Gude Landfill

Landfill Gas Monitoring Report

Third Quarter 2018
(July – September 2018)

Prepared By:

APTIM ENVIRONMENTAL AND INFRASTRUCTURE INC.
16406 U.S. Route 224 East
Findlay, Ohio 45840

For the:

Gude Landfill

Presented To:

Maryland Department of the Environment
1800 Washington Blvd. Suite 605
Baltimore, MD 21230

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1. BACKGROUND

The Montgomery County Department of Environmental Protection, Division of Solid Waste Services (DEP/DSWS) prepared and obtained Maryland Department of the Environment (MDE) approval for a Landfill Gas Monitoring Plan (LFGMP) for the closed Gude Landfill on April 22, 2009. The LFGMP presents information and procedures necessary to implement a landfill gas (LFG) monitoring program for the Gude Landfill. The Gude Landfill is owned and maintained by DEP/DSWS. The Gude Landfill is located at 600 E. Gude Drive, Rockville, Maryland in Montgomery County.

The LFGMP requires quarterly LFG monitoring of the monitoring wells located along the Gude Landfill property boundary and within on-site structures. In addition, DEP conducts weekly LFG monitoring of the wells located along the property boundary. The LFG monitoring is performed to assess the potential for subsurface migration of LFG, specifically, for the presence of methane gas beyond the landfill property.

The regulatory standard concerning the collection and monitoring of explosive gases (i.e. methane) at solid waste landfills in Maryland is established in the Code of Maryland Regulations (COMAR) Title 26, Subtitle 4, Chapter 7, Part 03B(9) – COMAR 26.04.07.03B(9) – "*A facility may not be designed or operated in such a manner that the concentration of explosive gases generated by the facility exceeds 25 percent of the lower explosive limits for the gases in facility structures, excluding gas control or recovery system components, and the lower explosive limit for the gases at the property boundary*." According to this standard, methane concentrations resulting from the presence of LFG in on-site structures at Gude Landfill cannot exceed 25 percent of the lower explosive limit (LEL) (1.25 percent by volume), and methane concentrations cannot exceed 100 percent of the LEL (5.00 percent by volume) at the Gude Landfill property boundary.

2. SUBSURFACE METHANE MONITORING

The Gude Landfill currently has twenty-four (24) permanent LFG compliance monitoring wells that are located along the southern and northwest property boundary. Ten (10) of the twenty-four (24) permanent LFG monitoring wells were installed in June 2010 and seven (7) were installed in December 2016. The LFG monitoring wells consist of multi-depth probes at differing depths: shallow (s) at 10-15 feet; intermediate (i) at 23-28 feet; and deep (d) at 33-38 feet that are spaced at intervals of approximately 300 feet. Several of the wells are single-depth probes due to shallow groundwater conditions. The monitoring wells provide a media through which LFG can be measured from various depths from the adjacent fill area. The monitoring wells are numbered W-01 through W-11 on the northwest slope and W-25 through W-30 on the south slope. All monitoring locations can be found on the attached **Figure 1**. The proposed monitoring well located between W-10 and W-11 could not be installed due to competent rock and construction and demolition material encountered in the subsurface.

On September 19, 2018 APTIM performed the Third Quarter 2018 (July – September 2018) monitoring event for the LFG monitoring wells along the Gude Landfill property boundary. APTIM utilized a Landtec GEM 5000 Infrared Gas Analyzer (GEM) to monitor for

the following parameters within the LFG monitoring wells: methane, carbon dioxide, oxygen, balance gas (assumed to be nitrogen) and relative pressure (static pressure). The procedure for the monitoring is as follows. A quick connect fitting is attached to both ends of the inlet tubing, which is attached to the GEM and into the corresponding fitting on each LFG monitoring well. The GEM pump is then turned on, which creates a vacuum on the LFG monitoring well and sampling (i.e. monitoring) is initiated. Continuous monitoring is performed on the LFG until all readings stabilize, for a period of not less than one minute, after which the reading is saved. Table 1 below (and **Appendix A**), summarizes the monitoring data for the LFG monitoring wells.

Two methane exceedances were found in the LFG monitoring wells during this quarterly monitoring event.

TABLE 1
SUMMARY OF QUARTERLY SUBSURFACE METHANE MONITORING
(September 19, 2018)

Monitoring Well Name	CH_4 %vol	CO_2 %vol	O_2 %vol	Balance (%vol)	Relative Pressure (in. H_2O)
MW01	0	5.2	15.1	79.7	0
MW02	0	7.5	7.2	85.3	-0.03
MW3S	0	2.3	16.6	81.1	-0.05
MW3I	0	0.5	18.9	80.6	0.01
MW3D	0.1	0.4	19.1	80.4	0.03
MW4S	0	0.1	19.5	80.4	-0.42
MW4I	0	0.1	19.5	80.4	-0.21
MW4D	0	0.2	19.3	80.5	0
MW5S	0	0.1	19.6	80.3	0.02
MW5I	0	0	19.7	80.3	-0.01
MW5D	0	0.6	19.3	80.1	-0.01
MW6S	0	0.1	19.8	80.1	0.03
MW6I	0	0	20	80	-0.01
MW6D	0	0	20.1	79.9	-0.03
MW7S	0	0	20.1	79.9	-0.04
MW7I	0	0	20.2	79.8	-0.05
MW8S	0	1.6	18.5	79.9	-0.02
MW8I	0	4.5	13.4	82.1	-0.06
MW8D	0	0.1	20.2	79.7	-0.01
MW9S	0	0.2	20.1	79.7	0.01
MW9I	0	0.8	19.2	80	-0.01
MW9D	0	0.1	20.2	79.7	-0.01

Monitoring Well Name	CH_4 %vol	CO_2 %vol	O_2 %vol	Balance (%vol)	Relative Pressure (in. H_2O)
MW10S	0	2.8	17.1	80.1	0.04
MW10I	0	5.1	14.7	80.2	0.03
MW10D	0	3.7	16.5	79.8	0.04
MW11	0	0	20	80	0.05
MW12	0	10.9	6.4	82.7	0.01
MW13	0	3.9	15.3	80.8	-0.03
MW14	0	3.9	15.8	80.3	-0.02
MW15	0	0.1	20.6	79.3	-0.03
MW16	10.2	5.2	14.5	70.1	0
MW17	0	8.4	10.6	81	0
MW18	40.3	29.1	1.1	29.5	-0.01
MW25S	2.2	11	6.4	80.4	0
MW25D	0.1	4.4	18.7	76.8	0
MW26C	0	9.6	11.1	79.3	0.05
MW27	0	3	15.7	81.3	0.03
MW28	0.5	2.3	14.6	82.6	0.07
MW29	0	0.1	20.5	79.4	0.05
MW30	0	2	17.9	80.1	0.05

Note 1. % vol. = Percent by Volume
Note 2. in. H_2O. = Inches of Water

3. EXPLOSIVE GAS MONITORING WITHIN ON-SITE STRUCTURES

At the Gude Landfill, six (6) structures are monitored for the presence of explosive gas as part of the quarterly LFG monitoring: Men's Shelter and Redevelopment Expansion; LFG Flare Station Shed; and Landfill Gas-to-Energy Facility Storage Container, Switchgear Enclosure, and the Former Power Plant Building.

On September 19, 2018 APTIM performed the Third Quarter 2018 monitoring event. Using the GEM 5000 and a Combustible Gas Monitor with sample pump, APTIM conducted methane monitoring inside the on-site structures located at the Gude Landfill. The GEM 5000 measures methane (% vol.), carbon dioxide (% vol.), oxygen (% vol.), and gas balance (% vol.). The Combustible Gas Monitor measures CH4 (ppm) and O2 (% volume). CB&I Staff walked through the interiors of the structures and monitored the perimeter wall interface, floor to wall interface in hallways and rooms, floor penetrations, and other likely potential gas pathways as well as the exterior perimeter of the structures.

No combustible gas (e.g. methane) was detected in any of the six (6) buildings at the Gude Landfill during the quarterly monitoring event.

3. WEEKLY SUBSURFACE METHANE MONITORING AT PROPERTY BOUNDARY

Monitoring Results

In addition to the APTIM quarterly LFG monitoring, DEP performs weekly monitoring of the LFG monitoring wells that are located along the Gude Landfill property boundary. In accordance with the LFGMP and supplemental correspondence with MDE, LFG (i.e. methane) exceedances that were measured as part of the DEP weekly monitoring are presented in this quarterly report. Documentation and explanation of the measured methane gas exceedances (of previous quarterly monitoring events) and corresponding response actions to mitigate the exceedance are also provided herein.

During the Third Quarter 2018, measured concentrations of methane in 18S exceeded existing MDE regulatory requirements for the entire period. It is likely that the measured methane exceedances were due to a combination of factors: water logged conditions in the subsurface, and waste in close proximity to the property line.

As a result of the methane exceedances, APTIM performed well field adjustments to improve vacuum and conducted follow-up gas monitoring. All monitoring wells, are currently in compliance and all, except for 18S (intermittent exceedances), remained fully in compliance during the entire Second Quarter of 2018.

Appendix B presents a summary of the methane exceedances that were recorded by DEP during the Second Quarter of 2018.

a. METHANE MITGATION PLAN

As a result of methane exceedances, a methane mitigation plan was implemented in the First Quarter 2010. The plan includes multiple steps to take to remediate gas being detected in the monitoring network. In some instances where wellfield adjustments were insufficient to control elevated methane concentrations, the County has elected to expand the collection system to control migration. In January of 2014, four additional LFG extraction wells were installed in the vicinity of W-26S and W-28S in response to elevated methane detected in that area. In May of 2014, two LFG extraction wells were installed to control methane migration in the area of probes W-05 and W-06 after wellfield adjustments did not decrease the methane concentrations below 5 percent by volume.

During the Third Quarter of 2018 frequent gas detections have reoccurred at probe 18S. As an initial response to these detections several adjustments have been made to the collection system to try to exert more vacuum on the adjacent LFG extraction wells. The vacuum was increased at the blower/flare station and the wellfield was adjusted in the vicinity of the probes to increase the gas collection from this area of the landfill. Adjacent wells were also checked for high water levels, but high water levels were not detected in any wells.

The County and APTIM will continue to implement portions of the methane mitigation plan as necessary to keep the site in compliance with subsurface methane requirements. The County

is currently investigating expansion of the LFG collection system to allow for improved gas collection in the area of 18S.

Figures

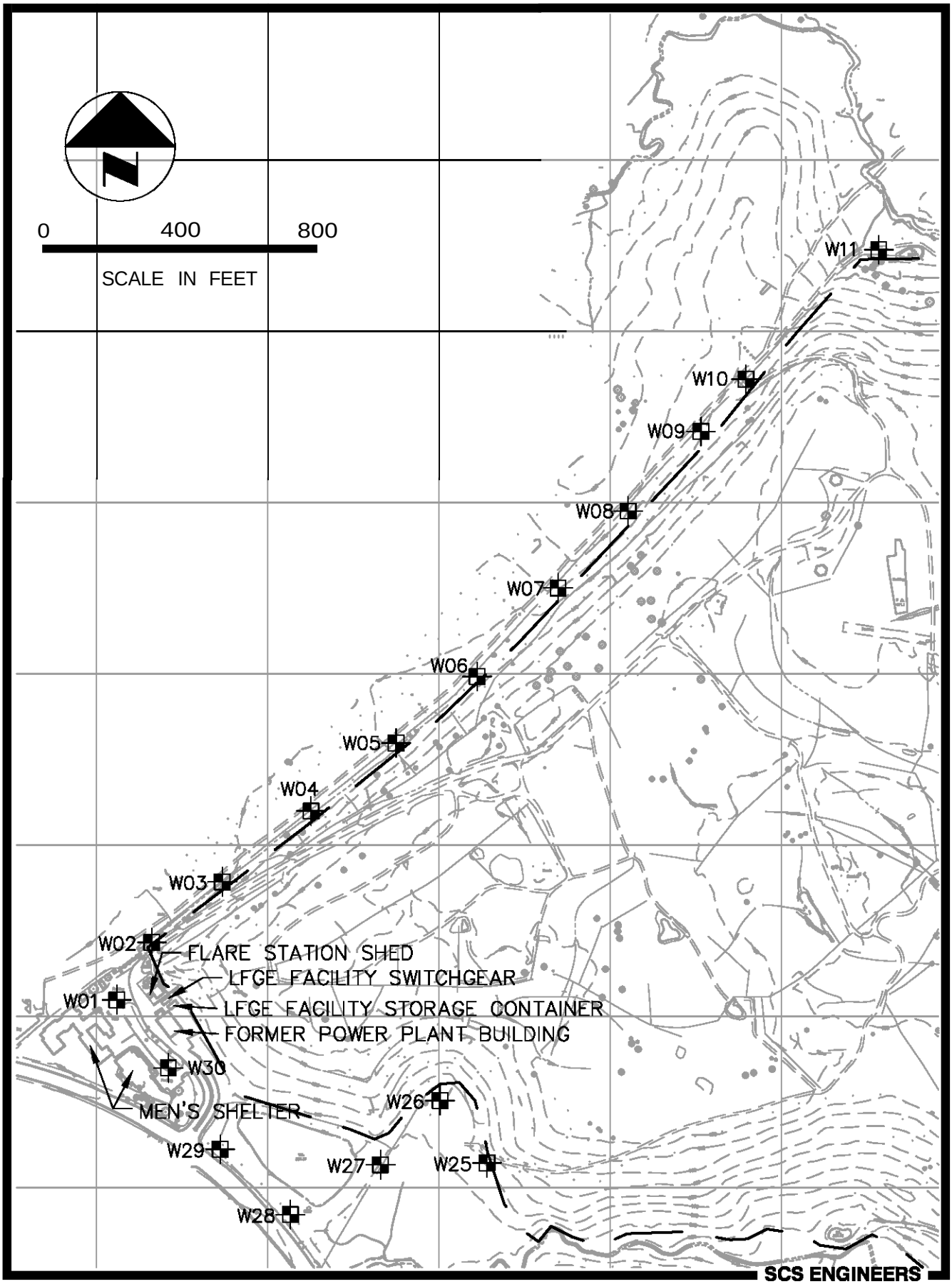

FIGURE 1 - METHANE MONITORING LOCATIONS

Appendix A

Field Data

Table 2 - Gude Landfill - 2018 3rd Quarter Monitoring Probe Results

Name	Date/Time	CH4 (% by vol.)	CO2 (% by vol.)	O2 (% by vol.)	Balance (% by vol.)	Relative Pressure (in-WC)	COMMENTS
MW01	12:57 PM	0	5.2	15.1	79.7	0	
MW02	1:03 PM	0	7.5	7.2	85.3	-0.03	
MW3S	1:08 PM	0	2.3	16.6	81.1	-0.05	
MW3I	1:09 PM	0	0.5	18.9	80.6	0.01	
MW3D	1:12 PM	0.1	0.4	19.1	80.4	0.03	
MW4S	1:16 PM	0	0.1	19.5	80.4	-0.42	
MW4I	1:17 PM	0	0.1	19.5	80.4	-0.21	
MW4D	1:19 PM	0	0.2	19.3	80.5	0	
MW5S	1:21 PM	0	0.1	19.6	80.3	0.02	
MW5I	1:25 PM	0	0	19.7	80.3	-0.01	
MW5D	1:28 PM	0	0.6	19.3	80.1	-0.01	
MW6S	1:33 PM	0	0.1	19.8	80.1	0.03	
MW6I	1:34 PM	0	0	20	80	-0.01	
MW6D	1:37 PM	0	0	20.1	79.9	-0.03	
MW7S	1:39 PM	0	0	20.1	79.9	-0.04	
MW7I	1:41 PM	0	0	20.2	79.8	-0.05	
MW8S	1:44 PM	0	1.6	18.5	79.9	-0.02	
MW8I	1:46 PM	0	4.5	13.4	82.1	-0.06	
MW8D	1:47 PM	0	0.1	20.2	79.7	-0.01	
MW9S	1:50 PM	0	0.2	20.1	79.7	0.01	
MW9I	1:52 PM	0	0.8	19.2	80	-0.01	
MW9D	1:54 PM	0	0.1	20.2	79.7	-0.01	
MW10S	1:56 PM	0	2.8	17.1	80.1	0.04	
MW10I	1:57 PM	0	5.1	14.7	80.2	0.03	
MW10D	2:00 PM	0	3.7	16.5	79.8	0.04	
MW11	2:03 PM	0	0	20	80	0.05	
MW12	2:06 PM	0	10.9	6.4	82.7	0.01	
MW13	2:12 PM	0	3.9	15.3	80.8	-0.03	
MW14	2:15 PM	0	3.9	15.8	80.3	-0.02	
MW15	2:38 PM	0	0.1	20.6	79.3	-0.03	
MW16	2:42 PM	10.2	5.2	14.5	70.1	0	Increased CH4
MW17	2:52 PM	0	8.4	10.6	81	0	

Name	Date/Time	CH4 (% by vol.)	CO2 (% by vol.)	O2 (% by vol.)	Balance (% by vol.)	Relative Pressure (in-WC)	COMMENTS
MW18	2:59 PM	40.3	29.1	1.1	29.5	-0.01	Increased CH4
MW25S	3:06 PM	2.2	11	6.4	80.4	0	
MW25D	3:08 PM	0.1	4.4	18.7	76.8	0	
MW26C	3:12 PM	0	9.6	11.1	79.3	0.05	
MW27	3:14 PM	0	3	15.7	81.3	0.03	
MW28	3:28 PM	0.5	2.3	14.6	82.6	0.07	
MW29	3:25 PM	0	0.1	20.5	79.4	0.05	
MW30	1:00 PM	0	2	17.9	80.1	0.05	

Appendix B

Quarterly Probe Data

	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure	Peak	Level	Pressure
Well #	7/5/2018			7/13/2018			7/20/2018			7/26/2018			7/30/2018			8/7/2018			8/16/2018			8/24/2018			8/29/2018			9/7/2018			9/10/2018			9/20/2018			9/28/2018		
1S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
2S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
3S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
3I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
3D	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
4S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.1	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
4I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
4D	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
5S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	32.0	33.2	0.00	0.0	0.0	0.00	0.0	0.0	0.00
5I	0.0	0.0	0.00	0.0	0.0	-0.03	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.1	0.0	0.00	0.0	0.0	0.00	57.1	58.3	0.00	0.0	0.0	0.00	0.0	0.0	0.00
5D	0.0	0.0	0.00	0.0	0.0	-0.01	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.5	0.4	0.00	0.0	0.0	0.00	0.0	0.0	0.00
6S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	4.9	3.7	0.00	0.0	0.0	0.00	0.0	0.0	0.00
6I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	11.8	11.5	0.01	0.0	0.0	0.00	0.0	0.0	0.00
6D	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	23.3	22.6	0.02	0.0	0.0	0.00	0.0	0.0	0.00
7S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.1	0.00	0.9	1.0	0.00	0.0	0.0	0.00	33.5	40.6	0.00	0.0	0.0	0.00	0.0	0.0	0.00
7I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	2.4	6.4	0.00	0.0	0.0	0.00	37.4	38.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
7D	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe	No probe	No probe	No Probe
8S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.2	0.3	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.2	0.1	0.00	0.0	0.0	0.00	0.1	0.0	0.00
8I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.1	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
8D	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
9S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
9I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
9D	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
10S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
10I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
10D	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
11S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
12S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
13S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
14S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
15S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
16S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.2	0.2	0.00	0.5	0.4	0.00	11.7	10.5	0.00	0.0	0.0	0.00	0.0	0.0	0.00	1.2	1.3	0.00	0.2	0.2	0.00	26.6	26.8	0.00	0.0	0.0	0.00	11.1	10.3	0.00
17S	0.0	0.0	0.00	0.0	0.0	0.00	0.1	0.1	0.00	0.2	0.1	0.00	0.2	0.1	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.1	0.0	0.00	0.0	0.0	0.00	0.1	0.0	0.00	0.0	0.0	0.00	0.1	0.0	0.00
18S	21.8	23.8	0.00	22.0	27.4	0.00	21.5	24.4	0.00	23.8	23.6	0.00	25.2	25.6	0.00	25.8	26.2	0.00	21.4	26.0	0.00	14.7	24.8	0.00	20.5	21.3	0.00	27.2	28.4	0.00	25.1	24.9	0.00	21.3	21.2	0.00	25.0	27.6	0.00
25S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.1	0.3	0.00	0.0	0.0	0.00	8.5	10.6	0.00
25I	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
26S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
27S	0.1	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
28S	0.7	0.7	0.00	0.2	0.1	0.00	0.1	0.1	0.00	0.2	0.2	0.00	0.0	0.0	0.00	0.7	0.3	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	-0.04	0.0	0.0	0.00	0.2	0.1	0.00
29S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.8	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
30S	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
GW 3A	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	0.0	0.0	NA	9.3	7.7	NA
MS 2S	covered	covered	covered	covered	covered	covered	0.0	0.0	0.00	0.0	0.0	0.00	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	covered	0.0	0.0	0.00