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JACKSON DISTRICT OFFICE

**3rd Quarter, 2016**

**(July, August, September)**

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## Summary of Activity

CEB = Central Environmental Building  
C3 = C3 aquifer  
D2 = D2 aquifer  
E = E aquifer  
SW = Southwest Property Area  
Maple = Maple Road

### *Treatment Activities*

07/08/16 - 07/09/16 - TW-9 (D2) and TW-17 (E ) were turned on to maintain the Pond level while TW-18 (E ) was down due to a DTE Energy power failure.

07/09/16 - TW-10 (C3) was turned on briefly to maintain the Pond level while TW-18 (E ) was down due to a DTE Energy power failure.

07/12/16 - TW-14 (C3) was turned on briefly to maintain the Pond level while LB-4 (D2) was down due to a DTE Energy power failure caused by storms in the area.

07/17/16 - 07/19/16 - TW-9 (D2) and TW-10 (C3) were turned on to maintain the Pond level while TW-18 (E ) and TW-21 (D2) were down due to a broken DTE Energy transformer.

07/18/16 - LB-4 (D2) was shut down due to a DTE Energy power failure caused by storms in the area.

08/15/16 - Treatment was shut down briefly for maintenance.

08/15/16 - 08/16/16 - TW-14 (C3) was turned on to maintain the Pond level.

09/10/16 - Treatment was shut down briefly due to intermittent DTE Energy power outages caused by storms in the area.

09/12/16 – 09/30/16 - TW-20's (C3) flow meter indicated the correct flow of 40 GPM but did not register extracted gallons properly beginning Sept 12.

09/22/16 - System 1A was shut down briefly for maintenance.

09/29/16 - TW-21 (D2) was shut down briefly due to a DTE Energy power loss and TW-9 (D2) was turned on to maintain the Pond level.

09/29/16-09/30/16 - TW-10 (D2) and TW-17 (E ) were turned on briefly to maintain the Pond level while TW-18 (E ) was shut down due to a DTE Energy power outage.

09/30/16 - System 1A was shut down briefly for maintenance.

## *Field Activities*

Shallow Groundwater Investigation August 8-17, 2016

### *Submittals/Responses*

07/15/16 PLS submitted Discharge Monitoring Report (DMR) to DEQ;  
PLS submitted Monthly Monitoring Report (NPDES) to DEQ

07/15/16 PLS submitted 2nd Quarter 2016 Report to DEQ

08/10/16 PLS submitted Discharge Monitoring Report (DMR) to DEQ;  
PLS submitted Monthly Monitoring Report (NPDES) to DEQ

09/07/16 PLS submitted Discharge Monitoring Report (DMR) to DEQ;  
PLS submitted Monthly Monitoring Report (NPDES) to DEQ

### *Anticipated Major Activities for the Next Quarter*

- Finalize Shallow Groundwater Investigation report
- Routine Maintenance

### *Quarterly Performance Analysis*

For the months of July, August, September 2016, over 248 pounds of 1,4-dioxane were removed and 65,876,914 gallons of water were extracted from the contaminated aquifers, treated and discharged. The total mass of 1,4-dioxane removed since May 1997 is over 92,600 pounds and the total volume of water discharged since May 1997 is over 7.7 billion gallons.

In general, the performance of the operation was as expected, purging and treating contaminated groundwater to the existing allowable capacities.

# **Mass Reduction**

**MASS REDUCTION DETAIL BY AQUIFER**

July 1 - July 31, 2016

	Extraction Well	Month To Date Gallons Extracted	Month To Date Average Daily Flow Rate GPM	Month To Date Average Daily Pounds Removed	Month To Date Pounds Removed	Month To Date Average Concentration ppb
<b>C3</b>						
	TW-1	11	0.0	0.00	0.00	78
	TW-2 (Dolph)	661,633	14.8	0.02	0.52	94
	TW-10	145,138	3.3	0.01	0.37	287
	TW-14	2,909	0	0.00	0.00	18
	TW-20	1,788,315	40	0.44	13.6	912
		<u>2,598,006</u>	<u>58</u>	<u>0.5</u>	<u>14</u>	
<b>Marshy</b>						
	PW-1	67,568	2	0.014	0.4	743
	<i>Sub-Totals</i>	<u>67,568</u>	<u>2</u>	<u>0.01</u>	<u>0.4</u>	
<b>E</b>						
	TW-16	1,366,426	31	0.3	9.3	818
	TW-17	249,384	6	0.03	0.8	382
	TW-18	6,417,157	144	0.5	15.9	297
	TW-19	3,184,003	71	0.6	18.2	686
	<i>Sub-Totals</i>	<u>11,216,970</u>	<u>251</u>	<u>1</u>	<u>44</u>	
<b>Southwest</b>						
	Active Wells	1,079,647	24	0.2	6.9	761
	<i>Sub-Totals</i>	<u>1,079,647</u>	<u>24</u>	<u>0.2</u>	<u>7</u>	
<b>D2</b>						
	LB-4	4,389,109	98	0.6	17.9	488
	TW-9	122,975	3	0.0	0.7	706
	TW-21	2,491,939	56	0.1	2.9	143
	<i>Sub-Totals</i>	<u>7,004,023</u>	<u>157</u>	<u>0.7</u>	<u>21</u>	
<b>Overall Totals</b>		<u>21,966,214</u>	<u>492</u>	<u>2.8</u>	<u>87.5</u>	

\*SW Active = TW-8, TW-22

**MASS REDUCTION DETAIL BY AQUIFIER**

**August 1 - August 31, 2016**

	Extraction Well	Month To Date Gallons Extracted	Month To Date Average Daily Flow Rate GPM	Month To Date Average Daily Pounds Removed	Month To Date Pounds Removed	Month To Date Average Concentration ppb
<b>C3</b>						
	TW-2 (Dolph)	660,249	15	0.0	0.5	96
	TW-14	51,838	1	0.0	0.0	18
	TW-20	1,786,730	40	0.4	13.6	910
	<i>Sub-Totals</i>	2,498,817	56	0	14	
<b>Marshy</b>						
	PW-1	8,356	0	0.0	0.1	950
	<i>Sub-Totals</i>	8,356	0	0	0	
<b>E</b>						
	TW-16	1,257,819	28	0.3	8.2	780
	TW-18	6,852,306	154	0.5	16.0	280
	TW-19	3,305,737	74	0.6	17.4	630
	<i>Sub-Totals</i>	11,415,862	256	1	42	
<b>Southwest</b>						
	Active Wells	1,067,817	24	0.2	6.5	730
	<i>Sub-Totals</i>	1,067,817	24	0	7	
<b>D2</b>						
	LB-4	4,465,758	100	0.6	17.1	460
	TW-21	2,414,606	54	0.1	3.1	160
	<i>Sub-Totals</i>	6,880,364	154	1	20	
<b>Overall Totals</b>		21,871,216	490	2.7	82.5	

\*SW Active = TW-8, TW-22

**MASS REDUCTION DETAIL BY AQUIFER**

September 1 - September 30, 2016

	Extraction Well	Month To Date Gallons Extracted	Month To Date Average Daily Flow Rate GPM	Month To Date Average Daily Pounds Removed	Month To Date Pounds Removed	Month To Date Average Concentration ppb
<b>C3</b>						
	TW-2 (Dolph)	573,081	13	0.0	0.5	94
	TW-10	91,213	2	0.0	0.2	320
	TW-20	1,733,314	40	0.4	10.6	735
	<u>Sub-Totals</u>	<u>2,397,608</u>	<u>56</u>	<u>0</u>	<u>11</u>	
<b>Marshy</b>						
	PW-1	119,036	3	0.0	0.9	883
	<u>Sub-Totals</u>	<u>119,036</u>	<u>3</u>	<u>0</u>	<u>1</u>	
<b>E</b>						
	TW-16	1,209,531	28	0.2	6.9	680
	TW-17	91,090	2	0.0	0.1	130
	TW-18	6,455,258	149	0.5	16.0	297
	TW-19	3,209,290	74	0.5	15.3	572
	<u>Sub-Totals</u>	<u>10,965,169</u>	<u>254</u>	<u>1</u>	<u>38</u>	
<b>Southwest</b>						
	Active Wells	1,029,781	24	0.2	5.4	625
	<u>Sub-Totals</u>	<u>1,029,781</u>	<u>24</u>	<u>0</u>	<u>5</u>	
<b>D0</b>						
	Ann Arbor Cleaning	28,000			0.0206	88
	<u>Sub-Totals</u>	<u>28,000</u>			<u>0.0206</u>	
<b>D2</b>						
	LB-4	4,321,396	100.0	0.6	17.8	493
	TW-9	13,017	0	0.0	0.1	640
	TW-21	2,298,415	53	0.1	3.0	160
	<u>Sub-Totals</u>	<u>6,632,828</u>	<u>154</u>	<u>1</u>	<u>21</u>	
<b>Overall Totals</b>		<u>21,144,422</u>	<u>489</u>	<u>2.6</u>	<u>76.7</u>	

\*SW Active = TW-8, TW-22



**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Month	Mass Removed from Unit E Only	Mass Removed from Southwest Only	Mass Removed from Marshy Only	Mass Removed from Units C3 and D2 Only	Mass Removed from Unit D0	Total Mass Removed from Units E, D2, C3, D0, Southwest and Marshy
Aug-00	0	0	8	366		374
Sep-00	0	0	9	332		341
Oct-00	0	5	9	583		597
Nov-00	0	3	12	1160		1175
Dec-00	0	0	10	1040		1050
Jan-01	0	0	7	816		823
Feb-01	0	0	7	1056		1063
Mar-01	0	0	11	1379		1390
Apr-01	0	0	9	1140		1149
May-01	0	1	8	990		999
Jun-01	0	2	8	933		943
Jul-01	0	2	10	1121		1133
Aug-01	0	2	13	1018		1033
Sep-01	0	1	9	909		919
Oct-01	0	5	8	896		909
Nov-01	0	4	5	827		836
Dec-01	0	6	4	768		778
Jan-02	0	6	5	753		764
Feb-02	0	4	6	691		701
Mar-02	0	7	7	663		677
Apr-02	0	6	7	682		695
May-02	100	9	7	898		1014
Jun-02	94	9	6	889		998
Jul-02	56	10	7	640		713
Aug-02	53	8	6	745		812
Sep-02	51	8	6	860		925
Oct-02	33	6	4	603		646
Nov-02	57	8	5	880		950
Dec-02	48	9	5	842		904
Jan-03	45	8	6	839		898
Feb-03	37	6	6	767		816
Mar-03	44	8	7	763		822
Apr-03	39	8	3	716		766
May-03	36	13	5	725		779
Jun-03	34	15	5	683		737
Jul-03	29	15	5	678		727
Aug-03	31	15	6	676		728
Sep-03	27	16	5	644		692
Oct-03	34	17	5	701		757
Nov-03	26	12	5	663		706
Dec-03	29	14	6	635		684
Jan-04	28	15	6	667		716
Feb-04	8	11	5	485		509
Mar-04	23	14	7	573		617
Apr-04	27	15	6	537		585
May-04	16	10	5	439		470
Jun-04	21	11	5	499		536
Jul-04	36	12	5	506		559

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Month	Mass Removed from Unit E Only	Mass Removed from Southwest Only	Mass Removed from Marshy Only	Mass Removed from Units C3 and D2 Only	Mass Removed from Unit D0	Total Mass Removed from Units E, D2, C3, D0, Southwest and Marshy
Aug-04	54	12	5	480		551
Sep-04	34	9	5	382		430
Oct-04	30	10	5	358		403
Nov-04	30	9	5	395		439
Dec-04	33	11	5	442		491
Jan-05	29	11	4	404		448
Feb-05	26	9	4	390		429
Mar-05	27	9	4	409		450
Apr-05	33	4	3	396		436
May-05	27	8	2	364		401
Jun-05	31	9	3	361		404
Jul-05	31	8	1	279		319
Aug-05	12	6	2	275		295
Sep-05	13	8	2	327		350
Oct-05	16	6	3	297		322
Nov-05	13	7	4	291		315
Dec-05	12	8	4	325		349
Jan-06	115	7	3	308		433
Feb-06	144	7	3	290		444
Mar-06	148	8	3	331		490
Apr-06	125	7	3	291		426
May-06	137	9	3	402		551
Jun-06	119	5	2	329		456
Jul-06	107	8	3	310		427
Aug-06	104	8	2	307		421
Sep-06	97	9	3	300		409
Oct-06	93	9	3	327		432
Nov-06	80	7	2	268		357
Dec-06	68	6	2	238		314
Jan-07	91	8	2	305		406
Feb-07	84	8	2	284		378
Mar-07	91	8	3	306		408
Apr-07	84	8	2	280		374
May-07	82	8	2	288		380
Jun-07	81	8	2	279		370
Jul-07	66	8	2	256		332
Aug-07	73	8	2	270		353
Sep-07	77	8	2	247		334
Oct-07	73	8	2	244		327
Nov-07	68	8	2	263		341
Dec-07	69	8	2	260		339
Jan-08	65	7	2	237		311
Feb-08	53	6	2	203		264
Mar-08	56	7	2	220		285
Apr-08	54	7	2	200		263
May-08	55	7	2	206		270
Jun-08	52	6	2	195		256
Jul-08	39	1	2	139		181

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Month	Mass Removed from Unit E Only	Mass Removed from Southwest Only	Mass Removed from Marshy Only	Mass Removed from Units C3 and D2 Only	Mass Removed from Unit D0	Total Mass Removed from Units E, D2, C3, D0, Southwest and Marshy
Aug-08	50	7	2	198		256
Sep-08	43	5	2	177		227
Oct-08	45	5	2	187		239
Nov-08	45	7	2	197		251
Dec-08	45	5	2	187		239
Jan-09	39	8	2	124		173
Feb-09	34	8	2	122		164
Mar-09	35	8	2	122		166
Apr-09	32	6	1	119		158
May-09	45	7	2	201		254
Jun-09	39	5	1	157		202
Jul-09	38	5	1	152		196
Aug-09	39	7	2	202		250
Sep-09	36	6	2	223		267
Oct-09	36	8	2	206		251
Nov-09	32	7	1	167		208
Dec-09	32	8	1	171		212
Jan-10	34	8	1	175		219
Feb-10	30	7	1	161		198
Mar-10	33	7	1	173		214
Apr-10	33	7	1	175		216
May-10	33	7	1	176		217
Jun-10	29	6	1	130		165
Jul-10	20	7	1	171		200
Aug-10	23	7	1	188		220
Sep-10	21	6	1	148		177
Oct-10	24	7	2	185		218
Nov-10	18	6	2	151		176
Dec-10	26	6	2	164		198
Jan-11	25	6	2	163		195
Feb-11	25	7	2	165		198
Mar-11	27	8	2	174		209
Apr-11	22	6	1	143		171
May-11	20	5	1	138		164
Jun-11	17	5	1	104		127
Jul-11	15	4	1	92		112
Aug-11	14	2	1	80		97
Sep-11	16	6	1	98		121
Oct-11	17	6	1	113		137
Nov-11	33	6	1	105		145
Dec-11	45	6	1	98		150
Jan-12	46	6	1	103		156
Feb-12	40	5	1	89		135
Mar-12	43	5	1	94	0.017	142
Apr-12	47	6	1	105	0.000	159
May-12	47	6	1	100	0.000	154
Jun-12	42	6	0.3	99	0.029	148
Jul-12	30	6	0.1	102	0.000	138

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Month	Mass Removed from Unit E Only	Mass Removed from Southwest Only	Mass Removed from Marshy Only	Mass Removed from Units C3 and D2 Only	Mass Removed from Unit D0	Total Mass Removed from Units E, D2, C3, D0, Southwest and Marshy
Aug-12	29	6	0.0	75	0.000	109
Sep-12	32	5	0.1	62	0.029	100
Oct-12	27	5	0.0	57	0.000	88
Nov-12	33	4	0.0	62	0.000	99
Dec-12	31	3	0.0	52	0.020	86
Jan-13	46	3	0.0	54	0.000	103
Feb-13	46	3	0.0	47	0.000	95
Mar-13	53	3	0.0	53	0.029	109
Apr-13	46	5	0.1	61	0.000	113
May-13	57	8	1.0	60	0.000	126
Jun-13	43	7	0.7	52	0.029	102
Jul-13	57	9	0.9	61	0.000	128
Aug-13	48	7	0.8	63	0.000	120
Sep-13	46	7	0.6	60	0.023	113
Oct-13	46	7	0.8	61	0.000	115
Nov-13	52	7	0.7	57	0.000	117
Dec-13	57	8	1.0	72	0.026	138
Jan-14	47	8	0.7	66	0.000	122
Feb-14	37	7	0.4	48	0.000	92
Mar-14	42	6	0.5	58	0.025	107
Apr-14	44	6	0.4	58	0.000	108
May-14	46	6	0.4	61	0.000	113
Jun-14	38	5	0.3	34	0.019	77
Jul-14	41	4	0.3	32	0.000	78
Aug-14	42	4	0.4	33	0.000	79
Sep-14	39	3	0.3	33	0.020	76
Oct-14	42	3	0.3	33	0.000	79
Nov-14	46	3	0.3	33	0.000	82
Dec-14	50	3	0.3	37	0.000	90
Jan-15	45	2	0.3	32	0.016	80
Feb-15	41	2	0.3	28	0.000	72
Mar-15	46	2	0.5	29	0.027	77
Apr-15	49	2	0.4	29	0.000	80
May-15	47	3	0.3	29	0.000	79
Jun-15	42	5	0.3	33	0.019	81
Jul-15	38	6	0.4	30	0.000	74
Aug-15	44	7	0.7	34	0.000	86
Sep-15	42	7	1.2	33	0.013	82
Oct-15	46	6	1.0	34	0.000	88
Nov-15	46	6	1.3	35	0.000	88
Dec-15	44	5	1.1	35	0.018	85
Jan-16	46	4	1.1	33	0.000	84
Feb-16	43	4	0.8	27	0.000	74
Mar-16	41	6	0.6	33	0.016	80
Apr-16	41	7	0.1	33	0.000	82
May-16	45	7	0.0	36	0.000	87
Jun-16	44	7	0.1	34	0.018	85
Jul-16	44	7	0.4	36	0.000	88

**MASS REDUCTION SUMMARY**  
**Mass Removed Per Month (lb)**

A	B	C	D	E	F	G
Month	Mass Removed from Unit E Only	Mass Removed from Southwest Only	Mass Removed from Marshy Only	Mass Removed from Units C3 and D2 Only	Mass Removed from Unit D0	Total Mass Removed from Units E, D2, C3, D0, Southwest and Marshy
Aug-16	42	7	0.1	34	0.000	83
Sep-16	38	5	0.9	32	0.021	77
<b>Total to date</b>	<b>7898</b>	<b>1279</b>	<b>540</b>	<b>60522</b>	<b>0.414</b>	<b>70239</b>

# Maps