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February 23, 2022

Ms. Sharon Hartzell
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290 Broadway - 18th Floor
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Mr. Brian Jankauskas
New York State Department of
Environmental Conservation
Division of Environmental Remediation
625 Broadway -12th Floor
Albany, New York 12233

Dear Ms. Hartzell and Mr. Jankauskas:

SUBJECT: BROOKHAVEN NATIONAL LABORATORY (BNL) INTERAGENCY AGREEMENT (IAG): 2021 ENVIRONMENTAL MONITORING REPORT CURRENT AND FORMER LANDFILL AREAS

Attached please find a copy of the subject document for your review, comment, and approval. The following outlines the key points of the report.

Current Landfill:

- Landfill gasses are not migrating to any buildings.
- Elevated levels chloroethane, 1,1-dichloroethane and benzene continue to be detected downgradient of the landfill. These concentrations are naturally attenuating and are not detected at the site boundary above the drinking water standard.
- There have been no detections of radionuclides above the drinking water standards since 1998.

Former Landfill:

- Landfill gasses were not detected.
- It was recommended in the *2020 Environmental Monitoring Report, Current and Former Landfill Areas* that groundwater monitoring of the Former Landfill monitoring well network be discontinued. With NYSDEC acceptance of the *2020 Environmental Monitoring Report, Current and Former Landfill Areas* report, these changes were implemented in Calendar Year 2021.

If you have any questions please contact Caroline Polanish, of my staff, at (631) 344-5224. We plan to brief you on the conclusions of this report during an upcoming IAG teleconference.

Sincerely,

Robert P. Gordon
Site Manager

Attachment:
2021 Landfill Report

cc: W. Parish, NYSDEC
A. Rapiejko, SCDHS
C. Polanish, SC-BHSO
S. Coleman, BSA
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BROOKHAVEN NATIONAL LABORATORY
2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

Prepared by

Brookhaven National Laboratory
Environmental Protection Division
Upton, New York

February 22, 2022

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BROOKHAVEN NATIONAL LABORATORY
2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

Executive Summary

This report documents the Operations and Maintenance activities undertaken during calendar year 2021 for the Current Landfill (Area of Concern [AOC] 3) and the Former Landfill Areas. The Former Landfill Areas include the Former Landfill (AOC 2A), Interim Landfill (AOC 2D), and Slit Trench (AOC 2E). Brookhaven National Laboratory is responsible for performing this work to comply with the post-closure O&M requirements specified in 6 New York State Code of Rules and Regulations (NYCRR) Part 360, Solid Waste Management Facilities, updated November 4, 2017. The landfill caps are functioning as designed and the 2021 results are consistent with results from previous years.

GROUNDWATER QUALITY

The groundwater quality at the Current Landfill remains relatively unchanged from 2020. Volatile organic compounds (VOCs) and metals continue to be detected downgradient of the Current Landfill. The most prevalent VOCs detected above NYSDEC Class GA Groundwater/Guidance Values are chloroethane, 1,1-dichloroethane and benzene, at maximum concentrations of 19.9 micrograms per liter (µg/L), 6.04 µg/L and 2.02 µg/L, respectively. As with previous years, aluminum, iron, manganese, and sodium were detected downgradient from the Current Landfill at concentrations above applicable standards. Concentrations of these metals were similar to those detected historically. Maximum concentrations of aluminum, iron, manganese, and sodium in downgradient wells were 508 µg/L, 89,100 µg/L, 3,680 µg/L and 94,700 µg/L, respectively. These results are an indicator of continued low-level leachate generation at this landfill. There were no detections of radionuclides above standards at the Current Landfill during 2021 nor have there been since groundwater monitoring began in 1997.

The groundwater monitoring well network for the Current Landfill Area is adequate at this time. VOCs, metals and water quality parameters will continue to be monitored semi-annually but VOCs will be monitored quarterly in wells 088-109 and 098-99. Radionuclides will continue to be monitored annually on wells 087-23, 087-27, 088-109 and 088-21.

The Former Landfill groundwater monitoring data collected during the previous two decades indicate groundwater impact is now essentially nonexistent therefore, groundwater monitoring of the Former Landfill monitoring well network was discontinued in 2020.

SOIL-GAS MONITORING

Soil-gas monitoring at the Current Landfill indicates that decomposition is still occurring. However, as with prior years, there is no indication that the vapors are migrating beyond the monitoring well network. Soil-gas monitoring at the Former Landfill Area indicates that there is no detection of gas emanating from the landfill. The existing soil gas monitoring well networks are sufficient to monitor both landfill areas.

MAINTENANCE AND REPAIR

Monthly inspections and routine maintenance of the cap, drainage channels and wells were performed throughout 2021. The handles on all the protective covers for the Former Landfill soil-gas wells were replaced with new stainless-steel handles.

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ACRONYMS

AOC	Area of concern
BNL	Brookhaven National Laboratory
BSA	Brookhaven Science Associates
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CY	Calendar year
DCS	Derived concentration technical standard
DOE	U.S. Department of Energy
DQOs	Data quality objectives
EIMS	Environmental Info. Mgmt. System
HWMF	Former Hazardous Waste Management Facility
LEL	Lower explosive limit
µg/L	Micrograms per liter
mg/L	Milligrams per liter
ng/L	Nanograms per liter
mrem	Millirem
MS/MSDs	Matrix spike/matrix spike duplicates
NPL	National Priorities List
NYSDEC	NY State Dept. of Environmental Conservation
NYSDOH	NY State Dept. of Health
O&M	Operations and Maintenance
OU	Operable Unit
PCBs	Polychlorinated biphenyls
pCi/L	Picocuries per liter
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
SCDHS	Suffolk County Department of Health Services
Sr-90	Strontium 90
TDS	Total dissolved solids
TKN	Total Kjeldahl nitrogen
TSS	Total suspended solids
TVOCs	Total volatile organic compounds
UEL	Upper explosive limit
USEPA	United States Environmental Protection Agency
VOCs	Volatile organic compounds

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1.0 INTRODUCTION

This report documents the Operation and Maintenance (O&M) activities and summarizes monitoring data collected during calendar year (CY) 2021 for the Current Landfill (Area of Concern [AOC] 3) and the Former Landfill Areas (Former Landfill AOC 2A, Interim Landfill AOC 2D, and Slit Trench AOC 2E). Brookhaven National Laboratory (BNL) is responsible for performing this work to comply with the post-closure O&M requirements specified in the 6 New York State Code of Rules and Regulations (6NYCRR) Part 360, Solid Waste Management Facilities, revised November 4, 2017. The details of the O&M programs are described in the Final Operations and Maintenance Manuals for the Current Landfill (CDM Federal, 1996a) and the Former Landfill Areas (CDM Federal, 1996c).

The following are the primary objectives of the O&M program:

- Monitor the effectiveness of the impermeable caps in protecting groundwater quality;
- Monitor the potential generation and migration of soil-gas; and
- Maintain and monitor the various components of the closure system (e.g., landfill caps, drainage structures, and environmental monitoring systems).

This is the twenty-sixth year of O&M for the Current Landfill, the twenty-fifth year for the Former Landfill and Slit Trench, and the twenty-fourth year for the Interim Landfill.

1.1 Site Description and Project Background

BNL is a 5,265-acre site located in central eastern Long Island, New York. The facility is a federally owned and funded international research and learning center managed by Brookhaven Science Associates (BSA) under contract with the United States Department of Energy (DOE). On December 21, 1989, the site was placed on the United States Environmental Protection Agency's (USEPA's) National Priorities List (NPL), a ranking of hazardous waste sites compiled by the federal government as part of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Placing BNL on the NPL resulted in the establishment of a remediation

task list for various locations around the facility. The site subsequently was divided into eight separate remediation work areas known as Operable Units (OU). The Current Landfill and Former Landfill Areas are located in OU I, near the south-central portion of the BNL site **(Figure 1)**.

Current Landfill. The Current Landfill consists of one unlined waste-cell that operated from the late 1960s until 1990 for disposing of waste generated at the Laboratory. An impermeable cap covering the cell was completed in November 1995. Additional information about the cap's construction can be obtained from the *Construction Certification Report for the Current Landfill* (CDM Federal, 1996b). Following the installation of the cap, the post-closure groundwater monitoring program was implemented in January 1996, in compliance with 6 NYCRR Part 360 Section 2.15, Solid Waste Management Facilities.

Groundwater quality near the Current Landfill is monitored under the O&M program for a wide variety of volatile organic compounds (VOCs), metals, radiological, and water chemistry (landfill leachate) parameters. Monitoring in this vicinity was expanded in 1999 to include a wetland area adjacent to the landfill's eastern boundary. The area shown on Figure 2, known as the Wooded Wetland area, is a two-acre wetland located between the Former Hazardous Waste Management Facility (HWMF) and the Current Landfill. The wetland receives surface runoff from the Current Landfill and usually contains standing surface water during the spring/early summer and dry in late summer/fall. Monitoring of the Wooded Wetland area was incorporated into the Current Landfill Monitoring Program and consisted of sampling and analyzing surface water and sediment annually through 2008, and then every other year to evaluate the potential for leachate migrating into this area, as originally performed under the *OU I Ecological Risk Assessment* (CDM Federal, 1999). In response to information provided in the *2015 Environmental Monitoring Report, Current and Former Landfill Areas* (BNL 2016) and additional tiger salamander information provided upon the request of the NYSDEC, it was agreed that further monitoring of the Wooded Wetlands would be limited to visual tiger salamander assessments. Furthermore, it was agreed to that no further sediment and surface water samples will be collected, and care would be taken by BNL to not disturb the buildup of detritus material in the Wooded Wetland.

As required under 6 NYCRR Part 360, groundwater quality must be monitored for a minimum of five years, after which the permittee may request modification of the sampling and analysis

requirements. In October 2001, BNL submitted the *Five-Year Evaluation Report for the Current Landfill* (BNL, 2001b). This report assessed groundwater trends over the five years after capping, and proposed changes to the sampling program. These changes were implemented in CY 2002. In July 2006, March 2011, June 2016 and June 2021 BNL issued CERCLA Five-Year Review Reports which discussed all remediation areas at the site, including the Current Landfill (BNL 2006, BNL 2011, BNL 2016, BNL 2021).

Former Landfill Area. The Former Landfill Area encompasses three closely located landfill units; the Former Landfill, the Slit Trench, and the Interim Landfill. The Former Landfill is an unlined waste-disposal area originally used by the United States Army starting in 1918. Waste disposal operations ceased in 1966, and the landfill was covered with soil. The Interim Landfill also is unlined and was reportedly used for approximately one year between the time the Former Landfill was closed and the Current Landfill was opened. The Slit Trench is unlined as well and is believed to have operated between 1960 and 1967 for disposal of construction and demolition debris (CDM Federal, 1996c).

The Former Landfill and Slit Trench were capped in November 1996 and the Interim Landfill was capped in October 1997. Additional information about the construction of the caps can be found in the *Construction Certification Report for the Former Landfill* (Roy F. Weston, 1997) and *Construction Certification Report for the Interim Landfill Capping* (PW Grosser, 1997). BNL started O&M activities in December 1996 at the Former Landfill and Slit Trench, and in November 1997 at the Interim Landfill. Under this O&M program, groundwater quality in downgradient wells near the Former Landfill was monitored for VOCs, metals, radionuclides, and landfill-leachate parameters.

In March 2002, BNL submitted a *Five-Year Evaluation Report for the Former Landfill* (P.W. Grosser, 2002), which assessed trends in groundwater quality over the five-year period following capping and proposed changes to the sampling program. These changes were implemented in CY 2003. In July 2006, March 2011, June 2016 and June 2021 BNL issued CERCLA Five-Year Review Reports which discussed all remediation areas at the site including the Former Landfill Area (BNL 2006, BNL 2011, BNL 2016, BNL 2021). With the groundwater data collected during the past two decades as evidence, and groundwater impact nonexistent, it was recommended in the

2020 Environmental Monitoring Report, Current and Former Landfill Areas (BNL 2021) that groundwater monitoring of the Former Landfill monitoring well network be discontinued. With NYSDEC acceptance of the *2020 Environmental Monitoring Report, Current and Former Landfill Areas* (BNL 2021) Report, these changes were implemented in CY 2021.

1.2 Overview of the Monitoring Program

Groundwater Monitoring

Data quality objectives (DQOs) for each of BNL's groundwater monitoring programs are presented in the *BNL Environmental Monitoring Plan* (BNL, 2022). The design of the data collection network was optimized as part of the process. Such optimization continues annually as part of the O&M program and is based on the interpretation of new data as well as historical trends. The primary DQO decision identified for the landfill monitoring programs is "Are the controls effectively improving groundwater quality below and downgradient of the landfill?"

Groundwater samples are collected from monitoring wells positioned upgradient and downgradient of each landfill area. Analytical data are reviewed, and determinations are made regarding the effectiveness of landfill controls.

The additional monitoring programs for the landfill areas consist of:

<u>*Soil-gas Monitoring*</u>. Measurements of methane, Lower Explosive Limit (LEL), and hydrogen sulfide are taken quarterly from monitoring locations surrounding the Current Landfill and annually from monitoring locations surrounding the Former Landfill to evaluate the movement of soil-gas from the landfills.

<u>*Routine Visual Inspection, Maintenance, and Repair*</u>. Monthly inspections are performed to monitor the structural and/or operational status of the landfill caps, drainage structures, and environmental monitoring systems. Semi-annual inspections of the landfills are also performed to ensure that institutional controls continue to be maintained.

<u>*Leachate Discharge*</u>. Visual inspections of the landfills are performed monthly to monitor for signs of leachate discharge. If observed, samples of the leachate are collected and analyzed.

Leachate was not observed during 2021.

These activities are discussed in greater detail in **Sections 2 through 4** of this report. **Section 5** contains the conclusions and recommendations. References are included in **Section 6**.

2.0 GROUNDWATER MONITORING

2.1 Monitoring Well Networks

2.1.1 Current Landfill

Since January 1996, groundwater quality at the Current Landfill has been monitored using eleven downgradient wells and one background monitoring well. **Figure 2** depicts the location of the monitoring wells. **Figure 3** shows the water table contours for this area in October 2021. The depths of the screen intervals for the Current Landfill wells and fourth quarter depth to water elevations are listed below.

Well ID	Depth to Water (ft BLS) 4th Q 2021	Screen Interval (ft BLS)	Screen Zone
087-09*	28.67	24–34	Shallow Glacial
087-11	16.19	11–21	Shallow Glacial
087-23	34.54	25–40	Shallow Glacial
087-24	34.51	70–80	Middle Glacial
087-26	15.16	70–80	Middle Glacial
087-27	15.30	5–20	Shallow Glacial
088-109	13.42	6–21	Shallow Glacial
088-110	15.52	10–25	Shallow Glacial
088-21	10.08	5–20	Shallow Glacial
088-22	10.22	70–80	Middle Glacial
088-23	10.22	120–130	Deep Glacial
098-99	13.23	39.5-49.5	Middle Glacial

BLS = Below Land Surface

*Background well

2.1.2 Former Landfill

Since January 1997, groundwater quality at the Former Landfill area has been monitored using 14 shallow monitoring wells (three background and 11 downgradient). However, as

recommended in the *2020 Environmental Monitoring Report, Current and Former Landfill Areas* (BNL 2021), groundwater monitoring of the Former Landfill monitoring well network has been discontinued. This change was implemented during CY 2021. For historical purposes, the screen zones for the Former Landfill Area wells are summarized below.

Well ID	Depth to Water (ft BLS) 4th Q 2021	Screen Interval (ft BLS)	Screen Zone
086-42*	NS	65–75	Middle Glacial
086-72*	NS	41.5–56.5	Shallow Glacial
087-22*	NS	43–53	Shallow Glacial
097-17	NS	29–39	Shallow Glacial
097-64	NS	29–44	Shallow Glacial
097-277	NS	40–55	Shallow Glacial
106-02	NS	55–65	Middle Glacial
106-30	NS	29–44	Shallow Glacial
106-20	NS	85-95	Middle Glacial
106-21	NS	55-65	Shallow Glacial
106-43	NS	43-53	Shallow Glacial
106-44	NS	44-54	Shallow Glacial
106-45	NS	44-55	Shallow Glacial
106-64	NS	30-40	Shallow Glacial

BLS = Below Land Surface
*Background well
NS = Not sampled

2.1.3 Sampling Frequency and Analytical Parameters

The majority of monitoring wells for the Current Landfill were sampled semiannually during June and November 2021, for VOCs, metals, and water chemistry parameters. A quarterly VOC sampling frequency was maintained for wells 088-109 and 098-99. Samples were analyzed for radionuclides once during 2021 for wells 087-23, 087-27, 088-21, and 088-109.

The BNL sampling team conducted the groundwater sampling, and General Engineering Laboratories, Inc of Charleston, South Carolina analyzed the samples. Groundwater samples were collected using BNL standard operating procedure (SOP) EM-SOP-302, *Groundwater Sampling-Low Flow Purging and Sampling Using Dedicated Bladder Pumps.* This year due to changes in

analytical lab preferred VOC Methods, EPA Method 524.2 has migrated to Method 8260LL. This method duplicates the suite of analytes and detection limits of Method 524.2. See **Table 1** for a summary of analyses performed, by well and sampling round.

2.1.4 Quality Assurance / Quality Control

The groundwater samples were collected and analyzed in accordance with strict quality assurance/ quality control (QA/QC) requirements as described in the BNL SOPs for groundwater monitoring. The analytical results for groundwater samples collected during 2021 satisfied the data-quality objectives. Furthermore, a master calibration/maintenance log is maintained for each field-measuring device (e.g., pH, conductivity, turbidity meters).

The analytical results of samples collected for the Current Landfill project underwent data verification, using EM-SOP-203, *Chemical Data Verification*, and EM-SOP-204, *Radiochemical Data Verification*. These procedures are designed to verify the accuracy and/or completeness of analytical data. The data verification process is implemented to detect the most common analytical problems that affect the quality of the results. To accomplish this task, QA/QC items such as the following were checked: holding times, matrix spikes, laboratory and field blanks, and field logs. If items are found that can affect the use and interpretation of the data, they are either corrected, as in the case of unreadable information on the field logs, or the data are "qualified," as in the case of contamination of the blanks or violations of the holding time.

Guidance on the collection of QA/QC samples is contained in the QAPP, and in BNL procedure EM-SOP-200, *Collection and Frequency of Field Quality Control Samples*. The QA/QC samples collected included trip blanks, field blanks, matrix spike/matrix spike duplicate (MS/MSDs), and blind duplicates.

Trip blanks were analyzed for aqueous VOCs only. One trip blank was shipped to the analytical laboratory with each set of samples submitted for VOC analyses. The results of the blank samples did not indicate any significant impact on the quality of the results. One duplicate sample was collected from the Current Landfill during the second and fourth quarters. No inconsistencies were detected in the blind duplicate analyses. The results are indicative of consistency with contract analytical laboratories and sampling methods, resulting in valid, reproduceable data. Matrix

spike/matrix spike duplicate (MS/MSD) samples were collected at the same frequency as the duplicates. Due to a lab error, Current Landfill well samples submitted for VOC analysis during the second quarter were analyzed outside their respective holding times on a secondary analytical run from wells 087-09, 087-23, 088-109 and 088-110. The secondary run was need due to a violation of internal quality control standards that only affected certain analytes of the 8260LL analytical method. The data has been qualified for the samples that were affected by this exceedance and subsequently denoted in the respective data tables. All qualified data was within acceptable limits and did not adversely impact the review of groundwater quality. However, second quarter replacement samples for these wells were recollected in July and the VOC data is presented in the tables. Furthermore, VOC samples collected during the third quarter for wells 088-109 and 098-99 arrived at the analytical laboratory exceeding their temperature range for proper preservation. BNL cancelled the analyses of these samples, however three rounds of data for the year were still analyzed for these wells.

2.2 Landfill Groundwater Monitoring Results

This section summarizes the 2021 results for VOCs, metals, water-chemistry parameters, and radionuclides detected for the Current Landfill. The historical trends in concentrations of key contaminants are assessed and shown graphically in **Figures 4 through 7**. Summary tables of all 2021 landfill groundwater data are presented in **Tables 2 through 5**. Detections that exceed groundwater standards are in bold text. The tables include groundwater standards, laboratory results, minimum detection limits, and laboratory data qualifiers.

The groundwater standards used for evaluating non-radiological groundwater data are those contained in the NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values (June 1998, with addendums April 2000 and June 2004) (NYSDEC 1998, 2000 and 2004) and 6NYCRR Part 703.5. Groundwater standards for radiological isotopes were supplemented with New York State Department of Health's (NYSDOH's) and United States Environmental Protection Agency (EPA) strontium-90 and tritium standards for drinking water. There were no groundwater standards for the gamma constituents; therefore, a Groundwater Screening Level was used. This value is based on a dose equivalent of 4 millirem (mrem)/year and was calculated as 4% of the DOE Derived Concentration Technical Standards (DCS) (DOE-STD-1196-2011) for the isotope of concern. These values are

listed under the "groundwater standards" column in the summary tables and annotated where appropriate. Laboratory results that exceed the lower of the groundwater standards or the Cleanup Goals listed in the Record of Decision (ROD) are highlighted in the data summary tables to facilitate review of the information.

The laboratory data qualifiers included in the tables vary for the different analyses. Explanations for the data qualifiers are included in the notes in each table. Complete 2021 laboratory data reports, chain of custody forms, and well-sampling logs for the landfills are archived and available upon request. In addition, analytical results are stored in the BNL Environmental Information Management System (EIMS) database.

2.2.1 Current Landfill

2.2.1.1 Volatile Organic Compounds (VOCs)

Benzene and chloroethane have historically been the primary groundwater contaminants detected downgradient of the Current Landfill. Benzene was detected above its standard of 1 microgram per liter (µg/L) in monitoring well 087-11 and 88-110. 1,1-Dichloroethane was detected above the groundwater standard of 5 µg/L in downgradient monitoring well 088-109 during 2021 **(Table 2)**. Chloroethane was detected in wells 088-109 and 088-110 above the groundwater standard of 5 µg/L. No other VOCs were detected above groundwater standards during 2021.

Benzene exceeded the 1 µg/L standard in well 087-11 during the June 2021 and November 2021 sampling events, with a maximum concentration of 2.02 µg/L. Well 088-110 exceeded the benzene standard during the November 2021 sampling event with result of 1.2 µg/L. Chloroethane exceeded the 5 µg/L standard in well 088-109 for November with a concentration of 19.9 µg/L. This concentration is significantly below the historic high of 560 ug/L detected in this well in 1998. Well 088-110 exceeded the chloroethane standard in June and November with a concentration of 5.9 µg/L and 6.1 µg/L respectively. Well 088-109 detected 1,1-Dichloroethane slightly above the standard of 5 µg/L in November at a concentration of 6.0 µg/L. There is no apparent seasonal or water table elevation correlation with VOC concentrations in this well based on an assessment of historical data.

Figure 4 plots the concentration trends of total VOCs (TVOC), benzene and chloroethane. Overall, the trend plots also show a distinct decrease in VOC concentrations from the high concentrations seen prior to the installation of the cap. This reflects the positive effects of the capping on the groundwater quality downgradient of the landfill.

2.2.1.2 Water Chemistry Parameters

Groundwater samples near the Current Landfill were analyzed semi-annually for ammonia, total Kjeldahl nitrogen (TKN), cyanide, sulfate, nitrite, nitrate, total nitrogen, chloride, alkalinity, total dissolved solids (TDS or residue, nonfilterable), and total suspended solids (TSS or residue, filterable) during 2021. The results are provided in **Table 3**. Elevated levels of these parameters can be indicative of the presence of landfill leachate. A comparison of downgradient and background wells shows that leachate continues to be generated from the Current Landfill, albeit at low concentrations. The establishment of stable water chemistry concentration levels indicates that the capping continues to effectively reduce the generation and migration of leachate.

During 2021, ammonia was the only water chemistry parameter detected above standards. Ammonia was detected above the standard of 2 milligrams per liter (mg/L) in well 087-11, 087-27, and 088-109. The highest concentration was found in well 087-11 at 6.5 mg/L in June 2021 **(Table 3)**. The levels of ammonia detected in downgradient wells are consistent with historic data.

Chloride was not detected above the standard of 250 mg/L in any wells in 2021. Downgradient well 088-21 had the highest concentration of chloride at 173 mg/L. **Figure 5** plots the trends for alkalinity and chloride. The trends for downgradient wells show low levels of chloride concentrations near the Current Landfill. The historical concentration trends plotted show overall stable levels of chloride apart from 087-26 which is showing a slight upward trend

Alkalinity, in the form of bicarbonate, is the concentration of anions available to neutralize acid, and is often used as an indicator of leachate contamination. The alkalinity in background well 087-09 ranged from 29 mg/L to 46 mg/L. The highest alkalinity concentration during 2021 was detected in downgradient, shallow Upper Glacial aquifer well 087-11, at 232 mg/L. There is no groundwater standard for alkalinity. The historical concentration trends plotted in **Figure 5** show overall stable to decreasing levels of alkalinity apart from 087-26 which is showing a slight upward trend

During 2021, all sulfate concentrations remained below the groundwater standard of 250 mg/L. The highest sulfate value reported for 2021 was detected in the June sample from monitoring well 087-09 at a concentration of 20 mg/L. This is consistent with historic background levels at the Current Landfill.

TDS and TSS results were similar to those from previous years. TDS concentrations in background well 087-09 ranged from 114 mg/L to 144 mg/L. TSS concentrations were non-detect for well 087-09. The maximum concentrations observed in downgradient wells were 354 mg/L and 57 mg/L of TDS and TSS, respectively.

No water chemistry parameters have exceeded groundwater standards in downgradient wells 087-24, 088-22, and 088-23, since 1998. These wells are all screened in the mid to deep-Upper Glacial aquifer to monitor the vertical extent of contamination from the Current Landfill.

2.2.1.3 Metals

Historically, iron is detected consistently above groundwater standards in the upgradient well, and the majority of downgradient wells surrounding the landfill. Precipitated iron from the BNL Water Treatment Plant was disposed of at the Current Landfill during past operations. However, metals concentrations in upgradient well 087-09 are still lower than in several downgradient wells, suggesting continued leachate migration from the landfill into the groundwater.

During 2021, sodium exceeded the groundwater standard in background well 087-09. Aluminum, iron, manganese, and sodium exceeded their respective groundwater standards in several downgradient wells **(Table 4)**.

Aluminum was reported above the standard of 200 µg/L in downgradient well 087-11 at a maximum concentration of 508 µg/L. This result is consistent with historic results reported for several Current Landfill wells, including background well 087-09.

Iron was reported above the standard of 300 µg/L in wells 087-11, 087-23, 087-27, 088-109, and 088-110. The background concentrations ranged were non-detect while downgradient concentrations ranged up to 89,100 µg/L in well 087-11. Well 087-11 has shown decreasing iron concentrations since the fourth quarter 2018. Iron trend graphs are plotted on **Figure 6**.

Manganese was detected above the standard of 300 µg/L in wells 087-11, 087-23, 087-27, 088-109, and 088-110. Manganese ranged from 2.2 µg/L to 6.1 µg/L in background well 087-09, and up to 3,680 µg/L in the downgradient well 088-110.

Sodium was detected above the standard of 20,000 µg/L in wells 087-09, 087-24, 087-26, and 088-110. Downgradient sodium levels ranged up to 94,700 µg/L in well 087-11.

2.2.1.4 Radionuclides

No radionuclides were detected above groundwater standards for strontium-90, tritium and gamma constituents during 2021 as shown in **Table 5**. As noted in **Section 2.2**, there are no groundwater standards for the gamma constituents; therefore, a groundwater screening level was used for comparison purposes and annotated where appropriate. Sr-90 was detected in well 088-21 at a concentration of 4.3 picocuries per liter (pCi/L), during November. This is below the standard of 8 pCi/L. Tritium was not detected in any wells sampled during 2021. The last time tritium was detected was in well 087-27 at 318 pCi/L in December of 2015. This is significantly below the groundwater standard of 20,000 pCi/L. **Figure 7** shows the historical strontium-90 and tritium concentration trends for the four wells sampled.

2.2.2 Former Landfill

As recommended in the *2020 Environmental Monitoring Report, Current and Former Landfill Areas* (BNL 2021), groundwater monitoring of the Former Landfill monitoring well network has been discontinued.

3.0 SOIL-GAS MONITORING

3.1 Soil-gas Monitoring Networks

Soil-gas readings were collected from wells surrounding the Current Landfill in March, June, September, and December 2021 and from the Former Landfill in August 2021. Methane, lower explosive limit (LEL), and hydrogen sulfide were measured using a Landtec® GEM 2000. The LEL for methane is 5.3% and the upper explosive limit (UEL) is 15%.

3.1.1 Current Landfill

Along the perimeter of the Current Landfill, 58 points were sampled for soil-gas, which includes four outpost soil-gas well clusters, GSGM-1 to GSGM-4, located along the south side of Brookhaven Avenue. 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. **Table 6** describes each soil-gas well adjacent to the landfill. Their locations are illustrated on **Figure 8**.

3.1.2 Former Landfill Area

Twenty-four sampling points were monitored for the Former Landfill Area. These points include 12 well couplets consisting of two sampling points per couplet. Details of each soil-gas well are given in **Table 6** and their locations shown in **Figure 9**.

3.1.3 Sampling Frequency

Soil-gas was monitored for each landfill in the following months.

Sampling Event	Current Landfill	Former Landfill
Round 1	March 2021	August 2021
Round 2	June 2021	None
Round 3	September 2021	None
Round 4	December 2021	None

3.2 Results of Soil-Gas Monitoring

Action levels for soil-gas are specified in 6 NYCRR Part 360-2.17(f) in terms of percent LEL, which is primarily related to the amount of methane present. This discussion focuses primarily on the methane levels detected during monitoring. Hydrogen sulfide is monitored but has no regulatory action level. 6 NYCRR Part 360-2.17(f) specifies that active measures to control decomposition gases are required when the concentration of methane or other explosive gases exceeds 25 percent of the LEL (or 1.3% methane) in facility structures, or 100 percent (%) of the LEL (or 5.3% methane) at the site boundary.

3.2.1 Current Landfill

A total of 23 soil-gas monitoring well clusters are positioned around the Current Landfill **(Figure 8)** and were sampled quarterly during 2021. Potential receptors, or areas where methane can accumulate near the Current Landfill, include the National Weather Service office building located 480 feet north northwest of the Current Landfill on the north side of Brookhaven Avenue. Four outpost soil-gas locations, GSGM-1 to GSGM-4, are located along the south side of Brookhaven Avenue, and are used to monitor the northern extent of the migration of landfill gas. Should methane extend to the south side of Brookhaven Avenue at concentrations exceeding 25 percent of the LEL (or 1.3% methane), active measures may be required to control its migration. This is a BNL administrative limit that would trigger further evaluation.

The results of the soil-gas monitoring for 2021 are summarized in **Table 7**. **Appendix A** contains the field notes recorded during the sampling events. Instrument measurements show that methane continues to be generated in several areas of the landfill. The percent of the LEL is elevated along the western side and the southeast boundary of the Current Landfill. In addition, SGMW-19A and SGMW-19B along the northern side of the Current Landfill had elevated LEL readings in three of the four quarterly sampling events. The LEL readings in these areas have remained stable since 1996 when monitoring began. The current gas venting system appears to be effective in controlling gas accumulation. These data are consistent with previous years.

Outpost wells, GSGM-1 to GSGM-4, located along the south side of Brookhaven Avenue and immediately upgradient of the landfill showed no methane during 2021, apart from GSGM-1A with a low detection of 2 percent of the LEL (0.1% methane) during the September sampling event. This indicates that the methane accumulation and migration does not extend to this area. Should methane, at concentrations exceeding 25 percent of the LEL (or 1.3% methane) extend to these outpost wells on the south side of Brookhaven Avenue, active measures may be required to control its migration.

Hydrogen sulfide is a product of anaerobic decay in landfills and can produce an odor like rotten eggs. It is a nuisance, but rarely a toxicity problem. For reference, the National Institute of Occupational Safety and Health sets an exposure limit of 10 parts per million (ppm) hydrogen sulfide in the breathing zone for an 8-hour period.

Hydrogen sulfide measurements collected from the soil-gas monitoring wells ranged from 0 ppm to 41 ppm. Well SGMW-12A located along the south section of the landfill, had the highest hydrogen sulfide concentration of 41 ppm, which was above the 10 ppm exposure limit. However, the measurement was taken from a vapor point screened 2.5 to 7.5 ft below the surface, and not from the ambient breathing zone. Elevated hydrogen sulfide was also detected in well SGMW-02B, which is screened 10.5 to 16 ft below the surface at a concentration of 27 ppm. Like methane, receptors to hydrogen sulfide are considered to be in areas such as basements where the gas can accumulate. Based upon the readings obtained from the outpost soil-gas wells along the south side of Brookhaven Avenue (GSGM-1 to GSGM-4), there is no evidence that hydrogen sulfide is migrating toward the National Weather Service building.

3.2.1.1 Trend in Soil-Gas Data

Historically the levels of methane and hydrogen sulfide in the wells along the northwest landfill boundary and southeast corner have remained elevated but stable.

3.2.2 Former Landfill Area

A total of 12 soil-gas monitoring well clusters are positioned around the Former Landfill Area **(Figure 9)**. During 2021, the well clusters were monitored once, in August. The only existing operating facility within the immediate vicinity of the Former Landfill Area is Building 670,

located approximately 650 feet to the southeast. This building houses the Chemical Holes Sr-90 groundwater treatment system. This facility does not have a basement. Based upon the sampling event, there was no methane or hydrogen sulfide detected. **Table 8** details the 2021 soil-gas monitoring results for the Former Landfill Area. **Appendix A** contains the field notes recorded during the sampling events.

3.2.2.1 Trends in Soil-Gas Data

The results of monitoring the Former Landfill Area continue to be consistent with the initial survey of the methane gas migration conducted in 1995, during which concentrations between 0% to 0.1% methane were recorded. Methane has not been detected since 2005. Although hydrogen sulfide gas was measured during this initial survey it has not been detected since 2010.

Presently, there is no measured pathway for methane gas migration, nor do the concentrations represent an explosive hazard, as shown by the non-detectable readings on the LEL meter. The age of the Former Landfill Area and the types of materials disposed of would likely result in low levels or the absence of methane or hydrogen sulfide.

4.0 MAINTENANCE AND REPAIR

Monthly site inspections were performed by BNL at the Current and Former Landfill areas to monitor the structural and/or operational status of the landfill cap, gas vents, drainage structure, fences and environmental monitoring system (groundwater wells, soil-gas wells) in accordance with the O&M Manuals. A copy of the inspection reports is included in **Appendix B**. Maintenance and repair work completed by BNL is discussed below.

4.1 Landfill Cap and Gas Vents

To prevent ruts in the landfills caused by the weight of the lawn mowers during periods of above normal precipitation, grass cutting is only conducted when soil conditions are optimal. During 2021, the grass at the Current and Former Landfills was cut during May and October. The vegetation along the Current Landfill asphalt road edges was partially sprayed with herbicide. Pine seedlings observed growing on the edge of the Former Landfill Area were hand pulled at the time of inspection. The seedlings only penetrated the top soil cover. Several animal burrows at both the Current and Former Landfills were filled in throughout 2021. The burrows did not penetrate past the protection layer of the cap.

4.2 Drainage Structures

The drainage structures at both the Current and Former Landfill areas were maintained. They were observed to be operational and structurally sound during the site inspections. Small pine seedlings and weeds were noted growing in the drainage channels of both landfills during various times of the year. The weeds died off as cold weather set in. If they grow back in sufficient numbers, they will either be cut back or sprayed with herbicide.

4.3 Environmental Monitoring System

The monitoring wells and soil-gas monitoring wells associated with the landfills required no significant maintenance. However, all the handles for the protective covers were replaced with stainless steel at the Former Landfill soil-gas wells. Access to the soil-gas monitoring wells was cleared via mechanical weed whacking prior to each sampling event.

4.4 Related Structures

No structures other than the replacement of handles described above required maintenance during 2021.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Groundwater Monitoring

5.1.1 Conclusions for the Current Landfill

- Although low levels of contaminants continue to be detected, the landfill controls are effective at reducing the impact of the Current Landfill on groundwater quality as evidenced by the improving quality of groundwater downgradient of the landfill.

- Benzene was detected in downgradient wells 087-11, and 088-110 at concentrations slightly above the groundwater standard with a maximum concentration of 2.0 µg/L in well 087-11. The other VOCs detected above the groundwater standard were chloroethane and 1,1-dichloroethane. 1,1-Dichloroethane was detected above the standard of 5 µg/L in monitoring well 088-109 with a maximum concentration of 6.0 µg/L. Chloroethane was detected in wells 088-109 and 088-110 above the groundwater standard of 5 µg/L with concentrations up to 19.9 µg/L. Although VOCs continue to be detected in downgradient wells, an analysis of the trends of VOCs indicate the concentrations are stable to decreasing. These VOCs are naturally attenuating as shown by groundwater monitoring and are not detected at the site boundary above the drinking water standard.

- Concentrations of landfill water chemistry parameters and metals such as ammonia and iron in several downgradient wells were above the upgradient values. This suggests that leachate continues to emanate from the landfill into groundwater. Ammonia was the only water chemistry parameter detected above the standard of 2 mg/L, in downgradient wells 087-11, 087-27 and 088-109 at a maximum of 6.5 mg/L.

- During 2021, sodium in the background well, and aluminum, iron, manganese, and sodium in several downgradient wells were detected above their respective groundwater standards. These parameters and concentrations are consistent with historic values.

- Tritium was not detected in any of the wells sampled during 2021. Strontium-90 was detected in downgradient well 088-21 of the Current Landfill, but at a concentration below

the groundwater standard. There have been no detections of radionuclides above the drinking water standards since 1998.

5.1.2 Recommendations for the Current Landfill

- The monitoring well network for the Current Landfill is adequate, and no changes to the network or the sampling frequency are recommended at this time.

5.2 Soil-Gas Monitoring

5.2.1 Conclusions for the Current Landfill

- Methane and/or hydrogen sulfide levels in wells located along the west landfill boundary, north landfill boundary and southeast corner have remained stable and have not shown any significant increases or decreases over time. No significant gas migration has been observed this year at the outpost soil-gas wells along Brookhaven Avenue.

5.2.2 Recommendations for the Current Landfill

- The soil-gas monitoring program is adequate at this time and no changes are recommended.

5.2.3 Conclusions for the Former Landfill Area

- Methane and hydrogen sulfide monitoring at the Former Landfill Area continue to show no detectable levels of landfill gas. Methane has not been detected at or above standards since monitoring began in 1996.

5.2.4 Recommendations for the Former Landfill Area

- The soil-gas monitoring program is adequate at this time and no changes are recommended.

5.3 Maintenance and Repair

- Maintenance of the landfill caps will continue in accordance with the O&M requirements.

5.3.1 Current Landfill

- Monthly inspections and maintenance will continue in accordance with the O&M requirements. Access to the soil-gas monitoring wells will continue to be cleared via

mechanical weed whacking. Continue the removal of small pines and weeds in the drainage channel during 2022.

5.3.2 Former Landfill Area

- Monthly inspections and maintenance will continue in accordance with the O&M requirements. Access to the soil-gas monitoring wells will continue to be cleared via mechanical weed whacking. Continue the removal of small pines and weeds in the drainage channel during 2022.

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Table 1

2021 Analytical Requirements for Groundwater Samples

Well ID	Project 1	Project 2	Decision Subunit	EPA 8260 Low Level VOCs	Pesticides Method 608	PCBs Method 608	TSS/TDS	Sufates/Chloride/Alkalinity	TK Nitrogen	Total Nitrogen	Nitrates	Nitrites	Ammonia	TAL Metals	Cyanide	EPA 901 Gamma Spec	EPA 906 Tritium	EPA 905 Sr 90	Frequency (events/year)
087-09	CLF		Background	X[b]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]				2b
087-11	CLF		Downgradient	X[b]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]				2b
087-23	CLF		Downgradient	X[b]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[a]	X[a]	X[a]	2b
087-24	CLF		Downgradient	X[a]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]				2b
087-26	CLF		Downgradient	X[b]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]				2b
087-27	CLF		Downgradient	X[b]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[a]	X[a]	X[a]	2b
088-109	CLF		Downgradient	X			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[a]	X[a]	X[a]	4
088-110	CLF		Downgradient	X[b]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]				2b
088-21	CLF		Downgradient	X[b]			X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[b]	X[a]	X[a]	X[a]	2b
088-22	CLF		Downgradient	X[a]			X[a]	X[a]	X[a]	X[a]	X[a]	X[a]	X[a]	X[a]	X[a]				1a
088-23	CLF		Downgradient	X[a]			X[a]	X[a]	X[a]	X[a]	X[a]	X[a]	X[a]	X[a]	X[a]				1a
098-99	CLF	OU I (South Boundary)	Downgradient	X															4

NOTES:
a: Collect in 4th Quarter only.
b: Collect in 2nd and 4th Quarters.

Table 2
Current Landfill - Summary of 2021 Volitile Organic Compounds.

		087-09		087-09		087-09		087-11		087-11		087-23		087-23		087-23	
	Groundwater Standards	6/23/2021		7/28/2021		11/8/2021		6/24/2021		11/8/2021		6/24/2021		7/28/2021		11/8/2021	
Analtye	(ug/L)	(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)	
1,1,1,2-Tetrachloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
1,1,2-Trichloroethane	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
1,1-Dichloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.04	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.6	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
1,2-Dichloropropane	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
1,3-Dichloropropane	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
2,2-Dichloropropane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	1	0.5	U	0.5	U	0.5	U	**2.02**		**1.47**		0.56	R*	0.47	J	0.5	U
Benzene, 1,2,4-trimethyl	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Benzene, 1,3,5-trimethyl-	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene, 1-methylethyl-	--	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Bromobenzene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Bromodichloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Chlorobenzene	5	0.5	R*	0.5	U	0.5	U	0.9		0.38	J	0.54	R*	0.5	U	0.5	U
Chlorobromomethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	5	0.5	U	0.5	U	0.5	U	2.45		1.92		1.13		0.5	U	0.5	U
Chloroform	7	0.22	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
cis-1,2-Dichloroethylene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Cymene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
DBCP	0.04	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	0.5	U	0.5	U
Dibromochloromethane	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Dibromomethane	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Dichlorodifluoromethane	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
EDB	0.05	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Ethene, 1,2-dichloro-, (E)-	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Ethylbenzene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Hexachlorobutadiene	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
m-Dichlorobenzene	3	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
m/p xylene	5	1	R*	0.5	U	0.5	U	1	U	0.5	U	1	R*	0.5	U	0.5	U
Methyl bromide	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Methyl chloride	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyl tert-butyl ether	10	0.5	U	0.5	U	0.5	U	0.29	J	0.5	U	0.22	J	0.5	U	0.5	U
Methylene chloride	5	0.5	R*	1.26	U	0.5	U	0.5	U	0.5	U	0.5	U	1.18	U	0.5	U
n-Butylbenzene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
n-Propylbenzene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Naphthalene	10	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Chlorotoluene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.21	J	0.5	U
o-Dichlorobenzene	3	0.5	U	0.5	U	0.5	U	0.25	J	0.5	U	0.5	U	0.5	U	0.5	U
o-Xylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
p-Chlorotoluene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
p-Dichlorobenzene	3	0.5	R*	0.5	U	0.5	U	0.71		0.4	J	0.33	R*	0.5	U	0.5	U
sec-Butylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
tert-Butylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Toluene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Trichloroethylene	5	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U
Vinyl chloride	2	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
524.2 TVOC	--	0.55						6.62				5.99					
8260 TVOC	--			0		0				4.17				0.68		0	

U: Analyte was analyzed for, but not detected above the MDL.

J: Value is estimated.

R: A rejected result; the data is rejected, not usable, and unreliable.

Bold/Shaded: Value exceeds Standard/Guiadance Value.

*: Data rejected during secondary review by BNL.

Table 2
Current Landfill - Summary of 2021 Volitile Organic Compounds.

		087-24		087-24		087-26		087-26		087-27		087-27		088-109		088-109		088-109	
	Groundwater Standards	6/24/2021		11/9/2021		6/25/2021		11/8/2021		6/25/2021		11/8/2021		3/10/2021		6/23/2021		7/28/2021	
Analtye	(ug/L)	(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)	
1,1,1,2-Tetrachloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
1,1,2-Trichloroethane	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	2.54		1.55	R*	0.5	U
1,1-Dichloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.04	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.6	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
2,2-Dichloropropane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	1	0.5	U	0.5	U	0.5	U	0.5	U	0.57		0.82	J	0.5	U	0.5	U	0.5	U
Benzene, 1,2,4-trimethyl	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene, 1,3,5-trimethyl-	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Benzene, 1-methylethyl-	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Bromobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Bromodichloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.41	J	0.93	J	0.5	U	0.5	R*	0.5	U
Chlorobromomethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.82	J	3.89		2.46		0.79	J
Chloroform	7	2.13		2.29		4.3		0.78	J	0.97		0.5	U	0.2	J	0.25	R*	0.5	U
cis-1,2-Dichloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
cis-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Cymene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
DBCP	0.04	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	1	U	0.5	U
Dibromochloromethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Dibromomethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
EDB	0.05	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Ethene, 1,2-dichloro-, (E)-	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Ethylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Hexachlorobutadiene	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
m-Dichlorobenzene	3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
m/p xylene	5	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	1	R*	0.5	U
Methyl bromide	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyl chloride	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Methyl tert-butyl ether	10	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methylene chloride	5	0.5	U	1.46	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	1.24	U
n-Butylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
n-Propylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	10	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Chlorotoluene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Dichlorobenzene	3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Xylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
p-Chlorotoluene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
p-Dichlorobenzene	3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
sec-Butylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
tert-Butylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
Toluene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl chloride	2	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U
524.2 TVOC	--	2.13				4.3				1.95				6.63		9.19			
8260 TVOC	--			2.29				0.78				2.57						0.79	

U: Analyte was analyzed for, but not detected above the MDL.

J: Value is estimated.

R: A rejected result; the data is rejected, not usable, and unreliable.

Bold/Shaded: Value exceeds Standard/Guiadance Value.

*: Data rejected during secondary review by BNL.

Table 2
Current Landfill - Summary of 2021 Volitile Organic Compounds.

		088-109		088-110		088-110		088-110		088-21		088-21		088-22		088-23		098-99	
	Groundwater Standards	11/8/2021		6/23/2021		7/28/2021		11/8/2021		6/24/2021		11/9/2021		11/9/2021		11/9/2021		3/10/2021	
Analtye	(ug/L)	(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)	
1,1,1,2-Tetrachloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	5	**6.04**		3.4	R*	1.37		1.33		0.5	U	0.5	U	0.5	U	0.5	U	4.97	
1,1-Dichloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.04	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.6	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropane	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
2,2-Dichloropropane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	1	0.7	J	1.06	R*	0.51	J	**1.2**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene, 1,2,4-trimethyl	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene, 1,3,5-trimethyl-	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene, 1-methylethyl-	--	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Bromobenzene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	5	0.5	U	0.23	J	0.5	U	0.48	J	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobromomethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	5	**19.9**		**5.87**		2.56		**6.05**		0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	7	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,2-Dichloroethylene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Cymene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
DBCP	0.04	0.5	U	1	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U	0.5	U	1	U
Dibromochloromethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
EDB	0.05	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Ethene, 1,2-dichloro-, (E)-	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Ethylbenzene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
m-Dichlorobenzene	3	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
m/p xylene	5	0.5	U	1	U	0.5	U	0.5	U	1	R*	0.5	U	0.5	U	0.5	U	1	U
Methyl bromide	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyl chloride	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Methyl tert-butyl ether	10	0.5	U	0.5	U	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Methylene chloride	5	0.5	U	0.5	R*	1.23	U	0.5	U	0.5	R*	1.46	U	1.47	U	1.29	U	0.5	U
n-Butylbenzene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
n-Propylbenzene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	10	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Chlorotoluene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Dichlorobenzene	3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Xylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
p-Chlorotoluene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
p-Dichlorobenzene	3	0.5	U	0.5	R*	0.5	U	0.44	J	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
sec-Butylbenzene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
tert-Butylbenzene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethylene	5	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl chloride	2	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U
524.2 TVOC	--			6.10						0								4.97	
8260 TVOC	--	26.56				4.44		9.5				0		0		0			

U: Analyte was analyzed for, but not detected above the MDL.

J: Value is estimated.

R: A rejected result; the data is rejected, not usable, and unreliable.

Bold/Shaded: Value exceeds Standard/Guiadance Value.

*: Data rejected during secondary review by BNL.

Table 2
Current Landfill - Summary of 2021 Volitile Organic Compounds.

Analtye	Groundwater Standards (ug/L)	098-99 6/24/2021 (ug/L)		098-99 11/9/2021 (ug/L)	
1,1,1,2-Tetrachloroethane	5	0.5	U	0.5	U
1,1,1-Trichloroethane	5	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	5	0.5	U	0.5	U
1,1,2-Trichloroethane	1	0.5	U	0.5	U
1,1-Dichloroethane	5	4.99		0.5	U
1,1-Dichloroethylene	5	0.5	U	0.5	U
1,1-Dichloropropene	5	0.5	U	0.5	U
1,2,3-Trichlorobenzene	5	0.5	U	0.5	U
1,2,3-Trichloropropane	0.04	0.5	U	0.5	U
1,2,4-Trichlorobenzene	5	0.5	U	0.5	U
1,2-Dichloroethane	0.6	0.5	U	0.5	U
1,2-Dichloropropane	1	0.5	U	0.5	U
1,3-Dichloropropane	5	0.5	U	0.5	U
2,2-Dichloropropane	5	0.5	U	0.5	U
Benzene	1	0.5	U	0.5	U
Benzene, 1,2,4-trimethyl	5	0.5	U	0.5	U
Benzene, 1,3,5-trimethyl-	5	0.5	U	0.5	U
Benzene, 1-methylethyl-	--	0.5	U	0.5	U
Bromobenzene	5	0.5	U	0.5	U
Bromodichloromethane	50	0.5	U	0.5	U
Bromoform	50	0.5	U	0.5	U
Carbon tetrachloride	5	0.5	U	0.5	U
Chlorobenzene	5	0.5	U	0.5	U
Chlorobromomethane	5	0.5	U	0.5	U
Chloroethane	5	0.5	U	0.5	U
Chloroform	7	0.5	U	0.5	U
cis-1,2-Dichloroethylene	5	0.26	J	0.5	U
cis-1,3-Dichloropropene	0.4	0.5	U	0.5	U
Cymene	5	0.5	U	0.5	U
DBCP	0.04	1	U	0.5	U
Dibromochloromethane	5	0.5	U	0.5	U
Dibromomethane	5	0.5	U	0.5	U
Dichlorodifluoromethane	5	0.5	U	0.5	U
EDB	0.05	0.5	U	0.5	U
Ethene, 1,2-dichloro-, (E)-	5	0.5	U	0.5	U
Ethylbenzene	5	0.5	U	0.5	U
Hexachlorobutadiene	0.5	0.5	U	0.5	U
m-Dichlorobenzene	3	0.5	U	0.5	U
m/p xylene	5	1	U	0.5	U
Methyl bromide	5	0.5	U	0.5	U
Methyl chloride	5	0.5	U	0.5	U
Methyl tert-butyl ether	10	0.5	U	0.5	U
Methylene chloride	5	0.5	U	1.24	U
n-Butylbenzene	5	0.5	U	0.5	U
n-Propylbenzene	5	0.5	U	0.5	U
Naphthalene	10	0.5	U	0.5	U
o-Chlorotoluene	5	0.5	U	0.5	U
o-Dichlorobenzene	3	0.5	U	0.5	U
o-Xylene	5	0.5	U	0.5	U
p-Chlorotoluene	5	0.5	U	0.5	U
p-Dichlorobenzene	3	0.5	U	0.5	U
sec-Butylbenzene	5	0.5	U	0.5	U
Styrene	5	0.5	U	0.5	U
tert-Butylbenzene	5	0.5	U	0.5	U
Tetrachloroethylene	5	0.5	U	0.5	U
Toluene	5	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.5	U	0.5	U
Trichloroethylene	5	0.5	U	0.5	U
Trichlorofluoromethane	5	0.5	U	0.5	U
Vinyl chloride	2	0.5	U	0.5	U
524.2 TVOC	--	5.25			
8260 TVOC	--			0	

U: Analyte was analyzed for, but not detected above the MDL.
J: Value is estimated.
R: A rejected result; the data is rejected, not usable, and unreliable.
Bold/Shaded: Value exceeds Standard/Guiadance Value.
*: Data rejected during secondary review by BNL.

Table 3

Current Landfill-Summary of 2021 Water Chemistry Data

Analtye	Groundwater Standards (mg/L)	087-09 6/23/2021 (mg/L)		087-09 11/8/2021 (mg/L)		087-11 6/24/2021 (mg/L)		087-11 11/8/2021 (mg/L)		087-23 6/24/2021 (mg/L)		087-23 11/8/2021 (mg/L)		087-24 6/24/2021 (mg/L)	
Alkalinity (as CaCO3)	--	45.9		29.1		232		173		73.3		45.8		29.3	
Ammonia (as N)	2	0.017	U	0.0534	U	**6.5**		**2.97**		0.579		0.394		0.0499	J
Chloride	250	19.5		30.9		7.69		4.05		7.11		4.63		48.6	
Cyanide	0.2	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U
Nitrate (as N)	10	3.78		1.3		0.184	J	0.066	U	0.814		0.15		0.382	
Nitrite (as N)	1	0.033	U	0.033	U	0.033	U	0.033	U	0.0402	J	0.033	U	0.033	U
Nitrite + Nitrate-N	10	4.67		1.46		0.0439	J	0.17	U	0.471		0.104		0.423	
Nitrogen	--	4.73		1.47		14.7		3.67		1.39		0.619		0.423	
Sulfate	250	19.5		14.8		0.517		0.45		5.23		5.62		8.47	
TDS	--	144		114		224		211		95.7		62.9		137	
Total Kjeldahl Nitrogen	--	0.0604	J	0.033	U	14.7		3.67		0.918		0.515		0.033	U
TSS	--	0.57	U	0.57	U	57.3		21.1		7.1		3.2		0.57	U

U: Analyte was analyzed for, but not detected above MDL.

J: Value is estimated.

H: Analytical holding time exceeded.

Bold/Shaded: Concentration exceeds Standard/Guidance Value.

NS: No sample data.

Table 3

Current Landfill-Summary of 2021 Water Chemistry Data

Analtye	Groundwater Standards (mg/L)	087-24 11/9/2021 (mg/L)		087-26 6/25/2021 (mg/L)		087-26 11/8/2021 (mg/L)		087-27 6/25/2021 (mg/L)		087-27 11/8/2021 (mg/L)		088-109 6/23/2021 (mg/L)		088-109 11/8/2021 (mg/L)	
Alkalinity (as CaCO3)	--	31.8		26.1		31.8		127		138		129		169	
Ammonia (as N)	2	0.0328	J	0.0195	J	0.0482	U	1.35		**2.02**		1.46		**2.35**	
Chloride	250	42.8		55.6		75.8		20.9		28.6		8.45		15	
Cyanide	0.2	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U
Nitrate (as N)	10	0.388		0.394		0.562		0.0529	J	0.033	U	0.042	J	0.0964	J
Nitrite (as N)	1	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U
Nitrite + Nitrate-N	10	0.358		0.439		0.62		0.107		0.17	U	0.0611		0.17	U
Nitrogen	--	0.55		0.449		0.639		2.44		2.28		2.34		3.17	
Sulfate	250	9.35		9.03		7.76		9.24		4.81		9.19		5.2	
TDS	--	141		144		204		167		236		150		210	
Total Kjeldahl Nitrogen	--	0.192		0.033	U	0.033	U	2.33		2.28		2.28		3.17	
TSS	--	0.57	U	1	J	0.57	U	26.8		11.6		14.4		18.4	

U: Analyte was analyzed for, but not detected above MDL.

J: Value is estimated.

H: Analytical holding time exceeded.

Bold/Shaded: Concentration exceeds Standard/Guidance Value

NS: No sample data.

Table 3

Current Landfill-Summary of 2021 Water Chemistry Data

Analtye	Groundwater Standards (mg/L)	088-110 6/23/2021 (mg/L)		088-110 11/8/2021 (mg/L)		088-21 6/24/2021 (mg/L)		088-21 11/9/2021 (mg/L)		088-22 11/9/2021 (mg/L)		088-23 11/9/2021 (mg/L)	
Alkalinity (as CaCO3)	--	134		142		26.1		35.4		21.7		33	
Ammonia (as N)	2	0.245		1.12		0.017	U	0.12		0.0194	J	0.043	J
Chloride	250	30		24.2		173		141		44.5		14.8	
Cyanide	0.2	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U	0.00167	U
Nitrate (as N)	10	0.0454	J	0.033	U	0.166		0.405		0.426		0.441	
Nitrite (as N)	1	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U
Nitrite + Nitrate-N	10	0.0638		0.17	U	0.154		0.291		0.453		0.467	
Nitrogen	--	0.533		1.22		0.229		0.494		0.512		0.483	
Sulfate	250	11.8		9.86		4.13		5.26		8.87		14.4	
TDS	--	191		223		354		291		151		75.7	
Total Kjeldahl Nitrogen	--	0.469		1.22		0.0748	J	0.203		0.0591	J	0.033	U
TSS	--	16		18.9		1.1	J	0.57	U	0.57	U	1.14	U

U: Analyte was analyzed for, but not detected above MDL.

J: Value is estimated.

H: Analytical holding time exceeded.

Bold/Shaded: Concentration exceeds Standard/Guidance Value

NS: No sample data.

Table 4

Current Landfill-Summary of 2021 Metals Data

Analtye	Groundwater Standards (ug/L)	087-09 6/23/2021 (ug/L)		087-09 11/8/2021 (ug/L)		087-11 6/24/2021 (ug/L)		087-11 11/8/2021 (ug/L)		087-23 6/24/2021 (ug/L)		087-23 11/8/2021 (ug/L)		087-24 6/24/2021 (ug/L)		087-24 11/9/2021 (ug/L)	
Aluminum	200*	68	U	68	U	**508**		**221**		68	U	68	U	68	U	68	U
Antimony	3	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Arsenic	10**	2	U	2	U	7.47		8.76		9.44		8.65		2	U	5	U
Barium	1000	20.3	B	18.9		44.5	B	28.4		26	B	18.7		19.8	B	19	B
Beryllium	3	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cadmium	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium	--	17200		9610		29000		23500		7260		4360	B	11100		11100	
Chromium	50	14.8		7.59	B	1	U	1	U	1	U	1	U	1	U	1	U
Cobalt	--	1	U	1	U	1	U	1	U	11.1	B	5.92	B	1	U	1	U
Copper	200	1.1	B	0.659	B	0.8	B	1.35	B	0.438	B	0.335	B	0.364	B	3	U
Iron	300	30	U	30	U	**89100**		**83600**		**42400**		**20300**		30	U	30	U
Lead	15***	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Magnesium	35000	7410		4240		8330		4390		2290		1370		6730		6480	
Manganese	300	6.05		2.18	B	**2160**		**1420**		**2240**		**2030**		1	U	1	U
Mercury	0.7	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U
Nickel	100	9.48	B	4.12	B	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Potassium	--	982	BE	962	B	6440		4240	B	1050	B	857	B	1530	B	1430	B
Selenium	10	2	U	1.5	U	2	U	1.5	U	2	U	1.5	U	2	U	1.5	U
Silver	50	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	1.3	B
Sodium	20000	15600		**22800**		8720		3470	B	4400	B	4520	B	**26200**		**25200**	
Thallium	0.5	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Vanadium	--	1	U	1	U	1.65	B	1	U	1	U	1	U	1	U	1	U
Zinc	2000	3.36	B	48.5	R	7.06	B	13.4	B	7.23	B	16.8	B	4.23	B	3.51	B

Table 4

Current Landfill-Summary of 2021 Metals Data

Analtye	Groundwater Standards (ug/L)	087-26 6/25/2021 (ug/L)		087-26 11/8/2021 (ug/L)		087-27 6/25/2021 (ug/L)		087-27 11/8/2021 (ug/L)		088-109 6/23/2021 (ug/L)		088-109 11/8/2021 (ug/L)		088-110 6/23/2021 (ug/L)		088-110 11/8/2021 (ug/L)	
Aluminum	200*	68	U	68	U	68	U	68	U	68	U	68	U	68	U	68	U
Antimony	3	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Arsenic	10**	2	U	2	U	5.16		7.1		4.32	B	8.75		9.84		9.94	
Barium	1000	38	B	61.5		24	B	38.3		48.8	B	44		24.5	B	40.6	
Beryllium	3	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cadmium	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium	--	8240		12800		18700		21600		24700		27800		18300		23000	
Chromium	50	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cobalt	--	1	U	1	U	6.64	B	8.31	B	5.54	B	2.31	B	4.16	B	4.65	B
Copper	200	2.16		1.87	B	0.639	B	0.46	B	3.28		2.3		0.3	U	0.3	U
Iron	300	30	U	131		**44600**		**57600**		**35300**		**48400**		**59300**		**63800**	
Lead	15***	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Magnesium	35000	5320		8240		5710		4550		5150		6070		5070		6300	
Manganese	300	1	U	3.7	B	**1370**		**1410**		**1640**		**1330**		**3680**		**3570**	
Mercury	0.7	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U
Nickel	100	1.5	U	1.5	U	2.41	B	2.21	B	1.5	U	1.5	U	1.5	U	1.5	U
Potassium	--	1710	B	2180	B	2540	B	3330	B	3670	BE	4520	B	2190	BE	3440	B
Selenium	10	2	U	1.5	U	2	U	1.5	U	2	U	1.5	U	2	U	1.5	U
Silver	50	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Sodium	20000	**32000**		**38300**		15100		19800		7650		13100		**20700**		18300	
Thallium	0.5	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Vanadium	--	1	U	1	U	1	U	1	U	1.74	B	1	U	2.08	B	1	U
Zinc	2000	3.3	U	14.8	B	4	B	15.1	B	9.78	B	53.9		3.38	B	63.1	R

Table 4

Current Landfill-Summary of 2021 Metals Data

Analtye	Groundwater Standards (ug/L)	088-21 6/24/2021 (ug/L)		088-21 11/9/2021 (ug/L)		088-22 11/9/2021 (ug/L)		088-23 11/9/2021 (ug/L)	
Aluminum	200*	68	U	68	U	68	U	68	U
Antimony	3	1	U	1	U	1	U	3.5	U
Arsenic	10**	2	U	2	U	2	U	5	U
Barium	1000	35.6	B	49	B	47.3	B	3.96	B
Beryllium	3	1	U	1	U	1	U	1	U
Cadmium	5	1	U	1	U	1	U	1	U
Calcium	--	13800		10500		10300		12300	
Chromium	50	1	U	1	U	1	U	1	U
Cobalt	--	1	U	1	U	1	U	1	U
Copper	200	0.468	B	0.897	B	0.757	B	3	U
Iron	300	75.1	B	79	B	116		97.1	B
Lead	15***	0.5	U	0.5	U	0.5	U	0.5	U
Magnesium	35000	7620		5400		7480		2920	B
Manganese	300	11.9		12.1		15		12.3	
Mercury	0.7	0.067	U	0.067	U	0.067	U	0.067	U
Nickel	100	1.5	U	1.5	U	1.5	U	1.5	U
Potassium	--	1780	B	2320	B	1850	B	662	B
Selenium	10	2	U	1.5	U	1.5	U	1.66	B
Silver	50	0.3	U	1	U	1	U	1	U
Sodium	20000	**94700**		**89200**		18300		12600	
Thallium	0.5	0.6	U	0.6	U	0.6	U	0.6	U
Vanadium	--	1	U	1	U	1	U	1	U
Zinc	2000	5.49	B	6.65	B	4.92	B	3.73	B

U: Analyte was analyzed for, but not detected above MDL.

J: Value is estimated

Bold/Shaded: Concentration exceeds Standard/Guidance Value.

B: Indicates that the value was less then the Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit(IDL).

E: %Difference of sample and SD is greater then 10%

N:The Matrix spike sample recovery is not within control limits.

*: USEPA SMCL Secondary Maximum Contaminant Levels (SMCLs)

** USEPA Maximum Contaminiant Level (MCL)

*** OUI Record of Decision Selected Cleanup Goal

Table 5

Current Landfill-Summary of 2021 Radionuclide Data

Analtye	**Groundwater Standards** pCi/L	**087-23 11/8/2021 pCi/L**				**087-27 11/8/2021 pCi/L**				**088-109 11/8/2021 pCi/L**				**088-21 11/9/2021 pCi/L**			
		Result	Qual	MDA	Error	Result	Qual	MDA	Error	Result	Qual	MDA	Error	Result	Qual	MDA	Error
Americium-241	1.2*	-0.348	U	9.75	5.89	5.89	U	10.7	6.58	-0.199	U	17.2	10.3	-2.91	U	16.3	10
Beryllium-7	40000	-3.2	U	23.7	13.7	8.93	U	28.3	14.7	13.8	U	27	13.7	-0.681	U	22.9	12.4
Cesium-134	80	-0.906	U	2.96	1.93	1.52	U	3.14	2.12	1.12	U	3.19	1.58	-1.54	U	2.68	1.65
Cesium-137	120*	-0.924	U	2.78	1.58	0.267	U	3.06	1.64	-0.503	U	2.79	1.63	0.104	U	2.76	1.49
Co-60	200*	1.85	U	3.57	1.67	0.5	U	3.19	1.6	1.26	U	3.62	1.76	0.103	U	2.8	1.41
Cobalt-57	4000*	-1.25	U	2.07	1.28	-1.02	U	2.31	1.54	0.0537	U	2.41	1.39	-1.05	U	2.36	1.42
Europium-152	841	1.57	U	7.9	4.3	0.235	U	8.46	4.85	-4.78	U	7.8	4.64	0.831	U	8.31	4.43
Europium-154	573	-3.86	U	7.85	4.61	0.0981	U	7.79	4.57	-4.12	U	7.59	4.74	1.92	U	8.71	4.24
Europium-155	4000*	-0.014	U	8.02	4.62	0.0186	U	9.33	5.17	0.575	U	9.73	5.52	1.42	U	10.4	5.88
Manganese-54	2000*	-0.349	U	2.84	1.59	0.252	U	2.64	1.59	0.181	U	2.78	1.44	-0.251	U	2.7	1.52
Sodium-22	400*	-1.22	U	2.72	1.58	0.188	U	2.72	1.56	-1.42	U	2.69	1.67	0.724	U	3.09	1.5
Strontium-90	8***	0.0244	U	0.756	0.413	1.21	N2	0.708	0.524	0.656	U	0.763	0.465	4.3		0.909	0.828
Tritium	20000***	133	U	432	251	364	U	445	273	317	U	445	271	79	U	444	254
Zinc-65	360	3.42	U	6.86	2.75	1.31	U	5.53	3.15	-3.24	U	5.59	3.46	-0.212	U	5.23	4.19

N2: Not usable based on the results that are not distinguishable from background. The reported activity value is less than or equal to the sum of the MDA and the uncertainty.

U: Analyte was analyzed for but not detected above the MDA.

J: Estimated value.

*: Department of Energy (DOE) Groundwater Screening Level.

***:Environmental Protection Agency (EPA) Drinking Water Standards.

Table 6
Current Landfill Soil Gas Monitoring Well Description

Current Landfill			
Soil Gas Monitoring Well	**Screen Location**	**Top of Screen (Feet BLS)**	**Bottom Screen (Feet BLS)**
SGM-1 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-1 PROBE B	**Intermediate**	**10.5**	**17.5**
SGM-1 PROBE C	**Deep**	**20**	**29.5**
SGM-2 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-2 PROBE B	**Intermediate**	**10.5**	**16**
SGM-2 PROBE C	**Deep**	**19**	**28**
SGM-3 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-3 PROBE B	**Intermediate**	**10.5**	**17**
SGM-3 PROBE C	**Deep**	**20**	**29**
SGM-4 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-4 PROBE B	**Intermediate**	**10.5**	**20**
SGM-4 PROBE C	**Deep**	**23**	**32**
SGM-5 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-5 PROBE B	**Intermediate**	**10.5**	**22**
SGM-5 PROBE C	**Deep**	**25**	**34**
SGM-6 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-6 PROBE B	**Intermediate**	**10.5**	**18.5**
SGM-6 PROBE C	**Deep**	**21.5**	**30.5**
SGM-7 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-7 PROBE B	**Intermediate**	**10.5**	**16**
SGM-7 PROBE C	**Deep**	**19**	**26**
SGM-8 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-8 PROBE B	**Intermediate**	**10.5**	**16.5**
SGM-8 PROBE C	**Deep**	**19.5**	**28.5**
SGM-9 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-9 PROBE B	**Intermediate**	**10.5**	**20.5**
SGM-9 PROBE C	**Deep**	**23.5**	**32.5**
SGM-10 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-10 PROBE B	**Intermediate**	**10.5**	**15.5**
SGM-10 PROBE C	**Deep**	**18.5**	**27.5**
SGM-11 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-11 PROBE B	**Intermediate**	**10.5**	**16**
SGM-12 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-12 PROBE B	**Intermediate**	**10.5**	**15**
SGM-13 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-13 PROBE B	**Intermediate**	**10.5**	**13**
SGM-14 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-14 PROBE B	**Intermediate**	**10.5**	**13**
SGM-15 PROBE A	**Shallow**	**2.5**	**5.5**
SGM-15 PROBE B	**Intermediate**	**8.5**	**11.5**
SGM-16 PROBE A	**Shallow**	**2.5**	**5.5**
SGM-16 PROBE B	**Intermediate**	**8.5**	**11**
SGM-17 PROBE A	**Shallow**	**2.5**	**5.5**

Table 6
Current Landfill Soil Gas Monitoring Well Description

Current Landfill			
Soil Gas Monitoring Well	**Screen Location**	**Top of Screen (Feet BLS)**	**Bottom Screen (Feet BLS)**
SGM-17 PROBE B	**Intermediate**	**8.5**	**11**
SGM-18 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-18 PROBE B	**Intermediate**	**10.5**	**13.5**
SGM-19 PROBE A	**Shallow**	**2.5**	**7.5**
SGM-19 PROBE B	**Intermediate**	**10.5**	**17**

BLS – Below Land Surface

Current Landfill Outpost Wells		
Site ID	**Depth to Bottom from top PVC (feet)**	**PVC Stick Up from Ground (feet)**
GSGM-1A	**12.00**	**2.50**
GSGM-1B	**21.00**	**2.50**
GSGM-1C	**29.40**	**2.50**
GSGM-2A	**14.25**	**2.50**
GSGM-2B	**20.05**	**2.50**
GSGM-2C	**27.00**	**2.50**
GSGM-3A	**13.91**	**2.50**
GSGM-3B	**17.75**	**2.50**
GSGM-4A	**11.50**	**2.50**
GSGM-4B	**15.20**	**2.50**

Table 6
Former Landfill Soil Gas Monitoring Well Description

Former Landfill			
Soil Gas Monitoring Well	**Screen Location**	**Top of Screen (Feet BLS)**	**Bottom Screen (Feet BLS)**
SGM-1 PROBE A	**Shallow**	**2.5**	**10**
SGM-1 PROBE B	**Intermediate**	**15**	**43**
SGM-2PROBE A	**Shallow**	**2.5**	**10**
SGM-2 PROBE B	**Intermediate**	**15**	**40**
SGM-3 PROBE A	**Shallow**	**2**	**9.5**
SGM-3 PROBE B	**Intermediate**	**14.5**	**36**
SGM-4 PROBE A	**Shallow**	**2.5**	**10**
SGM-4 PROBE B	**Intermediate**	**15**	**35.5**
SGM-5 PROBE A	**Shallow**	**2.5**	**10**
SGM-5 PROBE B	**Intermediate**	**15**	**37**
SGM-6 PROBE A	**Shallow**	**2.7**	**10.2**
SGM-6 PROBE B	**Intermediate**	**22**	**37.2**
SGM-7 PROBE A	**Shallow**	**2.8**	**10.3**
SGM-7 PROBE B	**Intermediate**	**15**	**42**
SGM-8 PROBE A	**Shallow**	**2.5**	**10**
SGM-8 PROBE B	**Intermediate**	**15**	**47**
SGM-9 PROBE A	**Shallow**	**2.5**	**10**
SGM-9 PROBE B	**Intermediate**	**15**	**52**
SGM-10 PROBE A	**Shallow**	**2.5**	**10**
SGM-10 PROBE B	**Intermediate**	**15**	**52**
SGM-11 PROBE A	**Shallow**	**2.5**	**10**
SGM-11 PROBE B	**Intermediate**	**15**	**46**
SGM-12 PROBE A	**Shallow**	**2.5**	**10**
SGM-12 PROBE B	**Intermediate**	**15**	**43.5**

BLS – Below Land Surface

Table 7

2021 Current Landfill Soil Gas Monitoring Summary Table

Soil/Gas Monitoring Well	Well ID	Methane (% By Volume) 3/25/2021	Methane (% By Volume) 6/17/2021	Methane (% By Volume) 9/23/2021	Methane (% By Volume) 12/16/2021	LEL (% By Volume) 3/25/2021	LEL (% By Volume) 6/17/2021	LEL (% By Volume) 9/23/2021	LEL (% By Volume) 12/16/2021	Hydrogen Sulfide (ppm By Volume) 3/25/2021	Hydrogen Sulfide (ppm By Volume) 6/17/2021	Hydrogen Sulfide (ppm By Volume) 9/23/2021	Hydrogen Sulfide (ppm By Volume) 12/16/2021
GSGM-1A		0	0	0.1	0	0	0	2	0	0	0	0	0
GSGM-1B		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-1C		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-2A		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-2B		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-2C		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-3A		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-3B		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-4A		0	0	0	0	0	0	0	0	0	0	0	0
GSGM-4B		0	0	0	0	0	0	0	0	0	0	0	0
SGMW-01A (CLF)	087-62	9.3	10.1	7.3	8.9	>100	>100	>100	>100	1	1	1	1
SGMW-01B (CLF)	087-78	8.8	9.5	6.8	7.8	>100	>100	>100	>100	1	0	1	2
SGMW-01C (CLF)	087-79	9.2	8.2	5.5	6	>100	>100	>100	>100	1	0	0	1
SGMW-02A (CLF)	087-63	42.1	43.7	45.1	45.9	>100	>100	>100	>100	0	3	3	0
SGMW-02B (CLF)	087-80	36.2	42	47.2	45.2	>100	>100	>100	>100	11	27	23	12
SGMW-02C (CLF)	087-81	36.1	39.9	47.9	43.1	>100	>100	>100	>100	3	0	5	6
SGMW-03A (CLF)	087-64	18.9	37.4	37.6	23.6	>100	>100	>100	>100	0	24	28	3
SGMW-03B (CLF)	087-82	41.1	48.4	50.5	48.3	>100	>100	>100	>100	8	21	27	11
SGMW-03C (CLF)	087-83	40.7	48.2	51.2	44.5	>100	>100	>100	>100	16	7	13	8
SGMW-04A (CLF)	087-65	36.7	42	40.9	32	>100	>100	>100	>100	0	5	6	0
SGMW-04B (CLF)	087-84	33.8	39.5	37.6	28.5	>100	>100	>100	>100	3	0	11	6
SGMW-04C (CLF)	087-85	26	31.3	29.2	18.7	>100	>100	>100	>100	3	0	8	3
SGMW-05A (CLF)	087-66	27.4	0.1	28	2.7	>100	2	>100	54	0	0	1	0
SGMW-05B (CLF)	087-86	26.2	25.7	26.6	15.1	>100	>100	>100	>100	1	0	2	0
SGMW-05C (CLF)	087-87	19.8	20.9	19.1	13.8	>100	>100	>100	>100	0	0	1	1
SGMW-06A (CLF)	087-67	8.8	0	1.5	5.9	>100	0	30	>100	0	0	0	0
SGMW-06B (CLF)	087-88	28.6	30.6	29.2	27.7	>100	>100	>100	>100	1	1	7	4
SGMW-06C (CLF)	087-89	26.3	29.1	25.7	23.9	>100	>100	>100	>100	2	4	4	2
SGMW-07A (CLF)	087-68	0	0	0	0	0	0	0	0	0	0	0	0

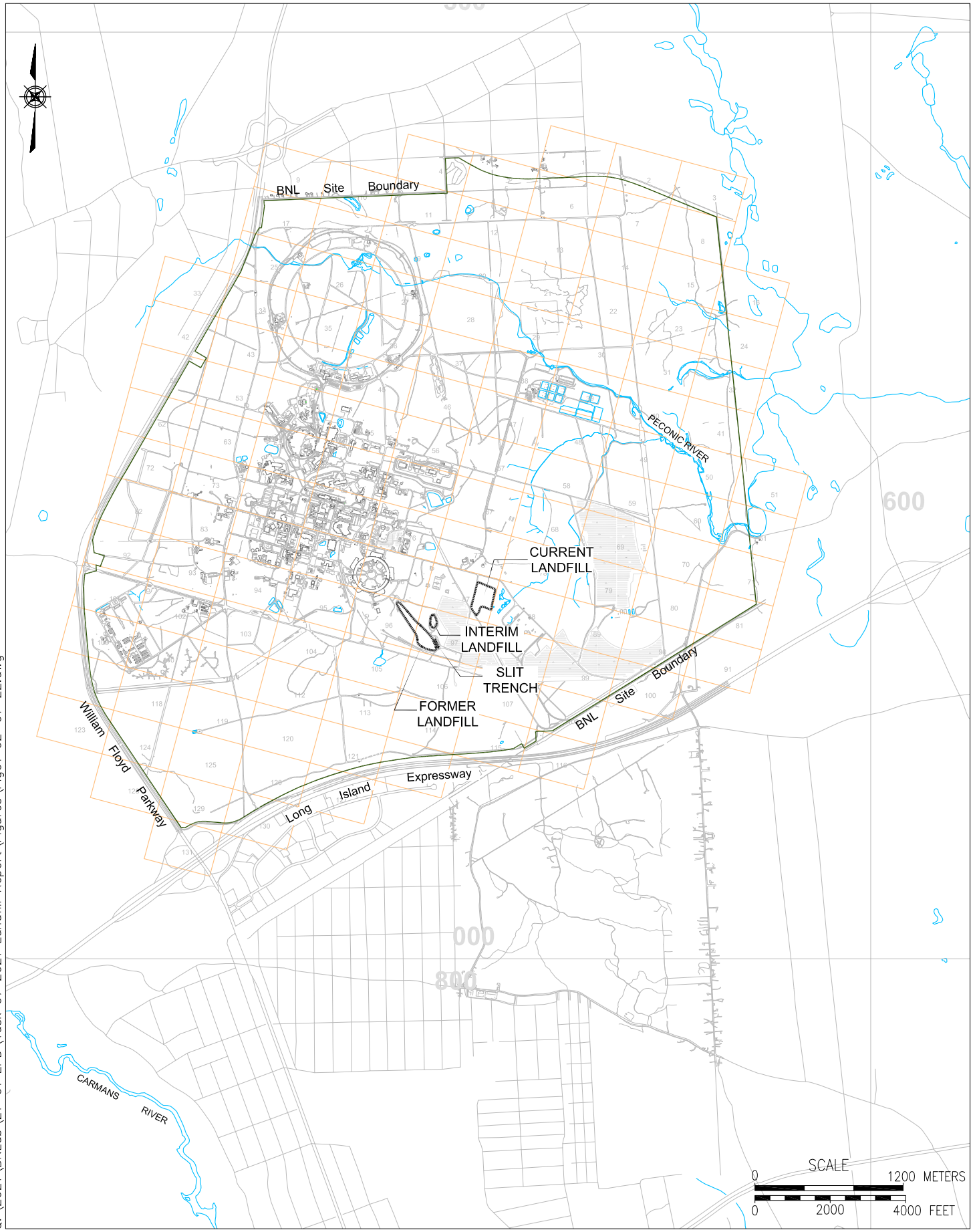
Table 7

2021 Current Landfill Soil Gas Monitoring Summary Table

Soil/Gas Monitoring Well	Well ID	Methane (% By Volume) 3/25/2021	Methane (% By Volume) 6/17/2021	Methane (% By Volume) 9/23/2021	Methane (% By Volume) 12/16/2021	LEL (% By Volume) 3/25/2021	LEL (% By Volume) 6/17/2021	LEL (% By Volume) 9/23/2021	LEL (% By Volume) 12/16/2021	Hydrogen Sulfide (ppm By Volume) 3/25/2021	Hydrogen Sulfide (ppm By Volume) 6/17/2021	Hydrogen Sulfide (ppm By Volume) 9/23/2021	Hydrogen Sulfide (ppm By Volume) 12/16/2021
SGMW-07B (CLF)	087-90	0	0.2	0	0	0	4	0	0	0	0	0	0
SGMW-07C (CLF)	087-91	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-08A (CLF)	087-69	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-08B (CLF)	087-92	0	0	0.1	0	0	0	2	0	0	0	0	0
SGMW-08C (CLF)	087-93	0	0	0.1	0	0	0	2	0	0	0	0	0
SGMW-09A (CLF)	087-70	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-09B (CLF)	087-94	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-09C (CLF)	087-95	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-10A (CLF)	087-71	2.5	15.8	19	0	50	>100	>100	0	0	19	32	0
SGMW-10B (CLF)	087-96	6.7	14.8	17	7.1	>100	>100	>100	>100	0	7	12	0
SGMW-10C (CLF)	087-97	6	12.7	13.9	6.3	>100	>100	>100	>100	3	4	0	5
SGMW-11A (CLF)	087-72	4.1	14.2	20.1	9	82	>100	>100	>100	0	12	27	5
SGMW-11B (CLF)	087-98	2.1	14.4	18.7	4.1	42	>100	>100	82	0	0	4	0
SGMW-12A (CLF)	087-73	35.7	40	42.8	29.8	>100	>100	>100	>100	11	33	41	14
SGMW-12B (CLF)	087-99	28.6	32.6	38	35.1	>100	>100	>100	>100	0	4	1	0
SGMW-13A (CLF)	087-74	0.2	1.2	27.6	22.2	4	24	>100	>100	0	0	0	0
SGMW-13B (CLF)	087-100	22.7	29.6	27.4	26.7	>100	>100	>100	>100	0	0	0	0
SGMW-14A (CLF)	087-75	0	0.1	0.3	0	0	2	6	0	0	0	0	0
SGMW-14B (CLF)	087-101	1	0.1	2.6	0.1	20	2	52	2	0	0	1	0
SGMW-15A (CLF)	088-111	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-15B (CLF)	088-114	0	0.1	0	0	0	2	0	0	0	0	0	0
SGMW-16A (CLF)	088-112	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-16B (CLF)	088-115	0	0.1	0	0	0	2	0	0	0	0	0	0
SGMW-17A (CLF)	088-113	0.1	0	0	0	2	0	0	0	0	0	0	0
SGMW-17B (CLF)	088-116	0.1	1	0	0	2	20	0	0	0	0	0	0
SGMW-18A (CLF)	087-76	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-18B (CLF)	087-102	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-19A (CLF)	087-77	0.8	3.4	9	0	16	68.8	>100	0	0	6	0	0
SGMW-19B (CLF)	087-103	7.3	15.6	15.9	0	>100	>100	>100	0	0	4	0	0

Table 8
2021 Former Landfill Soil-Gas Monitoring Summary Table

Soil/Gas Monitoring Well	Well ID	Methane (% By Volume) 8/26/2021	LEL (% By Volume) 8/26/2021	Hydrogen Sulfide (ppm By Volume) 8/26/2021
SGMW-01A (FLF)	096-41	0	0	0
SGMW-01B (FLF)	096-42	0	0	0
SGMW-02A (FLF)	096-43	0	0	0
SGMW-02B (FLF)	096-44	0	0	0
SGMW-03A (FLF)	096-45	0	0	0
SGMW-03B (FLF)	096-46	0	0	0
SGMW-04A (FLF)	096-47	0	0	0
SGMW-04B (FLF)	096-48	0	0	0
SGMW-05A (FLF)	097-50	0	0	0
SGMW-05B (FLF)	097-51	0	0	0
SGMW-06A (FLF)	097-52	0	0	0
SGMW-06B (FLF)	097-53	0	0	0
SGMW-07A (FLF)	097-54	0	0	0
SGMW-07B (FLF)	097-55	0	0	0
SGMW-08A (FLF)	097-56	0	0	0
SGMW-08B (FLF)	097-57	0	0	0
SGMW-09A (FLF)	097-58	0	0	0
SGMW-09B (FLF)	097-59	0	0	0
SGMW-10A (FLF)	097-60	0	0	0
SGMW-10B (FLF)	097-61	0	0	0
SGMW-11A (FLF)	097-62	0	0	0
SGMW-11B (FLF)	097-63	0	0	0
SGMW-12A (FLF)	096-49	0	0	0
SGMW-12B (FLF)	096-50	0	0	0



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Brookhaven National Laboratory

ENVIRONMENTAL PROTECTION DIVISION

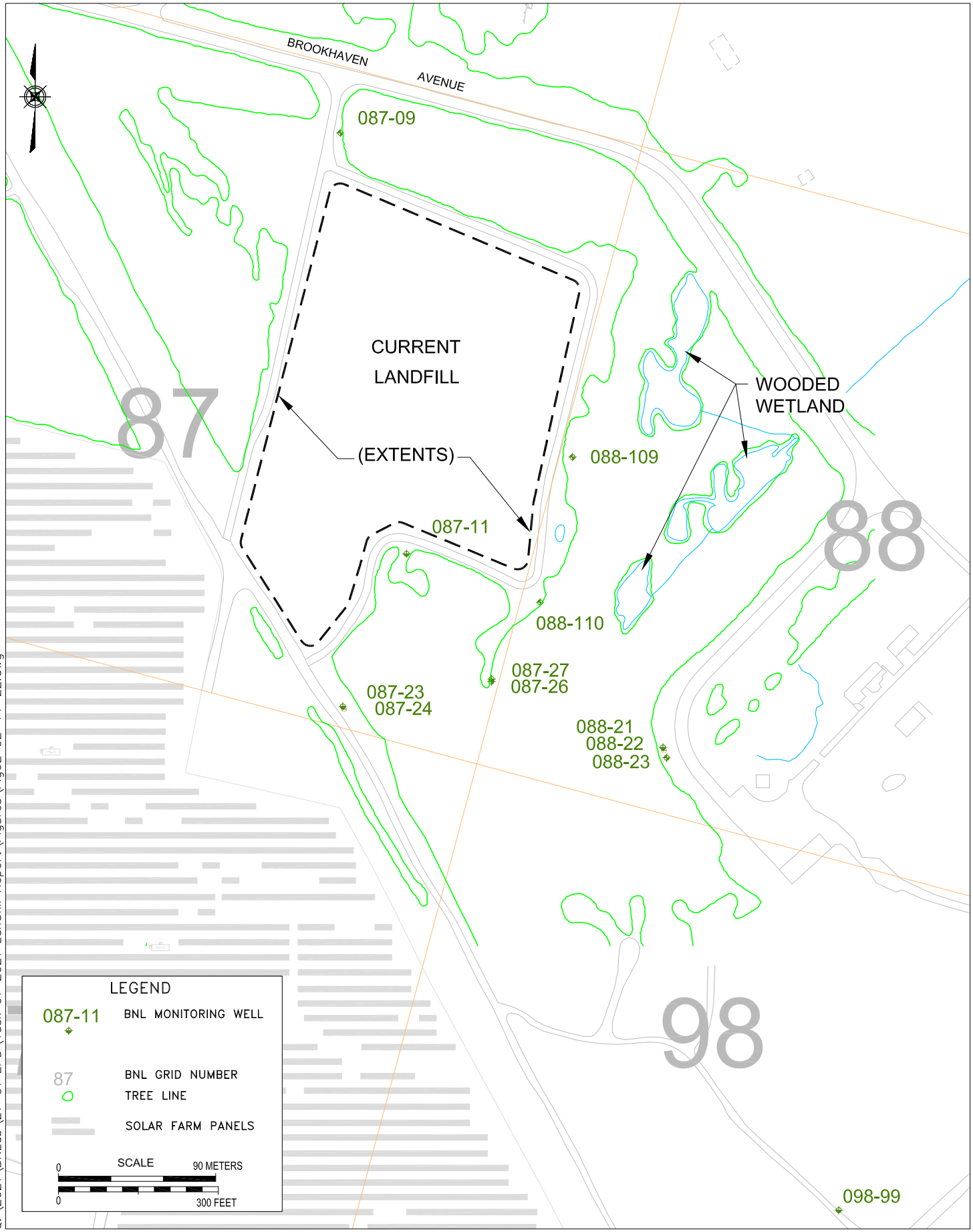
TITLE:

SITE LOCATION MAP

2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 1



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Brookhaven National Laboratory
ENVIRONMENTAL PROTECTION DIVISION

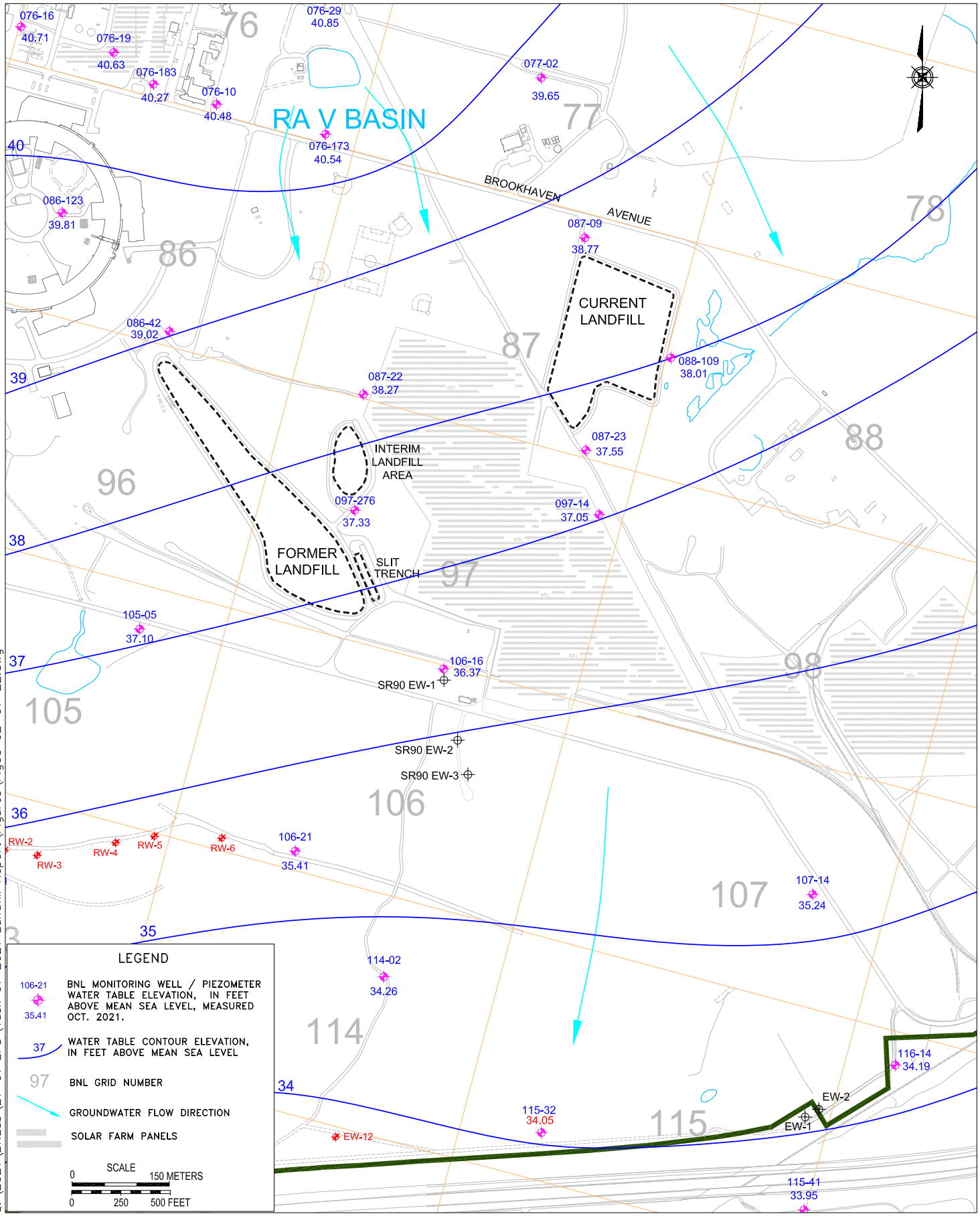
TITLE:

CURRENT LANDFILL MONITORING WELL LOCATIONS

2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/14/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 2



LEGEND

106-21 / 35.41 — BNL MONITORING WELL / PIEZOMETER WATER TABLE ELEVATION, IN FEET ABOVE MEAN SEA LEVEL, MEASURED OCT. 2021.

37 — WATER TABLE CONTOUR ELEVATION, IN FEET ABOVE MEAN SEA LEVEL

97 — BNL GRID NUMBER

GROUNDWATER FLOW DIRECTION

SOLAR FARM PANELS

SCALE
0 150 METERS
0 250 500 FEET

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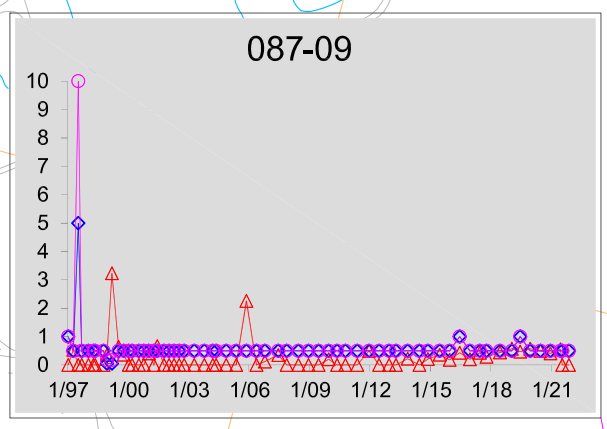
Brookhaven National Laboratory
ENVIRONMENTAL PROTECTION DIVISION

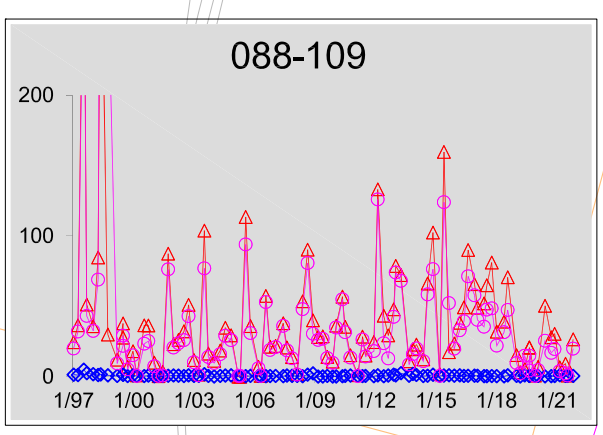
TITLE:

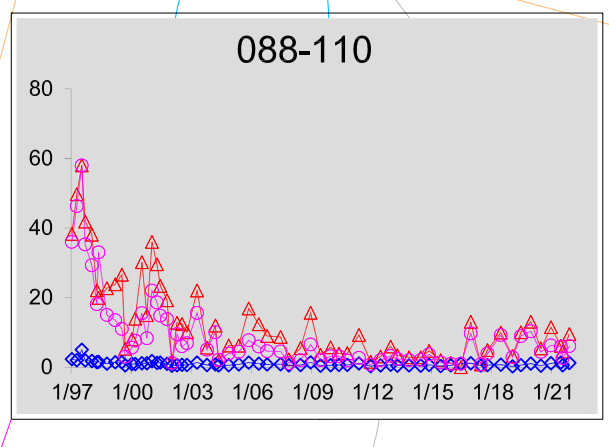
WATER TABLE CONTOUR MAP
2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

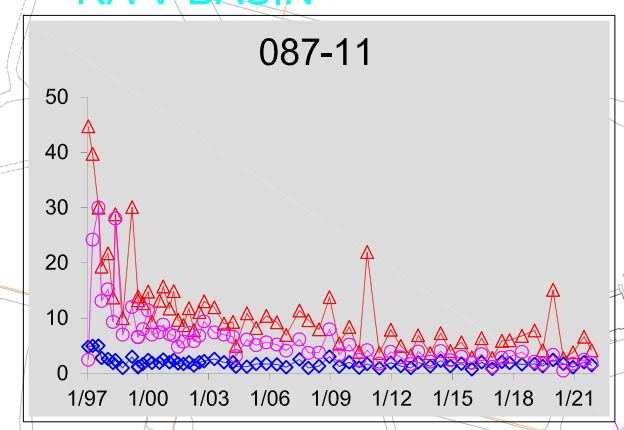
FIGURE NO.: 3

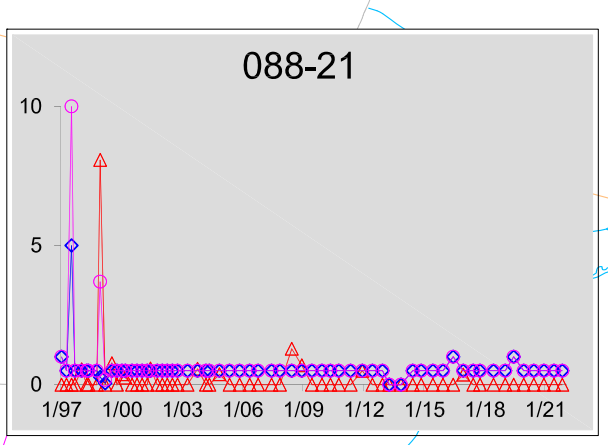


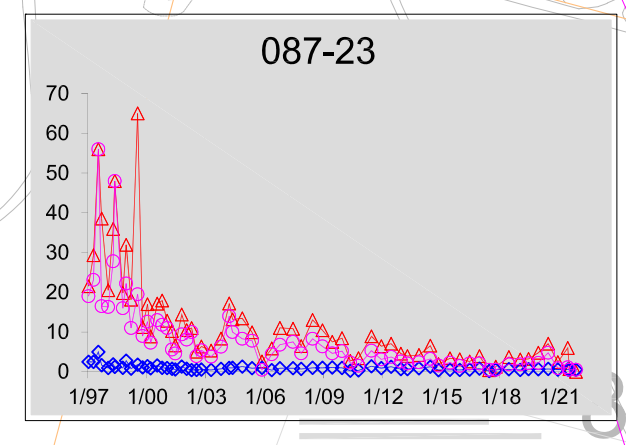


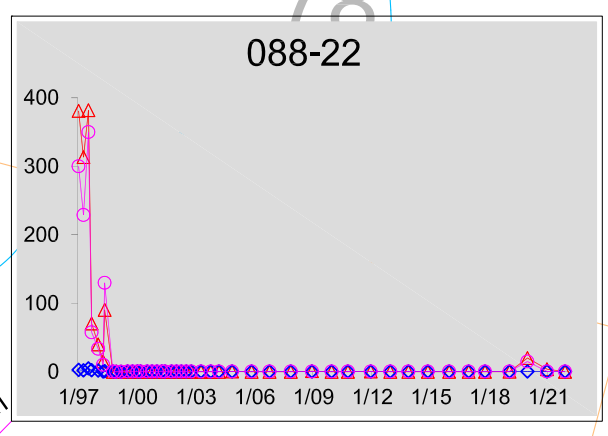


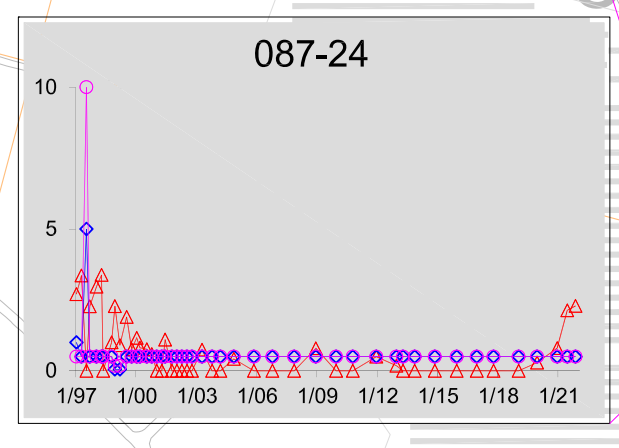
RA V BASIN

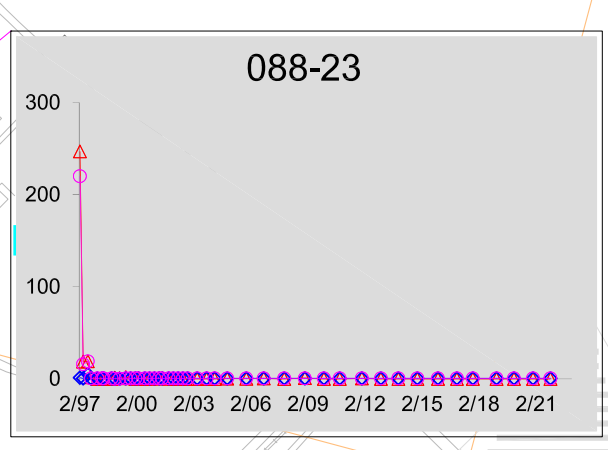


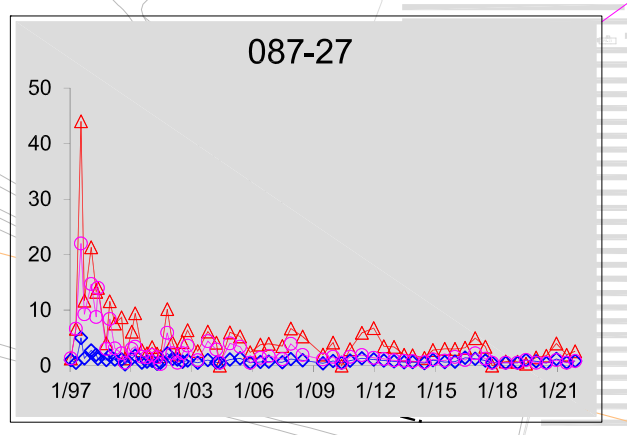












77

78

87

98

107

087-09

CURRENT LANDFILL

088-109

087-11

088-110

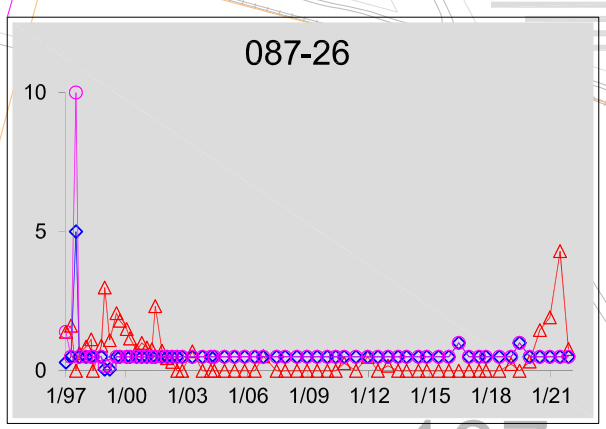
087-23
087-24

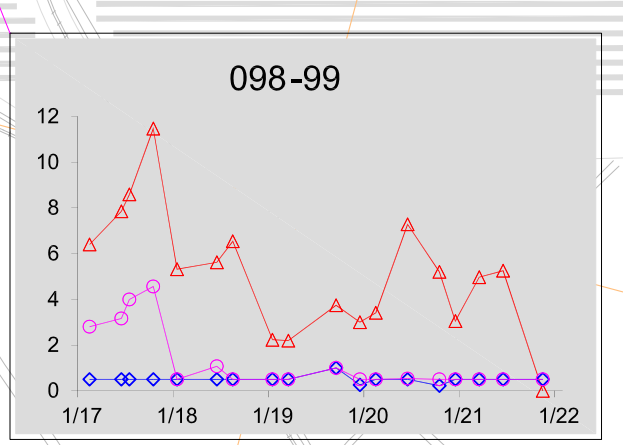
087-27
087-26

088-21
088-22
088-23

098-99

BROOKHAVEN AVE.





LEGEND

- 11 — MONITORING WELL
- Benzene (µG/L)
- Chloroethane (µG/L)
- TVOC (µG/L)
- 32 — BNL GRID NUMBER
- BNL RECHARGE BASIN
- RA V
- 087-09 — BACKGROUND
- 087-11 — DOWNGRADIENT
- SOLAR FARM PANELS

SCALE
0 500 FEET

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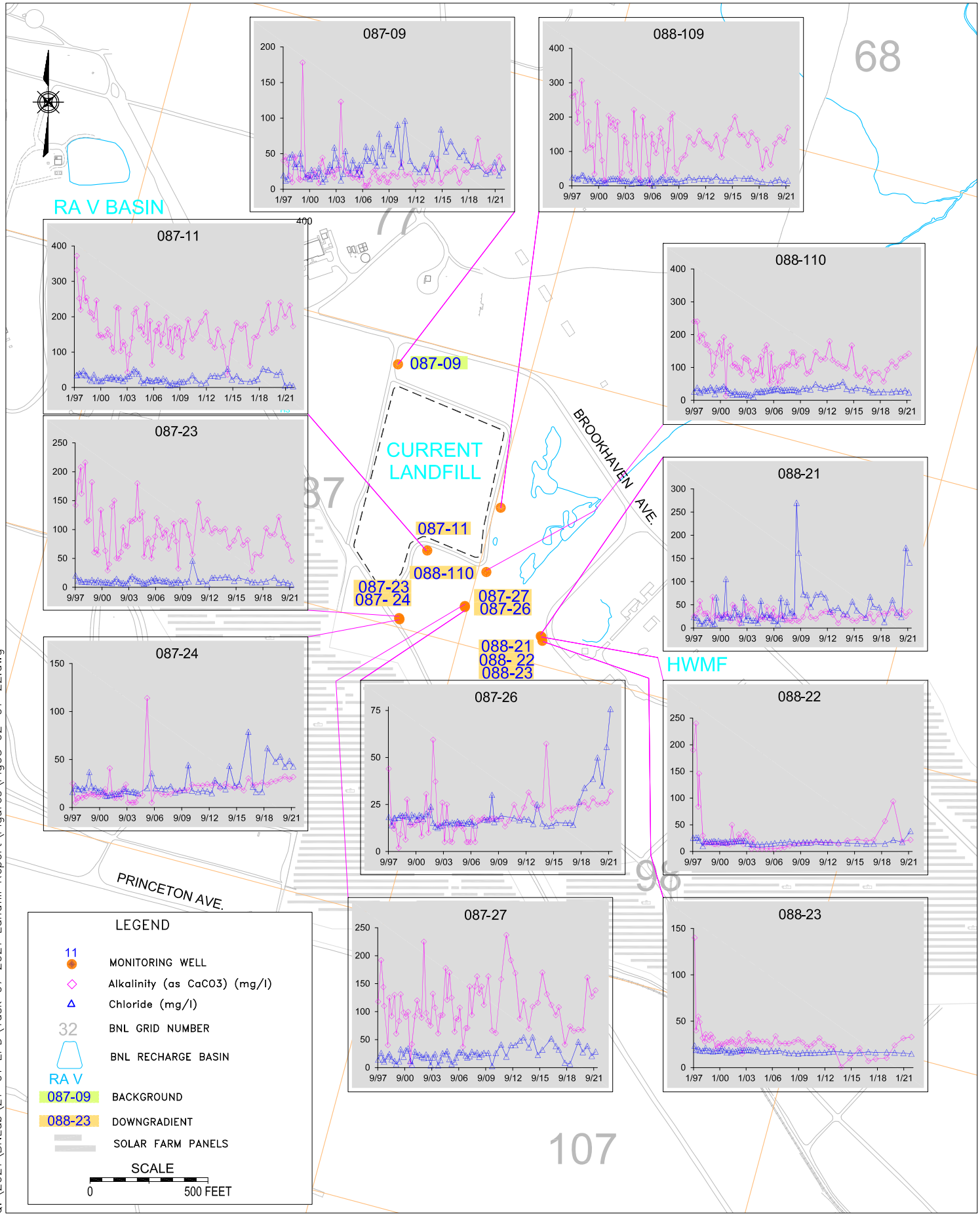
Brookhaven National Laboratory
ENVIRONMENTAL PROTECTION DIVISION

TITLE:

CURRENT LANDFILL
VOC TREND PLOTS
2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 4



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Brookhaven National Laboratory
ENVIRONMENTAL PROTECTION DIVISION

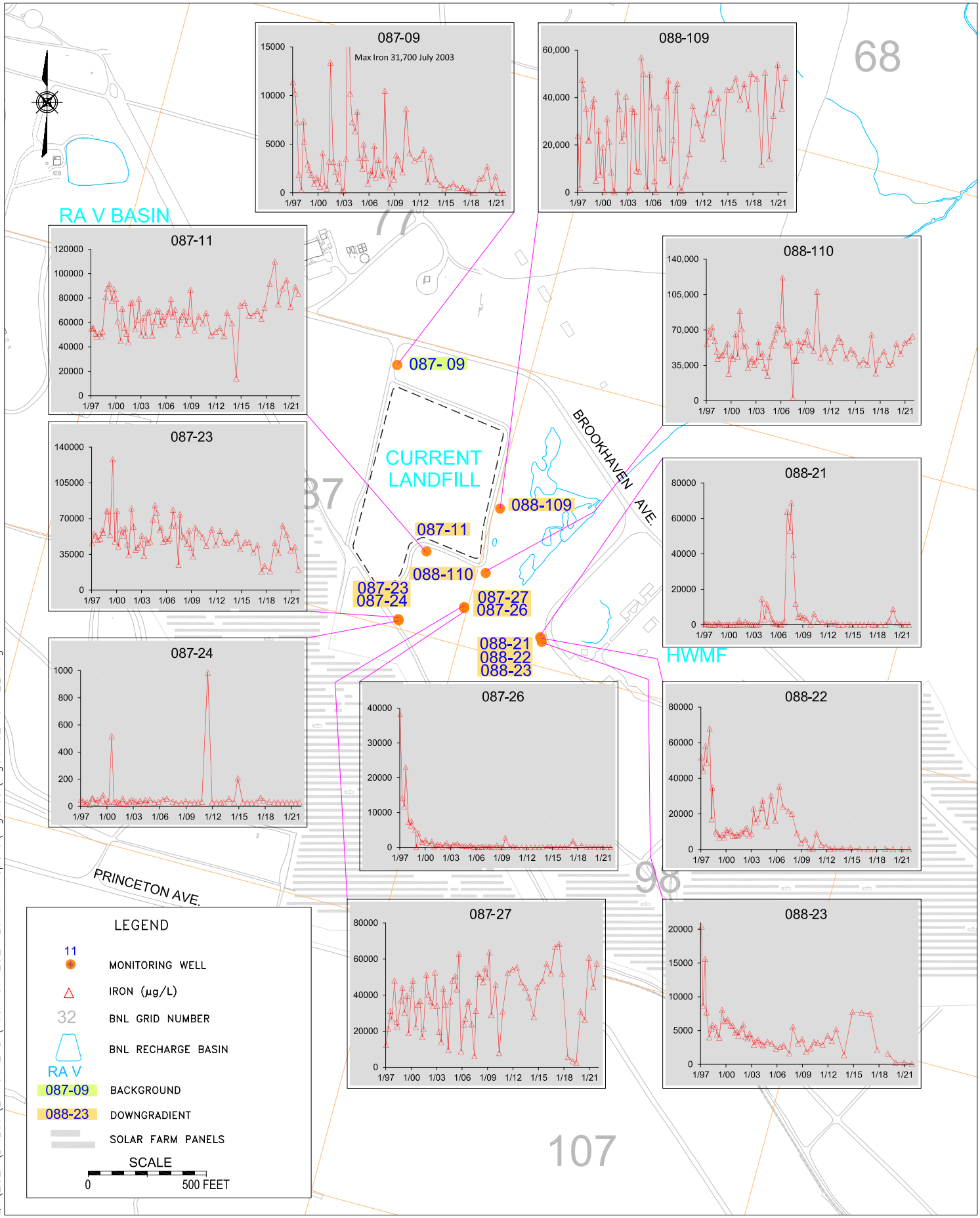
TITLE:

CURRENT LANDFILL ALKALINITY AND CHLORIDE TREND PLOTS

2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 5



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Brookhaven National Laboratory
ENVIRONMENTAL PROTECTION DIVISION

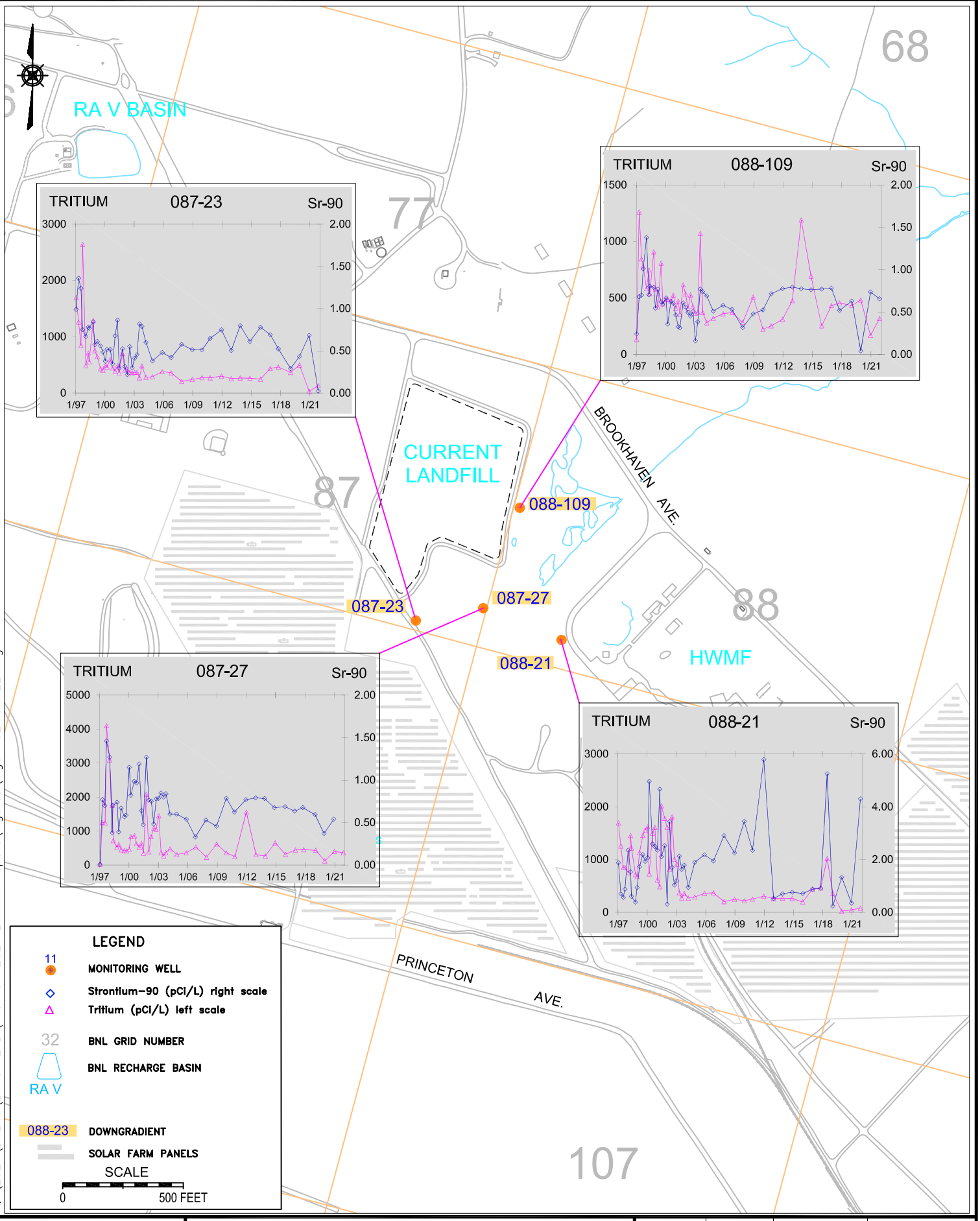
TITLE:

CURRENT LANDFILL IRON TREND PLOTS

2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 6



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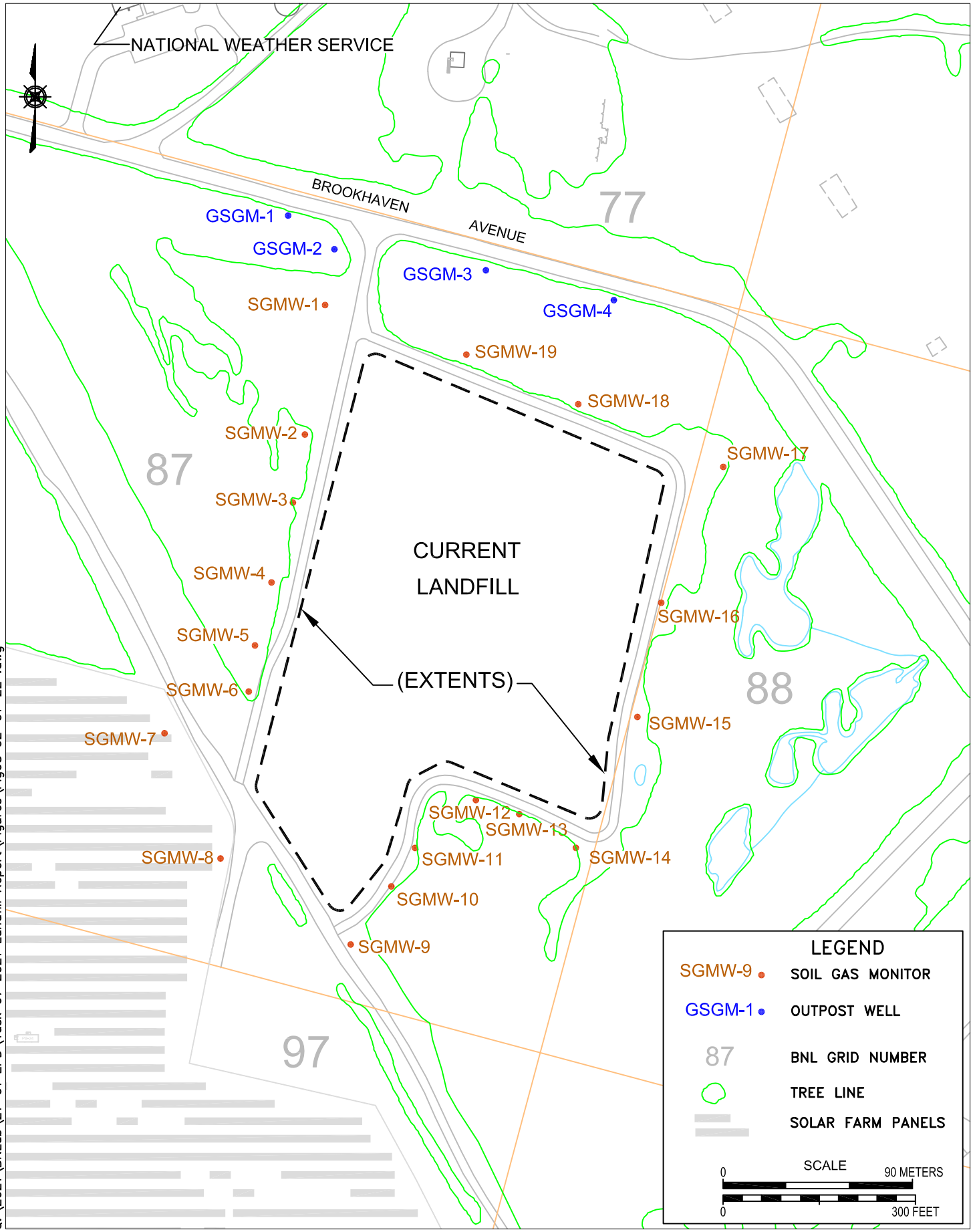
Brookhaven National Laboratory
ENVIRONMENTAL PROTECTION DIVISION

TITLE:
CURRENT LANDFILL TRITIUM AND STRONTIUM-90 TREND PLOTS
2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 7



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Brookhaven National Laboratory
ENVIRONMENTAL PROTECTION DIVISION

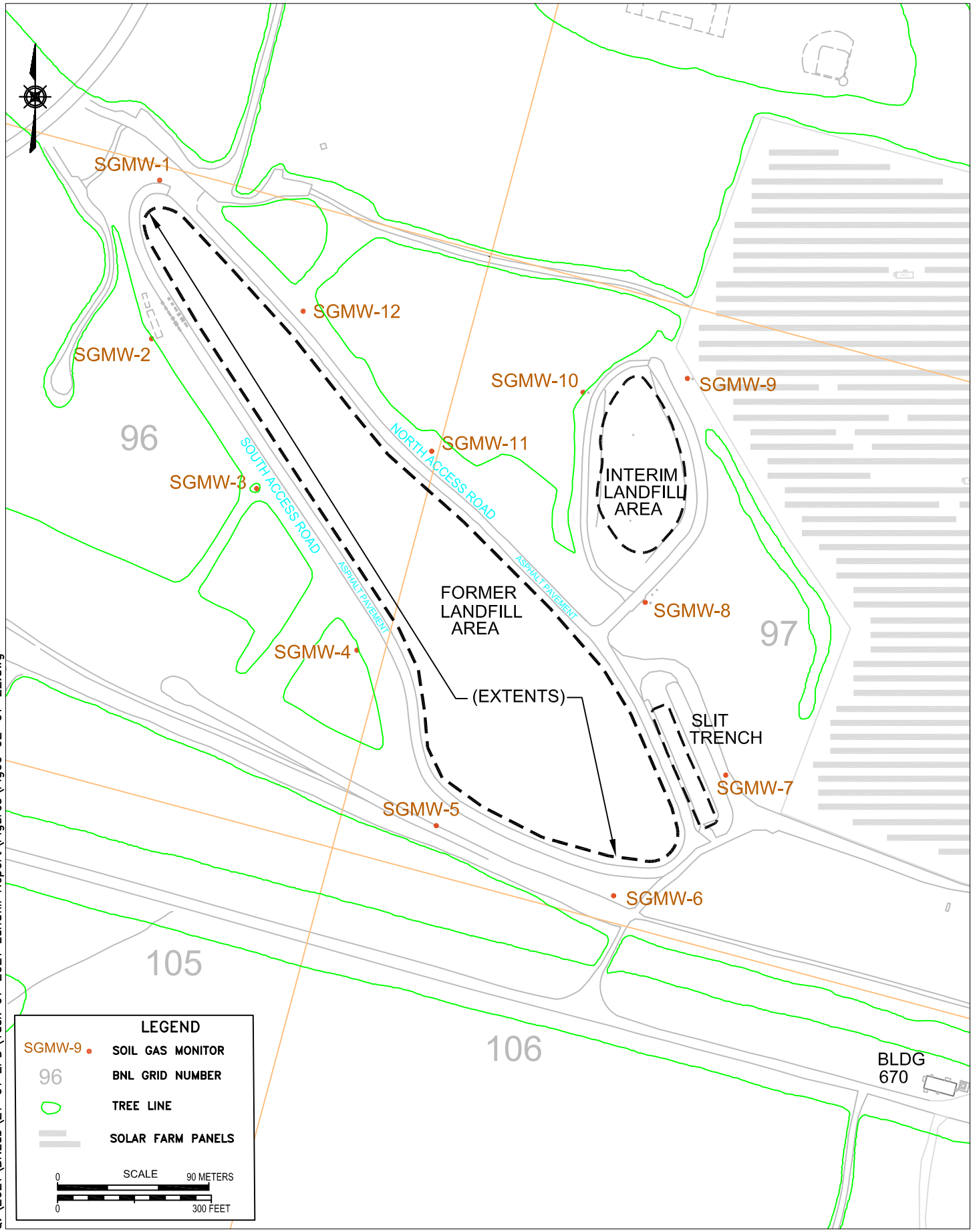
TITLE:

CURRENT LANDFILL SOIL-GAS MONITOR LOCATION MAP

2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 8



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Brookhaven National Laboratory

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

FORMER LANDFILL AREA SOIL-GAS MONITOR LOCATION MAP

2021 ENVIRONMENTAL MONITORING REPORT
CURRENT AND FORMER LANDFILL AREAS

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	02/01/22	–
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	–	–

FIGURE NO.: 9

Appendix A

Soil-gas Sampling Field Notes

3/24/21 Current Landfill
57° cloudy pressure 1023 humidity 78%

Location	WELL ID	CH_4%	LEL%	H_2S ppm	Time/comments
SGM - 1A	087-62	9.3	>100 186	1	~~1106~~ ~~1005~~
1B	087-78	8.8	>100 176	1	1113
1C	087-79	9.2	>100 184	1	1123
2A	087-63	42.1	>100 842	0	1129
2B	087-80	36.2	>100 724	11	1136
2C	087 81	36.1	>100 722	3	1146
3A	087 64	18.9	>100 378	0	1344
3B	087 82	41.1	>100 822	8	1351
3C	087 83	40.7	>100 814	16	1409
4A	087 65	36.7	>100 734	0	1414
4B	087 84	33.8	>100 676	3	1421
4C	087 85	26.0	>100 520	3	1432
5A	087 66	27.4	>100 548	0	1438
5B	087 86	26.2	>100 524	1	1444
5C	087 87	19.8	>100 396	0	1454
6A	087 67	8.8	>100 176	0	1501
6B	087 88	28.6	>100 572	1	1508
6C	087 89	26.3	>100 526	2	1518
7A	087 68	0	0	~~0~~	1131
7B	087 90	0	0	0	1137
7C	087 91	0	0	0	1147
8A	087 69	0	0	0	1152
8B	087 92	0	0	0	1158
8C	087 93	0	0	0	1208

3/24/21

3/25

Rite in the Rain

current Landfill

Location	WELL ID	CH_4 %	LEL %	H_2S	Time/comment
GSGM -9A	087 70	0	0	0	1320
9B	087 94	0	0	0	1327
9C	087 95	0	0	0	1338
10A	087 71	2.5	50	0	1343
10B	087 96	6.7	>100 134	0	1351
10C	087 97	6.0	>100 120	3	1400
11A	087 72	4.1	82	0	1405
11B	087 98	2.1	42	0	1413
12A	087 73	35.7	>100 714	11	1418
12B	087 99	28.6	>100 572	0	1425
13A	087 74	.2	5 4	0	1430
13B	087 100	22.7	>100 454	0	1437
14A	087 75	0	0	0	1442
14B	087 101	1.0	21 20	0	1448
15A	088 111	0	0	0	0959
15B	088 114	0	0	0	1006 3/25
16A	088 112	0	0	0	0943
16B	088 115	0	0	0	0950
17A	088 113	.1	2	0	1552
17B	088 116	.1	2	0	1600
18A	087 76	0	0	0	1538 3/24
18B	088 102	0	20	0	1547
19A	088 77	00.8	17 16	0	1525
19B	088 103	7.3	>100 146	0	1532

3/25/21 - current Landfill
50° 93% humidity pressure 1019

Location	WELL ID	CH_4 %	LEL %	H_2S	Time/comment
GSGM 1A	NA	0	0	0	1029
1B		0	0	0	1035
1C		0	0	0	1046
2A		0	0	0	1556
2B		0	0	0	1603
2C		0	0	0	1612
3A		0	0	0	1543
3B		0	0	0	1550
4A		0	0	0	1534
4B		0	0	0	1538

Rite in the Rain

20 Bar press 29.72 Hg 73° current Landfill 6/16/21

Location	WELL ID	CH_4 %	LEL %	H_2S	time/comments
SGM 1A	087-62	10.1	>100 202	1	1000
1B	087-78	9.5	>100 190	0	1010
1C	087-79	8.2	>100 164	0	1021
2A	087-63	43.7	>100 874	3	1324
2B	087-80	42.0	>100 840	27	1330
2C	087-81	39.9	>100 798	0	1340
3A	087-64	37.4	>100 748	24	1153
3B	087-82	48.4	>100 968	21	1200
3C	087-83	48.2	>100 964	07	1210
4A	087-65	42.0	>100 840	5	1125
4B	087-84	39.5	>100 790	0	1133
4C	087-85	31.3	>100 626	0	1144
5A	087-66	.1	2	0	1057
5B	087-86	25.7	>100 514	0	1104
5C	087-87	20.9	>100 418	0	1114
6A	087-67	0	0	0	1028
6B	087-88	30.6	>100 612	1	1035
6C	087-89	29.1	>100 582	4	1045
7A	087-68	0	0	0	1400
7B	087-90	0.2	4	0	1408
7C	087-91	0	0	0	1419
8A	087-69	0	0	0	1425
8B	087-92	0	0	0	1432
8C	087-93	0	0	0	1442

6/16/21

12/11/20

6/17/21 - 73° pressue 29.89 Hg (1015)

21

Loc	WELL ID	CH_4 %	LEL %	H_2S ppm	Time
SGM-9A	087-70	0	0	0	1349
9B	087-94	0	0	0	1356
9C	087-95	0	0	0	1406
10A	087-71	15.8	>100 316	19	1414
10B	087-96	14.8	>100 296	7	1421
10C	087-97	12.7	>100 254	4	1432
11A	087-72	14.2	>100 284	12	1438
11B	087-98	14.4	>100 288	0	1445
12A	087-73	40.0	>100 800	33	1451
12B	087-99	32.6	>100 652	4	1458
13A	087-74	1.2	25 24	0	1503
13B	087-100	29.6	>100 592	0	1510
14A	087-75	00.1	2	0	1515
14B	087-101	00.1	1	0	1522
15A	087-111	0	0	0	1527
15B	088-114	.1	1 2	0	1534
16A	088-112	0	0	0	1544
16B	088-115	.1	2	0	1551
17A	088-113	0	0	0	1556
17B	088-116	1.0	20	0	1603
18A	087-76	0	0	0	1609
18B	087-102	0	0	0	1616
19A	087-77	3.4	68 68.8	4	0937
19B	087-103	15.6	>100 312	4	0945

6/17/21

Rest in the Ruins

22

4/11/24

LOC	WELL ID	CH_4%	LEL%	H_2S	Time
GSGM 1A	NA	0	0	0	1107
1B		0	0	0	1114
1C		0	0	0	1120
2A		0	0	0	1040
2B		0	0	0	1047
2C		0	0	0	1054
3A		0	0	0	1025
3B		0	0	0	1033
4A		0	0	0	0954
4B		0	0	0	1001

9/22/21 29.99" Hg — Current Landfill — cloudy

Location	Well ID	CH_4 %	LEL %	H_2S	time/comm
SGM-1A	087-62	7.3	>100 146	1	1014
9/22/21 1B	087-78	6.8	>100 136	1	1021
1C	087-79	5.5	>100 110	0	1030
2A	087-63	45.1	>100 902	3	1036
2B	087 80	47.2	>100 944	23	1042
2C	087 81	47.9	>100 958	5	1052
3A	087 64	37.6	>100 752	28	1058
3B	087 82	50.5	>100 1010	27	1105
3C	087 83	51.2	>100 1024	13	1121
4A	087 65	40.9	>100 818	6	1128
4B	087 84	37.6	>100 752	11	1134
4C	087 85	29.2	>100 584	8	1148
5A	087 66	28.0	>100 560	1	1154
5B	087 86	26.6	>100 532	3	1200
5C	087 87	19.1	>100 382	1	1211
6A	087 67	1.5	31	0	1416
6B	087 88	29.2	>100 584	7	1422
6C	087 89	25.7	>100 514	4	1432
7A	087 68	[illegible]	>100 [illegible]	0	1443 [illegible]
7B	087 90	0	0	0	1450
7C	087 91	0	0	0	1500
8A	087 69	0	0	0	1506
8B	087 92	.1	2	0	1512
8C	087 93	.1	2	0	1524

Rite in the Rain

location	WELL ID	CH_4 %	LEL %	H_2S	time
9/23/24 9A	087	70.	0	0	0951
B	087	94	0	0	0958
C	087	95	0	0	1007
10A	087	71	19.0	>100 390	32	1013
B	087	96	17.0	>100 840	12	1019
C	087	97	13.9	>100 278	0	1029
11A	087	72	20.1	>100 402	27	1034
B	087	98	18.7	>100 374	4	1041
12A	087	73	42.8	>100 856	41	1047
B	087	99	38.0	>100 760	1	1056
13A	087	74	27.6	>100 552	0	1100
B	087	100	27.4	>100 548	0	1107
9/24/24 14A	087	75	.3	6	0	1558
B	087	101	2.6	52	1	1605
15A	088	111	0	0	0	1609
B	088	114	0	0	0	1615
16A	088	102	0	0	0	1545
B	088	115	0	0	0	1552 (better 09)
17A	088	103	0	0	0	1517
B	087	116	0	0	0	1508
18A	087-76		0	0	0	1456
B	087	102	0	0	0	1502
19A	087	77	9.0	>100 180	0	1439
B	087	103	15.9	>100 318	0	1445

9/23/24 77° cloudy 29.89 in Hg

Location	WELL ID	CH_4 %	LEL %	H_2S	time
GSGM 1A	NA	.1	2	0	1119
1B		0	0	0	1129
1C		0	0	0	1135
2A		0	0	0	1350
B		0	0	0	1357
C		0	0	0	1407
3A		0	0	0	1337
B		0	0	0	1344
4A		0	0	0	1324
B		0	0	0	1331

Rite in the Rain

12/13/14 Survey 48°

Location	Well ID	CH_4 %	LEL %	H_2S	time/comments
SGM-1A	087-62	8.9	>100 178	1	1022
1B	-78	7.8	>100 156	2	1030
1C	-79	6.0	>100 120	1	1040
2A	-63	45.9	>100 918	0	1045
2B	-80	45.2	>100 904	12	1052
2C	-81	43.1	>100 862	6	1102
3A	-64	23.6	>100 472	3	1108
3B	-82	48.3	>100 966	11	1115 smell
3C	-83	44.5	>100 890	8	1125 smell
4A	-65	32.0	>100 640	0	1133
4B	-84	28.5	>100 570	6	1141
4C	-85	18.7	>100 374	3	1151
5A	-66	2.7	55 (21	0	1156
5B	-86	15.1	>100 302	0	1202
5C	-87	13.8	>100 276	1	1212 smell
6A	-67	5.9	>100 118	0	1331
6B	-88	27.7	>100 554	4	1337
6C	-89	23.9	>100 478	2	1347
7A	-68	0	0	0	1111
7B	-90	0	0	0	1117
7C	-91	0	0	0	1128
8A	-69	0	0	0	1049
8B	-92	0	0	0	1055
8C	-93	0	0	0	1105

12/15

12/15-12/16/14

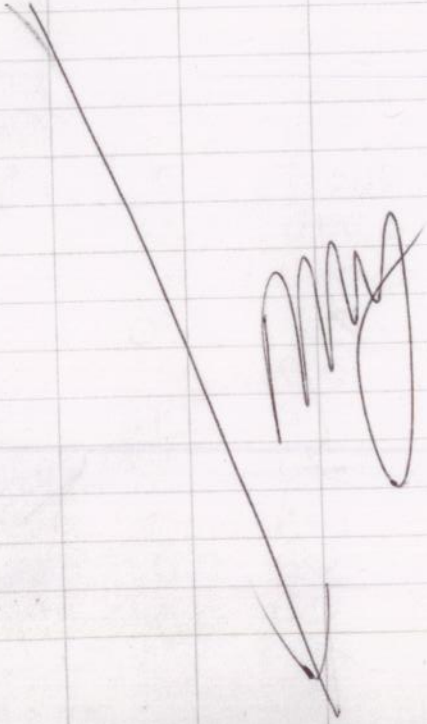
Location	Well ID	CH_4 %	LEL %	H_2S	time/comments
SGM-9A	087-70	0	0	0	1136
9B	94	0	0	0	1143
9C	95	0	0	0	1153
10A	087-71	0	0	0	1354
10B	96	7.1	>100 142	0	1401
10C	97	6.3	>100 126	5	1411
11A	72	9.0	>100 180	5	1416
11B	98	4.1	83 82	0	1423
12A	73	29.8	>100 596	14	1427
12B	99	35.1	>100 702	0	1434
13A	74	22.2	>100 444	0	1439
13B	100	26.7	>100 534	0	1446
14A	75	0	0	0	1451
14B	101	.1	1 2	0	1458
15A	088-111	0	0	0	1503
15B	114	0	0	0	1509
16A	112	0	0	0	1539
16B	115	0	0	0	1545
17A	113	0	0	0	1550
17B	116	0	0	0	1557
18A	087-76	0	0	0	1603
18B	102	0	0	0	1609
19A	77	0	0	0	1614
19B	103	0	0	0	1620

12/15

Rite in the Rain

12/16 Current landfill

Location	Well ID	CH_4 %	LEL %	H_2S	Time
GSGM-1A	NA	0	0	0	~~1358~~
	1B	0	0	0	~~1405~~
	1C	0	0	0	
	2A	0	0	0	1430
	B	0	0	0	1437
	C	0	0	0	
	3A	0	0	0	1415
	B	0	0	0	1422
	4A	0	0	0	1358
	B	0	0	0	1405



(44) Check former Launch III 1020 mb 85% humidity

M. Yost 8/26/21

Location	WELL ID	CH_4 %	LEL %	H_2S ppm	Comments
SGM 1A	096-41	0	0	0	0944
1B	096-42	~~0~~	~~0~~	0	1011
2A	096-43	0	0	0	1027
2B	096-44	0	0	0	1034
3A	096-45	0	~~0~~	~~0~~	~~1045~~ 1301
3B	096-46	0	~~0~~	~~0~~	~~1052~~ 1301
4A	096-47	0	0	0	1318
4B	096-48	0	0	0	1325
5A	097-50	0	0	0	1054
5B	097-51	0	0	0	1101
6A	097-52	0	0	0	1105
6B	097-53	0	0	0	1114
7A	097-54	0	0	0	1122
7B	097-55	0	0	0	1129
8A	097-56	0	0	0	1135
8B	097-57	0	0	0	1142
9A	097-58	0	0	0	1338
9B	097-59	0	0	0	1345

(cont.) (50)

Location	WELL ID	CH_4 %	LEL %	H_2S ppm	Comments
SGM 10A	097-60	0	0	0	1148
10B	097-61	0	0	0	1154
11A	097-62	0	0	0	1406
11B	097-63	0	0	0	1414
12A	096-49	0	0	0	1437
12B	096-50	0	0	0	1444

Appendix B

Monthly Landfill Site Inspection Forms

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 7-29-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: ___ ___

Time off Site: ___ ___

Weather Conditions: ___

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: All OK

Observed Conditions: ___

Recommendations: ___

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 2-26-21

Purpose of Inspection: ___ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: _____

Time off Site: _____

Weather Conditions: _____

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: All OK

Observed Conditions: _____

Recommendations: _____

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 3-30-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: ___

Time off Site: ___

Weather Conditions: ___

A. Inspection Checklist

	Component	Observed Condition: Excellent	Fair	Poor	Further Action Required: Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓	✓		✓	
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls					
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes					
	Recharge Areas	✓				✓
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road		✓		✓	
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Asphalt Road, CAP

Observed Conditions: Vegetation Growth on Road. Gopher Holes (4) on CAP

Recommendations: Contact Grounds to Remove Vegetation and Fill in Gopher Holes

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 4-29-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: ___ ___

Time off Site: ___ ___

Weather Conditions: ___

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap		✓		✓	
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓	✓		✓	

B. Description of Further Action Requirements:

1. Location: Asphalt Road, CAP

Observed Conditions: Vegetation Growing on Roads, CAP

Recommendations: Will Contact Grounds To Remove Vegetation

Gopher Holes were Filled in From Last Month

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 5-26-21

Purpose of Inspection: √ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: ___ ___

Time off Site: ___ ___

Weather Conditions: ___

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	√				√
	Cap					√
	Gas Vents	√				√
2.0	**Drainage Structures:**					
	Toe Drain	√				√
	Drainage Channels	√				√
	French Drains/Outfalls					
	Subsurface Drainage Pipes/Outfalls	√				√
	Manholes					√
	Recharge Areas	√				√
	Monitoring System:					
	Soil Gas Wells	√				√
	Groundwater Wells					
4.0	**Site Access:**					
	Asphalt Access Road		√			√
	Crushed-Concrete Access Road	√				√

B. Description of Further Action Requirements:

1. Location: Asphalt Road

Observed Conditions: Vegetation Growing Through Asphalt

Recommendations: Contact Grounds

Note: LANDFILL CAP Mowed last MONTH.

BROOKHAVEN NATIONAL LABORATORY
LTRA SITE INSPECTION FORM

Location (AOC): Current Landfill and Wooded Wetland
Date of Inspection: 6/15/21
Name of Inspector(s): R. Howe
Purpose of Inspection: ☒ Routine (Scheduled Frequency of 2x/yr) ☐ Heavy Rainfall ☐ Reported Incident

A. Inspection Checklist

Component	Observed Condition				Further Action	
Req'd	Excell.	Fair	Poor	Not Applic.	Yes (describe)	No
1. Landfill Cap/Soil Covers/Wetlands:						
Vegetation (e.g. grass)	X				Grass recently cut	X
Soil (Cap/Cover/Fill)	X				No burrows evident	X
Other:						
2. Drainage Structures:						
Standing Water	X				None	X
Toe Drain	X					X
Drainage Channels		X			Some veg. in channels	X
French Drains/Outfalls				X		X
Subsurface Drainage Pipes/Outfalls		X				X
Manholes				X		X
Berms				X		X
Roof Drains				X		X
Recharge Areas	X					X
Other:						
3. Monitoring System:						
Soil Gas Wells	X				Cleared recently	X
Groundwater Wells	X				Locked	X
Gas Vents	X					X
Other: __						
4. Site Access:						
Asphalt Access Road	X				Grass in cracks	X
Crushed-concrete Access Road				X		X
Fence	X					X
Gates/locks	X				Gates locked	X
LUIC Signs	X				3 signs in place	X
Other: Stairs access to cap	X				Good condition	X

5. Evidence of unauthorized work activities and/or unauthorized access has occurred? ☐ Yes ☒ No
If yes, describe evidence: _ _____

B. Description of Other Observations

Observed Conditions/Recommendations: The grass on the cap was recently cut. No active animal burrows seen. Previous burrows were filled-in. All three point of contact signs are in place and gates locked. The Wooded Wetland has some water present. LUIC Factsheet Changes: No changes for Current Landfill or Wooded Wetlands.

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 6-30-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: ___ ___

Time off Site: ___ ___

Weather Conditions:

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation		✓			✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road		✓			✓
	Crushed-Concrete Access Road	✓			✓	

B. Description of Further Action Requirements:

1. Location: Landfill CAP, Asphalt Roads

Observed Conditions: Grass getting a little long on CAP. Possibly Mow in AUGUST

Recommendations: Vegetation Growing through Asphalt, Edges of Road need to be weed whacked.

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 7-29-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: ___ ___

Time off Site: ___ ___

Weather Conditions: ___

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation		✓			✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	—				—
	Manholes	✓				✓
	Recharge Areas	✓				✓
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓			✓	

B. Description of Further Action Requirements:

1. Location: CAP

Observed Conditions: Grass getting A bit High. Mow in AUGUST OR SEPTEMBER.
ASphalt Road - Weeds/vegetation on Road

Recommendations: CONTACT Grounds

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 8-27-21
Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident
Time on Site: ___
Time off Site: ___
Weather Conditions: ___

A. Inspection Checklist

	Component	Observed Condition: Excellent	Fair	Poor	Further Action Required: Yes	No
1.0	**Landfill Cap:**					
	Vegetation		✓		✓	
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓			✓	
	French Drains/Outfalls					✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes					✓
	Recharge Areas	✓			✓	
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road		✓		✓	
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Cap, Asphalt Road
Observed Conditions: Grass getting a bit high on Landfill Vegetation growing through Asphalt and Edges of Landfill
Recommendations: Contact Grounds Again

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 9-28-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: ___ ___

Time off Site: ___ ___

Weather Conditions: ___

A. Inspection Checklist

	Component	Observed Condition: Excellent	Fair	Poor	Further Action Required: Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓	✓		✓	
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road		✓		✓	
		✓			✓	

B. Description of Further Action Requirements:

1. Location: CAL Asphalt Road

Observed Conditions: Grass on CAP Getting High

Vegetation Coming Through Asphalt

Recommendations: Contact Grounds to Mow/Remove Vegetation

BROOKHAVEN NATIONAL LABORATORY
LTRA SITE INSPECTION FORM

Location (AOC): Current Landfill and Wooded Wetland
Date of Inspection: 10/25/21
Name of Inspector(s): R. Howe, J. Milligan, K. Schwager, M. Samms
Purpose of Inspection: ☒ Routine (Scheduled Frequency of 2x/yr) ☐ Heavy Rainfall ☐ Reported Incident

A. Inspection Checklist

Component	Observed Condition				Further Action Req'd	
	Excell.	Fair	Poor	Not Applic.	Yes (describe)	No
1. Landfill Cap/Soil Covers/Wetlands:						
Vegetation (e.g. grass)	X				Grass cut early Oct.	X
Soil (Cap/Cover/Fill)		X			Burrows evident	
Other: _____						
2. Drainage Structures:						
Standing Water	X				None	X
Toe Drain	X					X
Drainage Channels		X			Some veg. in channels	
French Drains/Outfalls				X		X
Subsurface Drainage Pipes/Outfalls		X				X
Manholes				X		X
Berms				X		X
Roof Drains				X		X
Recharge Areas	X					X
Other: _____						
3. Monitoring System:						
Soil Gas Wells	X				Recently cleared of veg	X
Groundwater Wells	X				Locked	X
Gas Vents	X				Good condition	X
Other: __						
4. Site Access:						
Asphalt Access Road	X				Grass/veg in west road	
Crushed-concrete Access Road				X		X
Fence	X					X
Gates/locks	X				Gates locked	X
LUIC Signs	X				3 signs in place	X
Other: Stairs access to cap	X					X

5. Evidence of unauthorized work activities and/or unauthorized access has occurred? ☐ Yes ☒ No
If yes, describe evidence: _ _____

B. Description of Other Observations

Observed Conditions/Recommendations: The grass on the cap was cut in early October. Several active animal burrows identified on south, east and west slopes. Grounds were contacted to fill-in the burrows and seed. All three point of contact signs are in place and gates locked. The Wooded Wetland has some water present. LUIC Factsheet Changes: No changes for Current Landfill. For Wooded Wetlands, Administrative Controls, reference 2021 LUCMP.

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Jim Milligan, Bob Howe, Kathy Schroeder, Marteen.o Sands

Date of Inspection: 10/25/2021

Purpose of Inspection: X Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: 1435

Time off Site: 1520

Weather Conditions: 68° ove/cast

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
	Monitoring System:					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road		✓			✓
	Crushed-Concrete Access Road		✓			✓

B. Description of Further Action Requirements:

1. Location: Asphalt access Road

Observed Conditions: Vegitation growing on Roadway
Four Gopher holes on Land fill.
Grass Mowed October 6th.

Recommendations: Contact grounds about Vegitation and Gopher holes.

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): James Milligan

Date of Inspection: 11/19/2021

Purpose of Inspection: X Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: 1100

Time off Site: 1130

Weather Conditions: 47°, Windy, Clear

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				
	Cap	✓				
	Gas Vents	✓				
2.0	**Drainage Structures:**					
	Toe Drain	✓				
	Drainage Channels	✓				
	French Drains/Outfalls	✓				
	Subsurface Drainage Pipes/Outfalls	✓				
	Manholes	✓				
	Recharge Areas	✓				
	Monitoring System:					
	Soil Gas Wells	✓				
	Groundwater Wells	✓				
4.0	**Site Access:**					
	Asphalt Access Road	✓				
	Crushed-Concrete Access Road	✓			X	

B. Description of Further Action Requirements:

1. Location: Access Road. Spoke with grounds about vegitation in Roadway.
Observed Conditions:

Recommendations: Use Power Broom on Roadway to Remove Dirt and Vegitation.
Photos Taken.

BROOKHAVEN NATIONAL LABORATORY
CURRENT LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): James Milligan

Date of Inspection: 12/16/2021

Purpose of Inspection: X Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: 1000

Time off Site: 1100

Weather Conditions: 50° Sunny Clear

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				
	Cap	✓				
	Gas Vents	✓				
2.0	**Drainage Structures:**					
	Toe Drain	✓				
	Drainage Channels	✓				
	French Drains/Outfalls	✓				
	Subsurface Drainage Pipes/Outfalls	✓				
	Manholes	✓				
	Recharge Areas	✓				
	Monitoring System:					
	Soil Gas Wells	✓				
	Groundwater Wells	✓				
4.0	**Site Access:**					
	Asphalt Access Road		✓			
	Crushed-Concrete Access Road	✓				

B. Description of Further Action Requirements:

1. Location: _____

Observed Conditions: _____

Recommendations: Use Power Broom on Roadway to Remove Dirt and Vegitation

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 1-29-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: _____

Time off Site: _____

Weather Conditions: _____

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage Channel

Observed Conditions: Some Small Pine Saplings

Recommendations: Have Removed or Sprayed in Spring/Summer

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 2-26-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site:

Time off Site:

Weather Conditions:

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage Channel

Observed Conditions: Few small Pine Saplings

Recommendations: Have removed or sprayed in Spring/Summer

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 3-30-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: _____

Time off Site: _____

Weather Conditions: _____

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage Channels

Observed Conditions: Some Small Pine Saplings

Recommendations: Contact Grounds to Remove.

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 4-29-21
Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident
Time on Site: _____
Time off Site: _____
Weather Conditions: _____

A. Inspection Checklist

	Component	Observed Condition: Excellent	Fair	Poor	Further Action Required: Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents					✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓	✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage channels
Observed Conditions: Small pine saplings in channels

Recommendations: Contact Grounds to remove

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 5-26-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: _____

Time off Site: _____

Weather Conditions: _____

A. Inspection Checklist

	Component	Observed Condition: Excellent	Fair	Poor	Further Action Required: Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap					✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells					
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage Channels

Observed Conditions: Small Pine Saplings

Recommendations: Contact Grounds to remove saplings

Note: CAP Mowed

BROOKHAVEN NATIONAL LABORATORY
SITE INSPECTION FORM

Location (AOC): Former Landfill Area (includes the former and interim landfills and slit trench)
Date of Inspection: 6/15/21
Name of Inspector(s): R. Howe
Purpose of Inspection: ☒ Routine (Scheduled Frequency of 2x/yr) ☐ Heavy Rainfall ☐ Reported Incident

A. Inspection Checklist

Component	Observed Condition				Further Action	
Req'd	Excell.	Fair	Poor	Not Applic.	Yes (describe)	No
1. Landfill Cap/Soil Covers/Wetlands:						
Vegetation (e.g. grass)	X				Grass recently cut	X
Soil (Cap/Cover/Fill)		X				X
Other: _____						
2. Drainage Structures:						
Standing Water	X				None	X
Toe Drain	X					X
Drainage Channels		X			Need vegetation removal	
French Drains/Outfalls	X					X
Subsurface Drainage Pipes/Outfalls	X					X
Manholes				X		X
Berms				X		X
Roof Drains				X		X
Recharge Areas	X					X
Other: _____						
3. Monitoring System:						
Soil Gas Wells		X			Weeds cut recently	X
Groundwater Wells	X					X
Gas Vents	X					X
Other: _____	X					X
4. Site Access:						
Asphalt Access Road		X				X
Crushed-concrete Access Road		X				X
Fence				X		X
Gates/locks				X		X
Radiological Postings				X		X
Other: LUIC Signs		X			4 signs in place	X

5. Evidence of unauthorized work activities and/or unauthorized access has occurred? ☐ Yes ☒ No
If yes, describe evidence: _____

B. Description of Other Observations

Observed Conditions/Recommendations: Former Landfill, Interim Landfill, and Slit Trench caps are in good condition with no erosion evident. The grass was recently cut and cap was not spongy. No woodchuck burrows were evident. Vegetation/tree in the western drainage channels need to be cut or sprayed. Grass around soil gas wells was recently cut. New SS handles were recently installed on all the soil gas sampling wells. LUIC Factsheet Changes: None.

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 6-30-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site:

Time off Site:

Weather Conditions:

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation		✓			✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road		✓		✓	
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Landfill, Drainage channels, Asphalt Road

Observed Conditions: Grass getting a little long on Landfill.
Some Vegetation, Pine saplings in culverts
& Vegetation growing through Asphalt

Recommendations: Contact Grounds

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 7-29-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: _____

Time off Site: _____

Weather Conditions: _____

A. Inspection Checklist

	Component	Observed Condition: Excellent	Fair	Poor	Further Action Required: Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage Channels

Observed Conditions: Vegetation Growing & Pine Saplings

Recommendations: Contact Grounds To Remove

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 8-27-21

Purpose of Inspection: ✓ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: _____

Time off Site: _____

Weather Conditions: _____

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage Channels

Observed Conditions: Vegetation in Channels

Recommendations: Contact Grounds

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Eric Kramer

Date of Inspection: 9-28-21

Purpose of Inspection: ___ Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site:

Time off Site:

Weather Conditions:

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap					
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels		✓		✓	
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				✓
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: Drainage Channels

Observed Conditions: Some Excess Vegetation

Recommendations: Contact Grounds

BROOKHAVEN NATIONAL LABORATORY
SITE INSPECTION FORM

Location (AOC): Former Landfill Area (includes the former and interim landfills and slit trench)
Date of Inspection: 10/25/21
Name of Inspector(s): R. Howe, J. Milligan, K. Schwager
Purpose of Inspection: ☒ Routine (Scheduled Frequency of 2x/yr) ☐ Heavy Rainfall ☐ Reported Incident

A. Inspection Checklist

Component	Observed Condition				Further Action Req'd	
	Excell.	Fair	Poor	Not Applic.	Yes (describe)	No
1. Landfill Cap/Soil Covers/Wetlands:						
Vegetation (e.g. grass)	X				Grass cut early Oct.	X
Soil (Cap/Cover/Fill)	X					X
Other: _____						
2. Drainage Structures:						
Standing Water	X				None	X
Toe Drain	X					X
Drainage Channels		X			Need vegetation removal	
French Drains/Outfalls	X					X
Subsurface Drainage Pipes/Outfalls	X					X
Manholes				X		X
Berms				X		X
Roof Drains				X		X
Recharge Areas	X					X
Other: _____						
3. Monitoring System:						
Soil Gas Wells		X				X
Groundwater Wells	X					X
Gas Vents	X				Good condition	X
Other: _____	X					X
4. Site Access:						
Asphalt Access Road		X				X
Crushed-concrete Access Road		X				X
Fence				X		X
Gates/locks				X		X
Radiological Postings				X		X
Other: LUIC Signs		X			A 4 signs in place	X

5. Evidence of unauthorized work activities and/or unauthorized access has occurred? ☐ Yes ☒ No
If yes, describe evidence: _____
_____

B. Description of Other Observations

Observed Conditions/Recommendations: Former Landfill, Interim Landfill, and Slit Trench caps are in good condition with no erosion evident. The grass was cut in early October. No woodchuck burrows were observed. Vegetation/tree in the western drainage channels need to be cut or sprayed. LUIC Factsheet Changes: None.

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): Jim Milligan, Bob Howe, Kathy Schwager, Mariano Soares

Date of Inspection: 10/25/2021
Purpose of Inspection: X Routine ___ Heavy Rainfall ___ Reported Incident
Time on Site: 0930
Time off Site: 1030
Weather Conditions: 65° overcast

A. Inspection Checklist

Component		Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	✓				✓
	Cap	✓				✓
	Gas Vents	✓				✓
2.0	**Drainage Structures:**					
	Toe Drain	✓				✓
	Drainage Channels	✓				✓
	French Drains/Outfalls	✓				✓
	Subsurface Drainage Pipes/Outfalls	✓				✓
	Manholes	✓				✓
	Recharge Areas	✓				✓
3.0	**Monitoring System:**					
	Soil Gas Wells	✓				✓
	Groundwater Wells	✓				✓
4.0	**Site Access:**					
	Asphalt Access Road	✓				
	Crushed-Concrete Access Road	✓				✓

B. Description of Further Action Requirements:

1. Location: _____
Observed Conditions: Landfill mowing October 6th

Recommendations:

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): James Milligan

Date of Inspection: 11/19/2021

Purpose of Inspection: X Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: 1315

Time off Site: 1400

Weather Conditions: 47° windy, clear

A. Inspection Checklist

	Component	Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	X				
	Cap	X				
	Gas Vents	X				
2.0	**Drainage Structures:**					
	Toe Drain	X				
	Drainage Channels	X				
	French Drains/Outfalls	X				
	Subsurface Drainage Pipes/Outfalls	X				
	Manholes					
	Recharge Areas	X				
3.0	**Monitoring System:**					
	Soil Gas Wells					
	Groundwater Wells	X				
4.0	**Site Access:**					
	Asphalt Access Road	X				
	Crushed-Concrete Access Road	X				

B. Description of Further Action Requirements:

1. Location: Toe Drain RIP-RAP

Observed Conditions: few small pine saplings in stone. RTO ground fence. Labeled manholes "A", "B", "C"

Recommendations: None. Photos taken.

BROOKHAVEN NATIONAL LABORATORY
FORMER LANDFILL AREA
SITE INSPECTION FORM

Name of Inspector(s): James Milligan

Date of Inspection: 12/16/2021

Purpose of Inspection: Y Routine ___ Heavy Rainfall ___ Reported Incident

Time on Site: 0905

Time off Site: 0950

Weather Conditions: 50° Sunny at Clear

A. Inspection Checklist

Component		Observed Condition			Further Action Required	
		Excellent	Fair	Poor	Yes	No
1.0	**Landfill Cap:**					
	Vegetation	X				
	Cap	X				
	Gas Vents	X				
2.0	**Drainage Structures:**					
	Toe Drain	X				
	Drainage Channels	X				
	French Drains/Outfalls	X				
	Subsurface Drainage Pipes/Outfalls	X				
	Manholes	X				
	Recharge Areas					
3.0	**Monitoring System:**					
	Soil Gas Wells	X				
	Groundwater Wells	X				
4.0	**Site Access:**					
	Asphalt Access Road	X				
	Crushed-Concrete Access Road	X				

B. Description of Further Action Requirements:

1. Location: ___

Observed Conditions: ___

Recommendations: None.