COVER PAGE

Site Number:	**0978020001**
Site Name:	**Zion Site 1 Phase A Landfill**
Category:	**24D RCRA Permits Administrative Record**
Document Date:	**09/25/2025**
Permit ID:	
Permit Log:	**B-23R2**

Volume 7 of 7

THIS PAGE FOR IMAGING PURPOSES

ADMINISTRATIVE RECORD

For

Zion Site 1 Landfill, Phase A

0978020001 – Lake County

ILD980700728

Log No. B-23R2

TABLE OF CONTENTS

for

Volume 4 of 4 (continued)

- Renewal Permit Application
    - Appendix E-9 through Appendix E-25
- Outtakes
    - From June 20, 2025 revisions
    - From June 6, 2025 revisions

Appendix E-22

Gas Collection and Control System Data

2018 Annual Explosive Gas Monitoring
Zion Landfill
Zion, Illinois

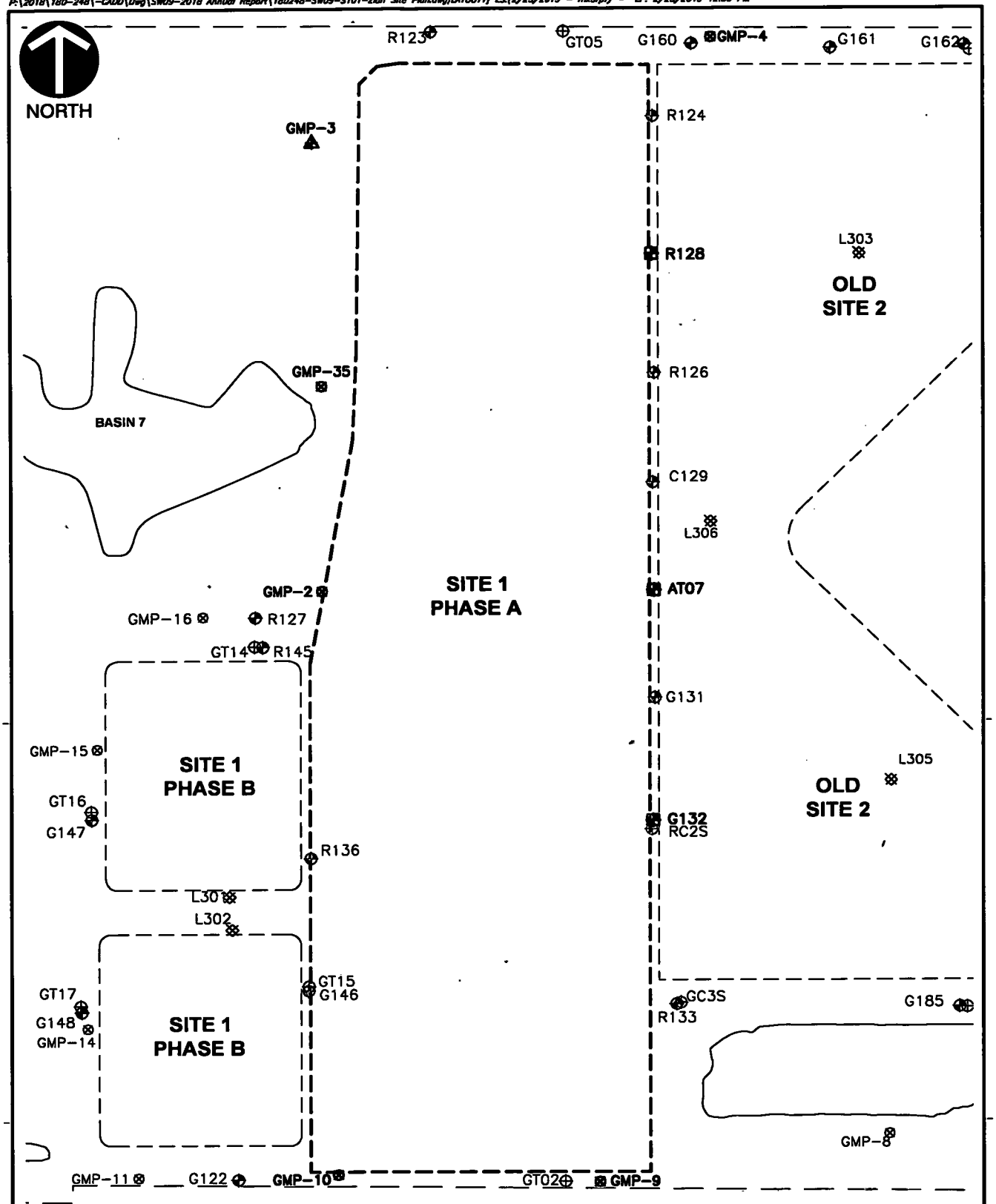
Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance (%)	Pressure
Ambient Air Data						
AMBIENT1	11/27/2018 14:39	0	0.2	22.1	77.7	-0.02
AMBIENT2	11/27/2018 14:44	0	0.1	22	77.9	-0.02
AMBIENT3	11/27/2018 16:09	0	0	22.3	77.7	-0.02
AMBIENT4	11/27/2018 16:15	0	0	21.9	78.1	-0.02
Building Data						
blowerbuilding	11/27/2018 17:03	0	0	22.1	77.9	-0.02
bluebarn	11/27/2018 16:01	0	0	22.9	77.1	-0.02
bluebtrailer	11/27/2018 16:19	0	0	21.8	78.2	-0.02
editrailer	11/27/2018 15:57	0	0.2	23	76.8	-0.01
scalehouse	11/27/2018 16:03	0	0	22.7	77.3	-0.01
zionoffice	11/27/2018 16:05	0	0	22.6	77.4	-0.02
Probe Data						
ZLFGMP 01	11/27/2018 13:57	0	0.2	21.1	78.7	-0.03
ZLFGMP 02	11/27/2018 14:09	2	3	21	74	0.02
ZLFGMP 03	11/27/2018 14:29	1.3	1	21.3	76.4	-0.02
ZLFGMP 04	11/27/2018 8:11	0.1	0.5	21.5	77.9	0.26
ZLFGMP 05	11/27/2018 8:19	0	1.6	21.8	76.6	-0.04
ZLFGMP 06	11/27/2018 15:01	0	1	18.5	80.5	-0.02
ZLFGMP 07	11/27/2018 14:57	0	1.2	20.6	78.2	-0.01
ZLFGMP 08	11/27/2018 15:09	0	1.5	21	77.5	-0.01
ZLFGMP 09	11/27/2018 15:16	0	0.4	22.6	77	-0.04
ZLFGMP 10	11/27/2018 15:23	0	0.1	22.9	77	-0.01
ZLFGMP 11	11/27/2018 15:29	0	0	23	77	-0.03
ZLFGMP 12	11/27/2018 15:36	0	0	23.1	76.9	-0.04
ZLFGMP 13	11/27/2018 15:42	0	0.5	21.8	77.7	0
ZLFGMP 14	11/27/2018 16:41	0	0.6	20.4	79	0
ZLFGMP 15	11/27/2018 16:48	0	0	22.1	77.9	-0.05
ZLFGMP 16	11/27/2018 12:11	0	1.6	20.6	77.8	0.05
ZLFGMP 16	11/27/2018 16:54	0	0	22.2	77.8	-0.02
ZLFGMP 17	11/27/2018 12:14	0	2.5	6.3	91.2	-0.04
ZLFGMP 18	11/27/2018 12:23	0	2.8	4.4	92.8	-0.01
ZLFGMP 19	11/27/2018 12:31	0	2.1	21.1	76.8	0.08
ZLFGMP 20	11/27/2018 12:39	0	1.4	21.3	77.3	0.72
ZLFGMP 30	11/27/2018 9:27	0	0.5	22.2	77.3	-0.02
ZLFGMP 31	11/27/2018 9:09	0	1.4	22.1	76.5	0.12
ZLFGMP 32	11/27/2018 9:17	0	0.7	22.4	76.9	0.03
ZLFGMP 33	11/27/2018 8:37	0	2.1	22.1	75.8	0.03
ZLFGMP 34	11/27/2018 11:53	0	0.6	21.4	78	0.01
ZLFGMP 35	11/27/2018 9:37	0	1	15.8	83.2	0.03
ZLFGMP 35	11/27/2018 14:17	0	0.5	21.7	77.8	-0.01
ZLFGMP 36	11/27/2018 9:42	0	2.1	20.8	77.1	0.11
ZLFGMP 37	11/27/2018 9:49	0	1.3	20.3	78.4	-0.02
ZLFGMP 38	11/27/2018 9:56	0	1.3	21.5	77.2	0
ZLFGMP 39	11/27/2018 10:03	0	2.3	17.9	79.8	0.01
ZLFGMP 40	11/27/2018 10:21	0	6.8	11	82.2	0.09
ZLFGMP 41	11/27/2018 11:59	0	0.8	20.5	78.7	0.12

2018 Annual Explosive Gas Monitoring
Zion Landfill
Zion, Illinois

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance (%)	Pressure
Ambient Air Data						
AMBIENT1	11/27/2018 14:39	0	0.2	22.1	77.7	-0.02
AMBIENT2	11/27/2018 14:44	0	0.1	22	77.9	-0.02
AMBIENT3	11/27/2018 16:09	0	0	22.3	77.7	-0.02
AMBIENT4	11/27/2018 16:15	0	0	21.9	78.1	-0.02
Building Data						
blowerbuilding	11/27/2018 17:03	0	0	22.1	77.9	-0.02
bluebarn	11/27/2018 16:01	0	0	22.9	77.1	-0.02
bluebtrailer	11/27/2018 16:19	0	0	21.8	78.2	-0.02
editrailer	11/27/2018 15:57	0	0.2	23	76.8	-0.01
scalehouse	11/27/2018 16:03	0	0	22.7	77.3	-0.01
zionoffice	11/27/2018 16:05	0	0	22.6	77.4	-0.02
Probe Data						
ZLFGMP 01	11/27/2018 13:57	0	0.2	21.1	78.7	-0.03
ZLFGMP 02	11/27/2018 14:09	2	3	21	74	0.02
ZLFGMP 03	11/27/2018 14:29	1.3	1	21.3	76.4	-0.02
ZLFGMP 04	11/27/2018 8:11	0.1	0.5	21.5	77.9	0.26
ZLFGMP 05	11/27/2018 8:19	0	1.6	21.8	76.6	-0.04
ZLFGMP 06	11/27/2018 15:01	0	1	18.5	80.5	-0.02
ZLFGMP 07	11/27/2018 14:57	0	1.2	20.6	78.2	-0.01
ZLFGMP 08	11/27/2018 15:09	0	1.5	21	77.5	-0.01
ZLFGMP 09	11/27/2018 15:16	0	0.4	22.6	77	-0.04
ZLFGMP 10	11/27/2018 15:23	0	0.1	22.9	77	-0.01
ZLFGMP 11	11/27/2018 15:29	0	0	23	77	-0.03
ZLFGMP 12	11/27/2018 15:36	0	0	23.1	76.9	-0.04
ZLFGMP 13	11/27/2018 15:42	0	0.5	21.8	77.7	0
ZLFGMP 14	11/27/2018 16:41	0	0.6	20.4	79	0
ZLFGMP 15	11/27/2018 16:48	0	0	22.1	77.9	-0.05
ZLFGMP 16	11/27/2018 12:11	0	1.6	20.6	77.8	0.05
ZLFGMP 16	11/27/2018 16:54	0	0	22.2	77.8	-0.02
ZLFGMP 17	11/27/2018 12:14	0	2.5	6.3	91.2	-0.04
ZLFGMP 18	11/27/2018 12:23	0	2.8	4.4	92.8	-0.01
ZLFGMP 19	11/27/2018 12:31	0	2.1	21.1	76.8	0.08
ZLFGMP 20	11/27/2018 12:39	0	1.4	21.3	77.3	0.72
ZLFGMP 30	11/27/2018 9:27	0	0.5	22.2	77.3	-0.02
ZLFGMP 31	11/27/2018 9:09	0	1.4	22.1	76.5	0.12
ZLFGMP 32	11/27/2018 9:17	0	0.7	22.4	76.9	0.03
ZLFGMP 33	11/27/2018 8:37	0	2.1	22.1	75.8	0.03
ZLFGMP 34	11/27/2018 11:53	0	0.6	21.4	78	0.01
ZLFGMP 35	11/27/2018 9:37	0	1	15.8	83.2	0.03
ZLFGMP 35	11/27/2018 14:17	0	0.5	21.7	77.8	-0.01
ZLFGMP 36	11/27/2018 9:42	0	2.1	20.8	77.1	0.11
ZLFGMP 37	11/27/2018 9:49	0	1.3	20.3	78.4	-0.02
ZLFGMP 38	11/27/2018 9:56	0	1.3	21.5	77.2	0
ZLFGMP 39	11/27/2018 10:03	0	2.3	17.9	79.8	0.01
ZLFGMP 40	11/27/2018 10:21	0	6.8	11	82.2	0.09
ZLFGMP 41	11/27/2018 11:59	0	0.8	20.5	78.7	0.12



LEGEND

GMP-2	GAS MONITORING PROBE LOCATION
AT07	AMBIENT AIR MONITORING LOCATION
GMP-3	COMBINATION GAS MONITORING PROBE AND AMBIENT AIR MONITORING LOCATION
	SITE 1 PHASE A BOUNDARY

REFERENCE

1. BASE DRAWING FILE SUPPLIED BY ENVIRONMENTAL INFORMATION LOGISTICS, INC.

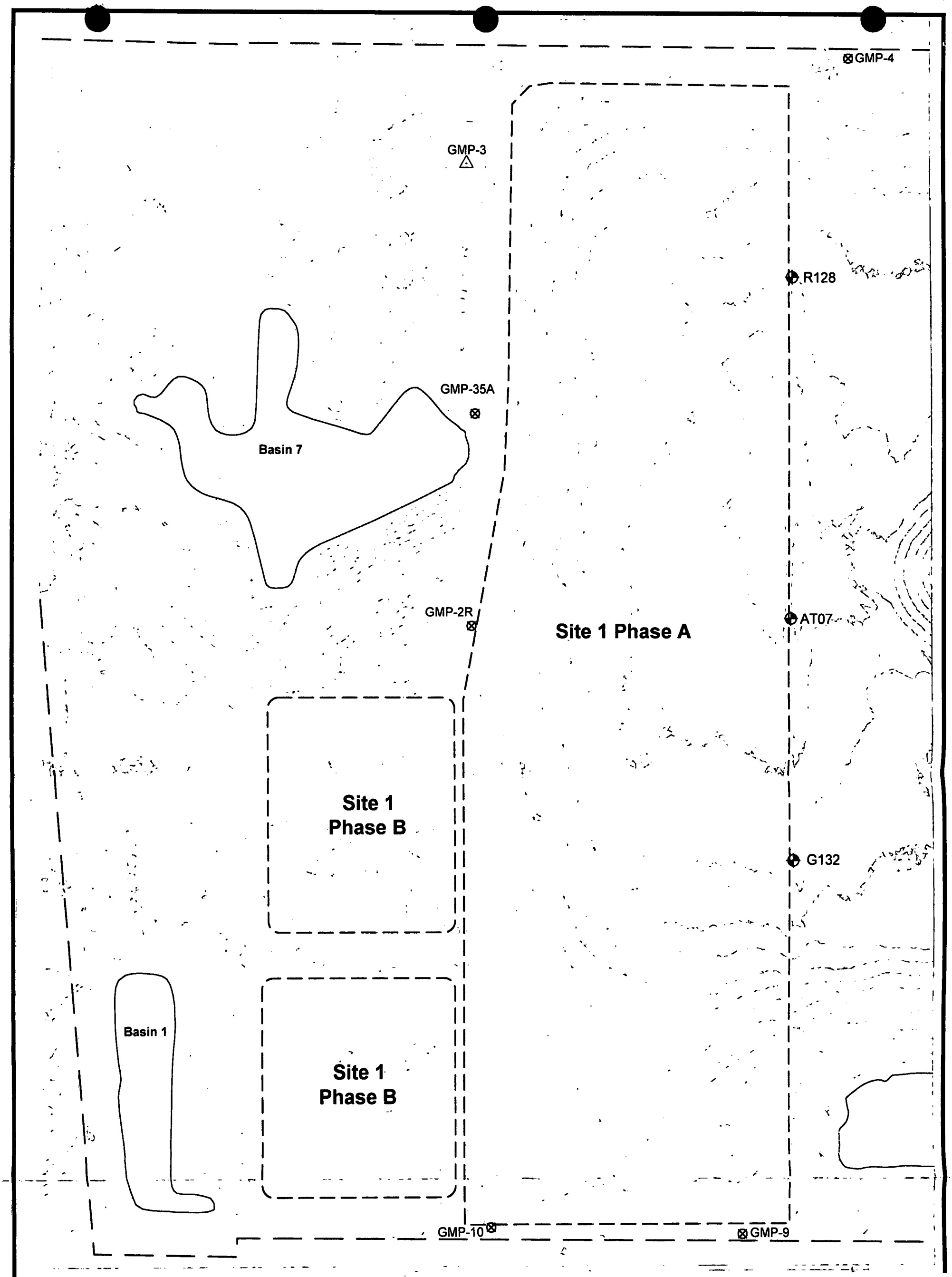
SCALE IN FEET
0 200 400

Civil & Environmental Consultants, Inc.
555 Butterfield Road, Suite 300 · Lombard, IL 60148
630-963-6026 · 877-963-6026
www.cecinc.com

BFI WASTE SYSTEMS OF NORTH AMERICA, LLC
ZION SITE 1A LANDFILL
ZION, ILLINOIS

GAS MONITORING PROBES AND AMBIENT AIR SAMPLING LOCATIONS

DRAWN BY:	MSK	CHECKED BY:	CML	APPROVED BY:	BRH	FIGURE NO.:	1
DATE:	02/25/2019	DWG SCALE:	1"=200'	PROJECT NO:	180-248.0009		



IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MED

Legend:

G132	Ambient Air Monitoring Point
GMP-11	Perimeter Landfill Gas Monitoring Point
	Combination Perimeter Landfill Gas Monitoring Probe and Ambient Air Monitoring Point
— —	Facility Boundary
— —	Waste Boundary

N

0 100 200

SCALE: 1" = 200'

PREPARED BY

EIL ENVIRONMENTAL INFORMATION LOGISTICS, LLC

PREPARED FOR

BFI Waste Systems of North America, LLC

Drawing 1

Gas Monitoring Probe and Ambient Air Monitoring Locations

Zion Site 1 Phase A Landfill
Zion, Illinois

990402

2024-10-04

Copy from M-8

R-000700

Zion Landfill Site 1 Phase A
Gas Extraction Report
January 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	1/4/2018 12:32	1.4	6.3	22.2	70.1	0.06	24.1	232.2	-9.47	-59.53	No Change: 1% open:
EW-1	1/4/2018 12:32	1.4	6.3	22.2	70.1	0.06	25.2	232.8	-9.51	-59.28	
EW-2	1/4/2018 12:15	1.7	3	23.5	71.8	0.05	24.4	216.1	-0.1	-59.28	No Change: 2% open:
EW-2	1/4/2018 12:15	1.7	3	23.5	71.8	0.05	24.6	216.1	-0.1	-59.28	
EW-3	1/4/2018 12:26	68.5	31.2	0.3	0	0.1	45.7	297	-13.89	-16.02	No Change,Valve completely closed: :
EW-3	1/4/2018 12:26	68.5	31.2	0.3	0	0.1	45.7	300.6	-13.59	-15.97	
EW-4	1/10/2018 9:24	59.8	34.7	0	5.5	0.37	51.6	560.2	-41.44	-43.94	Opened Valve > 1 turn: 55% Open:
EW-4	1/10/2018 9:24	59.8	34.7	0	5.5	0.19	52.7	406.7	-42.51	-43.6	
EW-6	1/4/2018 14:08	22.4	13	15.5	49.1	12.65	10.4	3536.4	-11.55	-56.57	No Change,Valve completely closed: :
EW-6	1/4/2018 14:08	22.4	13	15.5	49.1	12.35	10.4	3493.8	-11.55	-56.53	
EW-6	1/8/2018 14:54	51.9	28.5	4.3	15.3	3.64	43.9	1863.7	-3.62	-42.97	No Change,Valve completely closed: :
EW-6	1/8/2018 14:54	51.9	28.5	4.3	15.3	3.63	43.9	1863	-3.62	-42.8	
EW-7	1/8/2018 15:02	65	33.4	0	1.6	0.02	55.6	135.9	-15.5	-22.12	Opened Valve 1/2 to 1 turn,Valve completely open: :
EW-7	1/8/2018 15:02	65	33.4	0	1.6	0.02	56.8	131.6	-15.63	-21.95	
EW-8	1/8/2018 15:08	63.9	34.9	0	1.2	0.01	49.1	104	-30.91	-31.19	Opened Valve 1/2 to 1 turn,Valve completely open: :
EW-8	1/8/2018 15:08	63.9	34.9	0	1.2	0	49.5	52	-31.25	-31.19	
EW-9	1/4/2018 15:28	52.5	28.6	4.2	14.7	0.06	30.4	229.5	-55.37	-58.01	No Change: 45% open:
EW-9	1/4/2018 15:28	52.5	28.6	4.2	14.7	0.07	30.4	237.9	-55.37	-58.01	
EW-10	1/4/2018 12:08	30.9	17.4	12.8	38.9	0.06	24.6	230	-54.1	-59.24	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	1/4/2018 12:08	30.9	17.4	12.8	38.9	0.09	24.8	285.3	-50.83	-59.28	
EW-10	1/8/2018 14:48	65.5	33.8	0	0.7	0.02	43.5	150.6	1.1	-43.01	Opened Valve 1/2 turn or less: 1% open:
EW-10	1/8/2018 14:48	65.5	33.8	0	0.7	0	44.1	0	-5.44	-43.05	
EW-11	1/10/2018 9:32	59.6	31.7	0.9	7.8	0.01	45.1	96	-42.8	-42.92	Opened Valve 1/2 to 1 turn: 60% open:
EW-11	1/10/2018 9:32	59.6	31.7	0.9	7.8	0	45.5	54.4	-42.76	-42.92	
EW-12	1/10/2018 9:36	63	31.6	1.2	4.2	0.01	41.5	72.8	-42.68	-42.88	No Change,Valve completely open: :
EW-12	1/10/2018 9:36	63	31.6	1.2	4.2	0.08	41.7	265.2	-42.63	-42.84	
EW-12A	1/10/2018 9:39	41.9	26.5	7.6	24	33.78	41.4	5412.4	-40.89	-42.58	Closed Valve 1/2 to 1 turn: 90% open:

R 002770

Zion Landfill - Site 1 Phase A
Gas Extraction Report
January 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-12A	1/10/2018 9:39	41.9	26.5	7.6	24	33.78	41.7	5411.9	-40.76	-42.25	
EW-13	1/4/2018 11:59	43.9	25.7	7.6	22.8	0.06	26.2	223.2	-58.56	-59.03	Closed Valve 1/2 to 1 turn,Valve completely closed: :
EW-13	1/4/2018 11:59	43.9	25.7	7.6	22.8	0.07	24.3	237.9	-58.77	-58.77	
EW-13	1/8/2018 14:40	40.7	22.6	8.6	28.1	0.01	45	95.5	-43.14	-43.18	No Change,Valve completely closed: :
EW-13	1/8/2018 14:40	40.7	22.6	8.6	28.1	0.02	45.1	116	-41.78	-42.71	
EW-13	1/10/2018 9:18	64.3	34.2	0	1.5	0.03	39.7	177.6	46.37	-44.96	Opened Valve 1/2 turn or less: 2% open:
EW-13	1/10/2018 9:18	64.3	34.2	0	1.5	0	39.9	0	-1.1	-44.24	
EW-14	1/10/2018 9:46	64	32.9	0.2	2.9	0.26	41.7	474.8	-42.12	-42.58	No Change,Valve completely open: :
EW-14	1/10/2018 9:46	64	32.9	0.2	2.9	0.26	41.9	474.8	-42.12	-42.58	
EW-15	1/10/2018 9:53	62.4	33.3	0.3	4	0	41.7	51.6	-42.46	-42.25	Opened Valve 1/2 to 1 turn: 95% open:
EW-15	1/10/2018 9:53	62.4	33.3	0.3	4	0.01	41.9	69.6	-42.46	-42.58	
EW-16	1/4/2018 11:40	11.4	9.7	19.5	59.4	0.02	28.6	118	-38.39	-59.15	Closed Valve 1/2 turn or less: 1% open:
EW-16	1/4/2018 11:40	11.4	9.7	19.5	59.4	0.02	28.6	125.2	-38.39	-58.94	
EW-16	1/8/2018 14:22	52.5	25.6	4.3	17.6	0.04	44.2	187.7	-0.14	-43.73	No Change: 1% open:
EW-16	1/8/2018 14:22	52.5	25.6	4.3	17.6	0.02	44.6	148.3	-0.15	-43.73	
EW-17	1/10/2018 9:59	54.2	27.6	3.9	14.3	0.03	40.5	171.4	-39.53	-42.58	No Change: 1% open:
EW-17	1/10/2018 9:59	54.2	27.6	3.9	14.3	0	40.6	0	-39.53	-42.25	
EW-18	1/8/2018 14:17	66	32.9	0	1.1	0.02	55.2	143.4	-45.31	-45.08	No Change,Valve completely open: :
EW-18	1/8/2018 14:17	66	32.9	0	1.1	0.02	55.4	143.4	-45.31	-45.08	
EW-19	1/10/2018 10:08	60	32.7	1.1	6.2	0.36	42.1	560.6	-42.51	-42.33	Opened Valve 1/2 to 1 turn: 35% open:
EW-19	1/10/2018 10:08	60	32.7	1.1	6.2	0.39	42.3	584.2	-42.51	-42.33	
EW-20	1/4/2018 9:11	27.9	17.5	13.1	41.5	33.8	14.9	5515.8	-44.8	-55.97	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-20	1/4/2018 9:11	27.9	17.5	13.1	41.5	33.8	15.3	5519.1	-44.16	-56.23	
EW-20	1/8/2018 15:29	1.6	1	22.1	75.3	0	39.6	0	1.17	-36.65	Opened Valve 1/2 turn or less: 1% open:
EW-20	1/8/2018 15:29	1.6	1	22.1	75.3	0	39.9	0	-0.5	-36.65	
EW-20	1/9/2018 15:11	45.4	26.7	7.4	20.5	33.78	42.4	5368.1	-46.2	-46.74	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-20	1/9/2018 15:11	45.4	26.7	7.4	20.5	33.78	41.9	5373.4	-45.9	-46.74	
EW-20	1/10/2018 8:51	60.6	33.7	1.3	4.4	9.56	38.3	3023.4	-9.3	-45.72	Opened Valve 1/2 turn or less: 1% open:

R 002771

Zion Landfill Site 1 Phase A
Gas Extraction Report
January 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-20	1/10/2018 8:51	60.6	33.7	1.3	4.4	9.56	38.1	3023.1	-9.51	-45.72	
EW-21	1/10/2018 10:13	18.9	8.5	16.5	56.1	33.78	39.7	5387.5	-41.1	-42.58	No Change: 1% open:
EW-21	1/10/2018 10:13	18.9	8.5	16.5	56.1	33.78	39.7	5385	-41.44	-42.58	
EW-22	1/4/2018 9:21	60.8	33	1.4	4.8	2.08	29.7	1434.7	-2.83	-56.95	Opened Valve 1/2 turn or less: 4% open:
EW-22	1/4/2018 9:21	60.8	33	1.4	4.8	2.19	30.4	1470.7	-3.29	-56.91	
EW-23	1/4/2018 9:27	16	19.2	16.6	48.2	33.8	17.6	5401.5	-56.05	-56.57	Closed Valve 1/2 turn or less: 2% open:
EW-23	1/4/2018 9:27	16	19.2	16.6	48.2	33.8	19	5393.7	-56.05	-56.57	
EW-24	1/10/2018 9:01	57.2	32.4	0	10.4	0.38	46.8	574	-44.84	-45.76	Opened Valve 1/2 to 1 turn: 30% open:
EW-24	1/10/2018 9:01	57.2	32.4	0	10.4	0.22	47.7	434.2	-45.14	-45.55	
EW-25	1/4/2018 11:16	54.9	29.8	2.4	12.9	0.08	30.9	283.3	-9.85	-58.98	No Change: 58% open:
EW-25	1/4/2018 11:16	54.9	29.8	2.4	12.9	0.07	31.1	267.3	-9.85	-59.07	
EW-26	1/4/2018 9:50	5.2	4.4	19.4	71	0.1	19.6	288.1	-56.73	-57.58	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-26	1/4/2018 9:50	5.2	4.4	19.4	71	0	19.8	0	-56.05	-57.58	
EW-26	1/8/2018 12:49	63.7	31.7	0	4.6	0.03	51.8	160.9	11.89	-44.7	Opened Valve 1/2 turn or less: 2% open:
EW-26	1/8/2018 12:49	63.7	31.7	0	4.6	0	50.4	0	-0.24	-44.41	
EW-27	1/4/2018 11:33	56.8	31	3	9.2	0.08	33.1	278.1	-22.25	-58.6	No Change: 57% open:
EW-27	1/4/2018 11:33	56.8	31	3	9.2	0.08	33.1	265	-22.42	-58.69	
EW-28	1/4/2018 11:50	57.6	32.2	2.9	7.3	0.01	34.3	92.9	-38.77	-59.28	No Change,Valve completely open: :
EW-28	1/4/2018 11:50	57.6	32.2	2.9	7.3	0.07	34.3	250.9	-38.94	-59.07	

The following alternate standards have been approved for the following wells:
The following wells do not have an Oxygen Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZIONREW1
The following wells do not have a Pressure Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZIONREW1
Please refer to the Landfill Documentation section of the website for further information pertaining to the above listed alternate limits

R 002772

Zion Landfill - All Wells
Gas Extraction Report
February 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	2/15/2018 11:10	5.7	8.6	21.6	64.1	0	44.8	0	-5.77	-42.63	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-1	2/15/2018 11:10	5.7	8.6	21.6	64.1	0	45.1	0	-5.56	-42.58	
EW-2	2/15/2018 10:55	25.5	16.4	13.7	44.4	1.18	42.8	1060.7	-1.21	-42.67	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-2	2/15/2018 10:55	25.5	16.4	13.7	44.4	1.09	43	1018.4	-0.98	-43.01	
EW-3	2/15/2018 11:03	52.2	25	3.6	19.2	1.39	50.2	1094.7	-37.92	-42.8	Opened Valve 1/2 turn or less: 1% open:
EW-3	2/15/2018 11:03	52.2	25	3.6	19.2	0.47	50.5	638.5	-38.05	-42.75	
EW-4	2/15/2018 11:16	56.4	23.1	0.5	20	0.08	51.1	252.8	-42.51	-42.63	Opened Valve > 1 turn: 70% open:
EW-4	2/15/2018 11:16	56.4	23.1	0.5	20	0.06	51.4	218.1	-42.12	-42.67	
EW-6	2/15/2018 11:23	10.4	10.6	20.9	58.1	0	44.2	0	-19.7	-42.67	No Change,Valve completely closed: being influenced:
EW-6	2/15/2018 11:23	10.4	10.6	20.9	58.1	0	44.6	0	-19.79	-42.84	
EW-6	2/15/2018 12:50	45.7	28.2	4.9	21.2	0.04	49.5	188.1	-22.42	-39.62	No Change,Valve completely closed: :
EW-6	2/15/2018 12:50	45.7	28.2	4.9	21.2	0.03	50.4	162.8	-22.34	-39.62	
EW-7	2/15/2018 11:29	65.8	33.3	0.1	0.8	0.03	49.1	165	-42.8	-42.67	No Change,Valve completely open: :
EW-7	2/15/2018 11:29	65.8	33.3	0.1	0.8	0.03	49.3	162.4	-42.8	-42.67	
EW-8	2/15/2018 11:37	62.6	31.9	0	5.5	0.02	48.6	114.5	-42.8	-42.92	No Change,Valve completely open: :
EW-8	2/15/2018 11:37	62.6	31.9	0	5.5	0.02	48.7	125.4	-42.51	-43.01	
EW-9	2/15/2018 11:42	55	28.3	2.5	14.2	0	46.9	0	-42.8	-43.01	Opened Valve 1/2 turn or less: 47% open:
EW-9	2/15/2018 11:42	55	28.3	2.5	14.2	0.01	46.9	103	-42.8	-42.97	
EW-10	2/15/2018 10:50	25.6	17.5	14.3	42.6	0.79	42.3	819.4	-42.55	-42.63	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	2/15/2018 10:50	25.6	17.5	14.3	42.6	0.08	42.6	269.5	-41.87	-42.71	
EW-10	2/19/2018 9:39	44.7	22.1	6.4	26.8	0.02	41	140.6	-8.15	-44.79	No Change,Valve completely closed: :
EW-10	2/19/2018 9:39	44.7	22.1	6.4	26.8	0.02	42.3	140.6	-8.15	-44.79	
EW-10	2/19/2018 15:00	65.3	33.2	0	1.5	0.06	40.3	234.8	3.77	-43.94	Opened Valve 1/2 turn or less: 1% open:
EW-10	2/19/2018 15:00	65.3	33.2	0	1.5	0.01	39.6	95	-0.23	-43.9	
EW-11	2/15/2018 11:52	59.9	30	2.2	7.9	0	48.2	65.2	-42.55	-42.58	Opened Valve 1/2 to 1 turn: 65% open:
EW-11	2/15/2018 11:52	59.9	30	2.2	7.9	0.01	49.3	72.7	-42.8	-42.75	
EW-12	2/15/2018 12:03	65.2	29	0	5.8	0.08	51.6	284.2	54.01	-41.99	Opened Valve > 1 turn: 40% open cec must have closed valve:
EW-12	2/15/2018 12:03	65.2	29	0	5.8	0	51.1	0	-0.52	-41.1	
EW-12A	2/15/2018 12:06	54.3	28.9	3.3	13.5	25.18	50.9	4648.7	-40.13	-41.02	No Change: 90% open:
EW-12A	2/15/2018 12:06	54.3	28.9	3.3	13.5	25.27	50.9	4656.9	-40.17	-40.21	
EW-13	2/15/2018 10:47	38.7	22.6	8.5	30.2	0.38	43.2	573.4	-39.45	-42.63	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-13	2/15/2018 10:47	38.7	22.6	8.5	30.2	0.21	43.2	424.6	-39.45	-42.58	
EW-13	2/15/2018 12:45	57.8	29.3	0	12.9	0.16	51.3	399.8	14.39	-40.3	Opened Valve 1/2 turn or less: 1% open:
EW-13	2/15/2018 12:45	57.8	29.3	0	12.9	0	50.9	0	-1.61	-40.3	
EW-14	2/15/2018 12:18	59.9	29.7	1.8	8.6	0.01	50.4	108.6	-40.13	-39.96	No Change,Valve completely open: :
EW-14	2/15/2018 12:18	59.9	29.7	1.8	8.6	0.02	50.4	120.1	-40.13	-40	
EW-15	2/15/2018 12:23	61.5	32.4	0.8	5.3	0.01	49.3	108.9	-40.13	-40.04	Opened Valve 1/2 to 1 turn,Valve completely open: :

Zion Landfill - All Wells
Gas Extraction Report
February 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-15	2/15/2018 12:23	61.5	32.4	0.8	5.3	0.01	49.3	95.3	-40.13	-39.96	
EW-16	2/15/2018 10:34	65.3	31.9	0	2.8	0	45.5	0	5.69	-42.67	Opened Valve 1/2 turn or less: 2% open:
EW-16	2/15/2018 10:34	65.3	31.9	0	2.8	0	45.1	0	-0.31	-42.63	
EW-17	2/15/2018 12:31	56.5	27.8	3.3	12.4	0.03	49.1	150.1	-36.69	-40.3	No Change: 1% open:
EW-17	2/15/2018 12:31	56.5	27.8	3.3	12.4	0.01	49.3	109.2	-36.69	-40.3	
EW-18	2/15/2018 10:24	58.4	31.9	0.1	9.6	0.72	48.6	786.5	-43.48	-42.67	No Change,Valve completely open: :
EW-18	2/15/2018 10:24	58.4	31.9	0.1	9.6	0.76	48.9	806.1	-43.57	-42.71	
EW-19	2/15/2018 12:40	58.6	31.5	2	7.9	0	51.8	51.1	-40.55	-40.3	Opened Valve 1/2 to 1 turn: 40% open:
EW-19	2/15/2018 12:40	58.6	31.5	2	7.9	0.01	52.2	83.6	-40.42	-40.3	
EW-20	2/15/2018 9:14	57.6	33.2	0.3	8.9	0	39.9	0	-0.08	-42.33	Opened Valve 1/2 turn or less: 2% open:
EW-20	2/15/2018 9:14	57.6	33.2	0.3	8.9	0	40.1	0	-0.11	-42.33	
EW-21	2/15/2018 9:20	11.3	5.4	19.1	64.2	33.73	40.6	5383	-39.07	-42.71	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-21	2/15/2018 9:20	11.3	5.4	19.1	64.2	33.73	40.6	5388.6	-38.43	-42.67	
EW-22	2/15/2018 9:27	50.1	25.9	4.8	19.2	0.01	39.2	115.2	-2.05	-42.84	Closed Valve 1/2 turn or less: 3% open:
EW-22	2/15/2018 9:27	50.1	25.9	4.8	19.2	0.01	39.2	104.1	-1.96	-42.75	
EW-23	2/15/2018 9:30	19.9	15.9	15.6	48.6	0	39.2	0	-42.51	-42.88	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-23	2/15/2018 9:30	19.9	15.9	15.6	48.6	0	39.4	0	-42.12	-42.67	
EW-24	2/15/2018 9:37	58.1	29.5	0	12.4	0.37	46.2	565.7	-42.51	-42.71	Opened Valve 1/2 to 1 turn: 35% open:
EW-24	2/15/2018 9:37	58.1	29.5	0	12.4	0.01	46.2	108.9	-42.55	-42.67	
EW-25	2/15/2018 10:20	60.5	31.3	0	8.2	0.79	46.8	825.4	-43.48	-43.05	Opened Valve 1/2 turn or less: 60% open:
EW-25	2/15/2018 10:20	60.5	31.3	0	8.2	0.96	47.3	909.5	-44.16	-42.67	
EW-26	2/15/2018 9:49	10.8	14.2	10.2	64.8	0.95	38.8	915.6	-36.69	-42.71	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-26	2/15/2018 9:49	10.8	14.2	10.2	64.8	0.92	38.8	899.4	-35.33	-43.01	
EW-26	2/19/2018 15:22	19.4	17.7	7.3	55.6	0.24	37.9	476.7	-3.12	-44.24	No Change,Valve completely closed: :
EW-26	2/19/2018 15:22	19.4	17.7	7.3	55.6	0.25	38.1	490.2	-3.13	-44.24	
EW-26	2/20/2018 11:49	35.5	19.3	3.6	41.6	0.04	51.3	187.4	-41.74	-43.43	No Change,Valve completely open: well is being influenced:
EW-26	2/20/2018 11:49	35.5	19.3	3.6	41.6	0.04	50.7	187.4	-41.74	-43.43	
EW-27	2/15/2018 10:28	63.1	30.4	0	6.5	0.93	49.1	892	-43.57	-42.71	Opened Valve 1/2 turn or less: 60% open:
EW-27	2/15/2018 10:28	63.1	30.4	0	6.5	0.93	49.1	892	-43.57	-42.71	
EW-28	2/15/2018 10:37	58	32.2	1.7	8.1	0.84	43.5	853.2	-43.48	-42.33	No Change,Valve completely open: :
EW-28	2/15/2018 10:37	58	32.2	1.7	8.1	0.89	43.5	877.6	-43.48	-42.33	

The following alternate standards have been approved for the following wells:

The following wells do not have an Oxygen Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, FLARE 24, FLAREL16, FLARER12, TFLARE10, ZIONREW1

The following wells do not have a Temperature Limit: FLARE 24, FLAREL16, FLARER12, TFLARE10

The following wells do not have a Pressure Limit: EW-1, EW-12A, EW-161, EW-2, EW-21, EW-23, FLARE 24, FLAREL16, FLARER12, TFLARE10, ZIONREW1

Zion Landfill - Site 1 Phase A
Gas Extraction Report
March 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	3/8/2018 11:00	66.6	30.3	0	3.1	0.04	36.7	200.4	1.49	-40.89	Opened Valve 1/2 turn or less: 1% open:
EW-1	3/8/2018 11:00	66.6	30.3	0	3.1	0.01	37.4	109.1	-0.21	-40.76	
EW-2	3/8/2018 10:51	27.1	18.6	12.2	42.1	0	36	63.1	-0.01	-40.81	No Change,Valve completely closed: :
EW-2	3/8/2018 10:51	27.1	18.6	12.2	42.1	0	36.1	32.1	-0.01	-40.81	
EW-3	3/8/2018 10:55	50.5	26.2	3.7	19.6	0.03	47.1	169.6	-37.41	-40.97	No Change: 1% open:
EW-3	3/8/2018 10:55	50.5	26.2	3.7	19.6	0.03	47.1	157.5	-37.37	-40.81	
EW-4	3/8/2018 11:08	63.7	31.6	0	4.7	0.01	48.7	85.9	-40.42	-40.68	Opened Valve 1/2 to 1 turn: 80% open:
EW-4	3/8/2018 11:08	63.7	31.6	0	4.7	0.01	28.9	105.4	-40.47	-40.81	
EW-6	3/8/2018 11:11	7.5	9.1	20	63.4	0	38.5	0	-23.74	-40.72	No Change,Valve completely closed: well being influenced:
EW-6	3/8/2018 11:11	7.5	9.1	20	63.4	0	38.7	0	-23.74	-40.68	
EW-6	3/9/2018 14:46	1.8	4.1	22.7	71.4	0.38	53.4	573	-21.87	-36.19	No Change,Valve completely closed: :
EW-6	3/9/2018 14:46	1.8	4.1	22.7	71.4	0.37	54	564.9	-21.78	-36.19	
EW-6	3/14/2018 9:45	3.3	1.5	22.7	72.5	0.56	29.3	719.1	-18	-36.36	No Change,Valve completely closed: :
EW-6	3/14/2018 9:45	3.3	1.5	22.7	72.5	0.53	29.1	702.3	-18	-36.36	
EW-6	3/15/2018 12:52	52.9	28.8	0.8	17.5	0.02	58.3	151.7	1.16	-54.49	Opened Valve 1/2 turn or less: 1% open:
EW-6	3/15/2018 12:52	52.9	28.8	0.8	17.5	0.28	56.8	518.5	-0.05	-54.49	
EW-7	3/8/2018 11:16	63.3	30.7	0.2	5.8	0.05	45.7	208.1	-40.72	-40.93	No Change,Valve completely open: :
EW-7	3/8/2018 11:16	63.3	30.7	0.2	5.8	0.04	45.9	195	-40.76	-40.93	
EW-8	3/8/2018 11:23	59.7	30.8	0.4	9.1	0.02	45.7	113.9	-40.76	-40.97	No Change,Valve completely open: :
EW-8	3/8/2018 11:23	59.7	30.8	0.4	9.1	0.02	45.9	114.5	-40.76	-41.31	
EW-9	3/8/2018 11:30	52.8	29.7	2.8	14.7	0.02	40.8	124.9	-40.68	-40.97	No Change: 47% open:
EW-9	3/8/2018 11:30	52.8	29.7	2.8	14.7	0.01	40.8	107.7	-40.72	-40.97	
EW-10	3/8/2018 10:47	43.5	23.9	7.6	25	0.02	37.9	151.4	-5.39	-40.55	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	3/8/2018 10:47	43.5	23.9	7.6	25	0.02	38.3	139.6	-5.31	-40.64	
EW-10	3/8/2018 12:18	64.7	33.5	0	1.8	0.01	37.9	105.9	0.27	-40.68	Opened Valve 1/2 turn or less: 1% open:
EW-10	3/8/2018 12:18	64.7	33.5	0	1.8	0	39.7	0	-0.17	-40.64	
EW-11	3/8/2018 11:35	59.7	30.5	1	8.8	0.02	39.2	145	-40.76	-41.27	Opened Valve 1/2 to 1 turn: 75% open:
EW-11	3/8/2018 11:35	59.7	30.5	1	8.8	0	40.1	63.4	-40.68	-40.97	
EW-12	3/8/2018 11:39	60.8	32	0.8	6.4	0.03	40.8	158.1	-40.72	-41.14	Opened Valve > 1 turn: 55% Open:
EW-12	3/8/2018 11:39	60.8	32	0.8	6.4	0.02	40.8	127.2	-40.68	-40.97	
EW-12A	3/8/2018 11:41	55.1	30.8	2.8	11.3	33.76	41.7	5427.3	-40.76	-41.14	No Change: 90% open:
EW-12A	3/8/2018 11:41	55.1	30.8	2.8	11.3	33.76	41.7	5427.4	-40.76	-40.97	
EW-13	3/8/2018 10:43	44.7	25.2	6.8	23.3	0.02	41.9	114.1	-35.33	-40.64	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-13	3/8/2018 10:43	44.7	25.2	6.8	23.3	0.02	42.1	148.4	-33.97	-40.64	
EW-13	3/8/2018 12:12	63.3	33.8	0	2.9	0	36.5	0	25.44	-40.89	Opened Valve 1/2 turn or less: 1% open:
EW-13	3/8/2018 12:12	63.3	33.8	0	2.9	0.44	37.9	658.8	-0.45	-40.81	
EW-14	3/8/2018 11:46	49.9	27.5	4.5	18.1	0.02	38.1	113.9	-40.76	-40.97	No Change,Valve completely open: :
EW-14	3/8/2018 11:46	49.9	27.5	4.5	18.1	0.02	38.3	130.3	-40.85	-40.97	
EW-15	3/8/2018 11:50	51.1	28	4.9	16	0.04	38.1	177.9	-41.1	-40.97	Closed Valve 1/2 to 1 turn: 95% open:
EW-15	3/8/2018 11:50	51.1	28	4.9	16	0.03	38.5	163.6	-41.1	-41.31	
EW-16	3/8/2018 10:33	27.2	15.1	13.5	44.2	0.01	40.8	89.3	-16.65	-40.59	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-16	3/8/2018 10:33	27.2	15.1	13.5	44.2	0.02	40.8	135.6	-15.29	-40.64	
EW-16	3/8/2018 12:07	64.4	33.7	0	1.9	0.04	39.6	188	0.29	-40.89	Opened Valve 1/2 turn or less: 1% open:

Zion Landfill - Site 1 Phase A
Gas Extraction Report
March 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-16	3/8/2018 12:07	64.4	33.7	0	1.9	0.02	39.7	145.7	-0.1	-40.97	
EW-17	3/8/2018 11:53	52.5	27.9	4.9	14.7	0	36.7	0	-34.61	-40.89	No Change: 1% open:
EW-17	3/8/2018 11:53	52.5	27.9	4.9	14.7	0	37.4	0	-34.61	-40.89	
EW-17	3/8/2018 11:56	53.4	27.7	4	14.9	0.04	38.8	175.2	-36.35	-40.93	No Change: 1% open:
EW-17	3/8/2018 11:56	53.4	27.7	4	14.9	0.03	38.8	171.3	-36.35	-40.97	
EW-18	3/8/2018 10:20	55.7	29	1.6	13.7	0.03	39.2	166.7	-40.08	-40.59	No Change,Valve completely open: :
EW-18	3/8/2018 10:20	55.7	29	1.6	13.7	0.03	39.6	162.6	-40.08	-40.47	
EW-19	3/8/2018 12:02	58.4	31.2	2	8.4	0	39.4	0	-41.1	-41.31	Opened Valve 1/2 to 1 turn: 45% open:
EW-19	3/8/2018 12:02	58.4	31.2	2	8.4	0	39.6	0	-41.02	-41.23	
EW-20	3/7/2018 9:33	51.4	27.9	3.6	17.1	0.08	34.9	277	-0.17	-46.82	No Change: 2% open:
EW-20	3/7/2018 9:33	51.4	27.9	3.6	17.1	0.08	35.1	277	-0.16	-46.82	
EW-21	3/7/2018 9:40	23.3	11.6	14.4	50.7	13.34	38.5	3520.9	-13.25	-46.82	No Change,Valve completely closed: :
EW-21	3/7/2018 9:40	23.3	11.6	14.4	50.7	13.34	38.8	3519.8	-13.25	-46.86	
EW-22	3/7/2018 9:51	52.3	27.3	1.4	19	0	38.5	0	-2.02	-46.82	No Change: 3% open:
EW-22	3/7/2018 9:51	52.3	27.3	1.4	19	0	37	0	-2.01	-46.78	
EW-23	3/7/2018 9:55	62.4	31.6	0	6	0.04	35.8	211.4	6.41	-46.14	Opened Valve 1/2 turn or less: 1% open:
EW-23	3/7/2018 9:55	62.4	31.6	0	6	0	37.9	0	-1.02	-46.14	
EW-24	3/7/2018 10:05	48.9	26.4	2.5	22.2	0.01	41.2	100.4	-44.97	-45.47	No Change: 35% open:
EW-24	3/7/2018 10:05	48.9	26.4	2.5	22.2	0.01	41.4	100.4	-44.93	-45.47	
EW-25	3/8/2018 10:16	59.6	33.2	0	7.2	0.02	42.3	140.1	-40.42	-40.76	Opened Valve 1/2 to 1 turn: 65% open:
EW-25	3/8/2018 10:16	59.6	33.2	0	7.2	0.02	43.5	119.1	-40.59	-40.72	
EW-26	3/7/2018 10:30	0.1	10.9	7	82	0.02	33.8	149.6	-0.94	-35.3	No Change,Valve completely closed: :
EW-26	3/7/2018 10:30	0.1	10.9	7	82	0.02	41	144.6	-0.94	-35.38	
EW-26	3/9/2018 12:53	0.1	9	9.7	81.2	2.45	39.6	1532	-3.38	-39.24	No Change,Valve completely closed: :
EW-26	3/9/2018 12:53	0.1	9	9.7	81.2	2.45	39	1530	-3.38	-39.24	
EW-26	3/14/2018 9:14	0.2	2	23.6	74.2	0.35	28.4	582.9	-1.09	-35.68	No Change,Valve completely closed: :
EW-26	3/14/2018 9:14	0.2	2	23.6	74.2	0.35	29.1	581.2	-1.08	-35.68	
EW-26	3/16/2018 14:45	0.5	5.2	21.7	72.6	0	38.3	30.6	-2.14	-54.45	No Change,Valve completely closed: :
EW-26	3/16/2018 14:45	0.5	5.2	21.7	72.6	0	40.3	48.7	-2.13	-54.32	
EW-26	3/20/2018 15:36	44	22.1	4.9	29	0.02	45.5	127	-0.43	-54.92	No Change,Valve completely closed: :
EW-26	3/20/2018 15:36	44	22.1	4.9	29	0.01	45.5	108	-0.84	-55.25	
EW-27	3/8/2018 10:25	61.8	31.5	0.7	6	0.04	41.2	174.2	-40.42	-40.64	Opened Valve 1/2 to 1 turn: 65% open:
EW-27	3/8/2018 10:25	61.8	31.5	0.7	6	0.02	42.4	148.6	-40.08	-40.3	
EW-28	3/8/2018 10:36	60.6	31.8	0.6	7	0.04	38.5	182.2	-40.42	-40.81	No Change,Valve completely open: :
EW-28	3/8/2018 10:36	60.6	31.8	0.6	7	0.04	38.7	174.7	-40.42	-40.64	

Zion Landfill - Site 1A Wells
Gas Extraction Report
April 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	4/2/2018 10:43	2.2	3.5	21.7	72.6	0	52.9	0	-3.27	-32.46	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-1	4/2/2018 10:43	2.2	3.5	21.7	72.6	0	53.8	0	-3.25	-32.37	
EW-1	4/27/2018 10:15	4.8	3.3	20	71.9	0	60.4	0	-0.01	-76.61	No Change,Valve completely closed: :
EW-1	4/27/2018 10:15	4.8	3.3	20	71.9	0	60.4	52.8	-0.03	-76.61	
EW-2	4/2/2018 10:16	39.6	25	8.3	27.1	0	46.8	0	-0.02	-56.91	No Change,Valve completely closed: :
EW-2	4/2/2018 10:16	39.6	25	8.3	27.1	0	48.7	0	-0.02	-56.57	
EW-2	4/27/2018 10:05	21.2	12	14	52.8	0.04	60.3	194.6	-0.07	-76.27	No Change,Valve completely closed: :
EW-2	4/27/2018 10:05	21.2	12	14	52.8	0.02	60.6	149.8	-0.07	-76.27	
EW-3	4/2/2018 10:38	66.1	32.5	0	1.4	0.01	47.7	76.3	7.13	-35.64	Opened Valve 1/2 turn or less: 5% open:
EW-3	4/2/2018 10:38	66.1	32.5	0	1.4	0	54.1	52.4	-1.21	-33.73	
EW-3	4/27/2018 10:09	53.8	24.9	0.9	20.4	0.13	52.9	318.9	-75.07	-76.19	No Change: 5% open:
EW-3	4/27/2018 10:09	53.8	24.9	0.9	20.4	0.12	52.9	309.5	-75.07	-76.14	
EW-4	4/2/2018 12:12	59.5	34.2	0	6.3	0.02	55.2	148.5	-21.4	-44.96	Opened Valve 1/2 to 1 turn: 85% open:
EW-4	4/2/2018 12:12	59.5	34.2	0	6.3	0.06	55.2	236.7	-25.14	-43.22	
EW-4	4/27/2018 10:19	56.5	33.8	0	9.7	0.08	52.3	257	-76.77	-76.27	No Change: 85% open well affects 6:
EW-4	4/27/2018 10:19	56.5	33.8	0	9.7	0.08	52.3	248.2	-76.86	-76.61	
EW-6	4/2/2018 10:26	63.7	33.1	0	3.2	0.01	51.8	120.5	39.75	-57.37	Opened Valve > 1 turn: 15% open:
EW-6	4/2/2018 10:26	63.7	33.1	0	3.2	0	59.4	0	-2.41	-55.17	
EW-6	4/27/2018 10:24	40.4	30.7	0	28.9	0.04	53.8	181.5	-76.77	-76.44	Closed Valve 1/2 to 1 turn: 10% open:
EW-6	4/27/2018 10:24	40.4	30.7	0	28.9	0.04	54	178.1	-76.43	-76.61	
EW-7	4/2/2018 10:59	65.9	32.6	0	1.5	0	50.7	20	38.73	0.38	No Change: :
EW-7	4/2/2018 10:59	65.9	32.6	0	1.5	0.02	54.3	126.4	18.47	7.16	
EW-7	4/2/2018 12:16	61.9	31.3	0	6.8	0.01	52.7	93.7	-3.74	-46.06	No Change: 20% open valve was closed to make 6 compliant:
EW-7	4/2/2018 12:16	61.9	31.3	0	6.8	0.01	53.1	104.5	-3.88	-46.19	
EW-7	4/27/2018 10:28	57.7	31.7	0	10.6	0.06	52	218	-74.73	-76.61	No Change: 20% open:
EW-7	4/27/2018 10:28	57.7	31.7	0	10.6	0.05	52	198	-74.73	-76.61	
EW-8	4/2/2018 12:21	63.9	34.1	0	2	0.01	52.2	88.6	-46.88	-47.2	No Change,Valve completely open: :
EW-8	4/2/2018 12:21	63.9	34.1	0	2	0.01	52.2	88.6	-46.88	-47.16	
EW-8	4/27/2018 10:32	58.4	33.9	0	7.7	0.06	54.9	213.9	-76.77	-76.48	No Change,Valve completely open: :
EW-8	4/27/2018 10:32	58.4	33.9	0	7.7	0.06	54.9	217.4	-76.77	-76.36	
EW-9	4/2/2018 12:26	62.4	32.7	0.5	4.4	0.01	48.2	108.3	-48.58	-48.86	Opened Valve 1/2 to 1 turn: 55% open:
EW-9	4/2/2018 12:26	62.4	32.7	0.5	4.4	0.01	48.6	80.2	-48.66	-48.86	
EW-9	4/27/2018 10:37	48.9	26.7	2.8	21.6	0.06	60.1	222.5	-76.86	-76.61	No Change: 55% Open:

Zion Landfill - Site 1A Wells
Gas Extraction Report
April 2018

Civil & Environmental Consultants, Inc.

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EW-9	4/27/2018 10:37	48.9	26.7	2.8	21.6	0.07	61	225.5	-76.86	-76.61	
EW-10	4/2/2018 10:11	56.7	28	0.1	15.2	0.02	48.9	121.6	0.58	-56.91	Opened Valve 1/2 turn or less: 2% open:
EW-10	4/2/2018 10:11	56.7	28	0.1	15.2	0	50	0	-3.83	-56.57	
EW-10	4/27/2018 10:00	20.2	10.7	16.8	52.3	0.21	59.9	420.4	-28.87	-76.23	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	4/27/2018 10:00	20.2	10.7	16.8	52.3	0.1	60.4	289	-28.87	-76.27	
EW-10	4/30/2018 8:42	62.8	31.9	0	5.3	0	57.4	46.6	3.34	-78.6	Opened Valve 1/2 turn or less: 1% open:
EW-10	4/30/2018 8:42	62.8	31.9	0	5.3	0.07	58.1	253.6	-0.04	-77.97	
EW-11	4/2/2018 12:31	62.9	32.5	0	4.6	0.01	48.6	81	-49.6	-49.79	Opened Valve 1/2 to 1 turn: 85% open:
EW-11	4/2/2018 12:31	62.9	32.5	0	4.6	0	48.9	40.1	-49.51	-50	
EW-11	4/27/2018 10:42	61.5	30.9	0.6	7	0.05	58.6	191	-76.77	-76.61	Opened Valve 1/2 to 1 turn: 90% open:
EW-11	4/27/2018 10:42	61.5	30.9	0.6	7	0.06	59.7	204.9	-76.86	-76.53	
EW-12	4/2/2018 12:37	63.3	33.4	0.2	3.1	0	48	0	-50.96	-51.1	Opened Valve 1/2 to 1 turn: 65% open:
EW-12	4/2/2018 12:37	63.3	33.4	0.2	3.1	0	48.4	0	-50.62	-51.1	
EW-12	4/27/2018 10:46	58.1	29.2	1.6	11.1	0.02	58.6	107	-77.11	-76.61	Opened Valve 1/2 to 1 turn: 70% open:
EW-12	4/27/2018 10:46	58.1	29.2	1.6	11.1	0.06	59.2	210.3	-77.11	-76.61	
EW-12A	4/2/2018 12:40	55.4	30.8	2.3	11.5	33.78	48.4	5327.5	-49.94	-51.23	Opened Valve 1/2 to 1 turn: 95% open:
EW-12A	4/2/2018 12:40	55.4	30.8	2.3	11.5	33.78	48.4	5323.5	-50.49	-50.97	
EW-12A	4/27/2018 10:48	46.7	25.8	5.9	21.6	33.78	60.6	5048.8	-76.99	-76.27	Closed Valve 1/2 to 1 turn: 90% open:
EW-12A	4/27/2018 10:48	46.7	25.8	5.9	21.6	33.78	60.6	5047.6	-77.03	-76.57	
EW-13	4/2/2018 10:07	47.4	26.2	6	20.4	0	56.5	51.5	-47.22	-56.53	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-13	4/2/2018 10:07	47.4	26.2	6	20.4	0.01	56.3	88	-46.2	-56.78	
EW-13	4/3/2018 8:39	63.3	34.3	0	2.4	0.01	36.3	123	34.44	-67.84	Opened Valve 1/2 turn or less: 1% open:
EW-13	4/3/2018 8:39	63.3	34.3	0	2.4	0.01	36	100.7	-0.12	-67.84	
EW-13	4/27/2018 9:57	23.9	14.7	14.4	47	1.32	59.9	1036.5	-46.54	-76.19	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-13	4/27/2018 9:57	23.9	14.7	14.4	47	0	60.8	0	-47.56	-76.19	
EW-13	4/30/2018 8:37	63.1	32.7	0	4.2	0	58.3	0	20.85	-78.6	Opened Valve 1/2 turn or less: 1% open:
EW-13	4/30/2018 8:37	63.1	32.7	0	4.2	0.03	56.1	162	-0.22	-77.92	
EW-14	4/2/2018 12:45	59.8	30.6	1	8.6	0.01	48.9	101.5	-52.57	-52.58	No Change,Valve completely open: :
EW-14	4/2/2018 12:45	59.8	30.6	1	8.6	0	49.1	62.8	-52.31	-52.54	
EW-14	4/27/2018 10:54	54.4	28.5	2.7	14.4	0.01	64.6	95.7	-77.45	-76.61	No Change,Valve completely open: :
EW-14	4/27/2018 10:54	54.4	28.5	2.7	14.4	0.04	64.6	165.8	-77.11	-76.61	
EW-15	4/2/2018 12:51	63.6	32.5	0	3.9	0	47.7	65.8	-53.33	-53.52	Opened Valve 1/2 turn or less: 97% open:
EW-15	4/2/2018 12:51	63.6	32.5	0	3.9	0	48.2	36.6	-53.29	-53.86	
EW-15	4/27/2018 11:02	60.5	32	0	7.5	0.04	59.4	169.5	-76.86	-76.61	Opened Valve 1/2 turn or less,Valve completely open: :
EW-15	4/27/2018 11:02	60.5	32	0	7.5	0.03	59.4	157.6	-76.86	-76.61	

Zion Landfill - Site 1A Wells
Gas Extraction Report
April 2018

Civil & Environmental Consultants, Inc.

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EW-16	4/2/2018 9:53	49.4	26	4.6	20	0.01	46.2	77.3	-0.85	-55.89	No Change: 1% open:
EW-16	4/2/2018 9:53	49.4	26	4.6	20	0.01	46.8	77.3	-0.85	-56.23	
EW-16	4/27/2018 9:50	45	24.9	6.6	23.5	0.07	58.1	260.9	-1.94	-76.27	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-16	4/27/2018 9:50	45	24.9	6.6	23.5	0	58.3	0	-1.77	-76.14	
EW-16	4/30/2018 8:30	61	32.4	0	6.6	0	57.6	46.5	0.41	-78.35	Opened Valve 1/2 turn or less: 1% open:
EW-16	4/30/2018 8:30	61	32.4	0	6.6	0.02	57.6	127.8	-0.09	-77.92	
EW-17	4/2/2018 12:58	51.4	26.2	4.8	17.6	0.01	47.8	95.2	-50.62	-54.79	No Change: 1% open:
EW-17	4/2/2018 12:58	51.4	26.2	4.8	17.6	0.01	47.8	72.3	-50.62	-54.83	
EW-17	4/27/2018 11:10	50.7	25	4.5	19.8	0.06	60.8	215.6	-73.76	-76.61	No Change: 1% open:
EW-17	4/27/2018 11:10	50.7	25	4.5	19.8	0.04	60.8	163.5	-73.72	-76.61	
EW-18	4/2/2018 9:45	57.5	30	1	11.5	0	48	0	-55.37	-55.76	No Change,Valve completely open: :
EW-18	4/2/2018 9:45	57.5	30	1	11.5	0	48.4	0	-55.41	-55.55	
EW-18	4/27/2018 9:41	57.8	30.1	0	12.1	0	53.8	0	-75.75	-75.51	No Change,Valve completely open: :
EW-18	4/27/2018 9:41	57.8	30.1	0	12.1	0	53.8	0	-75.67	-75.47	
EW-19	4/2/2018 13:05	61.4	29.3	0.1	9.2	0.01	45.5	101.5	-55.71	-55.81	Opened Valve 1/2 to 1 turn: 50% open:
EW-19	4/2/2018 13:05	61.4	29.3	0.1	9.2	0.01	45.9	88.1	-55.5	-55.85	
EW-19	4/27/2018 11:14	51.8	26.4	3.2	18.6	0.03	59	156.1	-77.11	-76.61	No Change: 50% open:
EW-19	4/27/2018 11:14	51.8	26.4	3.2	18.6	0.03	59.2	154.4	-77.07	-76.61	
EW-20	4/2/2018 8:39	56.6	31.1	1.3	11	0.01	38.1	102.9	-0.01	-54.87	Opened Valve 1/2 turn or less: 3% open:
EW-20	4/2/2018 8:39	56.6	31.1	1.3	11	0.06	38.5	249.7	-0.18	-54.66	
EW-20	4/27/2018 11:19	61	32.5	0.3	6.2	0.06	63.9	241.3	-0.02	-76.61	Opened Valve 1/2 turn or less: 4% open:
EW-20	4/27/2018 11:19	61	32.5	0.3	6.2	3.19	64.8	1716.5	-3.19	-76.91	
EW-21	4/2/2018 8:43	20	15.8	16.6	47.6	16.37	41.9	3866.1	-16.31	-54.96	No Change,Valve completely closed: :
EW-21	4/2/2018 8:43	20	15.8	16.6	47.6	16.37	42.1	3867.1	-15.97	-54.58	
EW-21	4/27/2018 11:24	62	32.9	0	5.1	0	58.6	0	6.11	-76.61	Opened Valve 1/2 turn or less: 1% open:
EW-21	4/27/2018 11:24	62	32.9	0	5.1	0	56.7	0	-0.13	-76.95	
EW-22	4/2/2018 8:50	33.1	18.2	11.1	37.6	0.01	40.5	84.7	-16.09	-54.83	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-22	4/2/2018 8:50	33.1	18.2	11.1	37.6	0.04	40.8	181.8	-10.87	-55.21	
EW-22	4/2/2018 13:11	59.9	30	1.6	8.5	0	48	55.4	-0.05	-58.6	Opened Valve 1/2 turn or less: 1% open:
EW-22	4/2/2018 13:11	59.9	30	1.6	8.5	0	50.2	20.9	-0.56	-58.94	
EW-22	4/27/2018 11:28	49.8	27.1	4.9	18.2	0.01	59.9	99.7	-0.71	-76.61	No Change: 1% open:
EW-22	4/27/2018 11:28	49.8	27.1	4.9	18.2	0.01	59.5	106.6	-0.73	-76.61	
EW-23	4/2/2018 8:54	27.5	16.6	15.4	40.5	0.01	37.2	71.9	-56.73	-56.91	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-23	4/2/2018 8:54	27.5	16.6	15.4	40.5	0.01	38.7	88.4	-55.63	-56.61	
EW-23	4/27/2018 11:32	59.7	34.8	0	5.5	0.02	59.9	147.4	4.57	-76.61	Opened Valve 1/2 turn or less: 1% open:

Zion Landfill - Site 1A Wells
Gas Extraction Report
April 2018

Civil & Environmental Consultants, Inc.

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EW-23	4/27/2018 11:32	59.7	34.8	0	5.5	0.55	63.5	714.7	-0.95	-76.14	
EW-24	4/2/2018 8:59	49.7	22.6	2.1	25.6	0.02	42.4	121.6	-40.38	-57.37	No Change: 15% open closed to get 26 compliant:
EW-24	4/2/2018 8:59	49.7	22.6	2.1	25.6	0.01	42.8	110.1	-40.42	-57.33	
EW-24	4/2/2018 9:32	56.5	28.8	0	14.7	0.01	46.2	109.6	-41.44	-58.56	Opened Valve > 1 turn: 30% open was closed to make 26 compliant:
EW-24	4/2/2018 9:32	56.5	28.8	0	14.7	0	47.5	0	-46.28	-57.16	
EW-24	4/27/2018 11:36	51.6	31.2	0	17.2	0.02	50.2	109	-76.09	-76.19	No Change: 30% open:
EW-24	4/27/2018 11:36	51.6	31.2	0	17.2	0.01	50.2	77.1	-75.75	-76.23	
EW-25	4/2/2018 9:40	59.1	31.3	0	9.6	0	45.7	58.6	-55.2	-55.55	Opened Valve 1/2 to 1 turn: 75% open:
EW-25	4/2/2018 9:40	59.1	31.3	0	9.6	0	46.4	33.8	-55.37	-55.55	
EW-25	4/27/2018 9:37	56.8	30.7	0.4	12.1	0.25	52	441.2	-76.43	-76.27	Opened Valve 1/2 to 1 turn: 80% open:
EW-25	4/27/2018 9:37	56.8	30.7	0.4	12.1	0.18	52.9	376.3	-76.52	-76.27	
EW-26	4/2/2018 9:04	63.7	30.7	0	5.6	0.02	39	135.3	5.77	-57.97	Opened Valve 1/2 turn or less: 1% open:
EW-26	4/2/2018 9:04	63.7	30.7	0	5.6	0	39.4	0	-1.77	-57.58	
EW-26	4/27/2018 8:34	54.4	35.3	4.9	5.4	0	48.7	48.2	-71	-76.27	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-26	4/27/2018 8:34	54.4	35.3	4.9	5.4	0	50.9	30.8	-71	-76.27	
EW-27	4/2/2018 9:49	58.5	28.6	1.8	11.1	0	43.7	51.7	-55.37	-55.55	Opened Valve 1/2 to 1 turn: 70% open:
EW-27	4/2/2018 9:49	58.5	28.6	1.8	11.1	0.01	43.9	79	-55.37	-55.55	
EW-27	4/27/2018 9:45	63.3	32.5	0	4.2	0.18	51.1	377	-76.14	-76.19	Opened Valve 1/2 to 1 turn: 75% open:
EW-27	4/27/2018 9:45	63.3	32.5	0	4.2	0.17	51.1	367	-76.09	-76.02	
EW-28	4/2/2018 9:57	58.5	30.5	0.7	10.3	0.01	45.7	101.4	-56.05	-56.23	No Change,Valve completely open: :
EW-28	4/2/2018 9:57	58.5	30.5	0.7	10.3	0.01	45.7	107.5	-56.01	-56.23	
EW-28	4/27/2018 9:53	59.3	30.7	0	10	0.13	54.5	321.4	-76.77	-76.27	No Change,Valve completely open: :
EW-28	4/27/2018 9:53	59.3	30.7	0	10	0.15	54.5	335.7	-76.77	-76.27	

Zion Landfill - Site 1 Phase A
Gas Extraction Report
May 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	5/10/2018 11:23	64	30.9	0	5.1	0.04	71.1	186.5	1.03	-78.69	Opened Valve 1/2 turn or less: 1% open:
EW-1	5/10/2018 11:23	64	30.9	0	5.1	0.01	72	94.6	-0.28	-78.09	
EW-2	5/10/2018 11:12	29.2	16.7	10.6	43.5	0.04	70.7	192.2	-0.04	-76.19	No Change,Valve completely closed: :
EW-2	5/10/2018 11:12	29.2	16.7	10.6	43.5	0.03	70.9	173.3	-0.04	-75.76	
EW-3	5/10/2018 11:17	61.7	32.1	0	6.2	0.04	58.1	166.4	-76.82	-78.73	No Change: 5% open:
EW-3	5/10/2018 11:17	61.7	32.1	0	6.2	0.03	57	145.1	-77.11	-77.84	
EW-4	5/10/2018 11:29	56.9	35.1	0	8	0	65.7	29.3	-78.81	-79.15	No Change: 85% open:
EW-4	5/10/2018 11:29	56.9	35.1	0	8	0	56.5	0	-78.39	-78.52	
EW-6	5/10/2018 11:33	37.7	30.9	0	31.4	0	62.1	0	-79.83	-80.85	Closed Valve 1/2 to 1 turn: 5% open:
EW-6	5/10/2018 11:33	37.7	30.9	0	31.4	0.02	61.3	107	-79.28	-79.66	
EW-7	5/10/2018 11:38	60	34.5	0	5.5	0.03	61.3	148	-77.58	-80.59	No Change: 20% open:
EW-7	5/10/2018 11:38	60	34.5	0	5.5	0.03	58.8	149.4	-77.62	-80.13	
EW-8	5/10/2018 11:42	54.3	33.5	0	12.2	0.13	61.2	313.7	-80.17	-80.17	No Change,Valve completely open: :
EW-8	5/10/2018 11:42	54.3	33.5	0	12.2	0.04	61.2	178.3	-80.81	-80.81	
EW-9	5/10/2018 11:46	48.9	25.4	2.7	23	0.03	70.2	156.2	-80.51	-80.51	No Change: 55%,Open:
EW-9	5/10/2018 11:46	48.9	25.4	2.7	23	0.03	70.3	156.2	-80.51	-80.51	
EW-10	5/10/2018 11:07	21.6	9.8	15	53.6	0.02	72.5	132.2	-29.21	-76.44	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	5/10/2018 11:07	21.6	9.8	15	53.6	0.02	72.5	136.2	-29.04	-76.14	
EW-10	5/11/2018 9:03	62.6	32.3	0.1	5	0	41.9	0	4.4	-80	Opened Valve 1/2 turn or less: 1% open:
EW-10	5/11/2018 9:03	62.6	32.3	0.1	5	0.64	42.1	789.1	-0.11	-80.68	
EW-11	5/10/2018 11:51	57.5	30.9	1.1	10.5	0.02	69.4	132.4	-80.51	-80.51	Opened Valve 1/2 to 1 turn: 95% open:
EW-11	5/10/2018 11:51	57.5	30.9	1.1	10.5	0.02	69.8	135.5	-80.21	-80.17	
EW-12	5/10/2018 11:56	60.5	31.5	0.5	7.5	0	69.3	0	-80.51	-80.81	Opened Valve 1/2 to 1 turn: 80% open:
EW-12	5/10/2018 11:56	60.5	31.5	0.5	7.5	0.02	69.3	136.1	-80.25	-80.17	
EW-12A	5/10/2018 11:58	56.1	31.6	2.6	9.7	33.78	70	4987.6	-80.55	-80.72	No Change: 90% open:
EW-12A	5/10/2018 11:58	56.1	31.6	2.6	9.7	33.78	69.8	4991.2	-80.21	-80.17	
EW-13	5/10/2018 10:57	9.1	1.5	19.9	69.5	0	57	0	12.61	-76.53	Opened Valve 1/2 turn or less: 2% open:
EW-13	5/10/2018 10:57	9.1	1.5	19.9	69.5	0	56.7	0	-0.8	-76.27	
EW-13	5/11/2018 8:48	1.2	0.6	22.6	75.6	0	55.2	0	-40.42	-79.96	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-13	5/11/2018 8:48	1.2	0.6	22.6	75.6	1.39	55	1119.3	-8.49	-80.68	
EW-13	5/14/2018 9:31	59.3	34.1	0	6.6	0.39	56.5	640.2	45.18	-80.93	Opened Valve 1/2 turn or less: 1% open:
EW-13	5/14/2018 9:31	59.3	34.1	0	6.6	0	52.5	0	-0.39	-80	

Zion Landfill - Site 1 Phase A
Gas Extraction Report
May 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-14	5/10/2018 12:03	58	31.2	0.8	10	0	73.2	0	-80.85	-80.85	No Change,Valve completely open: :
EW-14	5/10/2018 12:03	58	31.2	0.8	10	0	73.6	0	-80.85	-80.85	
EW-15	5/10/2018 12:07	53.4	29.2	1.6	15.8	0	68.4	44.4	-80.51	-80.85	No Change,Valve completely open: :
EW-15	5/10/2018 12:07	53.4	29.2	1.6	15.8	0.02	68.4	124.5	-80.51	-80.47	
EW-16	5/10/2018 10:49	62.7	33.7	0	3.6	0.04	66.6	205.1	0.07	-77.12	Opened Valve 1/2 turn or less: 2% open:
EW-16	5/10/2018 10:49	62.7	33.7	0	3.6	0.03	66.6	163.8	-0.17	-76.78	
EW-17	5/10/2018 12:16	50.4	26.3	4.6	18.7	0.02	69.1	105.4	-76.82	-80.68	No Change: 1% open:
EW-17	5/10/2018 12:16	50.4	26.3	4.6	18.7	0.02	69.1	112	-76.82	-80.51	
EW-18	5/10/2018 10:40	58.9	31.2	0	9.9	0	62.2	0	-77.45	-77.46	No Change,Valve completely open: :
EW-18	5/10/2018 10:40	58.9	31.2	0	9.9	0	61.9	0	-77.45	-77.46	
EW-19	5/10/2018 12:22	57.9	32.2	2.1	7.8	0.03	70.9	152.5	-80.76	-80.85	Opened Valve 1/2 to 1 turn: 55% Open:
EW-19	5/10/2018 12:22	57.9	32.2	2.1	7.8	0.01	70.9	100.5	-80.55	-80.51	
EW-20	5/10/2018 8:11	10.5	5.2	18.7	65.6	20.95	58.8	4271.5	-20.72	-80.51	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-20	5/10/2018 8:11	10.5	5.2	18.7	65.6	20.07	58.8	4187.2	-19.66	-80.17	
EW-20	5/10/2018 14:16	61.8	34.2	0.3	3.7	0.05	75.9	206.6	-0.02	-80.81	Opened Valve 1/2 turn or less: 1% open:
EW-20	5/10/2018 14:16	61.8	34.2	0.3	3.7	0.3	77	516.9	-0.66	-80.85	
EW-21	5/10/2018 8:15	1.1	0.9	22.5	75.5	33.78	54.7	5185.9	-54.69	-80.51	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-21	5/10/2018 8:15	1.1	0.9	22.5	75.5	33.78	54.9	5211.3	-51.3	-80.51	
EW-22	5/10/2018 8:22	50.4	26.1	4.7	18.8	0.04	57.7	180.1	-0.88	-80.51	No Change: 1% open:
EW-22	5/10/2018 8:22	50.4	26.1	4.7	18.8	0.02	57.7	149.8	-0.89	-80.64	
EW-23	5/10/2018 8:26	12.3	7.7	17.3	62.7	0.03	56.7	154.3	-75.07	-80.85	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-23	5/10/2018 8:26	12.3	7.7	17.3	62.7	0	57.4	45.4	-74.73	-80.59	
EW-24	5/10/2018 8:30	50	27.2	0.1	22.7	0.04	52.2	166.5	-80.17	-80.85	No Change: 30% open:
EW-24	5/10/2018 8:30	50	27.2	0.1	22.7	0.04	52.2	163	-80.17	-80.85	
EW-25	5/10/2018 10:36	59	32	0	9	0.04	61.5	162.2	-77.45	-77.46	Opened Valve 1/2 to 1 turn: 90% open:
EW-25	5/10/2018 10:36	59	32	0	9	0.02	61.2	106.5	-77.45	-77.46	
EW-26	5/10/2018 8:36	6.1	2.9	20.3	70.7	0	58.6	0	-53.33	-80.85	No Change,Valve completely closed: :
EW-26	5/10/2018 8:36	6.1	2.9	20.3	70.7	0	58.8	0	-53.12	-80.85	
EW-26	5/10/2018 14:02	54.7	31.7	0.1	13.5	0.04	71.4	183.3	4.23	-80.85	Opened Valve 1/2 turn or less: 1% open:
EW-26	5/10/2018 14:02	54.7	31.7	0.1	13.5	0	70.5	0	-0.23	-80.34	
EW-27	5/10/2018 10:44	63.3	34.5	0	2.2	0.03	58.1	141.6	-77.11	-77.12	Opened Valve 1/2 to 1 turn: 85% open:
EW-27	5/10/2018 10:44	63.3	34.5	0	2.2	0.02	57.7	139.1	-77.37	-77.12	

Zion Landfill - Site 1 Phase A
Gas Extraction Report
May 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-28	5/10/2018 10:52	57.3	33.5	0.9	8.3	0.03	65.5	154.2	-77.45	-77.46	No Change,Valve completely open: :
EW-28	5/10/2018 10:52	57.3	33.5	0.9	8.3	0.02	65.3	130.1	-77.28	-77.46	

The following alternate standards have been approved for the following wells:

The following wells do not have an Oxygen Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZICEW5WH, ZIOCEW5E, ZIONCEW5, ZIONREW1
The following wells do not have a Pressure Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZICEW5WH, ZIOCEW5E, ZIONCEW5, ZIONREW1

R 002783

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
June 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	6/8/2018 8:28	0.5	0.4	22.7	76.4	0.01	59.9	93.2	-12.91	-58.43	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-1	6/8/2018 8:28	0.5	0.4	22.7	76.4	0.01	59.7	93.2	-12.57	-58.43	
EW-2	6/8/2018 8:10	33.4	21.2	9.1	36.3	0.01	58.5	95.6	-0.01	-58.18	No Change,Valve completely closed: :
EW-2	6/8/2018 8:10	33.4	21.2	9.1	36.3	0.01	58.6	95.6	-0.01	-58.18	
EW-3	6/8/2018 8:18	62.9	30.2	0	6.9	0.05	57.4	203.3	-57.75	-58.18	No Change: 5% open:
EW-3	6/8/2018 8:18	62.9	30.2	0	6.9	0.04	57.2	190.7	-57.75	-58.18	
EW-4	6/8/2018 8:35	62.4	34.9	0	2.7	0.02	55	140.4	-58.09	-58.39	No Change: 85% open:
EW-4	6/8/2018 8:35	62.4	34.9	0	2.7	0.02	54.5	140.4	-58.09	-58.26	
EW-6	6/8/2018 8:40	42.8	28.7	0.7	27.8	0.02	58.3	127.1	-66.79	-68.01	No Change: 5% open:
EW-6	6/8/2018 8:40	42.8	28.7	0.7	27.8	0.02	58.5	131.7	-66.62	-67.8	
EW-7	6/8/2018 8:44	57.1	29.2	0.1	13.6	0.03	58.1	160.5	-66.75	-67.8	No Change: 20% open:
EW-7	6/8/2018 8:44	57.1	29.2	0.1	13.6	0.03	57.7	144.8	-66.58	-67.8	
EW-8	6/8/2018 8:48	56.1	32.5	0	11.4	0	58.1	0	-68.24	-68.35	No Change,Valve completely open: :
EW-8	6/8/2018 8:48	56.1	32.5	0	11.4	0.03	58.1	144.5	-68.32	-68.31	
EW-9	6/8/2018 8:53	40.8	26.4	4.8	28	0.01	62.8	74.4	-67.94	-68.09	Closed Valve 1/2 to 1 turn: 50% open:
EW-9	6/8/2018 8:53	40.8	26.4	4.8	28	0	63	36	-67.94	-68.01	
EW-10	6/8/2018 8:06	64.4	33.6	0	2	0.03	59.7	175.6	1.54	-68.35	Opened Valve 1/2 turn or less: 1% open:
EW-10	6/8/2018 8:06	64.4	33.6	0	2	0	59.7	0	-8.15	-68.35	
EW-11	6/8/2018 8:57	59.3	29.1	1.6	10	0.03	61.3	159.6	-67.94	-68.14	Opened Valve 1/2 to 1 turn,Valve completely open: :
EW-11	6/8/2018 8:57	59.3	29.1	1.6	10	0.02	61.3	120.8	-68.28	-68.09	
EW-12	6/8/2018 9:07	61.6	35.1	0	3.3	0.08	58.1	286	27.6	-68.05	Opened Valve 1/2 turn or less: 1% open:
EW-12	6/8/2018 9:07	61.6	35.1	0	3.3	0.01	56.5	98.6	-0.37	-68.05	
EW-12A	6/8/2018 9:10	51.1	28.9	4	16	33.78	56.7	5146	-67.69	-67.97	No Change: 90% open:
EW-12A	6/8/2018 9:10	51.1	28.9	4	16	33.78	56.7	5144.6	-67.9	-68.01	
EW-13	6/7/2018 12:53	1.9	0.8	22.3	75	0	63.7	0	3.64	-66.74	No Change,Valve completely closed: :
EW-13	6/7/2018 12:53	1.9	0.8	22.3	75	0.08	62.4	279.5	3.7	-66.48	
EW-13	6/7/2018 13:09	58	15.2	2.3	24.5	0.02	78.6	150.5	0.04	-67.8	Opened Valve 1/2 turn or less: 1% open:
EW-13	6/7/2018 13:09	58	15.2	2.3	24.5	0.02	78.8	133.3	-0.06	-67.8	
EW-14	6/8/2018 9:15	57.5	30	0.6	11.9	0.02	62.4	116.8	-67.9	-67.67	No Change,Valve completely open: :
EW-14	6/8/2018 9:15	57.5	30	0.6	11.9	0.02	62.8	124	-67.6	-67.67	
EW-15	6/8/2018 9:20	57.7	31.8	0.1	10.4	0.02	63.7	126.2	-67.94	-67.75	No Change,Valve completely open: :
EW-15	6/8/2018 9:20	57.7	31.8	0.1	10.4	0.01	63.9	97.4	-67.9	-67.75	
EW-16	6/7/2018 12:39	60.2	35.3	0	4.5	0.04	77.4	190.2	1.87	-66.78	Opened Valve 1/2 turn or less: 3% open:
EW-16	6/7/2018 12:39	60.2	35.3	0	4.5	0.02	75.7	129.6	-0.47	-66.78	
EW-17	6/8/2018 9:30	52.3	26.3	3.8	17.6	0.02	63	126.4	-65.73	-68.39	No Change: 1% open:
EW-17	6/8/2018 9:30	52.3	26.3	3.8	17.6	0.02	63	126.4	-65.73	-68.39	

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
June 2018

Civil & Environmental Consultants, Inc.

EW-18	6/7/2018 12:28	55.4	28.9	0	15.7	0.13	72.7	320.8	-66.58	-66.74	No Change,Valve completely open: :
EW-18	6/7/2018 12:28	55.4	28.9	0	15.7	0.03	72.7	149	-66.58	-66.74	
EW-19	6/8/2018 9:38	53.5	27.8	3.3	15.4	0.03	62.2	145.1	-67.94	-67.8	No Change: 55% Open:
EW-19	6/8/2018 9:38	53.5	27.8	3.3	15.4	0.02	61.9	138.7	-67.94	-68.26	
EW-20	6/7/2018 10:42	50.2	28.3	3.8	17.7	0.08	91.8	261.5	-0.09	-67.33	No Change: 1% open:
EW-20	6/7/2018 10:42	50.2	28.3	3.8	17.7	0.08	93.2	263.8	-0.09	-67.46	
EW-21	6/7/2018 10:48	53	28.8	2.1	16.1	0.02	79.7	133.7	-0.03	-67.42	No Change,Valve completely closed: :
EW-21	6/7/2018 10:48	53	28.8	2.1	16.1	0.02	79.7	117.3	-0.02	-67.46	
EW-22	6/7/2018 10:57	47.3	25.8	4.9	22	0.03	86.4	151.6	-0.61	-67.25	No Change: 1% open:
EW-22	6/7/2018 10:57	47.3	25.8	4.9	22	0.02	86.5	142.3	-0.6	-67.12	
EW-23	6/7/2018 11:06	59.7	34	0	6.3	0.05	86.5	207	5.77	-66.78	Opened Valve 1/2 turn or less: 1% open:
EW-23	6/7/2018 11:06	59.7	34	0	6.3	0.02	91.2	142.8	-0.06	-67.12	
EW-24	6/7/2018 11:11	48.9	30.4	0	20.7	0.03	61.9	154.5	-66.58	-67.12	No Change: 30% open:
EW-24	6/7/2018 11:11	48.9	30.4	0	20.7	0.03	61.7	150.6	-66.58	-67.12	
EW-25	6/7/2018 12:22	55.9	28.8	0	15.3	0.03	72.1	145.2	-66.58	-66.99	Opened Valve 1/2 to 1 turn,Valve completely open: :
EW-25	6/7/2018 12:22	55.9	28.8	0	15.3	0.04	71.1	184.3	-66.92	-66.78	
EW-26	6/7/2018 11:49	3.1	5.6	21.1	70.2	0	82.2	57.6	-58.43	-66.78	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-26	6/7/2018 11:49	3.1	5.6	21.1	70.2	0.02	84.4	114.5	-58.43	-66.78	
EW-26	6/8/2018 9:44	60.7	34	0	5.3	0.06	67.1	242.8	2.75	-68.18	Opened Valve 1/2 turn or less: 1% open:
EW-26	6/8/2018 9:44	60.7	34	0	5.3	0	67.5	0	-0.49	-67.8	
EW-27	6/7/2018 12:34	60.3	34.4	0.1	5.2	0.02	65.7	114.1	-66.84	-67.12	Opened Valve 1/2 to 1 turn: 95% open:
EW-27	6/7/2018 12:34	60.3	34.4	0.1	5.2	0.02	65.1	129.8	-66.58	-66.82	
EW-28	6/7/2018 12:45	58.7	34.7	0	6.6	0.02	75.9	127.5	-66.71	-66.78	No Change,Valve completely open: :
EW-28	6/7/2018 12:45	58.7	34.7	0	6.6	0.04	75.7	183.6	-66.58	-66.74	

The following alternate standards have been approved for the following wells:

The following wells do not have an Oxygen Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, FLARE 24, FLAREL16, FLARER12, TFLARE10, ZIONREW1
The following wells do not have a Temperature Limit: FLARE 24, FLAREL16, FLARER12, TFLARE10
The following wells do not have a Pressure Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, FLARE 24, FLAREL16, FLARER12, TFLARE10, ZIONREW1

Please refer to the Landfill Documentation section of the website for further information pertaining to the above listed alternate limits

R 002785

Zion Landfill - [redacted] Phase A Wells
Gas Extraction Report
July 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	7/9/2018 10:03	57.9	29.2	0	12.9	0	85.6	39.6	0.81	-47.2	Opened Valve 1/2 turn or less: 1% open:
EW-1	7/9/2018 10:03	57.9	29.2	0	12.9	0	86.9	0	-0.05	-47.58	
EW-2	7/9/2018 9:50	34.7	19.8	8.4	37.1	0	91.9	44	-0.02	-47.12	No Change,Valve completely closed: :
EW-2	7/9/2018 9:50	34.7	19.8	8.4	37.1	0	92.1	44	-0.02	-47.12	
EW-3	7/9/2018 9:55	60.6	30.1	0	9.3	0.02	72.3	113.8	-46.41	-46.78	No Change: 5% open:
EW-3	7/9/2018 9:55	60.6	30.1	0	9.3	0.01	72	108.2	-46.37	-47.16	
EW-4	7/9/2018 10:09	60.4	33.2	0	6.4	0	63.3	42.7	-46.75	-47.08	No Change: 85% open:
EW-4	7/9/2018 10:09	60.4	33.2	0	6.4	0	62.8	55.6	-46.75	-47.12	
EW-6	7/9/2018 10:16	46.2	29.1	0	24.7	0	71.2	0	-64.76	-68.14	No Change: 5% open:
EW-6	7/9/2018 10:16	46.2	29.1	0	24.7	0.01	66	80.5	-65.1	-68.18	
EW-7	7/9/2018 10:21	61.9	35.2	0	2.9	0.01	70.7	93.6	-65.77	-68.18	No Change: 20% open:
EW-7	7/9/2018 10:21	61.9	35.2	0	2.9	0.01	70.5	80.1	-65.77	-67.71	
EW-8	7/9/2018 10:25	55.8	34	0	10.2	0.01	73.4	93.1	-68.03	-68.35	No Change,Valve completely open: :
EW-8	7/9/2018 10:25	55.8	34	0	10.2	0.07	73.2	232.5	-67.81	-68.14	
EW-9	7/9/2018 10:30	46	29.2	4.9	19.9	0.01	86	64.7	-67.47	-67.8	Closed Valve 1/2 to 1 turn: 45% open:
EW-9	7/9/2018 10:30	46	29.2	4.9	19.9	0	88.7	0	-67.9	-67.8	
EW-10	7/9/2018 9:49	26.4	14.6	12.8	46.2	0	80.6	0	-65.44	-68.47	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	7/9/2018 9:49	26.4	14.6	12.8	46.2	0.01	81	92.2	-63.74	-68.14	
EW-10	7/10/2018 7:13	51.9	25.6	3.2	19.3	0.01	72	74.7	-63.74	-68.14	Opened Valve 1/2 turn or less: 1% open:
EW-10	7/10/2018 7:13	51.9	25.6	3.2	19.3	0.02	72.5	107	-63.74	-67.8	
EW-11	7/9/2018 10:35	61.8	32.3	0.3	5.6	0	82.2	0	-67.47	-67.8	No Change,Valve completely open: :
EW-11	7/9/2018 10:35	61.8	32.3	0.3	5.6	0.02	82	124.1	-67.81	-67.8	
EW-12	7/9/2018 10:44	61.1	31.8	0	7.1	0.01	78.1	79.6	-65.1	-67.75	Opened Valve > 1 turn: 20% open:
EW-12	7/9/2018 10:44	61.1	31.8	0	7.1	0	77.2	0	-66.45	-67.54	
EW-12A	7/9/2018 10:50	39.8	23.4	7.8	29	33.78	75.2	5049.7	-66.79	-67.8	Closed Valve > 1 turn: 70% open:
EW-12A	7/9/2018 10:50	39.8	23.4	7.8	29	33.78	75.4	5052.1	-66.37	-67.54	
EW-13	7/9/2018 9:40	55.3	31.7	1.9	11.1	0	90.9	24.6	-0.35	-67.8	No Change: 1% open:
EW-13	7/9/2018 9:40	55.3	31.7	1.9	11.1	0	91.4	0	-0.35	-67.8	
EW-14	7/9/2018 10:55	59.1	32.7	0.8	7.4	0	82.8	52.9	-67.22	-67.75	No Change,Valve completely open: :
EW-14	7/9/2018 10:55	59.1	32.7	0.8	7.4	0	82.6	49.6	-67.47	-67.8	
EW-15	7/9/2018 11:00	54.3	30.7	0.7	14.3	0	84.4	0	-67.47	-68.14	No Change,Valve completely open: :
EW-15	7/9/2018 11:00	54.3	30.7	0.7	14.3	0	84.4	0	-67.81	-68.14	
EW-16	7/9/2018 9:31	46.9	28.1	4.9	20.1	0	78.8	0	-9.38	-68.14	Closed Valve 1/2 turn or less: 1% open:
EW-16	7/9/2018 9:31	46.9	28.1	4.9	20.1	0	79	0	-8.75	-68.14	
EW-17	7/9/2018 11:06	49.9	25.9	4.7	19.5	0.4	80.2	550.7	-64.84	-67.97	No Change: 1% open:
EW-17	7/9/2018 11:06	49.9	25.9	4.7	19.5	0.43	80.2	571.1	-65.01	-67.8	
EW-18	7/9/2018 9:19	56.1	28.6	0	15.3	0	77.9	0	-68.15	-68.98	No Change,Valve completely open: :
EW-18	7/9/2018 9:19	56.1	28.6	0	15.3	0.03	77.7	157.3	-67.94	-68.18	
EW-19	7/9/2018 11:11	56.7	29.4	1.2	12.7	0	85.3	22.6	-67.26	-67.8	Opened Valve 1/2 to 1 turn: 60% open:
EW-19	7/9/2018 11:11	56.7	29.4	1.2	12.7	0	85.3	0	-67.81	-67.75	

R 002786

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
July 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-20	7/9/2018 8:18	51.4	28.5	3.6	16.5	0.02	79.7	150.2	-0.04	-68.18	No Change: 1% open:
EW-20	7/9/2018 8:18	51.4	28.5	3.6	16.5	0.02	80.2	119.7	-0.04	-68.18	
EW-21	7/9/2018 8:27	60.3	31.3	0	8.4	0	77.9	0	0.59	-68.18	Opened Valve 1/2 turn or less: 1% open:
EW-21	7/9/2018 8:27	60.3	31.3	0	8.4	0	78.1	0	-0.05	-68.14	
EW-22	7/9/2018 8:30	48	25.4	4.8	21.8	0.01	79.5	101	-0.66	-68.47	No Change: 1% open:
EW-22	7/9/2018 8:30	48	25.4	4.8	21.8	0.01	79.5	93.9	-0.66	-68.56	
EW-23	7/9/2018 8:35	14.4	8.5	17	60.1	0	85.1	0	-17.2	-68.47	Closed Valve 1/2 turn or less,Valve completely closed:
EW-23	7/9/2018 8:35	14.4	8.5	17	60.1	0	85.8	46.6	-17.2	-68.18	
EW-24	7/9/2018 8:40	49.8	25.8	0	24.4	0	64.6	63.9	-67.47	-68.22	No Change: 30% open:
EW-24	7/9/2018 8:40	49.8	25.8	0	24.4	0	64.4	63.9	-67.47	-68.18	
EW-25	7/9/2018 9:14	58.1	31.2	0	10.7	0	70.7	22.9	-68.11	-68.18	No Change,Valve completely open: :
EW-25	7/9/2018 9:14	58.1	31.2	0	10.7	0	70.5	0	-67.98	-68.47	
EW-26	7/9/2018 8:47	19.9	11.1	14.1	54.9	0	87.1	22.4	-67.9	-68.64	Closed Valve 1/2 turn or less,Valve completely closed:
EW-26	7/9/2018 8:47	19.9	11.1	14.1	54.9	0	88.5	54.8	-67.43	-68.47	
EW-26	7/10/2018 7:36	41	26.6	0	32.4	0.01	77.2	103.6	0.05	-67.8	Opened Valve 1/2 turn or less: 1% open:
EW-26	7/10/2018 7:36	41	26.6	0	32.4	0	68.9	40	-4.29	-67.63	
EW-27	7/9/2018 9:24	61.3	33.3	0.3	5.1	0.01	68.7	93.4	-68.49	-68.81	Opened Valve 1/2 to 1 turn,Valve completely open: :
EW-27	7/9/2018 9:24	61.3	33.3	0.3	5.1	0.01	67.6	66.8	-67.94	-68.56	
EW-28	7/9/2018 9:35	56.6	32.1	1	10.3	0.01	76.6	98.9	-66.79	-67.16	No Change,Valve completely open: :
EW-28	7/9/2018 9:35	56.6	32.1	1	10.3	0	76.6	41	-66.79	-67.12	

R 002787

Civil & Environmental Consultants, Inc.

Zion Landfill - Phase 1 Site A Wells
Gas Extraction Report
August 2018

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	8/2/2018 7:40	6	7.5	16.7	69.8	0	85	0	-0.94	-49.83	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-1	8/2/2018 7:40	6	7.5	16.7	69.8	0	85	0	-0.79	-49.24	
EW-2	8/1/2018 12:49	28.7	16.2	10.9	44.2	0	90	0	-0.02	-48.47	No Change,Valve completely closed: :
EW-2	8/1/2018 12:49	28.7	16.2	10.9	44.2	0	90	16.3	-0.01	-48.47	
EW-3	8/2/2018 7:36	64.8	32.4	0	2.8	0.02	70	140.6	-48.87	-49.32	No Change: 5% open:
EW-3	8/2/2018 7:36	64.8	32.4	0	2.8	0	70	0	-48.79	-49.36	
EW-4	8/2/2018 7:44	38.4	22	8	31.6	0	60	62.1	-49.6	-49.75	Closed Valve > 1 turn: 75% open:
EW-4	8/2/2018 7:44	38.4	22	8	31.6	0	60	0	-49.6	-50.04	
EW-4	8/6/2018 10:40	48.8	29.3	3.7	18.2	0	60	0	-43.14	-43.64	No Change: 75% open:
EW-4	8/6/2018 10:40	48.8	29.3	3.7	18.2	0	60	0	-43.14	-43.56	
EW-6	8/2/2018 7:49	44	29.5	0.1	26.4	0	68	0	-67.94	-70.85	No Change: 5% open:
EW-6	8/2/2018 7:49	44	29.5	0.1	26.4	0.01	68	102.8	-67.94	-70.64	
EW-7	8/2/2018 7:52	58.5	31.5	0.1	9.9	0.01	70	102.6	-68.45	-71.06	No Change: 20% open:
EW-7	8/2/2018 7:52	58.5	31.5	0.1	9.9	0.03	70	140.9	-68.45	-70.72	
EW-8	8/2/2018 7:57	58.2	33.9	0	7.9	0	74	0	-71.25	-71.36	No Change,Valve completely open: :
EW-8	8/2/2018 7:57	58.2	33.9	0	7.9	0	74	0	-71.21	-71.36	
EW-9	8/2/2018 8:02	49.4	27.8	2	20.8	0	87	0	-70.96	-71.31	No Change: 45% open:
EW-9	8/2/2018 8:02	49.4	27.8	2	20.8	0	87	0	-71.34	-71.61	
EW-10	8/1/2018 12:40	21.3	9.9	14.6	54.2	0	80	0	-69.68	-71.48	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	8/1/2018 12:40	21.3	9.9	14.6	54.2	0.02	80	112.8	-66.33	-70.51	
EW-10	8/2/2018 7:31	63.9	31.9	0.1	4.1	0.01	55	114.2	0.84	-70.68	Opened Valve 1/2 turn or less: 1% open:
EW-10	8/2/2018 7:31	63.9	31.9	0.1	4.1	0.01	60	102.9	-0.06	-71.31	
EW-11	8/2/2018 8:11	48.3	26.5	5.4	19.8	0	83	0	-71.34	-71.44	Closed Valve 1/2 to 1 turn: 95% open:
EW-11	8/2/2018 8:11	48.3	26.5	5.4	19.8	0	81	0	-71	-71.06	
EW-11	8/6/2018 10:45	55.3	30.1	1.5	13.1	0	81	0	-69	-69.19	Opened Valve 1/2 turn or less: 97% open:
EW-11	8/6/2018 10:45	55.3	30.1	1.5	13.1	0	84	0	-68.96	-69.32	
EW-12	8/2/2018 8:19	61	35.7	0.2	3.1	0	78	0	-71.3	-71.4	Opened Valve > 1 turn: 50% open:
EW-12	8/2/2018 8:19	61	35.7	0.2	3.1	0	78	40.7	-71.3	-71.4	
EW-12A	8/2/2018 8:25	23.5	11.7	13.4	51.4	33.78	78	4983.8	-71.34	-71.06	Closed Valve > 1 turn: 50% open:
EW-12A	8/2/2018 8:25	23.5	11.7	13.4	51.4	33.78	78	4986.5	-71	-71.31	
EW-13	8/1/2018 12:33	52.2	28.7	2.3	16.8	0	80	36.1	-0.3	-70.85	Opened Valve 1/2 turn or less: 2% open:
EW-13	8/1/2018 12:33	52.2	28.7	2.3	16.8	0	80	55.6	-0.33	-70.51	
EW-14	8/2/2018 8:31	57.6	30.9	1.4	10.1	0	80	0	-70.96	-71.06	No Change,Valve completely open: :
EW-14	8/2/2018 8:31	57.6	30.9	1.4	10.1	0	80	49.4	-71.3	-71.27	
EW-15	8/2/2018 8:39	50.1	29.4	2.6	17.9	0	84	41.1	-71.3	-71.31	No Change,Valve completely open: :
EW-15	8/2/2018 8:39	50.1	29.4	2.6	17.9	0	84	36.7	-71.34	-71.31	

Civil & Environmental Consultants, Inc.

Zion Landfill - Phase 1 Site A Wells
Gas Extraction Report
August 2018

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-16	8/1/2018 12:23	54.9	30.5	0.9	13.7	0	70	41	-0.3	-70.55	Opened Valve 1/2 turn or less: 2% open:
EW-16	8/1/2018 12:23	54.9	30.5	0.9	13.7	0	70	44.3	-0.64	-70.55	
EW-17	8/2/2018 8:46	49.2	26	4.8	20	0.23	80	417.1	-69.13	-71.31	No Change: 1% open:
EW-17	8/2/2018 8:46	49.2	26	4.8	20	0.23	80	417.2	-69	-71.27	
EW-18	8/1/2018 12:14	56.6	28.1	0	15.3	0.03	60	142.6	-70.87	-70.85	No Change,Valve completely open: :
EW-18	8/1/2018 12:14	56.6	28.1	0	15.3	0	60	0	-70.87	-71.06	
EW-19	8/2/2018 8:51	57.3	29.8	1.4	11.5	0.03	84	146.3	-71.3	-71.27	Opened Valve 1/2 to 1 turn: 65% open:
EW-19	8/2/2018 8:51	57.3	29.8	1.4	11.5	0.01	84	94.6	-71.34	-71.74	
EW-20	8/1/2018 10:49	55	31.8	0	13.2	0.03	80	154	-0.05	-71.82	Opened Valve 1/2 turn or less: 2% open:
EW-20	8/1/2018 10:49	55	31.8	0	13.2	7.59	80	2597.2	-7.01	-71.53	
EW-21	8/1/2018 10:53	8.3	8.1	20.9	62.7	24.79	72	4557.6	-24.59	-71.53	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-21	8/1/2018 10:53	8.3	8.1	20.9	62.7	25.2	70	4603.4	-24.93	-71.23	
EW-22	8/1/2018 10:59	50.3	24.5	4.4	20.8	0.01	70	111.1	-0.49	-70.51	No Change: 1% open:
EW-22	8/1/2018 10:59	50.3	24.5	4.4	20.8	0.01	70	105	-0.49	-70.51	
EW-23	8/1/2018 11:02	59.5	34.8	0	5.7	0.02	70	126	3.89	-70.51	Opened Valve 1/2 turn or less: 1% open:
EW-23	8/1/2018 11:02	59.5	34.8	0	5.7	0	70	0	-0.03	-70.17	
EW-24	8/1/2018 11:08	46	28.6	0.7	24.7	0	54	0	-69.68	-70.25	Closed Valve 1/2 to 1 turn: 25% open:
EW-24	8/1/2018 11:08	46	28.6	0.7	24.7	0	54	0	-69.51	-70.55	
EW-25	8/1/2018 12:09	34.3	18.9	7.6	39.2	0	60	0	-71.17	-71.19	Closed Valve > 1 turn: 85% open:
EW-25	8/1/2018 12:09	34.3	18.9	7.6	39.2	0	60	0	-70.87	-70.85	
EW-25	8/2/2018 7:20	52.1	35.7	0.2	12	0	50	49.1	-71.34	-71.31	Opened Valve 1/2 to 1 turn: 90% open:
EW-25	8/2/2018 7:20	52.1	35.7	0.2	12	0	50	0	-71.3	-71.27	
EW-26	8/1/2018 11:24	35.1	21.7	9	34.2	0	70	0	-68.83	-70.17	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-26	8/1/2018 11:24	35.1	21.7	9	34.2	0	70	0	-68.54	-70.17	
EW-26	8/2/2018 7:25	12.2	5.8	17.7	64.3	0	55	0	-7.47	-70.38	No Change,Valve completely closed: :
EW-26	8/2/2018 7:25	12.2	5.8	17.7	64.3	0	55	37.2	-7.47	-70.38	
EW-26	8/6/2018 10:33	55.5	36.2	0	8.3	0.02	50	119.5	5.77	-63.94	Opened Valve 1/2 turn or less: 1% open:
EW-26	8/6/2018 10:33	55.5	36.2	0	8.3	0	53	0	-0.05	-63.6	
EW-27	8/1/2018 12:18	58.1	31.1	1.3	9.5	0.01	60	85.6	-70.19	-70.17	No Change,Valve completely open: :
EW-27	8/1/2018 12:18	58.1	31.1	1.3	9.5	0	60	0	-70.19	-70.17	
EW-28	8/1/2018 12:27	56.7	34.1	0.2	9	0.01	70	77.7	-70.19	-70.17	No Change,Valve completely open: :
EW-28	8/1/2018 12:27	56.7	34.1	0.2	9	0.01	70	77.7	-70.19	-70.17	

The following alternate standards have been approved for the following wells:
The following wells do not have an Oxygen Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZIONREW1
The following wells do not have a Temperature Limit:
The following wells do not have a Pressure Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZIONREW1
Please refer to the Landfill Documentation section of the website for further information pertaining to the above listed alternate limits

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
September 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	9/6/2018 10:59	60.7	28.3	0.1	10.9	0	68.2	0	0.65	-52.03	Opened Valve 1/2 turn or less: 1% open:
EW-1	9/6/2018 10:59	60.7	28.3	0.1	10.9	0	68.5	0	-0.21	-51.69	
EW-2	9/6/2018 10:48	25.4	13.9	12.6	48.1	0	67.6	0	-0.02	-51.61	No Change,Valve completely closed: :
EW-2	9/6/2018 10:48	25.4	13.9	12.6	48.1	0	67.6	0	-0.02	-51.78	
EW-3	9/6/2018 10:55	65.2	33.1	0	1.7	33.78	64.9	5241.4	-51.08	-51.78	No Change: 5% open:
EW-3	9/6/2018 10:55	65.2	33.1	0	1.7	33.78	64.9	5241.4	-51.08	-51.78	
EW-4	9/6/2018 11:05	65.5	30.3	0.2	4	33.78	63.1	5247.5	-51.46	-51.65	No Change: 75% open:
EW-4	9/6/2018 11:05	65.5	30.3	0.2	4	33.78	62.6	5249.2	-51.46	-51.78	
EW-6	9/6/2018 11:10	46.1	31.4	0	22.5	1.16	64.6	944.8	-70.11	-70.59	No Change: 5% open:
EW-6	9/6/2018 11:10	46.1	31.4	0	22.5	1.09	64.6	917.8	-70.11	-70.81	
EW-7	9/6/2018 11:14	58.7	30.5	0	10.8	0.35	66.6	519.8	-68.75	-70.59	No Change: 20% open:
EW-7	9/6/2018 11:14	58.7	30.5	0	10.8	0.35	66.4	516.4	-68.75	-70.85	
EW-8	9/6/2018 11:18	58.9	33.2	0	7.9	0.32	66.4	494.3	-70.53	-70.59	No Change,Valve completely open: :
EW-8	9/6/2018 11:18	58.9	33.2	0	7.9	0.26	66.4	449.8	-70.45	-70.59	
EW-9	9/6/2018 11:23	54.2	27.5	2.3	16	0.05	72	186	-70.74	-70.85	No Change: 45% open:
EW-9	9/6/2018 11:23	54.2	27.5	2.3	16	0.04	72.1	176.4	-70.66	-70.85	
EW-10	9/6/2018 10:43	16.9	7	16.7	59.4	3.74	67.6	1820.8	-7.6	-70.93	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	9/6/2018 10:43	16.9	7	16.7	59.4	3.48	67.8	1757.2	-7.26	-70.51	
EW-10	9/7/2018 9:37	30	14.7	11.6	43.7	0.01	67.3	82.9	-4.61	-70.76	No Change,Valve completely closed: :
EW-10	9/7/2018 9:37	30	14.7	11.6	43.7	0	67.5	0	-3.04	-70.72	
EW-10	9/7/2018 14:27	61.9	31.6	0.7	5.8	0	73.8	0	4.88	-70.08	Opened Valve 1/2 turn or less: 1% open:
EW-10	9/7/2018 14:27	61.9	31.6	0.7	5.8	0.09	75	286.1	-0.15	-69.75	
EW-11	9/6/2018 11:28	60.2	30.9	1.1	7.8	0.04	67.6	174	-70.45	-70.85	Opened Valve 1/2 turn or less,Valve completely open: :
EW-11	9/6/2018 11:28	60.2	30.9	1.1	7.8	0.07	67.6	235.6	-70.45	-70.59	
EW-12	9/6/2018 11:32	61.3	31.7	0.1	6.9	0.12	68	301.4	-70.74	-70.85	Opened Valve > 1 turn: 70% open:
EW-12	9/6/2018 11:32	61.3	31.7	0.1	6.9	0.09	68	265.6	-70.7	-70.85	
EW-12A	9/6/2018 11:38	39.9	23.7	7.8	28.6	33.78	68.2	5052.1	-70.79	-70.93	Closed Valve > 1 turn: 10% open:
EW-12A	9/6/2018 11:38	39.9	23.7	7.8	28.6	33.78	68	5058.7	-70.11	-70.64	
EW-13	9/6/2018 10:39	7.9	6.5	21.5	64.1	2.64	61.3	1540.1	-4.32	-70.17	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-13	9/6/2018 10:39	7.9	6.5	21.5	64.1	0	60.1	0	-0.03	-70.59	
EW-13	9/7/2018 9:27	61.3	33.1	0.3	5.3	0.01	67.8	75.1	-0.08	-70.42	Opened Valve 1/2 turn or less: 1% open:
EW-13	9/7/2018 9:27	61.3	33.1	0.3	5.3	0.04	68	187.7	-0.48	-70.72	
EW-14	9/6/2018 11:42	57.6	30.8	0.7	10.9	0.08	68	241.2	-70.7	-70.76	No Change,Valve completely open: :
EW-14	9/6/2018 11:42	57.6	30.8	0.7	10.9	0.07	68.2	226.3	-70.66	-70.59	
EW-15	9/6/2018 11:46	52.1	30	2.2	15.7	0.03	69.3	148.4	-70.57	-70.59	No Change,Valve completely open: :
EW-15	9/6/2018 11:46	52.1	30	2.2	15.7	0.06	69.4	220.6	-70.49	-70.72	
EW-16	9/6/2018 10:22	51.3	29.9	3.5	15.3	3.79	66.2	1861.2	-4.28	-70.89	No Change: 2% open:
EW-16	9/6/2018 10:22	51.3	29.9	3.5	15.3	3.8	66.2	1862	-4.29	-70.89	
EW-17	9/6/2018 11:52	50.7	28	3.7	17.6	0.07	70	229.8	-65.31	-70.93	No Change: 1% open:
EW-17	9/6/2018 11:52	50.7	28	3.7	17.6	0.07	70	224.6	-65.27	-71.27	
EW-18	9/6/2018 10:14	57.1	29.5	0	13.4	33.78	66.2	5088.4	-70.83	-70.85	No Change,Valve completely open: :

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
September 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-18	9/6/2018 10:14	57.1	29.5	0	13.4	33.78	66.2	5088.7	-70.79	-70.93	
EW-19	9/6/2018 12:06	34.6	18.2	10.8	36.4	0.04	70.2	166	-70.74	-70.85	Closed Valve > 1 turn: 50% open:
EW-19	9/6/2018 12:06	34.6	18.2	10.8	36.4	0.03	70	149.1	-70.66	-70.76	
EW-19	9/7/2018 9:48	61.5	32.5	1.1	4.9	0.07	68.7	224.3	-71.51	-71.1	Opened Valve 1/2 to 1 turn: 55% open:
EW-19	9/7/2018 9:48	61.5	32.5	1.1	4.9	0	69.1	0	-71.21	-70.76	
EW-20	9/6/2018 8:38	21.5	11.3	15.3	51.9	3.85	64	1863.6	-5.31	-70.89	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-20	9/6/2018 8:38	21.5	11.3	15.3	51.9	2.75	63.9	1578.1	-3.63	-70.85	
EW-20	9/7/2018 8:52	63.2	34.9	0	1.9	0	67.3	0	0.33	-70.47	Opened Valve 1/2 turn or less: 1% open:
EW-20	9/7/2018 8:52	63.2	34.9	0	1.9	0	68	0	-0.04	-71.99	
EW-21	9/6/2018 8:43	64.8	32.5	0	2.7	0	62.4	0	7.35	-70.97	Opened Valve 1/2 turn or less: 1% open:
EW-21	9/6/2018 8:43	64.8	32.5	0	2.7	0	63.5	0	-0.17	-70.93	
EW-22	9/6/2018 8:53	62	32.3	0.7	5	0.26	65.8	487.3	-0.49	-69.92	Opened Valve 1/2 turn or less: 2% open:
EW-22	9/6/2018 8:53	62	32.3	0.7	5	0.32	66.2	545.8	-1.27	-70.25	
EW-23	9/6/2018 9:03	9.2	4.6	19.3	66.9	33.78	64.8	5246.9	-41.23	-70.25	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-23	9/6/2018 9:03	9.2	4.6	19.3	66.9	33.78	65.5	5246.6	-40.81	-70.25	
EW-24	9/6/2018 9:07	48.2	29	0	22.8	33.78	62.1	5120.3	-69.21	-69.92	No Change: 25% open:
EW-24	9/6/2018 9:07	48.2	29	0	22.8	33.78	62.2	5118	-69.43	-69.66	
EW-25	9/6/2018 10:07	56.4	32.3	0.1	11.2	33.78	65.5	5091	-70.79	-70.85	No Change,Valve completely open: :
EW-25	9/6/2018 10:07	56.4	32.3	0.1	11.2	33.78	65.5	5091	-70.79	-70.59	
EW-26	9/6/2018 9:29	38.8	23.3	8.1	29.8	33.78	64.4	5089.8	-68.07	-70.25	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-26	9/6/2018 9:29	38.8	23.3	8.1	29.8	33.78	64.8	5091.7	-67.56	-70.04	
EW-26	9/7/2018 9:06	30.2	16.7	11.5	41.6	0.09	67.3	283.1	-21.95	-70.08	No Change,Valve completely closed: :
EW-26	9/7/2018 9:06	30.2	16.7	11.5	41.6	0.07	67.5	239.2	-21.95	-69.75	
EW-26	9/7/2018 14:19	54.7	32.9	0.5	11.9	0.01	77.2	78.2	1.24	-69.19	Opened Valve 1/2 turn or less: 1% open:
EW-26	9/7/2018 14:19	54.7	32.9	0.5	11.9	0.07	77.4	257.7	-0.08	-69.07	
EW-27	9/6/2018 10:17	62.3	33.1	0	4.6	33.78	65.1	5101	-69.85	-69.92	No Change,Valve completely open: :
EW-27	9/6/2018 10:17	62.3	33.1	0	4.6	33.78	64.9	5101.6	-69.77	-69.87	
EW-28	9/6/2018 10:33	57.5	31.8	1.1	9.6	33.78	66	5092.1	-69.98	-69.92	No Change,Valve completely open: :
EW-28	9/6/2018 10:33	57.5	31.8	1.1	9.6	33.78	66	5093.6	-69.77	-70.17	

The following alternate standards have been approved for the following wells:

The following wells do not have an Oxygen Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, FLARE 24, ZIONREW1
The following wells do not have a Temperature Limit:
The following wells do not have a Pressure Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZIONREW1

Please refer to the Landfill Documentation section of the website for further information pertaining to the above listed alternate limits

R 002791

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
October 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	10/1/2018 12:15	0.5	0.3	23.2	76	0	59.7	0	-14.61	-49.7	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-1	10/1/2018 12:15	0.5	0.3	23.2	76	0	59.7	0	-14.95	-49.79	
EW-2	10/1/2018 11:55	31.5	17.8	10.4	40.3	0.01	59.4	106.3	-0.01	-49.49	No Change,Valve completely closed: :
EW-2	10/1/2018 11:55	31.5	17.8	10.4	40.3	0.01	59.4	106.3	-0.01	-49.79	
EW-3	10/1/2018 12:02	61.3	30.4	0.2	8.1	0.02	59.4	137.5	-49	-49.7	No Change: 5% open:
EW-3	10/1/2018 12:02	61.3	30.4	0.2	8.1	0.01	59.4	100.4	-49.09	-49.79	
EW-4	10/1/2018 12:22	61.5	35.1	0	3.4	0.02	56.7	121.5	-49.26	-49.45	No Change: 75% open:
EW-4	10/1/2018 12:22	61.5	35.1	0	3.4	0.02	56.7	121.5	-49.26	-49.45	
EW-6	10/1/2018 12:31	42.4	30.4	0	27.2	0	61.5	0	-65.73	-68.05	No Change: 5% open:
EW-6	10/1/2018 12:31	42.4	30.4	0	27.2	0	61.5	0	-66.03	-68.14	
EW-7	10/1/2018 12:35	62.4	34.3	0	3.3	0.01	59.5	98.3	-63.95	-68.01	No Change: 20% open:
EW-7	10/1/2018 12:35	62.4	34.3	0	3.3	0.01	59.5	98.3	-63.95	-67.08	
EW-8	10/1/2018 12:39	55.3	33.5	0.2	11	0	60.1	0	-69.98	-70.34	No Change,Valve completely open: :
EW-8	10/1/2018 12:39	55.3	33.5	0.2	11	0.15	60.1	346.4	-69.3	-69.36	
EW-9	10/1/2018 12:47	51.1	29	1.8	18.1	0.1	61.2	283	-65.56	-65.72	No Change: 45% open:
EW-9	10/1/2018 12:47	51.1	29	1.8	18.1	0.02	61.2	138.5	-64.59	-64.7	
EW-10	10/1/2018 11:50	24.2	11.5	14.6	49.7	0	58.5	35.8	-37.45	-65.04	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	10/1/2018 11:50	24.2	11.5	14.6	49.7	0.01	58.6	78	-36.18	-67.08	
EW-10	10/2/2018 8:42	65.5	33	0	1.5	0.02	56.1	121.3	8.45	-70.51	Opened Valve 1/2 turn or less: 1% open:
EW-10	10/2/2018 8:42	65.5	33	0	1.5	0	56.1	0	-0.69	-70.59	
EW-11	10/1/2018 12:53	58	30.3	1.6	10.1	0	60.1	0	-65.9	-65.85	No Change,Valve completely open: :
EW-11	10/1/2018 12:53	58	30.3	1.6	10.1	0	60.4	0	-66.58	-67.08	
EW-12	10/1/2018 12:58	60.6	33	0.9	5.5	0.02	60.3	123.5	-65.22	-65.21	Opened Valve > 1 turn,Valve completely open: :
EW-12	10/1/2018 12:58	60.6	33	0.9	5.5	0	60.4	0	-66.24	-67.03	
EW-12A	10/1/2018 13:01	25	14	13.6	47.4	33.76	60.8	5240.5	-47.26	-66.06	Closed Valve 1/2 to 1 turn: 5% open:
EW-12A	10/1/2018 13:01	25	14	13.6	47.4	33.76	60.8	5243.4	-46.88	-65.72	
EW-13	10/1/2018 11:37	59.1	32.5	1.3	7.1	0.02	59.9	125.3	-0.38	-64.83	Opened Valve 1/2 turn or less: 2% open:
EW-13	10/1/2018 11:37	59.1	32.5	1.3	7.1	0.01	59.9	87	-0.51	-67.33	
EW-14	10/1/2018 13:07	60	33	0.2	6.8	0	60.8	0	-67.26	-67.42	No Change,Valve completely open: :
EW-14	10/1/2018 13:07	60	33	0.2	6.8	0	60.6	0	-67.35	-67.5	
EW-15	10/1/2018 13:11	52.1	30.2	1.3	16.4	0	60.4	0	-66.28	-66.53	No Change,Valve completely open: :
EW-15	10/1/2018 13:11	52.1	30.2	1.3	16.4	0	60.4	0	-67.52	-68.09	
EW-16	10/1/2018 11:09	49.6	28.7	4.7	17	0	59.9	0	-5.77	-66.74	No Change: 2% open:
EW-16	10/1/2018 11:09	49.6	28.7	4.7	17	0	59.7	0	-5.77	-68.14	
EW-17	10/1/2018 13:17	55	28.6	2.8	13.6	0	61	38.8	-62.17	-66.36	No Change: 1% open:
EW-17	10/1/2018 13:17	55	28.6	2.8	13.6	0	61	29	-62.38	-67.08	
EW-18	10/1/2018 10:55	56.6	29.1	0.2	14.1	0	60.4	0	-65.9	-65.72	No Change,Valve completely open: :

Zion Landfill - Site I Phase A Wells
Gas Extraction Report
October 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-18	10/1/2018 10:55	56.6	29.1	0.2	14.1	0	60.6	0	-65.9	-65.93	
EW-19	10/1/2018 13:21	51.9	27.4	3.7	17	0.16	61.2	350.3	-65.9	-65.72	No Change: 55% open:
EW-19	10/1/2018 13:21	51.9	27.4	3.7	17	0	61.2	0	-65.9	-65.85	
EW-20	10/1/2018 9:27	46.9	26.9	4.7	21.5	0.27	55.8	500.6	-0.26	-68.43	No Change: 1% open:
EW-20	10/1/2018 9:27	46.9	26.9	4.7	21.5	0.26	55.8	499.3	-0.26	-67.08	
EW-21	10/1/2018 9:33	16.9	8.8	17.3	57	33.76	54.7	5123.4	-65.56	-65.97	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-21	10/1/2018 9:33	16.9	8.8	17.3	57	33.76	55	5129.8	-64.54	-67.54	
EW-22	10/1/2018 9:38	53.3	28	3.9	14.8	0.01	56.5	105.1	-14.99	-65.85	No Change: 2% open:
EW-22	10/1/2018 9:38	53.3	28	3.9	14.8	0.01	56.5	105.1	-14.99	-65.38	
EW-23	10/1/2018 9:43	59.5	36.4	0	4.1	0	55.9	0	6.45	-65.51	Opened Valve 1/2 turn or less: 1% open:
EW-23	10/1/2018 9:43	59.5	36.4	0	4.1	0.02	55.9	149.5	-0.31	-65.93	
EW-24	10/1/2018 9:49	48	30.6	0	21.4	0.01	57.6	92	-65.22	-65.25	No Change: 25% open:
EW-24	10/1/2018 9:49	48	30.6	0	21.4	0	57.6	0	-64.88	-65.38	
EW-25	10/1/2018 10:49	52.3	30.5	0.7	16.5	0	58.8	0	-66.58	-66.82	No Change,Valve completely open: :
EW-25	10/1/2018 10:49	52.3	30.5	0.7	16.5	0	59	0	-68.28	-68.43	
EW-26	10/1/2018 9:53	48.1	30.2	3.5	18.2	0	56.3	0	-39.32	-65.72	No Change: 1% open:
EW-26	10/1/2018 9:53	48.1	30.2	3.5	18.2	0	56.3	0	-39.41	-65.72	
EW-27	10/1/2018 11:00	60.9	33.3	0.6	5.2	0	58.5	0	-65.31	-65.25	No Change,Valve completely open: :
EW-27	10/1/2018 11:00	60.9	33.3	0.6	5.2	0	58.5	0	-65.56	-65.38	
EW-28	10/1/2018 11:14	59.9	33.3	0.6	6.2	0	58.5	0	-65.22	-65.21	No Change,Valve completely open: :
EW-28	10/1/2018 11:14	59.9	33.3	0.6	6.2	0	58.5	0	-65.9	-65.85	

The following alternate standards have been approved for the following wells:
The following wells do not have an Oxygen Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZIONREW1
The following wells do not have a Temperature Limit:
The following wells do not have a Pressure Limit: EW-1, EW-12A, EW-2, EW-21, EW-23, ZIONREW1
Please refer to the Landfill Documentation section of the website for further information pertaining to the above listed alternate limits

R 002793

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
November 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	11/1/2018 10:40	58.8	29.3	0	11.9	0	50	0	1.78	-55.85	Opened Valve 1/2 turn or less: 2% open:
EW-1	11/1/2018 10:40	58.8	29.3	0	11.9	0	49.8	0	-0.61	-55.59	
EW-2	11/1/2018 10:31	63.2	33.2	0	3.6	0	50.2	0	0.01	-57.2	Opened Valve 1/2 turn or less: 1% open:
EW-2	11/1/2018 10:31	63.2	33.2	0	3.6	0.02	50.4	135.3	-0.16	-56.27	
EW-3	11/1/2018 10:35	64	34.2	0	1.8	33.78	56.5	5259	-54.69	-56.23	No Change: 5% open:
EW-3	11/1/2018 10:35	64	34.2	0	1.8	33.78	56.5	5259.1	-54.69	-56.61	
EW-4	11/1/2018 10:45	61.3	34.4	0	4.3	33.78	56.3	5262.7	-54.35	-55.25	No Change: 75% open:
EW-4	11/1/2018 10:45	61.3	34.4	0	4.3	33.78	56.3	5262.7	-54.35	-55.47	
EW-6	11/1/2018 10:51	51	33.5	0	15.5	33.78	59.4	5148.2	-67.6	-70.21	No Change: 5% open:
EW-6	11/1/2018 10:51	51	33.5	0	15.5	33.78	59.7	5145.6	-67.94	-69.19	
EW-7	11/1/2018 10:58	62.4	35.4	0	2.2	33.78	56.1	5177.4	-65.9	-70.17	No Change: 20% open:
EW-7	11/1/2018 10:58	62.4	35.4	0	2.2	33.78	56.1	5177.4	-65.9	-70.21	
EW-8	11/1/2018 11:02	59.4	34.2	0	6.4	33.78	55.6	5151.3	-69.64	-70.17	No Change,Valve completely open: :
EW-8	11/1/2018 11:02	59.4	34.2	0	6.4	33.78	55.8	5153.1	-69.3	-69.79	
EW-9	11/1/2018 11:06	49.4	29.9	2.2	18.5	20.37	53.8	4003.9	-68.87	-69.19	No Change: 45% open:
EW-9	11/1/2018 11:06	49.4	29.9	2.2	18.5	20.37	54	4003.3	-68.87	-69.41	
EW-10	11/1/2018 10:26	62.8	31.7	0	5.5	0	48.6	0	5.44	-68.47	Opened Valve 1/2 turn or less: 2% open:
EW-10	11/1/2018 10:26	62.8	31.7	0	5.5	4.41	48.4	2057.3	-0.24	-70.21	
EW-11	11/1/2018 11:10	60.3	31.4	1.5	6.8	33.78	54.1	5159.7	-68.87	-69.49	No Change,Valve completely open: :
EW-11	11/1/2018 11:10	60.3	31.4	1.5	6.8	33.78	54.1	5159	-68.96	-69.83	
EW-12	11/1/2018 11:14	58.9	31.5	0.4	9.2	24.01	55.9	4335.1	-69.68	-70.17	No Change,Valve completely open: :
EW-12	11/1/2018 11:14	58.9	31.5	0.4	9.2	23.89	55.8	4324.3	-69.68	-70.17	
EW-12A	11/1/2018 11:17	62	32.8	0	5.2	0	56.3	0	7.13	-69.83	Opened Valve 1/2 to 1 turn: 10% open:
EW-12A	11/1/2018 11:17	62	32.8	0	5.2	3.4	56.3	1785.3	-3.76	-69.11	
EW-13	11/1/2018 10:22	30.4	16.6	11.8	41.2	12.65	48.4	3328.9	-29.6	-69.83	Closed Valve 1/2 turn or less,Valve completely closed
EW-13	11/1/2018 10:22	30.4	16.6	11.8	41.2	12.18	48.4	3265.3	-29.89	-69.41	
EW-13	11/2/2018 8:51	59.6	32.7	0.1	7.6	0	45.5	0	40.38	-71.23	Opened Valve 1/2 turn or less: 1% open:
EW-13	11/2/2018 8:51	59.6	32.7	0.1	7.6	1.23	46.4	1088.8	-0.72	-70.55	
EW-14	11/1/2018 11:22	61.2	34.6	0	4.2	21.24	56.5	4082.7	-69.3	-69.83	No Change,Valve completely open: :
EW-14	11/1/2018 11:22	61.2	34.6	0	4.2	21.17	56.3	4076.4	-69.3	-69.83	
EW-15	11/1/2018 11:27	58.5	33.1	0.2	8.2	1.03	55	898.8	-69.3	-69.83	No Change,Valve completely open: :
EW-15	11/1/2018 11:27	58.5	33.1	0.2	8.2	1.48	55.2	1076.9	-69.64	-70.17	
EW-16	11/1/2018 10:12	63.1	34.7	0	2.2	0	54.5	0	0.28	-69.83	Opened Valve 1/2 turn or less: 3% open:
EW-16	11/1/2018 10:12	63.1	34.7	0	2.2	0	54.7	0	-0.2	-69.19	
EW-17	11/1/2018 11:38	57	28.9	2.5	11.6	19.49	54.1	3930.9	-66.24	-69.96	No Change: 1% open:
EW-17	11/1/2018 11:38	57	28.9	2.5	11.6	19.25	54.3	3906.6	-66.11	-70.21	
EW-18	11/1/2018 10:00	54.4	29.3	0	16.3	27.59	54	4656.8	-70.36	-70.89	No Change,Valve completely open: :

Zion Landfill - Site 1 Phase A Wells
Gas Extraction Report
November 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-18	11/1/2018 10:00	54.4	29.3	0	16.3	27.15	54.1	4619.3	-70.28	-70.21	
EW-19	11/1/2018 11:44	53.3	29.3	3.6	13.8	14.61	53.8	3381.4	-69.98	-70.21	No Change: 55% open:
EW-19	11/1/2018 11:44	53.3	29.3	3.6	13.8	14.15	53.8	3328.8	-69.98	-70.17	
EW-20	11/1/2018 8:34	37.5	24.3	7.3	30.9	1.58	49.5	1223.3	-1.63	-68.05	Closed Valve 1/2 turn or less,Valve completely closed
EW-20	11/1/2018 8:34	37.5	24.3	7.3	30.9	1.83	49.3	1315.6	-1.28	-68.81	
EW-20	11/2/2018 8:22	56	35.3	0	8.7	0	39.7	0	0.34	-71.23	Opened Valve 1/2 turn or less: 1% open:
EW-20	11/2/2018 8:22	56	35.3	0	8.7	0	39.2	0	-0.08	-70.51	
EW-21	11/1/2018 8:55	64.3	34.7	0	1	0	50	0	7.77	-69.83	Opened Valve 1/2 turn or less: 1% open:
EW-21	11/1/2018 8:55	64.3	34.7	0	1	0.13	51.6	354.2	-0.58	-68.56	
EW-22	11/1/2018 9:00	57.9	29.9	1.7	10.5	0.01	49.8	76.2	-1.03	-68.52	No Change: 2% open:
EW-22	11/1/2018 9:00	57.9	29.9	1.7	10.5	0.01	50.2	82.6	-1.03	-68.73	
EW-23	11/1/2018 9:07	9.6	7.3	19.7	63.4	0	47.1	0	-44.84	-68.64	Closed Valve 1/2 turn or less,Valve completely closed
EW-23	11/1/2018 9:07	9.6	7.3	19.7	63.4	0	47.1	0	-45.35	-68.81	
EW-24	11/1/2018 9:13	51.5	30.7	0	17.8	8.72	55.2	2629.9	-66.58	-68.64	Opened Valve 1/2 to 1 turn: 30% open:
EW-24	11/1/2018 9:13	51.5	30.7	0	17.8	9.5	55.4	2742.3	-66.92	-68.47	
EW-25	11/1/2018 9:56	55.8	31.5	0.2	12.5	28.65	52.7	4755.1	-69.68	-70.17	No Change,Valve completely open: :
EW-25	11/1/2018 9:56	55.8	31.5	0.2	12.5	28.67	52.7	4756.6	-69.68	-70.21	
EW-26	11/1/2018 9:18	4.9	2.3	21.6	71.2	0	48.7	0	-42.04	-68.64	Closed Valve 1/2 turn or less,Valve completely closed
EW-26	11/1/2018 9:18	4.9	2.3	21.6	71.2	0	48.9	0	-42.46	-68.22	
EW-26	11/2/2018 8:27	62.2	33	0	4.8	0	41.4	38.9	6.88	-70.17	Opened Valve 1/2 turn or less: 1% open:
EW-26	11/2/2018 8:27	62.2	33	0	4.8	0	43	0	-0.54	-69.83	
EW-27	11/1/2018 10:03	60.2	31.1	0.9	7.8	23.47	52.2	4308.8	-68.92	-69.15	No Change,Valve completely open: :
EW-27	11/1/2018 10:03	60.2	31.1	0.9	7.8	22.9	52.2	4258.4	-68.58	-68.81	
EW-28	11/1/2018 10:16	56.9	33.2	1.3	8.6	33.78	52.5	5172	-68.28	-69.11	No Change,Valve completely open: :
EW-28	11/1/2018 10:16	56.9	33.2	1.3	8.6	33.78	52.7	5169	-68.66	-69.15	

Zion Landfill - All Wells
Gas Extraction Report
December 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
Site 1 Phase A Vertical											
EW-1	12/3/2018 16:10	0.9	0.5	23.8	74.8	0.02	32.5	140	-43.48	-81.78	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-1	12/3/2018 16:10	0.9	0.5	23.8	74.8	0.03	32.5	148.3	-43.14	-81.78	
EW-2	12/3/2018 15:53	2	1	23.7	73.3	0.08	32.2	280.3	-2.33	-82.12	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-2	12/3/2018 15:53	2	1	23.7	73.3	0.01	32	117.1	-1.97	-81.57	
EW-3	12/3/2018 16:00	67.2	31.6	0.2	1	0.06	49.6	213.5	-81.19	-81.78	No Change: 5% open:
EW-3	12/3/2018 16:00	67.2	31.6	0.2	1	0.06	49.6	218.9	-81.19	-81.74	
EW-4	12/4/2018 8:49	56.2	33.7	0.1	10	0.06	51.6	215.3	-81.57	-81.99	No Change: 75% open:
EW-4	12/4/2018 8:49	56.2	33.7	0.1	10	0.06	52	207.1	-81.53	-81.69	
EW-6	12/4/2018 8:53	44.8	32.7	0	22.5	0.03	41.7	153.5	-81.57	-81.82	No Change: 5% open:
EW-6	12/4/2018 8:53	44.8	32.7	0	22.5	0.06	41.9	220.1	-81.7	-81.69	
EW-7	12/4/2018 8:57	60.1	33.5	0	6.4	0.06	45.7	214.6	-79.49	-81.4	No Change: 20% open:
EW-7	12/4/2018 8:57	60.1	33.5	0	6.4	0.06	45.9	214.6	-79.49	-81.4	
EW-8	12/4/2018 8:59	60.6	35.7	0.5	3.2	0.07	44.8	230	-81.49	-81.69	No Change,Valve completely open: :
EW-8	12/4/2018 8:59	60.6	35.7	0.5	3.2	0.07	45.1	230	-81.53	-81.69	
EW-9	12/4/2018 9:03	52.9	29	2.6	15.5	0.02	34	137.9	-81.78	-81.95	No Change: 45% open:
EW-9	12/4/2018 9:03	52.9	29	2.6	15.5	0.04	34	182.8	-81.74	-81.69	
EW-10	12/3/2018 15:45	10.5	4.7	20.8	64	0.02	32.9	136.5	-37.75	-81.69	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-10	12/3/2018 15:45	10.5	4.7	20.8	64	0.07	33.1	247.6	-24.46	-81.78	
EW-10	12/5/2018 8:41	65.4	33.1	0	1.5	0.02	28	124.8	2.47	-81.36	Opened Valve 1/2 turn or less: 1% open:
EW-10	12/5/2018 8:41	65.4	33.1	0	1.5	0	28.4	0	-1.71	-81.36	
EW-11	12/4/2018 9:06	52.8	28.8	4	14.4	0.04	37.2	164.9	-81.87	-81.74	No Change,Valve completely open: :
EW-11	12/4/2018 9:06	52.8	28.8	4	14.4	0.04	37.2	185.3	-81.78	-82.03	
EW-12	12/4/2018 9:09	61.3	30.4	0.1	8.2	0.03	42.4	149.5	-81.53	-81.99	No Change,Valve completely open: :
EW-12	12/4/2018 9:09	61.3	30.4	0.1	8.2	0.04	43	164.5	-81.61	-81.95	
EW-12A	12/4/2018 9:11	34	25.1	10.9	30	33.77	44.6	5105.4	-77.45	-81.91	Closed Valve 1/2 to 1 turn: 5% open:
EW-12A	12/4/2018 9:11	34	25.1	10.9	30	33.77	45	5112	-76.43	-81.69	
EW-13	12/3/2018 15:38	21.5	12.7	16	49.8	0.07	32.4	240.5	-54.01	-81.78	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-13	12/3/2018 15:38	21.5	12.7	16	49.8	0.09	32.5	274.2	-50.96	-81.78	
EW-13	12/5/2018 8:32	63	34.1	0	2.9	0.04	30.7	211.7	22.38	-82.03	Opened Valve 1/2 turn or less: 1% open:
EW-13	12/5/2018 8:32	63	34.1	0	2.9	0	37.4	0	-67.56	-81.4	
EW-14	12/4/2018 9:15	57	29.4	0.8	12.8	0.06	39.6	217.7	-81.78	-82.03	No Change,Valve completely open: :
EW-14	12/4/2018 9:15	57	29.4	0.8	12.8	0.06	39.6	217.7	-81.78	-82.03	
EW-15	12/4/2018 9:18	54.4	31.1	2.1	12.4	0.07	34.5	232	-81.78	-81.69	No Change,Valve completely open: :
EW-15	12/4/2018 9:18	54.4	31.1	2.1	12.4	0.07	34.7	232	-81.83	-81.95	
EW-16	12/3/2018 15:25	42.2	24.8	8.1	24.9	0.02	38.8	135.1	-21.06	-81.48	Closed Valve 1/2 turn or less,Valve completely closed: :
EW-16	12/3/2018 15:25	42.2	24.8	8.1	24.9	0.03	38.8	177	-19.7	-81.44	
EW-16	12/5/2018 8:25	63	35.8	0	1.2	0.02	36.9	154.4	24.67	-82.03	Opened Valve 1/2 turn or less: 1% open:
EW-16	12/5/2018 8:25	63	35.8	0	1.2	0	46.9	67.5	-0.13	-82.03	

Zion Landfill - All Wells
Gas Extraction Report
December 2018

Civil & Environmental Consultants, Inc.

Well ID	Date/Time	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	Diff. Press. (in. H2O)	Temp.	Flow (scfm)	Well Pres. (in. H2O)	Header Pres. (in. H2O)	Comments
EW-17	12/4/2018 9:24	58.5	30.9	2.3	8.3	0.07	38.5	242.6	-74.06	-81.78	No Change: 1% open:
EW-17	12/4/2018 9:24	58.5	30.9	2.3	8.3	0.07	38.3	241.8	-74.06	-82.03	
EW-18	12/3/2018 15:10	59.7	25.1	0.6	14.6	0.1	43.7	285.3	-81.95	-81.78	No Change,Valve completely open: :
EW-18	12/3/2018 15:10	59.7	25.1	0.6	14.6	0.1	43.9	276.9	-81.95	-81.69	
EW-19	12/4/2018 9:29	49.5	27.8	4.9	17.8	0.04	36.1	185.4	-81.87	-82.03	Closed Valve 1/2 to 1 turn: 50% open:
EW-19	12/4/2018 9:29	49.5	27.8	4.9	17.8	0.02	36.3	133	-81.87	-82.03	

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ATTACHMENT E

MONTHLY EVALUATION OF FLARE AND PLANT DOWNTIME

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
January 2018

AVERAGE FLOW AT ENCLOSED FLARE:	**2,744**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**939**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,264**	SCFM
MMBTU FOR POWER STATION:****	**26,802**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**61,403**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**20,757.50**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**49.6%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**49.6%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**47.0%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**743.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**743.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**1.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**734.0**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**10.0**	HOURS
HOURS OF POWER STATION OFF-LINE:	**1.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
February 2018

AVERAGE FLOW AT ENCLOSED FLARE:	2,582	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	1,231	SCFM
AVERAGE FLOW AT POWER STATION: *	1,166	SCFM
MMBTU FOR POWER STATION:****	23,531	MMBTU
MMBTU FOR ENCLOSED FLARE:****	50,217	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	21,473	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	47.9%	CH_4%
AVERAGE METHANE % AT CANDLESTICK FLARE:	44.6%	CH_4%
AVERAGE METHANE AT POWER STATION:	49.8%	CH_4%
TOTAL HOURS IN MONTH 28 DAYS:	672	HOURS
HOURS OF POWER GENERATION AVAILABLE:	667.4	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	668.7	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	3.3	HOURS
HOURS OF CANDLESTICK FLARING:	644.1	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	27.9	HOURS
HOURS OF POWER STATION OFF-LINE:	4.6	HOURS

* STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
March 2018

AVERAGE FLOW AT ENCLOSED FLARE:	2,428	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	1372	SCFM
AVERAGE FLOW AT POWER STATION: *	1,233	SCFM
MMBTU FOR POWER STATION:****	25,449	MMBTU
MMBTU FOR ENCLOSED FLARE:****	50,777	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	28,322.42	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	47.0%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	45.8%	CH_4 %
AVERAGE METHANE AT POWER STATION:	46.5%	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	744	HOURS
HOURS OF POWER GENERATION AVAILABLE:	731.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	732.8	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	11.2	HOURS
HOURS OF CANDLESTICK FLARING:	742.5	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	1.5	HOURS
HOURS OF POWER STATION OFF-LINE:	13.00	HOURS

* STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
April 2018

AVERAGE FLOW AT ENCLOSED FLARE:	3,035	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	680	SCFM
AVERAGE FLOW AT POWER STATION: *	1,389	SCFM
MMBTU FOR POWER STATION:****	29,188	MMBTU
MMBTU FOR ENCLOSED FLARE:****	64,055	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	6,538.46	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	48.5%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	47.2%	CH_4 %
AVERAGE METHANE AT POWER STATION:	48.2%	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	720	HOURS
HOURS OF POWER GENERATION AVAILABLE:	718.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	716.7	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	3.3	HOURS
HOURS OF CANDLESTICK FLARING:	335.5	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	384.5	HOURS
HOURS OF POWER STATION OFF-LINE:	2.00	HOURS

* STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
May 2018

AVERAGE FLOW AT ENCLOSED FLARE:	**3,368**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**734**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,151**	SCFM
MMBTU FOR POWER STATION:**	**25,376**	MMBTU
MMBTU FOR ENCLOSED FLARE:**	**74,557**	MMBTU
MMBTU FOR CANDLESTICK FLARE:**	**5,329.23**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**49.2%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**46.8%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**49.0%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**741.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**741.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**3.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**255.5**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**488.5**	HOURS
HOURS OF POWER STATION OFF-LINE:	**3.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
June 2018

AVERAGE FLOW AT ENCLOSED FLARE:	2,855	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	1,267	SCFM
AVERAGE FLOW AT POWER STATION: *	973	SCFM
MMBTU FOR POWER STATION:****	20,022	MMBTU
MMBTU FOR ENCLOSED FLARE:****	59,412	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	26,239.33	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	47.6%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	47.5%	CH_4 %
AVERAGE METHANE AT POWER STATION:	47.2%	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	720	HOURS
HOURS OF POWER GENERATION AVAILABLE:	718.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	720.0	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	0.0	HOURS
HOURS OF CANDLESTICK FLARING:	718.8	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	1.2	HOURS
HOURS OF POWER STATION OFF-LINE:	2.00	HOURS

* STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
July 2018

AVERAGE FLOW AT ENCLOSED FLARE:	2,891	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	1,314	SCFM
AVERAGE FLOW AT POWER STATION: *	906	SCFM
MMBTU FOR POWER STATION:****	19,258	MMBTU
MMBTU FOR ENCLOSED FLARE:****	61,858	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	26,993.00	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	47.8%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	45.7%	CH_4 %
AVERAGE METHANE AT POWER STATION:	47.5%	CH_4 %
TOTAL HOURS IN MONTH: 31 DAYS:	744	HOURS
HOURS OF POWER GENERATION AVAILABLE:	737.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	737.2	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	6.8	HOURS
HOURS OF CANDLESTICK FLARING:	740.3	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	3.7	HOURS
HOURS OF POWER STATION OFF-LINE:	7.00	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
August 2018

AVERAGE FLOW AT ENCLOSED FLARE:	**2,932**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,311**	SCFM
AVERAGE FLOW AT POWER STATION: *	**771**	SCFM
MMBTU FOR POWER STATION:****	**16,623**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**63,500**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**26,984.62**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.2%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**47.2%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**47.9%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**741.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**740.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**4.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**718.8**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**25.2**	HOURS
HOURS OF POWER STATION OFF-LINE:	**3.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
September 2018

AVERAGE FLOW AT ENCLOSED FLARE:	**2,790**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,328**	SCFM
AVERAGE FLOW AT POWER STATION: *	**946**	SCFM
MMBTU FOR POWER STATION:****	**19,797**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**58,754**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**27,669.15**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.2%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**48.2%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**48.0%**	CH_4 %
TOTAL HOURS IN MONTH: 30 DAYS:	**720**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**718.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**719.5**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**0.5**	HOURS
HOURS OF CANDLESTICK FLARING:	**711.9**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**8.1**	HOURS
HOURS OF POWER STATION OFF-LINE:	**2.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
October 2018

AVERAGE FLOW AT ENCLOSED FLARE:	**2,574**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,337**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,200**	SCFM
MMBTU FOR POWER STATION:****	**26,313**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**53,739**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**29,595.94**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**49.0%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**49.0%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**49.0%**	CH_4 %
TOTAL HOURS IN MONTH: 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**737.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**701.7**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**42.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**744.0**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**0.0**	HOURS
HOURS OF POWER STATION OFF-LINE:	**8.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
November 2018

AVERAGE FLOW AT ENCLOSED FLARE:	**2,906**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,108**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,216**	SCFM
MMBTU FOR POWER STATION:****	**26,056**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**62,786**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**23,260.32**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.3%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**47.4%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**48.0%**	CH_4 %
TOTAL HOURS IN MONTH: 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**735.2**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**736.7**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**7.3**	HOURS
HOURS OF CANDLESTICK FLARING:	**729.4**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**14.6**	HOURS
HOURS OF POWER STATION OFF-LINE:	**8.80**	HOURS

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** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
December 2018

AVERAGE FLOW AT ENCLOSED FLARE:	**3,146**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**944**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,242**	SCFM
MMBTU FOR POWER STATION:****	**26,100**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**66,766**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**19,650.42**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**47.2%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**47.8%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**46.8%**	CH_4 %
TOTAL HOURS IN MONTH: 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**739.5**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**740.5**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**3.5**	HOURS
HOURS OF CANDLESTICK FLARING:	**717.2**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**26.8**	HOURS
HOURS OF POWER STATION OFF-LINE:	**4.50**	HOURS

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** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

ATTACHMENT B

ANNUAL GAS PROBE MONITORING

Civil & Environmental Consultants, Inc.

Attachment B
2019 Annual Explosive Gas Monitoring
Zion Landfill Site I Phase A

Well ID	Date/Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance (%)	Pressure
Ambient Air Data						
AMBIENT1	11/26/2019 11:09	0	0.2	21.4	78.4	0
AMBIENT2	11/26/2019 11:37	0	0.3	21.4	78.3	0
AMBIENT3	11/26/2019 11:39	0	0.1	21.5	78.4	0.01
AMBIENT4	11/26/2019 12:18	0	0.2	21.5	78.3	0
Building Data						
blowerbuilding	11/26/2019 12:42	0	0	21.5	78.5	0
bluebarn	11/26/2019 12:45	0	0	21.6	78.4	0
editrailer	11/26/2019 12:40	0	0	21.6	78.4	0
scalehouse	11/26/2019 12:49	0	0	21.6	78.4	-0.01
zionoffice	11/26/2019 12:47	0	0	21.6	78.4	0
Probe Data						
ZLFGMP 01	11/26/2019 10:51	0	0.3	21	78.7	0
ZLFGMP 02	11/26/2019 10:56	0.4	1	21.2	77.4	-0.01
ZLFGMP 03	11/26/2019 11:13	0.1	0.8	21.3	77.8	-0.02
ZLFGMP 04	11/26/2019 11:22	0	7.1	19	73.9	0
ZLFGMP 05	11/26/2019 11:29	0.1	1.3	21.2	77.4	0
ZLFGMP 06	11/26/2019 11:55	0	1.8	18.4	79.8	0
ZLFGMP 07	11/26/2019 11:50	0	1.1	20.9	78	-0.05
ZLFGMP 08	11/26/2019 12:00	0	3.7	18.4	77.9	-0.01
ZLFGMP 09	11/26/2019 12:03	0	1.6	21	77.4	-0.06
ZLFGMP 10	11/26/2019 12:06	0	3.3	16.1	80.6	0
ZLFGMP 11	11/26/2019 12:10	0	1.4	21.1	77.5	0
ZLFGMP 12	11/26/2019 12:13	0	0.6	20.7	78.7	0
ZLFGMP 13	11/26/2019 12:20	0	0.8	20.7	78.5	0.01
ZLFGMP 14	11/26/2019 12:33	0	0.1	21.2	78.7	0
ZLFGMP 15	11/26/2019 12:28	0	0.3	21.3	78.4	-0.15
ZLFGMP 16	11/26/2019 12:37	0	0	21.5	78.5	0
ZLFGMP 16	11/26/2019 11:00	0	5.3	20.2	74.5	0
ZLFGMP 35	11/26/2019 11:07	0	0.8	21.3	77.9	-0.01

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
January 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,683**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**880**	SCFM
AVERAGE FLOW AT POWER STATION: *	**882**	SCFM
MMBTU FOR POWER STATION:****	**17,590**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**76,696**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**15,807.76**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**46.3%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**45.9%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**46.0%**	CH_4 %
TOTAL HOURS IN MONTH: 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**714.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**740.7**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**3.3**	HOURS
HOURS OF CANDLESTICK FLARING:	**644.5**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**99.5**	HOURS
HOURS OF POWER STATION OFF-LINE:	**30.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
February 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,722**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,144**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,314**	SCFM
MMBTU FOR POWER STATION:****	**24,717**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**70,469**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**20,636.41**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**46.4%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**44.5%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**46.1%**	CH_4 %
TOTAL HOURS IN MONTH 28 DAYS:	**672**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**672.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**672.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**0.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**667.6**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**4.4**	HOURS
HOURS OF POWER STATION OFF-LINE:	**18.00**	HOURS

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** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
March 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,694**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,375**	SCFM
AVERAGE FLOW AT POWER STATION: *	**719**	SCFM
MMBTU FOR POWER STATION:****	**13,774**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**73,198**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**26,300.02**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**44.4%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**42.8%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**44.5%**	CH_4 %
TOTAL HOURS IN MONTH: 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**709.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**735.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**9.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**736.0**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**7.0**	HOURS
HOURS OF POWER STATION OFF-LINE:	**35.00**	HOURS

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** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
April 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**2,878**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,206**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,489**	SCFM
MMBTU FOR POWER STATION:****	**28,775**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**55,930**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**21,386.81**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**44.7%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**41.8%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**44.7%**	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	**724**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**712.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**716.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**8.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**698.7**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**25.3**	HOURS
HOURS OF POWER STATION OFF-LINE:	**12.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
May 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,194**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,269**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,345**	SCFM
MMBTU FOR POWER STATION:****	**27,898**	MMBTU
MMBTU FOR ENCLOSED FLARE:******	**66,618**	MMBTU
MMBTU FOR CANDLESTICK FLARE:******	**24,786.30**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**46.2%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**43.3%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**46.1%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**741.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**743.5**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**0.5**	HOURS
HOURS OF CANDLESTICK FLARING:	**742.9**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**1.1**	HOURS
HOURS OF POWER STATION OFF-LINE:	**3.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
June 2019

AVERAGE FLOW AT ENCLOSED FLARE:	3,697	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	1,348	SCFM
AVERAGE FLOW AT POWER STATION: *	1,091	SCFM
MMBTU FOR POWER STATION:****	20,581	MMBTU
MMBTU FOR ENCLOSED FLARE:****	69,966	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	25,458.80	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	43.5%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	43.2%	CH_4 %
AVERAGE METHANE AT POWER STATION:	43.5%	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	720	HOURS
HOURS OF POWER GENERATION AVAILABLE:	714.2	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	5.8	HOURS
HOURS OF ENCLOSED FLARING:***	716.5	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	3.5	HOURS
HOURS OF CANDLESTICK FLARING:	720.0	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	0.0	HOURS
HOURS OF POWER STATION OFF-LINE:	6.00	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
July 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,425**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,482**	SCFM
AVERAGE FLOW AT POWER STATION: *	**1,092**	SCFM
MMBTU FOR POWER STATION:****	**20,394**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**68,745**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**28,401.29**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**45.5%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**42.9%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**45.5%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**676.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**726.5**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**17.5**	HOURS
HOURS OF CANDLESTICK FLARING:	**735.7**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**8.3**	HOURS
HOURS OF POWER STATION OFF-LINE:	**68.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
August 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,748**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,351**	SCFM
AVERAGE FLOW AT POWER STATION: *	**782**	SCFM
MMBTU FOR POWER STATION:****	**15,958**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**77,341**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**26,742.78**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**46.3%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**43.9%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**46.1%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**729.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**734.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**10.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**742.6**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**1.4**	HOURS
HOURS OF POWER STATION OFF-LINE:	**15.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
September 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,816**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,189**	SCFM
AVERAGE FLOW AT POWER STATION: *	**838**	SCFM
MMBTU FOR POWER STATION:****	**16,523**	MMBTU
MMBTU FOR ENCLOSED FLARE:******	**76,528**	MMBTU
MMBTU FOR CANDLESTICK FLARE:******	**23,390.75**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**46.0%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**45.8%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**45.8%**	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	**720**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**709.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**718.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**2.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**707.4**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**12.6**	HOURS
HOURS OF POWER STATION OFF-LINE:	**11.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
October 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,880**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,139**	SCFM
AVERAGE FLOW AT POWER STATION: *	**797**	SCFM
MMBTU FOR POWER STATION:****	**16,789**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**82,574**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**24,492.63**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**47.3%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**47.6%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**47.2%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**735.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**741.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**3.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**744.0**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**0.0**	HOURS
HOURS OF POWER STATION OFF-LINE:	**9.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
November 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,870**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**1,013**	SCFM
AVERAGE FLOW AT POWER STATION: *	**741**	SCFM
MMBTU FOR POWER STATION:****	**15,416**	MMBTU
MMBTU FOR ENCLOSED FLARE:******	**81,418**	MMBTU
MMBTU FOR CANDLESTICK FLARE:******	**21,628.68**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.8%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**49.2%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**48.6%**	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	**720**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**705.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**710.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**10.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**714.7**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**5.5**	HOURS
HOURS OF POWER STATION OFF-LINE:	**15.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
December 2019

AVERAGE FLOW AT ENCLOSED FLARE:	**3,887**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**948**	SCFM
AVERAGE FLOW AT POWER STATION: *	**760**	SCFM
MMBTU FOR POWER STATION:****	**16,204**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**85,054**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**20,891**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.6%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**48.8%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**48.3%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**727.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**741.5**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**2.5**	HOURS
HOURS OF CANDLESTICK FLARING:	**743.7**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**0.3**	HOURS
HOURS OF POWER STATION OFF-LINE:	**17.00**	HOURS

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** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

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Civil & Environmental Consultants, Inc.

Attachment B
2020 Annual Explosive Gas Monitoring
Zion Landfill Site I Phase A

Well ID	Date/Time	% CH_4 LEL	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance (%)	Pressure
Ambient Air Data							
AMBIENT1	11/30/2020 10:11	0.0	0.0	0.0	20.9	79.1	0.00
AMBIENT2	11/30/2020 10:52	0.0	0.0	0.0	21.0	79.0	0.00
AMBIENT3	11/30/2020 10:53	0.0	0.0	0.0	21.0	79.0	0.00
AMBIENT4	11/30/2020 12:23	0.0	0.0	0.0	21.0	79.0	-0.01
Building Data							
blowerbuilding	11/30/2020 12:54	0.0	0.0	0.0	20.5	79.5	-0.11
bluebarn	11/30/2020 12:59	0.0	0.0	0.0	20.2	79.8	0.00
editrailer	11/30/2020 12:57	0.0	0.0	0.0	20.3	79.7	-0.01
scalehouse	11/30/2020 12:49	0.0	0.0	0.0	20.6	79.4	-0.01
zionoffice	11/30/2020 13:02	0.0	0.0	0.0	20.1	79.9	-0.03
Probe Data							
ZLFGMP 01	11/30/2020 9:46	0.0	0.0	0.0	20.9	79.1	-0.12
ZLFGMP 02	11/30/2020 10:02	20.0	1.0	0.2	14.2	84.6	0.00
ZLFGMP 03	11/30/2020 10:22	10.0	0.5	0.4	16.7	82.4	-0.01
ZLFGMP 04	11/30/2020 10:28	0.0	0.0	0.4	21.0	78.6	-0.03
ZLFGMP 05	11/30/2020 10:42	2.0	0.1	1.7	19.3	78.9	0.00
ZLFGMP 06	11/30/2020 11:17	0.0	0.0	1.9	18.7	79.4	0.00
ZLFGMP 07	11/30/2020 11:43	0.0	0.0	0.0	20.0	80.0	-0.01
ZLFGMP 08	11/30/2020 11:50	0.0	0.0	2.7	17.9	79.4	-0.01
ZLFGMP 09	11/30/2020 11:55	0.0	0.0	2.0	18.8	79.2	0.00
ZLFGMP 10	11/30/2020 12:07	0.0	0.0	1.8	18.8	79.4	0.00
ZLFGMP 11	11/30/2020 12:12	0.0	0.0	0.3	20.5	79.2	-0.04
ZLFGMP 12	11/30/2020 12:17	0.0	0.0	0.1	20.7	79.2	0.00
ZLFGMP 13	11/30/2020 12:24	0.0	0.0	0.1	20.9	79.0	-0.05
ZLFGMP 14	11/30/2020 12:30	0.0	0.0	0.3	20.5	79.2	-0.01
ZLFGMP 15	11/30/2020 12:40	0.0	0.0	0.0	20.9	79.1	-0.02
ZLFGMP 16Z1B	11/30/2020 12:46	0.0	0.0	0.0	20.5	79.5	0.00
ZLFGMP 35	11/30/2020 10:12	0.0	0.0	0.0	21.1	78.9	0.00

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
January 2020

AVERAGE FLOW AT ENCLOSED FLARE:	3,650	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	962	SCFM
AVERAGE FLOW AT POWER STATION: *	1,090	SCFM
MMBTU FOR POWER STATION:****	23,158	MMBTU
MMBTU FOR ENCLOSED FLARE:****	78,106	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	21,207.99	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	47.4%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	48.8%	CH_4 %
AVERAGE METHANE AT POWER STATION:	47.2%	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	744	HOURS
HOURS OF POWER GENERATION AVAILABLE:	741.3	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	743.5	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	0.5	HOURS
HOURS OF CANDLESTICK FLARING:	744.0	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	0.0	HOURS
HOURS OF POWER STATION OFF-LINE:	2.70	HOURS

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** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
February 2020

AVERAGE FLOW AT ENCLOSED FLARE:	**3,780**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**928**	SCFM
AVERAGE FLOW AT POWER STATION: *	**763**	SCFM
MMBTU FOR POWER STATION:****	**15,413**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**76,679**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**19,452.29**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.0%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**49.6%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**47.8%**	CH_4 %
TOTAL HOURS IN MONTH 29 DAYS:	**696**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**696.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**696.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**0.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**696.0**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**0.0**	HOURS
HOURS OF POWER STATION OFF-LINE:	**0.00**	HOURS

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** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
March 2020

AVERAGE FLOW AT ENCLOSED FLARE:	**3,941**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**903**	SCFM
AVERAGE FLOW AT POWER STATION: *	**665**	SCFM
MMBTU FOR POWER STATION:****	**14,521**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**86,112**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**19,978.71**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.4%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**49.4%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**48.4%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**743.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**743.5**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**0.5**	HOURS
HOURS OF CANDLESTICK FLARING:	**737.6**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**6.4**	HOURS
HOURS OF POWER STATION OFF-LINE:	**1.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
April 2020

AVERAGE FLOW AT ENCLOSED FLARE:	**3,912**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**741**	SCFM
AVERAGE FLOW AT POWER STATION: *	**967**	SCFM
MMBTU FOR POWER STATION:****	**20,061**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**82,948**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**15,886.23**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**48.5%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**49.1%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**48.4%**	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	**720**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**705.9**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**14.1**	HOURS
HOURS OF ENCLOSED FLARING:***	**720.0**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**0.0**	HOURS
HOURS OF CANDLESTICK FLARING:	**719.1**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**0.9**	HOURS
HOURS OF POWER STATION OFF-LINE:	**14.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
May 2020

AVERAGE FLOW AT ENCLOSED FLARE:	3,815	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	985	SCFM
AVERAGE FLOW AT POWER STATION: *	507	SCFM
MMBTU FOR POWER STATION:****	10,914	MMBTU
MMBTU FOR ENCLOSED FLARE:****	83,144	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	21,715.05	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	48.9%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	48.8%	CH_4 %
AVERAGE METHANE AT POWER STATION:	48.9%	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	744	HOURS
HOURS OF POWER GENERATION AVAILABLE:	725.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	734.0	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	10.0	HOURS
HOURS OF CANDLESTICK FLARING:	744.0	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	0.0	HOURS
HOURS OF POWER STATION OFF-LINE:	19.00	HOURS

* STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
June 2020

AVERAGE FLOW AT ENCLOSED FLARE:	4,006	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	825	SCFM
AVERAGE FLOW AT POWER STATION: *	367	SCFM
MMBTU FOR POWER STATION:****	7,493	MMBTU
MMBTU FOR ENCLOSED FLARE:****	84,992	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	17,242.52	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	48.8%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	49.2%	CH_4 %
AVERAGE METHANE AT POWER STATION:	48.8%	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	720	HOURS
HOURS OF POWER GENERATION AVAILABLE:	689.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	716.0	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	4.0	HOURS
HOURS OF CANDLESTICK FLARING:	699.6	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	20.4	HOURS
HOURS OF POWER STATION OFF-LINE:	31.00	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
July 2020

AVERAGE FLOW AT ENCLOSED FLARE:	3,965	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	755	SCFM
AVERAGE FLOW AT POWER STATION: *	268	SCFM
MMBTU FOR POWER STATION:****	5,254	MMBTU
MMBTU FOR ENCLOSED FLARE:****	83,985	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	16,222.06	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	47.5%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	48.6%	CH_4 %
AVERAGE METHANE AT POWER STATION:	47.2%	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	744	HOURS
HOURS OF POWER GENERATION AVAILABLE:	684.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	734.4	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	9.6	HOURS
HOURS OF CANDLESTICK FLARING:	728.1	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	15.9	HOURS
HOURS OF POWER STATION OFF-LINE:	62.00	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
August 2020

AVERAGE FLOW AT ENCLOSED FLARE:	**4,224**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**661**	SCFM
AVERAGE FLOW AT POWER STATION: *	**174**	SCFM
MMBTU FOR POWER STATION:****	**2,604**	MMBTU
MMBTU FOR ENCLOSED FLARE:******	**89,030**	MMBTU
MMBTU FOR CANDLESTICK FLARE:******	**14,001.10**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**46.7%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**46.9%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**46.5%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**530.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**743.3**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**0.7**	HOURS
HOURS OF CANDLESTICK FLARING:	**743.8**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**0.2**	HOURS
HOURS OF POWER STATION OFF-LINE:	**214.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
September 2020

AVERAGE FLOW AT ENCLOSED FLARE:	4,265	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	786	SCFM
AVERAGE FLOW AT POWER STATION: *	262	SCFM
MMBTU FOR POWER STATION:****	2,702	MMBTU
MMBTU FOR ENCLOSED FLARE:****	80,537	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	15,571.44	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	45.4%	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	45.6%	CH_4 %
AVERAGE METHANE AT POWER STATION:	45.3%	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	720	HOURS
HOURS OF POWER GENERATION AVAILABLE:	375.0	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	0.0	HOURS
HOURS OF ENCLOSED FLARING:***	685.0	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	26.3	HOURS
HOURS OF CANDLESTICK FLARING:	715.5	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	4.5	HOURS
HOURS OF POWER STATION OFF-LINE:	345.00	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
October 2020

AVERAGE FLOW AT ENCLOSED FLARE:	**4,108**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**695**	SCFM
AVERAGE FLOW AT POWER STATION: *	**160**	SCFM
MMBTU FOR POWER STATION:****	**2,558**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**84,473**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**14,102.45**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**46.0%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**45.3%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**45.8%**	CH_4 %
TOTAL HOURS IN MONTH 31 DAYS:	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**575.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**736.2**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**7.8**	HOURS
HOURS OF CANDLESTICK FLARING:	**737.7**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**6.3**	HOURS
HOURS OF POWER STATION OFF-LINE:	**169.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
November 2020

AVERAGE FLOW AT ENCLOSED FLARE:	**3,965**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**615**	SCFM*
AVERAGE FLOW AT POWER STATION: *	**145**	SCFM
MMBTU FOR POWER STATION:****	**2,834**	MMBTU
MMBTU FOR ENCLOSED FLARE:****	**81,092**	MMBTU
MMBTU FOR CANDLESTICK FLARE:****	**12,685.29**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**47.3%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**47.2%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**47.8%**	CH_4 %
TOTAL HOURS IN MONTH 30 DAYS:	**720**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**672.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**712.1**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**7.9**	HOURS
HOURS OF CANDLESTICK FLARING:	**719.7**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**0.3**	HOURS
HOURS OF POWER STATION OFF-LINE:	**49.50**	HOURS

*November Avg Flow obtained from Fleetzoom data

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Energy Developments

OPERATIONS SUMMARY REPORT
ZION
December 2020

AVERAGE FLOW AT ENCLOSED FLARE:	**4,090**	SCFM
AVERAGE FLOW AT CANDLESTICK FLARE:	**632**	SCFM
AVERAGE FLOW AT POWER STATION: *	**0**	SCFM
MMBTU FOR POWER STATION:****	**0**	MMBTU
MMBTU FOR ENCLOSED FLARE:******	**87,415**	MMBTU
MMBTU FOR CANDLESTICK FLARE:******	**13,730.15**	MMBTU
AVERAGE METHANE % AT ENCLOSED FLARE:	**47.4%**	CH_4 %
AVERAGE METHANE % AT CANDLESTICK FLARE:	**48.2%**	CH_4 %
AVERAGE METHANE AT POWER STATION:	**47.4%**	CH_4 %
TOTAL HOURS IN MONTH 31 **DAYS:**	**744**	HOURS
HOURS OF POWER GENERATION AVAILABLE:	**0.0**	HOURS
HOURS OF NO POWER GENERATION OR FLARING:**	**0.0**	HOURS
HOURS OF ENCLOSED FLARING:***	**742.6**	HOURS
HOURS OF ENCLOSED FLARE STATION OFF-LINE:	**1.4**	HOURS
HOURS OF CANDLESTICK FLARING:	**742.3**	HOURS
HOURS OF CANDLESTICK FLARE STATION OFF-LINE:	**1.7**	HOURS
HOURS OF POWER STATION OFF-LINE:	**744.00**	HOURS

* **STATION FLOW FIGURES ARE FROM THE POWER STATION FLOWMETER WHILE THE ENGINES ARE RUNNING** updated 10/29/2010

** FLARE STATIONS AND POWER STATION OPERATED CONCURRENTLY

*** FLARE FLOW RATES ARE TAKEN FROM THE FLOWMETERS DIGITAL CHART RECORDERS. THE METHANE CONTENT IS AN AVERAGE OF THE 4 O & M SITE REPORTS FOR THE ENCLOSED AND CANDLESTICK FLARE.

**** FLARE MMBTU IS CALCULATED BY THE FOLLOWING FORMULA: (scfm x 60 x %CH_4 x 1012(GHV) x hrs of operation)/1,000,000

Appendix E-23

Financial Assurance Documentation

REPUBLIC SERVICES

BFI Waste Systems of North America, LLC.
26W580 Schick Road
Hanover Park, IL 60133
Phone: (630) 894-5001

December 18, 2020

Compliance Unit- Financial Assurance
Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, IL 62794-9276

FED EX Tracking # 8146 8841 9311

RE: IEPA No. 0978020001
ILD980700728
Onyx Zion Landfill- Site 1 Phase A
Financial Assurance Update

To whom it may concern:

Enclosed is a new insurance policy (#CPC-IL96-010) in the amount of $3,304,028. The period of coverage is from December 13, 2020 to December 12, 2021. If you have any questions or require additional information, please contact this office.

Sincerely,

James Hitzeroth
Environmental Manager
Republic Services, Inc.

Attachment: Policy Number: CPC-IL96-010

Cc: File
Cc: GFL

GLOBAL INDEMNITY ASSURANCE COMPANY
30 Main Street, Suite 330
BURLINGTON, VERMONT 05401

ENDORSEMENT: 25

ATTACHING TO AND FORMING PART OF POLICY NUMBER: CPC-IL96-010

The above referenced policy has been amended as follows. Please attach this endorsement to the original policy.

POLICY CHANGE EFFECTIVE: December 13, 2020 12:01 a.m.

NAMED INSURED:	Browning-Ferris Industries of Illinois, Inc.		
LOCATION OF INSURED:	BFI of Illinois, Inc. 2230 Ernest Krueger Circle Waukegan IL 60085		
POLICY PERIOD EXTENSION:	December 13, 2020 - December 12, 2021		
RETROACTIVE DATE:	December 13, 1996		
LIMITS OF LIABILITY:	COVERAGE A:	$	-
	COVERAGE B:	$	3,304,028
	CORRECTIVE MEASURES	$	-
	SCRAP TIRE TRANSPORT	$	-
Renewal Premium:		$	15,694

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED

Brenda Stewart
AUTHORIZED REPRESENTATIVE

December 3, 2020
DATE

CERTIFICATE OF INSURANCE FOR CLOSURE AND/OR POST-CLOSURE CARE

Name and Address of Insurer (herein called the "Insurer"): GLOBAL INDEMNITY ASSURANCE COMPANY
(1) 30 MAIN STREET, SUITE 330, BURLINGTON, VT 05401

Name and Address of Insured (herein called the "Insured"): Browning-Ferris Industries of Illinois, Inc.
(2) 2230 Ernest Krueger Circle, Waukegan, IL 60085

Facilities Covered:

	Closure Amount (4)	Post-Closure Amount (5)	Closure and Post-Closure Amounts (6)
USEPA I.D. No. (3) 980700728			
Name: Browning-Ferris Industries of Illinois, Inc.	$ -	$ 3,304,028	$ 3,304,028
Address: 2230 Ernest Krueger Circle			
City: Waukegan, IL 60085			
USEPA I.D. No.			
Name			
Address			
City			

Please attach a separate page if more space is needed for all facilities.

Face Amount: $ 3,304,028 (7)

Policy Number: CPC-IL96-010 (8)

Effective Date: December 13, 2020 (9)

The Insurer hereby certifies that it has issued to the Insured the policy of insurance identified above to provide financial assurance for Closure and Post-Closure Care (10) for the facilities identified above. The Insurer further warrants that such policy conforms in all respects with the requirements of 35 Illinois Administrative Code 724.243(e), 724.245(e), and 40 CFR Parts 265.143(d) and 264.145(d) as referenced in 725.243 and 725.245 respectfully, as applicable and as such regulations were constituted on the date shown immediately below. It is agreed that any provision of the policy inconsistent with such regulations is hereby amended to eliminate such inconsistency.

Whenever requested by the Director of the Illinois Environmental Protection Agency, hereafter called IEPA the Insurer agrees to furnish to the IEPA Director a duplicate original of the policy listed above, including all endorsements thereon.

Name — (Authorized signature for Insurer) Brenda Stewart

Typed Name: Brenda Stewart

Title: Authorized Representative

Signature of witness or notary: Kayla Norton

Date: December 3, 2020

KAYLA NORTON
NOTARY PUBLIC
STATE OF VERMONT
Exp: 1/31/21

The Agency is authorized to require that the Insured submit this document under Illinois Compiled Statutes, 1994, Chapter 415, Act 5, Section 21(f)(as amended). Failure to do so may result in a civil penalty against the Insured of not to exceed $25,000 per day of violation. Falsification of this information by any person may constitute a Class 4 felony, and may also carry a fine of not to exceed $25,000 per day for the first offense. This form has been approved by the Forms Management Center.

L 532 1203
LPC 151 Rev. Dec-96

GLOBAL ASSURANCE INDEMNITY
Premium calculation worksheet

POLICY NUMBER: **CPC-IL96-010**

	NEW LIMITS	OLD LIMITS	AMENDMENT ADJUSTMENT
Effective Date	12/13/2020		12/13/2020
Expiration Date	12/12/2021		12/12/2021
Closure Costs	-		-
Post-Closure Costs	3,304,028		3,304,028
Corrective Action	-		-
	3,304,028	-	3,304,028
	0.475%	0.475%	0.475%
Annual Premium	15,694	-	15,694
Days Effective/Proration Factor	365	-	100.00%
Closure Costs			-
Post-Closure Costs			15,694
Corrective Action			-
Partial Year Premium			-
TOTAL PREMIUM			15,694
Premium Already Invoiced			-
Premium Due:			15,694

Appendix E-24

Construction Acceptance Report, Gas Extraction System, February 1998

CONSTRUCTION ACCEPTANCE REPORT

BFI ZION LANDFILL
SITE I/II
LANDFILL GAS EXTRACTION SYSTEM
LAKE COUNTY
ZION, ILLINOIS

Submitted By
BFI Waste Systems of North America, Inc.

Prepared By
RMT, Inc.

February 1998

REGISTERED PROFESSIONAL ENGINEER
CURTIS DEAN MADSEN
062-051101
STATE OF ILLINOIS

Curtis D. Madsen, P.E.
Project Manager

Mark J. Torresani, P.E.
Senior Project Engineer

RMT, INC.
744 HEARTLAND TRAIL = 53717-1934
P.O. BOX 8923 = 53708-8923
MADISON, WI
608/831-4444 = 608/831-3334 FAX

February 16, 1998

Mr. Edwin C. Bakowski, P.E.
Director - Division of Land Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East, 2nd Floor
Springfield, Illinois 62794-9276

Subject: Construction Acceptance Report
BFI Zion Landfill - Site 2
BFI Waste Systems of North America, Inc.
IEPA Site No. 0978020002

Dear Mr. Bakowski:

RMT, Inc., on behalf of BFI Waste Systems of North America, Inc. (BFI), is pleased to submit one original and two copies of the enclosed construction acceptance report for the construction of the Landfill Gas and Leachate Management System for BFI Zion Landfill, Site 2. Please note that an original report and two copies of each report are being submitted for each of the three sites.

If you have any questions regarding this submittal, please contact Curt Madsen or Mark Torresani of RMT at (608) 831-4444 or Mr. Jim Lewis of BFI at (847) 746-5777.

Sincerely,

RMT, Inc.

Mark J. Torresani

Mark J. Torresani, P.E.
Senior Project Engineer

Curtis D. Madsen, P.E.
Project Manager

jlc

cc: See attached distribution list.

RMT, Inc.
744 Heartland Trail - 53717-1934
P.O. Box 8923 - 53708-8923
Madison, WI
608/831-4444 - 608/831-3334 FAX

February 16, 1998

Mr. Edwin C. Bakowski, P.E.
Director - Division of Land Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East, 2nd Floor
Springfield, Illinois 62794-9276

Subject: Construction Acceptance Report
BFI Zion Landfill - Site 1A
BFI Waste Systems of North America, Inc.
IEPA Site No. 0978020001 - Phase A

Dear Mr. Bakowski:

RMT, Inc., on behalf of BFI Waste Systems of North America, Inc. (BFI), is pleased to submit one original and two copies of the enclosed construction acceptance report for the construction of the Landfill Gas and Leachate Management System for BFI Zion Landfill, Site 1A. Please note that an original report and two copies of each report are being submitted for each of the three sites.

If you have any questions regarding this submittal, please contact Curt Madsen or Mark Torresani of RMT at (608) 831-4444 or Mr. Jim Lewis of BFI at (847) 746-5777.

Sincerely,

RMT, Inc.

Mark J. Torresani

Mark J. Torresani, P.E.
Senior Project Engineer

Curtis D. Madsen, P.E.
Project Manager

jlc

cc: See attached distribution list.

RMT, Inc.
744 Heartland Trail - 53717-1934
P.O. Box 8923 - 53708-8923
Madison, WI
608/831-4444 - 608/831-3334 FAX

February 16, 1998

Mr. Edwin C. Bakowski, P.E.
Director - Division of Land Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East, 2nd Floor
Springfield, Illinois 62794-9276

Subject: Construction Acceptance Report
BFI Zion Landfill - Site 1B
BFI Waste Systems of North America, Inc.
IEPA Site No. 0978020001 - Phase B

Dear Mr. Bakowski:

RMT, Inc., on behalf of BFI Waste Systems of North America, Inc. (BFI), is pleased to submit one original and two copies of the enclosed construction acceptance report for the construction of the Landfill Gas and Leachate Management System for BFI Zion Landfill, Site 1B. Please note that an original report and two copies of each report are being submitted for each of the three sites.

If you have any questions regarding this submittal, please contact Curt Madsen or Mark Torresani of RMT at (608) 831-4444 or Mr. Jim Lewis of BFI at (847) 746-5777.

Sincerely,

RMT, Inc.

Mark J. Torresani

Mark J. Torresani, P.E.
Senior Project Engineer

Curtis D. Madsen, P.E.
Project Manager

jlc

cc: See attached distribution list.

RMT, INC.
744 HEARTLAND TRAIL - 53717-1934
P.O. BOX 8923 - 53708-8923
MADISON, WI
608/831-4444 - 608/831-3334 FAX

BFI ZION LANDFILL GAS/LEACHATE MANAGEMENT
CONSTRUCTION ACCEPTANCE REPORT
DISTRIBUTION LIST

Ed Bakowski
ILEPA SWD
1021 North Grand Avenue East
2nd Floor
Springfield, IL 62794-9276
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BFI Zion
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Zion, Illinois 60099
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Zion, IL 60099
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1 copy

Table of Contents

List of Tables

List of Appendices

List of Drawings

Illinois Environmental Protection Agency Application Forms (LPC-PA1, LPC-PA16, and Oath/Affidavit for Owner/Operator Authority)

LPC-PA1

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

General Application for Permit (LPC-PA1)

This form must be used for any application for permit from the Bureau of Land, except for waste stream applications and applications for the composting of landscape waste only. One original and two (2) photocopies, or three (3) if applicable, of all permit application forms must be submitted. Attach the original and appropriate number of copies of any necessary plans, specifications, reports, etc. to fully support and describe the activities or modifications being proposed. If necessary, attach sufficient information to demonstrate compliance with all applicable RCRA requirements. Incomplete applications will be rejected. Please refer to the instructions for further guidance.

Note: Permit applications which are to be hand-delivered to the Bureau of Land, Permit Section must be delivered to the 1240 North Ninth Street location between the hours of 8:30 a.m. to 5:00 p.m., Monday through Friday (excluding State holidays).

Please type or print legibly.

I. SITE IDENTIFICATION

Name: BFI Waste Systems of North America, Inc. Site # (IEPA): 0 9 7 8 0 2 0 0 0 1 Phase A

Physical Site Location (street, road, etc.): 701 Green Bay Road

City, Zip Code: Zion 60099 County: Lake

Existing DE/OP Permit Nos. (if applicable): RCRA Permit Log No. B-23-TA-2

II. OWNER/OPERATOR IDENTIFICATION

	OWNER	OPERATOR
Name:	BFI Waste Systems of North America, Inc.	BFI Waste Systems of North America, Inc.
Address:	701 Green Bay Road	701 Green Bay Road
	Zion, IL 60099	Zion, IL 60099
Contact Name:	Mike Williams	Mike Williams
Phone #:	(847) 746-5777	(847) 746-5777

III. PERMIT APPLICATION IDENTIFICATION

TYPE SUBMISSION/REVIEW PERIOD:

___ New Landfill/180 days (35 IAC Part 813)
___ Landfill Expansion/180 days (35 IAC Part 813)
___ 1st Sign. Mod/90 days (35 IAC Part 814)
X Sign. Mod to Operate/90 days (35 IAC Part 813)
___ Other Sign. Mod/90 days (35 IAC Part 813)
___ Renewal of Landfill/90 days (35 IAC Part 813)
___ Developmental/90 days (35 IAC Part 807)
___ Operating/45 days (35 IAC Part 807)
___ Supplemental/90 days (35 IAC Part 807)
___ Permit Transfer/90 days (35 IAC Part 807)
___ Generic/90 days

TYPE FACILITY:

X Landfill
___ Land Treatment
___ Transfer Station
___ Treatment
___ Storage
___ Incinerator
___ Composting
___ Recycling/Reclamation
___ Other (Specify)

TYPE WASTE:

X General Municipal Refuse
X Hazardous
X Special (Non-hazardous)
___ Chemical Only (exc. putrescible)
___ Inert Only (exc. chemical and putrescible)
___ Used Oil
___ Solvents
___ Landscape/Yard Waste
___ Other (Specify)

DESCRIPTION OF THIS PERMIT REQUEST: (Include a brief narrative description here.)

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System.

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IV. COMPLETENESS REQUIREMENTS

The following items must be checked Yes, No or N/A. Each item will be reviewed by the log clerk. Blank items wi result in rejection of the application. Please refer to the instructions for further guidance.

1. Have all public notice letters (LPC-PA16) been mailed and are copies and supporting documentation enclosed? — x Yes ___ No ___ N/A

2. a. Is the Siting Certification Form (LPC-PA8) completed and enclosed? — ___ Yes x No ___ N/A

   b. Is siting approval currently under litigation? — ___ Yes x No ___ N/A

3. a. Is a closure, and if necessary a post closure, plan covering these activities being submitted, or — ___ Yes x No ___ N/A

   b. has one already been approved? (Provide permit number _____.) — x Yes ___ No ___ N/A

4. a. For waste disposal sites only: Has any employee, owner, operator, officer or director of the owner or operator had a prior conduct certification denied, cancelled or revoked? — ___ Yes x No ___ N/A

   b. Have you included a demonstration of how you comply or intend to comply with 35 Ill. Adm. Code Part 745? — ___ Yes ___ No x N/A

5. a. Is land ownership held in beneficial trust? — ___ Yes x No ___ N/A

   b. If yes, is a beneficial trust certification form (LPC-PA9) completed and enclosed? — ___ Yes ___ No x N/A

6. a. Does the application contain information or proposals regarding the hydrogeology; groundwater monitoring, modeling or classification; a groundwater impact assessment; or vadose zone monitoring for which you are requesting approval? — ___ Yes x No ___ N/A

   b. If yes, have you submitted a third (3rd) copy of the application (4 total) and supporting documents?

V. SIGNATURES (Original signatures required. Signature stamps or applications transmitted electronically or by facsimile are not acceptable.)

All applications shall be signed by the person designated below or by a duly authorized representative of that pe

Corporation - By a principal executive officer of at least the level of vice-president.
Partnership or Sole Proprietorship - By a general partner or the proprietor, respectively.
Government - By either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above; and
2. is submitted with this application (a copy of a previously submitted authorization can be used).

I hereby affirm that all information contained in this Application is true and accurate to the best of my knowledge and belief.

Owner Signature: _____ Title: ~~Divisional~~ District Vice President Date: 2/3/98

Owner FEIN or S.S. Number 362704946

Operator Signature: _____ Title: ~~Landfill Manager~~ District Vice President Date: 2/3/98

Operator FEIN or S.S. Number 362704946

Engineer Signature: _____ Name: Curt Madsen Date: 2/9/98

Engineer Address: RMT, INC.
744 Heartland Trail
Madison, WI 53717

Engineer Seal:

REGISTERED PROFESSIONAL ENGINEER
CURTIS DEAN MADSEN
062-051101
STATE OF ILLINOIS

Engineer Phone No.: (608) 831-4444

All information submitted as part of the Application is available to the public unless specifically designate the Applicant to be treated confidentially as a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Agency rules and guidelines.

LWE/mls/sp0002Z/1-2

OFFICIAL SEAL
NANCY J WEINER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES:07/31/00

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

General Application for Permit (LPC-PA1)

This form must be used for any application for permit from the Bureau of Land, except for waste stream applications and applications for the composting of landscape waste only. One original and two (2) photocopies, or three (3) if applicable, of all permit application forms must be submitted. Attach the original and appropriate number of copies of any necessary plans, specifications, reports, etc. to fully support and describe the activities or modifications being proposed. If necessary, attach sufficient information to demonstrate compliance with all applicable RCRA requirements. Incomplete applications will be rejected. Please refer to the instructions for further guidance.

Note: Permit applications which are to be hand-delivered to the Bureau of Land, Permit Section must be delivered to the 1240 North Ninth Street location between the hours of 8:30 a.m. to 5:00 p.m., Monday through Friday (excluding State holidays).

Please type or print legibly.

I. SITE IDENTIFICATION

Name: BFI Waste Systems of North America, Inc. Site # (IEPA): 0 9 7 8 0 2 0 0 0 1

Physical Site Location (street, road, etc.): 701 Green Bay Road Phase B

City, Zip Code: Zion 60099 County: Lake

Existing DE/OP Permit Nos. (if applicable): 1992-328-LFM Modification No. 3 Log No. 1996-117

II. OWNER/OPERATOR IDENTIFICATION

	OWNER	OPERATOR
Name:	BFI Waste Systems of North America, Inc.	BFI Waste Systems of North America, Inc.
Address:	701 Green Bay Road	701 Green Bay Road
	Zion, IL 60099	Zion, IL 60099
Contact Name:	Mike Williams	Mike Williams
Phone #:	(847) 746-5777	(847) 746-5777

III. PERMIT APPLICATION IDENTIFICATION

TYPE SUBMISSION/REVIEW PERIOD:

___ New Landfill/180 days (35 IAC Part 813)
___ Landfill Expansion/180 days (35 IAC Part 813)
___ 1st Sign. Mod/90 days (35 IAC Part 814)
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___ Permit Transfer/90 days (35 IAC Part 807)
___ Generic/90 days

TYPE FACILITY:

x Landfill
___ Land Treatment
___ Transfer Station
___ Treatment
___ Storage
___ Incinerator
___ Composting
___ Recycling/Reclamation
___ Other (Specify)

TYPE WASTE:

x General Municipal Refuse
___ Hazardous
x Special (Non-hazardous)
___ Chemical Only (exc. putrescible)
___ Inert Only (exc. chemical and putrescible)
___ Used Oil
___ Solvents
___ Landscape/Yard Waste
___ Other (Specify)

DESCRIPTION OF THIS PERMIT REQUEST: (Include a brief narrative description here.)

Construction Acceptance Report to Obtain Opertaing Permit for Landfill Gas Extraction System.

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IV. COMPLETENESS REQUIREMENTS

The following items must be checked Yes, No or N/A. Each item will be reviewed by the log clerk. Blank items wi result in rejection of the application. Please refer to the instructions for further guidance.

1.	Have all public notice letters (LPC-PA16) been mailed and are copies and supporting documentation enclosed?	X Yes	___ No	___ N/A
2. a.	Is the Siting Certification Form (LPC-PA8) completed and enclosed?	___ Yes	X No	___ N/A
b.	Is siting approval currently under litigation?	___ Yes	X No	___ N/A
3. a.	Is a closure, and if necessary a post closure, plan covering these activities being submitted, or	___ Yes	X No	___ N/A
b.	has one already been approved? (Provide permit number _____.)	X Yes	___ No	___ N/A
4. a.	For waste disposal sites only: Has any employee, owner, operator, officer or director of the owner or operator had a prior conduct certification denied, cancelled or revoked?	___ Yes	X No	___ N/A
b.	Have you included a demonstration of how you comply or intend to comply with 35 Ill. Adm. Code Part 745?	___ Yes	___ No	X N/A
5. a.	Is land ownership held in beneficial trust?	___ Yes	X No	___ N/A
b.	If yes, is a beneficial trust certification form (LPC-PA9) completed and enclosed?	___ Yes	___ No	X N/A
6. a.	Does the application contain information or proposals regarding the hydrogeology; groundwater monitoring, modeling or classification; a groundwater impact assessment; or vadose zone monitoring for which you are requesting approval?	___ Yes	X No	___ N/A
b.	If yes, have you submitted a third (3rd) copy of the application (4 total) and supporting documents?			

V. SIGNATURES (Original signatures required. Signature stamps or applications transmitted electronically or by facsimile are not acceptable.)

All applications shall be signed by the person designated below or by a duly authorized representative of that pe

Corporation - By a principal executive officer of at least the level of vice-president.
Partnership or Sole Proprietorship - By a general partner or the proprietor, respectively.
Government - By either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above; and
2. is submitted with this application (a copy of a previously submitted authorization can be used).

I hereby affirm that all information contained in this Application is true and accurate to the best of my knowledge and belief.

Owner Signature: [signature] Title: ~~Divisional~~ District Vice President Date: 2/3/98

Owner FEIN or S.S. Number 362704946

Operator Signature: [signature] Title: District Vice President Landfill Manager Date: 2/3/98

Operator FEIN or S.S. Number 362704946

Engineer Signature: [signature] Name: Curt Madsen Date: 2/9/98

Engineer Address: RMT, Inc.
744 Heartland Trail
Madison, WI 53717

Engineer Seal: REGISTERED PROFESSIONAL ENGINEER * STATE OF ILLINOIS * CURTIS DEAN MADSEN 062-051101

Engineer Phone No.: (608) 831-4444

All information submitted as part of the Application is available to the public, except when specifically designate the Applicant to be treated confidentially as a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Agency rules and guidelines.

LWE/mls/sp0002z/1-2

[signature]

OFFICIAL SEAL
NANCY J WEINER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES:07/31/00

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

General Application for Permit (LPC-PA1)

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Please type or print legibly.

I. SITE IDENTIFICATION

Name: BFI Waste Systems of North America, Inc. Site # (IEPA): 0 9 7 8 0 2 0 0 0 2

Physical Site Location (street, road, etc.): 701 Green Bay Road

City, Zip Code: Zion 60099 County: Lake

Existing DE/OP Permit Nos. (if applicable): 1980-24-DE & 1980-24-OP Supplemental Permit No. 1996-118-SP
Log. No. 1996-118

II. OWNER/OPERATOR IDENTIFICATION

	OWNER	OPERATOR
Name:	BFI Waste Systems of North America, Inc.	BFI Waste Systems of North America, Inc.
Address:	701 Green Bay Road	701 Green Bay Road
	Zion, IL 60099	Zion, IL 60099
Contact Name:	Mike Williams	Mike Williams
Phone #:	(847) 746-5777	(847) 746-5777

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___ Supplemental/90 days (35 IAC Part 807)
___ Permit Transfer/90 days (35 IAC Part 807)
___ Generic/90 days

TYPE FACILITY:

_X_ Landfill
___ Land Treatment
___ Transfer Station
___ Treatment
___ Storage
___ Incinerator
___ Composting
___ Recycling/Reclamation
___ Other (Specify)

TYPE WASTE:

_X_ General Municipal Refuse
___ Hazardous
_X_ Special (Non-hazardous)
___ Chemical Only (exc. putrescible)
___ Inert Only (exc. chemical and putrescible)
___ Used Oil
___ Solvents
___ Landscape/Yard Waste
___ Other (Specify)

DESCRIPTION OF THIS PERMIT REQUEST: (Include a brief narrative description here.)

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System.

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

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2. a. Is the Siting Certification Form (LPC-PA8) completed and enclosed? — ___ Yes X No ___ N/A

   b. Is siting approval currently under litigation? — ___ Yes X No ___ N/A

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   b. has one already been approved? (Provide permit number _____.) — X Yes ___ No ___ N/A

4. a. For waste disposal sites only: Has any employee, owner, operator, officer or director of the owner or operator had a prior conduct certification denied, cancelled or revoked? — ___ Yes X No ___ N/A

   b. Have you included a demonstration of how you comply or intend to comply with 35 Ill. Adm. Code Part 745? — ___ Yes ___ No X N/A

5. a. Is land ownership held in beneficial trust? — ___ Yes X No ___ N/A

   b. If yes, is a beneficial trust certification form (LPC-PA9) completed and enclosed? — ___ Yes ___ No X N/A

6. a. Does the application contain information or proposals regarding the hydrogeology; groundwater monitoring, modeling or classification; a groundwater impact assessment; or vadose zone monitoring for which you are requesting approval? — ___ Yes X No ___ N/A

   b. If yes, have you submitted a third (3rd) copy of the application (4 total) and supporting documents?

V. SIGNATURES (Original signatures required. Signature stamps or applications transmitted electronically or by facsimile are not acceptable.)

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Partnership or Sole Proprietorship - By a general partner or the proprietor, respectively.
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A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above; and
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I hereby affirm that all information contained in this Application is true and accurate to the best of my knowledge and belief.

Owner Signature: _____ Title: District Divisional Vice President Date: 2/3/98

Owner FEIN or S.S. Number 362704946

Operator Signature: _____ Title: ~~Landfill Manager~~ District Vice President Date: 2/3/98

Operator FEIN or S.S. Number 362704946

Engineer Signature: _____ Name: Curt Madsen Date: 2/9/98

Engineer Address: RMT, Inc.
744 Heartland Trail
Madison, WI 53717

Engineer Seal: REGISTERED PROFESSIONAL ENGINEER * CURTIS DEAN MADSEN 062-051101 * STATE OF ILLINOIS

Engineer Phone No.: 608) 831-4444

All information submitted as part of the Application is available to the public except that specifically designate the Applicant to be treated confidentially as a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Agency rules and guidelines.

LWE/mls/sp00022/1-2

OFFICIAL SEAL
NANCY J WEINER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES:07/31/00

LPC-PA16

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

The Honorable A. Geo-Karis
2610 Sheridan Road, Suite 213
Zion, IL 60099

Date: 2/16/98

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

Illinois Environmental Protection AGency
Bureau of Land, Permit Section (#33)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: BFI Waste Systems of North America, Inc.

Site # (IEPA): 0978020001 Phase A and Phase B 0978020002

Address: 701 Green Bay Road

City: Zion 60099

County: Lake

TYPE PERMIT SUBMISSION:		TYPE FACILITY:		TYPE WASTE:	
New Landfill	___	Landfill	X	General Municipal Refuse	X
Landfill Expansion	___	Land Treatment	___	Hazardous	___
First Significant Modification	___	Transfer Station	___	Special (Non-Hazardous)	X
Significant Modification to Operate	X	Treatment Facility	___	Chemical Only (exc. putrescible)	___
Other Significant Modification	___	Storage	___	Inert Only (exc. chem. & putrescible)	___
Renewal of Landfill	___	Incinerator	___	Used Oil	___
Development	___	Composting	___	Solvents	___
Operating	___	Recycling/Reclamation	___	Landscape/Yard Waste	___
Supplemental	___	Other	___	Other (Specify ___)	___
Transfer	___				
Name Change	___				
Waste Stream	___				
Generic	___				

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side).

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Please retain a copy for your own use.

LWE:CR:lat/sp/678Y,1-2

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director
2200 Churchill Road, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

Mr. Michael Waller
Lake County Courthouse
18 N. County Street
Waukegan, IL 60085

Date: 2/16/98

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

Illinois Environmental Protection AGency
Bureau of Land, Permit Section (#33)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: BFI Waste Systems of North America, Inc.
Site # (IEPA): 0978020001 Phase A and Phase B 0978020002
Address: 701 Green Bay Road
City: Zion 60099
County: Lake

TYPE PERMIT SUBMISSION:		TYPE FACILITY:		TYPE WASTE:	
New Landfill	___	Landfill	X	General Municipal Refuse	X
Landfill Expansion	___	Land Treatment	___	Hazardous	___
First Significant Modification	___	Transfer Station	___	Special (Non-Hazardous)	X
Significant Modification to Operate	X	Treatment Facility	___	Chemical Only (exc. putrescible)	___
Other Significant Modification	___	Storage	___	Inert Only (exc. chem. & putrescible)	___
Renewal of Landfill	___	Incinerator	___	Used Oil	___
Development	___	Composting	___	Solvents	___
Operating	___	Recycling/Reclamation	___	Landscape/Yard Waste	___
Supplemental	___	Other	___	Other (Specify _____)	___
Transfer	___				
Name Change	___				
Waste Stream	___				
Generic	___				

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side).

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Please retain a copy for your own use.

LWE:CR:lat/sp/678Y,1-2

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

Ms. Dawn McLain
Village of Winthrop Harbor
830 Sheridan Road
Winthrop Harbor, IL 60096

Date: 2/16/98

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

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Bureau of Land, Permit Section (#33)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: BFI Waste Systems of North America, Inc.

Site # (IEPA): 0978020001 Phase A and Phase B 0978020002

Address: 701 Green Bay Road

City: Zion 60099

County: Lake

TYPE PERMIT SUBMISSION:		TYPE FACILITY:		TYPE WASTE:	
New Landfill	___	Landfill	X	General Municipal Refuse	X
Landfill Expansion	___	Land Treatment	___	Hazardous	___
First Significant Modification	___	Transfer Station	___	Special (Non-Hazardous)	X
Significant Modification to Operate	X	Treatment Facility	___	Chemical Only (exc. putrescible)	___
Other Significant Modification	___	Storage	___	Inert Only (exc. chem. & putrescible)	___
Renewal of Landfill	___	Incinerator	___	Used Oil	___
Development	___	Composting	___	Solvents	___
Operating	___	Recycling/Reclamation	___	Landscape/Yard Waste	___
Supplemental	___	Other	___	Other (Specify _____)	___
Transfer	___				
Name Change	___				
Waste Stream	___				
Generic	___				

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side).

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
1.			
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10.			
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12.			

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State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

Village of Wadsworth
4155 W. Wadsworth Road
Wadsworth, IL 60083

Date: 2/16/98

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

Illinois Environmental Protection AGency
Bureau of Land, Permit Section (#33)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: BFI Waste Systems of North America, Inc.

Site # (IEPA): 0978020001 Phase A and Phase B 0978020002

Address: 701 Green Bay Road

City: Zion 60099

County: Lake

TYPE PERMIT SUBMISSION:		TYPE FACILITY:		TYPE WASTE:	
New Landfill	___	Landfill	X	General Municipal Refuse	X
Landfill Expansion	___	Land Treatment	___	Hazardous	___
First Significant Modification	___	Transfer Station	___	Special (Non-Hazardous)	X
Significant Modification to Operate	X	Treatment Facility	___	Chemical Only (exc. putrescible)	___
Other Significant Modification	___	Storage	___	Inert Only (exc. chem. & putrescible)	___
Renewal of Landfill	___	Incinerator	___	Used Oil	___
Development	___	Composting	___	Solvents	___
Operating	___	Recycling/Reclamation	___	Landscape/Yard Waste	___
Supplemental	___	Other	___	Other (Specify ___)	___
Transfer	___				
Name Change	___				
Waste Stream	___				
Generic	___				

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side).

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

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State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

Mr. Robert Churchill
976 Hillside Ave.
Antioch, IL 60002

Date: 2/16/98

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

Illinois Environmental Protection AGency
Bureau of Land, Permit Section (#33)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: BFI Waste Systems of North America, Inc.

Site # (IEPA): 0978020001 Phase A and Phase B 0978020002

Address: 701 Green Bay Road

City: Zion 60099

County: Lake

TYPE PERMIT SUBMISSION:		TYPE FACILITY:		TYPE WASTE:	
New Landfill	___	Landfill	X	General Municipal Refuse	X
Landfill Expansion	___	Land Treatment	___	Hazardous	___
First Significant Modification	___	Transfer Station	___	Special (Non-Hazardous)	X
Significant Modification to Operate	X	Treatment Facility	___	Chemical Only (exc. putrescible)	___
Other Significant Modification	___	Storage	___	Inert Only (exc. chem. & putrescible)	___
Renewal of Landfill	___	Incinerator	___	Used Oil	___
Development	___	Composting	___	Solvents	___
Operating	___	Recycling/Reclamation	___	Landscape/Yard Waste	___
Supplemental	___	Other	___	Other (Specify _____)	___
Transfer	___				
Name Change	___				
Waste Stream	___				
Generic	___				

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side).

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
1.			
2.			
3.			
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State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

City of Zion - Clerk
828 Sheridan Road
Zion, IL 60099

Date: 2/16/98

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

Illinois Environmental Protection AGency
Bureau of Land, Permit Section (#33)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: BFI Waste Systems of North America, Inc.

Site # (IEPA): 0978020001 Phase A and Phase B 0978020002

Address: 701 Green Bay Road

City: Zion 60099

County: Lake

TYPE PERMIT SUBMISSION:		TYPE FACILITY:		TYPE WASTE:	
New Landfill	___	Landfill	X	General Municipal Refuse	X
Landfill Expansion	___	Land Treatment	___	Hazardous	___
First Significant Modification	___	Transfer Station	___	Special (Non-Hazardous)	X
Significant Modification to Operate	X	Treatment Facility	___	Chemical Only (exc. putrescible)	___
Other Significant Modification	___	Storage	___	Inert Only (exc. chem. & putrescible)	___
Renewal of Landfill	___	Incinerator	___	Used Oil	___
Development	___	Composting	___	Solvents	___
Operating	___	Recycling/Reclamation	___	Landscape/Yard Waste	___
Supplemental	___	Other	___	Other (Specify ___)	___
Transfer	___				
Name Change	___				
Waste Stream	___				
Generic	___				

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side).

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
1.			
2.			
3.			
4.			
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State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

Mr. Robert L. Grevera
Lake County Courthouse
18 N. County Street
Waukegan, IL 60085

Date: 2/16/98

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

Illinois Environmental Protection AGency
Bureau of Land, Permit Section (#33)
2200 Churchill Road, Post Office Box 19276
Springfield, Illinois 62794-9276

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Site # (IEPA): 0978020001 Phase A and Phase B 0978020002

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County: Lake

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Significant Modification to Operate	X	Treatment Facility	___	Chemical Only (exc. putrescible)	___
Other Significant Modification	___	Storage	___	Inert Only (exc. chem. & putrescible)	___
Renewal of Landfill	___	Incinerator	___	Used Oil	___
Development	___	Composting	___	Solvents	___
Operating	___	Recycling/Reclamation	___	Landscape/Yard Waste	___
Supplemental	___	Other	___	Other (Specify ___)	___
Transfer	___				
Name Change	___				
Waste Stream	___				
Generic	___				

DESCRIPTION OF PROJECT: (For multiple waste stream applications, see reverse side).

Construction Acceptance Report to Obtain Operating Permit for Landfill Gas Extraction System

Date: _____

	Generator Name	Waste Stream Identification Generic Name	Waste Class Hazardous/ Non-Hazardous
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OATH/AFFIDAVIT FOR OWNER/OPERATOR AUTHORITY

I do herein swear that the following individual: Mike Williams, is the District Vice President of Browning-Ferris Industries of North America, Inc., (BFI) and is authorized to sign any and all applications, permits, and other documents pertaining to BFI. I further swear that I am the District Vice President of BFI and am authorized to prepare and sign this document.

Signed,

Mike Williams
District Vice President
BFI of North America

Before me did appear Mike Williams and swear that he is the District Vice President of BFI of North America and is authorized to make this statement.

Signed,

Notary

OFFICIAL SEAL
NANCY J WEINER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES:07/31/00

11/25/98
Date

325 E. Fullerton Avenue · Carol Stream, Illinois 60188
Phone 630-588-2940 · Fax 630-588-0316

Section 1
Introduction

1.1 Purpose and Scope

BFI Waste Systems of North America, Inc. (BFI), is pleased to submit this Construction Acceptance Report and accompanying engineering plan set to the Illinois Environmental Protection Agency (IEPA) for the construction of a landfill gas extraction system on Sites I and II of the Zion Landfill. This permit application includes a report and the accompanying plans that document and compare the construction results to the Construction Plans and Project Manual. The Construction Plans and Project Manual were based on the Supplemental Permit Applications prepared for Site I, Phase A, Site I, Phase B, and Site II, by RMT, Inc. (RMT), dated April 1996. Correspondence regarding the permits for the construction of the landfill gas and leachate collection system is included in Appendix A. The scope of this report includes documentation of the construction of the following system features:

- Gas/Leachate extraction wells
- Gas header pipe installation
- Leachate extraction system
- Condensate extraction and storage system
- Integrated blower/control system and flare

The following information was used to develop this documentation report and its accompanying plans:

- Daily construction observation reports
- Construction Plans and Project Manual
- Photographs
- Record surveys
- Contractor's submittals
- Manufacturer's information

On the basis of RMT's documentation assessment, the Landfill Gas and Leachate Management System has been constructed in substantial conformance with the Construction Plans and Project Manual prepared by RMT and BFI, and with applicable IEPA requirements. Observed deviations from these plans and regulations have been noted in this report.

1.2 Background

The Zion Landfill in the past has accepted municipal solid wastes, nonhazardous special wastes, and hazardous waste. Hazardous waste disposal was limited to the Site I, Phase A area.

Supplemental Permit Applications to construct the gas and leachate collection and flare system for Site I, Phase A, Site I, Phase B, and Site II were submitted by RMT, on behalf of BFI, to the IEPA on April 2, 1996 (Site II), April 4, 1996 (Site IB), and May 6, 1997 (Site IA). The Supplemental Permits to install the system were approved by the IEPA on July 3, 1996, August 5, 1996, and March 6, 1997 (see Appendix A). The Construction Plans and Project Manual for the Landfill Gas Management System were prepared by RMT for BFI. Terra Engineering and Construction Corporation from Madison, Wisconsin, was awarded the contract to construct the system.

The construction began on January 13, 1997, with the installation of the extraction wells, which was completed on February 18, 1997. The header pipe installation began February 6, 1997, and was completed in August 15, 1997. Additional construction included the placement of the condensate collection system and the integrated blower/control unit, and the flare system. Construction was substantially completed in December 1997.

System startup activities initially began December 3, 1997, and will continue through early 1998. At the time of this submittal, startup activities have been limited to the gas extraction and combustion components. The leachate extraction system in Site II will be started when the leachate storage tank that is part of the Site III construction is completed and documented.

RMT performed design engineering on the project and performed construction observation services. During the construction, Terra was assisted by CQM for verification of horizontal and vertical locations/elevations of the system components.

1.3 Project Summary

ACTIVITY	
Construction start	January 1997
Construction substantial completion	December 4, 1997
Initial system startup	December 4, 1997
Number of gas extraction wells installed	72
Range gas extraction well depths	24.5 feet to 75.8 feet
Average gas extraction well depth	51.9 feet
Gas header pipe material	SDR 17 HDPE
Leachate extraction pumps installed	36 (Site II extraction wells)
Condensate sumps installed	5

Section 2
Construction Quality Assurance/ Quality Control and CQA Officer Certification

2.1 Roles and Responsibilities

Below is a list of the names and addresses of the companies that performed the tasks and carried out the roles and responsibilities listed in the CQA Plan:

Role/Responsibility	Company
Owner/Operator	BFI Waste Systems of North America, Inc. 701 Greenbay Road Zion, Illinois Phone: 847-746-5777 Fax: 847-746-0666 Site Manager: Jim Lewis
General Contractor	Terra Engineering and Construction Corporation (Terra) 2201 Vondron Road Madison, Wisconsin 53704-6795 Phone: 608-221-3501 Fax: 608-221-4075 Construction Manager: John R. Karsten, P.E. CQM, Inc. (CQM) 2778 Manitowoc Road, Suite A Green Bay, Wisconsin 54311 Phone: 414-465-3911 Fax: 414-465-3913 Field Technician: Dennis Mordja
Project Engineer/Designer	BFI Waste Systems of North America, Inc. (BFI) 757 North Eldridge Houston, Texas 77079 Phone: 281-870-7857 Fax: 281-584-8043 Project Manager: Lance Robinson

Role/Responsibility	Company
Project Engineer/Designer	Mark J. Torresani, P.E. RMT, Inc. (RMT) 744 Heartland Trail Madison, WI 53708 Phone: 608-831-4444 Fax: 608-831-3334
Surveyor	Timothy J. Ambrosius, P.E. CQM, Inc. 2778 Manitowoc Road, Suite A Green Bay, Wisconsin 54311 Phone: 414-465-3911 Fax: 414-465-3913
Soil Testing Laboratory	RMT, Inc. 744 Heartland Trail Madison, WI 53708
CQA Officer	Curtis D. Madsen, P.E. RMT, Inc. 744 Heartland Trail Madison, WI 53708 Phone: 608-831-4444 Fax: 608-831-3334
CQA Officer-In-Absentia	Scott Chafer/Rob Regan/Marc Goodhue RMT, Inc. 744 Heartland Trail Madison, WI 53708

The CQA Officer was on-site and observed and documented portions of Site I/II Landfill Gas/Leachate Extraction System construction. The CQA Officer supervised and was responsible for all inspections, testing, and activities required to be implemented as part of the CQA program under Part 811, Subpart E of 35 IAC.

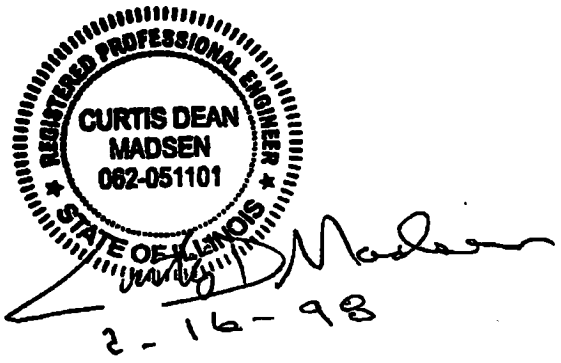
Scott Chafer, Rob Regan, and Marc Goodhue were designated the CQA Officer-In-Absentia during different periods of the construction when the CQA Officer was not present to conduct inspections and testing. The CQA Officer was not on-site during certain portions of construction; however, the CQA Officer supervised the CQA Officer-In-Absentia and assumed full responsibility for all inspections performed by the designated CQA Officer-In-Absentia.

Form CQA-1 in Appendix G contains signed documentation designating the RMT field staff as the CQA Officer-In-Absentia to meet the requirements of 35 IAC, Section 811.503(b).

2.2 CQA Officer Certification

This Acceptance Report was prepared under the supervision of the following professional engineer as required by 35 IAC 811.505(d)(1):

Name:	Mr. Curtis D. Madsen, P.E.
Date of Preparation:	February 1998
Registration No.:	062-051101
Statement:	This Supplemental Permit Application was prepared under my supervision, and the Landfill Gas/Leachate Extraction System construction has been prepared and constructed in compliance with the approved engineering design.
Seal:	



Section 3
Site Survey and Construction Control

This Construction Acceptance Report and Engineering Plan Set contains documentation of the record survey performed throughout the construction. The record survey was performed by CQM using the established survey control and temporary control points, and provides record grades and locations of the following construction items:

- Horizontal locations of the gas and leachate extraction wells
- Horizontal and vertical locations of the gas header piping and final cover placement
- Horizontal and vertical locations of the condensate collection and extraction system
- Horizontal and vertical locations of the leachate transfer piping

Section 4
Landfill Gas Management System Construction

4.1 General Description

The landfill gas management system has been designed to limit migration of landfill gas across the landfill boundary. The system will extract gas through vertical wells by creating overlapping negative pressure zones. The landfill gas and leachate management system consists of the following components:

- 72 gas extraction wells (EW-1 to EW-72)
- Header pipe
- Laterals from the well to the header pipe
- Leachate extraction piping
- Condensate sumps (CS-1 to CS-5)
- Condensate knockout units
- Condensate storage tank for Site I, Phase B and Site II
- Condensate storage tank for Site I, Phase A
- Integrated blower/control system
- Enclosed flare system and controls
- 36 leachate extraction pumps (at EW-37 to EW-72)

4.2 Landfill Gas/Leachate Extraction System

4.2.1 Gas Extraction Wells

Seventy-two gas extraction wells were constructed by installing a 6-inch-diameter (SDR 17) high-density polyethylene (HDPE) pipe for Site I, Phase B and 8-inch and 12-inch-diameter pipes for Site I, Phase A and Site II, in a 36-inch-diameter borehole. The boreholes were drilled by Terra, using a track-mounted drill rig with a western bore bucket (see Photograph No. 1 in Appendix B). The wells were installed between the period January 13, 1997, and February 18, 1997.

The base and final grades used to determine approximate well depths prior to field construction were based on previous design drawings and actual final grade survey data. Refer to Table 1 for actual well depths and details. Wells went through moist, general waste, mostly black and decomposing, and terminated above the bore of the landfill. Waste cuttings from Site 1, Phase B and Site 2 were placed in a truck and hauled to the active portion of the landfill in Site I, Phase B. Waste cuttings from Site 1, Phase A were re-compacted in the northern half of Site 1, Phase A, prior to final cover placement. Boring logs for the 72 extraction well boreholes are presented in Appendix C.

The gas extraction wells were constructed of 6-, 8-, and 12-inch-diameter (SDR 17) HDPE pipe consisting of a nonperforated section coupled to a perforated section of HDPE pipe, as shown on Photograph No. 2 in Appendix B and in details on Plan Sheet 21.

The perforated HDPE well pipe was fusion-welded to the nonperforated HDPE pipe. An HDPE cap was fusion-welded to the bottom of the perforated pipe, and the piping was inserted into the center of the borehole. For the wells in Site I, Phase A and Site II, the perforated pipe section of the well consisted of SDR 17 HDPE, a 12-inch-diameter pipe, and was connected to the nonperforated section by two reducers, all fusion-welded. Washed stone was then backfilled into the borehole with an endloader to surround the HDPE well casing, which filled the borehole to at least 1 foot above the perforated pipe (see Photograph No. 3 in Appendix B). An isolation layer of 3/8-inch bentonite chips was then installed above the washed river stone to form a 4-foot bentonite seal. The granular bentonite was then hydrated with water (see Photograph No. 4 in Appendix B). The borehole was then backfilled with clay (or well graded soils) to at least 1 foot below the final cover. The remaining borehole was filled with granular bentonite and hydrated with water. The nonperforated pipe extended approximately 3 feet above the existing ground. (Gas extraction well forms are contained in Appendix C.) For all wells in Site I, Phase A and Phase B that penetrate the final cover geomembrane, an HDPE sleeve was placed around the well and the bottom was extrusion welded to the geomembrane. A coupling boot was used to seal the annular space at the top of the pipe sleeve to the well. These boots have an elastic mid-section, to allow for settlement of the ground, and are fastened to the pipes using stainless steel clamps (see Photograph No. 5 in Appendix B).

4.2.2 Well Heads

Each gas extraction is connected to the header pipe with a well head consisting of a T fitting, reducers, a valve, and connecting hose and lateral pipe (see details on Plan

TABLE 1

AS-BUILT GAS EXTRACTION WELL SCHEDULE

BFI-Zion Landfill

Sites 1A, 1B, 2 Leachate and Gas Extraction System Construction

Lake County, Illinois

Extraction Well Number		Northing (feet)	Easting (feet)	Surface Elevation (feet)	Base Elevation (feet)	Well Base Elevation (feet)	Drilling Depth (feet)	Perforated Pipe Length (feet)	Solid Wall Pipe Length (feet)
Site 1A									
EW	1	12,416	9,311	789.3	749.4	750.4	39.9	23.9	19.6
EW	2	12,031	9,350	802.5	747.4	748.4	55.1	32.8	24.9
EW	3	12,137	9,119	807.3	746.6	747.6	60.7	32.7	31.5
EW	4	12,426	9,097	789.0	749.9	750.9	39.1	22.8	19.2
EW	5	12,420	8,890	788.2	749.3	750.3	38.9	22.9	19.4
EW	6	12,245	8,894	797.3	747.3	749.3	50.0	31.9	20.5
EW	7	12,078	8,892	799.1	746.5	747.5	52.6	33.0	23.6
EW	8	11,913	8,884	798.0	746.8	747.8	51.2	37.0	18.1
EW	9	11,720	8,871	795.2	745.8	746.8	49.4	34.0	19.2
EW	10	11,726	9,245	812.4	746.2	747.2	66.2	41.0	29.3
EW	11	11,577	8,869	799.0	745.3	746.3	53.7	34.2	23.2
EW	12	11,430	8,851	797.1	745.5	746.5	51.6	37.1	18.3
EW	13	11,427	9,169	811.4	743.7	744.7	67.7	44.0	27.9
EW	14	11,225	8,837	795.0	743.8	744.8	51.2	35.2	19.5
EW	15	11,054	8,814	791.7	742.0	743.1	49.7	34.0	19.0
EW	16	11,171	9,075	809.0	743.8	745.0	65.2	42.5	26.1
EW	17	10,865	8,801	782.5	741.7	742.7	40.8	24.5	19.5
EW	18	10,825	9,077	801.2	740.8	741.8	60.4	38.0	26.4
EW	19	10,662	8,813	776.7	739.6	740.6	37.1	19.8	20.6
EW	20	10,466	8,823	771.6	738.9	739.9	32.7	14.0	22.2
EW	21	10,293	8,794	763.5	739.0	740.0	24.5	9.3	18.4
EW	22	10,281	8,992	767.8	738.3	739.3	29.5	11.1	21.5
EW	23	10,253	9,175	766.4	739.5	740.5	26.9	10.0	19.8
EW	24	10,446	9,176	777.7	739.0	740.0	38.7	22.0	20.6
EW	25	10,551	9,011	785.9	740.2	741.2	45.7	28.8	20.1
EW	26	10,580	9,312	783.2	738.4	739.4	44.8	28.8	20.4
EW	27	10,933	9,293	804.6	740.8	741.8	63.8	42.0	24.8
EW	28	11,226	9,357	809.7	743.5	744.5	66.2	44.5	24.8
					Site 1A Totals		1353.9	831.8	618.4
Site 1B									
EW	29	11,027	8,473	764.2	696.9	697.9	67.3	49.0	20.9
EW	30	10,996	8,272	751.9	710.1	711.1	41.8	26.0	17.9
EW	31	10,806	8,302	746.4	703.5	704.5	42.9	28.0	17.1
EW	32	10,813	8,517	750.6	704.8	705.8	45.8	31.0	17.6
EW	33	10,505	8,312	743.2	700.4	701.4	42.8	27.0	17.9
EW	34	10,477	8,539	747.7	709.0	710.0	38.7	22.0	19.3
EW	35	10,295	8,330	745.0	696.7	697.7	48.3	33.0	17.4
EW	36	10,278	8,516	746.4	695.6	696.6	50.8	33.2	20.3
					Site 1B Totals		878.4	249.2	148.4

TABLE 1

AS-BUILT GAS EXTRACTION WELL SCHEDULE

BFI-Zion Landfill

Sites 1A, 1B, 2 Leachate and Gas Extraction System Construction

Lake County, Illinois

Extraction Well Number		Northing (feet)	Easting (feet)	Surface Elevation (feet)	Base Elevation (feet)	Well Base Elevation (feet)	Drilling Depth (feet)	Perforated Pipe Length (feet)	Solid Wall Pipe Length (feet)
Site 2									
EW	37	11,508	9,544	803.8	734.5	735.5	69.3	50.5	22.6
EW	38	11,816	9,520	801.1	734.8	735.9	66.3	47.5	22.2
EW	39	12,138	9,522	794.1	735.8	736.8	58.3	42.3	20.2
EW	40	12,423	9,570	781.7	735.6	736.6	46.1	32.0	19.0
EW	41	12,392	9,747	782.7	735.0	736.0	47.7	34.3	16.7
EW	42	12,399	9,925	776.8	733.6	734.6	43.2	31.0	16.3
EW	43	12,121	9,817	796.7	733.8	734.8	62.9	46.5	19.6
EW	44	11,827	9,827	798.5	735.4	736.4	63.1	44.7	20.7
EW	45	11,513	9,858	799.9	733.6	734.6	66.3	48.6	21.3
EW	46	12,398	10,082	775.8	732.6	733.6	43.2	29.7	17.0
EW	47	12,123	10,176	792.7	732.5	733.5	60.2	43.0	20.7
EW	48	11,822	10,183	794.7	731.2	732.2	63.5	45.0	21.5
EW	49	11,515	10,157	794.7	730.7	732.7	64.0	44.0	22.6
EW	50	12,396	10,262	776.7	730.6	732.3	46.1	31.7	17.3
EW	51	12,403	10,433	775.8	730.8	731.8	45.0	31.7	17.4
EW	52	12,226	10,450	781.3	729.7	731.2	51.6	33.0	21.9
EW	53	12,052	10,448	781.7	731.1	732.1	50.6	33.0	21.1
EW	54	11,875	10,448	782.6	730.7	731.7	51.9	34.0	21.5
EW	55	11,709	10,439	784.1	729.5	731.0	54.6	36.0	22.0
EW	56	11,532	10,440	783.3	731.4	732.4	51.9	34.0	20.9
EW	57	11,365	10,442	781.5	730.7	732.2	50.8	37.0	16.5
EW	58	11,181	10,438	780.2	730.8	731.8	49.4	36.1	16.6
EW	59	11,008	10,440	778.5	730.6	731.9	47.9	33.4	16.9
EW	60	10,837	10,445	776.3	730.3	731.8	46.0	32.0	16.4
EW	61	10,693	10,354	780.2	730.7	732.0	49.5	36.5	15.6
EW	62	10,612	10,224	781.0	731.7	733.0	49.3	34.6	17.2
EW	63	10,937	10,146	793.8	730.5	733.0	63.3	43.6	20.8
EW	64	11,255	10,159	792.1	730.8	732.8	61.3	43.0	20.7
EW	65	10,617	10,052	782.7	732.6	733.6	50.1	37.3	15.9
EW	66	10,605	9,904	782.8	732.9	733.9	49.9	35.3	17.4
EW	67	10,937	9,886	798.3	733.3	734.3	65.0	46.6	19.8
EW	68	11,238	9,883	800.3	733.0	736.5	67.3	46.6	21.3
EW	69	10,606	9,725	785.7	733.3	734.3	52.4	32.8	22.0
EW	70	10,606	9,593	787.7	732.9	733.9	54.8	35.0	22.7
EW	71	10,927	9,584	801.0	735.2	736.2	65.8	49.7	19.9
EW	72	11,216	9,547	804.4	728.6	729.6	75.8	56.8	23.1
					Site 2 Totals		2004.4	1408.8	705.3

BY: ASP
CHECKED: MJT
PROJECT NO.: 3828
FILE: p:\data\projects\3828\wschedul.xls
DATE: 12/18/97

Sheet 21 and Photograph No. 5 in Appendix B). On top of each gas extraction well, an HDPE tee with a PVC cap or blind flange (depending on the location) was fastened to the well casing. Attached to the tee-fitting is a 4-inch ball valve and a 4-inch-diameter flexible hose which is fastened to the 4-inch HDPE lateral pipe. Two monitoring ports are located at each well just below the reducer tee.

4.2.3 Header Pipe Installation

The gas header piping, which transports the LFG from the extraction wells to the blower station consists of SDR 17 HDPE pipe of various diameters as indicated on Plan Sheets A-3, A-4, and A-5. The gas header piping was installed as shown on Plan Sheet A-1 and in detail on Plan Sheet 24.

Header pipe installation began on February 6, 1997, and continued until August 15, 1997. The header pipe was placed in a backhoe-excavated trench with tapered sideslopes, bedded with 6 inches of granular fill (see Photograph No. 6 in Appendix B). The top of the header pipe was installed a minimum of 4 feet below the final grade for frost protection. The header pipe sections were fused together prior to trench installation. The minimum header pipe slope is approximately 2 percent. See Appendix D for pipe elevations, slopes, and lengths of pipe.

The header pipe is sloped to one of the five condensate sumps, allowing condensate to flow to these stations. All the header from Site I, Phase A was kept separate from other header pipe, to keep separate condensate from this area of the facility. Header pipe from Site I, Phase A drains to condensate pump station CS-1 and the remainder of the site drains to condensate pump station CS-3. The header pipe from Site I, Phase A connects with the header from Site II and Site I, Phase B after the condensate knockout tanks in the blower building.

As the header pipe was being placed, a warning ribbon was placed in the soil above the trench as shown in Photograph No. 7 in Appendix B and in detail on Plan Sheet 24. Waste that was excavated from the trench was placed back in the trench where possible or placed in dump trucks and hauled to the active face of the landfill in Site I, Phase B. Granular fill was placed in the trench to bed the pipe, and the existing cover was replaced. Excavated waste that was replaced in the deeper trench locations is above the granular fill and beneath the final cover soil. The trench backfill was placed in approximately 6-inch lifts and was compacted with a Dynapac CA15 compactor (see Photograph No. 8 in Appendix B). All select clay backfill was compacted to at least 90 percent of the maximum dry density as determined by the Standard Proctor Test. Nuclear density tests were performed randomly on each 6-inch lift to confirm that the compaction was adequate. Soil

test results are included in Appendix E, and on-site soil density tests are summarized in Appendix E. A summary of laboratory soil test results is included in Table 2. Soil testing was not conducted as part of the gas system installation in Site I, Phase B, since the final cover in this area was placed after the gas system was installed.

Prior to completion of construction, an air pressure test was performed on each pipe to determine if there were any air leaks in the header pipe leachate lines and air lines. A HDPE cap with a valve and pressure gauge was attached at the end of the header pipe that was to be connected to the blower. A portable air compressor was used to pressurize the header, leachate, and air pipes (see Photograph No 9 in Appendix B). Gas header and leachate pipes were pressure tested at a minimum pressure of 50 psi and air lines were tested at a minimum pressure of 100 psi. The pressure was maintained for at least 8 hours. Header pipe, leachate pipe, and air line test results are included in Appendix F.

4.3 Condensate Storage and Extraction System

4.3.1 Condensate Sumps

Five condensate sumps were installed adjacent to the gas header line. A reducer tee was fused into the low point of the header line adjacent to the condensate pump station location. This tee allows the condensate to gravity-drain from the header line into the condensate pumping station through a 4-inch-diameter (SDR 11) HDPE pipe.

The condensate pump stations were constructed two different ways, depending on the location. CS-1 and CS-2, which are outside the limits of waste, are double contained as shown in detail on Plan Sheet 23. Pump stations outside the limits of waste (CS-1 and CS-2) consist of an 8-inch diameter (SDR 11) HDPE pipe encased in a 12-inch diameter (SDR 17) HDPE pipe with a 12-inch diameter (SDR 17) HDPE flat cap welded on the bottom. Condensate sumps located within the limits of waste consist of an 8-inch pipe connected by a reducer to a 12-inch pipe with an HDPE cap fused to the bottom. A submersible pneumatic pump was placed inside condensate sumps to pump condensate to the condensate storage tanks.

The discharge pipes from the condensate sumps transport the condensate to the condensate storage tanks for removal. In all locations where the condensate storage pipe is outside the limits of waste, a secondary HDPE containment pipe is provided. The second containment pipe can be monitored for liquid with a riser pipe as shown in detail on Plan Sheet 23. Refer to Details on Plan Sheet 23 for additional information regarding the condensate system.

TABLE 2

SUMMARY OF LABORATORY SOIL TESTS

BFI-Zion Landfill
Sites 1A, 1B, and 2 Gas and Leachate Extraction System Construction
Lake County, Illinois

Location	Lift #	Sample Date	P200 (%)	Clay Content (%)	Liquid Limit (%)	Plasticity Index (%)	Hydraulic Conductivity (cm/sec)	Shelby Tube		Unified Soil Classification	Std. Proctor	
								Dry Density	Moisture Content		Max. Density	Opt. Moisture
Site 2, Profile A, Sta. 7+50	3	2/13/97	-	-	-	-	-	-	-	-	115.0	15.7
Site 1A, Profile N, Sta. 6+50	-	4/10/97	77.2	47.1	37	19	4.50E-09	114.7	16.6	CL	-	-
Site 2, Profile A, Sta. 10+00	2	5/7/97	78.2	41.1	29	14	-	-	-	CL	-	-
Site 2, Profile A(Lat. to EW63), Sta. 1+50	3	6/19/97	81.7	45.5	34	15	6.40E-09	114.0	15.5	CL	-	-
Site 2, Profile A, Sta. 6+00	3	7/24/97	81.1	44.4	34	17	-	-	-	CL	-	-
Summary:												
Mean			79.6	44.5	34	16	5.5E-09					
Standard Deviation			2.2	2.5	3	2	1.3E-09					
Maximum			81.7	47.1	37	19	6.4E-09					
Minumum			77.2	41.1	29	14	4.5E-09					

BY: ASP

CHECKED: MJT

PROJECT NO.: 3828.03

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4.3.2 Condensate Storage Tanks

The condensate sumps pump condensate to the collection tanks located near the blower building (see Photograph No. 10 in Appendix B). A separate 8,000-gallon tank for Site I, Phase A is provided to allow for the collection and testing of condensate generated from landfill gas produced in Site I, Phase A. The other 8,000-gallon tank will serve the remainder of the gas system (Site I, Phase B and Site II). The condensate storage tanks were constructed by Modern Welding Company, Inc., of Newark, Ohio. The tanks are aboveground skid mounted and include the following features:

- 8,000-gallon capacity each
- Above ground skid mounted for ease of installation
- 12 inch thick compacted granular base material
- Secondary containment (a double-walled tank) with an insulated annular space with leak monitoring capability
- Visual and audible alarms to signal high levels of condensate
- Corrosion protective coating (interior and exterior surfaces)

Certification testing results and shop drawings for the condensate tanks are included in Appendix H.

Condensate transfer pipes from condensate collection sumps CS-1 and CS-2 are insulated and heat traced aboveground to prevent freezing within the pipes.

4.4 Integrated Blower and Control System

4.4.1 Blower Station

The blower and control system has been designed and constructed to meet the specific requirements of the Zion Landfill gas and leachate extraction system. The blower building and system controls are located as shown on Plan Sheets A-3 and 20. This area is enclosed by a fence to limit access to authorized site personnel. The blower building is shown in Photograph No. 11 in Appendix B. Within the blower building are two condensate knockout pots, two 50 Hp blowers, monitoring instruments, a 10 Hp compressor (for pneumatic pumps), valves, and fittings.

A 12-inch minimum thickness gravel pad was prepared prior to the installation of the skid-mounted blower building. The building was lifted by a crane onto the gravel pad.

The blower unit was connected to the 16-inch and 12-inch gas header pipes, and the necessary power, control panel, and other related items were installed. The pre-fabricated building and the blower/controls were delivered to the site pre-wired. The blower building and internal components were supplied by Mobil International of Pryor, Oklahoma. Detailed drawings of the blower building and components within the building are included in Appendix I.

With minor modifications, the blower can be upgraded to increase the performance, if necessary, by changing wheel and motor sizes. The blower and motor assembly includes the following features:

- Aluminum wheel; spark-resistant construction
- Indirect drive (V-belt)
- 50-Hp, explosion-proof motor
- Spark-resistant housings

4.4.2 Enclosed Flare System

The enclosed flare system that burns the landfill gas from the site was installed within fenced in area of the blower building area and flare compound as shown on Plan Sheets A-2 and A-20. The flare is approximately 40 feet tall and has an 11-foot diameter. The flare is positioned on a 16 foot by 16 foot reinforced concrete slab (see Photograph No. 12 in Appendix B). Photograph Nos. 13 and 14 in Appendix B show the flare and reinforced concrete slab. Further details of the flare system, including shop drawings and specifications, are included in Appendix I.

4.4.3 Electrical and Control System

Electrical work (*e.g.*, electric power, controls) for the LFG extraction system was performed by Aldrich Electric, Inc., under contract with Terra. Electrical power was accessed from a transformer located at the facility.

Electrical drawings for the blower buildings, condensate tanks, controls, and flare are included in Appendices H and I.

4.5 Leachate Collection System

Components of the leachate collection system includes 36 pneumatic pumps installed in each extraction well (EW-37 to EW-72) in Site II, and leachate and air lines.

Leachate conveyance lines and air supply lines were installed in Site I, Phase A and Site II to each extraction well as shown on Plan Sheet A-3 and in detail on Plan Sheet 24. The leachate

line consists of 2 inch and 3 inch SDR 17 HDPE pipe and is double contained outside the limits of waste. The air supply line consists of a 2-inch SDR 11 HDPE pipe.

The air lines and leachate lines installed in Site I, Phase A are not connected to a pump, but were placed with this construction for future use. Leachate pumps were installed only in Site II.

The double contained leachate pipe was ended near the location of where the new leachate storage tank for the site will be located. The location of the double encased leachate lines are shown on Plan Sheet A-3. The leachate line from Site II will be connected to the leachate storage tank during installation of the tank.

Section 5
System Startup

5.1 General Discussion

The system startup was a multi-step operation consisting of the following components:

- Activation of the blower
- System monitoring and balancing
- Continued system evaluation

5.2 Startup

The landfill gas collection system was started on December 4, 1997. Representatives from Mobil International and from Calidus were on hand to make final checks on the system and start the system. At the time of start-up, the system components were checked for proper operation. During the initial months of operation, the gas wells and header pipe valves will be adjusted to maximize system efficiency (see Photograph No. 13 in Appendix B).

At the time of this submittal, the leachate collection and transfer components have been placed in initial operation. The leachate pumps were not started until new leachate storage tanks were constructed.

5.3 System Operating Plan

The system will be monitored during operation in accordance with the plan included with this document. Different operating plans for the system were previously submitted to the IEPA for each site. However, due to the fact that the landfill gas and leachate management system documented with this report is operated as one integrated system. This application proposes to simplify the system operation with the following by superseding all previously submitted operations information and operating guidelines.

5.3.1 Monitoring

Monitoring of the landfill gas system operation will be performed to ensure its effectiveness and continued safe operation. The objective of gas system monitoring is to "balance" the gas system. A balanced system is adjusted to extract the maximum amount of gas within the landfill without causing excessive amounts of air to be drawn into the extraction system. To achieve a balanced system, the following parameters will be monitored:

At each extraction well:

- Vacuum, gas temperature and methane concentration monthly
- Gas flow rate every month

At the blower/flare:

- Gas flow rate, methane concentration and flare operating temperature monthly

Building inlet sample ports (on main header):

- Gas inlet temperature and system vacuum monthly

Records from these monitoring activities will be maintained at the landfill office.

5.3.2 Maintenance

Regular maintenance of the landfill gas system equipment and operating systems is necessary to provide for efficient operation and to maintain compliance with the operational requirements of IAC and the operating permit. Routine preventive maintenance also serves to minimize equipment downtime and extend equipment service life.

Table 3 lists the maintenance schedule for the proposed landfill gas system. Maintenance records will be kept for each piece of equipment and each task performed. Records kept of all maintenance activities will be kept on-site at the landfill office.

Table 3

System Maintenance Schedule Summary

Maintenance Activity	Frequency
Wells/Probes	
1. Inspect for settling, weeds, leaks, water	Monthly
Extraction System Piping	
1. Inspect for settling, weeds, leaks, water	Monthly
2. Exercise header isolation valves	Quarterly
Condensate System	
1. Check storage tank volumes and condition	Weekly
2. Check isolation valve operation; inspect for leaks at fittings	Quarterly
3. Analyze condensate for pH, COD, TSS, and conductivity	Annually
4. Analyze condensate for priority pollutants	Annually
Blower Building	
1. Inspect piping, fittings, valves, seals for leaks or breakage	Weekly
2. Drain knock-out pot during changeover	Weekly
3. Check for belt condition, loose connections, vibration at blower	Weekly
4. Drain blower and header low points during changeover	Monthly
5. Inspect fire extinguishers	Quarterly
6. Lubricate blower motor bearings	Quarterly
7. Lubricate exhaust fan	Quarterly
8. Calibrate explosive gas sensor(s) and check alarm function	Semi-Annually
9. Lubricate blower bearings	Annually
10. Clean knock-out pot and demister	Annually
11. Check motor/blower alignment	Semi-Annually
12. LFG samples at blower discharge	Semi-Annually
Flare	
1. Drain flame arrestor	Semi-Annually
2. Inspect control panel for water damage	Weekly
3. Check propane level	Monthly
4. Replace charts	Weekly
5. Weed, debris removal	Monthly
6. Clean flame arrestor	Annually
7. Visually inspect refractory	Quarterly
8. Inspect gas solenoids	Annually
9. Clean/inspect flame scanner view and vent	Semi-Annually
10. Purge blower/motor lubrication	Semi-Annually

Section 6
Conclusion

6.1 Final Cover Restoration

The landfill cover areas disturbed during well drilling and trenching activities were restored with on-site cover soil and graded to provide positive drainage and smooth contours. Once properly graded, the disturbed areas were covered with seed, fertilizer, and mulch.

6.2 Substantial Conformance

Based on field observations, field testing, and surveys made during construction, the Zion Landfill Gas and Leachate Extraction System has been constructed in substantial conformance with the Supplemental Permits, with comments and exceptions as noted.

Appendix E-25

Documentation of Post-Closure Costs

ENVIRONMENTAL INFORMATION LOGISTICS, LLC

January 14, 2025

Mr. Jim Hitzeroth
Environmental Manager
BFI Waste Systems of North America, LLC
26 W 580 Schick Road
Hanover Park, Illinois 60133

Re: Proposal - 2025 Groundwater and Leachate Sampling and Reporting - Zion Site 1 Phase A Landfill

Dear Mr. Hitzeroth:

EIL proposes to perform groundwater and leachate sampling and reporting for the Zion Site 1 Phase A Landfill as outlined below.

The scope of work consists of groundwater and leachate sampling and reporting required by the Illinois EPA Bureau of Land permit. Specific items included in the scope of work consist of the following:

- Sample groundwater and leachate semi-annually and annually, respectively, in accordance with the permit;
- Direct First Environmental to analyze groundwater and leachate for the required matrix of locations/parameters;
- Prepare groundwater statistics reports for the Zion Site 1 Phase A Landfill for IEPA BOL; and
- Electronically report groundwater and leachate monitoring results to the Illinois EPA.

The estimated cost to perform each task is summarized on Table 1. The signed Exhibit B to our MSA is attached. Please contact me should you have questions regarding this proposal. EIL appreciates the opportunity to serve you at the Zion Site 1 Phase A Landfill.

Sincerely,
Environmental Information Logistics

Joseph D. Miller, P.G.
Hydrogeologist

Attachments

Table 1
Estmated Cost For Groundwater and Leachate Sampling and Reporting
Zion Site 1 Phase A Landfill
January 2025 - December 2025

Task	Estimated Cost
BOL Reporting (Semi-Annual Statistics Reports and IEPA EDDs)	$ 9,000
Groundwater and Leachate Sampling and Laboratory Coordination	$ 5,275
Total =	$ 14,275

First
Environmental
Laboratories, Inc.
1600 Shore Road • Naperville, Illinois 60563 • Phone (630) 778-1200 • Fax (630) 778-1233
IL ELAP / NELAC Certification # 100292

January 16, 2025

To Whom It May Concern:

In response to your request, First Environmental Laboratories, Inc. is pleased to submit the following cost estimates for analytical services to be performed at the **Zion Landfill (Site 4141).** These are the per sample costs based on the current version of the site permit and our master supplier agreement with Republic Services and valid through the end of the agreement in 2027.

Site	Annual Estimate
Zion Site 1 Phase A	$8,783.14
Zion Site 1 Phase B	$9,931.21
Zion Site 2 (ADS Zion Landfill)	$6,729.37
TOTAL	**$25,443.72**

Not included are the costs for any verification, background or assessment parameters that may be requested by the consultant.

Not included in the above pricing is any overnight shipping of bottles or samples as directed by the consultant. Routine sample or bottle ground shipping is included as a value-added service when sufficient notice is given.

Should the need arise in which the Illinois EPA or a contractor of the Illinois EPA would collect samples for the permitted parameters, First Environmental Laboratories will honor the prices provided for this site. The prices are based upon our national agreement with Republic Services, Inc. and subject to the same terms and conditions.

I thank you for the opportunity to provide analytical services. Should you have any questions or need additional information, please call me at (630) 778-1200.

Sincerely,

Neal E Cleghorn

Neal Cleghorn
Project Manager

First
Environmental
Laboratories, Inc.
1600 Shore Road • Naperville, Illinois 60563 • Phone (630) 778-1200 • Fax (630) 778-1233
IL ELAP / NELAC Certification # 100292

Site 1 Phase A:

List	Unit Cost	# Samples	Total
	1st Qtr		
Annual Leachate	$1236.36	1	$1236.36
		Q1 Total:	**$1236.36**
	2nd Qtr		
GW wells that overlap	$456.98	7	$3198.86
GW wells no overlap	$325.79	3	$977.37
		Q2 Total:	**$4176.23**
	3rd Qtr		
Verifications	$100.00	1	$100.00
		Q3 Total:	**$100.00**
	4th Qtr		
GW wells that overlap	$377.38	7	$2641.66
GW wells no overlap	$209.63	3	$628.89
		Q4 Total:	**$3270.55**
		Annual Total:	**$8,783.14**

Site 1 Phase B:

List	Unit Cost	# Samples	Total
	1st Qtr		
GW Assessment (GT15)	$162.22	1	$162.22
GW Assessment (GT16)	$168.88	1	$168.88
		Q1 Total:	**$331.10**
	2nd Qtr		
LT BOL List	$928.98	1	$928.98
SSR	$1038.50	1	$1038.50
GW (G1/G2 List)	$232.25	8	$1858.00
GW Assessment (GT16)	$1,244.00	1	$1,244.00
		Q2 Total:	**$5,069.48**
	3rd Qtr		
GW Assessment (GT15)	$162.22	1	$162.22
GW Assessment (GT16)	$168.88	1	$168.88
		Q3 Total:	**$331.10**
	4th Qtr		
LT BOL List	$928.98	1	$928.98
SSR	$1038.50	1	$1038.50
GW (G1/G2 List)	$232.25	8	$1858.00
GW Assessment (GT16)	$374.05	1	$374.05
		Q4 Total:	**$4199.53**

First
Environmental
Laboratories, Inc.
1600 Shore Road • Naperville, Illinois 60563 • Phone (630) 778-1200 • Fax (630) 778-1233
IL ELAP / NELAC Certification # 100292

Site 1 Phase B:		**Annual Total:**	**$9,931.21**

Site 2:

List	Unit Cost	# Samples	Total
	1st Qtr		
GW (List G1)	$224.68	1	$224.68
		Q1 Total:	**$224.68**
	2nd Qtr		
GW (G1/G2 List)	$232.25	10	$2322.50
Tank	$183.71	1	$183.71
		Q2 Total:	**$2506.21**
	3rd Qtr		
GW (List G1)	$224.68	1	$224.68
		Q3 Total:	**$224.68**
	4th Qtr		
GW (G1/G2 List)	$377.38	10	$3773.80
		Q4 Total:	**$3773.80**
		Annual Total:	**$6,729.37**

Outtakes from 6-20-25 Revisions

Others

from L-50-52

Revisions

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

39(i) Certification for Operating a Waste Management Facility

Pursuant to 415 ILCS 5/39(i), prior to issuing any RCRA permit, or any permit for a waste storage site, sanitary landfill, waste disposal site, waste transfer station, waste treatment facility, waste incinerator, clean construction or demolition debris fill operation, or used tire storage site, the Illinois EPA must conduct an evaluation of the prospective owner's or operator's prior experience in waste management operations, clean construction or demolition debris fill operations, and tire storage site management. As part of that evaluation please complete and submit this form with your permit application.

This form may be completed online and saved locally before printing, signing and submitting it to the Illinois EPA at the address below. If the form is completed manually, please type or print clearly.

Illinois Environmental Protection Agency
Division of Land Pollution Control - #33
39(i) Certification
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

I. Applicant Information

Site Name: Zion Site 1 Landfill — IEPA BOL No.: 0978020001

Site Address: 701 Green Bay Road

City: Zion — State: IL — Zip Code: 60099

Permit Numbers (if applicable): B-23R

Owner

Owner Name: Zion Landfill, Inc.

Street Address: 701 Green Bay Road

City: Zion — State: IL — Zip: 60099

Operator

Operator Name: BFI Waste Systems of North America, LLC

Street Address: 26 W. 580 Schick Rd.

City: Hanover Par — State: IL — Zip: 60099

Is this 39(i) certification for the owner or the operator?

○ Owner ◉ Operator ○ Owner and operator are the same entity

II. Officers and Employees with Site Responsibility

Unless the owner and operator are the same entity, a separate 39(i) form must be submitted for both the owner and operator. Persons operating under the authority of the owner should be listed on the owner's 39(i) form and persons operating under authority of the operator should be listed on the operator's 39(i) form.

A. Officers: List the name and title of all officers of the owner or operator that will have personal involvement or active participation in the operation or management of the site or facility for which the application is submitted.

Name	Title
Matthew Healy	Vice President

B. Employees: List the name and title of each employee of the owner or operator that will have personal involvement or active participation in the overall operation or management of the site or facility for which the application is submitted (e.g. site managers, site engineers, and other persons who direct or control the overall day-to-day management of the operation, but not persons whose duties are exclusively limited to equipment operation, labor, or similar non-managerial functions).

Name	Title
James Hitzeroth	Environmental Manager

III. Owner, Operator, Officer, and Employee Information

A. Prior Conduct Identification

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified under Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and include a copy of each final administrative or judicial determination that required an affirmative response. If the information for each owner, operator, officer, and employee has not changed since the applicant's last submission of a 39(i) certification, the applicant can skip to Section III(C), below.

1) Has there been a finding that any person named in Section II violated federal, State, or local laws, regulations, standards, or ordinances in the operation of one or more waste management facilities or sites, clean construction or demolition debris fill operation facilities or sites, or tire storage sites? ○ Yes ⊘ No

2) Has any person named in Section II ever been convicted in this or another State of any crime which is a felony under the laws of this State, or convicted of a felony in a federal court; or convicted in this or another state or federal court of any of the following crimes: forgery, official misconduct, bribery, perjury, or knowingly submitting false information under any environmental law, regulation, or permit term or condition? ○ Yes ⊘ No

3) Has there been a finding against any person named in Section II of gross carelessness or incompetence in handling, storing, processing, transporting or disposing of waste, clean construction or demolition debris, or used or waste tires, or a finding of gross carelessness or incompetence in using clean construction or demolition debris as fill? ○ Yes ⊘ No

B. Pending Proceedings

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified in Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and provide information identified in Attachment A regarding the pending proceeding.

1. Is there any proceeding currently pending against any person named in Section II that could result in a conviction or finding described in subsection A, above? ○ Yes ⊘ No

2. Is there any proceeding currently pending against any person named in Section II that could result in the reversal of a conviction or finding described in subsection A, above? ○ Yes ⊘ No

C. Prior Application Information

If (i) the applicant has previously submitted the Attachments required pursuant to subsections A and B above and (ii) the Attachments previously submitted are still complete, true, and correct, then the applicant does not need to include Attachments with this submission if the following box is checked:

☐ By checking this box, I affirm that the Attachments previously submitted are still complete, true, and correct and wish to incorporate them into this Certification.

If the above box is checked, identify the application that contains the previously submitted Attachments that are complete, true, and correct.

Authorization for Release of Information

This Certification must be signed by an officer of the applicant.

The undersigned authorizes any representative of the Illinois Environmental Protection Agency bearing this release to obtain any information from the Illinois State Police pertaining to the criminal records of the applicant and hereby directs the Illinois State Police to release such information upon request of the bearer. The undersigned authorizes a review of and full disclosure of all records, or any part thereof, concerning the applicant's criminal records by and to a duly authorized agent of the Illinois Environmental Protection Agency, whether the records are of public, private, or confidential nature. The intent of this authorization is to give consent for full and complete disclosure of the applicant's criminal records.

The undersigned fully understands that any information which is developed directly or indirectly, in whole or in part, as a result of this authorization will be considered in determining whether a permit shall be issued by the Illinois Environmental Protection Agency under the Environmental Protection Act [415 ILCS 5]. The undersigned further agrees to release the Illinois State Police and the Illinois Environmental Protection Agency, its agents and designees under this release, from any and all liability which may be incurred as a result of compliance with this authorization for release of information.

Certification Statements

I certify under penalty of law that the information submitted, including information on any Attachments submitted as part of or incorporated into this Certification, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Signature of Applicant Officer

05/04/2021
Date

Matthew Healy
Printed Name

Vice President
Title

Attachment A (1 of 1)

This Attachment must be completed for each owner or operator, and for each officer or employee identified in Section II, for whom one or more affirmative responses were included in Section III.

Name: _____ Title: _____

Status: ☐ Owner ☐ Operator ☐ Officer ☐ Employee (check all that apply)

A. Prior Findings or Convictions

1. Has there been a finding that the person named above violated federal, State, or local laws, regulations, standards, or ordinances in the operation of one or more waste management facilities or sites, clean construction or demolition debris fill operation facilities or sites, or tire storage sites? ○ Yes ○ No

2. Has the person named above ever been convicted in this or another State of any crime which is a felony under the laws of this State, or convicted of a felony in a federal court; or convicted in this or another state or federal court of any of the following crimes: forgery, official misconduct, bribery, perjury, or knowingly submitting false information under any environmental law, regulation, or permit term or condition? ○ Yes ○ No

3. Has there been a finding against the person named above of gross carelessness or incompetence in handling, storing, processing, transporting or disposing of waste, clean construction or demolition debris, or used or waste tires, or a finding of gross carelessness or incompetence in using clean construction or demolition debris as fill? ○ Yes ○ No

If the answer to any of the above questions is Yes, attach a copy of each final administrative or judicial determination that required an affirmative response.

B. Pending Proceedings

Is there any proceeding currently pending that could result in one of the following:

1. A conviction or finding described in subsection A, above? ○ Yes ○ No

2. The reversal of a conviction or finding described in subsection A, above? ○ Yes ○ No

If the answer to any of the above questions is Yes, please provide information about the pending proceeding, including the parties involved, the adjudicating body, the docket number, the nature of the proceeding, and the status. The box below will expand as needed. Attach additional sheets if necessary.

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

39(i) Certification
for Operating a Waste Management Facility

Pursuant to 415 ILCS 5/39(i), prior to issuing any RCRA permit, or any permit for a waste storage site, sanitary landfill, waste disposal site, waste transfer station, waste treatment facility, waste incinerator, clean construction or demolition debris fill operation, or used tire storage site, the Illinois EPA must conduct an evaluation of the prospective owner's or operator's prior experience in waste management operations, clean construction or demolition debris fill operations, and tire storage site management. As part of that evaluation please complete and submit this form with your permit application.

This form may be completed online and saved locally before printing, signing and submitting it to the Illinois EPA at the address below. If the form is completed manually, please type or print clearly.

Illinois Environmental Protection Agency
Division of Land Pollution Control - #33
39(i) Certification
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

I. Applicant Information

Site Name: Zion Site 1 Landfill — IEPA BOL No.: 0978020001

Site Address: 701 Green Bay Road

City: Zion — State: IL — Zip Code: 60099

Permit Numbers (if applicable): B-23R

Owner

Owner Name: Zion Landfill, Inc.

Street Address: 701 Green Bay Road

City: Zion — State: IL — Zip: 60099

Operator

Operator Name: BFI Waste Systems of North America, LLC

Street Address: 26 W. 580 Schick Rd.

City: Hanover Par — State: IL — Zip: 60099

Is this 39(i) certification for the owner or the operator?

☑ Owner ○ Operator ○ Owner and operator are the same entity

II. Officers and Employees with Site Responsibility

Unless the owner and operator are the same entity, a separate 39(i) form must be submitted for both the owner and operator. Persons operating under the authority of the owner should be listed on the owner's 39(i) form and persons operating under authority of the operator should be listed on the operator's 39(i) form.

A. Officers: List the name and title of all officers of the owner or operator that will have personal involvement or active participation in the operation or management of the site or facility for which the application is submitted.

Name	Title
Mike Stoeckigt	Region Vice President

B. Employees: List the name and title of each employee of the owner or operator that will have personal involvement or active participation in the overall operation or management of the site or facility for which the application is submitted (e.g. site managers, site engineers, and other persons who direct or control the overall day-to-day management of the operation, but not persons whose duties are exclusively limited to equipment operation, labor, or similar non-managerial functions).

Name	Title
James Lewis	

III. Owner, Operator, Officer, and Employee Information

A. Prior Conduct Identification

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified under Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and include a copy of each final administrative or judicial determination that required an affirmative response. If the information for each owner, operator, officer, and employee has not changed since the applicant's last submission of a 39(i) certification, the applicant can skip to Section III(C), below.

1) Has there been a finding that any person named in Section II violated federal, State, or local laws, regulations, standards, or ordinances in the operation of one or more waste management facilities or sites, clean construction or demolition debris fill operation facilities or sites, or tire storage sites? ○ Yes ⊘ No

2) Has any person named in Section II ever been convicted in this or another State of any crime which is a felony under the laws of this State, or convicted of a felony in a federal court; or convicted in this or another state or federal court of any of the following crimes: forgery, official misconduct, bribery, perjury, or knowingly submitting false information under any environmental law, regulation, or permit term or condition? ○ Yes ⊘ No

3) Has there been a finding against any person named in Section II of gross carelessness or incompetence in handling, storing, processing, transporting or disposing of waste, clean construction or demolition debris, or used or waste tires, or a finding of gross carelessness or incompetence in using clean construction or demolition debris as fill? ○ Yes ⊘ No

B. Pending Proceedings

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified in Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and provide information identified in Attachment A regarding the pending proceeding.

1. Is there any proceeding currently pending against any person named in Section II that could result in a conviction or finding described in subsection A, above? ○ Yes ⊘ No

2. Is there any proceeding currently pending against any person named in Section II that could result in the reversal of a conviction or finding described in subsection A, above? ○ Yes ⊘ No

C. Prior Application Information

If (i) the applicant has previously submitted the Attachments required pursuant to subsections A and B above and (ii) the Attachments previously submitted are still complete, true, and correct, then the applicant does not need to include Attachments with this submission if the following box is checked:

☐ By checking this box, I affirm that the Attachments previously submitted are still complete, true, and correct and wish to incorporate them into this Certification.

If the above box is checked, identify the application that contains the previously submitted Attachments that are complete, true, and correct.

Authorization for Release of Information

This Certification must be signed by an officer of the applicant.

The undersigned authorizes any representative of the Illinois Environmental Protection Agency bearing this release to obtain any information from the Illinois State Police pertaining to the criminal records of the applicant and hereby directs the Illinois State Police to release such information upon request of the bearer. The undersigned authorizes a review of and full disclosure of all records, or any part thereof, concerning the applicant's criminal records by and to a duly authorized agent of the Illinois Environmental Protection Agency, whether the records are of public, private, or confidential nature. The intent of this authorization is to give consent for full and complete disclosure of the applicant's criminal records.

The undersigned fully understands that any information which is developed directly or indirectly, in whole or in part, as a result of this authorization will be considered in determining whether a permit shall be issued by the Illinois Environmental Protection Agency under the Environmental Protection Act [415 ILCS 5]. The undersigned further agrees to release the Illinois State Police and the Illinois Environmental Protection Agency, its agents and designees under this release, from any and all liability which may be incurred as a result of compliance with this authorization for release of information.

Certification Statements

I certify under penalty of law that the information submitted, including information on any Attachments submitted as part of or incorporated into this Certification, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Signature of Applicant Officer

4-26-21
Date

MIKE STOECKIGT
Printed Name

REGION VICE PRESIDENT
Title

Attachment A (1 of 1)

This Attachment must be completed for each owner or operator, and for each officer or employee identified in Section II, for whom one or more affirmative responses were included in Section III.

Name: _____ Title: _____

Status: ☐ Owner ☐ Operator ☐ Officer ☐ Employee (check all that apply)

A. Prior Findings or Convictions

1. Has there been a finding that the person named above violated federal, State, or local laws, regulations, standards, or ordinances in the operation of one or more waste management facilities or sites, clean construction or demolition debris fill operation facilities or sites, or tire storage sites? ○ Yes ○ No

2. Has the person named above ever been convicted in this or another State of any crime which is a felony under the laws of this State, or convicted of a felony in a federal court; or convicted in this or another state or federal court of any of the following crimes: forgery, official misconduct, bribery, perjury, or knowingly submitting false information under any environmental law, regulation, or permit term or condition? ○ Yes ○ No

3. Has there been a finding against the person named above of gross carelessness or incompetence in handling, storing, processing, transporting or disposing of waste, clean construction or demolition debris, or used or waste tires, or a finding of gross carelessness or incompetence in using clean construction or demolition debris as fill? ○ Yes ○ No

If the answer to any of the above questions is Yes, attach a copy of each final administrative or judicial determination that required an affirmative response.

B. Pending Proceedings

Is there any proceeding currently pending that could result in one of the following:

1. A conviction or finding described in subsection A, above? ○ Yes ○ No

2. The reversal of a conviction or finding described in subsection A, above? ○ Yes ○ No

If the answer to any of the above questions is Yes, please provide information about the pending proceeding, including the parties involved, the adjudicating body, the docket number, the nature of the proceeding, and the status. The box below will expand as needed. Attach additional sheets if necessary.

Outtakes from 6-6-25 Revisions

ORG R 002915

File 0120-037-01-05
May 6, 2021

RCRA PART B POST-CLOSURE PERMIT RENEWAL APPLICATION ZION SITE 1, PHASE A LANDFILL

VOLUME I a

SECTION A TO F

IEPA Site No. 0978020001
ILD 980700728

Prepared For:

BFI Waste Systems of North America, LLC
26 West 580 Schick Rd.
Hanover Park, IL 60103

PREPARED BY

Weaver Consultants Group

File 0120-037-01-05
May 6, 2021

RCRA PART B POST-CLOSURE PERMIT RENEWAL APPLICATION ZION SITE 1, PHASE A LANDFILL

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RCRA PART B POST-CLOSURE PERMIT RENEWAL APPLICATION ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

RCRA PART B POST-CLOSURE PERMIT RENEWAL APPLICATION ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

TABLE OF CONTENTS

List of Figures

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

List of Tables

List of Appendices (A-1 through E-11 contained in **Volume I** and E-12 through E-24 contained in **Volume II)**

Volume I:

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

File 0120-037-01-05
May 6, 2021

RCRA PART B POST-CLOSURE PERMIT RENEWAL APPLICATION ZION SITE 1, PHASE A LANDFILL

VOLUME I a

SECTION A TO SECTION F

IEPA Site No. 0978020001

ILD 980700728

Prepared For:

BFI Waste Systems of North America, LLC
26 West 580 Schick Rd.
Hanover Park, IL 60103

PREPARED BY

Weaver Consultants Group

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

List of Figures

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

List of Tables

List of Appendices (A-1 through E-11 contained in **Volume I** and E-12 through E-24 contained in **Volume II)**

Volume I:

RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL

TABLE OF CONTENTS

A. FORMS, CERTIFICATIONS, CONFIDENTIALITY, PUBLIC INVOLVEMENT

A.1 RCRA Part A Application Form

A Part A Application is included in **Appendix A-1**. The Part A application has been signed by the facility Owner and Operator.

A.2 Certification Using the LPC-PA23 Form

A completed LPC-PA23 form is also provided in **Appendix A-1**, also signed by the Owner and Operator.

A.2.1 Facility Certification

The appropriate certification statement signed by the facility Owner and Operator is included on the LPC-PA23 Form, which is presented in **Appendix A-1**.

A.2.2 Technical Information Certification

The certification of the technical information presented in this application is included on the LPC-PA23 Form, which is presented in **Appendix A-1**.

A.2.3 39i Certification

The 39i Certifications for the facility Owner and Operator are presented in **Appendix A-2**. As the owner and operator are different entities, a separate form is provided for both the Owner (Zion Landfill, Inc.) and Operator (BFI Waste Systems of North America, LLC).

A.3 Public Disclosure Exemption Claims and Trade Secret Claims

Section A.3 is not applicable because the owner/operator:

- Is not requesting a public disclosure exemption;
- Is not invoking a trade secret claim; or
- Is not asserting that any portion of the submittal is regarded as privileged in relation to this application.

A.3.1 No Information Claimed Exempt from Public Disclosure

No information in this application is claimed exempt from public disclosure. Therefore subsections A.3.2, A.3.3, and A.3.4 are not applicable.

A.4 Public Participation: Facility Mailing List & Information Repositories

A.4.1 Facility Mailing List

A Facility Mailing List has been established that includes a list of entities who must be notified of permit-related activities. The most recent version of the Facility Mailing List (obtained from Illinois EPA in April 2021) is included in **Appendix A-3.**

The list will be updated and resubmitted to the Illinois EPA as needed to include individuals who have interacted with the facility, such as: respondents to mailings and those attending public meetings when a permit modification is requested. If mail to contacts on the Facility Mailing list is returned, then those contacts will be removed. Illinois EPA will review and approve all updates prior to using an updated mailing list.

A.4.2 Identification of Repository

A copy of this Permit Renewal Application has been placed on file at the following locations:

Zion-Benton Public Library
2400 Gabriel Ave.
Zion, IL 60099
Ph: (847) 872-4680

The library hours for limited lobby service currently are:

- Mon, Wed, Th: 10 AM – 6 PM
- Tue: 10 AM- 7 PM
- Sat: 10 AM – 5 PM

Office of County Board Chair
Lake Co. Board Office
18 North County Street
Waukegan, IL 60085

Contact info:

Ms. Sandy Hart
Lake County Board Chair
Ph: (847) 377-2300

Business hours are: 8:30 AM – 4:30 PM (M-F).

A.4.3 Contents of Repository

The above repositories contain a copy of this Permit Renewal Application. If revisions are made to this application after review by Illinois EPA, then the additional information will also be added to the repository.

A.4.4 Public Notice of Repository Availability

Together with the submission of this application to Illinois EPA, a notice has been sent to the facility mailing list including the following information:

1. Identification and address of the facility and the hazardous waste management operations that the permit application addresses;
2. A statement that the permit application materials have been prepared and are available for community members to review and copy at the repositories;
3. The location and business hours of the repositories;
4. A statement that the applicant will update the repository materials periodically during the Illinois EPA's review of the permit application;
5. The name, address and telephone number of the applicant's contact person to address questions regarding the application or to be added to the facility's mailing list for future permit activities; and
6. The following statement: "For general information on the hazardous waste management permit program in Illinois, please contact: the Illinois EPA RCRA Community Involvement Coordinator".

This notice was made no later than the date the permit application was submitted to the Illinois EPA. A copy of the notice distributed to the above referenced facility mailing list is provided in **Appendix A-3**. The notice was sent via certified mail.

B. FACILITY DESCRIPTION

B.1 General Facility Description

The most recent version of the effective Hazardous Waste Management RCRA Post-Closure Permit (Permit) issued by the Illinois EPA Bureau of Land is Mod No. 7, dated March 12, 2018. Permit Modification No. 7 references the permit conditions contained in the eight sections and two attachments issued by Illinois EPA in the Permit dated July 28, 2015. A copy of the effective facility Permit (including both the March 12, 2018 and July 28, 2015 versions of the document) are presented in **Appendix B-1**.

A description of the facility is provided in Section I of the Hazardous Waste Management RCRA Post Closure Permit Log No. B-23R (Permit). The following general facility description summary is based on information contained in Section I of the effective Permit. A General Facility Layout is provided as **Figure B-1**.

The original waste disposal permit for the facility was issued to Browning-Ferris Industries (BFI) to operate a 59-acre solid waste disposal facility at the location now known as Zion Site 1 Landfill in October 1976. The waste disposal area comprised approximately 40 acres. This permit was issued before the effective date of the RCRA hazardous waste regulations. The RCRA hazardous waste regulations became effective in November 1980 and the Zion Site 1 Landfill operated under RCRA hazardous waste interim standards from 1980 until the first RCRA disposal permit was issued by Illinois EPA in April 1988.

During operation, the above 40-acre waste disposal facility received mainly non-hazardous waste, but some hazardous waste was disposed in the unit currently known as Site 1, Phase A. BFI ceased disposing hazardous waste in this unit in 1990. Closure activities were completed for Site 1, Phase A in 1997 and BFI certified completion of closure on February 10, 1998.

Ten acres of the initially permitted Zion Landfill Site 1 were re-permitted by Illinois EPA for disposal of only non-hazardous waste on June 24, 1994. This portion of the facility came to be known as the Zion Landfill Site 1, Phase B, which is unrelated to this permit renewal application. This landfilling operation occurred in two cells: Cell 1, consisting of approximately 4.9 acres and Cell 2, consisting of approximately 4.7 acres. Non-hazardous waste was disposed in these units from 1994 until 1996. Closure activities for both cells were completed in 1998 and Illinois EPA approved the certification of closure of these units on August 28, 1998.

The remaining approximately 10 acres of the originally permitted 59-acre facility house ancillary equipment and structures associated with the Site 1, Phase A and B landfills, including:

- Tanks and associated loading areas used to manage the collected leachate before it is sent off-site for treatment; and
- Blowers, flare, and gas to energy station associated with the gas management system at the facility.

The area to the east of Site 1, Phase A (Site 1A) is a permitted operating non-hazardous waste landfill currently owned and operated by GFL Environmental. (this facility is also unrelated to this permit renewal application). Zion Landfill, Inc. is the entity that owns the Zion Landfill Site 1, however as the operator, BFI has retained the post-closure care responsibilities for the Zion Landfill Site 1A (RCRA unit) and Site 1B (non-hazardous unit).

B.1.1 Operation of the Facility

The Zion Landfill is located at 9th Street and Green Bay Road within the City limits of Zion, Lake County, Illinois. The closed hazardous waste landfill identified as the Zion Landfill Site 1A is in Benton Township.

The activities included in the Hazardous Waste Management RCRA Post-Closure Permit that are the subject of this Permit Renewal Application (i.e., Site 1, Phase A) occur on approximately 49 acres. Most of the surrounding acreage is utilized for non-hazardous solid waste disposal-related activities, including the following:

- Site 1, Phase B, which is comprised of two cells (Cell No. 1 and Cell No. 2) that contain non-hazardous waste (no hazardous waste), which are also closed, as described above; and
- Site 2, which also contains only solid waste (no hazardous waste), in which the western portion is closed, but the eastern portion is still active and currently owned and operated by GFL Environmental.

A legal description of the facility developed and certified by a professional land surveyor licensed to practice in Illinois is presented in **Appendix B-2**. The Tax Property Identification Numbers of the land which comprises the facility is 03-12-200-016 and 04-07-200-013.

B.1.2 Hazardous Waste Management Units at the Facility

Prior to 1991, the Zion Landfill commercially accepted RCRA hazardous waste into the section permitted for this activity (Site 1A). The disposal footprint for Site 1A is approximately 40 acres. The hazardous wastes disposed at the facility originated from a range of business and industry including manufacturing, petrochemical, steel, utilities, and government. No hazardous waste has been accepted into Site 1 Phase A since 1990 and the Site 1 Phase A landfill has been closed since 1998. According to Permit Condition III.A, the permittee must continue to provide post-closure care for Site 1A until at least February 9, 2028.

B.1.3 Solid Waste Management Units at the Facility

No solid waste management units that are currently subject to RCRA Corrective Action have been identified at the facility to date.

B.2 Topographic Map

B.2.1 Facility + 1 Mile

Figure B-2 is a 2018 USGS topographic map including areas within 1 mile around the closed Site 1A RCRA unit. This map depicts the boundary of the Site 1A facility and the surrounding land uses.

The site is located within the City of Zion limits. Other former waste disposal units associated with the Zion Landfill are located to the east and west of the Zion Landfill Site 1A. The former waste disposal areas immediately bordering Site 1A are also closed and have also received final cover. The Shepherds Crook Golf Course is located north and west of Site 1A. Property south of Site 1A is presently used for agricultural purposes, while residential land use is present to the southeast of Site 1A.

B.2.2 Facility + 1,000 Feet

Figure B-3 is the 2020 topographic map of the facility, along with areas surrounding the facility. This map is at a scale of 1 inch equals 200 feet, with a contour interval that is sufficient to show the pattern of surface water flow in the vicinity of and from the Zion Landfill Site 1A. Additional drawings showing other site features are provided elsewhere in this Permit Renewal Application.

The above map contains the following, as required by 35 IAC 703.183(s):

- Map orientation, date, and scale;
- Legal boundary of the facility;
- Surrounding land uses (included on **Figure B-2**);
- Access controls;
- Buildings and structures;
- Storm drains, sewers, sanitary and process;
- Waste injection or groundwater withdrawal wells;
- Run-on/run-off control systems
- Fire control facilities (i.e. fire extinguishers);
- Wind rose (provided separately as **Appendix B-3**);
- Hazardous waste management units;
- Applicable equipment; and
- Surface waters, including intermittent streams.

The following items are listed in 35 IAC 703.183(s), but not applicable to the Zion Site 1A facility and therefore not shown on either **Figure B-2** or **Figure B-3**:

- Areas in the 100 year flood plain (neither the facility, nor areas within 1,000 feet of the facility are located within the 100 year flood plain – see letter from FEMA in **Appendix B-4**);
- Flood control or drainage barriers; and
- Solid waste management units (SWMUs). No SWMUs have been identified at the facility.

B.3 Location Standards

B.3.1 Seismic Standard

Nothing has changed relative to the seismic standards described in the originally approved RCRA Part B Permit Application prepared prior to issuance of the 1988 permit. Therefore, no additional information is provided in this Application and no permit modifications are requested relative to the seismic standards.

B.3.2 Floodplain Standard

Appendix B-4 contains an April 24, 1996 letter from the Federal Emergency Management Agency (FEMA) reflecting that the site is not located within the limits of a 100-year floodplain area. The FEMA map included in the original Part B Permit Application showed a small area approximately 400-feet north and a larger around approximately 1,600 feet east of the Site 1 Phase A landfill as being A Zones which are considered flood hazards. The updated FEMA map has removed these A Zones. The latest available FIRM maps from FEMA (confirming that the site is not located within a 100-year floodplain) are dated 2013 and are also included in **Appendix B-4.**

B.3.3 Facilities in the 100-year Floodplain

As the facility is not located within the 100-year floodplain, this section and subsections are not applicable.

B.4 Operating Record

The operating record will include results of post-closure groundwater sampling, analyses, and statistical evaluation; inspection reports; training records; leachate removal records; and annual reports. The operating record will be retained at the facility or a secure location at another office of the owner or operator.

C. GROUNDWATER MONITORING

C.1 Exemption from Groundwater Protection Requirement

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.1.1 Waste Piles

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.1.2 Landfill

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.1.3 No Migration

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.2 Interim Status Groundwater Monitoring Data

The permittee has submitted regular quarterly and annual groundwater monitoring reports to Illinois EPA in accordance with prior permits. Copies of these reports, as well as interim status groundwater monitoring reports are contained in the operating record, as well as Illinois EPA files. Due to the significant volume of these historical reports and consistent with the most recent permit renewal application, they have not been reproduced for this Permit Renewal Application.

Many of the original permitted wells were damaged during various prior landfill construction activities. In 1991, low level volatile organic constituents (VOCs) were detected in some of these wells. The permittee notified Illinois EPA of the situation and initiated several investigations. The conclusion of the investigations, which were submitted to Illinois EPA, was that the source of the contamination was landfill gas. Damaged wells and wells that had gone dry due to construction activities were acting as conduits for the gas. To address the issue, in March 1992, the permittee submitted a Class 3 Modification proposing corrective action which included the construction of an active gas extraction system at the site. The gas extraction

system was approved under a Temporary Authorization on July 16, 1996. The system was installed in 1997 and certified in 1998. Technical details pertaining to this system are discussed below in Section E.5.

Other actions taken in response to the 1991 VOC detections included replacing damaged wells. Several wells were replaced in 1992 and 1993 in accordance with Illinois EPA approvals. In March 2000, damaged wells A129 and G139 were replaced with R129 and A139 respectively.

C.3 Historical Hydrogeological Summary

Throughout the history of the Zion Landfill, including both solid and hazardous waste programs, at least 30 subsurface investigations have been conducted for various purposes, including hydrogeologic exploration and piezometer/monitoring well installation. Since 1975, over 250 borings, piezometers, gas probes, monitoring wells, and replacement wells have been drilled and/or installed on the combined properties of the facility. Approximately 300 additional holes have been dug for trench probe inspections on Sites 1 and 2.

The initial hydrogeologic report for Site 1 was prepared by Soil Testing Services, Inc. (STS, 1975). It was based on ten soil borings installed in November 1974. Using that data and data from ten additional borings in the eastern portion of the site, James Douglas Andrews, P.E., Environmental Engineering, Inc., prepared additional reports as part of the 1980 Application for Permit (Andrews, 1980; STS, 1980). These reports discussed various aspects of hydrogeological conditions below the facility.

In late 1983 and early 1984, hydrogeologic investigations were conducted by Wehran Engineering and Recra Research, Inc. to further develop site-specific information that was used in the original RCRA Part B Permit Application. The Recra Research report was included in the original application.

After these investigations, borings have been installed to place or replace monitoring wells and piezometers. Further, hydrogeologic studies have been conducted on portions of the landfill lying north, west, and east of Site 1A to satisfy various solid waste permitting requirements.

In 1995, in preparation for a solid waste landfill expansion, Roberta Jennings & Belinda Staurowsky – Consulting Hydrogeologists integrated all previous investigations at the site into one inclusive report. Although the primary focus of the report was the expansion area east of the Zion Site 1A Landfill, the report also summarized the Site 1A features. The hydrogeologic

discussion from the report and key figures and tables are provided in **Appendix C-1. Appendix C-1** contains a drawing (No. 31) from the Jennings report showing the average groundwater flow beneath the property. The drawing was developed using groundwater elevations from several years. A summary of the hydrogeologic investigations conducted at the site is also provided in **Appendix C-1**.

The Jennings report indicates the hydrogeologic conditions beneath the site are substantially the same as described in the original Part B Permit Application. Following is a summary of the conditions.

- Natural ground surface elevation at the site ranges from approximately 720 feet mean sea level (MSL) to 760 feet MSL.
- The uppermost aquifer unit is the glacial till. The unit is approximately 100 feet thick and consists of a weathered portion and unweathered portion. The weathered portion ranges in thickness from about 10 to 20 feet, including approximately two feet of topsoil. Below the weathered portion lies 80 to 90 feet of unweathered clay soil.
- Within the glacial tills are isolated, discontinuous lenses of silts and silty clayey sands, which are interpreted as interglacial lacustrofluvial deposits. In general, when these intra-till sorted sediments are present, they are encountered between 20 to 60 feet below the ground surface.
- The intra-till sorted sediments do not constitute an aquifer. However, because the sediments are more permeable than the surrounding till, the intra-till sorted sediment units are monitored as potential contaminant pathways. Based on the hydraulic conductivities, these sediments do not meet the requirements of 35 IAC 620.210 for Class I, Potable Resource Groundwater. The hydraulic gradients through these sediments are predominantly vertical, with horizontal flow negligible, except to and from an intercepting well or where sorted sediments intersect a surface boundary such as the wall of an excavation.
- Locally continuous interglacial sand is continuous beneath the landfill at approximately 100 feet. Beneath Site 1A, this sand layer is approximately 20 to 50 feet thick. This zone has been referred to historically and herein as the "shallow drift aquifer".
- The shallow drift aquifer is the uppermost aquifer underlying the site for purposes of this application. This aquifer is in the interglacial sand deposits. This unit meets the

definition of 35 IAC 620.210 for Class I, Potable Resource Groundwater. Vertical flow predominates, although horizontal flow is also present. The horizontal flow beneath Site 1A is complex. Water flows toward the center of the site from both the northwest and southeast and then flows downgradient to the east-northeast. This approximates the geologic structure beneath the site that appears to include a stream channel deposit near the center of the site.

- Beneath the sand layer lies an unconsolidated material consisting of interfingering dense clay, silty clay/clayey silt, sandy clay, clayey sand and fine silty sand. In general, this material has a higher percentage of coarser grained material than the upper till unit.
- A second sand unit is encountered at approximately 150 feet below ground surface. This sand layer is approximately 15 to 60 feet thick.
- Bedrock is encountered at approximately 200 to 225 feet below ground surface.

A summary of the hydraulic properties of various soil units beneath the Zion Site 1A Landfill is presented below.

Glacial Till

Property	Approximate Value	Source of Data
Particle Size Analysis	Clay: aprox. 39% Silt: aprox. 42% Sand: aprox. 19%	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995
Porosity	30%	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995
Hydraulic Conductivity	2.80×10^{-8} cm/sec (recompacted) 2.65×10^{-8} cm/sec (mean value for site)	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995

Intratill Sediments

Property	Approximate Value	Source of Data
Porosity	40%	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995
Transmissivity	0.09 to 53.18 gal/day/ft	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995
Hydraulic Conductivity	3.66×10^{-5} cm/sec (geometric mean)	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995

Interglacial Sand / Shallow Drift Aquifer

Property	Approximate Value	Source of Data
Porosity	25-50%	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995
Transmissivity	< 1 to > 12,000 gal/day/ft	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995
Hydraulic Conductivity	3.97×10^{-4} cm/sec (geometric mean)	Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995
General Flow Direction	Generally to the East	Four quarters of potentiometric contour maps from 1995 and 2009 and 2019/2020
Rate	1.02 ft./year (average over 4 quarters)	Four quarters of groundwater elevation contour maps from 1995

C.4 Topographic Map Requirements

In accordance with 35 IAC 703.183(s), the topographic map is included as **Figure B-3**. A legal description of the Site 1A property boundary is included in **Appendix B-2**. The following information referenced in the above regulation is provided elsewhere in the application as follows:

- The wind rose for the area is provided in **Appendix B-3**;
- There is no 100 year flood plain located within 1,000 feet of the facility (see documentation from FEMA in **Appendix B-4**);
- Surrounding land uses are shown on **Figure B-2** (Site Location/Surrounding Land Use Map);
- Injection and withdrawal wells are shown on **Figure C-1** (Groundwater Monitoring Network) and maps included in **Appendix C-1**; and
- Streams and surface waters are shown on **Figure B-2** (Site Location/Surrounding Land Use Map).

The topographic map shows the waste management area and property boundary. The location of the groundwater monitoring wells is also provided on **Figure B-3**.

The point of compliance is shown on **Figure C-1**. The point of compliance is specified by Illinois EPA and is the point at which the groundwater protection standard applies and at which monitoring is conducted. The groundwater protection standard is based upon the greater of the statistical background value as calculated by the methods included herein or the 35 IAC 620 Class I Groundwater Quality Standard, or two times the PQL (depending upon the frequency of detection in the background data). The point of compliance is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends downward into the uppermost aquifer underlying the regulated units.

The general groundwater flow direction in the shallow drift aquifer is from west to east, with a slight component to the northeast over the southern portion of Site 1A. Thus, monitoring wells to the west of Site 1A are considered upgradient and wells to the east are downgradient. However, locally groundwater flow can be to the north and south. Historical groundwater elevation contour maps from 2009, as well as more recent contour maps from 2020 are

included in **Appendix C-2**. These maps confirm that the current groundwater flow direction in the shallow drift aquifer is consistent with the historic data.

C.5 Contaminant Plume Description

This section is not applicable. No plume of contamination from the Zion Site 1A Landfill has been identified.

C.6 Detection Monitoring Program

Detection monitoring remains the most appropriate groundwater monitoring program for Site 1A. The Detection Monitoring Program will consist of sampling groundwater monitoring wells in the shallow drift aquifer at least twice per year throughout the remainder of the post-closure care period. The "shallow drift aquifer" is the uppermost continuous aquifer beneath the facility.

Another shallower zone that yields water has been monitored throughout the current Part B permit period. Consistent with historical practices, this zone is also proposed to be monitored as part of the post-closure groundwater monitoring program proposed herein. This "shallow zone" program is also described below.

C.6.1 Indicator Parameters, Waste Constituents, Reaction Products Monitored

A list of indicator parameters has been historically monitored in the groundwater based on the wastes previously accepted for disposal at the Site 1A facility. These parameters were selected because they are persistent, detectable/quantifiable, mobile, not highly biodegradable, and generally do not exist naturally in groundwater. In addition, most of these constituents have an established 35 IAC 620 Groundwater Quality Standard.

A summary of the hazardous waste codes historically received at the Site 1A facility, along with a description that includes the basis for listing is provided on **Table C-1**. As shown in **Table C-1**, the list of indicator parameters is representative of the chemical characteristics of the hazardous waste codes historically disposed at the facility.

The indicator parameters represent families of constituents as follows:

Volatile Organics: A series of volatile organic compounds (VOCs) will be included as indicator parameters. VOCs do not occur naturally, but are prominent in the wastes historically disposed

at Site 1A and in landfill leachate and therefore represent appropriate indicator parameters. VOCs are the most common constituent related to the specific hazardous waste codes that were historically disposed in the landfill. The suite of VOCs selected is representative of a typical SW-846 8260 scan. The list of specific VOCs included is provided in **Table C-2**.

Please note that the Storet number listed in the existing permit for 1,2-Dichloropropane is presently listed as 31541. However, to be consistent with the solid waste facility permits (for Site 1 Phase B and Site 2), please modify this Storet number to 34541.

Metals and Cyanide: A series of metals representative of the historic hazardous wastes disposed at the facility will also be monitored on a regular basis, along with cyanide. Two sets of samples will be analyzed for metals. One sample container will not be filtered and the results from this container are considered to represent total metals. Another container will be filtered in the field with a 0.45 micron filter and therefore will be considered dissolved analysis. Significant concentrations of these metals generally do not occur naturally and therefore metals also represent quality indicator parameters. The specific metals selected are based upon the basis for listing the hazardous wastes that had historically been disposed at Site 1A. The list of specific metals included is provided in **Table C-2**.

In addition to the above indicator parameters, various field parameters will also be monitored, including specific conductance, pH, temperature, and turbidity. The primary purpose for collecting this data is to evaluate when the purge process can terminate and groundwater samples can be collected. Therefore, statistical comparisons between upgradient and downgradient concentrations will not be conducted for these field parameters.

C.6.2 General Monitoring Program Requirements

A groundwater detection monitoring program will be implemented to monitor groundwater beneath the facility. The uppermost aquifer monitored beneath the facility is the shallow drift aquifer.

The point of compliance is defined as the vertical surface located at the hydraulically downgradient limit of the landfill that extends down into the uppermost aquifer underlying the landfill. The point of compliance is shown on **Figure C-1**.

Shallow Drift Aquifer

The proposed groundwater monitoring system is shown on **Figure C-1**. Well locations are based on their position with respect to groundwater flow lines. In general, upgradient wells are located to the west of Site 1A. Upgradient wells are selected to be representative of groundwater that is unimpacted by Site 1A. Downgradient wells are located to the east. The point of compliance is formed by these downgradient wells. Additional monitoring wells on either side of the point of compliance (to the north and south) are in a sidegradient position relative to groundwater flow. These sidegradient wells are included in the groundwater monitoring system as a precaution to account for potential dispersion.

Shallow Zone

Throughout the current Part B permit period, the permittee has monitored shallow zone monitoring wells. The shallow zone is located approximately 50-70 feet above the shallow drift aquifer discussed above. The interglacial deposits where the shallow zone wells are screened are discontinuous. There are no known water wells in the area using water from this unit. The purpose of the shallow zone wells is to serve as an early warning system to detect potential leaks before constituents could potentially migrate to the deeper uppermost aquifer (i.e., the shallow drift aquifer).

C.6.3 Groundwater Monitoring System

A summary of the construction detail for the proposed groundwater monitoring wells is provided in **Table C-3**. This table identifies the well designations, coordinates, ground surface elevation, inside casing elevation, screen interval, bottom of well elevation, internal casing material, internal casing diameter, geologic formation monitored, and date installed. **Figure C-1** shows the location of these wells.

C.6.4 Description of Sampling and Analysis Procedures

The following sampling and analysis procedures will be followed for monitoring wells screened in both the shallow draft aquifer and the shallow zone.

Pre-Sampling Preparation

Preparation for a successful sampling event must begin in advance of field sampling operations. In as much as possible, sampling events will be scheduled at least 2-3 weeks in advance of the sampling event. This will allow time for the preparation and assembly of sampling equipment,

sampling bottles, labels, chain of custody forms, and paperwork. Prior to sampling, monitoring equipment will be assembled and carefully inspected to ensure proper working order and supply. Worn or discolored equipment will be replaced or repaired. Batteries for field meters will be checked and if necessary, replaced.

The expiration date of the calibration buffers will be checked. If expired, fresh buffers will be obtained. The field meters will be calibrated and evaluated for drift and stability. The supply of incidental sampling equipment, including the 0.45 micron filters will be evaluated.

The laboratory performing the groundwater analysis shall supply the necessary coolers, pre-cleaned containers, trip blanks, chemical preservatives, labels, custody seals, chain-of-custody and shipping forms. Sample containers need to be constructed of a material compatible and non-reactive with the material it is to contain. Adequate instructions to the laboratory must be given in advance of each monitoring event. Details concerning changes to the monitoring plan and/or procedures will be given to the laboratory in writing prior to the field sampling personnel arriving on the site. A specific contact person shall be established at both the facility and contract laboratory for communication between the two parties.

Although every effort will be made to adhere to established schedules, sampling schedules are subject to change based on factors such as weather. No sampling will occur during inclement weather conditions (i.e., when precipitation in the form of rain or snow will potentially contaminate samples, when winds are high enough to cause blowing dust and other materials to uncontrollably contaminate samples, or when the weather is so cold that it interferes with the operation of equipment or the sampling crew's ability to exercise effective quality control). The decision to postpone or delay a sampling event will be at the discretion of the Project Manager and will be reported to the Illinois EPA if such a delay extends beyond the permitted time-frame.

Water Level and Well Depth Measurements

Water levels will be measured at the monitoring wells and recorded. The depth below ground of wells that do not have a dedicated pump will be measured on an annual basis. The depth below ground of wells having a dedicated pump will be measured every five years or whenever it is pulled.

Groundwater Purging

Dedicated purge and sampling equipment serves to minimize potential cross-contamination between wells. Groundwater samples are extracted using individual dedicated submersible pumps. If dedicated sampling equipment is not functional for a sampling event, the affected well(s) will be sampled with a disposable bailer or with equipment that has been decontaminated in the field prior to the sampling event.

Groundwater will be purged prior to sampling such that the water level is not lowered to within the screen interval. Wells installed in poorly productive horizons will be purged until the water level is lowered to immediately above the well screen.

A total of three well volumes of groundwater will be purged from each well, if possible. Less volume will be purged from wells in which the static water level lies close to or within the screen interval or that recharge slowly.

The temperature, pH, and specific conductance of groundwater will be monitored regularly during purging and the results recorded.

Groundwater purged from detection monitoring wells will be directed into the adjacent perimeter stormwater ditch or disposed of on the ground within the waste limits. Groundwater purged from wells undergoing assessment and/or corrective action will be containerized and disposed with leachate.

Sample Collection

Upon arrival at the well location, observe and record the condition of the well and its surrounding area on a field information form. Carefully observe each well or piezometer for signs of deterioration or other problems (e.g. rusted or broken locks, crumbling or cracked surface pad, missing well cap, standing water, etc.). If problems are observed, report the problem to appropriate personnel. **Figure C-2** is a sample Groundwater Sampling Form. The actual format of this form may change during the life of the permit. Alternate forms may be used, if the same basic information is provided. Also, electronic forms may be utilized.

Groundwater will be sampled following purging. The pump rate will be maintained at approximately 100 ml/minute or less prior to sample collection. The groundwater level will not be lowered to within the screen interval during sampling. Field measurements for pH, specific

conductance, and temperature will be performed and recorded. Samples will be containerized in order of volatility, as listed below.

Samples will be collected in the following order:

- Field parameters,
- Volatile Organics (VOCs),
- Total metals,
- Dissolved metals, and
- Inorganics.

When sampling for VOCs, care must be exercised to minimize loss of the volatile organic compounds. Precautionary measures to be taken include:

- Drawing VOC samples slowly from the dedicated tubing. The sample container should be tilted slightly and the sample will be released slowly and allowed to run down the side of the container in a manner which minimizes sample agitation or aeration.
- Fill bottles to capacity with sample and eliminate air bubbles. This is done by overfilling the container to a point where the liquid meniscus is above the top of the container. Tightly cap container. Invert container after capping and tap to visually examine for air bubbles. Should air be detected, refill with new sample until a "zero headspace" sample is obtained.

Each piece of down hole equipment, including: submersible pumps and tubing are presently dedicated to a specific well. Filtering will be performed in-line, as the groundwater is removed from each well. Therefore, the need for decontamination of non-dedicated equipment will be minimal.

Sample Preservation and Shipment Procedures

Since multiple analyses will be required, different types of containers and preservatives will be necessary. Multiple pre-labeled containers will be supplied by the laboratory for each sampling point. The appropriate preservatives will be attached to the bottle in small vials or will have been added to each container (as required) during sample preparation by the analytical laboratory. Sample preservation should be performed immediately upon sample collection.

The sample containers and chemical preservatives to be utilized for the indicator parameters will be as follows:

Parameter Group	Container	Preservative
VOCs	40 mL glass vials w/ no headspace	HCl to pH < 2
Metals (total and dissolved)	500 mL plastic (sample unfiltered for total metals and filtered for dissolved metals)	HNO_3 to pH < 2
Cyanide	500 mL plastic	NaOH to pH > 12

Immediately after collection, bottles will be placed in coolers with ice. Samples will be maintained at approximately 4-6°C. The samples will be sent to the laboratory and will arrive (at the laboratory) within 48 hours of collection. The temperature inside the coolers containing the samples will be verified upon receipt of the coolers.

Chain of Custody Procedures

At the time each sample is taken, a chain-of-custody record will be completed and sent to the laboratory, along with the groundwater samples. **Figure C-3** is a sample chain-of-custody form. The format for this form is expected to change from time to time during the life of the permit. Alternate forms may be utilized, if the same basic information is provided.

Upon transfer of sample possession to subsequent custodians, the chain-of-custody record will be signed by the person taking custody of the sample container and the person giving up custody. Upon receipt of samples at the laboratory, the date and time of arrival will be noted on the chain-of-custody records. The laboratory receiver will verify that the seal is intact, if present, and custody has not been broken. The shipping container seal will then be broken. The chain-of-custody records will be included in the analytical report prepared by the laboratory.

As part of the chain-of-custody procedure, each sample container will be labeled with the sample identification and the parameter to be analyzed.

Quality Control Samples

Field blanks and trip blanks may be used to assess the integrity of the sampling and shipping process. At a minimum, one trip blank will be included for each cooler containing samples to be analyzed for volatile organics. Trip blanks will only be analyzed for VOCs. If the samplers have reason to suspect ambient contamination during sampling, a field blank will be analyzed for the same list of parameters using the same analytical methods as used for the groundwater samples. The blank results will be provided in the laboratory reports for the groundwater event.

Analytical Procedures

From time to time during the post-closure care period, the permittee may contract analytical services from various laboratories. In general, a single laboratory will perform analysis for one or more full calendar year(s). Each contracted laboratory will be required to provide a copy of its Laboratory Quality Control Procedures, which will be maintained by the permittee and will be available for review by Illinois EPA inspectors, upon request.

When matrix conditions within a sample allow, the practical quantitation limit (PQL) for each indicator parameter will be at least equal to the Class I groundwater quality standard listed in 35 IAC 620. The PQL is defined in 35 IAC 724.197(i)(5) as the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility. The PQL utilized will be identified on the analytical reports provided by the laboratory. Occasionally, PQLs may vary due to interferences, changes in laboratory procedures, or other factors.

The analytical methods for the indicator parameters proposed in the detection groundwater monitoring program will be as follows:

VOCs:	SW-846 8260
Total and Dissolved Ba, Cd, Cr, Pb, Ni:	SW-846 6010B
Total and Dissolved Hg:	SW-846 7470A
Cyanide:	SW-846 9012

Analytical methods will be in accordance with the latest promulgated version of USEPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods-SW-846 Third Edition, Final Update III, Revision 4". If the specific methods listed above are updated or if a new method is promulgated, then the updated method may be utilized.

C.6.5 Evaluation of Groundwater Surface

Shallow Drift Aquifer

Groundwater elevations will be measured when groundwater samples are collected. Prior to groundwater purging and sample withdrawal, an accurate depth to water-level measurement will be taken with a portable, conventional static water level indicator. The depth to water level meter will be properly decontaminated prior to the first measurement and after each measurement has been recorded for each well. The water level measurements will be recorded and a groundwater elevation contour map will be developed.

Shallow Zone

While groundwater elevations will be measured on a regular basis at wells screened in the shallow zone using the same procedures as above, a groundwater elevation contour map will not be developed for the shallow zone because this unit is discontinuous.

C.6.6 Background Quality

Background groundwater quality has been previously evaluated for both the shallow drift aquifer and shallow zone based upon the previously approved statistical procedures contained in the prior permit renewal application and the current effective Permit. The background values for the List G1 parameters were approved by Illinois EPA with Permit Modification Log # B-23R-M-1 and are listed in Section IV to the current effective Permit (see **Appendix B-1**). Background values for List G2 parameters were approved by Illinois EPA with Permit Modification Log # B-23R-M-3 and are also listed in Section IV to the current effective Permit.

No revisions to the currently approved background values are being sought as part of this Permit Renewal Application. However, a typographical error is believed to be included in the existing permit regarding the background values listed for cyanide (dissolved) and cyanide (total). The background values for both constituents are listed as 0.005 ug/L. However, prior documentation submitted to Illinois EPA indicates that the background value for both these constituents should be 5 ug/L, not 0.005 ug/L. Alternatively, the background values could be listed as 0.005 mg/L. The laboratory is unable to report to 0.005 ug/L under existing SW-846 analytical methods.

C.6.7 Statistical Evaluations

Shallow Drift Aquifer

The prediction limit statistical method previously calculated, reviewed, and approved by the Illinois EPA remains appropriate. The prediction limit method is referenced in 35 Ill. Adm. Code 724.197(h)(3) and in various guidance documents on statistical analysis of groundwater quality data published by the USEPA, including the Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance, dated March, 2009.

Background groundwater quality values have been developed for each indicator parameter. Interwell statistical procedures are being applied to the shallow drift aquifer and therefore, the background data is obtained from the upgradient wells screened in the shallow drift aquifer. The prediction limit test using the 0.01 level of significance (i.e., 99% confidence) will be the statistical method applied.

The appropriate methodology for calculating the prediction limit is based upon the normality characteristics of the background data. Normality testing has been performed on the background dataset. Data from each of the upgradient wells was pooled for subsequent statistical evaluation. Based on the Shapiro-Wilk normality tests, the data was separated according to data normality or percentage of data below the PQL. The intrawell prediction limits for normally distributed parameters was calculated according to the methods in ASTM, 2005. This method provides for prediction limit calculations based on the number of background values, the number of future observations, and the false positive rate. The prediction limit approach utilizes verification sampling to differentiate statistically significant increases from false positive errors. The prediction limit for normally distributed constituents is calculated as follows:

$$\bar{x} + s * \sqrt{1 + \frac{1}{n}} * t_{[n-1,\alpha]}$$

Where:

α is the false positive rate for each individual test (i.e., 0.01);
$t_{[n-1,\alpha]}$ is the one sided $(1-\alpha)$ 100 % point of Student's t distribution on n-1 degrees of freedom (see Table in **Appendix C-3**);
$\bar{x}$ is the mean of the data set;
s is the standard deviation of the background data set; and

n is the total number of background measurements (pooled from each of the upgradient wells).

Prediction limits for lognormally distributed data were calculated using natural logarithms of the original data. For presentation purposes, after calculation of the prediction limit, the natural logarithm prediction limits are converted back to original units.

In accordance with USEPA, 1992, the prediction limits for background data that was neither normally nor lognormally distributed were calculated using nonparametric procedures. The nonparametric prediction limits were established as the maximum detected concentration in the pooled background database. Also, parameters with greater than 50% of the background data reported below the PQL will be considered to have an indeterminate distribution. In this case, the background levels will be based on nonparametric prediction limits (i.e., the highest concentration in the pooled background data set).

Lastly, the background levels for constituents with 100 percent of the data reported below the PQL will be established based on the practical quantitation limit (PQL) for the referenced SW 846 Method.

Shallow Zone

The same statistical procedure has been applied to data collected from wells screened in the shallow zone. The only difference is that background data from each individual well was utilized for purposes of computing the background prediction limits, rather than the pooled background data from upgradient wells, as was the case for the shallow drift aquifer.

C.6.8 Statistically Significant Increases

Shallow Drift Aquifer

The procedures for evaluating for a preliminary statistically significant increase are based upon whether the indicator parameter is present in the background data set or not.

If a parameter is present in the background data, then the following procedures will apply.

The data obtained from point of compliance wells will be compared to the background prediction limit established as discussed above or the 35 IAC 620, Class I Groundwater Quality Standard, whichever is greater, each time groundwater quality is evaluated at the point of compliance.

If a parameter is not present in the background data, then the following procedures will apply.

A preliminary statistically significant increase will be identified if either of the following conditions are noted:

1. The measured concentration of a single constituent is greater than two times the PQL; or
2. The measured concentration of two (2) or more constituents is greater than the PQL for each constituent.

If a preliminary statistically significant change is noted, the permittee has the option of declaring the preliminary increase a confirmed increase without performing verification sampling or may initiate verification procedures to evaluate whether the increase will be considered confirmed. The verification procedures will include collection of another sample from the specific well(s) for the specific parameter(s) exhibiting the preliminary statistically significant increase. The verification sample will be collected within 45 days of receipt of the laboratory report that indicates a preliminary exceedance.

Collection, preservation, and analysis of the resample will be carried out in a manner as described above. Only wells and/or parameters exhibiting a preliminary statistical increase will be included in the scope of the verification sampling. The results of the resampling will be compared to the appropriate standard described above. If the resample results are equal to or less than the above standard, then detection monitoring will continue. If the second round of sampling and analysis confirms the initial findings, the permittee may declare a confirmed increase, or has the option of further evaluating the validity of the statistics using the trend analysis approach described below.

Certain naturally occurring parameters (such as certain metals) show considerable fluctuation at individual wells and at different times (both annual due to seasonal fluctuations and over longer periods of time). While routine statistical evaluation of these parameters sometimes indicate a significant change has occurred, in actuality, there has been no impact from the landfill. Rather, the change is a naturally occurring phenomena. Trends will be maintained for these parameters and the trends may be used to demonstrate the change is normal as evidenced by natural fluctuations over time.

The specific trend evaluation performed in this situation will be the Mann-Kendall Test. The Mann-Kendall test can evaluate both upward and downward trends. The Mann-Kendall Test Statistic is the difference in the number of increasing values and the number of decreasing values in the database. The test statistic, along with the sample size (*n*), will be used to calculate the corresponding probability of the trend being true. If the test statistic (*S*) is less than zero (i.e., the total number of negatives is greater than the total number of positives), then an overall downward trend is present. If the test statistic is greater than zero (i.e., the total number of positives is greater than the total number of negatives), then an upward trend is present. A description of the test methodology and assumptions associated with the Mann-Kendall Test is presented below.

The Mann-Kendall Test requires no distributional assumptions, but does require insertion of the reporting limit (i.e., the PQL) where the concentration was reported as not detected. Trend testing will be performed at a Type I error rate of 0.01 (i.e., 99% confidence). This provides a sufficient level of confidence for individual tests. Example calculations utilizing the Mann-Kendall Test are provided in both Gibbons (1994) and Gilbert (1987) and are also included within **Appendix C-3**.

The procedure for the Mann-Kendall test is as follows:

1. Order the data by sampling date: $x_1, x_2, \ldots, x_n$, where x_i is the measured value on occasion *i*.

2. Record the signs of each of the *N'* possible differences $x_{i'} - x_i$, where $i'>i$. For example, let:

$$\text{sgn}(x_{i'}-x_i) = \begin{cases} 1 & \text{if } x_{i'}-x_i > 0 \\ 0 & \text{if } x_{i'}-x_i = 0 \\ -1 & \text{if } x_{i'}-x_i < 0 \end{cases}$$

3. The Mann-Kendall statistic is then computed as:

$$S = \sum_{i=1}^{n-1} \sum_{i'=k+1} \text{sgn}(x_{i'}-x_i)$$

which is the number of positive differences minus the number of negative differences.

Values of *S, n*, and the associated probability for the test of S=0 for values of *n* up to ten are given in Table 9.4 of Gibbons (1994), which is also provided in **Appendix C-3**. For values of *n*

greater than ten, refer to Table A.21 in Hollander and Wolfe (1973), which is also provided in **Appendix C-3**. A significance level of 0.01 will be utilized. If the probability obtained from either Table 9.4 of Gibbons (1994) or Table A.21 of Hollander and Wolfe (1973) is less than 0.01, then the data set will be considered to have a statistically significant trend.

If trend analyses fail to show a pattern indicating a statistically significant upward trend, routine detection monitoring will continue.

If trend analyses show a statistically significant upward trend for the specific indicator parameter at a specific well, then it will be concluded that a statistically significant increase has occurred (in the affected well). Upon this conclusion, the permittee will notify Illinois EPA in writing within seven (7) business days indicating the affected well(s) and the parameter(s).

Unless the permittee pursues an alternate source demonstration as described below, within the specified timeframe, upon identification of a confirmed statistically significant increase, all point of compliance wells will be sampled and analyzed for the parameters listed in 35 IAC 724 Appendix I (Appendix I). If any Appendix I parameters are detected, additional sampling/analysis for the detected parameter(s) will be performed within 30 days of receipt of the final laboratory data from the initial Appendix I event. The permittee will subsequently prepare a Class 3 Permit Modification to propose a Compliance Monitoring Program for the point of compliance wells, which will be based on the results from the Appendix I sampling event(s). This Class 3 Modification application will be submitted within 120 days of receipt of the final laboratory data from the Appendix I resample event. The application must include the following information:

A) An identification of the concentration of any constituent in Appendix I detected in the groundwater at each monitoring well at the compliance point;

B) Any proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements of Section 724.199;

C) Any proposed additions or changes to the monitoring frequency, sampling and analysis procedures or methods, or statistical methods used at the facility necessary to meet the requirements of Section 724.199;

D) For each hazardous constituent detected at the compliance point, a proposed concentration limit under Section 724.194(a)(1) or (a)(2), or a

notice of intent to seek an alternate concentration limit under Section 724.194(b).

As an alternative to performing the above Appendix I sampling, the permittee also has the option of demonstrating that the confirmed statistically significant increase is from a source other than the landfill or the increase resulted from an error in sampling, analysis, or evaluation. In this instance, the permittee will proceed as follows:

1. Notify the Illinois EPA in writing that they intend to make this demonstration. This notification must be submitted to the Illinois EPA within seven (7) days of the date that the increase is discovered;
2. Submit a report to the Illinois EPA which demonstrates that a source other than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation. This report must be submitted within ninety (90) days of the date that the increase is discovered;
3. Submit to the Illinois EPA an application to make any appropriate changes to the Groundwater Detection Monitoring Program (if any). This application must be submitted within ninety (90) days of the date that the increase is discovered;
4. Continue to monitor in accordance with the detection monitoring program at the facility.

If the above demonstration is denied by the Illinois EPA, then the permittee would then be obligated to perform the Appendix I sampling referenced above. In addition, the permittee is not relieved of the requirement to submit a permit modification to begin a compliance groundwater monitoring program, unless the above demonstration successfully shows that the source of the statistical increase was related to a source other than the regulated unit or the increase resulted from error in sampling, analysis, or evaluation.

Shallow Zone

The procedures for evaluating for a statistically significant increase in the shallow zone will be the same as the procedures implemented for the shallow drift aquifer, except that the statistical analysis will be performed on an intrawell basis, rather than an interwell basis.

C.7 Compliance Monitoring Program

As discussed above, no documented impacts have been identified in the groundwater to date and the facility is implementing a detection groundwater monitoring program. Therefore, a compliance monitoring program is not required and this section is not applicable.

C.7.1 Description of the Monitoring Program

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.1 Waste Description

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.2 Concentration Limits

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.3 Compliance Point

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.4 Compliance Period

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.2 Alternate Concentration Limits

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.2.1 Adverse Effects on Groundwater Quality

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.2.2 Potential Adverse Effects Hydraulically Connected Surface Water

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.3 General Monitoring Program Requirements

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.4 Groundwater Monitoring System

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.5 Description of Sampling and Analysis Procedures

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.6 Background Quality

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.7 Statistical Evaluations

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.8 Evaluation of Groundwater Surface

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.9 Annual Appendix I

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.10 Statistically Significant Increases

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.8 Corrective Action Program

As mentioned above, presence of hazardous constituents has not been identified in the groundwater. Therefore, a corrective action program is not required, and this section and all subsections are not applicable.

C.8.1 Description of Corrective Action Program

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.1 Characterization of Contaminated Groundwater

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.2 Concentration Limits

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.3 Compliance Point

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.4 Compliance Period

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.5 Construction Detail

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.6 Effectiveness of Corrective Action

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.2 Alternate Concentration Limits

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.2.1 Adverse Effects on Groundwater Quality

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.2.2 Potential Adverse Effects on Hydraulically Connected Surface Water

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.3 Corrective Action Plan

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4 Groundwater Monitoring Program

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.1 General Monitoring Program Requirements

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.2 Groundwater Monitoring System

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.3 Description of Sampling and Analysis Procedures

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.4 Background Quality

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.5 Statistical Evaluations

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.6 Evaluation of Groundwater Surface

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.7 Extension of Compliance Period

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.8 Effectiveness of Corrective Action

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.9 Evaluation of the Corrective Action Program

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.9 Reporting Requirements

Groundwater monitoring, testing, and analytical data obtained as part of the Detection Monitoring Program described above will be compiled in the facility operating record. The data will include all computations, calculations, and related statistical evaluations.

The groundwater samples will be collected to meet the requirements of the Detection Groundwater Monitoring Program described above. The applicable data will be submitted to the Illinois EPA in accordance with the following schedule:

Samples to be Collected During The Months of	Results Submitted to the Illinois EPA by the Following	Parameters
April – May	July 15	VOCs, Metals, and Cyanide
October – November	January 15	VOCs

Groundwater surface elevation data and the field parameters (pH, specific conductance, temperature, and turbidity) shall be collected each sampling event and submitted to the Illinois

EPA in accordance with the schedule included in the above table. The groundwater flow rate and direction in the shallow drift aquifer will be reported annually by July 15 each year.

The Permittee shall report the surveyed elevation of the top of the well casing "stick-up", referenced to MSL in accordance with the following schedule:

1. For wells identified in **Table C-3**, every five (5) years (during the annual sampling event); or at the request of the Illinois EPA; or whenever the elevation changes.

2. For any new wells, at the time of installation and reported in the as-built diagrams, subsequent measurements shall be made every five (5) years (during the annual sampling event), or at the request of the Illinois EPA, or whenever the elevation changes.

Elevation of the bottom of each monitoring well, as referenced to MSL, is to be reported every five (5) years or more frequently, if the dedicated pumps are removed from the monitoring wells for maintenance. This measurement shall be taken during the annual sampling event.

D. PROCEDURES TO PREVENT HAZARDS

D.1 Security

D.1.1 Waiver From Security Requirements

A waiver from applicable security requirements is not being sought, therefore this section is not applicable.

D.1.2 Restricting Entry to the Facility

Since the facility is closed and regularly undergoing post-closure care and maintenance, the activities near the unit will be minimal. Activities will be limited to those inspection, monitoring and repair/maintenance activities necessary during post-closure. The individuals involved in these planned activities will be aware of the hazardous nature of the closed site. The potential for exposure to hazardous waste or hazardous waste constituents to unknowing persons or livestock will be minimal, since no wastes are exposed.

Multiple security controls deter unknowing and unauthorized entry to the site. The perimeter of the facility is fenced to control entry. The fence is routinely inspected, and repairs are made as necessary to maintain an adequate barrier. Traffic enters and exits the Zion 1A Landfill through the main gate on Green Bay Road. When the site is open, this gate is continuously monitored. The gate is locked when the site is closed. Other gates, located along 9th Street and onto Kenosha Road (see **Figure B-2**), are kept locked and are only opened by permittee personnel for planned (e.g. construction, leachate removal) or emergency activities.

Because of normal wear, it is anticipated that annual maintenance will be required to provide a functional security system. Therefore, fencing repair and replacement will be performed on an as-needed basis. Chains, locks and signs will be checked at least annually to assess whether replacement or maintenance is needed.

Finally, because the solid waste landfill on the eastern side of the property will continue to be active throughout much of the hazardous waste unit's post-closure care period, site personnel will be present for a great portion of each operating day. The presence of trained, attentive employees will provide added security for the closed Site 1A facility.

D.1.3 Warning Signs

Signs are posted at all gates to the facility. Additional signs are located along the perimeter of the Site 1A facility. The signs, which have been created to be legible from 25-feet, contain the following information:

DANGER – UNAUTHORIZED PERSONNEL KEEP OUT

Signs that are not be legible from a distance of 25 feet will be replaced on an as needed basis.

D.2 Equipment Requirements

D.2.1 Waiver

The permittee is not requesting a waiver of the preparedness and prevention requirements of Subpart C of 35 IAC 724.

D.2.2 Internal Communications

Because the facility is closed and no longer receiving hazardous waste, the equipment maintained on-site to prevent hazards is relatively minimal. Buildings are equipped with methane detectors. The primary means of internal and external communication on-site during the post-closure period will be by 2-way radio and/or cellular phone. Personnel performing post-closure compliance activities at Site 1A will have either a radio and/or cell phone with them. Fire extinguishers are provided in buildings and on construction equipment.

D.2.3 External Communications

When post-closure activities are required on-site, the staff performing the work regularly carry cellular telephones, which can be used in the event of an emergency.

D.2.4 Emergency Response Equipment

The facility will maintain proper supplies of emergency equipment. This equipment includes, but is not limited to, the following:

1. Fire extinguishers located throughout each building at the facility, around fuel storage areas, and on mobile landfill equipment.
2. Landfill equipment capable of carrying supplies of water and capable of dispersing water as necessary.
3. Landfill equipment capable of moving and placing earth material.

4. First aid stations located at various locations around the facility.
5. Communications equipment (two-way radios and telephones) which allows various personnel at the facility to contact each other.

D.2.5 Water for Fire Control

A water detention basin that regularly holds water is located west of Site 1A that can serve as a source of water for firefighting purposes, in the unlikely event of a fire at the Site 1A facility.

D.2.6 Personal Protective Equipment

There are a number of general safety rules to ensure safe operations. Emergency equipment such as first aid kits, eyewashes, and showers are found in many of the buildings. Employees are required to wear applicable personal protective equipment while performing their work. Smoking on-site is restricted. Contractors performing closure and post-closure services at the site will be provided a fact sheet concerning the nature of the landfill prior to working. A sample contractor handout is provided in **Appendix D-1**.

D.2.7 Testing & Maintenance of Emergency Equipment

As described above, the facility is not regularly staffed with personnel and personnel performing the various required post-closure tasks carry cellular telephones for communication. Therefore, there is no need for maintenance of facility communications systems.

Emergency equipment maintained at the closed landfill includes: fire extinguishers and a safety eye bath. These items will be maintained in accordance with the manufacturers recommendations.

D.2.7.1 Equipment Testing

The emergency equipment is tested periodically to assure proper operation. Fire extinguishers are periodically tested in accordance with the manufacturer's recommendations. The safety eye bath requires no periodic testing or maintenance.

D.2.7.2 Schedule

The fire extinguishers on-site will be tested a minimum of one time per year during one of the regular post-closure site inspections.

D.2.8 Equipment and Power Failure

In the event of a power outage, the leachate extraction pumps within the landfill would cease operation. The automated pumps will operate again, once power has been restored. Portable generators are also available, should auxiliary power be necessary. Potential issues related to operation of the leachate pumps will be identified and corrected in accordance with the inspection requirements described in Section D.3 below.

D.3 Inspection Requirements

Regular maintenance and inspections are performed to preserve the proper functioning of the facility. Depending upon the results from the inspections, maintenance activities may be performed on such things as fence/gates, office buildings, interior roads, utilities, the groundwater monitoring system, and the leachate/gas collection system.

During post-closure care and maintenance, routine inspections will be conducted on the schedule described below in Section D.3.1. Findings made during each inspection will be recorded on the appropriate post-closure inspection log. Copies of the inspection logs will be made part of the operating record and will be kept at the facility or within the facility post-closure files kept at the offices of the post-closure contact. Documentation of repairs performed or replacements required to properly maintain the site will be kept in the inspection logs.

D.3.1 Inspection Log

Throughout the post-closure period, inspections will be conducted to verify that systems supporting the closed facility are functioning properly. The systems specific to the closed hazardous waste landfill include the final cap, the groundwater monitoring network, and the leachate/gas collection system, including the leachate accumulation tank.

Copies of the Post-Closure Inspection Log Forms are presented in **Appendix D-2**. The forms include the date and time of each inspection, the name of inspector, notation of the observations made, and date of required repairs or remedial actions. Alternate documentation forms/spreadsheets may be utilized, if the information listed below is provided.

D.3.1.1 Items Inspected

The following items will be regularly inspected:

Weekly Basis:

Items related to 90-day Leachate Accumulation Tank will be inspected on a weekly basis. According to 35 IAC 725.295, the default inspection frequency under 35 IAC 725 Subpart J for each of the following items is at least once each operating day:

- Overfill/spill control equipment to ensure that it is in good working order;
- Above ground portions of the tank system, to detect corrosion or releases of waste;
- The construction materials and area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases; and
- Data from release detection equipment.

While the default inspection frequency for a 90-day leachate accumulation tank is at least once each operating day pursuant to 35 IAC 725 Subpart J, a weekly inspection frequency may be implemented if: 1) the tank uses leak detection equipment to alert facility personnel to leaks, or 2) the facility implements established workplace practices to ensure leaks are promptly identified. As described below in Section E.3.3, leak detection equipment has been installed to monitor the leachate level in the tank, which can be monitored remotely over a web-based platform. This equipment also provides notice of potential leaks, in the form of alarm notifications. Consequently, a weekly inspection frequency will be implemented for the 90-day leachate accumulation tank.

If the leak detection system is not functional, then the following workplace practices will be employed to justify implementation of a weekly inspection frequency:

- The liquid level in the tank will be monitored on a daily basis using the on-line remote monitoring system;
- The daily leachate level will be recorded on a log. The log will also indicate whether any leachate was pumped from the tank that day; and
- In the absence of known pumping from the tank into the tanker truck that transports the leachate to the treatment facility, if the leachate level remains either steady or increasing, then the integrity of the tank will be deemed intact. If the level in the tank is found to be decreasing over 2 consecutive days without the scheduled pumping to the tanker truck, then the permittee will perform an inspection of the tank within 24 hours

and take necessary steps to address a leak, if the primary tank is found to be compromised.

The following items will be inspected on a Monthly Basis:

- Gas Collection and Control System (GCSS)
- Leachate Collection System (LCS)

The following items will be inspected on a Quarterly Basis:

- Site security
- Vegetation, run-off, erosion
- Runoff control & spill prevention
- Leachate collection system
- Gas collection system
- Blower building

The groundwater monitoring system will be inspected on a Semi-Annual basis.

D.3.1.2 Types of Problems

An unsatisfactory observation during an inspection will initiate a response. The response time and effort will depend on the severity of the condition(s) noted. The problem component will be repaired to a condition suitable to function as it was intended.

The following identifies the types of problems (i.e., malfunctions or deterioration) the inspector will assess during inspections.

Security Devices

The perimeter fencing, entrance gate, locks and signs used to prevent unauthorized access to the closed facility will be inspected for evidence of damage.

Vegetation/Runoff

Cover vegetation and surrounding on-site vegetation will be inspected for evidence of vegetative stress or excessive bare vegetation that could result in erosion issues. The slopes and drainage ditches will also be inspected for evidence of erosion obstruction or discoloration.

Groundwater Monitoring Wells

Groundwater monitoring wells will be inspected for security (locking caps) and evidence of physical damage to the protective casing or surface grouting on an annual basis.

Final Cover

The final cover will be inspected for evidence of cracking, subsidence and/or ponding of stormwater, erosion, presence of burrowing animals or deep-routed vegetation (such as small saplings or bushes), presence of large areas of dead vegetation, continuity of vegetation, and evidence of discoloration or leachate penetration.

If standing water on the Site 1 Phase A cap becomes a persistent issue within certain areas of the cap (i.e., due to settlement, subsidence, or displacement), the permittee has the option of addressing it in either of following manners:

1. Install additional clay/topsoil and reseed; or
2. Implement the following modified design.

The second option will be to install a tile drainage system above the liner and below the vegetative cover. Cap maintenance activities are conducted at the facility on a routine basis. However, due to the natural settlement of waste within the landfill, various points/pockets on the final cover may settle at a differential rate. This settlement may cause some locations to have a lower elevation that may not allow accumulated precipitation to immediately run off to the storm water detention system. This ponding can remain until evaporation occurs. If needed, the following final cover design revisions are expected to allow expedited removal of the surface rain water through a field type drain tile system.

A drainage tile will be installed in the lower elevation of identified depressions and channeled to an area down slope for discharge. The perforated tile will remove the impounded water at a faster rate than evaporation and maintain a dryer cap in the depressed area. As the drainage tile system drains the water, some visual ponding may be observed. The typical corrective action of adding soil and reseeding can create additional settlement and damage to the vegetative cover due to increased weight and ponding can quickly be reestablished. The approach outlined should remove the impounded water through natural drainage over time and cause minimal cap disturbance and vegetative destruction.

The proposed drainage tile system, along with ongoing inspection and maintenance activities on the final cover will allow for the preservation of the liner and vegetative cover throughout the post-closure period.

The type of final cover vegetation utilized at the Zion Site 1 Phase A facility is predominantly a mixture of grasses, including rye fescue, alfalfa, and sweet clover. To maintain the final cover, it will be mowed a minimum of once annually throughout the post-closure period, or as needed.

If cover maintenance activities are conducted or stressed vegetation is observed, it is expected that periodic reseeding and mulching will be necessary to maintain sufficient vegetation. Areas that require reseeding, mulching, and fertilizing will be performed by qualified personnel. A balanced fertilizer and straw mulch will be employed to assist in establishing vegetation.

Leachate Collection System

Areas that will be specifically monitored include collection pipes, extraction wells, pneumatic pumps, leachate storage tank, and loadout pad, and control panels. Visible piping will be visually inspected to ensure there are no cracks or other integrity issues. The pumps will be monitored to ensure that they are operational. This will include confirmation that the airline is connected, investigation of the leachate levels in the wells, and inspection of the counter measurement on the pump. The counter measurement will indicate the number of strokes on the pump. A low number of strokes since the last visit plus an elevated leachate level could suggest that the pump has not been operating properly.

If silting or settlement has occurred within the extraction wells, an evaluation will be made of the ability of the well to function as an extraction point. If it is determined that the well can no longer function properly, a new extraction point will be designated and reported to the IEPA.

Extraction pumps will be removed, inspected, cleaned and tested, but only on an as-needed basis. At the same time, depth of the well measurements will be taken to evaluate whether differential settlement or silting has occurred. Silting or settlement will be addressed in a manner appropriate with the degree to which its intended operation is affected. These inspections will be performed on each well individually to allow continued operation of the leachate collection system. Leachate extraction pumps will be replaced if repair becomes unfeasible or unpractical.

The facility has constructed a concrete load-out pad adjacent to the existing storage tank containment area. The load-out pad provides spill control during the pumping of leachate from the storage tank. The floor of the concrete pad is sloped to the center of the pad and to a trap drain located on the side of the load-out pad. A trap drain was installed for the routing of spilled material and/or stormwater to a dual-contained fiberglass sump that routes the liquid back to the storage tank. The concrete load-out pad will be inspected for evidence of cracks and the trap drain and sump system will be inspected for evidence of leaks, corrosion and overall integrity.

Cover Elevation Reference Points

The final cover elevation reference points (i.e., survey control points) will be inspected for structural integrity. These reference points may be surveyed periodically during post-closure to assess the degree of subsidence and/or differential settlement that may occur during post-closure (if visual evidence of subsidence and/or differential settlement is observed).

Gas Extraction System

During operation of the gas collection system, inspections of various components of the system will be performed to verify proper operation. The following types of problems will evaluated during inspections:

- Leaking regulators;
- Leaking airlines;
- Leaky compressor;
- Power issues; and
- Functionality of condensate pumps.

D.3.1.3 Inspection Frequency

The frequency for inspections is listed above in Section D.3.1.1.

D.3.2 Repair Log

An unsatisfactory observation of the conditions will initiate a response. The response time and effort will depend on the severity of the unsatisfactory condition and include such things as:

1. Application, compaction, and grading of clay soils in areas of poor drainage, differential settling, and erosion or installation of the drainage tile system discussed above.
2. Removal of accumulations of sediment and debris from drainage ditches and monitoring wells.
3. Reseeding and mulching in areas of cover vegetation failure.
4. Containment and management of surface contamination and repair of final cover.
5. Replacement or repair of structures and equipment (i.e., monitoring wells or leachate/gas extraction wells and ancillary equipment).

If repairs are required based on results from inspections, they will be documented, including:

1. The item needing repair;
2. The problem identified during the inspection needing repair;
3. Date the inspection occurred;
4. Name of the person conducting the inspection;
5. Name of the person making the repair;
6. Date of repair;
7. Efforts associated with making the repair;
8. Other appropriate comments (if applicable).

Response to observations of unsatisfactory conditions will be described on a Repair Log after remedial action has been completed. An example log is contained in **Appendix D-2.** An alternate format may be utilized, if the same information is documented.

D.3.3 24 Hour Reporting

If an item noted during an inspection reveals any noncompliance with the permit which may endanger human health or the environment, then 1) the appropriate information will be reported to Illinois EPA within 24 hours from the time the Permittee becomes aware of the circumstances and 2) provide a written description of the incident within 5 days of the time the Permittee became aware of the circumstances.

E. POST-CLOSURE REQUIREMENTS

E.1 Information Regarding the Unit Closed as a Landfill

The two fundamental aspects of the design of an appropriate leachate or gas management system in a closed landfill are: (1) the geology/hydrogeology around and beneath the landfill; and (2) landfill construction. The following sections provide information pertaining to the above topics.

E.1.1 General Information Regarding Unit to Receive Post-Closure Care

A scaled drawing showing the location and boundaries of the Zion Landfill Site 1A is included in this Post-Closure Permit Renewal Application as **Figure B-3**. A certified copy of the survey plat and post-closure notice previously filed with the Lake County Recorder are presented in **Appendix E-1**.

Prior to 1991, the Zion Landfill Site 1, Phase A facility accepted hazardous waste for disposal. The landfill closure was performed and a closure certification report was submitted to the Illinois EPA in February 1998. Based upon prior communications with Illinois EPA and according to the Effective Permit, February 1998 is considered the beginning of the 30-year post closure period for Site 1A.

The Zion Site 1 Phase A has been certified closed by the Illinois EPA, so no Closure Plan is required or included in this Post-Closure Permit Renewal Application. The following sections present the applicable information relevant to the continued implementation of an effective post-closure program at a closed landfill.

E.1.2 Geology and Hydrogeology Around/Beneath the Unit

A description of the geology and hydrogeology around/beneath the unit is presented above in Section C.3 (Historical Hydrogeological Summary).

E.1.3 Characterization of Waste/Contaminated Soil Present in the Landfill Unit

Site 1 Phase A accepted hazardous wastes from a variety of industries, including manufacturing, petrochemical, steel, and utilities. The hazardous characteristics of the wastes accepted included heavy metals and corrosivity. Some waste materials are considered hazardous by default due to the generation process. The facility accepted some of these "listed" wastes as well. Examples of listed wastes accepted include wastewater treatment sludges from

electroplating operations; various solvents used in degreasing; pesticides; laboratory chemicals; and emission control dust from steel production. Much of the hazardous waste managed at the Zion Landfill's Site 1A was from clean-up activities and generally consisted of soil contaminated with lower concentrations of hazardous constituents.

Zion Landfill Site 1A was a co-disposal landfill. Co-disposal, a common practice at that time, disposed of both hazardous waste and solid waste in the same landfill. The quantity of hazardous waste compared to the total quantity of solid, non-hazardous, municipal waste accepted in Site 1 Phase A was relatively small.

E.1.4 Initial Closure Activities

As described below in further detail in Section E.1.5, the Zion Landfill Site 1A was closed in-place with the installation of a final cover system. Large volumes of landfilled waste materials/contaminated soil were not removed as part of initial closure activities. Further, the landfilled wastes did not require stabilization, nor significant quantities of structural fill to establish final contours. The final cover system was installed as described below.

E.1.5 Details Associated with the Closed Unit

The Zion Landfill Site 1, Phase A was the first known portion of the property developed for waste disposal. The first known land permit allowing development of a waste disposal facility was issued in 1975. Although facility files have been searched to locate detailed documentation pertaining to construction of the Site 1A landfill, due to the age of the facility and the scope of the regulations relative to record keeping during landfill construction that occurred in the 1970s, detailed construction completion reports have not been identified. However, various engineering cross sections illustrating the bottom of the landfill have been located. These cross sections indicate "excavation limits" believed to represent the bottom of the landfill. A copy of these cross sections is provided in **Appendix E-2**.

According to these cross sections, the bottom of the landfill is located at an elevation of approximately 750 ft. MSL at the northern portions, sloping to 730 ft. MSL. at the southern end of Site 1A. These drawings also indicate that the sidewalls were built at a 2:1 slope.

Based on the knowledge of the current landfill staff, Site 1A was constructed of a 10-foot thick in-situ clay liner. Two leachate collection trenches were installed. These trenches trend north-south and are connected on the south end of Site 1A. The trenches run from the south end

approximately half way to the north border of Site 1A. Due to the timeframe that these features were installed, no construction details are available.

The following cut-off walls/slurry walls have also been installed:

1. A clay division berm was installed along the east border of Site 1A to separate Site 1A from the adjacent (non-hazardous) Site 2 facility; and
2. A slurry wall was installed along the east and south portions of Site 1A to cut off shallower sand seams.

Additional details pertaining to the above features are presented in the following sections.

The clay division berm was constructed in several different phases as follows:

An approximately 1,200-foot long portion of the berm was constructed in September-October 1991. Fill materials utilized for construction generally consisted of a mixture of gray silty clay obtained from an on-site borrow area. The clayey soil was placed in 6 inch compacted lifts. The total volume of clay soil placed during this phase of the project was approximately 17,500 in-place cubic yards. Construction activities during this phase are documented in the report entitled, Construction Documentation, Winthrop Harbor Clay Division Berm, dated October 1991, prepared by Donohue & Associates, Inc. A copy of this report is included as **Appendix E-3A**.

An approximately 680-foot long section of the clay division berm was installed from May 6 to May 29, 1992. Fill materials utilized for construction generally consisted of a mixture of gray silty clay obtained from on-site borrow areas. The clayey soil was placed in 6 inch compacted lifts. The total volume of clay placed during this phase of the project was 10,170 in-place cubic yards. Construction activities during this phase of the project are documented in the report entitled, Construction Documentation Winthrop Harbor Clay Division Berm Stations 11700N to 12380N Constructed May 6-29, 1992, prepared by SEC Donohue Inc. A copy of this report is included as **Appendix E-3B**.

An approximately 1,120-foot long portion of the clay division berm was installed from May 6 to June 2, 1992. This portion of the clay berm was constructed from the north end of the existing clay berm at Station 11700N, in a southerly direction to approximately Station 10580N. Fill materials utilized for construction generally consisted of a mixture of gray silty clays obtained

from on-site borrow areas. Lift thickness was approximately 6 inches compacted. The total volume of clay soil placed during this phase of construction was approximately 14,153 in-place cubic yards. Construction activities during this phase are documented in the report entitled, Construction Documentation Winthrop Harbor Clay Division Berm Stations 10580 to 11700 Constructed May 6 – June 2, 1992, dated June 1992, prepared by SEC Donohue Inc. A copy of this report is included as **Appendix E-3C**.

Construction of an approximate 680-foot long portion of the clay division berm began on June 2, 1992. This portion of the clay berm was constructed from the north end of the clay berm described above at approximately station 11700N, then proceeding in a northerly direction to approximately Station 12380N. Fill materials utilized for the construction generally consisted of a mixture of gray silty clay obtained from on-site borrow areas. Lift thickness was approximately 6 inches compacted. The total volume of clay soil placed during this phase of construction was approximately 9,826 in-place cubic yards. Construction activities during this phase are documented in the report entitled, Construction Documentation, Winthrop Harbor Clay Division Berm, Stations 11700N to 12380N Constructed June 2-11, 1992, dated June 1992, prepared by SEC Donohue, Inc. A copy of this report is included as **Appendix E-3D**.

A 1,700 foot section of clay division berm was installed on top of the previously installed clay berm during September-October 1992. Fill materials utilized for construction generally consisted of a mixture of gray silty clays obtained from an on-site borrow area. Lift thickness was approximately 6 inches compacted. The total volume of clay soil placed during this phase of construction was approximately 12,827 in-place cubic yards. Construction activities during this phase of construction are documented in the report entitled, Construction Documentation, Winthrop Harbor Clay Division Berm Stations 10800N to 12500N Constructed September 15 – October 2, 1992, dated October 1992, prepared by SEC Donohue Inc. A copy of this report is included as **Appendix E-3E**.

A slurry cut off wall was installed along a portion of the east and south borders of Site 1A. The construction of this slurry cutoff wall took place in two phases. The primary purpose of this slurry trench cutoff wall was to cut off shallower sand seams in the soils along the east and south sections of Site 1A. This in turn, was intended to minimize seepage from shallow saturated sand seams during construction of the Site 1B landfill cells located to the west of Site 1A.

The first phase of the construction is documented in a report entitled, Construction Observation Report for the Winthrop Harbor Waste Management Facility Slurry Trench Cutoff Wall, dated February 1989, prepared by Foth & Van Dyke. A copy of this report is included in **Appendix E-3F**.

The second phase of construction is documented in a report entitled, Construction Observation Report For The Slurry Trench Cutoff Wall, Zion Waste Management Facility, Zion, Illinois, prepared by Mc Donald-Maas Associates, dated January 1991. A copy of this report is included in **Appendix E-3G**.

The above reports and drawings were prepared to demonstrate that construction was performed in substantial compliance with the design. The reports include trench slurry test results, backfill test results, photo documentation, Quality Assurance Manuals, laboratory test results for key-in materials, visual classification of the key-in material for the wall, and laboratory test results for backfill. The drawings depict conditions encountered during the construction of the slurry trench cutoff wall.

After receipt of waste materials ceased, a final cover system was installed at the facility. In 1993 and 1996, auger borings were performed on a 100-foot grid pattern to verify the thickness of clay cap material placed over Site 1A. The thickness of the clay capping material varied from 1.5 feet to 10 feet. Results from these borings were submitted to Illinois EPA with a letter dated May 3, 1996. A modified final cover design was presented to Illinois EPA within a Class 3 Permit Modification prepared by Ries Environmental, Inc., dated July 31, 1996. A copy of this permit modification is included as **Appendix E-4**. The permit modification includes cross sections showing the final cover design installed at the landfill (identified as "Proposed Final Cover" In the July 1996 permit modification) and the final cover design that was permitted prior to July 1996 for both the flatter top portions of the landfill and sideslopes. The revised final cover design presented in the above permit modification was approved in a letter from Illinois EPA dated March 6, 1997.

The installation of the final cover was completed in 1997 and consists of the following layers in ascending order:

- Minimum of two feet of compacted clay;
- 40 mil LLDPE geomembrane (over the upper, flatter portions of the landfill);

- Geocomposite (single-sided on top of landfill and double sided on the sideslopes);
- Protective soil layer generally comprised of a minimum of 2.5 feet of soil overlain by 6 inches of topsoil; and
- Vegetation layer.

The final cover system installation activities performed in 1997 are documented in the report entitled, Construction Acceptance Report For the Site 1 – Phase A Final Closure, Permit No. B-23-M-16, Zion Sanitary Landfill, Zion, Illinois, Dated February 1998, prepared by CQM, Inc. This report includes drawings and cross sections documenting the installation of the final cover system. As this report has previously been submitted to the Illinois EPA, due to its large size (it is comprised of a total of three bound volumes), only the narrative portion of this report is included herein (see **Appendix E-5**).

Various drainage ditches, swales, and diversion berms have also been installed to manage surface water flow around the facility. Details pertaining to these features are also presented in the Construction Acceptance Report referenced above.

E.2 Contact Person

The post-closure contact for the Zion Site 1 Phase A Landfill is:

Mr. Jim Hitzeroth
BFI Waste Systems of North America, LLC
26 West 580 Schick Road
Hanover Park, IL 60133
Phone: (224) 970-1129

The Illinois EPA post-closure permit and associated permit modifications will be maintained at the above location.

E.3 Operation of the Leachate Collection System

A leachate collection system has been installed at the Zion Site 1 Phase A Landfill. The following sections provide a description of the operation of the leachate collection system.

E.3.1 Quality of Leachate in the Leachate Collection System

Samples of leachate have historically been collected and analyzed in accordance with Permit Condition III.G.7. The leachate samples are collected on a rotating basis from EW-2, EW-6, EW-

20, and EW-23. Pursuant to Permit Condition III.G.7, the leachate samples are collected annually and analyzed for the constituents listed in 35 Ill. Adm. Code 811, Appendix C., which include: various inorganic constituents, metals, VOCs, Pesticides/PCBs, SVOCs, Herbicides, and Dioxins. The analytical results from the last several years of sampling are presented in **Appendix E-6**.

The leachate samples will be collected by personnel trained in sampling various environmental media, including groundwater and leachate. The samples will be collected in certified clean sample containers, with the appropriate quantity of chemical preservatives in accordance with SW-846, Test Methods for Evaluating of Solid Waste directly from the leachate extraction wells or tank, if needed. The sampling personnel will wear clean latex or nitrile gloves during sampling, so that representative samples are obtained and for the protection of the sampling staff. The samples will be placed in a cooler on ice immediately upon collection and submitted to an accredited analytical laboratory under standard chain of custody procedures. The samples will be analyzed pursuant to standard SW-846 Methods.

No changes to the current leachate sampling/analysis protocol contained in the current Effective Permit are being proposed.

E.3.2 Leachate Collection System Within the Landfill

In 2000, 23 leachate extraction air actuated pumps were installed on Site 1A to discharge leachate from the wells to the existing leachate management system. The pumps were connected to the air supply and leachate discharge piping via flexible hose. Operation of the pumps is controlled by a 1-inch diameter stainless steel ball valve on the air supply piping and a 1 ¼ inch diameter stainless steel ball valve on the leachate discharge piping. A needle valve installed on the air exhaust line from the pump can also be used to control pump operation. Specifications relating to these pumps are included within the Construction Acceptance Report, Site 1 Phase A Leachate Extraction System, Onyx Zion Landfill, IEPA Site No. 0978020001, RCRA Permit Log No. B-23-M-21, prepared by Weaver Boos & Gordon, Inc., dated September 27, 2000. A copy of this report is contained in **Appendix E-7**.

Immediately after closure of Site 1A in the late 1990s, leachate was transferred off-site by pumping directly from the manhole located on the southeast corner of Site 1 – Phase B. In 2000, a concrete pad and containment system was installed in the loadout area next to the leachate above ground storage tank located in the southwest corner of the site, near the

landfill gas flare system. Details pertaining to the installation of this system are presented in the above report dated September 27, 2000.

Further upgrades to the leachate collection system performed in 2000 included the installation of additional leachate discharge piping and air supply line from the manhole to EW-21. Prior to that time, leachate was collected in the manhole, and to conduct off-site disposal operations, the tanker truck had to pull onto the landfill and pump the leachate directly out of the manhole. A pneumatic pumping system was installed in the manhole to allow the leachate to be pumped from the manhole to the existing leachate extraction system forcemain located adjacent to EW-21. This allowed the leachate to be collected in an above ground storage tank and unloaded on a concrete loadout containment pad. Additional details pertaining to these upgrades are provided on the drawing entitled, Site 1 – Phase A Forcemain Profile and Details included in **Appendix E-8.** Although these upgrades were installed in 2000, the Illinois EPA needed to approve the change to the permit before the change could be included in the permit. A Temporary Authorization request and Class 3 permit modification request was submitted to Illinois EPA, both dated February 24, 2003. The Temporary Authorization was approved by Illinois EPA in a letter dated May 10, 2006.

A cross-section of the manhole is included in **Appendix E-8**. Cleanouts were installed on the new forcemain line installed in 2006 on the northwest corner of Site 1B, Cell No. 2 and between the two above ground storage tanks.

In 2006, approximately 540 feet of leachate forcemain that routes leachate from Site 1A to the hazardous waste storage tank was replaced when efforts to jet out a clog in the line were unsuccessful. Prior to abandonment, the area around the witness pipe of the 6"/3" dual contained forcemain was excavated for cleaning. Northern Plant Services was contracted to jet out the forcemain. As the pipe was being cleaned, any liquids or solids removed were pumped into a tanker truck for disposal. After approximately six hours of jetting, a down-well camera was used to reveal that blockage was still present and deemed too hard to remove. After jetting attempts were complete, the 3" line was triple rinsed with clean water to remove any remaining loose material with the liquid being pumped into the on-site hazardous waste storage tank. A 6"/3" end cap was then welded onto each end of the pipe prior to backfilling over the now abandoned pipe.

The trench for the replacement forcemain was dug around the west side of the gas-to-energy building and in between two existing leachate storage tanks on the south side of the blower building. The trench was excavated approximately 4.5 feet deep.

The new leachate forcemain was constructed from dual-walled HPDE 6"/3" SDR 17/11 pipe. Pipe and fittings were butt-fusion welded in accordance with industry standards for HPDE pipe construction. Air pressure tests were conducted on the HDPE 6"/3" SDR 17/11 piping to verify the integrity of the butt-fusion welds and mechanical connections. After welding, the piping was pressurized to forty (40) pounds per square inch (psi) with an air compressor and maintained for a minimum duration of one (1) hour. WCG CQA personnel observed the air pressure testing.

The HDPE 6"/3" SDR 17/11 forcemain was placed in the trench. Prior to backfilling, the north end of the line was tied into the existing forcemain and the east end connected to the hazardous waste storage tank.

A cleanout was also installed where the new line tied into the existing line on the northwest corner of Site 1B, Cell No. 2. A report documenting the above construction activities dated July 11, 2006 was submitted to the Illinois EPA.

In 2007, the northern part of Site 1, Phase A was not moving leachate as efficiently as projected, so the leachate forcemain was extended. New leachate forcemain was installed within the final cover between EW-2 and EW-28. The new forcemain was tied into EW-10 to allow the removal of leachate from both the north and south sides of the unit. These upgrades to the leachate collection system were documented in a report entitled, Construction Acceptance Report, Improvements to Leachate Collection System, Zion Site 1, Phase A Landfill, dated December 2009, prepared by Weaver Boos Consultants. A copy of this report is contained in **Appendix E-9**.

A portion of the leachate forcemain piping which carried leachate from leachate extraction wells within Site 1 Phase A to the leachate accumulation tank was replaced in November 2010. The upgrades to the leachate collection system were implemented in response to a blockage discovered during a routine inspection in October 2010. Given that attempts to jet the line and remove the blockage were not successful, approximately 1,910 feet of replacement forcemain was installed. The replacement consisted of a dual-contained line serving extraction wells EW-20 through EW-28. The previous forcemain was disconnected and the lines capped. The CQA

Report documenting this upgrade to the leachate collection system is presented in **Appendix E-10**.

A portion of leachate forcemain transmitting leachate from Site 1 Phase A across the northern boundary of Site 1 Phase B to the leachate accumulation tank was replaced in November 2015. These upgrades were implemented in response to restricted leachate flow discovered within a section of east-west trending piping between Site 1B Cell No. 1 and Site 1B Cell No. 2. After repeated attempts at clearing the blockage(s) via jetting, it was decided that this section of approximately 625 feet of forcemain would be abandoned and replaced. The new leachate forcemain was constructed from 3" x 6" dual contained HDPE pipe. The CQA Report documenting these upgrades to the leachate collection system is presented in **Appendix E-11**. The documentation report was approved by Illinois EPA with the issuance of Permit Mod No. 6, dated June 23, 2016.

Another section of leachate forcemain was replaced in 2017 in response to the identification of a blockage that did not allow leachate to be transmitted from the closed landfill to the leachate accumulation tank. Approximately 320 feet of replacement leachate forcemain was installed, old forcemain piping was abandoned, and repairs were made to a leachate forcemain junction. The CQA Report documenting these upgrades to the leachate collection system is presented in **Appendix E-12**. The documentation report was approved by Illinois EPA with the issuance of Permit Mod No. 7, dated March 12, 2018.

A plan view of the leachate collection system as it is designed to date is included in **Appendix E-13**. The plan view details the existing leachate collection system, including the piping locations, leachate extraction wells, cleanouts, one manhole, leachate storage tank and loadout, and the blower building.

The facility is not subject to the requirements of 35 IAC 724.401(c), which include a top liner, composite bottom liner, and a leak detection system (LDS). Therefore, information pertaining to the requirements of 35 IAC 724.401(c) are not applicable to this Permit Renewal Application.

E.3.3 Leachate Collection System Outside Landfill

Leachate is extracted from wells by a submersible pump and drains to the manhole where it is pumped back into the forcemain to the 8,000 gallon dual-walled above ground tank (see **Figure**

E-1). Gas condensate is routed to one of two condensate sumps and then pumped to the storage tank.

This tank is considered a 90 day accumulation tank under 35 IAC 722.117 (Conditions for Exemption for a Large Quantity Generator That Accumulates Hazardous Waste). This regulation allows a large quantity generator (LQG) to accumulate hazardous waste in a tank without a RCRA Permit, if:

1. The hazardous waste is only present in the tank for 90 days or less; and
2. The LQG complies with the applicable requirements of 35 IAC 725 Subpart J, except Closure and Post-Closure Care, Waste Analysis and comply with applicable requirements of Subparts AA, BB, and CC.

E.3.3.1 Leachate Tank – 90 Day Storage Requirement

The first condition for exemption of the above tank is the 90 day accumulation requirement. The landfill leachate accumulating in the tank can only remain in the tank for no more than 90 days pursuant to 35 IAC 722.117(a). The leachate collection system is designed to pump leachate from a collection sump into the accumulation tank whenever leachate levels reach a pre-determined level within the leachate extraction wells. Thus, leachate has the potential to flow continuously into the accumulation tank.

While the regulations do not offer explicit detail on how the 90 day requirement shall be maintained and documented for continuous flow process tanks, United States Environmental Protection Agency (USEPA) has offered written guidance on the subject. The following procedures included in a letter found on USEPA's RCRA On-Line Database (14763) from USEPA to National Paint and Coatings Association dated February 16, 2007 will be utilized to demonstrate compliance with the 90 day storage requirement. As stated in this letter:

> *...In the case of hazardous wastes flowing through tanks continuously, there is a means of demonstrating when a tank is 'emptied' within 90 days ... that would not require completely emptying the tank, and that may be more suitable for tanks with continuous flow. More specifically, a mass balance approach (i.e., turnover approach...) can be used for continuous flow tanks... The key parameters in this mass balance approach are the volume of the tank (e.g., 6,000 gallons), the daily throughput of hazardous waste (e.g., 300 gallons per day) and the time period the hazardous waste 'resides' in the tank. In*

this example, the hazardous waste entering the tank would have a residence time of 20 days (6,000 gallons/300 gallons per day = 20 days) and meet the requirement of [40 CFR 262.17(a)(2)] since the hazardous waste has been in the tank for less than 90 days [EPA's RCRA On-Line Database 14763].

The above letter from USEPA also discusses the types of records that a generator must maintain to demonstrate compliance with the 90-day time limit:

Large quantity generators accumulating hazardous wastes through a continuous flow process must also demonstrate that the hazardous waste has not been stored for more than 90 days. This may be achieved by use of inventory, or some form of accounting and monitoring data. For example, a generator could confirm that the volume of a tank has been emptied every 90 days by recording the results of monitoring equipment both entering and leaving the tank. This recordkeeping, in conjunction with the tank volume, would enable inspectors, as well as facility personnel to demonstrate compliance with [40 CFR 262.17(a)(2)].

The above guidance indicates that the quantity of leachate flowing into the tank should be kept in the operating record to allow for documentation of compliance with the 90 day accumulation requirement. To demonstrate compliance with the 90 Day Storage Requirement, the quantity of leachate in the tank will be tracked on the log contained in **Table E-2** attached. The information from the remote leachate level monitoring equipment installed on the leachate accumulation tank (described below in Section E.3.3.2) can be utilized to attain the data included on the form included as **Table E-2**. Alternately, facility personnel may attain the tank level data on-site. One entry will be made to the log each week. To comply with the 90 day storage requirement, a minimum of 8,000 gallons of leachate must flow through the tank on average, every 90 days.

E.3.3.2 Leachate Tank – Applicable Subpart J Requirements

The second condition for exemption of the above existing tank as stated in 35 IAC 722.117 is that the LQG must comply with the applicable requirements of Subpart J (35 IAC 725 – Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities). The following presents the major applicable Subpart J requirements, followed by a description of how compliance will be attained.

The Subpart J requirements are subdivided into requirements for "existing tanks" and "new tanks". The 2019 amended regulations did not modify the definitions of "existing tank" and "new tank". Under the original RCRA regs, tanks holding hazardous waste before the effective date of the original Subpart J regs (i.e., 1980-81) were deemed "interim status tanks", while all other tanks needed a permit to hold hazardous waste. The RCRA regulations for hazardous waste tanks were significantly amended in 1986, when the terms "new" and "existing" tank were introduced. Under the 1986 amendments, "new" tanks were defined as tanks that started holding hazardous waste after the effective date of the 1986 rule (July 14, 1986). Based on the above regulations and guidance, the Zion Site 1A leachate accumulation tank is considered a "new" tank, as it started accumulating hazardous waste in 2000.

Design/Installation of Tank

A new tank is to meet the design and installation standards of Subpart J, 35 IAC 725.292 - Design and Installation of New Tank Systems and Components. These standards require that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the wastes to be stored or treated, and corrosion protection so that it will not collapse, rupture, or fail. Further, the owner or operator must obtain a written assessment reviewed and certified by a qualified Professional Engineer (P.E.), in accordance with 35 IAC 702.126(d), attesting that the system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. The assessment performed by the P.E. must include the applicable information contained in 35 IAC 725.292.

To comply with the above requirements, a "Hazardous Waste Tank Assessment" was performed by a licensed P.E. in 2014. A copy of this report is attached as **Appendix E-14**. The following information is presented in this report:

- Introduction [40 CFR 264.192(a)];
- Design standards [264.192(a)(1)];
- Hazardous characteristics of the waste [264.192(a)(2)];
- Factors affecting the potential for corrosion [264.192 (a)(3)];
- Inspection during installation [264.192(b)];
- Tightness testing [264.192(d)];

- Ancillary equipment [264.192(e)];
- Containment and detection of releases [264.193], which indicates that the tank; and
- Certification Statement.

The above February 2014 Report from ST Environmental provides an assessment of the tank system. Section 9.0 of the above document certifies the following:

> *In accordance with the review conducted, the existing tank system has sufficient structural integrity and is acceptable for continued storage of the hazardous waste discussed herein in accordance with 40 CFR 264, Subpart J.*

Thus, the February 2014 Report from ST Environmental satisfies the above requirement for a written tank assessment certified by a P.E.

Secondary Containment

Subpart J, 35 IAC 725.293 includes standards for containment and detection of releases. According to this regulation, the secondary containment system must be as follows:

- Designed, installed, and operated to prevent migration of wastes or accumulated liquid out of the system to the soil, groundwater, or surface water at any time during the use of the tank system; and
- Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

Additional information is presented in 35 IAC 725.293(c) providing more details as to how the above requirements are to be satisfied. According to 35 IAC 725.293(c), the secondary containment system must be at a minimum as follows:

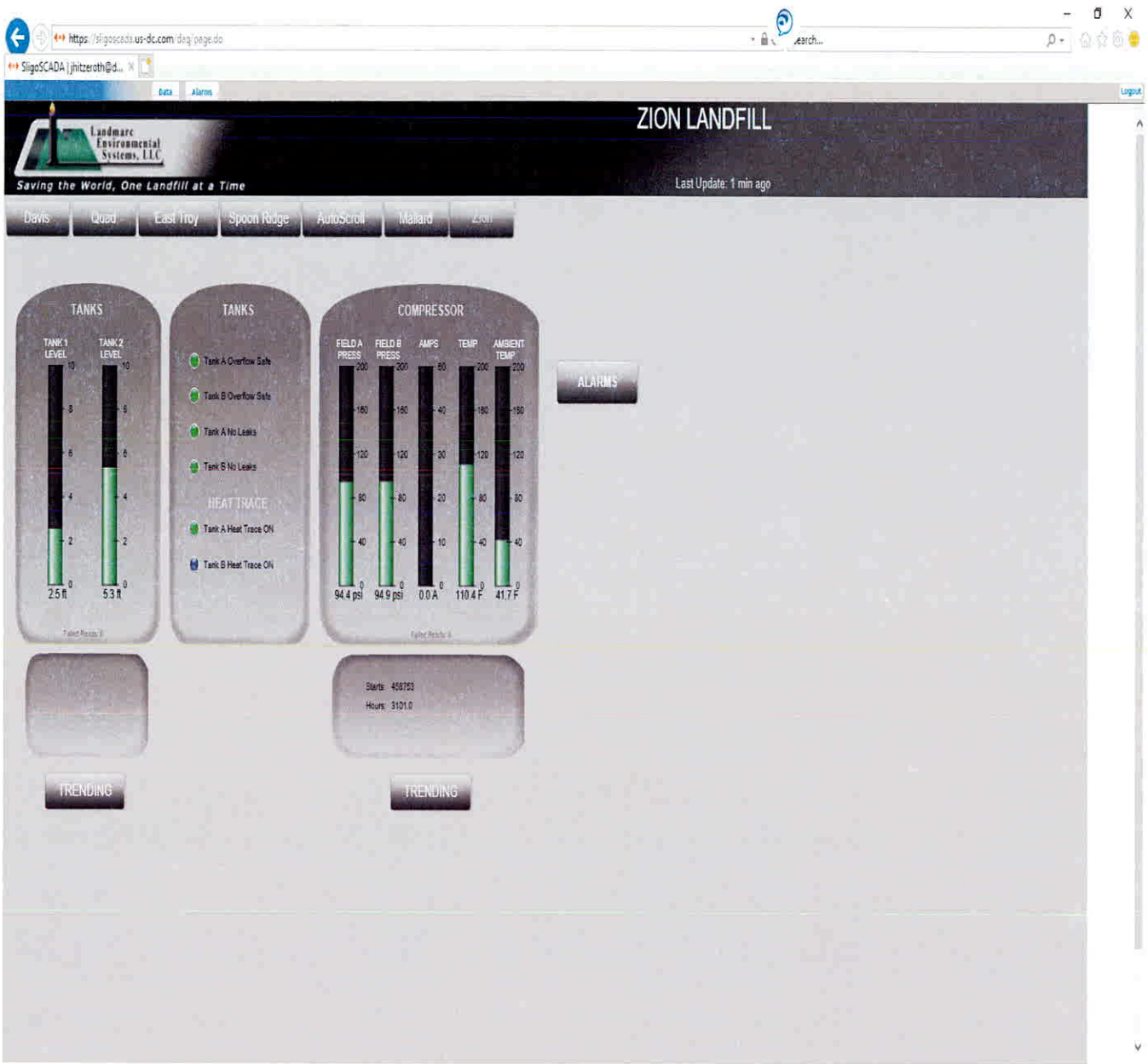
1. Constructed of or lined with materials compatible with the wastes to be placed in the tank system and of sufficient strength and thickness to prevent failure due to pressure gradients, physical contact with the waste to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;
2. Placed on a foundation or base capable of providing support to the secondary containment system and resistance to pressure gradients above and below the system and capable of preventing failure due to settlement, compression, or uplift;

3. Provided with a leak detection system that is designed and operated so that it will detect the failure of either the primary and secondary containment structure or any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or as otherwise provided in the RCRA permit if the operator has demonstrated to the Agency, by way of permit application, that the existing detection technology or site conditions will not allow detection of a release within 24 hours;
4. Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system within 24 hours or as otherwise provided in the RCRA permit if the operator has demonstrated to the Agency, by way of permit application, that removal of the released waste or accumulated precipitation cannot be accomplished within 24 hours.

As documented in the engineer's report contained in **Appendix E-14**, the existing Zion Site 1A leachate tank complies with items 1, 2, and 4 above. Item 3 (leak detection) is discussed below.

Leak Detection System

Pursuant to 35 IAC 725.293(c)(3), the secondary containment system must be provided with a leak detection system meeting the requirements listed in Item 3 above. A remote monitoring system meeting the above requirements was installed at the leachate accumulation tank in 2020. This system allows the liquid level in the tank to be monitored remotely. One foot of leachate equates to approximately 1,000 gallons. The system also provides an automatic notification, if issues with the tank system are detected. A screen shot of the automated tank monitoring, as shown from the on-line platform, is presented below:



The Site 1A tank is "Tank 1". The "Tank A Overflow Safe" indicator is tripped based on a sensor monitoring the overflow pipe from the tank to the secondary containment. The Tank A "No Leaks" indicator provides an alert based on a sensor located in between the dual tank wall containment if the interior wall is breached and liquid is detected in the space between the primary and secondary tank walls.

General Tank Operating Requirements

The leachate accumulation tank will be operated in accordance with 35 IAC 725.294. The contents of the tank will not cause the tank, its ancillary equipment or secondary containment system to rupture, leak, corrode, or otherwise fail. The permittee will also use appropriate controls and practices described herein to prevent spills and overflows from the tank or secondary containment systems, including the following:

- Spill prevention controls;
- Overfill prevention controls; and
- Maintenance of sufficient freeboard in the secondary containment area to prevent overtopping.

While no leaks or spills have occurred since the tank system was first utilized in 2000, if a leak or spill occurs, then the requirements of 35 IAC 725.296 would be followed. This includes notification of the Illinois EPA within 24 hours in the event of a release to the environment (i.e., a release not sufficiently contained by the secondary containment system). If the tank system is deemed unfit for use, it will be removed from service and the permittee will satisfy the following requirements:

- Flow of leachate into the tank will be ceased so that the cause of the release can be assessed;
- Leachate will be removed from the tank;
- A visual inspection of the release will be performed to prevent further migration and visibly contaminated soil or surface water will be removed and properly disposed;
- The appropriate notifications and reports will be performed or produced;
- The tank system will either be closed or repaired; and
- Major repairs will be certified.

Labeling/Marking of Tank

Under 35 IAC 722.117(a)(5)(B), the leachate accumulation tank is labeled with the words "Hazardous Waste".

The tank is also marked/labeled with an indication of the hazards of the contents. The leachate is not characteristically hazardous under RCRA, so will not be labeled as ignitable, corrosive, reactive, or toxic. Example labels may include, but are not limited to:

- Hazard communication consistent with Subpart E (Labeling) and Subpart F (Placarding) of 49 CFR 172; or
- A hazard statement or pictogram consistent with 29 CFR 1910.1200 (Hazard Communication); or
- A chemical hazard label consistent with NFPA 704.

To satisfy the above requirements, labels are present on the tank with the 4-Digit DOT Placard UN 3082 and Hazard Class 9, which signifies Environmentally Hazardous Substances, Liquid, N.O.S. This placard is recommended for frequently transported hazardous materials by truck, rail, or aircraft.

Emergency Procedures

The permittee will comply with the 35 IAC 722 Subpart M - Preparedness, Prevention and Emergency Procedures for LQGs. The applicable regulations state that the LQG must maintain and operate the tank in a manner that minimizes the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water which could threaten human health or the environment. To satisfy these requirements, various equipment will be provided near the tank, tested, and properly maintained, including:

1. *Internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel*. The facility is a closed landfill that is not regularly staffed. Personnel are only occasionally present to perform certain post-closure operation and maintenance activities. These personnel will satisfy this requirement by maintaining a working cellular phone with them during implementation of their work.
2. *Device capable of summoning emergency assistance from local response teams.* Personnel working near the tank will maintain a working cellular phone with them.
3. *Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment*. A fire extinguisher is located in the area of the secondary containment tank and blower building. Spill control and decontamination equipment are also stored in a building located near the tank. The equipment maintained at the facility is included in the Contingency Plan presented in **Appendix E-15**.

4. *Water at adequate volume and pressure to supply water hose streams, or foam producing equipment, or automatic sprinklers, or water spray systems.* If water is needed to fight a fire, an adequate supply is available from the surface water pond/ditch located on-site.

The equipment above will be periodically tested and maintained to keep the equipment in proper working order, if an emergency were to occur.

Leachate and gas condensate loadout is conducted on an as needed basis from a concrete loadout pad located near the tank. The 40-foot by 14-foot concrete pad includes footings at a depth of 4.5 feet and four foot deep concrete bearing walls. It is sloped to center where it drains through a floor drain. The pad provides spill control when transferring the contents of the on-site storage tank to the tanker trucks for off-site disposal. The floor of the pad is designed to drain to a sump which contains an automatic float-controlled pump that conveys liquid from the pad to the tank. The combined containment capacity of the pad, sump and vault is approximately 6,000 gallons, which is sufficient containment for an over-the-road tanker truck. Drawings of the storage tank design and drawings of the loadout pad are included as Figure 4 of 4 in the Construction Acceptance Report included in **Appendix E-7**.

The dual contained sump has an automatic float-controlled pump which conveys liquid to the hazardous waste tank. The pump has a manual shutoff system that is used when loading activities occur. This shutoff is used in the event of any emergency measures or repair activities.

When leachate from the tank is being transferred from the tank to the tanker for transportation to the treatment facility, personnel present will have a working cell phone with them. The tanker truck is loaded on a concrete load out pad that collects spilled liquids (if spills occur) in a sump and routes the liquid back to the tank. Therefore, the chance of a release to the environment during the transfer of leachate is remote.

A Contingency Plan has also been developed for the facility. The content of the Contingency Plan is based upon the requirements contained in 35 IAC 724 Subpart D, Sections 724.150 through 724.156. The Contingency Plan includes the attempts to make arrangements with local police, fire, and other emergency response personnel, taking into account the characteristics of the landfill leachate that accumulates in the tank. A copy of this plan is included in **Appendix E-**

15. It will be implemented in the event of a fire, explosion, or release from the tank that could threaten human health or the environment.

According to 35 IAC 722.117(a)(7), training must be provided to facility personnel in two primary areas:

1. Hazardous waste management procedures; and
2. Emergency response (including Contingency Plan implementation).

The above training may be attained from either classroom instruction, online training (e.g., computer-based or electronic) or on-the-job training that teaches them to perform their duties in a way that ensures compliance with 35 IAC 722.117(a)(7). The training program will be led by a person trained in hazardous waste management procedures.

Facility personnel must successfully complete the training program presented herein within 6 months after the date of their employment, assignment to the facility, or assignment to a new position at the facility, whichever is later. Employees must not work in unsupervised positions until they have completed the training described herein. Facility personnel must take part in an annual review of the initial training program described herein.

Records documenting the above training on current personnel will be kept in the facility record until closure of the tank. Training records on former employees will be kept for at least three years from the date the employee last worked at the facility. The training program will include the elements described below.

Because the facility is a closed former hazardous waste landfill, operations occurring on-site are limited to occasional operation and maintenance (O&M) activities. Consequently, only two permittee job positions have been assigned regular duties at the facility. The two job titles involved in performing on-going operation and maintenance activities associated with the leachate accumulation tank include:

- Environmental Technician, performed by site employee Roger Abel or his successor; and
- Environmental Manager, performed by BFI employee Jim Hitzeroth or his successor.

Job descriptions for these two job titles are presented in **Appendix E-16**. Both of the above job titles will receive the training described below.

Hazardous Waste Management Procedures Training:

This portion of the training program will be performed in a way that allows the facility to comply with the RCRA regulations. Although the likelihood of permittee employees directly contacting the landfill leachate is low, the training will allow workers to safely handle hazardous wastes, if needed. The training will cover hazardous waste management procedures relevant to the positions that the employees hold at the facility.

The landfill leachate accumulating in the tank is regularly pumped from the tank to tanker trucks. No direct contact with the leachate occurs during this process. However, if the need arises for direct contact with the leachate, then proper personal protective equipment (PPE) shall be utilized by employees.

Emergency Response Training:

The emergency response training provided to the above employees will include the Hazardous Waste Operations and Emergency Response (HAZWOPER) Training under 29 CFR 1910.120, including 40 hours of initial training and annual 8 hour refresher training. The 8 hour refresher training will satisfy the requirements for annual refresher training presented in 35 IAC 722.117(a)(7)(C). Emergency response training will also include training tailored more specifically towards the operation and maintenance activities performed related to the 90-day leachate accumulation tank. This facility-specific training will focus upon reviewing the contents of the Contingency Plan (included in **Appendix E-15**). An outline of the topics to be covered during the Contingency Plan training is as follows:

- Procedures to follow in case of a fire;
- Procedures to follow in case of an explosion;
- Procedures to follow in case of a release;
- Procedures to follow in case of an injury;
- Procedures to follow during site evacuation;
- Responsibilities of the Site Emergency Coordinator; and
- List of whom to call in an emergency.

E.3.4 Management of Leachate Collection System (LCS)

The leachate is collected from a series of extraction wells and ultimately routed to a leachate collection tank described in the section above. Leachate collected in the tank is regularly

removed via tanker truck and transported to an off-site treatment facility. Piping and instrumentation diagrams are included in **Appendix E-13.**

As mentioned above in Section E.1.5, two leachate collection trenches were installed on the bottom of the Site 1A landfill. They trend north-south and drain towards the south end of Site 1A. Extraction wells are also used to extract landfill leachate. The vertical extraction wells gravity drain leachate to the manhole located southwest of Site 1A shown on the Sheets in **Appendix E-13**. From the manhole, the leachate is pumped into the forcemain that routes leachate to the above ground tank. The boring logs for the extraction wells are included in **Appendix E-17.** The Extraction Wellhead Details are included in the Figures section contained in the Construction Acceptance Report included herein as **Appendix E-7**.

A table detailing the following extraction well specifications is included as **Table E-1**:

- Northing/Easting coordinates;
- Bottom of landfill at each location;
- Total feet at drilling;
- Reported and measured well depth; and
- Depth to pump top and bottom.

As shown in this table, the bottom of the extraction wells are generally located near the bottom of the landfill and the pumps are typically set within one foot of the bottom of the extraction wells. The leachate extraction pumps are set to pump whenever liquid reaches the top of the pump (which are typically 3 feet long).

The quantity of leachate hauled from the accumulation tank will be kept in the operating record. The contents of the tank are unloaded and transported by a licensed hazardous waste transporter. During loading of the tanker trucks, the following procedures will be implemented:

- Trucks will be parked in the load out pad area as level as possible;
- Valves will be checked for tightness before removing caps from connections;
- All hose or pipe connections will be secure to prevent potential spills or leaks;
- During loading, pipes and hoses will be protected from traffic movement that could cause breakage or pulling on the lines;

- Supplies of absorbent materials and equipment will be available to control, contain and cleanup spills;
- The truck driver and/or facility personnel will be present during the loading process at all times; and
- Personnel involved in leachate loading operations will wear proper protective clothing.

The Site 1 Phase A leachate is currently transported off-site in 5,000 gallon tanker trucks by the following transporter:

ERC Midwest Carriers
360C South Curtis Rd.
West Allis, Wisconsin 53214
Transporter's ID No. UPW508337MN
USEPA Id No. WIR000140988
Illinois Special Waste Hauling Permit No.: 5363

Copies of the manifests for shipment of the hazardous waste offsite are maintained in the post-closure operating record. The manifests detail the date of shipment, amount hauled, hauling facility, and final treatment and/or disposal facility.

Currently the leachate is transported off-site to the following facility:

CID Recycling and Disposal Facility
P. O. Box 1309
138th and Interstate 94
Calumet City, Illinois 60409

The leachate (wastewater) generated from Site 1A is classified as a F039 listed hazardous waste. The CID facility is a licensed treatment, storage and disposal facility, and CID treats the leachate through a biological treatment method and removes the solids from the waste stream prior to disposal.

Another leachate transporter and/or disposal facility may be utilized in the future, so long as they have attained the proper licenses and permits.

The leachate level within the tank will also be monitored. As designed, the ball float within the leachate tank causes the leachate extraction system to automatically shut down when the leachate reaches a certain level within the tank. This measure was implemented to prevent the tanks from overflowing.

E.3.5 Summary of Leachate Management Program Conducted to Date

Post-closure operation and maintenance activities have been implemented at the Zion Site 1 Phase A Landfill over the duration of the existing effective Post-Closure Permit, which was first issued in 2011. Regular inspections and maintenance of the leachate collection system have occurred in accordance with the existing Post-Closure Permit. Historical documentation is maintained as part of the facility record.

CID Recycling & Disposal Facility is a permitted off-site treatment works that meets the requirements of 35 Illinois Administrative Code (IAC) 811.309(e)(1). CID is a permitted treatment facility, and wastewater discharges are required to meet the requirements of their water permit obtained pursuant to 35 IAC 309. The volume of leachate generated and transported off-site for disposal from the Site 1 Phase A unit (in gallons) since 2012 is as follows:

2012:	198,617 gallons
2013:	197,371 gallons
2014:	190,080 gallons
2015:	125,115 gallons
2016:	152,662 gallons
2017:	154,940 gallons
2018:	232,624 gallons
2019:	235,622 gallons
2020:	176,763 gallons

Copies of the manifests for shipment of the leachate off-site are maintained in the facility record. The manifests detail the date of shipment, amount hauled, hauling facility, and final treatment and/or disposal facility.

Documentation concerning the operation and maintenance inspections and maintenance regarding the leachate management program have been collected throughout the duration of the post-closure period. Maintenance issues related to the operation of the leachate extraction system are regularly addressed as situations arise. Representative documentation from 2019 and 2020 are included in **Appendix E-18**.

E.4 Operation of Leak Detection System

As a leak detection system is not required at the facility due to the age of the facility, this section is not applicable.

E.5 Operation of the Gas Monitoring/Collection System

A dual leachate/gas extraction system has been installed at the facility. The following sections provide a discussion of the gas system.

The landfill gas collection system is an integrated network of perimeter and central system extraction wells. Five gas monitoring probes are positioned around the perimeter of Site 1A for purposes of compliance. The landfill gas is collected from the extraction wells and transported through a series of headers to a centrally located blower building and electrical generation facility. When the electrical generation facility is not operating or excess gas is produced, gas from the landfill is routed to a flare.

An air permit has been issued that covers the air emissions from the facility. The permitted gas system is operated in accordance with the air permit requirements.

E.5.1 Detailed Description of the Landfill Gas Collection System

Landfill gas is collected from Site 1A through a system of extraction wells (EW-1 through EW-28) and piping network and routed through a moisture separator and then into an energy recovery system located north of the leachate collection tank. The dry gas is routed to the gas plant where it is injected into internal combustion engines which drive five generators to produce electricity. The gas may also be disposed through an enclosed flare system during an emergency or when the gas-to-energy plant is unable to receive gas from the landfill. The drawings in **Appendix E-19** provide additional details pertaining to the flare system.

The gas extraction wells were installed in 1997 as part of closure activities. The installation of the extraction wells, as well as the other components of the gas collection system, is documented in the report entitled, Construction Acceptance Report, BFI Zion Landfill Site I/II Landfill Gas Extraction System, Lake County, Zion, Illinois, dated February 1998, prepared by RMT, Inc. Because this report has previously been submitted to the Illinois EPA, only the Table of Contents and narrative portion are included in this document (see **Appendix E-24**).

A plan view of the gas collection system as it is designed to date is included in **Figures 2** and **3** in **Appendix E-13**. The plan view details the existing gas collection system, including the air flow lines, piping locations, gas extraction wells, cleanouts, one manhole, liquid storage tank and loadout, blower building, and gas to energy facility.

A description of the machinery, compressors, flare, piping, and appurtenances necessary to the system are included within the Construction Acceptance Report referenced above included in **Appendix E-24**. Specifically, this report includes:

- Photographic documentation related to the gas collection system;
- Extraction well boring logs and construction details;
- Air pressure test results;
- Soil test results;
- Survey data;
- Daily field notes;
- Condensate tank information; and
- Blower building and flare information.

The blower building and flare system have been upgraded since initial installation in 1997. The current layout of this area is shown on Drawing A-14 in **Appendix E-19**.

The gas collection system is designed to collect gas and transport it to a central point for processing for beneficial use. It is designed to function for at least the remainder of the 30-year post closure period for Site 1A. The 30 year post closure period began in February 1998 and can be terminated no earlier than February 2028.

E.5.2 Landfill Gas Monitoring Plan

A Gas Monitoring Plan is provided as **Appendix E-20**. This plan will monitor for the buildup and composition of landfill gas. This plan includes the following major elements:

- Narrative describing most likely gas migration paths;
- A figure showing the monitoring devices;
- Documentation that the below ground monitoring devices satisfy applicable requirements;
- Ambient air monitoring procedures;
- Monitoring inside buildings associated with Site 1A; and
- Parameters to be tested.

Consistent with Permit Condition III.E.1, gas monitoring will be performed on an annual basis.

Gas monitoring equipment must have infrared sensor technology for CH4 and CO2 measurements, galvanic fuel cell/chemical sensor for O2 measurement, temperature probe to measure the temperature of the gas stream, internal pressure sensors to measure static, available, and differential pressures, the ability to be calibrated in the field, the ability to measure data and user defined comments electronically, and the ability to download stored data into a .csv or excel file.

Raw gas monitoring data will be retained by both the environmental manager and the third party contractor as an electronic file. In addition, a written log book will be kept by the individual responsible for the operation and maintenance of the gas system.

E.5.3 Landfill Gas Disposal/Processing System

Landfill gas collected from the extraction wells is used to generate energy at an on-site power station or burned within a flare when the energy plant is unable to accept the gas. The location of the power station and flare is shown on **Figure E-1**. A drawing showing the layout and details of the power station is included in **Appendix E-19**.

E.5.4 Summary of Landfill Gas Collection/Monitoring/Processing Systems

Visual inspections will be performed during the gas monitoring events to verify the proper condition of the well heads and the cap. The visual inspection of the well heads will ensure there are no cracks, bad o-rings, or blockage that could be caused by liquid, ice, or other substances. The well casings above grade will be visually inspected along with the surrounding area for signs of damage, deterioration, or potential problems. There must be a tight seal between the boot and the well casing.

To maintain the gas collection system, the isolation valve on the collection header will be exercised regularly. If monitoring of the operating parameters indicates the presence of surging or a pipe break, the following procedure will be implemented:

a. Close the inline valve on the problem length of pipe to isolate it from the entire system and prevent having to shut down the entire system. Close all wellhead valves on the isolated portion of the header.

b. Repair the damaged pipe.

Additional details pertaining to the maintenance of the gas monitoring and maintenance system are provided in the Operations and Maintenance Manual, Landfill Gas Extraction System, dated August 1998, which is provided in **Appendix E-21**. This document contains the following information:

- Purpose of the landfill gas extraction system;
- Site and system description;
- The physical components of the system, including: extraction wells, gas collection header and lateral piping network, condensate pump stations, condensate/leachate collection tank, knockout pot, extraction system blowers, blower building, air compressor, and flare system;
- Maintenance of each of the above physical components;
- Testing procedures;
- Contingency measures; and
- Safety procedures.

Collected gas will be flared and/or routed to the gas to energy facility. Details pertaining to these features are included on the drawings in **Appendix E-19**. Condensate will be pumped to the dual contained less than 90-day accumulation tank and transported offsite with the leachate accumulating from Site 1A. Copies of the manifests for the hazardous waste hauled off site will be kept in the facility record.

Over the last 10 years, the landfill gas collection system has functioned as designed. The results from regular inspection and maintenance work performed on the gas monitoring system is included in the Annual Reports regularly submitted to the Illinois EPA by March 1, each year.

E.6 Post-Closure Inspection Plan

The procedures to be followed to inspect the functionality of the various components of the post-closure care at the Zion Site 1A Landfill were previously presented above in Section D.3.

E.6.1 Inspection Log

The inspection logs are discussed above in Section D.3.1.

E.6.1.1 Items Inspected

The items inspected are discussed above in Section D.3.1.1.

E.6.1.2 Types of Problems

The types of problems the inspector must look for during an inspection are discussed above in Section D.3.1.2.

E.6.1.3 Inspection Frequency

The inspection frequency for each item to be inspected is presented above in Section D.3.1.3.

E.6.2 Repair Log

A repair log, to be utilized if inspections identify items needing repair, is presented above in Section D.3.2.

E.6.3 24 Hour Reporting

If an inspection identifies an issue that may endanger human health or the environment, the 24 hour reporting procedures are presented above in Section D.3.3.

E.7 Post-Closure Monitoring Plan

The monitoring to be performed during the post-closure care period is discussed throughout this permit application.

E.7.1 Facility Controls

E.7.2 Surveys and Corrective Action

The permittee shall protect and maintain the surveyed benchmarks present at or near the closed Site 1 Phase A facility, in accordance with Permit Condition III.C.8. No revisions to the General Post-Closure Care Requirements contained in Permit Condition III.C are being sought as part of this Permit Renewal Application.

The closed Site 1 Phase A Landfill is subject to post-closure requirements in accordance with 35 IAC 724.210(b). A surveyed plat prepared and certified by a professional land surveyor indicating the type, location, and quantity of wastes disposed at the facility was previously provided to the local zoning authority following closure. A copy of this information was previously also transmitted to Illinois EPA. A copy of this documentation is presented in **Appendix E-1**.

No solid waste management units (SWMUs) with cover systems and/or engineered barriers or units/areas subject to an Environmental Land Use Control (ELUC) or Uniform Environmental Covenants Act (UECA). Therefore, no ongoing survey requirements are applicable.

E.7.3 Leachate Collection System

Monitoring of the leachate collection system is proposed to continue in accordance with the monitoring program implemented in accordance with the effective Permit.

E.7.3.1 Leachate Quality

A representative sample of the leachate will be collected and analyzed by a laboratory in accordance with Section E.3.1 above.

E.7.3.2 Leachate Quantity

The quantity of leachate that accumulates in the leachate tank will be quantified as discussed above in Section E.3.4. In addition, each tanker load of leachate hauled from the facility is documented on a manifest that includes the total quantity of leachate hauled. The quantities of leachate removed from the facility are regularly tabulated and presented within the Annual Facility Reports, due by March 1 each year.

E.7.3.3 Leachate Reporting

The quality and quantity of leachate generated at the closed Site 1 Phase A landfill will be regularly reported to Illinois EPA with the Annual Report due by March 1 each year.

E.7.4 Leak Detection System (LDS)

As a leak detection system is not required at the facility due to the age of the facility, this section is not applicable.

E.7.5 Groundwater Monitoring System

The groundwater monitoring program to be performed during the post-closure period is presented above in Section C.

E.7.6 Gas Collection System

E.7.6.1 Gas Quality

The quality of gas collected from the closed Site 1 Phase A facility will be monitored in accordance with the Gas Monitoring Plan included in this Permit Renewal Application as **Appendix E-20.**

The results of the annual gas probe monitoring are presented in the Annual Reports, due each year by March 1. The results from the perimeter gas monitoring program over the last several years has not identified instances of landfill gas in a probe over 50 percent of the lower explosive limit (LEL).

E.7.6.2 Gas Quantity

As of 2020, the gas extraction system contains 28 gas extraction wells that are tuned monthly to optimize gas extraction and maintain compliance with New Source Performance Standards regulations. Monthly gas extraction well monitoring data is maintained within the facility's record files. Information gathered from 2018-20 related to the gas collection and control system is presented in **Appendix E-22**.

E.7.6.3 Summary of Results from the Gas Collection/Monitoring System

The information obtained from the gas collection, monitoring, and processing systems will be maintained in the facility's operating records and submitted each year with the Annual Report, due by March 1 of the following year.

E.8 Post-Closure Maintenance Plan

E.8.1 Procedures, Equipment & Materials

The preventative and corrective maintenance procedures, equipment, and materials required to properly maintain adequate post-closure care of the closed landfill are presented above in Section D. The following items are included in the maintenance plan, as applicable:

- Security control devices;
- Erosion damage repair;
- Settlement, subsidence, and displacement;
- Mowing, fertilization, and other vegetative cover maintenance;
- Run-on and run-off control features;

- Leachate removal system;
- Gas monitoring/extraction system; and
- Replacement of groundwater monitoring wells, as needed.

Additionally, the final cover elevation reference points (i.e., survey control points) consisting of surveyed monuments will be regularly inspected for structural integrity. These reference points may be surveyed periodically during post-closure to assess the degree of subsidence and/or differential settlement that may occur during post-closure (if visual evidence of subsidence and/or differential settlement is observed).

E.8.2 Rationale

The above maintenance program was devised to remedy identified deterioration or malfunction of equipment or structures revealed by the inspection on a schedule which ensures the problem does not lead to an unacceptable environmental or human health hazard. Where a hazard is imminent or has already occurred, remedial action will be taken.

E.8.3 Frequency

The frequency for maintaining the items mentioned above is presented in Section D.3 of this Permit Renewal Application, Inspection Requirements.

E.9 Survey Plat

A survey plat for the Zion Site 1A facility is presented in **Appendix E-1.** This survey plat was prepared by a professional land surveyor and identifies the Zion Site 1A Landfill property with respect to permanently surveyed benchmarks and the legal boundary of the facility. The plat contains a note, prominently displayed stating that the land has been used to manage hazardous wastes and the owner/operator obligations to restrict disturbance of the units containing hazardous waste in accordance with the applicable Subpart G regulations. The survey plat was previously filed with the local zoning authority over local land use and a copy provided to Illinois EPA.

E.10 Notice in Deed and Certification

A notice has been previously filed on the deed to the property notifying any potential purchaser that:

- The land has been used to manage hazardous waste;

- Use of these areas is restricted;
- A survey plat of the type/location/quantity of material in the disposal units or areas has been filed with the Illinois EPA, and the County Recorder; and
- For hazardous waste disposed prior to January 12, 1981, identify the type, location, and quantity of the hazardous waste to the best of the owner or operator's knowledge and in accordance with any records the owner or operator has kept.

A copy of the above notice is contained in **Appendix E-1**.

E.11 Post Closure Cost Estimate

A table estimating the costs for performing the required post-closure care activities is presented as **Table E-3**. This table includes a summary of the costs, including calculations and supporting information used in developing the estimate. The cost estimate is based on third party costs, includes the number of years post-closure care must still be provided, and specifies that the costs are based on 2021 costs. The post-closure cost estimate identifies the various tasks needed to carry out the required post-closure care activities, the cost associated with each task, and the amount of time/materials/efforts needed to perform each task, along with their unit costs.

E.12 Financial Assurance Mechanism for Post-Closure Care

The permittee is utilizing post-closure insurance as the mechanism to satisfy the financial assurance requirements for post-closure care of the facility. A copy of the latest insurance policy #CPC-IL96-010 is presented in **Appendix E-23**. This documentation was previously provided to Illinois EPA in a separate letter from the permittee dated December 18, 2020. Once Illinois EPA approves the Post-Closure Cost Estimate included in this Permit Renewal Application, future updates to the financial assurance mechanism will be consistent with the latest approved post-closure cost estimate.

E.13 State Mechanisms

The state of Illinois has not assumed legal responsibility for compliance with post-closure requirements or assured that state funds are available to cover post-closure requirements. Therefore, this section is not applicable.

F. CORRECTIVE ACTION

In accordance with Section 3004(u) of RCRA and 35 Ill. Adm. Code 724.201, the Permittee shall institute such corrective action as necessary to protect human health and the environment from all releases of hazardous wastes or hazardous constituents, listed in 35 Ill. Adm. Code 721, Appendix H from any solid waste management unit (SWMU) at the Zion facility. Illinois EPA and USEPA issued a joint RCRA permit to this facility in 1988. The USEPA portion of that permit contained requirements for addressing two SWMUs at the facility. According to Permit Condition V.A.2 in the Effective Permit, the Permittee has adequately addressed corrective action at these two SWMUs.

No additional SWMUs have since been identified at the facility. Therefore, Sections F.1 through F.7 are not applicable. However, the Permittee must provide corrective action, as appropriate, for any future releases from SWMUs.

F.1 Identification of SWMUs

Not applicable.

F.2 Characterization of SWMUs

Not applicable.

F.3 Characterization of Releases from SWMUs

Not applicable.

F.4 Information Required for Renewal Applications

Not applicable.

F.5 Proposed Interim Measures to be Conducted

Not applicable.

F.6 Cost Estimate for Required Corrective Action

Not applicable.

Table C-2
Summary of Indicator Parameters

Volatile Organic Compounds (VOCs) – List G1:

Parameters	Storet Number
Acetone	81552
Acrolein	34210
Acrylonitrile	34215
Benzene	34030
Bromodichloromethane	32101
Bromoform	32104
Bromomethane	34413
Carbon Tetrachloride	32102
Chlorobenzene	34301
Chloroethane	34311
2-Chloroethyl Vinyl Ether	34576
Chloroform	32106
Chloromethane	34418
1,1-Dichloroethane	34496
1,2-Dichloroethane	34531
1,1-Dichloroethene	34501
trans-1,2-Dichloroethene	34546
1,2-Dichloropropane	34541
cis-1,3-Dichloropropene	34704
trans-1,3-Dichloropropene	34699
1,4-Dioxane	81582
Ethyl Benzene	78113
Isobutyl Alcohol	77033
Methylene Chloride	34423
Pyridine	77045
1,1,2,2-Tetrachloroethane	34516
Toluene	34010
1,1,1-Trichloroethane	34506
1,1,2-Trichloroethane	34511
Trichloroethene	39180
Vinyl Chloride	39175
1,2-Dichlorobenzene	34536
1,3-Dichlorobenzene	34566
1,4-Dichlorobenzene	34571
Hexachlorobutadiene	39702
Hexachloroethane	34396
Naphthalene	34696
Nitrobenzene	34447

Table C-2
Summary of Indicator Parameters

1,2,4-Trichlorobenzene	34551

Metals – List G2:

Parameters	Storet Number
Barium, (total and dissolved)	01005
Cadmium, (total and dissolved)	01025
Chromium, (total and dissolved)	01034
Cyanide, (total and dissolved)	00723
Lead, (total and dissolved)	01049
Mercury, (total and dissolved)	71890
Nickel, (total and dissolved)	01065

Table C-3
Groundwater Monitoring System Summary

Well Designation	Northing (ft)	Easting (ft)	Ground Surface Elevation (ft msl)	2008 Inside Casing Elevation (ft msl)	Screen Interval (ft msl)	Bottom of Well Elevation (ft msl)	Internal Casing Material	Internal Casing Diameter (in)	Geologic Formation Monitored	Date Installed
G121*	10,535.5	7,807.7	726.8	729.05	627.0 -- 632.0	627.0	SS	2.0	SDA	9/85
R127*	11,302.6	8,512.8	760.8	763.18	651.4 -- 656.1	650.9	PVC	2.0	SDA	9/05
R136*	10,760.4	8,632.0	745.7	748.03	634.7 -- 644.5	634.2	PVC	2.0	SDA	9/05
R123*	12,616.2	8,895.8	760.5	763.06	640.9 -- 645.6	640.4	PVC	2.0	SDA	9/05
R124	12,426.9	9,375.2	781.5	788.28	634.8 -- 644.8	634.8	SS	2.0	SDA	10/93
R128	12,119.3	9,372.8	796.3	802.93	647.7 -- 652.7	647.7	SS	2.0	SDA	10/93
R126	11,851.4	9,375.9	803.0	807.89	648.4 -- 658.4	648.4	SS	2.0	SDA	10/93
C129	11,606.4	9,374.0	810.1	812.54	644.9 -- 649.6	644.4	PVC	2.0	SDA	09/05
G131	11,121.6	9,378.6	806.9	811.10	649.8 -- 654.8	649.8	SS	2.0	SDA	7/93
G132	10,844.6	9,373.3	798.7	805.02	637.3 -- 647.3	637.3	PVC/SS	2.0	SDA	7/93
R133	10,430.6	9,424.3	755.4	758.75	639.0 -- 649.0	639.0	PVC/SS	2.0	SDA	2/89
GT02	10,032.8	9,185.4	742.36	745.52	712.3 -- 717.3	712.3	SS	2.0	SZ	10/84
GT05	12,617.3	9,184.2	761.29	762.00	707.9 -- 712.9	707.1	SS	2.0	SZ	9/84

Notes:
* = Upgradient Well
SDA = Shallow Drift Aquifer
SZ = Shallow Zone

R 003014

Table E-3

Cost Estimate for Post-Closure Care - May 2021
Zion Landfill, Site 1 Phase A

	Item	Units	Quantity	Unit Cost	Extended Cost	Post-Closure Care Period began February 10, 1998. As of February 10, 2021, 23 years have been completed and 7 years of the minimum 30 year post-closure period have yet to be completed.
1	Landfill Inspections	Monthly	12	$750	$9,000	Frequency and scope of inspections presented in Section D.3 of May 2021 Permit Renewal Application.
2	90-Day Leachate Acculation Tank Inspections	Weekly	52	$100	$5,200	Weekly inspection is only required on 90-Day Leachate Accumulation Tank (see Section D.3 in May 2021 Permit Renewal Application).
3	Mowing (minimum of once per year)	Acres	49	$60	$2,940	Annual mowing required pursuant to Section D.3 of May 2021 Permit Renewal Application.
4	Vegetation Repair (1/2 ft. topsoil layer) - Fertilizer, Mulch & Seed	Acre	0.25	$7,800	$1,950	Expect no more than 0.25 acre of vegetative cover replacement per year.
5	Fence Repair and Maintenance	Annual	1	$675	$675	Fence repair only expected once per year during remaining post-closure care period.
	Subtotal Costs - Post-Closure Inspection:				**$19,765**	
6	Groundwater Sample Collections (13 wells sampled semi-annually x 2nd & 4th qtrs.)	Wells	26	$100	$2,600	11 wells listed in Section IV of Permit and 2 in Section IV-A.
7a	Laboratory Analysis - Annual Event-2nd Qtr. (List G1/G2) 13 wells/year x 1 sample/well for List G1 and G2	Wells	13	$303	$3,939	In accordance with Section IV and IV-A of Permit: List G1 constituents analyzed 2x per year, List G1 1x. Analytical costs based on estimate from First Environmental Laboratories, dated 2/25/2021.
7b	Laboratory Analysis - 4th Qtr. Event (List G1 only) (13 wells/year x 1 sample/well for List G1)	Wells	13	$195	$2,535	In accordance with Section IV and IV-A of Permit: 4th Qtr. Event only for List G1. Analytical costs based on estimate from First Environmental Laboratories, dated 2/25/2021.
8	Groundwater Reporting - Semi-annual basis	Events	2	$1,500	$3,000	Two groundwater reports required per year, in accordance with Section IV and IV-A of the Permit.
9	Gas Monitoring - 5 perimeter probes and ambient	Year	1	$500	$500	Scope is in accordance with Gas Monitoring Plan included with May 2021 Permit Renewal Application.
	Subtotal Costs - Groundwater/Gas Monitoring:				**$12,574**	
10	Leachate Removal, Transportation & Disposal	gallons/year	215,000	$0.56	$120,400	The quantity of leachate removal is based on the average amount of hazardous waste leachate manifested and transported from the site in 2018-20 (232,624 gal, 235,622 gal, and 176,763 gal). Although leachate production is expected to decrease with time, to be conservative, this quantity is assumed to be produced during the rest of the 30 year post-closure period.
11	Leachate Analysis	year	1	$844	$844	One sample of leachate analyzed per year for 35 IAC 811 Appendix C constituents, pursuant to Permit Condition III.G.7. Leachate analysis is based on Analytical costs from First Environmental Laboratories, dated 2/25/2021.
12	Maintenance of Leachate Collection/Extraction System (includes pump maintenance/replacement, line cleaning, and quarterly leachate head level measurements)	Lump Sum	1	$45,000	$45,000	Lump sum estimate is based on 2021 costs listed in operation and maintenance agreement.
	Subtotal Costs - Leachate:				**$166,244**	
	Total Annual Cost in 2021 Dollars				**$198,583**	
	10% Contingency (on annual costs)				$19,858	
	Total Annual Cost (w/ Contingency)				**$218,441**	
	Remaining Post-Closure Care Period (years)				7.0	The post-closure period ends on February 10, 2028. As of February 10, 2021, 23 years been completed and 7 remain.
	Total Current Annual Costs (annual cost with contingency x years of post-closure remaining):				**$1,390,081**	
	Lump Sum (One Time) Cost Items to be Incurred Prior to End of Post-Closure Care Period					
	Certification of Post-Closure Care	Lump Sum	1	500	$500	
	Monitoring Well Decommissioning/Abandonment	Well	13	$1,000	$13,000	13 wells to be abandoned by drilling subcontractor, in accordance with 77 IAC 920.
	Abandonment of Gas Probes	Probe	5	540	$2,700	5 gas probes included in Gas Monitoring Plan
	Total Lump Sum (One-Time) Costs:				**$16,200**	
	10% Contingency (on one time costs)				$1,620	
	TOTAL POST-CLOSURE CARE COSTS				**$1,407,901**	

OMB# 2050-0024; Expires 05/31/2020

United States Environmental Protection Agency
RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal (Select only one.)

☐	Obtaining or updating an EPA ID number for an on-going regulated activity that will continue for a period of time. (Includes HSM activity)
☐	Submitting as a component of the Hazardous Waste Report for _____ (Reporting Year)
	☐ Site was a TSD facility and/or generator of ≥ 1,000 kg of non-acute hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in **one or more months of the reporting year** (or State equivalent LQG regulations)
☐	Notifying that regulated activity is no longer occurring at this Site
☐	Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities
☑	Submitting a new or revised Part A Form

2. Site EPA ID Number

I	L	D	9	8	0	7	0	0	7	2	8

3. Site Name

Zion Landfill Site 1, Phase A

4. Site Location Address

Street Address: 701 Green Bay Rd.		
City, Town, or Village: Zion		County: Lake
State: IL	Country: United States	Zip Code: 60099

5. Site Mailing Address ☑ Same as Location Address

Street Address		
City, Town, or Village		
State	Country	Zip Code

6. Site Land Type

☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)

A. (Primary) 562212	C.
B.	D.

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 |

OMB# 2050-0024; Expires 05/31/2020

8. Site Contact Information

☐ Same as Location Address

First Name **James**	MI **W**	Last Name **Hitzeroth**
Title **Environmental Manager**		
Street Address **26 W. 580 Schick Rd.**		
City, Town, or Village **Hanover Park**		
State **IL**	Country **United States**	Zip Code **60133**
Email **JHitzeroth@republicservices.com**		
Phone **224-970-1129**	Ext --	Fax

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner

☐ Same as Location Address

Full Name **Zion Landfill, Inc.**	Date Became Owner (mm/dd/yyyy) **1/7/2021**

Owner Type

☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

Street Address **701 Green Bay Road**		
City, Town, or Village **Zion**		
State **IL**	Country **United States**	Zip Code **60099-9564**
Email **james.lewis@advanceddisposal.com**		
Phone **847-599-5910**	Ext	Fax
Comments		

B. Name of Site's Legal Operator

☐ Same as Location Address

Full Name **BFI Waste Systems of North America, LLC**	Date Became Operator (mm/dd/yyyy) **10/15/1976**

Operator Type

☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

Street Address **26 W. Schick Rd**		
City, Town, or Village **Hanover Park**		
State **IL**	Country **United States**	Zip Code **60133**
Email **JHitzeroth@republicservices.com**		
Phone **224-970-1129**	Ext	Fax
Comments		

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 | OMB# 2050-0024; Expires 05/31/2020

10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities

☑ Y ☐ N	1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c		
	☑	a. LQG	-Generates, in any calendar month (includes quantities imported by importer site) 1,000 kg/mo (2,200 lb/mo) or more of non-acute hazardous waste; or - Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or - Generates, in any calendar month or accumulates at any time, more than 100 kg/mo (220 lb/mo) of acute hazardous spill cleanup material.
	☐	b. SQG	100 to 1,000 kg/mo (220-2,200 lb/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material.
	☐	c. VSQG	Less than or equal to 100 kg/mo (220 lb/mo) of non-acute hazardous waste.
☐ Y ☑ N	2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section. *Note: If "Yes", you MUST indicate that you are a Generator of Hazardous Waste in Item 10.A.1 above.*		
☑ Y ☐ N	3. Treater, Storer or Disposer of Hazardous Waste—Note: Part B of a hazardous waste permit is required for these activities.		
☐ Y ☑ N	4. Receives Hazardous Waste from Off-site		
☐ Y ☑ N	5 Recycler of Hazardous Waste		
	☐	a. Recycler who stores prior to recycling	
	☐	b. Recycler who does not store prior to recycling	
☐ Y ☑ N	6. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply.		
	☐	a. Small Quantity On-site Burner Exemption	
	☐	b. Smelting, Melting, and Refining Furnace Exemption	

B. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

F039						

C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes. Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 |

OMB# 2050-0024; Expires 05/31/2020

11. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)

A. Other Waste Activities

☐ Y ☑ N	1. Transporter of Hazardous Waste—If "Yes", mark all that apply.
☐	a. Transporter
☐	b. Transfer Facility (at your site)
☐ Y ☑ N	2. Underground Injection Control
☐ Y ☑ N	3. United States Importer of Hazardous Waste
☐ Y ☑ N	4. Recognized Trader—If "Yes", mark all that apply.
☐	a. Importer
☐	b. Exporter
☐ Y ☑ N	5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If "Yes", mark all that apply.
☐	a. Importer
☐	b. Exporter

B. Universal Waste Activities

☐ Y ☑ N	1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If "Yes" mark all that apply. Note: Refer to your State regulations to determine what is regulated.
☐	a. Batteries
☐	b. Pesticides
☐	c. Mercury containing equipment
☐	d. Lamps
☐	e. Other (specify) _____
☐	f. Other (specify) _____
☐	g. Other (specify) _____
☐ Y ☑ N	2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

☐ Y ☑ N	1. Used Oil Transporter—If "Yes", mark all that apply.
☐	a. Transporter
☐	b. Transfer Facility (at your site)
☐ Y ☑ N	2. Used Oil Processor and/or Re-refiner—If "Yes", mark all that apply.
☐	a. Processor
☐	b. Re-refiner
☐ Y ☑ N	3. Off-Specification Used Oil Burner
☐ Y ☑ N	4. Used Oil Fuel Marketer—If "Yes", mark all that apply.
☐	a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
☐	b. Marketer Who First Claims the Used Oil Meets the Specifications

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 | OMB# 2050-0024; Expires 05/31/2020

D. Pharmaceutical Activities

☐ Y ☑ N	1. Operating under 40 CFR 266 Subpart P for the management of hazardous waste pharmaceuticals—if "Yes", mark only one. Note: See the item-by-item instructions for definitions of healthcare facility and reverse distributor.
☐	a. Healthcare Facility
☐	b. Reverse Distributor
☐ Y ☑ N	2. Withdrawing from operating under 40 CFR 266 Subpart P for the management of hazardous waste pharmaceuticals. Note: You may only withdraw if you are a healthcare facility that is no longer an LQG or SQG.

12. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR 262 Subpart K.

☐ Y ☑ N	A. Opting into or currently operating under 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories— If "Yes", mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities.
☐	1. College or University
☐	2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university
☐	3. Non-profit Institute that is owned by or has a formal written affiliation with a college or university
☐ Y ☑ N	B. Withdrawing from 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories.

13. Episodic Generation

☐ Y ☑ N	Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If "Yes", you must fill out the Addendum for Episodic Generator?

14. LQG Consolidation of VSQG Hazardous Waste

☐ Y ☑ N	Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If "Yes", you must fill out the Addendum for LQG Consolidation of VSQGs hazardous waste.

15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)

☐ Y ☑ N	LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility.
	A. ☐ Central Accumulation Area (CAA) or ☐ Entire Facility
	B. Expected closure date: _____ mm/dd/yyyy
	C. Requesting new closure date: _____ mm/dd/yyyy
	D. Date closed : _____ mm/dd/yyyy ☐ 1. In compliance with the closure performance standards 40 CFR 262.17(a)(8) ☐ 2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8)

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 | OMB# 2050-0024; Expires 05/31/2020

16. Notification of Hazardous Secondary Material (HSM) Activity

☐ Y ☑ N	Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), (25), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material.

17. Electronic Manifest Broker

☐ Y ☑ N	Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator?

18. Comments (include item number for each comment)

19. Certification I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11).**

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy) 4-26-21
Printed Name (First, Middle Initial Last) MIKE STOECKIGT	Title REGION VICE PRESIDENT
Email MIKE.STOECKIGT@GFLENV.COM	

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy) 05/04/2021
Printed Name (First, Middle Initial Last) Matthew R Healy	Title Vice President
Email MHEALY@RepublicServices.com	

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 |

OMB# 2050-0024; Expires 05/31/2020

ADDENDUM TO THE SITE IDENTIFICATION FORM:
NOTIFICATION OF HAZARDOUS SECONDARY MATERIAL ACTIVITY

ONLY fill out this form if:

- You are located in a State that allows you to manage excluded hazardous secondary material (HSM) under 40 CFR 260.30, 261.4(a)(23), (24), (25), or (27) (or state equivalent; See https://www.epa.gov/epawaste/hazard/dsw/statespf.htm for a list of eligible states; AND
- You are or will be managing excluded HSM in compliance with 40 CFR 260.30, 261.4(a)(23), (24), (25), or (27) (or state equivalent) or have stopped managing excluded HSM in compliance with the exclusion(s) and do not expect to manage any amount of excluded HSM under the exclusion(s) for at least one year. Do not include any information regarding your hazardous waste activities in this section. Note: If your facility was granted a solid waste variance under 40 CFR 260.30 prior to July 13, 2015, your management of HSM under 40 CFR 260.30 is grandfathered under the previous regulations and you are not required to notify for the HSM management activity excluded under 40 CFR 260.30.

1. Reason for Notification (Include dates where requested)

☐ Facility will begin managing excluded HSM as of _____ (mm/dd/yyyy).

☐ Facility is still managing excluded HSM/re-notifying as required by March 1 of each even-numbered year.

☐ Facility has stopped managing excluded HSM as of _____ (mm/dd/yyyy) and is notifying as required.

2. Description of Excluded HSM Activity. Please list the appropriate codes (see Code List section of the instructions) and quantities, in short tons, to describe your excluded HSM activity ONLY (do not include any information regarding your hazardous wastes). Use additional pages if more space is needed.

A. Facility Code	B. Waste Code(s) for HSM	C. Estimate Short Tons of excluded HSM to be managed annually	D. Actual Short Tons of excluded HSM that was managed during the most recent odd-numbered year	E. Land-based Unit Code

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 |

OMB# 2050-0024; Expires 05/31/2020

ADDENDUM TO THE SITE IDENTIFICATION FORM: EPISODIC GENERATOR

ONLY fill out this form if:

- You are an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more then 60 days, that moves the generator to a higher generator category pursuant to 40 CFR 262 Subpart L. Note: Only one planned and one unplanned episodic event are allowed within one year; otherwise, you must follow the requirements of the higher generator category. Use additional pages if more space is needed.

Episodic Event	
1. Planned ☐ Excess chemical inventory removal ☐ Tank cleanouts ☐ Short-term construction or demolition ☐ Equipment maintenance during plant shutdowns ☐ Other _____	2. Unplanned ☐ Accidental spills ☐ Production process upsets ☐ Product recalls ☐ "Acts of nature" (Tornado, hurricane, flood, etc.) ☐ Other _____
3. Emergency Contact Phone	4. Emergency Contact Name
5. Beginning Date _____ (mm/dd/yyyy)	6. End Date _____ (mm/dd/yyyy)

Waste 1

7. Waste Description				8. Estimated Quantity (in pounds)	
9. Federal and/or State Hazardous Waste Codes					

Waste 2

7. Waste Description				8. Estimated Quantity (in pounds)	
9. Federal and/or State Hazardous Waste Codes					

Waste 3

7. Waste Description				8. Estimated Quantity (in pounds)	
9. Federal and/or State Hazardous Waste Codes					

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 |

OMB# 2050-0024; Expires 05/31/2020

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT PART A FORM

1. Facility Permit Contact

First Name	James	MI	Last Name Hitzeroth
Title	Environmental Manager		
Email	JHitzeroth@republicservices.com		
Phone	224-970-1129	Ext	Fax

2. Facility Permit Contact Mailing Address

Street Address	26W580 Schick Rd.	
City, Town, or Village	Hanover Park	
State IL	Country United States	Zip Code 60133

3. Facility Existence Date (mm/dd/yyyy)

10/15/1976

4. Other Environmental Permits

A. Permit Type	B. Permit Number	C. Description
N	0 0 6 7 7 2 4	Stormwater Discharge Permit
E	1 9 9 5 3 4 3	IL Solid Waste Dispoal Permit
E	9 3 0 8 0 0 1 2	IL Air Permit
E	1 9 9 2 3 2 8	IL Solid Waste Disposal Permit

5. Nature of Business

Closed RCRA Subtitle C Landfill

EPA ID Number | I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 | OMB# 2050-0024; Expires 05/31/2020

6. Process Codes and Design Capacities

Line Number		A. Process Code			B. Process Design Capacity (1) Amount	B. Process Design Capacity (2) Unit of Measure	C. Process Total Number of Units	D. Unit Name
0	1	D	8	0	5,160,000	Y	1	Zion Site 1A Landfill
0	2	S	0	2	8,000	G	1	Leachate Tank

7. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes (1) Process Codes								D. Processes (2) Process Description (if code is not entered in 7.D1))
0	1	F	0	3	9	200,000	gallons	S	0	2						

8. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

9. Facility Drawing

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

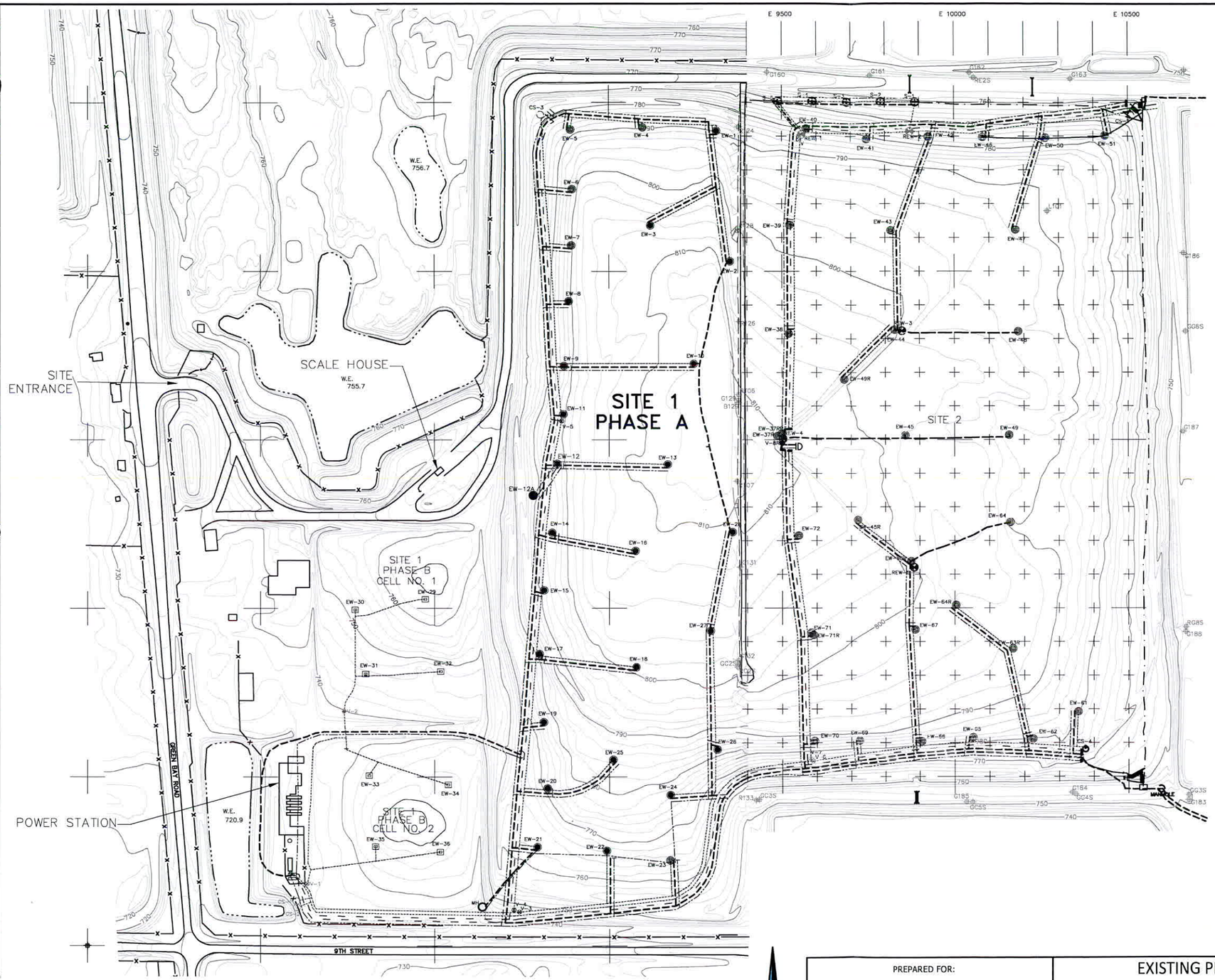
10. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

11. Comments

A map satisfying Item 8 above is provided in the Part B Post-Closure Permit Renewal Application as Figure B-2. A drawing satisfying Item 9 above is provided in the Part B Post-Closure Permit Renewal Application as Figure B-3. Photographs satisfying Item 10 showing existing structures and storage areas are presented in the Part B Post-Closure Permit Renweal Application in Appendix A-1, immediately following this Part A Application Form.

R 003026



LEGEND

- EXISTING GAS HEADER PIPING
- EXISTING CONDENSATE DISCHARGE PIPING
- EXISTING AIR SUPPLY PIPING
- EXISTING LEACHATE FORCEMAIN PIPING
- EXISTING LATERAL GAS PIPING
- EW-43 — EXTRACTION WELL
- EW-28 — EXTRACTION WELL WITH PUMP
- REW-2 — REMOTE EXTRACTION WELLHEADS
- S-1 — NORTH TRENCH SUMP
- CS-5 — CONDENSATE SUMP
- R133 — GROUNDWATER MONITORING WELL
- GMP-7 — GAS MONITORING PROBE
- V-8 — VALVE BOX

APPROXIMATE GRAPHIC SCALE

300 0 150 300 600

1 inch = 300 ft.

N

PREPARED FOR:

ZION LANDFILL

EXISTING PIPING LAYOUT

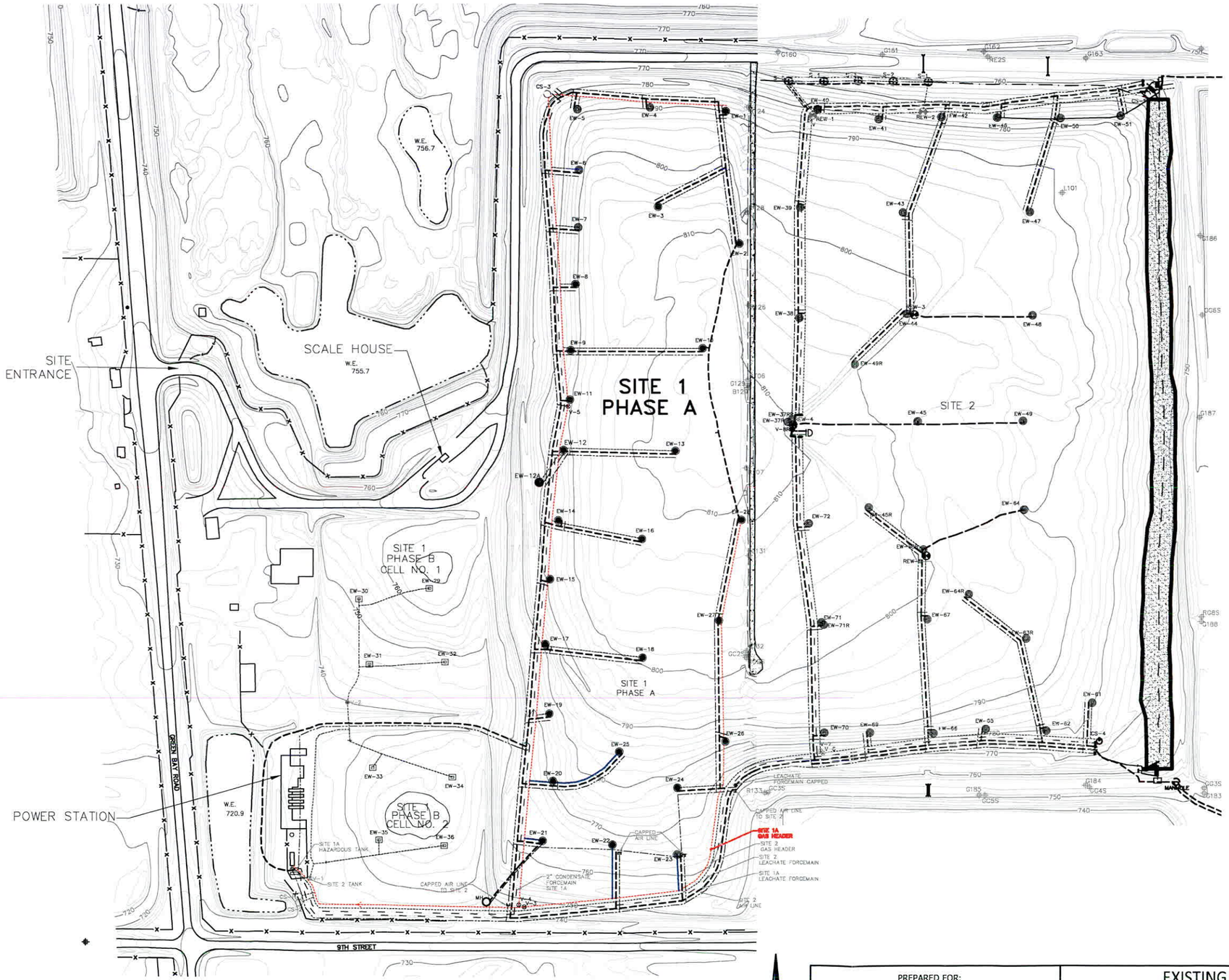
SITE 1A - ZION LANDFILL
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

Weaver Consultants Group
CHICAGO, ILLINOIS
(312) 922-1030 www.wcgrp.com

DRAWN BY:	RMD
REVIEWED BY:	MM
DATE:	2/15/2021
FILE:	0120-037-10
CAD:	zn000216.dwg

FIGURE 1

R 003027



LEGEND

- EXISTING GAS HEADER PIPING
- EXISTING CONDENSATE DISCHARGE PIPING
- EXISTING AIR SUPPLY PIPING
- EXISTING LEACHATE FORCEMAIN PIPING
- EXISTING LATERAL GAS PIPING
- EW-43 — EXTRACTION WELL
- EW-28 — EXTRACTION WELL WITH PUMP
- REW-2 — REMOTE EXTRACTION WELLHEADS
- S-1 — NORTH TRENCH SUMP
- CS-5 — CONDENSATE SUMP
- R133 — GROUNDWATER MONITORING WELL
- GMP-7 — GAS MONITORING PROBE
- V-8 — VALVE BOX

APPROXIMATE GRAPHIC SCALE

300 0 150 300 600

1 inch = 300 ft.

N

PREPARED FOR:

ZION LANDFILL

EXISTING GAS FLOW

SITE 1A - ZION LANDFILL
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

Weaver Consultants Group
CHICAGO, ILLINOIS
(312) 922-1030 www.wcgrp.com

DRAWN BY: RMD
REVIEWED BY: MM
DATE: 2/15/2021
FILE: 0120-037-10
CAD: zn000217.dwg

FIGURE 2

SITE ENTRANCE

SCALE HOUSE
W.E. 755.7

W.E. 756.7

SITE 1 PHASE A

SITE 2

SITE 1 PHASE B CELL NO. 1

SITE 1 PHASE B CELL NO. 2

SITE 1A AIR LINE

POWER STATION

W.E. 720.9

SITE 1A HAZARDOUS TANK

SITE 2 TANK

CAPPED AIR LINE TO SITE 2

2" CONDENSATE FORCEMAIN SITE 1A

CAPPED AIR LINE

LEACHATE FORCEMAIN CAPPED

SITE 1A GAS HEADER

SITE 2 GAS HEADER

SITE 2 LEACHATE FORCEMAIN

SITE 1A LEACHATE FORCEMAIN

SITE 2 GAS LINE

MANHOLE

GREEN BAY ROAD

9TH STREET

LEGEND

- EXISTING GAS HEADER PIPING
- EXISTING CONDENSATE DISCHARGE PIPING
- EXISTING AIR SUPPLY PIPING
- EXISTING LEACHATE FORCEMAIN PIPING
- EXISTING LATERAL GAS PIPING
- EW-43 — EXTRACTION WELL
- EW-28 — EXTRACTION WELL WITH PUMP
- REW-2 — REMOTE EXTRACTION WELLHEADS
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- CS-5 — CONDENSATE SUMP
- R133 — GROUNDWATER MONITORING WELL
- GMP-7 — GAS MONITORING PROBE
- V-8 — VALVE BOX

APPROXIMATE GRAPHIC SCALE

300 0 150 300 600

1 inch = 300 ft.

N

PREPARED FOR:

ZION LANDFILL

EXISTING AIR LINE FLOW

SITE 1A - ZION LANDFILL
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

Weaver Consultants Group
CHICAGO, ILLINOIS
(312) 922-1030 www.wcgrp.com

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FILE:	0120-037-10
CAD:	zn000218.dwg

FIGURE 3

R 003029

LEGEND

- EXISTING GAS HEADER PIPING
- EXISTING CONDENSATE DISCHARGE PIPING
- EXISTING AIR SUPPLY PIPING
- EXISTING LEACHATE FORCEMAIN PIPING
- EXISTING LATERAL GAS PIPING
- EW-43 — EXTRACTION WELL
- EW-28 — EXTRACTION WELL WITH PUMP
- REW-2 — REMOTE EXTRACTION WELLHEADS
- S-1 — NORTH TRENCH SUMP
- CS-5 — CONDENSATE SUMP
- R133 — GROUNDWATER MONITORING WELL
- GMP-7 — GAS MONITORING PROBE
- V-8 — VALVE BOX

SITE ENTRANCE

SCALE HOUSE
W.E. 755.7

W.E. 756.7

SITE 1 PHASE A

SITE 2

SITE 1 PHASE B CELL NO. 1

SITE 1 PHASE B CELL NO. 2

SITE 1A LEACHATE FORCEMAIN

SITE 1A HAZARDOUS TANK

SITE 2 TANK

CAPPED AIR LINE TO SITE 2

2" CONDENSATE FORCEMAIN SITE 1A

SITE 1A GAS HEADER

SITE 2 GAS HEADER

SITE 2 LEACHATE FORCEMAIN

SITE 1A LEACHATE FORCEMAIN

LEACHATE FORCEMAIN CAPPED

MANHOLE

GREEN BAY ROAD

9TH STREET

POWER STATION
W.E. 720.9

APPROXIMATE GRAPHIC SCALE
300 0 150 300 600
1 inch = 300 ft.

N

PREPARED FOR:
ZION LANDFILL

EXISTING LEACHATE FLOW

SITE 1A - ZION LANDFILL
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

Weaver Consultants Group
CHICAGO, ILLINOIS
(312) 922-1030 www.wcgrp.com

DRAWN BY:	RMD
REVIEWED BY:	MM
DATE:	2/15/2021
FILE:	0120-037-10
CAD:	zn000219.dwg

FIGURE 4

INFORMATION ABOUT ZION LANDFILL FOR WORKERS INVOLVED IN POST-CLOSURE ACTIVITIES

SITE BACKGROUND

The Zion Landfill Site 1, Phase A facility located at 9th Street and Green Bay Road in Zion, Lake County, Illinois (the Zion Landfill). Since its initial permit in 1975, the primary activity at the facility has been landfilling solid, non-hazardous, municipal waste. Figure 1 attached shows the configuration of the facility.

In 1980, Federal regulations identified certain wastes as being hazardous and required specific management of these wastes. One requirement was that hazardous wastes could only be stored, treated or disposed in permitted facilities. The Zion Landfill applied for and received a permit to dispose of hazardous waste in one section of the facility commonly known as Site 1 Phase A. Hazardous wastes were accepted and landfilled in this area until 1991. Active hazardous waste management no longer occurs at the site and certification of closure for the site was submitted to the IEPA in February 1998. The landfill is strictly regulated by the Illinois Environmental Protection Agency (IEPA) under a hazardous waste post-closure permit called a RCRA Part B Permit.

HAZARDOUS WASTE MANAGED

The Zion Landfill's hazardous waste landfill (Site 1 Phase A) accepted hazardous wastes from a variety of industries, including manufacturing, petrochemical, steel, and utilities. The hazardous characteristics of the wastes accepted included heavy metals and corrosivity. Some waste materials are automatically considered hazardous due to the process by which it is generated. The Zion Landfill accepted some of these "listed" wastes as well. Examples of listed wastes accepted include wastewater treatment sludges from electroplating operations; various solvents used in degreasing; pesticides; laboratory chemicals; and emission control dust from steel production. Much of the hazardous waste managed at the Zion Landfill's hazardous waste landfill (Site 1 Phase A) was from clean-up activities and generally consisted of soil contaminated with low concentrations of hazardous constituents.

Site 1 Phase A was a co-disposal landfill. Co-disposal, a common practice at that time, disposed of both hazardous waste and solid waste in the same landfill. The quantity of hazardous waste compared to the total quantity of solid, non-hazardous, municipal waste accepted in Site 1 Phase A was relatively small.

MONITORING SYSTEMS

There are several monitoring and management systems in place at the Zion Landfill to ensure against adverse affects to human health and the environment. Circling the closed hazardous waste landfill is a system of groundwater monitoring wells. Samples of groundwater are obtained from each of these wells on a regular basis. The samples are analyzed for an extensive list of organic and inorganic parameters. The data is statistically evaluated and is provided to the IEPA for purposes of determining whether a statistically significant increase concentrations of groundwater parameters is occurring. Further information concerning groundwater sampling and reporting can be obtained from the Landfill Manager.

Methane gas, a by-product of solid waste decomposition, is commonly produced at a landfill for 7 to 15 years after the landfill cap is applied. The Zion Landfill has received a permit from IEPA to install and operate a gas control system for the entire facility (solid and hazardous waste landfills). Vertical wells and horizontal piping are installed within the landfill to promote gas migration to specified areas where it is collected and either flared or used to fuel turbines for electrical generation. The practice controls the mechanism for gas escape and minimizes pressure build-up. In addition to the active gas control system, periodic gas monitoring is conducted around the site and continuously in the buildings.

Leachate is the liquid which forms in the bottom of a landfill as a result of waste decomposition and infiltration of precipitation. The gas control system described above is a dual extraction system that allows for the monitoring and removal of leachate. Leachate from the hazardous waste landfill (Site 1 Phase A), which is hazardous by definition, is removed and routed to a storage tank prior to transporting off-site for proper treatment and disposal.

Mechanisms are in place to ensure security of the site, to respond to emergencies, and to perform regular inspection and maintenance activities.

TRAINING

Contractors hired by the facility to perform post-closure work that has the potential for exposure to hazardous waste or hazardous waste constituents must be trained in accordance with the requirements of 29 CFR 1910.120(p) prior to commencing work on the Zion Landfill Hazardous Waste Unit (Site 1 Phase A).

PRECAUTIONS

Workers are reminded to conduct safe and sound work consistent with normal industrial practices for the specific type of work. Site-specific precautions and observations are noted:

- In any emergency, notify Zion Landfill's manager or his designated representative immediately.
- Report unusual or abnormal smells to Zion Landfill's manager or his designated representative. A faint gas aroma is normal.
- Report seeps or breeches in the landfill cover to the Zion Landfill's manager or his designated representative.
- Report breeches in the security system to the Zion Landfill's manager or his designated representative. Always report when entering or leaving the site.
- Report unusual observations (e.g., flares not burning, monitoring wells disturbed, abnormal wildlife activities).

PROPERTY LINE
(FROM CQM DRAWING)

SITE 2 EXPANSION AREA
SOLID WASTE BOUNDARY
(FROM CQM)

SITE ENTRANCE

SCALE HOUSE

SITE 1
PHASE A

SITE 2

SITE 1
PHASE B
CELL NO. 1

SITE 1
PHASE B
CELL NO. 2

CELL
CONSTRUCTION
LIMITS
(FROM CQM)

CELL CONSTRUCTION LIMITS
(FROM CQM)

LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE SITE 1A WASTE MANAGEMENT BOUNDARY
- APPROXIMATE WATER EDGE

APPROXIMATE GRAPHIC SCALE

400 0 200 400 800

1 inch = 400 ft.

N

PREPARED FOR:

ZION LANDFILL

FACILITY LAYOUT

SITE 1 - PHASE A
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

Weaver Consultants Group
CHICAGO, ILLINOIS
(312) 922-1030 www.wcgrp.com

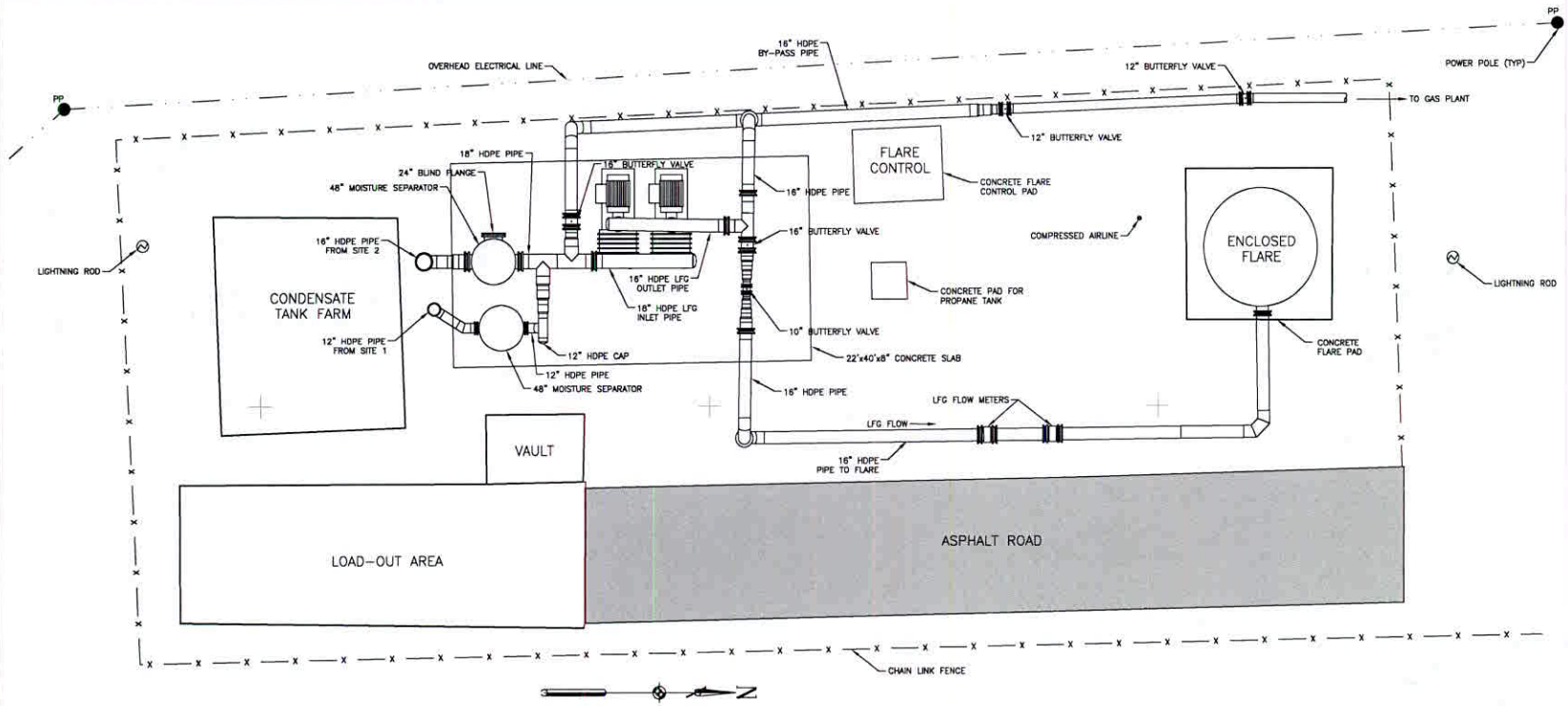
DRAWN BY:	RMD
REVIEWED BY:	MM
DATE:	4/14/2021
FILE:	0120-037-10
CAD:	SITE 1.dwg

FIGURE 1

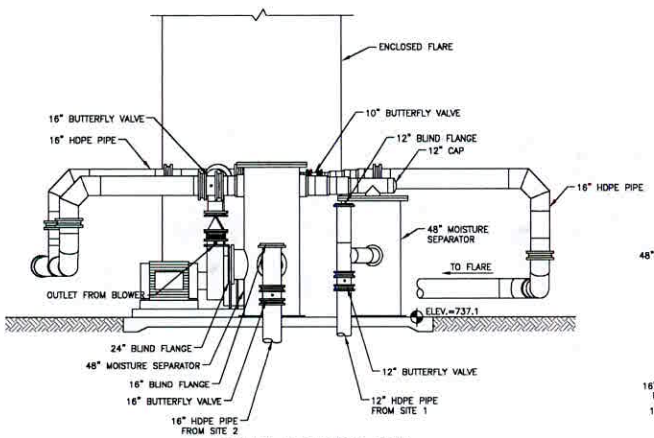
Appendix E-19

Blower Building, Flare, and Power Plant As-Built Drawings

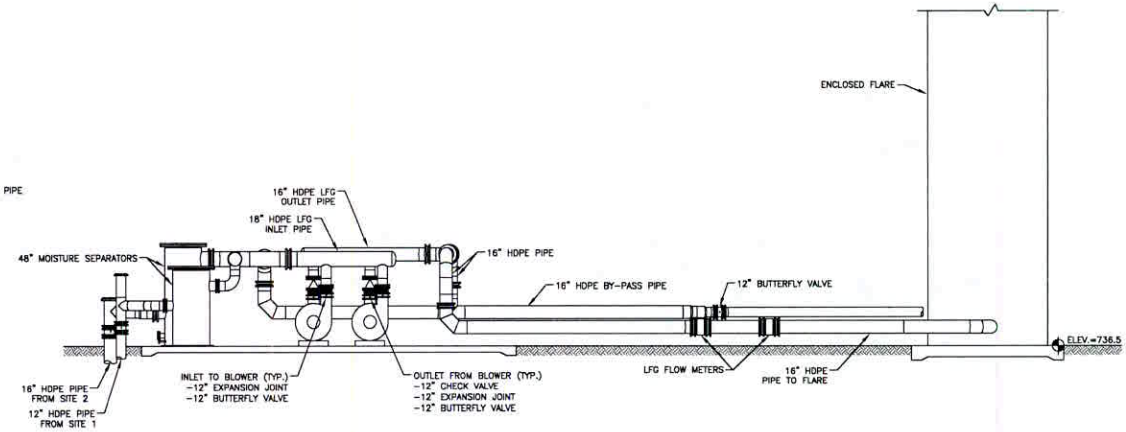
R 003035



PLAN VIEW
SCALE: 1"=6'



SOUTH ELEVATION VIEW
SCALE: N.T.S.



EAST ELEVATION VIEW
SCALE: N.T.S.

NO.	DATE:	BY:
	RELEASE	DATE: BY:
	Project Review	
6		
5		
4		
3		
2		
1		

DESCRIPTION

REVISIONS

VEOLIA ENVIRONMENTAL SERVICES

CQM, Inc.
Construction Quality Management
2778 Manitowoc Road, Suite A
Green Bay, WI 54311

Blower Building and Flare As-Built

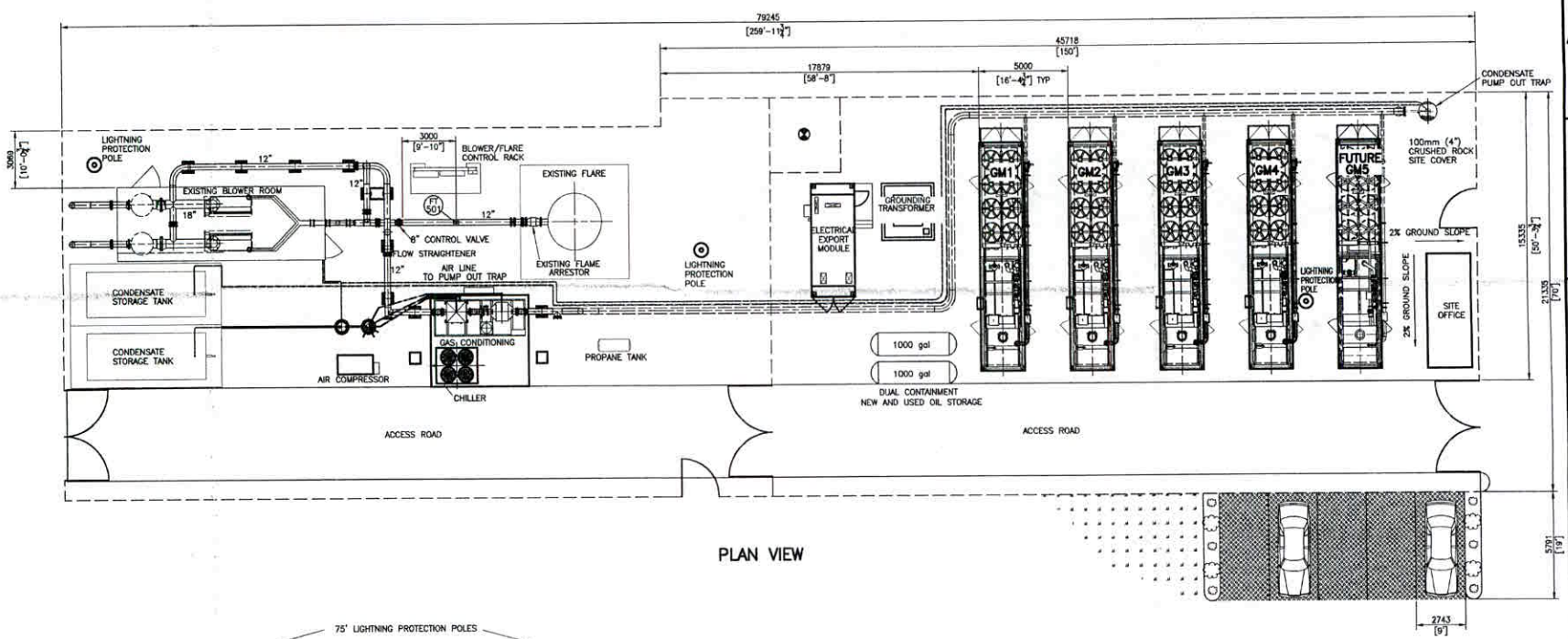
Construction Documentation Drawings
2007 Composite Cover & LFG System
Veolia ES Zion Landfill
Zion, Illinois

DRAWN BY: WBE

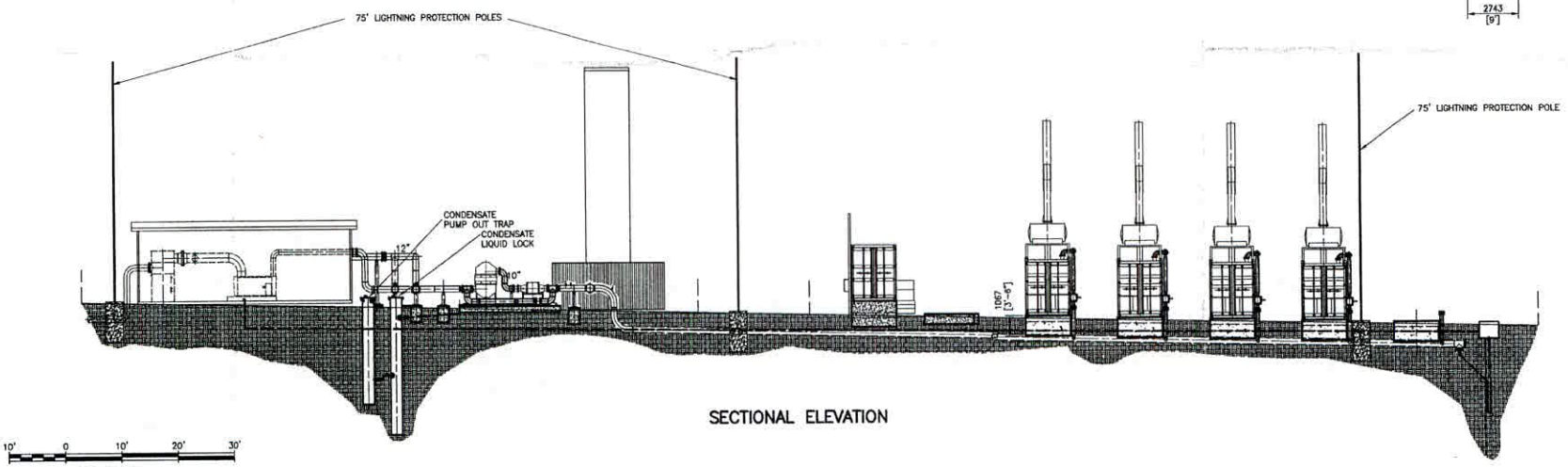
DATE: March 2008

SCALE: As Shown

DRAWING NO.
A-14



PLAN VIEW



SECTIONAL ELEVATION

10' 0 10' 20' 30'

SCALE 1"=10'

APPROVED FOR CONSTRUCTION

REV	AMENDMENTS	DRAWN	DESIGNED	CHECKED	APPROVED	DATE
1	LIGHTNING POLE HOLDS REMOVED, LOCATIONS UPDATED.	P.J.K.	S.B.	C.R.	C.S.	05/11/01
0	I.F.C. - ORIGINAL ISSUE.	P.J.K.	S.B.	T.K.W.	M.O.	25/10/01

ASSOCIATED DRAWING	DRAWING NUMBER
BURIED EARTHING GRID AND LIGHTNING PROTECTION DETAILS	891-EA-003
POWER STATION FUEL RAIL ARRANGEMENT	891-BA-005
PIPING & INSTRUMENTATION DIAGRAM LANDFILL GAS	891-BA-003

Energy Developments
PO BOX 830068
HOUSTON TX
77283-0068
TEL 713 781 5353
FAX 713 781 5303

DRAWN	DESIGN	APPRD
K.I.M.	S.B.	C.J.S.
DATE 19/01/01	DATE 19/01/01	DATE 26/10/01

PROJECT: ZION LFG POWER PROJECT

DRAWING TITLE: POWER STATION SITE LAYOUT

SCALE	DRAWING NUMBER	PAGE	REV	SIZE
1"=10'	891-BA-001	OF	1	A1

LAST PLOTTED TIME: 08:51 DATE: 05/12/01 LAST MODIFIED TIME: 08:51 DATE: 05/12/01

R 003036

Appendix E-15

Contingency Plan

CONTINGENCY PLAN

Zion Landfill Site 1, Phase A

TABLE OF CONTENTS

INTRODUCTION AND GENERAL INFORMATION

The Zion Landfill Site 1, Phase A (Zion Site 1A) is a closed hazardous waste landfill facility located in Zion, Lake County, Illinois. Zion Landfill, Inc. owns the closed facility, while BFI Waste Systems of North America, LLC (BFI) operates Site Zion Site 1A. The facility is located at 9th Street and Green Bay Road. The address, telephone numbers and contact for the site are:

Zion Landfill
701 Green Bay Road
Zion, Illinois 60099
Contact: Mark Bingham, General Manager
Phone: 847/599-5910

The site is located in both Newport and Benton Townships. The facility layout is shown on **Figure 1**. The total property encompasses approximately 250 acres. However, only approximately 40 acres have been used for disposal of hazardous waste. The remaining property is utilized for non-hazardous solid waste disposal, surface water management and other ancillary facilities.

Zion Site 1A was utilized for co-disposal of solid and hazardous waste and is regulated under 35 IAC 724. The facility stopped receiving waste in 1993 and received final cover in 1997. A minimum of 30 years of post-closure care is required at the facility, beginning in February of 1998.

The facility has been designed with contemporary engineering techniques, under secure geologic and hydrogeologic conditions, to contain waste material in a manner which will protect human health and the environment. In addition to secure geology, a sophisticated groundwater monitoring system exists on site which is designed as an early warning mechanism for possible contaminant migration, should it occur. Safety equipment, a communications system, perimeter fencing and safe operational practices stipulated in the facility's RCRA Post-Closure Permit further ensure the security of the site.

Design and operations are in accordance with the State Illinois Environmental Protection Agency (IEPA) criteria and Federal Regulations mandated by the Resource Conservation and Recovery Act (RCRA). Presented herein is an Emergency/Contingency Plan to aid in the protection of human health and the environment.

The following information is included within this Contingency Plan:

1. Procedures to follow in case of a fire.

2. Procedures to follow in case of an explosion.
3. Procedures to follow in case of a release.
4. Procedures to follow in case of an injury.
5. Procedures to follow during site evacuation.
6. Responsibilities of the Site Emergency Coordinator.
7. List of whom to call in an emergency situation.

It is not expected that emergency situations will occur on site due to the extensive preparedness and prevention methods employed. However, site employees will be trained to use this Contingency Plan. In addition, a copy of this will be maintained on-site and a copy will be provided to the appropriate local authorities and response facilities that may be called upon to provide emergency services. A copy of the Contingency Plan will be sent by certified mail to the appropriate local authorities and response facilities listed in **Attachment 2**.

RESPONSIBILITIES OF THE EMERGENCY COORDINATOR

The primary Emergency Coordinator for the facility will be the General Manager of the operating facility located near the closed Zion Site 1A. In the event of his or her absence or incapacity to serve as the Emergency Coordinator, the Operations Manager (of the operating landfill) will be the secondary Emergency Coordinator. The tertiary Emergency Coordinator for the facility will be the Safety Manager (of the operating facility). Contact with the designated Emergency Coordinator can be in person or by phone during operating hours. After operating hours, the Emergency Coordinator can also be reached cellular phone. The current names and phone numbers of these personnel are listed on **Attachment 1** at the end of this document.

The Emergency Coordinator is responsible for coordinating all emergency response measures and must be familiar with the facility's Emergency/Contingency Plan, as well as operations and activities at the site, locations and characteristics of the waste being handled, locations of pertinent records, and the facility layout. The Emergency Coordinator is authorized to commit the resources necessary to implement the Emergency/Contingency Plan.

IMPLEMENTATION

The Emergency Coordinator will determine how and when the Contingency Plan will be implemented. In general, most mishaps and small accidents can be responded to by site personnel and will not warrant formal implementation of this Contingency Plan. However,

should there ever be a fire, explosion, or release of hazardous waste or hazardous waste constituents from the closed facility that could threaten human health or the environment, then the Contingency Plan must be formally implemented.

The responsibilities of the Emergency Coordinator are as follows:

1. Whenever there is an imminent or actual emergency situation, the Emergency Coordinator must immediately:
    A. Activate internal communication systems to notify all personnel.
    B. Notify appropriate State or local agencies with designated response roles if their help is needed. The contact list for these agencies is provided in **Attachment 2.**
2. Whenever there is an emergency or potential emergency situation, the Emergency Coordinator must immediately attempt to identify the character, source, amount, and aerial extent of the situation. The Emergency Coordinator may do this by observation or review of site records and manifests and, if necessary, by chemical analysis.
3. Concurrently, the Emergency Coordinator must assess possible hazards to human health or the environment that may result from any release, explosion or fire. This assessment must consider both direct and indirect effects of the situation (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated or the effects of any hazardous surface water run-off from water or chemical agents used to control a fire.)
4. If the Emergency Coordinator determines that the site had a reportable release, explosion or fire which could threaten human health or the environment outside the facility, he/she must report their findings as follows:
    A. If the Emergency Coordinator's assessment indicates that evacuation of local areas is be advisable, then the Emergency Coordinator must immediately consult with appropriate local authorities. He/she must be available to help appropriate officials decide whether the local area should be evacuated; and
    B. The Emergency Coordinator must immediately notify the Illinois Emergency Management Agency 24-hour response line at (800) 782-7860 and the USEPA

National Response Center (800) 424-8802 (available 24 hours a day). The report must include:

Name and telephone number of the person making the report;

Name and address of the facility;

Time and type of incident;

Name and quantity of material(s) involved, to extent know;

The extent of injuries, if any, and

The possible hazards to human health, or the environment outside the facility.

In carrying out the mandates as stated above, the Emergency Coordinator should notify all other appropriate company personnel and applicable consultants for assistance in assessing and responding to any emergencies.

EMERGENCY RESPONSE PROCEDURES

During its active life, the hazardous waste landfill (Site 1 – Phase A) accepted some characteristic and listed hazardous wastes. Specifically, the wastes accepted included those listed in **Table 1**. These wastes were co-disposed with non-hazardous, solid, municipal wastes. Since hazardous wastes were co-disposed and not segregated, it could be present at any location within Site 1- Phase A. The total amount of hazardous waste represents a small percentage of waste, when compared to the total amount of non-hazardous waste in Site 1 – Phase A.

The leachate from this landfill is considered hazardous by definition (F039) due to the process that produced the waste (i.e., the leachate is considered a listed hazardous waste because it is produced from a landfill that previously received hazardous waste). Leachate is removed by pumping into tankers and is treated/disposed off-site. The leachate is removed from the facility by tanker truck after accumulating in a double walled above ground storage tank, as described in the May 2021 Permit Renewal Application.

The hazardous waste landfill (Site 1 – Phase A) has received final cover. Since the facility is closed and no new wastes will be accepted at the hazardous waste landfill, the potential for fires, explosions, or releases from the hazardous waste landfill is minor. However, since hazardous leachate is routinely handled and since solid waste operations will continue

elsewhere at the site, the potential for emergencies due to human error, natural occurrences, or vandalism is a possibility.

The following are descriptions of actions that may be taken during various emergencies.

PROCEDURES TO FOLLOW IN CASE OF FIRE

Earthen material, stockpiled for daily cover at the site, is readily available for use in extinguishing fires. Earth moving equipment is on-site to spread this material, should the need arise. Water is also available in retention ponds at several locations on site. Fire hydrants are located nearby. Fire extinguishers are located in buildings, in vehicles, and on equipment to be used in case of small, localized fires.

In the event of a fire, or an imminent threat of fire, the following steps will be taken:

1. The internal alarm system will be sounded.
2. The person who identifies the fire will notify the Emergency Coordinator and if necessary, the fire department will be notified. The Emergency Coordinator will make all decisions pertaining to the emergency, unless and until the fire department arrives at the facility and takes over responsibility for fighting the fire. In assessing the severity of the fire and communicating with the fire department, the Emergency Coordinator will factor in any significant weather conditions (e.g. high winds and dry conditions; wind direction, etc.).
3. The Emergency Coordinator will manage incoming traffic to ensure easy access by emergency equipment and personnel.
4. Trained facility personnel will use fire extinguishers as necessary for small fires or apply earth material (soil) to smother and control larger fires.
5. If the fire cannot be immediately controlled and threatens to spread, earthen berms will be constructed around the potentially affected area to control further spread of fire.
6. If these measures are not effective, or if toxic fumes are present as a result of the fire in sufficient quantities to endanger human health, outside help must be called upon.
7. All personnel will assemble at front gate or 9th Street gate (rally points) unless otherwise instructed by the Emergency Coordinator or his/her designate.

PROCEDURES TO FOLLOW IN CASE OF EXPLOSION

Should an explosion or the imminent threat of an explosion occur, the following procedures will be implemented:

1. Immediately notify the Emergency Coordinators. Upon arrival, he/she will make all decisions pertaining to the emergency. In assessing the severity of the explosion and communicating with emergency responders, the Emergency Coordinator will factor in all significant weather conditions (e.g. wind direction).
2. Manage incoming traffic to ensure easy access by emergency equipment and personnel.
3. If explosion has occurred and injury has resulted, follow steps to be taken in case of injury. If no injuries have resulted, and there is no further explosion is imminent, the affected area must be cleaned up and repairs made to any damaged structures.
4. If an imminent explosion threatens, trenches should be dug to relieve pressure and the source of the possible explosion, if known, should be immediately segregated unless it is assessed that doing so will endanger human health. If danger to human health is threatened, the immediate area must be evacuated in accordance with this Plan.
5. If there is a threat to human health beyond site boundaries, the local authorities must be immediately notified as well as other State responders.
6. All personnel will assemble at the front gate (rally point) unless otherwise directed by the Emergency Coordinator or his designate. The rally point is the front gate to the facility located on the northwest side of the existing facility.

PROCEDURES TO FOLLOW IN CASE OF A RELEASE

A release constitutes any release of waste or contaminants outside of the area of operations to the air or water, or to an area which might potentially contaminate the environment. Since there will be no active operations at the closed hazardous waste landfill, the only likely release in Site 1 Phase A would be a release of leachate.

Procedures to follow in case of a release will vary with the degree of potential harm, and are generally as follows:

1. Upon identification of a release, the first person to detect the spill should immediately notify the Emergency Coordinator. Upon arrival, he/she will determine the nature and degree of the emergency and make decisions pertaining to the emergency, and may

direct unnecessary personnel to assemble at the front gate (rally point). In assessing the severity of the release, the Emergency Coordinator will factor in any significant weather conditions (e.g. precipitation, high winds, etc.).

2. Manage incoming traffic to ensure easy access by emergency equipment and personnel.
3. If applicable, immediately repair the structure (e.g. berm) through which the release has occurred and clean-up and properly remove all affected earthen materials for proper disposal.
4. If applicable, immediately repair the structure (e.g. berm) through which the release has occurred and clean-up and properly remove all affected earthen materials for proper disposal.
5. If release to water occurs, all efforts must be made to dam any waters before migration off-site and to remove any affected water from drainage-ways, ponds, etc., for proper disposal or treatment, and clean-up and remove all affected earth materials for proper disposal.
6. All personnel within the contaminated area will wear proper safety equipment, such as protective clothing, boots, gloves, goggles, and if necessary, respirators.
7. If release to air occurs, all personnel in the vicinity will be removed from the immediate area, or will utilize the proper breathing apparatus and appropriate safety clothing.
8. If release of contaminants into air or water occurs which cannot be contained on-site and which is in sufficient quantity to endanger human health or the environment, outside help must be enlisted.

PROCEDURES TO FOLLOW IN CASE OF INJURY

In case of personal injury, the following steps must be taken:

1 Immediately notify the Emergency Coordinator.

2 If the injury is minor, first aid shall be applied and the injured party shall be taken to the hospital for observation, if warranted.

3 If the injury is major or indeterminate, the hospital(s) shall be immediately notified and an ambulance or other emergency unit should be dispatched. First aid, CPR, or procedures for toxic shock shall be given by a person qualified to do so, if warranted.

4 An injured person shall not return to work until he or she is certified by a physician as being able to work.

The routes to the nearby hospital for medical assistance is provided behind **Attachment 3**.

PROCEDURES TO FOLLOW DURING SITE EVACUATION

The Emergency Coordinator will decide if site evacuation becomes necessary. If such is necessary, he/she will implement the following procedures:

1. Immediately notify all personnel and other persons on-site to commence evacuation. This notification will be by all internal means of communication available (i.e. telephones, two-way radios, orally). Also notify the appropriate authorities.
2. Route all personnel and other persons on-site through the facility site entrance, which exits off-site. **Figure 1** shows the site entrance on the west side of the facility. After exiting the facility, the personnel should report to the designated Rally Point, so that all personnel can be accounted for by the Emergency Coordinator.
3. If all available gates providing access off-site are blocked or inaccessible due to the nature of the emergency, earthmoving equipment will be utilized to provide exit through the fence at the point most convenient for evacuation.
4. Following evacuation, the Emergency Coordinator will be responsible to account for all evacuated personnel.

EMERGENCY EQUIPMENT AVAILABLE

At all times, the facility will maintain proper supplies of emergency equipment. This equipment includes, but is not limited to, the following:

1. Fire extinguishers located throughout each building on the facility, around fuel storage areas, and on landfill equipment.
2. Landfill equipment capable of carrying supplies of water and capable of dispersing water as necessary.
3. Landfill equipment capable of moving and placing earth material.
4. First aid stations located at various locations around the facility.
5. Communications equipment (two-way radios and telephones) which allows various personnel at the facility to contact each other.

POST EMERGENCY ACTIONS

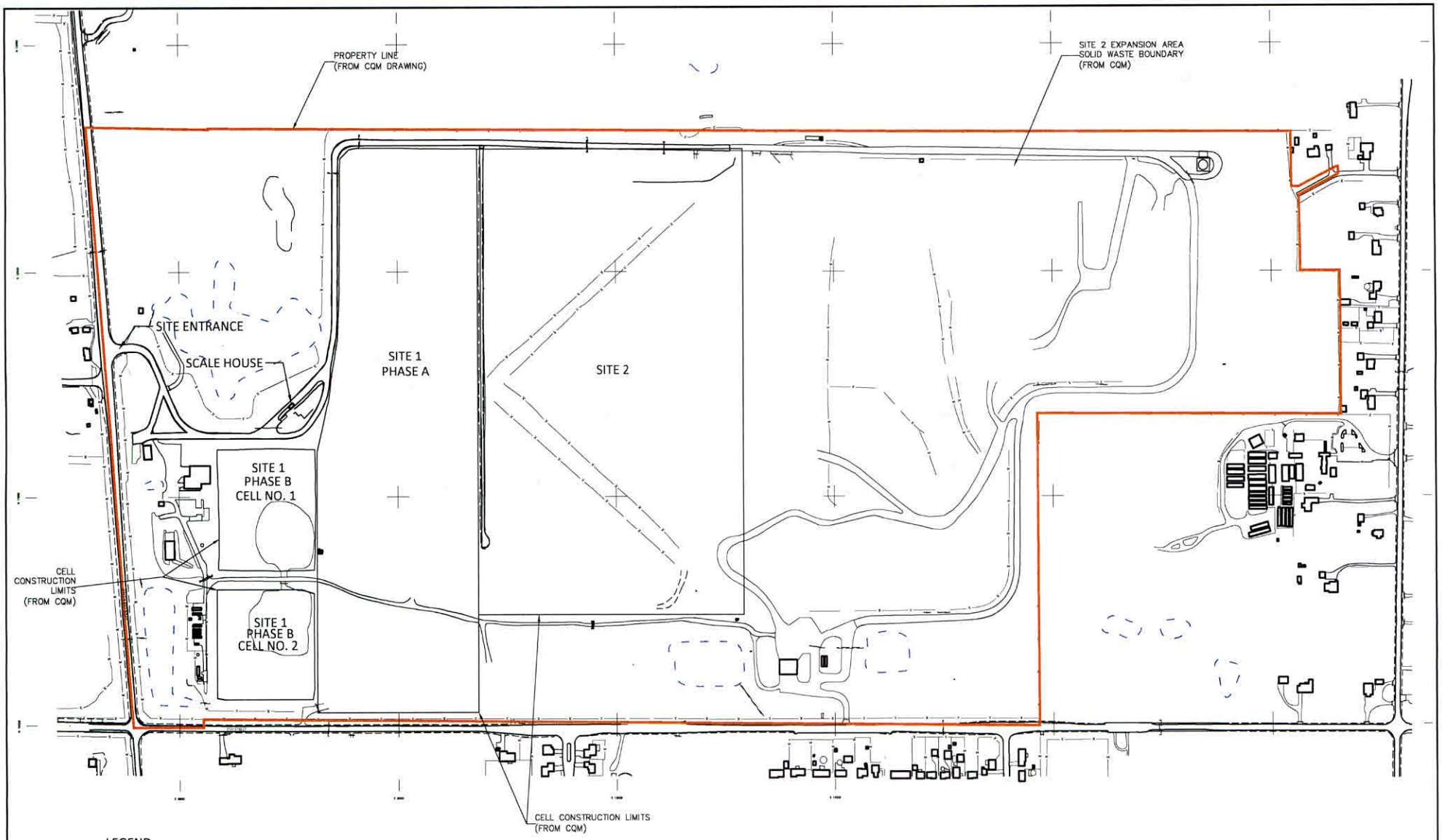
Following an emergency, the Emergency Coordinator must arrange for proper management (i.e. storage, transportation, and treatment/disposal) of any clean-up residue generated in response to the emergency. Equipment, clothing or tools which contacted spilled materials prior to use in other operations should be thoroughly cleaned before reuse. Equipment utilized in response activities should be checked to ensure that it is operable. Materials and supplies depleted in the response should be restocked.

INCIDENT REPORTING

Whenever the Emergency/Contingency Plan is implemented, a report documenting the emergency, the response to the emergency and the post-emergency activities, will be placed in the site's operating record. A copy of the report will be submitted to the Illinois EPA within 15 days of the event.

FIGURE 1

SITE LAYOUT



LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE SITE 1A WASTE MANAGEMENT BOUNDARY
- APPROXIMATE WATER EDGE

APPROXIMATE GRAPHIC SCALE

400 0 200 400 800

1 inch = 400 ft.

N

PREPARED FOR:

ZION LANDFILL

FACILITY LAYOUT

SITE 1 - PHASE A
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

Weaver Consultants Group
CHICAGO, ILLINOIS
(312) 922-1030 www.wcgrp.com

DRAWN BY:	RMD
REVIEWED BY:	MM
DATE:	4/14/2021
FILE:	0120-037-10
CAD:	SITE 1.dwg

FIGURE 1

TABLES

TABLE 1

SUMMARY OF HAZARDOUS WASTES PREVIOUSLY PLACED IN

SITE 1 – PHASE A

Type of Waste	Regulatory Codes/RCRA Listing	Potential Hazard
Acid and Caustics	D002	Corrosive
Heavy Metals	D005, D006, D007, D008, D009, F006, F019, K052, K061	Toxic. Sometimes ignitable.
Plating bath residues and chemicals	F007, F008, P029	Toxic. May contain reactive cyanide.
Pickle liquor from steel finishing	K062	Corrosive and toxic.
Pesticides	P004, U036, U061	Toxic
Laboratory Chemicals	U044, U226	Toxic

ATTACHMENT 1

EMERGENCY COORDINATOR PHONE NUMBERS

May 2021

ATTACHMENT 1

EMERGENCY COORDINATOR PHONE NUMBERS

Primary Coordinator	General Manager
	Mark Bingham **Phone: 847/599-5910** **Cell: 757/434-2356**
Secondary Coordinator	**Safety & Operations Manager**
	John Hagopian **Phone: 847/731-5110** **Cell: 847/344-2016**

ATTACHMENT 2

EMERGENCY CONTACTS AND MAILING LIST

The off-site emergency contacts for the Zion Site 1 Phase A facility are listed below.

Fire Departments

- Zion Fire Department Station No. 2 ..... 911/(847) 746-4043
- Village of Winthrop Harbor Fire ..... 911/(847) 872-5957

Ambulance/EMS

- Ambulance (Zion) ..... 911/(847) 746-4043
- Ambulance/EMS (Village of Winthrop Harbor) ..... 911/(847) 872-5957

Police Departments

- Lake County Sheriff's Department (847) 377–4000 or (847) 549-5200 (non-business hrs.)
- Village of Winthrop Harbor Police ..... (847) 872-2131
- City of Zion Police ..... (847) 872-8000
- Illinois State Police (Des Plaines, IL) ..... (847) 294-4400

Hospital

- Froedtert Pleasant Prairie Hospital ..... (262) 777-8000

Environmental

- Solid Waste Agency of Lake County, IL ..... (847) 336-9340
- IEPA Emergency Response Unit ..... (217) 785-0830
- IEPA Des Plaines Field Office ..... (847) 294-4000
- Illinois Emergency Management Agency (IEMA) ..... (800) 782-7860
- ComEd Electric: 24-hour Emergency No ..... (800) 334-7661
- N.I. Corp. Gas: 24-hour Emergency No. ..... (800) 942-6100

EMERGENCY CONTACT ADDRESSES

Immediate Care Facilities:

Waukegan Immediate Care
1075 N. Green Bay Road
Waukegan, IL 60085
Telephone: (847) 782-7120
Hours: M-F 8 AM – 6 PM
Sa/Su: 9 AM to 3 PM

Pleasant Prairie Immediate Care Clinic
10256 Old Green Bay Road
Pleasant Prairie, WI 53158
Ph: 262-551-4200

2. Hospital:

Froedtert Pleasant Prairie Hosp.
9555 76th St.
Pleasant Prairie, WI 53158
Telephone: (262) 577-8000
Emergency Room Open 24 hours

3. Fire Protection District:

City of Zion Fire Station
2016 Lewis Ave.
Zion, IL 60099
Telephone: (847) 746-4043

Winthrop Harbor Fire Department
830 Sheridan Rd.
Winthrop Harbor, IL 60096
Telephone: (847) 872-5957

4. Illinois Environmental Protection Agency:

Des Plaines Field Office
9511 W. Harrison St.
Des Plaines, IL 60016

Ph: (847) 294-4000

5. Environmental Response Contractors:

A list of the environmental response contractors which may be contacted in the event hazardous materials are identified on the site are provided below.

Heritage Environmental Services, Inc.
15330 Canal Bank Road
Lemont, IL 60439

Emergency Response and Training Solutions (ERTS)
24/7/365 Nationwide Emergency Response: 1-800-924-6804

6. Contingency Plan Mailing List:

Illinois Environmental Protection Agency
Division of Land Pollution Control
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
Telephone: (217) 524-3300

Illinois Environmental Protection Agency
Division of Land Pollution Control
9511 W. Harrison St.
Des Plaines, IL 60016
Telephone: (847) 294-4000

Waukegan Immediate Care
1075 N. Green Bay Road
Waukegan, IL 60085
Telephone: (847) 782-7120
Hours: M-F 8 AM – 6 PM
Sa/Su: 9 AM to 3 PM

Froedtert Pleasant Prairie Hospital
9555 76th St.
Pleasant Prairie, WI 53158
Telephone: (262) 577-8000

City of Zion Fire Station
2016 Lewis Ave.
Zion, IL 60099
Telephone: (847) 746-4043

Winthrop Harbor Fire Department
830 Sheridan Rd.
Winthrop Harbor, IL 60096
Telephone: (847) 872-5957

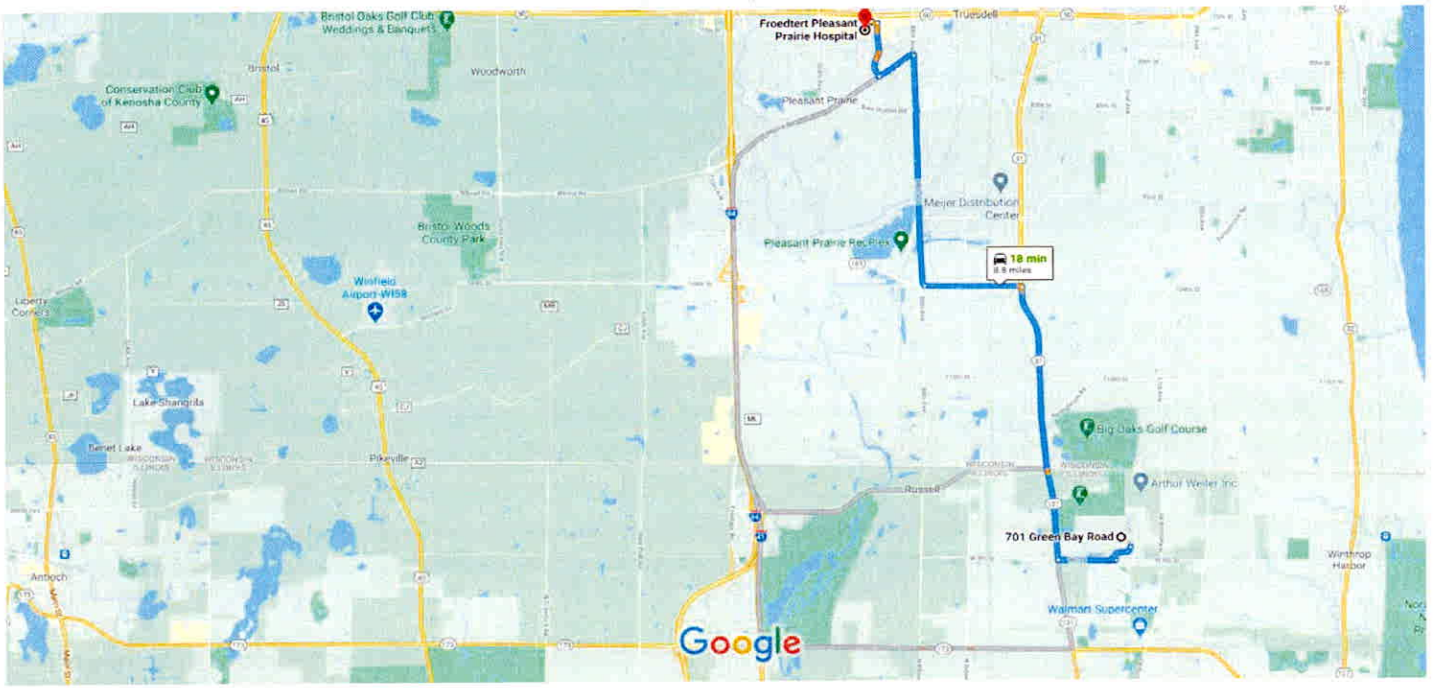
ATTACHMENT 3

DIRECTIONS TO NEARBY MEDICAL FACILITIES

Google Maps

701 Green Bay Rd, Zion, IL 60099 to Froedtert Pleasant Prairie Hospital

Drive 8.8 miles, 18 min



Map data ©2021 1 mi

via 88th Ave	Fastest route, the usual traffic ⚠ This route has restricted usage or private roads.	18 min 8.8 miles
via W Russell Rd and I-41/I-94 W		20 min 11.6 miles
via I-41/I-94 W		22 min 13.3 miles

Explore Froedtert Pleasant Prairie Hospital

Restaurants Hotels Gas stations Parking Lots More