

## 13 LANDFILL SOILS GAS MONITORING

<b>DQO START DATE</b>	January 1, 2003
<b>IMPLEMENTATION DATE</b>	January 1, 2021
<b>POINT OF CONTACT</b>	William Dorsch (631) 344-5186 Robert Howe (631) 344-5588

### SUMMARY OF PROPOSED CHANGES

There are no proposed changes for calendar year 2021.

### DESCRIPTION AND TECHNICAL BASIS

The Former Landfill (Former Landfill, Interim Landfill, and Slit Trench) and the Current Landfill require post-closure monitoring in accordance with the requirements of 6 New York Codes, Rules and Regulations (NYCRR) Part 360, Solid Waste management Facilities, and the Operable Unit (OU) I Record of Decision (ROD). The monitoring period shall be a minimum of 30 years following landfill closure.

The Current Landfill was capped in 1995. Additional information regarding cap construction may be obtained from the construction certification report for the Current Landfill (CDM Federal, 1996). The Former Landfill and nearby Slit Trench were capped in November 1996 and the Interim Landfill was capped in October 1997. Additional information regarding cap construction may be obtained from the construction certification report for the Former Landfill (CDM Federal, 1997) and the Interim Landfill (PW Grosser, 1997).

Monitoring covered by this Data Quality Objective (DQO) will be soil gas monitoring of methane and hydrogen sulfide concentrations around each landfill. Soil gas monitoring data are evaluated for the potential for hazardous concentrations of gas near the landfill areas and the potential for off-site migration. Monitoring is conducted in accordance with the Final Operations and Maintenance Manual for the Current Landfill (CDM, 1996) and the Final Operations and Maintenance Manual for the Former Landfill Area (CDM, 1996). Both landfill areas contain passive venting for the controlled release of landfill gasses.

In accordance with NYCRR Part 360-2.17(f), decomposition gases generated within a landfill must be controlled to avoid hazards to health, safety, and property. Measures to control decomposition gases must be undertaken when the concentration of methane or other explosive gases exceeds 25 percent of the Lower Explosive Limit (LEL) for gases in facility structures on or off site or 100 percent of the LEL for gases at or beyond the site boundary. Notification to the New York State Department of Environmental Conservation (NYSDEC) shall be made within seven days of an observed exceedance.

Each of Brookhaven National Laboratory's (BNL) landfills has soil gas monitoring networks. Since the landfills were capped, BNL has been routinely monitoring for LEL, methane, and hydrogen sulfide using a LANDTEC® GEM 2000+ under BNL procedure EM-SOP-503. The review of data collected by project managers is done in accordance with procedures to ensure data is of acceptable quality. The Current Landfill has a total of 58 sampling points for monitoring soil gas positioned along the perimeter of the landfill. The sampling points include 12 soil gas well clusters consisting of three sampling intervals per cluster and 11 soil gas well couplets consisting of two sampling intervals per couplet.

The Former Landfill has a total of 24 sampling points for soil gas monitoring, also positioned along the perimeter of the landfill. These sampling points include six well couplets consisting of two sampling points per couplet.

#### **DRIVERS FOR MONITORING BEING CONDUCTED UNDER THIS CHANGE**

- Compliance
- Support Compliance
- Surveillance
- Restoration

#### **DATA QUALITY OBJECTIVE ANALYSIS**

##### **Step 1: State the Problem**

Material disposed of in the landfills decomposes, generating gases that may migrate to areas outside the landfill boundaries. These gases may be explosive at certain concentrations and may cause harm to personnel and/or property.

##### **Step 2: Identify the Decision**

*Is the as-built passive venting landfill gas collection system adequate to control soil gas levels near the landfills to safe levels and prevent the off-site migration of gases at hazardous levels?*

##### **Step 3: Identify Inputs to the Decision**

Soil gas monitoring data should be evaluated for the potential for hazardous conditions on site and the potential for off-site migration at the following frequency:

- Current landfill – Quarterly
- Former landfill – Annually

Since there have been little to no detections of methane during monitoring at the Former Landfill Area for more than 20 years, in March 2014 BNL recommended and the regulators concurred that the soil gas monitoring frequency be reduced from semiannual to annual.

##### **Step 4: Define the Study Boundaries**

Landfill perimeter gas monitoring network.

##### **Step 5: Develop the Decision Rules**

*Is the as-built passive venting landfill gas collection system adequate to control soil gas levels near the landfills to safe levels and prevent the off-site migration of gases at hazardous levels?*

*Does the BNL Environmental Incident Procedure need to be deployed? Does NYSDEC need to be notified?*

**Decision Rule**

**If** the soil gas levels in the soil gas monitoring wells are <25 percent of the LEL for gases in facility structures on or off site or <100 percent of the LEL for gases at or beyond the landfill site boundary, **then** deployment of the BNL Environmental Incident Procedure and notification to NYSDEC is not required.

**If** the soil gas levels in soil gas monitoring wells are >25 percent of the LEL for gases in facility structures on or off site or > or equal to 100 percent of the LEL for gases at or beyond the landfill site boundary, **then** perform an evaluation to determine whether additional landfill controls are necessary and notify NYSDEC within seven days, as required.

**Step 6: Specify Acceptable Error Tolerances**

Design is per NYCRR Part 360 requirements.

**Step 7: Optimize the Design**

Design is per NYCRR Part 360 requirements. Since there have been little to no detections of methane during monitoring at the Former Landfill Area for more than 20 years, in March 2014, BNL recommended and the regulators concurred that the soil gas monitoring frequency be reduced from semiannual to annual.

See Appendix B for the monitoring program for this DQO.

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