2025 Annual Report

Landfill Gas Performance Monitoring
Everett Landfill Site

Prepared for
City of Everett Public Works Department

Prepared by
Herrera Environmental Consultants, Inc.

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Everett Landfill Site

Prepared for
City of Everett Public Works Department
3200 Cedar Street
Everett, Washington 98201

Prepared by
Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, Washington 98121
Telephone: 206-441-9080

June 5, 2026

Certificate of Professional Engineer

This document has been prepared under the supervision of a professional engineer.



06/05/2026

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Introduction

Herrera Environmental Consultants, Inc. (Herrera) is contracted by City of Everett Public Works (City) to support in the operations and maintenance of the landfill gas (LFG) system at the Everett Landfill Site. This annual report presents LFG monitoring techniques, data, and results at the Everett Landfill for the year 2025. This document satisfies the Gas Pathway reporting requirements of the landfill site Consent Decree (CD) between the City and Washington State Department of Ecology (Ecology) and the associated Cleanup Action Plan (CAP) and Compliance Monitoring and Contingency Plan (CMCP).

This annual report also provides a summary of the LFG collection and control system. It includes the chronology of the collection and control system's installation for sections completed in previous years and sections currently being developed.

Summary

This annual report provides relevant information pertaining to the Landfill Gas (LFG) control and collection systems at the Everett Landfill Site along with the results of the 2025 LFG compliance monitoring as set forth in the landfill site CD between the City and Ecology and the associated CAP and CMCP. Annual LFG compliance monitoring for 2025 included quarterly methane monitoring at LFG probes and onsite methane surface monitoring. Data presented in this report was collected both by City of Everett technicians and by Herrera staff.

Monitored methane concentrations were below the limits set forth in the CMCP at all compliance monitoring probes except for the fourth quarter monitoring event measurement at LG-70. During the same period of monitoring, the monitoring results of three compliance probes north of LG-70 and surface monitoring results around the ground surface of LG-70 did not show increased methane concentrations. This indicates that the methane detected at LG-70 was not migrating off site or to the surface. Additional methane measurements were collected at LG-70 on February 27, March 2, March 9, and between March 11 and 25, 2026, resulting in methane concentration measurements of 0 percent on all occasions. This concentration is consistent with historical data. Nearby probes of LG-71, LG-72, and LG-73 were also monitored during the March 11 through 25 additional sampling event and were likewise found to have methane concentrations of zero.

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Background

The City of Everett Landfill (also known as landfill or landfill site) is a closed landfill located in the City of Everett, Washington. Approximately 70 acres in size, the landfill site is located in the new Riverfront section in the eastern part of the City. The landfill actively collected waste during 50 years of operation until 1974.

In 2001, the City entered into a CD with Ecology. The current property developer, Riverfront Commercial Investment, LLC, subsequently signed on to the CD. As an attachment to the CD, the CAP defines cleanup requirements for all exposure pathways for both existing undeveloped and future developed conditions. The CMCP is an attachment to the CAP. The CMCP defines the protocol for demonstrating that the landfill site complies with CD/CAP requirements. The City performs routine monitoring of the LFG collection system and landfill site engineering controls, as outlined in the CMCP. This report describes and presents the results of this monitoring during 2025, as required by Section 3.5.5 of the CMCP.

Riverfront Commercial Investment, LLC purchased the property in 2013 and is currently redeveloping the landfill into a mixed-use area. A new roadway crossing the landfill site (Riverfront Boulevard) was completed in 2021, and the portion of the landfill site redevelopment southwest of the roadway was completed in 2024. This southwest quadrant of the landfill site, also known as Phase 1 of construction, includes two mixed-use buildings and open/parking lot areas, the first of which was finished and occupied in October 2023. The second mixed-use building and open/parking lot area was finished and occupied in March 2024. Construction on the northwest portion of the landfill site, also known as Phase 2, began in May of 2025. The eastern portion of the landfill site currently remains undeveloped.

Landfill Gas Collection System

Beginning in 2004, the LFG system has been installed in phases. Before it was expanded to accommodate development, the LFG collection system was composed of manifold (header) pipes that generally followed the outer perimeter of the 70-acre landfill site. The expanded system includes several extensions of the header pipes throughout the portion of the landfill site that is currently under development. Perforated collector pipes within and along the landfill boundary connect into the header pipes. The header pipes are typically solid-wall, 8-inch-diameter high-density polyethylene (HDPE), and the collector pipes are typically 4-inch- or 6-inch-diameter perforated HDPE. See Figure 1 for a map of the current LFG system. At present, almost the entire landfill perimeter is surrounded by active gas interception trenches. Only the narrow portion of the property south of 41st Street has a single collection trench through the middle and not around the perimeter. A summary of construction activities related to the LFG collection system is listed in Table 1.

Table 1. Summary of Landfill Construction Activities.

Year	Description
2004	• An LFG extraction trench (also known as a gas interception or collection trench) was constructed along most of the northern portion of the west landfill boundary and commenced operation. This trench was designed to prevent offsite migration by intercepting gas originating from the landfill site. • A northern extension of the perimeter gas interception trench was constructed along the southern edge of the 36th Street right-of-way.
2006	• A second LFG extraction trench was installed along the northern edge of the 36th Street right-of-way, parallel to and north of the 2004 trench. • The 41st Street overcrossing gas extraction system was installed.
2013	• An additional perimeter gas interception trench was installed along the eastern landfill boundary, utilizing the existing leachate collector trench.
2018	• A new segment of gas interceptor was completed along the southeastern landfill boundary, as an extension of the existing gas collector along the eastern boundary, also utilizing the existing leachate collector trench.
2020	• A second, separate gas extraction trench was constructed from the southern tip of the landfill site some 480 feet northward, east of the combined leachate collector/gas extraction trench.
2021	• The initial phase of the Riverfront Development project on the landfill site was completed, including the Riverfront Boulevard and its active LFG collection system.
2023	• The collection system beneath the Phase 1 development parking lot and two mixed-use buildings (Buildings A and B) was activated.
2025	• Construction began on the collection system beneath the Phase 2 development including Capstone building.

In 2021, the initial phase of the Riverfront Development project on the landfill site was completed. This initial phase included the Riverfront Boulevard and its' active LFG collection system. Upon the dedication of Riverfront Boulevard in July of 2021, it became open for public use. The LFG collection system in the Boulevard has been active since that time, under control and monitoring by the City. The Riverfront Boulevard LFG collection system was originally connected entirely to the north blower facility. As shown in Figure 1, it is now split between the north and south blower facilities.

In October 2023, the first Riverfront building (Building B) was completed and subsequently occupied. A portion of the development parking lot was also opened for public use. The second Riverfront building (Building A) and another portion of the development parking lot was completed and opened for public use in March 2024. Prior to that, the LFG Collection system was modified and expanded to provide LFG collection beneath these developed areas. The collection system beneath the development parking lot and two mixed-use buildings was activated and connected to the south blower facility in October 2023. As required by CMCP Section 3.6, confirmational sampling at LFG discharge points was conducted on December 28, 2023. This sampling and the associated analysis and results showing compliance at the discharge point are mentioned in the 2023 Annual Report (Herrera 2024) and discussed in detail in the City of Everett Landfill Gas Emission – 2023 Confirmational Sampling Results technical memorandum (Herrera 2024). The active LFG collection system will continue to be monitored and expanded as development continues on the landfill site.

The results of surface emissions monitoring indicate how well the LFG collection system, in conjunction with the low permeability cover system installed across the developed area, is performing to capture LFG and prevent migration up to the landfill boundary surface within the publicly-accessible areas. Monitoring LFG surface emissions across the Phase 1 area began in 2023 when Building B and the portion of development parking lot became publicly accessible. In 2025, surface emissions monitoring was conducted both along the Riverfront Boulevard and in the Phase 1 area.

Construction of the collection system beneath the Phase 2 development, including the Capstone building, began in July 2025. This Phase 2 collection system has not yet been completed or activated, and the Phase 2 area is not yet open to the public. No compliance monitoring has yet been required or performed on this portion of the landfill/development.

Blower System

The LFG system is served by two blower facilities that apply vacuum to the header pipe network. The north blower facility is located near the intersection of 36th Street and Riverfront Boulevard. The south blower facility is located at the south end of the landfill site immediately west of Riverfront Boulevard and south of the 41st Street Roundabout. Each blower facility has two blowers, including one duty unit and one standby unit. The North Blower and South Blower facilities provide vacuum for the existing perimeter, 41st Street, Riverfront Boulevard, and West Site LFG collection system headers.

The blower facilities are also the LFG discharge points. The blower facilities vent collected LFG to the atmosphere through a discharge stack that extends vertically from the blower skid. Table 2 and Figure 1 show which segments of the LFG collection system connect to the two blower facilities. By manipulating isolation and control and monitoring valves throughout the system, segments of LFG collection piping can be switched from one blower facility to the other, as needed, and the vacuum can be adjusted based on monitoring results and operational needs. City and Herrera personnel perform LFG monitoring, as well as system control and valve monitoring, on a monthly basis. Both the City and Herrera use a Landtec GEM 5000 for informational and operational purposes.

Both blower stations began a set of upgrades in 2023. The South Blower piping was modified to accommodate a new flow meter that was installed on the dilution inlet pipe in September 2023. The new meter enabled more accurate analysis of the system. Electrical infrastructure for a new generator was also installed at the South Blower station to provide continued system operation during power outages. South Blower improvement work concluded in early 2024 with the installation of the permanent generator. The North Blower station was replaced with a completely new skid; new blowers; updated electrical controls; condensate separators; and flow, pressure, and temperature sensors. In order to replace aging equipment, the new skid was installed about 60 feet southeast of the original blower station in December 2023. The North Blower Station was also connected to the existing power system at City Sewer Lift Station 33, which includes a backup power generator.

Table 2. List of Device Control and Monitoring Valves and Blower Station Connections.			
Device/Node	**Blower**	**Device/Node**	**Blower**
CM-PER001	South	CM-PER052	North
CM-PER002	South	CM-PER053	North
CM-PER003	South	CM-PER054	North
CM-PER004	South	CM-PER055	North
CM-PER005	South	CM-PER056	North
CM-PER006	South	CM-PER057	North
CM-PER007	South	CM-PER058	North
CM-PER008	South	CM-PER059	North
CM-PER009	South	CM-PER060	North
CM-PER010	South	CM-PER061	South
CM-PER011	South	CM-PER062	South
CM-PER012	South	CM-PER063	South
CM-PER013	South	CM-BLVD001	South
CM-PER014	South	CM-BLVD002	South
CM-PER015	South	CM-BLVD003	South
CM-PER016	South	CM-BLVD004	South
CM-PER017	South	CM-BLVD005	South
CM-PER018	South	CM-BLVD006	South
CM-PER019	South	CM-BLVD007	South
CM-PER020	South	CM-BLVD008	South
CM-PER021	South	CM-BLVD009	North
CM-PER022	South	CM-BLVD010	North
CM-PER023	South	CM-BLVD011	North
CM-PER024	South	CM-BLVD012	North
CM-PER025	South	CM-SUBA001	South
CM-PER026	South	CM-SUBA002	South
CM-PER027	South	CM-SUBA003	South
CM-PER028	South	CM-SUBA004	South
CM-PER029	South	CM-SUBA005	South
CM-PER030	South	CM-SUBA006	South
CM-PER031	South	CM-SUBA007	South
CM-PER032	South	CM-SUBA008	South
CM-PER033	South	CM-SUBB001	South
CM-PER034	South	CM-SUBB002	South
CM-PER035	South	CM-SUBB003	South
CM-PER036	South	CM-SUBB004	South
CM-PER037	South	CM-SUBB005	South

Table 2 (continued). List of Device Control and Monitoring Valves and Blower Station Connections.

Device/Node	Blower	Device/Node	Blower
CM-PER038	South	CM-SUBB006	South
CM-PER039	South	CM-SUBB007	South
CM-PER040	South	CM-SUBC001	South
CM-PER041	South	CM-SUBC002	South
CM-PER042	South	CM-SUBC003	South
CM-PER043	South	CM-SUBC004	South
CM-PER044	South	CM-SUBC005	South
CM-PER045	South	CM-BLGA001	South
CM-PER046	South	CM-BLGA002	South
CM-PER047	North	CM-BLGA003	South
CM-PER048	North	CM-BLGA004	South
CM-PER049	North	CM-BLGB001	South
CM-PER050	North	CM-BLGB002	South
CM-PER051	North	CM-BLGB003	South
		CM-BLGB004	South

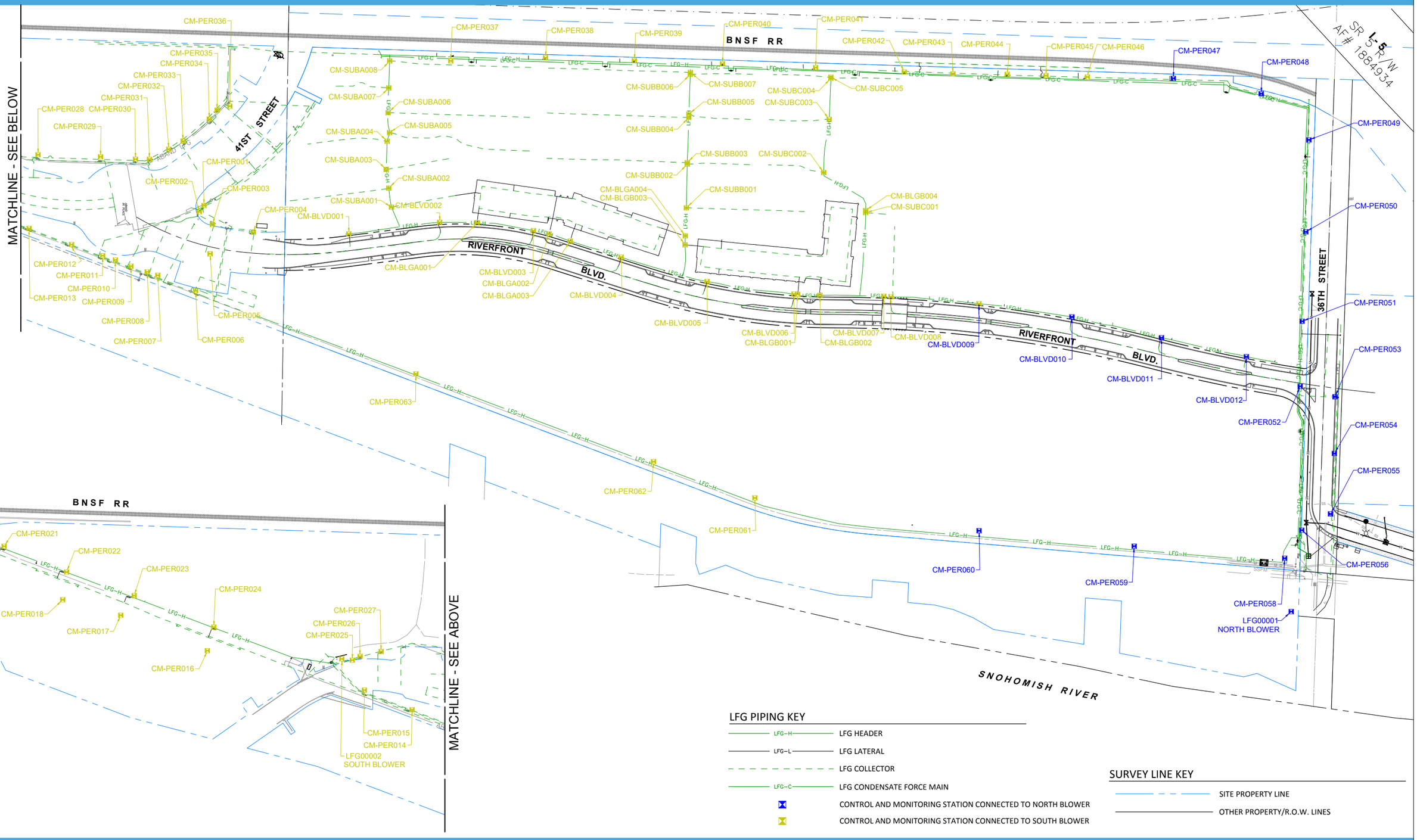
Notes:

Device node is connected to south blower

Device node is connected to north blower

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Figure 1.
Landfill Gas System Map and Blower Connections.



LFG PIPING KEY

- LFG-H — LFG HEADER
- LFG-L — LFG LATERAL
- LFG COLLECTOR
- LFG-C — LFG CONDENSATE FORCE MAIN
- CONTROL AND MONITORING STATION CONNECTED TO NORTH BLOWER
- CONTROL AND MONITORING STATION CONNECTED TO SOUTH BLOWER

SURVEY LINE KEY

- SITE PROPERTY LINE
- OTHER PROPERTY/R.O.W. LINES

Produced by Herrera Environmental Consultants (herrerainc.com)

0 50 100 200 Feet

C:\proj\Y2015\15-06075-002\CAD\Dwg\LFG-BlowerConnectionsExhibit.dwg | 1/11/2024 3:37 PM | Chuck Marston

Landfill Gas Collection System Status

LFG monitoring was completed at the Everett Landfill Site in 2025, according to CD/CAP requirements for the gas environmental exposure pathway. This monitoring is necessary to document compliance with cleanup action standards and to ensure protection of human health and the environment.

Four quarterly monitoring events were conducted on the following dates:

1. First Quarter: March 12, March 13, and March 21, 2025
2. Second Quarter: June 24, and June 26, 2025
3. Third Quarter: September 16, and October 8, 2025
4. Fourth Quarter: December 17, and December 18, 2025

The LFG compliance monitoring tasks performed this year include:

- Quarterly perimeter probe monitoring performed by the City
- Quarterly landfill surface emission monitoring
  - Areas associated with Buildings A and B (Phase 1) performed by Herrera
  - Riverfront Boulevard., 41st Street Roundabout, East Perimeter Trail performed by the City

Landfill Gas Perimeter Probe Monitoring

Background

A network of LFG compliance monitoring probes is established around the perimeter of the landfill site. The locations of these probes are shown in Figure 2. These probes are used to determine if LFG control systems are effective in preventing offsite migration of methane. The CAP and CMCP establish a contingency plan trigger of 5 percent methane by volume, measured at any perimeter compliance monitoring probe. 5 percent is the lower explosive limit of methane (i.e., the lowest concentration of gas that can explode and create a fire if there is an ignition source). Measured methane concentrations below 5 percent by volume are thus considered in compliance with landfill site requirements.

Methods

The City utilized a Landtec GEM 5000 analyzer to measure gas concentrations and static pressure from probes surrounding the perimeter of the landfill site. Probe measurements are collected quarterly per the CMCP.

Thirty-nine (39) probes were monitored in 2025. Thirty-six (36) of the probes are used for compliance monitoring. Three probes (LG-14, LG-15, and LG-16) are not considered compliance probes, due to their completion in fill. The thirty-six (36) compliance probes are positioned beyond the fill and can accurately measure if methane is migrating from the landfill. LG-14, LG-15, and LG-16 are not situated outside of the landfill boundary like the thirty-six (36) compliance probes are. These three are monitored solely to inform LFG system operations and monitor how gas levels fluctuate. Monitoring probes are shown on the map in Figure 2. Compliance probes are yellow, and information-only probes are purple.

The GEM 5000 is a handheld portable gas analyzer that samples the LFG and measures the concentrations of methane, carbon dioxide, and oxygen, as listed in Table 3. The GEM 5000 measures methane and carbon dioxide by dual wavelength infrared cell and oxygen by internal electrochemical cell. City staff took LFG readings at each probe on a quarterly basis and sent the readings to Herrera for reporting and analysis.

Table 3. Quarterly Data Collection Parameters.

Compound	Units	Measurement Method	Description
CH_4	Percent by volume	Dual wavelength infrared cell	Methane concentration of sampled landfill gas
CO_2	Percent by volume	Dual wavelength infrared cell	Carbon dioxide concentration of sampled landfill gas
O_2	Percent by volume	Internal electrochemical cell	Oxygen concentration of sampled landfill gas

Results

Each of the 36 compliance probes were monitored each quarter and had methane levels below the contingency plan trigger of 5 percent, with the exception of those discussed in the following sections. Results from quarterly probe monitoring are shown in Table 4.

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Figure 2.
LFG Monitoring Probes.



Type of Probe
- Compliance
- Information-Only

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Snohomish County, Esri Imagery, 2022

0 250 500 1,000 Feet

File Path: K:\Projects\Y2022\22-07824-100\Proj\Everett_LFG_System\Everett_LFG_System.aprx\Figure 2. LFG Monitoring Probes 8.5x11
Date: 5/1/2025
Author: rstebbing

Table 4. Perimeter Probe Monitoring Results.				
Device ID	**Date**	**CH_4 (% by volume)**	**CO_2 (% by volume)**	**O_2 (% by volume)**
LG000021	3/12/2025	0	0.2	20.4
LG000021	6/24/2025	0	0.1	21.1
LG000021	9/16/2025	0	0.1	21.4
LG000021	12/18/2025	0	0.1	21
LG000023	3/12/2025	0	0.2	20.4
LG000023	6/24/2025	0	0.1	21.1
LG000023	9/16/2025	0	0.1	21.4
LG000023	12/18/2025	0	0.1	21
LG000024	3/12/2025	0	0.2	20.3
LG000024	6/24/2025	0	0.1	21
LG000024	9/16/2025	0	0.1	21.4
LG000024	12/18/2025	0	0.2	21
LG000025	3/12/2025	0	0.3	20.3
LG000025	6/24/2025	0	0.1	21.1
LG000025	9/16/2025	0	0.2	21.4
LG000025	12/18/2025	0	2	20.5
LG000026	3/12/2025	0	0.2	20.3
LG000026	6/24/2025	0	2.3	17.9
LG000026	9/16/2025	0	3	18.4
LG000026	12/18/2025	0	0.2	20.9
LG000027	3/12/2025	0	0.2	20.3
LG000027	6/24/2025	0	0.1	21
LG000027	9/16/2025	0	0.2	21.4
LG000027	12/18/2025	0	0.1	20.9
LG000028	3/12/2025	0	1.1	18.9
LG000028	6/24/2025	0	2	19.3
LG000028	9/16/2025	0	1.9	19.7
LG000028	12/18/2025	0	1	16.5
LG000030	3/12/2025	0	2.8	18
LG000030	6/24/2025	0	3.5	18.3
LG000030	9/16/2025	0	2.4	19.7
LG000030	12/18/2025	0	3.4	16.8
LG000031	3/12/2025	0	0.4	20.1
LG000031	6/24/2025	0	3.3	18.5
LG000031	9/16/2025	0	3	19.3
LG000031	12/18/2025	0	0.5	20.6

Table 4 (continued). Perimeter Probe Monitoring Results.				
Device ID	**Date**	**CH_4 (% by volume)**	**CO_2 (% by volume)**	**O_2 (% by volume)**
LG000032	3/12/202025	0	5.6	12.3
LG000032	6/24/2025	0	7.9	14.3
LG000032	9/16/2025	0	6.7	16
LG000032	12/18/2025	0	6.4	9.3
LG000033	3/12/2025	0	0.3	20
LG000033	6/24/2025	0	0.4	20.6
LG000033	9/16/2025	0	0.2	21.2
LG000033	12/18/2025	0	0.1	20.8
LG000034	3/12/2025	0	1.3	18.8
LG000034	6/24/2025	0	2.3	18.5
LG000034	9/16/2025	0	2.5	19.1
LG000034	12/18/2025	0	0.2	20.7
LG000035	3/12/2025	0	7.8	1
LG000035	6/24/2025	0	10.8	10.6
LG000035	9/16/2025	0	7.8	15.5
LG000035	12/18/2025	0	1.8	15.8
LG000041	3/12/2025	0.1	0.6	21.2
LG000041	6/24/2025	0	10.8	7
LG000041	9/16/2025	0	9.4	12.1
LG000041	12/18/2025	0	3	18.2
LG000055	3/12/2025	0.1	8.2	12.7
LG000055	6/24/2025	0	9	11.4
LG000055	9/16/2025	0	7.7	13.1
LG000055	12/18/2025	0	17.1	1.4
LG000057	3/12/2025	0	0.7	20.7
LG000057	6/24/2025	0	6	9.9
LG000057	9/16/2025	0	4.7	13.1
LG000057	12/18/2025	0	0.8	19.9
LG000058	3/12/2025	0	6.1	11.4
LG000058	6/24/2025	0	1.3	18.4
LG000058	9/16/2025	0	6.2	12.9
LG000058	12/18/2025	0	5.3	14.4
LG000059	3/12/2025	0	8	9.1
LG000059	6/24/2025	0	9.9	10.9
LG000059	9/16/2025	0	14.3	3.1
LG000059	12/18/2025	0	11.2	4.8

Table 4 (continued). Perimeter Probe Monitoring Results.				
Device ID	**Date**	**CH_4 (% by volume)**	**CO_2 (% by volume)**	**O_2 (% by volume)**
LG000062	3/12/2025	0.1	0.1	21.3
LG000062	6/24/2025	0	1	18.4
LG000062	9/16/2025	0	0.3	20.7
LG000062	12/18/2025	0	1.4	19.6
LG000070	3/12/2025	0	2.6	7.7
LG000070	6/24/2025	0	0.1	20.2
LG000070	9/16/2025	0	0.1	20.8
LG000070	12/18/2025	7.6	8.9	1.8
LG000071	3/12/2025	0	0.9	19.9
LG000071	6/24/2025	0	0.9	19.2
LG000071	9/16/2025	0	7.4	12.1
LG000071	12/18/2025	0	2.7	15.5
LG000072	3/12/2025	0	0.7	20.1
LG000072	6/24/2025	0	1.1	18.9
LG000072	9/16/2025	0	1.2	19.5
LG000072	12/18/2025	0	1.2	20
LG000073	3/12/2025	0.1	0.8	20
LG000073	6/24/2025	0	0.8	19.4
LG000073	9/16/2025	0	0.9	19.9
LG000073	12/18/2025	0	1	20.3
LG000076	3/12/2025	0	3.9	15.4
LG000076	6/24/2025	0	0.5	20.1
LG000076	9/16/2025	0	5	14.3
LG000076	12/18/2025	0	5.2	13.9
LG000078	3/12/2025	0	1.3	19.3
LG000078	6/24/2025	0	1.7	18.9
LG000078	9/16/2025	0	8	10
LG000078	12/18/2025	0	6.8	10.2
LG000085	3/12/2025	0.1	5.6	12.5
LG000085	6/24/2025	0	11.7	5.5
LG000085	9/16/2025	0	14.4	5.5
LG000085	12/18/2025	0	9.3	9.2
LG000086	3/12/2025	0.1	0.2	21.5
LG000086	6/24/2025	0	12	4.2
LG000086	9/16/2025	0	15	4.5
LG000086	12/18/2025	0	10.9	11.9

Table 4 (continued). Perimeter Probe Monitoring Results.				
Device ID	**Date**	**CH_4 (% by volume)**	**CO_2 (% by volume)**	**O_2 (% by volume)**
LG000087	3/12/2025	0.1	2.6	19.1
LG000087	6/24/2025	0	6.4	11.1
LG000087	9/16/2025	0	9.1	10.8
LG000087	12/18/2025	0	5.5	14.9
LG000088	3/12/2025	0.1	0.1	21.7
LG000088	6/24/2025	0	0	20.7
LG000088	9/16/2025	0	0	20.2
LG000088	12/18/2025	0	0.1	20.9
LG000089	3/12/2025	0.1	0.5	21.2
LG000089	6/24/2025	0	0.1	20.6
LG000089	9/16/2025	0.7	0.2	19.8
LG000089	12/18/2025	0	0.2	20.8
LG000090	3/12/2025	0.1	0.1	21.8
LG000090	6/24/2025	0	0.2	20.6
LG000090	9/16/2025	0	0.1	20.1
LG000090	12/18/2025	0	0.1	21
LG000091	3/12/2025	0.1	2.7	18
LG000091	6/24/2025	0	5.1	13.5
LG000091	9/16/2025	0	4.7	15
LG000091	12/18/2025	0.1	8.3	5.2
LG000092	3/12/2025	0.1	0.1	21.3
LG000092	6/24/2025	0	0	19.7
LG000092	9/16/2025	0	0.4	20.6
LG000092	12/18/2025	0	0.3	20.8
LG000093	3/12/2025	0.1	0.1	21.1
LG000093	6/24/2025	0	0.2	19.6
LG000093	9/16/2025	0	0.6	20.5
LG000093	12/18/2025	0	0.1	21.3
LG000094	3/12/2025	0.1	0.1	21
LG000094	6/24/2025	0	2.8	17.4
LG000094	9/16/2025	0	3.1	18.3
LG000094	12/18/2025	0	1.4	18.6
LG000095	3/12/2025	0	3.3	19.4
LG000095	6/24/2025	0	9.4	17.4
LG000095	9/16/2025	0	0.7	20.5
LG000095	12/18/2025	0	16.7	3

Table 4 (continued). Perimeter Probe Monitoring Results.				
Device ID	**Date**	**CH_4 (% by volume)**	**CO_2 (% by volume)**	**O_2 (% by volume)**
LG000014	3/12/2025	0.1	0.1	21.7
LG000014	6/24/2025	0	0	19.8
LG000014	9/16/2025	0.4	0	19.9
LG000014	12/18/2025	0	0.2	20.8
LG000015	3/12/2025	18.9	3.9	10.7
LG000015	6/24/2025	47.7	21.2	0.6
LG000015	9/16/2025	17.2	24.6	0.4
LG000015	12/18/2025	0	0.2	20.8
LG000016	3/12/2025	0.1	0.1	21.7
LG000016	6/24/2025	0	0.1	20.8
LG000016	9/16/2025	0	1	15.2
LG000016	12/18/2025	0.1	0.1	20.6

Notes:

Information-only probe

Methane exceedance observed at compliance probe

Methane observed at information-only probe

Notable Areas/Probes

Landfill Perimeter – North End – LG-70

Of the 36 compliance monitoring probes, only LG-70, located at the northeast corner of the landfill, had a methane reading above 5 percent in any quarter. For the fourth quarter monitoring event taken December 18th, LG-70 had a reading of 7.6 percent methane. This methane exceedance, above 5 percent, is highlighted yellow in Table 4.

The fourth quarter monitoring event was conducted at a time of abnormal weather and river conditions. One week prior to the fourth quarter monitoring event, the Snohomish River adjacent to the landfill had experienced historic high river levels and flooding due to an "atmospheric river" precipitation event. The river level remained high at the time of the monitoring event, likely affecting deep aquifer water table elevations and soil gas movement within the site. The field technician conducting the fourth quarterly monitoring observed standing water in the vicinity of LG-70 on the day of sampling and noted that the monitoring device began to pull water out of the gas probe before the reading was complete, indicating the soil in the vicinity of the probe was saturated. This suggests that the groundwater elevation at the time of sampling was above the probe screen and prevented soil gas from entering the probe to produce an accurate measurement. Obtaining a valid reading requires the stagnant air in the upper portion of the probe to be purged, evidenced by a lengthy pump run with readings that converge and

stabilize on a final result. Therefore, the reading is not valid because a complete sampling sequence was not possible at this location.

While this probe reading was over the 5 percent compliance limit, the LG-71, LG-72, and LG-73 compliance probes north of LG-70 (LG-70 is positioned between the landfill boundary and LG-71, LG-72, and LG-73) did not show elevated methane concentrations during the same period of monitoring. This indicates that the methane detected at LG-70 was not migrating farther off site. Additionally, quarterly surface monitoring in the vicinity of LG-70, conducted the day before the elevated LG-70 monitoring result, indicated typical atmospheric methane levels (approximately 2.0 ppm or 0.0002 percent by volume). This also indicates that the methane detected at LG-70 was not migrating to the surface.

When methane exceeds the regulatory limit of 5 percent at any perimeter probe the following contingency measures should occur, per Section 3.3 of the CMCP:

1. Report the exceedance to Ecology within 7 days
2. Resample the probe(s) within 72 hours
    a. If methane is detected above 5 percent again, then a continuous reading methane sampling and recording device will be placed on one or more of the probe(s). Continuous gas sampling results will be recorded for one month and the average of all recorded methane readings will be computed.
    b. Canister sampling may be conducted to determine whether the flammable gas originates from migrating landfill gas or from some other source in the area such as organic peat deposits.
3. If the average concentration of methane from the month-long continuous gas sampling exceeds 5 percent, and no evidence of another source other than the landfill is confirmed by any canister results, then subsurface gas migration is confirmed. Temporary, localized control would be evaluated, selected, and installed to control migration in the vicinity of the affected perimeter compliance monitoring location. Method of control would be coordinated with and approved by Ecology. Weekly monitoring would begin or be reinstated for representative off-site buildings within 500 feet of the sampling site. This would continue until the affected monitoring probes no longer have methane present at greater than 5 percent.

The exceedance at LG-70 was not recognized until late February 2026 during Herrara's data review for preparation of this Annual Report began. For this reason, the proper contingency measures were not implemented at the time they should have been. The City's Landfill Manager was notified on March 9 of the exceedance, which was followed by notification to Ecology on March 10. In that notification to Ecology, the City proposed and subsequently conducted daily monitoring (Monday through Friday only) between March 9 and March 26, 2026 at LG-70 and the probes to the north (LG-71, LG-72, LG-73). This was in addition to monitoring conducted on February 27 and March 2, 2026, at LG-70. These results are included in Table 5, below.

Methane concentrations at LG-70 were 0 percent on all occasions. Adjacent probes LG-71, LG-72, and LG-73 also observed methane concentrations of 0 percent on all occasions. These concentrations are

consistent with historical data collected prior to 2025 fourth quarterly monitoring event. Gas probe LG-70 has historically not contained any appreciable methane since 2005, when the north segment of the gas extraction system was installed. Although elevated methane (6.5 percent) was detected in April and July of 2016, subsequent monitoring of this probe yielded little to no methane (maximum 0.5 percent) detected after 2016 to the present. The brief episode of slightly elevated methane in 2016 at LG-70 was thought to be due to excavation and construction of a large pump station adjacent to this probe around that time. Based on these results, the elevated methane level in observed at LG-70 in 2025 was most likely a temporary condition related to elevated groundwater levels in the vicinity associated with the flooding event.

Table 5. Perimeter Probe Monitoring Results.

Device ID	Date	CH_4 (% by volume)	CO_2 (% by volume)	O_2 (% by volume)
LG000070	2/27/2026 16:34	0	3.9	7.5
LG000070	3/2/2026 15:16	0	4.1	6.5
LG000070	3/9/2026 13:48	0	3.8	10.2
LG000070	3/11/2026 16:18	0	4.1	8.3
LG000070	3/12/2026 13:40	0	4.2	8.1
LG000070	3/13/2026 13:37	0	4.2	7.8
LG000070	3/16/2026 14:24	0	4.2	6.6
LG000070	3/17/2026 7:05	0	4.2	5.9
LG000070	3/18/2026 14:34	0	4.1	5.8
LG000070	3/19/2026 14:12	0	4.1	5.8
LG000070	3/20/2026 12:19	0	3.8	5.8
LG000070	3/23/2026 10:28	0	1.8	15.3
LG000070	3/24/2026 12:01	0	0.6	19.2
LG000070	3/25/2026 12:48	0	1.7	11.6
LG000070	3/26/2026 15:15	0	3.1	4.8
LG000071	3/9/2026 13:58	0	0.2	20.3
LG000071	3/11/2026 16:29	0	0.5	19.9
LG000071	3/12/2026 13:47	0	0.4	20.1
LG000071	3/13/2026 13:46	0	0.3	20.2
LG000071	3/16/2026 14:36	0	0.3	20.3
LG000071	3/17/2026 7:12	0	0.2	20
LG000071	3/18/2026 14:36	0	0.2	20.2
LG000071	3/19/2026 14:19	0	0.3	20
LG000071	3/20/2026 12:21	0	0.2	20
LG000071	3/23/2026 10:36	0	0.3	20.1
LG000071	3/24/2026 12:03	0	0.3	20.1
LG000071	3/25/2026 12:50	0	0.3	20.1
LG000071	3/26/2026 15:07	0	0.2	19.3

Table 5 (continued). Perimeter Probe Monitoring Results.				
Device ID	**Date**	**CH_4 (% by volume)**	**CO_2 (% by volume)**	**O_2 (% by volume)**
LG000072	3/9/2026 13:51	0	0.9	19.4
LG000072	3/11/2026 16:26	0	1	19
LG000072	3/12/2026 13:43	0	1	19.3
LG000072	3/13/2026 13:42	0	0.6	19.7
LG000072	3/16/2026 14:30	0	0.8	19.5
LG000072	3/17/2026 7:08	0	0.6	19.3
LG000072	3/18/2026 14:39	0	0.7	19.7
LG000072	3/19/2026 14:15	0	0.7	19.5
LG000072	3/20/2026 12:23	0	0.8	19.4
LG000072	3/23/2026 10:32	0	0.8	19.6
LG000072	3/24/2026 12:05	0	0.8	19.6
LG000072	3/25/2026 12:52	0	0.7	19.7
LG000072	3/26/2026 15:09	0	0.6	18.9
LG000073	3/9/2026 13:53	0	1.1	19.4
LG000073	3/11/2026 16:33	0	1	19.4
LG000073	3/12/2026 13:45	0	1	19.4
LG000073	3/13/2026 13:44	0	1.1	19.3
LG000073	3/16/2026 14:34	0	0.7	19.7
LG000073	3/17/2026 7:10	0	0.7	19.4
LG000073	3/18/2026 14:41	0	0.8	19.8
LG000073	3/19/2026 14:17	0	0.9	19.3
LG000073	3/20/2026 12:26	0	0.8	19.5
LG000073	3/23/2026 10:34	0	0.6	19.8
LG000073	3/24/2026 12:07	0	0.7	19.7
LG000073	3/25/2026 12:54	0	0.6	19.9
LG000073	3/26/2026 15:11	0	0.6	19.1

Landfill Interior – East Side – LG-15

In Figure 2, the three probes on the east perimeter trail—LG-14, LG-15, and LG-16—are shown in purple. LG-15 observed methane concentrations above 5 percent on the first three quarterly monitoring dates during 2025. LG-14, LG-15, and LG-16 are not compliance monitoring probes, due to their completion in fill, but the City continues to monitor them to inform operations.

Landfill Gas Surface Emissions Monitoring

City and Herrera personnel used a Landtec SEM 5000 Tunable Diode Laser Absorption Spectroscopy (TDLAS) detector to measure methane concentrations across the surface of the landfill within publicly accessible areas per CD requirements. The SEM 5000 methane detector is calibrated to the landfill site location and adjusts measurements based on the background methane concentrations measured upwind and downwind.

In order to keep surface monitoring data aligned with perimeter probe monitoring data, surface monitoring data is collected as close as possible to the time of the quarterly LFG compliance probe monitoring. City and Herrera staff collected surface monitoring data, and Herrera analyzed the data after each event.

Onsite Surface Monitoring

Background

The CMCP requires that the landfill surface be monitored for methane emissions to evaluate the performance of the LFG collection system, cap/barriers, etc. In 2025, this involved monitoring the gravel path south of the LFG South Blower Station, the paved east perimeter trail, the west Riverfront Boulevard sidewalk, the east Riverfront Boulevard sidewalk, and the open/parking lot areas associated with Buildings A and B (Phase 1) on a quarterly basis. After the building and exterior areas of Buildings B and A were opened for public access in October 2023 and March 2024, respectively, the periodic surface monitoring was performed every 2 weeks for the first 3 months. Monitoring frequency switched to quarterly after monitored methane levels remained in compliance for 3 consecutive months.

Methods and Results

Monitoring personnel used a Landtec SEM 5000 methane detector and walked the extents of the landfill to record surface methane concentrations. The SEM 5000 methane detector was calibrated on each day of monitoring to accurately record the methane concentrations and the corresponding GPS points. City personnel monitored the gravel path south of the south blower station, the paved east perimeter trail, the west Riverfront Boulevard sidewalk, and the east Riverfront Boulevard sidewalk. Herrera personnel monitored the interior and exterior of Buildings A and B and the publicly accessible parking area (following a serpentine path). All surface gas monitoring procedures were conducted following the Code of Federal Regulations (CFR) Part 60 Subpart WWW *Standards of Performance for Municipal Solid Waste Landfills* as required by the Environmental Protection Agency (EPA).

Surface monitoring paths and results for the Herrera monitored areas are shown in Figure 3. Surface monitoring paths and results for the City-monitored areas are shown in Figure **4**. The maximum observed levels are shown on each figure and stated in Table 6.

The SEM 5000 uses GPS to geolocate recorded methane concentrations in real time. When GPS signal is lost inside the building, the stored location is logged with the coordinate of the last location before the connection was lost. Consequently, the datapoints shown within and beside the building in Figure 3 do not necessarily appear in the correct location. To accommodate this, Table 6 summarizes the results of Figure 3. Table 6 lists the maximum interior and exterior methane concentrations observed for the publicly open buildings and parking lot on the four dates surface monitoring was conducted in 2025.

The threshold for the onsite monitoring identified in the CAP is 100 ppm inside buildings and 500 ppm for exterior areas. None of the concentrations recorded during 2025 surface monitoring events exceeded these thresholds. As shown in Figure 3 and Table 6, the maximum methane concentration measured for exterior areas was 3.9 ppm (well below the 500 ppm threshold) on March 21, 2025. As shown in Table 6, the maximum methane concentration measured for interior areas was 3.7 ppm on March 21, 2025 (below the 100 ppm threshold). Each dot on the figure represents a collected air monitoring read. The highest methane concentration observed during each monitoring event noted on Figure 3 and Figure **4**.

Table 6. Publicly Open Building and Parking Lot Surface Monitoring Results Summary.

	Interior Air Results (Compliance Threshold is 100 ppm)	**Exterior Air Results (Compliance Threshold is 500 ppm)**
Date	**Highest Methane Level Recorded (ppm)**	
Friday, March 21, 2025	3.7	3.9
Thursday, June 26, 2025	3.1	3.6
Wednesday, October 8, 2025	3.0	3.7
Wednesday, December 17, 2025	2.2	2.7

Offsite Structure Monitoring

Background

Offsite monitoring was discontinued in the offsite structures after the January 2023 monitoring event. Per the CMCP, "offsite monitoring will be discontinued after 3 years if there is no confirmed LFG detection in any monitored offsite building." Quarterly monitoring for offsite structures has been completed for 3 consecutive years (November 2019 through January 2023) with no exceedances.

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Figure 3.
Quarterly Monitoring Results for Herrera-Monitored Areas, 2025.

N

March 21, 2025

June 26, 2025

October 8, 2025

December 17, 2025

Maximum Methane Concentration Observed on Day: 3.7 ppm

Maximum Methane Concentration Observed on Day: 2.7 ppm

41ST ST

Maximum Methane Concentration Observed on Day: 3.9 ppm

Maximum Methane Concentration Observed on Day: 3.6 ppm

CAP Threshold
- Inside Buildings: 100 ppm
- Exterior Areas: 500 ppm

Methane Concentration (ppm)
- 1.4 - 2.0
- 2.1 - 2.6
- 2.7 - 3.0
- 3.1 - 3.6
- 3.7 - 3.9

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Snohomish County, ESRI (Aerial, 2023)

0 125 250 500 Feet

File Path: K:\Projects\V2022\22-21824.100\Prod\Everett LFG_System\MXD\Figure3_Quarterly_HEC_Monitoring_Results_11x17_2025
Date: 1/27/2025
Author: rstebbing

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Figure 4.
Quarterly Monitoring Results for City-Monitored Areas, 2025.

N

March 13, 2025

June 24, 2025

September 16, 2025

December 17, 2025

36TH ST
5
38TH ST
39TH ST
40TH ST
41ST ST

Maximum Methane Concentration Observed on Day: 9.2 ppm

Maximum Methane Concentration Observed on Day: 25.5 ppm

Maximum Methane Concentration Observed on Day: 52.2 ppm

Maximum Methane Concentration Observed on Day: 2.5 ppm

CAP Threshold
- Inside Buildings: 100 ppm
- Exterior Areas: 500 ppm

Methane Concentration (ppm)
- 1.6 - 2.2
- 2.3 - 3.6
- 3.7 - 15.9
- 16.0 - 31.2
- 31.3 - 52.2

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Snohomish County, ESRI (Aerial, 2023)

0 250 500 1,000 Feet

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