



October 20, 2021

Daniel Hamel
Michigan Department of EGLE
Remediation and Redevelopment Division
Jackson District Office Building
301 E. Louis Glick Highway
Jackson, Michigan 49210

Re: **Gelman Quarterly Progress Report**
3rd Quarter, 2021
July 1, 2021 to September 30, 2021

Dear Mr. Hamel:

Please find enclosed the Quarterly Progress Report for the period of July 1, 2021 to September 30, 2021.

Should you have any questions regarding this document, please contact me at 269-993-7585.

Sincerely,

FLEIS & VANDENBRINK

A handwritten signature in blue ink, appearing to read 'Jim Brode', is positioned above the printed name and title.

Jim Brode, CPG
Senior Project Manager

GelmanSciences

3rd Quarter, 2021 (July, August, September)

Table of Contents

Summary of activity during this quarter

Submittals/Responses

Anticipated activities for the next quarter

Quarterly Performance Analysis

Quarterly Influent Peroxide

Mass Reduction

Maps:

- 1,4-Dioxane Isoconcentration Map, Marshy Area – Peat (April 2021 – September 2021)
- Potentiometric Surface Map, Marshy Area – Peat (September 9, 2021)
- 1,4-Dioxane Isoconcentration Map, Marshy Area – Sand (April 2021 – September 2021)
- Potentiometric Surface Map, Marshy Area – Sand (September 9, 2021)
- 1,4-Dioxane Isoconcentration Map, Southwest Property (April 2021 – September 2021)
- Potentiometric Surface Map, Southwest Property (September 9, 2021)
- 1,4-Dioxane Isoconcentration Map, Units SW, C3, D0 & D2 (April 2021 – September 2021)
- 1,4-Dioxane Isoconcentration Map, Unit E (April 2021 – September 2021)
- Potentiometric Surface Map, Units SW, C3, D0 & D2 (September 9, 2021)
- Potentiometric Surface Map, Units D2 & E (September 9, 2021)
- Potentiometric Surface Map, Unit E (September 9, 2021)

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

- 7/1/21-7/8/21 - TW-20 (C3) was shut down to control pond level.
- 7/29/21 - New extraction well TW-24 (C3) was started.
- 7/23/21 - TW-20 (C3) was shut down briefly for maintenance.
- 7/29/21-7/31/21 - TW-20 (C3) was shut down to control pond level.
- 8/1/21-8/11/21 - TW-20 (C3) was shut down for maintenance and to control pond level.
- 8/12/21-8/16/21 – TW-2 (Dolph) (C3), TW-20 (C3), TW-21 (D2), TW-24 (C3), PW-1 (Marshy), TW-22 (SW), TW-28 (SW), TW-18 (E), and Treatment Systems were shut down due to a DTE power outage.
- 8/12/21-8/18/21 - LB-4 (D2), TW-23 (E) were shut down due to a DTE power outage.
- 8/17/21-8/26/21 - TW-20 (C3) was shut down for maintenance and to control pond level.
- 8/17/21-8/31/21 - TW-2 (Dolph) (C3) was shut down for maintenance.
- 8/18/21 - Treatment System 1A was shut down briefly for maintenance.
- 8/22/21-8/26/21 - TW-22 (SW) and TW-28 (SW) were shut down for maintenance.
- 8/22/21-8/30/21 - PW-1 (Marshy) was shut down for maintenance.
- 8/22/21-8/31/21 - TW-24 (C3) was shut down for maintenance.
- 8/23/21-8/26/21 - TW-21 (D2), LB-4 (D2), TW-18 (E), TW-23 (E), and Treatment Systems were shut down for maintenance.
- 9/1/21-9/30/21 – TW-2 (Dolph) (C3) was shut down while waiting for well rehabilitation.
- 9/1/21-9/30/21 – TW-24 (C3) was shut down while treatment system is optimized to handle additional influent.
- 9/17/21 - TW-22 (SW) flow was briefly reduced below detectable rates during sampling.
- 9/23/21-9/30/21 - TW-22 (SW) was shut down for rehabilitation.
- 9/27/21-9/28/21 - TW-21 (D2) and TW-23 (E) were shut down due to electrical work in the area.
- 9/30/21 - New extraction well TW-29 (E) was started. TW-29 is a replacement well for TW-19.

Field Activities

- Routine groundwater monitoring.
- Routine remediation system operation and maintenance.
- Worked on access agreements for multiple well locations.
- 7/29/21 – Started extraction at TW-24.
- 8/23/21-8/26/21 – Annual system maintenance and Red Pond cleaning.
- 8/24/21-8/27/21 – Installed new extraction well TW-29.
- 9/30/21 – Started extraction at TW-29.
- September – Exposed confirmed HDPE line from Evergreen house to IW-2.

Submittals/Responses

7/20/21	Gelman submitted Discharge Monitoring Report (DMR) to EGLE Gelman submitted Monthly Monitoring Report (NPDES) to EGLE Gelman submitted 2nd Quarter 2021 Report to EGLE
8/20/21	Gelman submitted Discharge Monitoring Report (DMR) to EGLE Gelman submitted Monthly Monitoring Report (NPDES) to EGLE
8/30/21	Gelman submitted Western Area GSI Work Plan to EGLE
9/3/21	Gelman submitted a Notice of Noncompliance for NPDES Permit No. MI-0048453 to EGLE
9/20/21	Gelman submitted Discharge Monitoring Report (DMR) to EGLE Gelman submitted Monthly Monitoring Report (NPDES) to EGLE

Anticipated Major Activities for the Next Quarter

- Drilling/installation of monitoring wells in Western Area.
- Drilling of test borings along Valley Drive.
- Delineation of wetland on east side of Third Sister Lake.
- Installation of onsite extraction wells.
- Continuation of property access arrangements.
- Submittal of right-of-way permit for portion of Rose Extraction System.
- Submittal of NPDES permit application for First Sister Lake discharge.
- Cleaning of multiple extraction wells.
- Implementation of Western Area GSI Work Plan.

Quarterly Performance Analysis

For the months of July, August, and September 2021, over 174 pounds of 1,4-dioxane were removed and 60,559,340 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 96,830 pounds and the total volume of water discharged since May 1997 is over 9.0 billion gallons.

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

QUARTERLY H₂O₂ INFLUENT	
9/17/2021	H ₂ O ₂
Well Name	µg/l
TW-20	<50
TW-18	<50
TW-23	<50
TW-2 (Dolph)	Not Sampled (well offline until rehabilitation)
TW-14	<50
LB-4	<50
TW-19	Not Sampled (well plugged)
TW-22	<50
TW-28	<50
TW-21	<50
PW-1	<50

Mass Reduction

MASS REDUCTION DETAIL BY AQUIFIER

July 1 - July 31, 2021

	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
C3	TW-2 (Dolph)	1,530,470	34	0.056	1.7	135
	TW-20	561,070	13	0.104	3.2	724
	TW-24	89,395	2.0	0.046	1.4	1,900
	Sub-Totals	2,180,935	49	0.21	6.4	
Marshy	PW-1	152,935	3.4	0.029	0.89	698
	Sub-Totals	152,935	3.4	0.029	0.89	
E	TW-18	4,579,277	103	0.29	9.1	237
	TW-23	4,463,638	100	0.45	14	375
	Sub-Totals	9,042,915	203	0.74	23	
Southwest	TW-28	891,633	20	0.16	4.9	664
	TW-22	142,770	3.2	0.019	0.60	501
	Sub-Totals	1,034,403	23	0.18	5.5	
D2	LB-4	4,470,372	100	0.61	19	503
	TW-21	4,474,886	100	0.35	11	290
	Sub-Totals	8,945,258	200	0.96	30	
Overall Totals		21,356,446	478	2.1	66	

MASS REDUCTION DETAIL BY AQUIFIER

August 1 - August 31, 2021

	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
C3	TW-2 (Dolph)	417,437	9.4	0.015	0.45	128
	TW-10	106,232	2.4	0.018	0.56	742
	TW-14	355,997	8.0	0.0088	0.27	48
	TW-20	213,592	4.8	0.03	1.0	632
	TW-24	632,838	14	0.31	9.6	1,855
	Sub-Totals	1,726,096	39	0.38	12	
Marshy	PW-1	58,550	1.3	0.010	0.32	655
	Sub-Totals	58,550	1.3	0.010	0.32	
E	TW-17	150,204	3.4	0.0049	0.15	102
	TW-18	3,498,280	78	0.20	6.3	214
	TW-23	3,350,514	75	0.30	9.2	330
	Sub-Totals	6,998,998	157	0.51	16	
Southwest	TW-28	812,583	18	0.14	4.2	620
	TW-22	70,926	1.6	0.0088	0.27	461
	Sub-Totals	883,509	20	0.14	4.5	
D2	LB-4	3,354,417	75	0.37	11	405
	TW-9	164,990	3.7	0.018	0.5	435
	TW-21	3,416,163	77	0.24	7.5	266
	Sub-Totals	6,935,570	155	0.63	19	
Overall Totals		16,602,723	372	1.7	52	

MASS REDUCTION DETAIL BY AQUIFER

September 1 - September 30, 2021

	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
C3						
	TW-10	131,847	3.1	0.025	0.8	663
	TW-14	1,471,044	34	0	1	102
	TW-20	692,453	16	0	4	670
	<i>Sub-Totals</i>	2,295,344	53	0.20	5.9	
Marshy						
	PW-1	91,504	2.1	0.016	0.49	642
	<i>Sub-Totals</i>	91,504	2.1	0.016	0.49	
E						
	TW-18	4,433,625	103	0.28	8.5	229
	TW-29	34,304	0.79	0.0043	0.13	450
	TW-23	4,165,606	96	0.39	12	334
	<i>Sub-Totals</i>	8,633,535	200	0.67	20	
Southwest						
	TW-28	1,079,885	25	0.19	5.8	643
	TW-22	63,107	1.5	0.0082	0.25	469
	<i>Sub-Totals</i>	1,142,992	26	0.20	6.0	
D0						
	Ann Arbor Cleaning	30,000			0.014	57
	<i>Sub-Totals</i>	30,000			0.014	
D2						
	LB-4	4,326,493	100	0.52	16	433
	TW-21	4,246,132	98	0.29	8.7	245
	<i>Sub-Totals</i>	8,572,625	198	0.81	24	
Overall Totals						
		20,766,000	480	1.9	57	

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-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

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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

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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

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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
Oct-16	40	5	0.9	31	0.000	77
Nov-16	41	6	0.1	33	0.000	79
Dec-16	43	6	0.2	33	0.017	82
Jan-17	44	6	0.8	36	0.000	87
Feb-17	36	5	0.6	29	0.000	71
Mar-17	39	5	0.6	33	0.017	78
Apr-17	34	5	0.3	31	0.000	70
May-17	32	5	0.5	27	0.000	64
Jun-17	31	4	0.3	26	0.018	61
Jul-17	32	5	0.1	36	0.000	73
Aug-17	29	6	0.0	37	0.000	71
Sep-17	31	5	0.0	27	0.033	63
Oct-17	36	4	0.2	28	0.000	67
Nov-17	34	5	0.7	28	0.000	68
Dec-17	32	5	0.8	28	0.020	65
Jan-18	36	6	0.9	32	0.000	75
Feb-18	28	4	0.5	26	0.000	59
Mar-18	37	4	0.6	34	0.019	75
Apr-18	33	4	0.7	31	0.000	68
May-18	36	4	0.5	35	0.000	75
Jun-18	33	4	0.4	32	0.016	70
Jul-18	33	4	0.3	32	0.000	69
Aug-18	31	4	0.4	33	0.000	68
Sep-18	33	3	0.5	34	0.020	71
Oct-18	39	3	0.6	34	0.000	77
Nov-18	32	3	0.6	33	0.000	69
Dec-18	37	0.8	0.6	35	0.021	73
Jan-19	36	4	0.6	37	0.000	77
Feb-19	26	5	0.4	27	0.000	59
Mar-19	28	6	0.3	31	0.009	65
Apr-19	31	7	0.4	32	0.000	70
May-19	30	6	0.2	33	0.000	70
Jun-19	27	5	0.1	28	0.019	61
Jul-19	33	8	0.2	30	0.000	71
Aug-19	39	8	0.3	31	0.000	78
Sep-19	33	8	0.4	29	0.021	70
Oct-19	33	6	0.0	29	0.000	68
Nov-19	33	6	0.2	27	0.000	67
Dec-19	33	6	0.5	29	0.018	68
Jan-20	25	5	0.4	43	0.000	73
Feb-20	27	7	0.5	31	0.000	65
Mar-20	29	6	0.4	31	0.015	66
Apr-20	28	6	0.3	29	0	63
May-20	28	7	0.3	32	0	68
Jun-20	29	6	0.2	31	0.018	66
Jul-20	33	5	0.2	33	0	71

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-20	33	6	0.2	28	0	67
Sep-20	28	6	0.2	29	0.013	63
Oct-20	32	7	0.3	31	0	70
Nov-20	35	7	0.3	31	0	73
Dec-20	31	6	0.3	24	0.014	61
Jan-21	30	6	0.3	28	0.000	64
Feb-21	27	6	0.3	28	0.000	61
Mar-21	27	6	0.3	26	0.012	60
Apr-21	27	8	0.2	29	0.000	65
May-21	25	7	0.3	36	0.000	68
Jun-21	24	6	1.1	37	0.006	68
Jul-21	23	6	0.9	36	0.000	66
Aug-21	16	4	0.3	31	0.000	52
Sep-21	20	6	0.5	30	0.014	57
Total to date	9797	1599	564	62393	1	74352

Maps