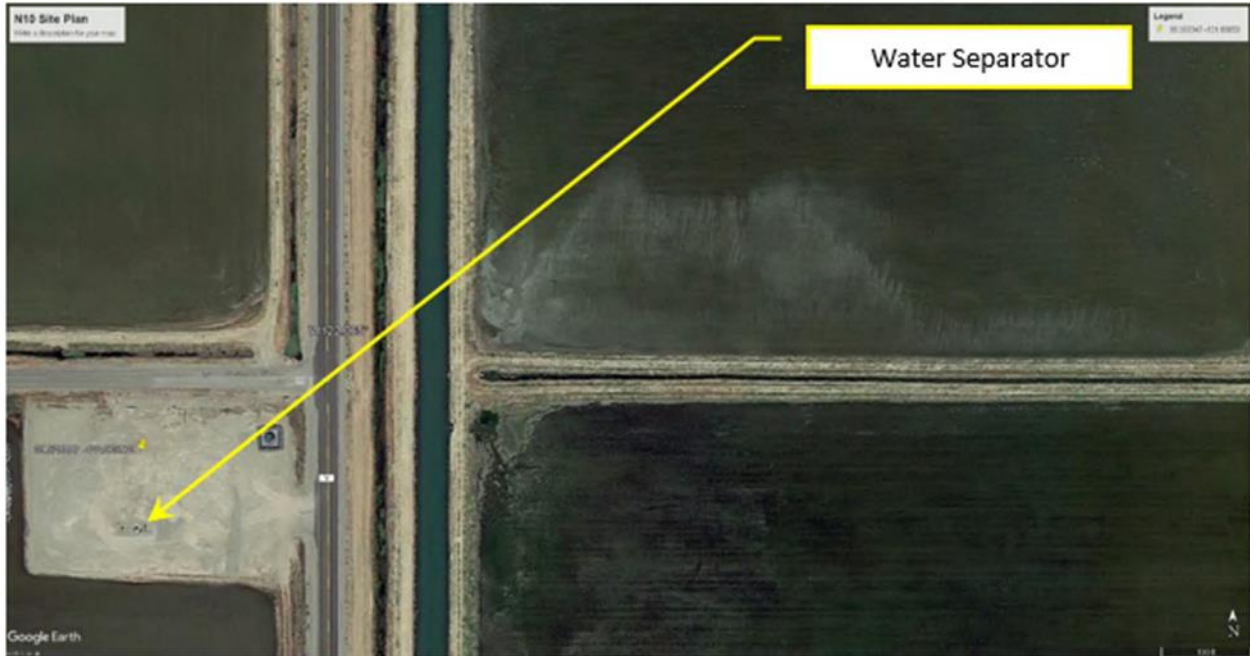
Northern Gas Wells N10

Coordinates (Lat/Long)

39.528887, -122.065979

Sample Locations (Test Date 1/18/2018)

Site Plan



Note: Sample taken from pressure discharge of water separator and tested in external tub.

Water Quality Data/Emission Estimates

Date		1/18/2018					Liquid Phase					Gas Phase					Areas		
Loc. #	Location	Time	Sample ID	Temp (oC)	pH	Salinity (mg/l)	Oil (mg/l)	Benzene	EthylBenzene (ug/l)	Toluene	Total Xylenes	TNMHC	Benzene	EthylBenzene Flux (ug/m ² -min)	Toluene	Total Xylenes	Methane	Actual Emissions (m ²)	PTE
1	Flux Chamber in Tub	8:45	802	10.8	7.76	11,700	28	210	95	200	340	624	16.21	11.28	1.43	4.53	11,681.72		7
Total																	0	7	
Actual Emissions											PTE								
Loc. #	TNMHC	Benzen e (ug/min)	EthylBenze ne	Toluene	Total Xylenes	Methane	TNMHC	Benzene	EthylBenzene (ug/min)	Toluene	Total Xylenes	Methane							
1							4,556	118	82	10	33	85,228							
Total	0	0	0	0	0	0	4,556	118	82	10	33	85,228							
Total (lb/y)	0	0	0	0	0	0	5	0	0	0	0	99							

Process Dimensions

Surface	Dia		Area	
	(ft)	(m)	(ft ²)	(m ²)
Tank Interior	10	3.0	79	7