

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

# Prepared by Brookhaven National Laboratory Environmental Protection Division Upton, New York

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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 soilgas wells were replaced with new stainless-steel handles.

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# **ACRONYMS**

Conservation

BNL         Brookhaven National Laboratory         O&M         Operations and Maintenance           BSA         Brookhaven Science Associates         OU         Operable Unit           CERCLA         Comprehensive Environmental Response, Compensation and Liability Act         PCBs         Polychlorinated biphenyls           CY         Calendar year         QA/QC         Quality Assurance/Quality Control           CY         Calendar year         QAPP         Quality Assurance Project Plan           DCS         Derived concentration technical standard         SCDHS         Suffolk County Department of Health Services           DOE         U.S. Department of Energy         Sr-90         Strontium 90           DQOs         Data quality objectives         TDS         Total dissolved solids           EIMS         Environmental Info. Mgmt. System         TKN         Total Kjeldahl nitrogen           HWMF         Former Hazardous Waste         TSS         Total suspended solids           Management Facility         TVOCs         Total volatile organic compounds           LEL         Lower explosive limit         UEL         Upper explosive limit           μg/L         Milligrams per liter         WCS         Volatile organic compounds           MS/MSDs         Matrix enike/matrix spike duplicates <th>AOC</th> <th>Area of concern</th> <th>NYSDOH</th> <th>NY State Dept. of Health</th>	AOC	Area of concern	NYSDOH	NY State Dept. of Health
CERCLAComprehensive Environmental Response, Compensation and Liability ActPCBs POlychlorinated biphenylsCYCalendar yearQA/QCQuality Assurance/Quality ControlDCSDerived concentration technical standardSCDHSSuffolk County Department of Health ServicesDOEU.S. Department of EnergySr-90Strontium 90DQOsData quality objectivesTDSTotal dissolved solidsEIMSEnvironmental Info. Mgmt. SystemTKNTotal Kjeldahl nitrogenHWMFFormer Hazardous WasteTSSTotal suspended solidsManagement FacilityTVOCsTotal volatile organic compoundsLELLower explosive limitUELUpper explosive limitμg/LMicrograms per literUSEPAUnited States Environmentalmg/LMilligrams per literVOCsVolatile organic compoundsmremMillirem	BNL	Brookhaven National Laboratory	O&M	Operations and Maintenance
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EIMS Environmental Info. Mgmt. System HWMF Former Hazardous Waste Management Facility LEL Lower explosive limit	DOE	U.S. Department of Energy	Sr-90	Strontium 90
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mrem Millirem	mg/L	Milligrams per liter		Protection Agency
	ng/L	Nanograms per liter	VOCs	Volatile organic compounds
MS/MSDs Matrix enika/matrix enika dunlicates	mrem	Millirem		
MONIODS Marix Spike/Marix Spike auplicates	MS/MSDs	Matrix spike/matrix spike duplicates		
NPL National Priorities List	NPL	National Priorities List		
NYSDEC NY State Dept. of Environmental	NYSDEC	NY State Dept. of Environmental		

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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).

<u>Current Landfill</u>. 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 OUI 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).

<u>Former Landfill Area.</u> 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) 4 <sup>th</sup> 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

#### 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

<sup>\*</sup>Background well

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) 4 <sup>th</sup> 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

#### 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

<sup>\*</sup>Background well

NS = Not sampled

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 ( $\mu$ g/L) in monitoring well 087-11 and 88-110. 1,1-Dichloroethane was detected above the groundwater standard of 5  $\mu$ g/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  $\mu$ g/L. No other VOCs were detected above groundwater standards during 2021.

Benzene exceeded the 1  $\mu$ g/L standard in well 087-11 during the June 2021 and November 2021 sampling events, with a maximum concentration of 2.02  $\mu$ g/L. Well 088-110 exceeded the benzene standard during the November 2021 sampling event with result of 1.2  $\mu$ g/L. Chloroethane exceeded the 5  $\mu$ g/L standard in well 088-109 for November with a concentration of 19.9  $\mu$ g/L. This concentration is significantly below the historic high of 560  $\mu$ g/L detected in this well in 1998. Well 088-110 exceeded the chloroethane standard in June and November with a concentration of 5.9  $\mu$ g/L and 6.1  $\mu$ g/L respectively. Well 088-109 detected 1,1-Dichloroethane slightly above the standard of 5  $\mu$ g/L in November at a concentration of 6.0  $\mu$ g/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  $\mu$ g/L in downgradient well 087-11 at a maximum concentration of 508  $\mu$ g/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  $\mu$ g/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  $\mu$ g/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  $\mu$ g/L in wells 087-11, 087-23, 087-27, 088-109, and 088-110. Manganese ranged from 2.2  $\mu$ g/L to 6.1  $\mu$ g/L in background well 087-09, and up to 3,680  $\mu$ g/L in the downgradient well 088-110.

Sodium was detected above the standard of 20,000  $\mu$ g/L in wells 087-09, 087-24, 087-26, and 088-110. Downgradient sodium levels ranged up to 94,700  $\mu$ g/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<sup>®</sup> 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.

#### 6.0 REFERENCES

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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	Χ <sub>D</sub>			Χ <sub>D</sub>	Χ <sub>D</sub>	Χ'n	Χp	Χp	Χp	Χp	Χ <sub>D</sub>	Χ <sub>D</sub>				2b
087-11	CLF		Downgradient	Xp			Xp	X <sub>p</sub>	Xp	Xp	Xp	Xp	X <sub>p</sub>	Xp	X <sub>p</sub>				2b
087-23	CLF		Downgradient	Xp			Xp	X <sub>p</sub>	Xp	Xp	Xp	Xp	Xp	Xp	X <sub>p</sub>	Xa	X <sup>a</sup>	X <sup>a</sup>	2b
087-24	CLF		Downgradient	Xa			Xp	$X_p$	Xp	Xp	Xp	Xp	$X_p$	Xp	Xp				2b
087-26	CLF		Downgradient	$X_p$			Xp	$X_p$	$X_p$	Xp	Xp	Xp	$X_p$	$X_p$	$X_p$				2b
087-27	CLF		Downgradient	$X_p$			Xp	$X_p$	$X_p$	Xp	Xp	Xp	$X_p$	$X_p$	$X_p$	Xa	Xa	Xa	2b
088-109	CLF		Downgradient	Х			Xp	$X_p$	$X_p$	Xp	$X_p$	Xp	$X_p$	$X_p$	$X_p$	Xa	Xa	X <sup>a</sup>	4
088-110	CLF		Downgradient	$X_p$			Xp	$X_p$	$X_p$	Xp	Xp	Xp	$X_p$	$X_p$	$X_p$				2b
088-21	CLF		Downgradient	$X_p$			Xp	$X_p$	$X_p$	Xp	Xp	Xp	X <sub>p</sub>	$X_p$	$X_p$	X <sup>a</sup>	X <sup>a</sup>	X <sup>a</sup>	2b
088-22	CLF		Downgradient	Xa			X <sup>a</sup>	Xa	Xa	X <sup>a</sup>	Xa	Xa	X <sup>a</sup>	Xa	X <sup>a</sup>				1a
088-23	CLF		Downgradient	Xa			Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa				1a
098-99	CLF	OU I (South Boundary)	Downgradient	Х															4

#### NOTES:

a: Collect in 4th Quarter only.

b: Collect in 2nd and 4th Quarters.

		087-0	10	087-0	10	087-0	10	087-1	1	087-1	1	087-2	2	087-	22	087-	22
	Groundwater Standards	6/23/2				11/8/2		6/24/20			_	6/24/20		7/28/2	_	11/8/2	_
Analtye	(ug/L)	(ug/l		(ug/l		(ug/l		(ug/L		(ug/l	_	(ug/L		(ug/		(ug/	
1,1,1,2-Tetrachloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U		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		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		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 D*	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		U	0.5	U n*	0.5	U	0.5	U
p-Chlorotoluene	5	0.5	R*	0.5	U	0.5	U	0.5	U		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		U	0.5	U	0.5	U	0.5	U
Styrene	5	0.5	U	0.5	U	0.5	U	0.5	U		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		U	0.5	U n*	0.5	U	0.5	U
Tetrachloroethylene	5	0.5	U n*	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 n*	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.5	U n*	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 n*	0.5	U	0.5	U
Trichlorofluoromethane	5	0.5	U n*	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	₩	_	-	-	<u> </u>	6.62	-	4.47	$\vdash$	5.99	-	0.00	├	•	_
8260 TVOC		<u> </u>	1	0	<u> </u>	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.

st: Data rejected during secondary review by BNL.

		087-2	24	087-2	4	087-2	:6	087-2	:6	087-2	7	087-27	7	088-10	9	088-10	9	088-10	)9
	Groundwater Standards	6/24/2		11/9/20		6/25/20		11/8/2				11/8/20	-	3/10/20		6/23/20	_	7/28/20	
<u>Analtye</u>	(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	ט	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		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		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		U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	5 5	0.5	U	0.5	U	0.5	U	0.5	U		U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	0.04	0.5 0.5	U	0.5	U	0.5 0.5	U	0.5 0.5	U		U	0.5 0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane 1,2,4-Trichlorobenzene	5	0.5	U	0.5	U	0.5	U	0.5	U		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		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		U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropane	5	0.5	U	0.5	Ū	0.5	U	0.5	U		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	J	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		U	0.5	U	0.5	U	0.5	R*	0.5	U
Bromobenzene	5	0.5	U	0.5	$\supset$	0.5	U	0.5	U		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		J	0.93	J	0.5	U	0.5	R*	0.5	U
Chlorobromomethane Chloroethane	5 5	0.5	U	0.5	U	0.5 0.5	U	0.5 0.5	U	0.5	U	0.5 0.82	IJ	0.5 3.89	U	0.5 2.46	U	0.5	IJ
Chloroform	7	2.13	U	2.29	U	4.3	U	0.78	J	0.97	U	0.82	U	0.2	J	0.25	R*	0.79	U
cis-1,2-Dichloroethylene	5	0.5	U	0.5	U	0.5	U	0.78	U		U	0.5	U	0.5	U	0.23	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		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		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	כ	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	J	0.5	U	0.5	U		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		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		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		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		U	0.5	U	1	U	1	R*	0.5	U
Methyl bromide  Methyl chloride	5 5	0.5	U	0.5	U	0.5 0.5	U	0.5 0.5	U		U	0.5	U	0.5	U	0.5	U R*	0.5	U
Methyl tert-butyl ether	10	0.5	U	0.5	U	0.5	U	0.5	U		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		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		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		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		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		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		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		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		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		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		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		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		U	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethylene	5 5	0.5 0.5	U	0.5 0.5	U	0.5 0.5	U	0.5 0.5	U		U	0.5	U	0.5 0.5	U	0.5	U	0.5	U
Trichlorofluoromethane Vinyl chloride	2	0.5	U	0.5	U	0.5	U	0.5	U		U	0.5	U	0.5	U	0.5	R*	0.5	U
524.2 TVOC		2.13	U	0.5	U	4.3	U	0.5	U	1.95	U	0.5	U	6.63	U	9.19	IV.	0.5	0
8260 TVOC		2.13	$\vdash$	2.29		7.3	<del>                                     </del>	0.78	H	1.33	$\vdash$	2.57	H	0.03		J.13	$\vdash$	0.79	+
J: Analyte was analyzed for, but not det				2.23		l	<u> </u>	0.70	<u> </u>	<u> </u>	Ш	2.31	ш					0.73	

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.

st: Data rejected during secondary review by BNL.

		088-1	00	088-1	10	088-11	^	088-1	10	088-2	1	088-2	1	088-2	2	088-2	2	098-9	00
	Groundwater Standards	11/8/2		6/23/2		7/28/20	_	11/8/2		6/24/20		11/9/20		11/9/20				3/10/2	
Analtye	(ug/L)	(ug/		(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	Ħ
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	כ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	J	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	כ	0.5	R*	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	J	0.5	U
Dichlorodifluoromethane	5	0.5	כ	0.5	R*	0.5	U	0.5	U	0.5	R*	0.5	כ	0.5	U	0.5	כ	0.5	U
EDB	0.05	0.5	כ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	כ	0.5	U	0.5	כ	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		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	<u> </u>		<u> </u>			0								4.97	$\vdash$
8260 TVOC		26.56		l		4.44	<u> </u>	9.5				0		0		0		<u> </u>	Ш

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.

 $<sup>\</sup>ensuremath{^{*:}}$  Data rejected during secondary review by BNL.

	1				
	Groundwater Standards	098-9		098-9	
Analtye	(ug/L)	6/24/2 (ug/		11/9/2 (ug/l	
1,1,1,2-Tetrachloroethane	<u>(us/ : /</u> 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 1,2,4-Trichlorobenzene	0.04	0.5 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 Bromoform	50 50	0.5 0.5	U	0.5	U
Carbon tetrachloride	50	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 Dibromomethane	5 5	0.5 0.5	U	0.5	U
Dichlorodifluoromethane	5	0.5	U	0.5	U
EDB	0.05	0.5	IJ	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 chloride	5 5	0.5 0.5	U	0.5	U
Methyl chloride  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 3	0.5 0.5	U	0.5	U
p-Dichlorobenzene 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		_	
U: Analyte was analyzed for, but not det	ested above the MDI	l	l	0	<u> </u>

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st: Data rejected during secondary review by BNL.

Table 3

Current Landfill-Summary of 2021 Water Chemistry Data

		087-09	087-09 0		087-09		-	087-11		087-23	3	087-23		087-24	
	Groundwater Standards	6/23/20	21	11/8/20	21	6/24/20	21	11/8/202	21	6/24/20	21	11/8/202	21	6/24/20	21
<u>Analtye</u>	<u>(mg/L)</u>	(mg/L)	_	(mg/L)		(mg/L)	1	(mg/L)		(mg/L)	1	(mg/L)		(mg/L)	L
Alkalinity (as CaCO3)		45.9	45.9 2		29.1			173	173			45.8		29.3	
Ammonia (as N)	2	0.017	U	0.0534	כ	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	3.78 1			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.

**Bold/Shaded:** Concentration exceeds Standard/Guidance Value.

NS: No sample data.

J: Value is estimated.

H: Analytical holding time exceeded.

Table 3

Current Landfill-Summary of 2021 Water Chemistry Data

		087-24		087-26	;	087-26		087-27	7	087-27		088-10	9	088-109	•
	Groundwater Standards	11/9/202	21	6/25/20	21	11/8/202	21	6/25/20	21	11/8/202	21	6/23/20	21	11/8/202	21
<u>Analtye</u>	<u>(mg/L)</u>	(mg/L)		(mg/L)	1	(mg/L)		(mg/L)	1	(mg/L)		(mg/L)		(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	J	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	$\supset$	0.00167	כ	0.00167	U	0.00167	כ	0.00167	כ	0.00167	U	0.00167	J
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.

**Bold/Shaded:** Concentration exceeds Standard/Guidance Value

NS: No sample data.

J: Value is estimated.

H: Analytical holding time exceeded.

Table 3

Current Landfill-Summary of 2021 Water Chemistry Data

		088-11	0	088-110	)	088-21		088-21		088-22		088-23	
	Groundwater Standards	6/23/20	21	11/8/202	21	6/24/202	21	11/9/202	21	11/9/202	21	11/9/202	21
<u>Analtye</u>	<u>(mg/L)</u>	(mg/L)		(mg/L)		(mg/L)		(mg/L)		(mg/L)		(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	J	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

		087-0	9	087-09	9	087-2	l1	087-1	1	087-2	23	087-2	23	087-2	24	087-2	24
	Groundwater Standards	6/23/20	)21	11/8/20	21	6/24/2	021	11/8/2	021	6/24/2	021	11/8/2	021	6/24/2	021	11/9/2	021
<u>Analtye</u>	<u>(ug/L)</u>	(ug/L	)	(ug/L)	)	(ug/	<u>L)</u>	(ug/l	_)	(ug/l	<u>L)</u>	(ug/l	_)	(ug/	<u>L)</u>	(ug/	L)
Aluminum	200*	68	U	68	U	508		221		68	U	68	U	68	U	68	U
Antimony	3	1	J	1	J	1	U	1	U	1	U	1	U	1	J	1	U
Arsenic	10**	2	U	2	ט	7.47		8.76		9.44		8.65		2	J	5	U
Barium	1000	20.3	В	18.9		44.5	В	28.4		26	В	18.7		19.8	В	19	В
Beryllium	3	1	U	1	ט	1	J	1	J	1	J	1	J	1	J	1	U
Cadmium	5	1	C	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium		17200		9610		29000		23500		7260		4360	В	11100		11100	
Chromium	50	14.8		7.59	В	1	J	1	J	1	J	1	J	1	J	1	U
Cobalt		1	J	1	כ	1	J	1	J	11.1	В	5.92	В	1	J	1	U
Copper	200	1.1	В	0.659	В	0.8	В	1.35	В	0.438	В	0.335	В	0.364	В	3	U
Iron	300	30	U	30	U	89100		83600		42400		20300		30	U	30	U
Lead	15***	0.5	U	0.5	ט	0.5	J	0.5	J	0.5	J	0.5	J	0.5	J	0.5	U
Magnesium	35000	7410		4240		8330		4390		2290		1370		6730		6480	
Manganese	300	6.05		2.18	В	2160		1420		2240		2030		1	J	1	U
Mercury	0.7	0.067	כ	0.067	כ	0.067	U	0.067	J	0.067	U	0.067	J	0.067	U	0.067	U
Nickel	100	9.48	В	4.12	В	1.5	כ	1.5	כ	1.5	כ	1.5	כ	1.5	כ	1.5	U
Potassium		982	BE	962	В	6440		4240	В	1050	В	857	В	1530	В	1430	В
Selenium	10	2	U	1.5	כ	2	כ	1.5	כ	2	כ	1.5	כ	2	כ	1.5	U
Silver	50	0.3	J	0.3	כ	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	1.3	В
Sodium	20000	15600		22800		8720		3470	В	4400	В	4520	В	26200		25200	
Thallium	0.5	0.6	U	0.6	ט	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Vanadium		1	U	1	J	1.65	В	1	U	1	U	1	U	1	U	1	U
Zinc	2000	3.36	В	48.5	R	7.06	В	13.4	В	7.23	В	16.8	В	4.23	В	3.51	В

Table 4
Current Landfill-Summary of 2021 Metals Data

		087-2	6	087-2	26	087-2	27	087-2	27	088-1	09	088-1	09	088-1	10	088-1	10
	Groundwater Standards	6/25/20	)21	11/8/2	021	6/25/2	021	11/8/2	021	6/23/2	021	11/8/2	021	6/23/2	021	11/8/2	021
<u>Analtye</u>	<u>(ug/L)</u>	(ug/L	)	(ug/l	L <u>)</u>	(ug/	<u>L)</u>	(ug/L	.)	(ug/	<u>L)</u>	(ug/L	.)	(ug/	<u>L)</u>	(ug/L	.)
Aluminum	200*	68	U	68	U	68	U	68	U	68	U	68	U	68	U	68	U
Antimony	3	1	J	1	U	1	U	1	U	1	J	1	U	1	U	1	U
Arsenic	10**	2	J	2	J	5.16		7.1		4.32	В	8.75		9.84		9.94	
Barium	1000	38	В	61.5		24	В	38.3		48.8	В	44		24.5	В	40.6	
Beryllium	3	1	J	1	J	1	J	1	J	1	J	1	J	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	J	1	J	1	J	1	J	1	J	1	J	1	U	1	U
Cobalt		1	ט	1	J	6.64	В	8.31	В	5.54	В	2.31	В	4.16	В	4.65	В
Copper	200	2.16		1.87	В	0.639	В	0.46	В	3.28		2.3		0.3	U	0.3	U
Iron	300	30	ט	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	J	3.7	В	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	J	1.5	J	2.41	В	2.21	В	1.5	J	1.5	J	1.5	U	1.5	U
Potassium		1710	В	2180	В	2540	В	3330	В	3670	BE	4520	В	2190	BE	3440	В
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	כ	0.6	U	0.6	J	0.6	U	0.6	ט	0.6	J	0.6	J	0.6	U
Vanadium		1	U	1	U	1	U	1	U	1.74	В	1	U	2.08	В	1	U
Zinc	2000	3.3	ט	14.8	В	4	В	15.1	В	9.78	В	53.9		3.38	В	63.1	R

Table 4
Current Landfill-Summary of 2021 Metals Data

		088-2	21	088-2	21	088-2	22	088-2	23
	Groundwater Standards	6/24/2	021	11/9/2	021	11/9/2	021	11/9/2	021
<u>Analtye</u>	<u>(ug/L)</u>	(ug/	<u>L)</u>	(ug/L	.)	(ug/l	<u>L)</u>	(ug/l	.)
Aluminum	200*	68	U	68	J	68	J	68	כ
Antimony	3	1	U	1	J	1	J	3.5	J
Arsenic	10**	2	U	2	כ	2	כ	5	כ
Barium	1000	35.6	В	49	В	47.3	В	3.96	В
Beryllium	3	1	U	1	כ	1	כ	1	כ
Cadmium	5	1	U	1	U	1	U	1	U
Calcium		13800		10500		10300		12300	
Chromium	50	1	U	1	כ	1	כ	1	כ
Cobalt		1	U	1	J	1	כ	1	J
Copper	200	0.468	В	0.897	В	0.757	В	3	U
Iron	300	75.1	В	79	В	116		97.1	В
Lead	15***	0.5	U	0.5	J	0.5	٦	0.5	J
Magnesium	35000	7620		5400		7480		2920	В
Manganese	300	11.9		12.1		15		12.3	
Mercury	0.7	0.067	U	0.067	J	0.067	כ	0.067	J
Nickel	100	1.5	U	1.5	U	1.5	U	1.5	U
Potassium		1780	В	2320	В	1850	В	662	В
Selenium	10	2	U	1.5	U	1.5	U	1.66	В
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	J	0.6	U	0.6	U
Vanadium		1	U	1	U	1	U	1	U
Zinc	2000	5.49	В	6.65	В	4.92	В	3.73	В

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

Bold/Shaded: Concentration exceeds Standard/Guidance Value.

J: Value is estimated

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.

<sup>\*:</sup> USEPA SMCL Secondary Maximum Contaminant Levels (SMCLs)

<sup>\*\*</sup> USEPA Maximum Contaminiant Level (MCL)

<sup>\*\*\*</sup> OUI Record of Decision Selected Cleanup Goal

Table 5

Current Landfill-Summary of 2021 Radionuclide Data

			087	-23			087	-27			088-	109			088-	-21	
	Groundwater Standards		11/8/	2021			11/8/	2021			11/8/	2021			11/9/	2021	
<u>Analtye</u>	pCi/L		pCi	/L			pCi	/L			pCi	/L			pCi	/L	
		Result	Qual	MDA	<u>Error</u>	Result	Qual	MDA	Error	Result	Qual	MDA	<u>Error</u>	Result	Qual	MDA	<u>Error</u>
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.

<sup>\*:</sup> Department of Energy (DOE) Groundwater Screening Level.

<sup>\*\*\*:</sup>Environmental Protection Agency (EPA) Drinking Water Standards.

#### Table 6 Current Landfill Soil Gas Monitoring Well Description

	Current I	andfill	
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
SGM-17 PROBE A	Shallow	2.5	5.5

Table 6 Current Landfill Soil Gas Monitoring Well Description

	Current 1	Landfill	
Soil Gas	Screen	Top of Screen	<b>Bottom Screen</b>
Monitoring Well	Location	(Feet BLS)	(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

	Forme	r Landfill	
Soil Gas	Screen	Top of Screen	Bottom Screen
Monitoring Well	Location	(Feet BLS)	(Feet BLS)
CCL 4 PROPER			40
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

GSGM-1A GSGM-1B GSGM-1C GSGM-2A GSGM-2B GSGM-2B GSGM-3A GSGM-3B GSGM-3A GSGM-3B GSGM-4A GSGM-4B SGMW-01A (CLF) GSGMW-01B (CLF) GSGMW-01B (CLF) GSGMW-01C (CLF) GSGMW-01C (CLF)	0 0 0 0 0 0	0 0 0 0	0.1 0 0	0	0	0	2	0	0		_	Į.
GSGM-1C GSGM-2A GSGM-2B GSGM-2C GSGM-3A GSGM-3B GSGM-4A GSGM-4B SGMW-01A (CLF) SGMW-01B (CLF) 087-6	0 0 0	0	0		0				J	0	0	0
GSGM-2A GSGM-2B GSGM-2C GSGM-3A GSGM-3B GSGM-4A GSGM-4B SGMW-01A (CLF) SGMW-01B (CLF) 087-6	0 0 0	0	-		3	0	0	0	0	0	0	0
GSGM-28 GSGM-2C GSGM-3A GSGM-3B GSGM-4A GSGM-4B SGMW-01A (CLF) 087-6 SGMW-01B (CLF) 087-7:	0			0	0	0	0	0	0	0	0	0
GSGM-2C GSGM-3A GSGM-3B GSGM-4A GSGM-4B SGMW-01A (CLF) 087-6.	0	0	0	0	0	0	0	0	0	0	0	0
GSGM-3A GSGM-3B GSGM-4A GSGM-4B SGMW-01A (CLF) 087-6: SGMW-01B (CLF) 087-7:			0	0	0	0	0	0	0	0	0	0
GSGM-3B GSGM-4A GSGM-4B SGMW-01A (CLF) 087-6: SGMW-01B (CLF) 087-7:	0	0	0	0	0	0	0	0	0	0	0	0
GSGM-4A GSGM-4B SGMW-01A (CLF) 087-6: SGMW-01B (CLF) 087-7:		0	0	0	0	0	0	0	0	0	0	0
GSGM-4B  SGMW-01A (CLF) 087-6:  SGMW-01B (CLF) 087-7:	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-01A (CLF) 087-6: SGMW-01B (CLF) 087-7:	0	0	0	0	0	0	0	0	0	0	0	0
SGMW-01B (CLF) 087-7	0	0	0	0	0	0	0	0	0	0	0	0
1 1	-62 9.3	10.1	7.3	8.9	>100	>100	>100	>100	1	1	1	1
SGMW-01C (CLF) 087-7	-78 8.8	9.5	6.8	7.8	>100	>100	>100	>100	1	0	1	2
	-79 9.2	8.2	5.5	6	>100	>100	>100	>100	1	0	0	1
SGMW-02A (CLF) 087-6	-63 42.1	43.7	45.1	45.9	>100	>100	>100	>100	0	3	3	0
SGMW-02B (CLF) 087-8	-80 36.2	42	47.2	45.2	>100	>100	>100	>100	11	27	23	12
SGMW-02C (CLF) 087-8:	-81 36.1	39.9	47.9	43.1	>100	>100	>100	>100	3	0	5	6
SGMW-03A (CLF) 087-6-	-64 18.9	37.4	37.6	23.6	>100	>100	>100	>100	0	24	28	3
SGMW-03B (CLF) 087-8:	-82 41.1	48.4	50.5	48.3	>100	>100	>100	>100	8	21	27	11
SGMW-03C (CLF) 087-8:	-83 40.7	48.2	51.2	44.5	>100	>100	>100	>100	16	7	13	8
SGMW-04A (CLF) 087-6	-65 36.7	42	40.9	32	>100	>100	>100	>100	0	5	6	0
SGMW-04B (CLF) 087-8-	-84 33.8	39.5	37.6	28.5	>100	>100	>100	>100	3	0	11	6
SGMW-04C (CLF) 087-8	-85 26	31.3	29.2	18.7	>100	>100	>100	>100	3	0	8	3
SGMW-05A (CLF) 087-6	-66 27.4	0.1	28	2.7	>100	2	>100	54	0	0	1	0
SGMW-05B (CLF) 087-8	-86 26.2	25.7	26.6	15.1	>100	>100	>100	>100	1	0	2	0
SGMW-05C (CLF) 087-8		20.9	19.1	13.8	>100	>100	>100	>100	0	0	1	1
SGMW-06A (CLF) 087-6		0	1.5	5.9	>100	0	30	>100	0	0	0	0
SGMW-06B (CLF) 087-8		30.6	29.2	27.7	>100	>100	>100	>100	1	1	7	4
SGMW-06C (CLF) 087-8:	88 286	50.0										
SGMW-07A (CLF) 087-6		29.1	25.7	23.9	>100	>100	>100	>100	2	4	4	2

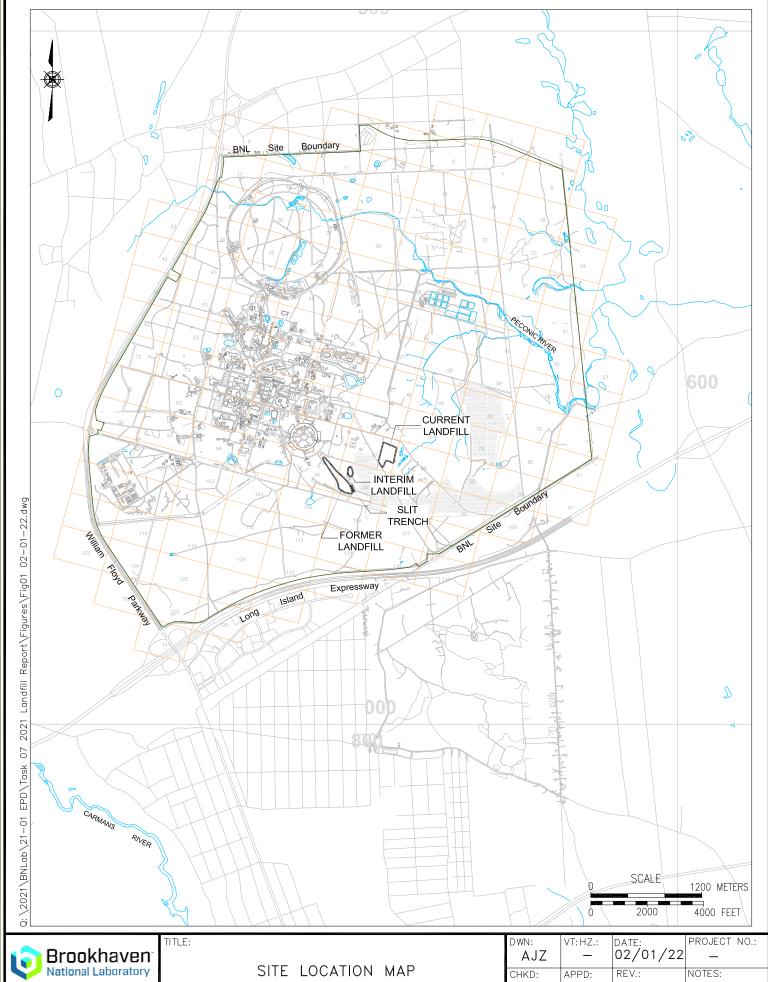
Table 7

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

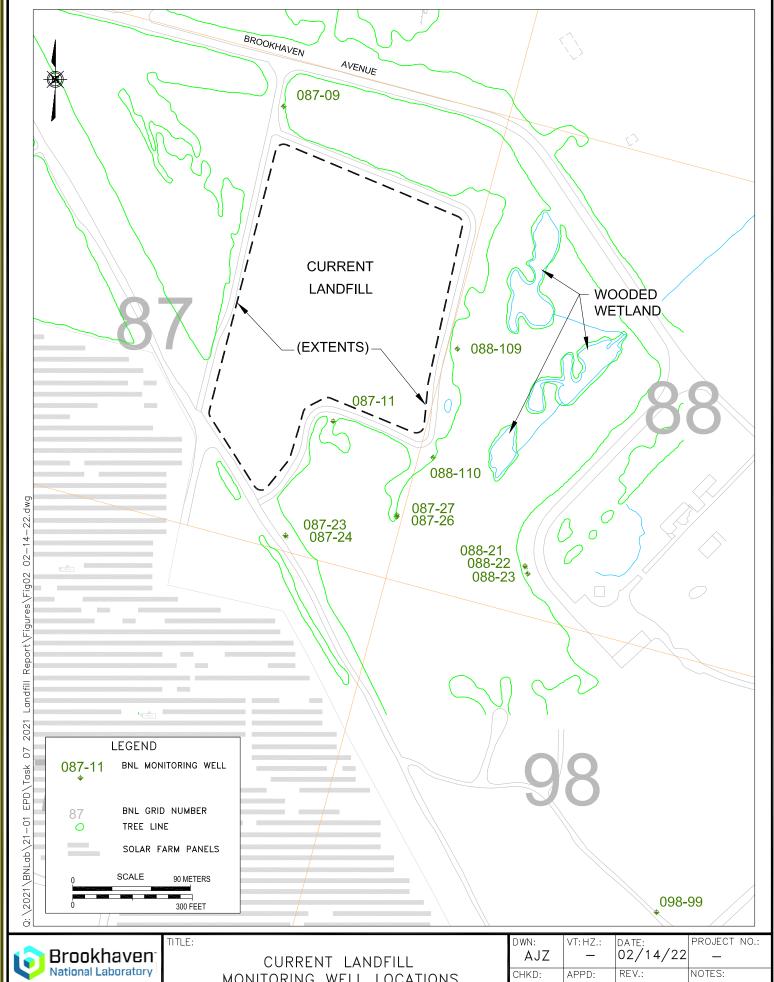
Soil/Gas Monitoring Well	Well ID	Methane (% By Volume) 8/26/2021	LEL (% By Volume) 8/26/2021	Hydrogen Sulfide (ppm By Volume) 8/26/2021
SGMW-01A (FLF)	096-41	0	0	0
SGMW-01B (FLF)	096-42	0	0	0
SGMW-02A (FLF)	096-43	0	0	0
SGMW-02B (FLF)	096-44	0	0	0
SGMW-03A (FLF)	096-45	0	0	0
SGMW-03B (FLF)	096-46	0	0	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



ENVIRONMENTAL PROTECTION DIVISION

2021 ENVIRONMENTAL MONITORING REPORT CURRENT AND FORMER LANDFILL AREAS

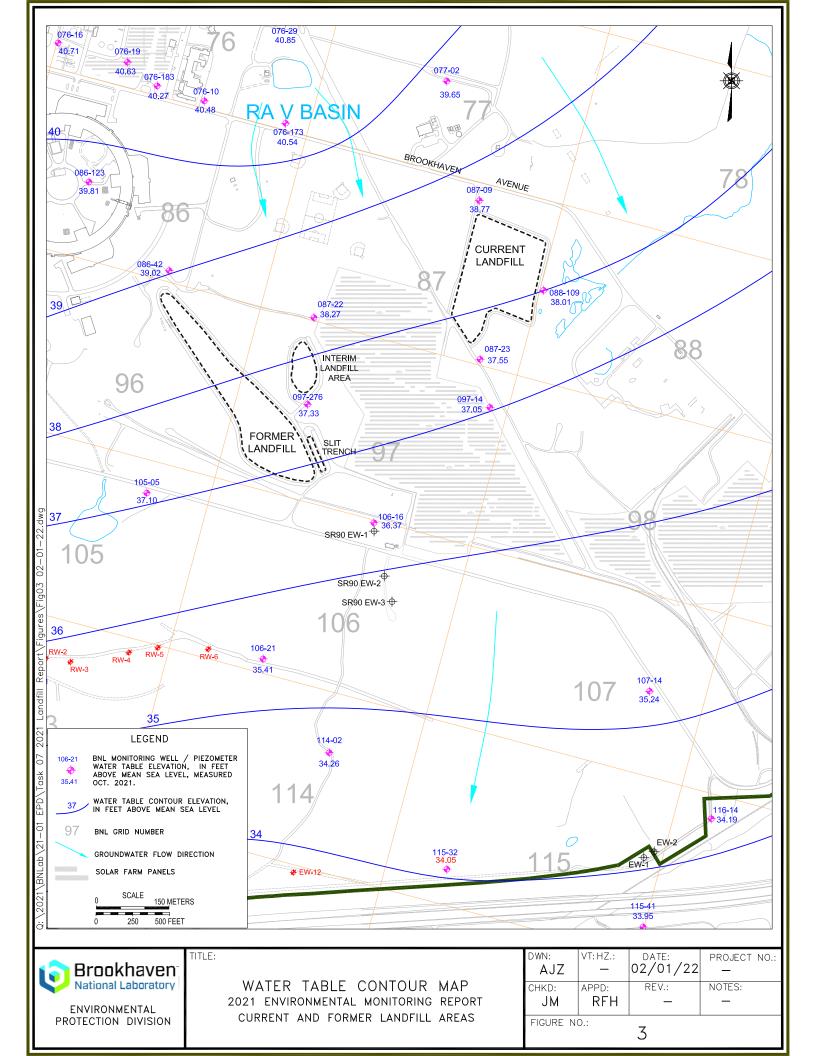
DWN:		DATE:	PROJECT NO.:
AJZ	_	02/01/22	_
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	_	_
FIGURE N	0.:	1	

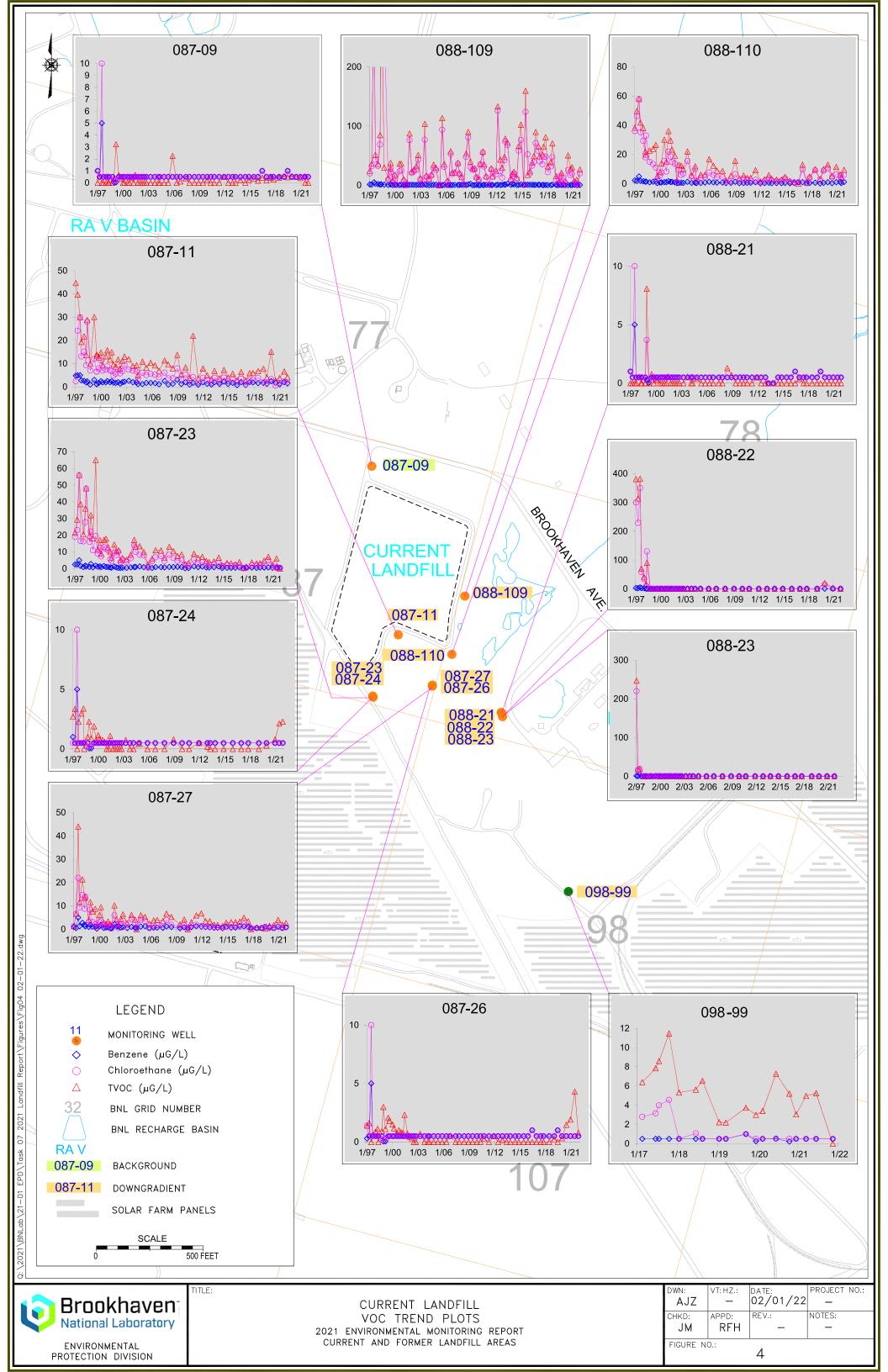


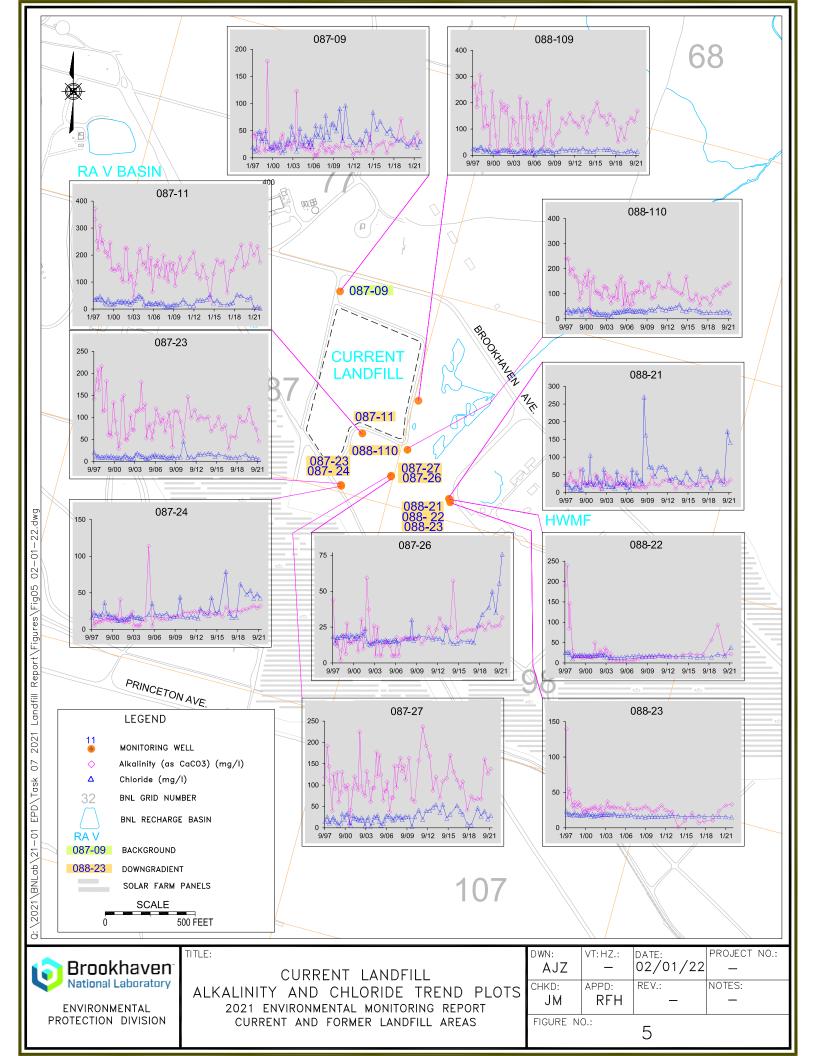
ENVIRONMENTAL PROTECTION DIVISION

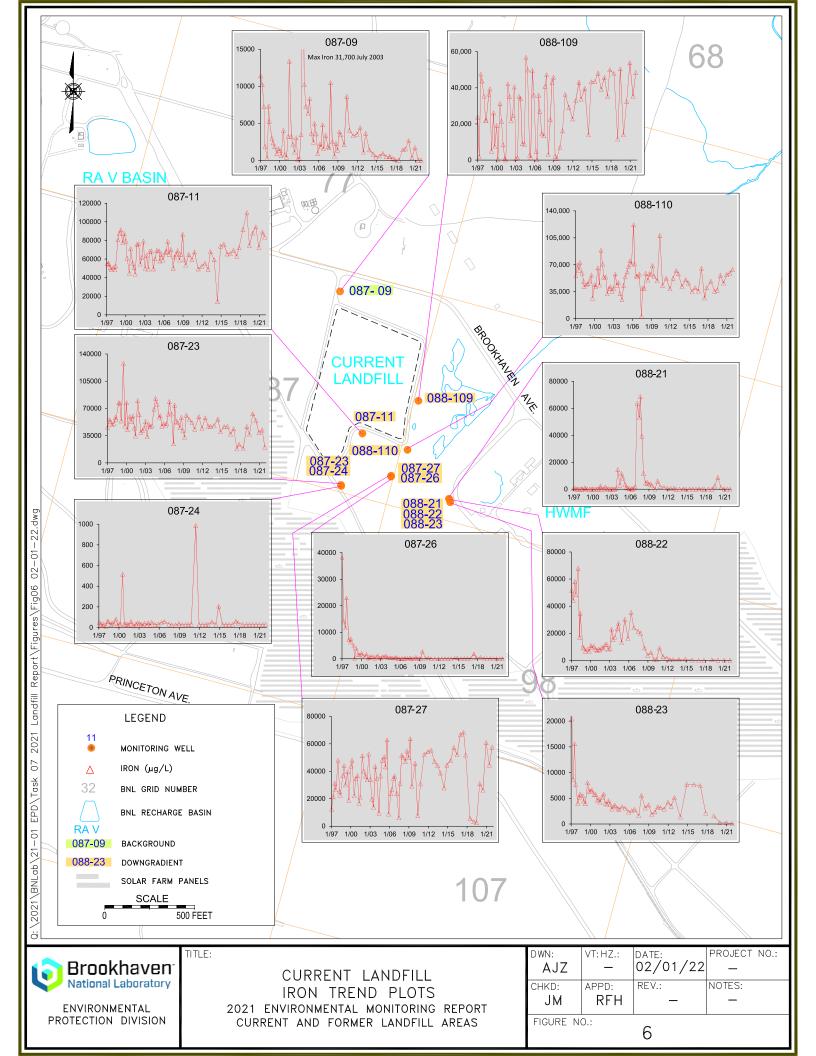
MONITORING WELL LOCATIONS 2021 ENVIRONMENTAL MONITORING REPORT CURRENT AND FORMER LANDFILL AREAS

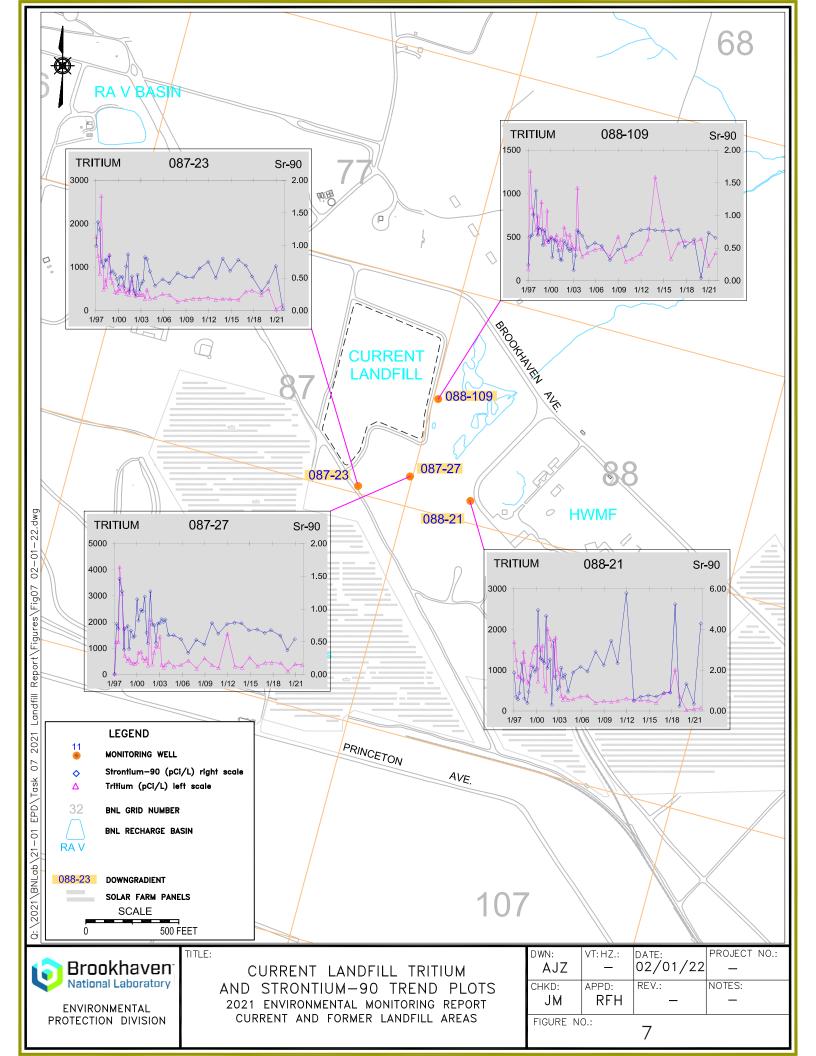
DWN:		DATE:	PROJECT NO.:
AJZ	_	02/14/22	_
CHKD:	APPD:	REV.:	NOTES:
JM	RFH	_	_
FIGURE N	0.:	2	

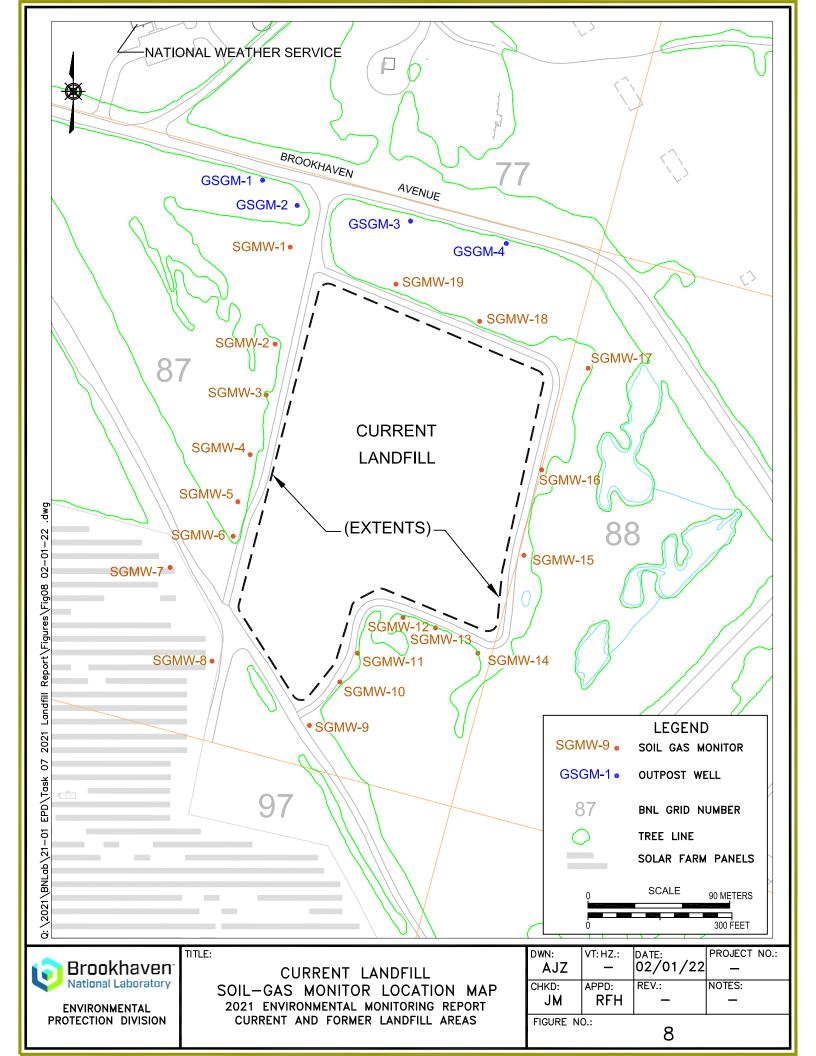


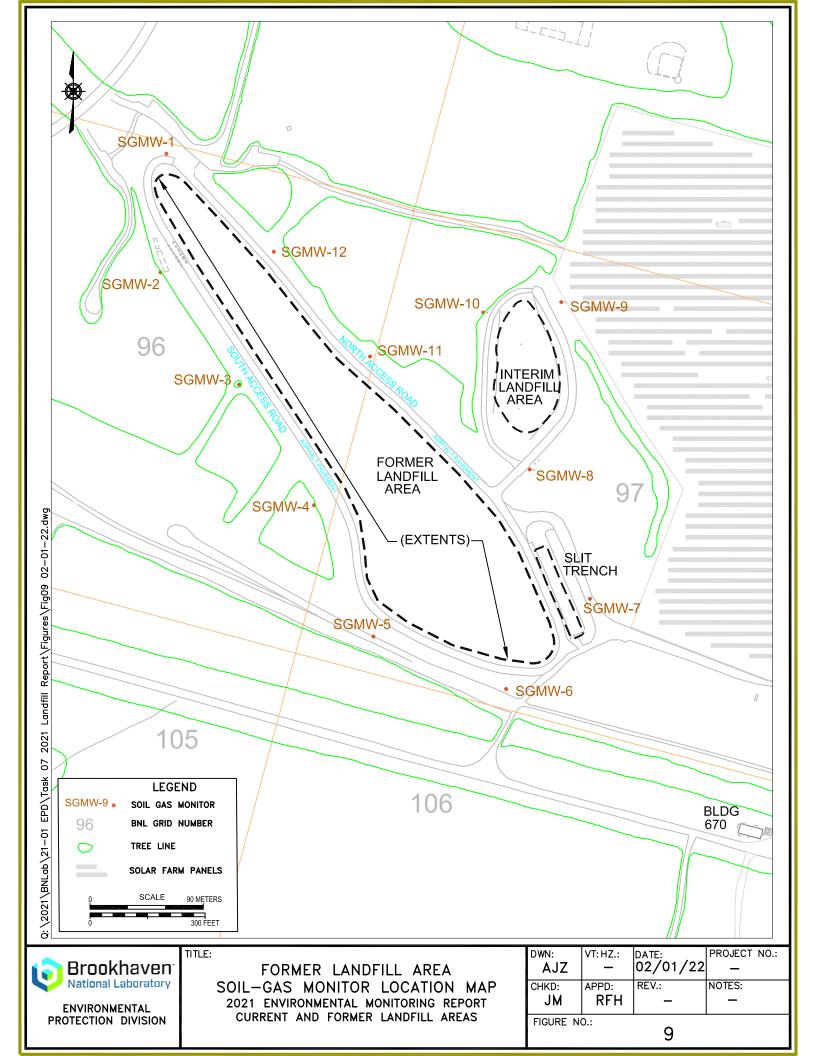












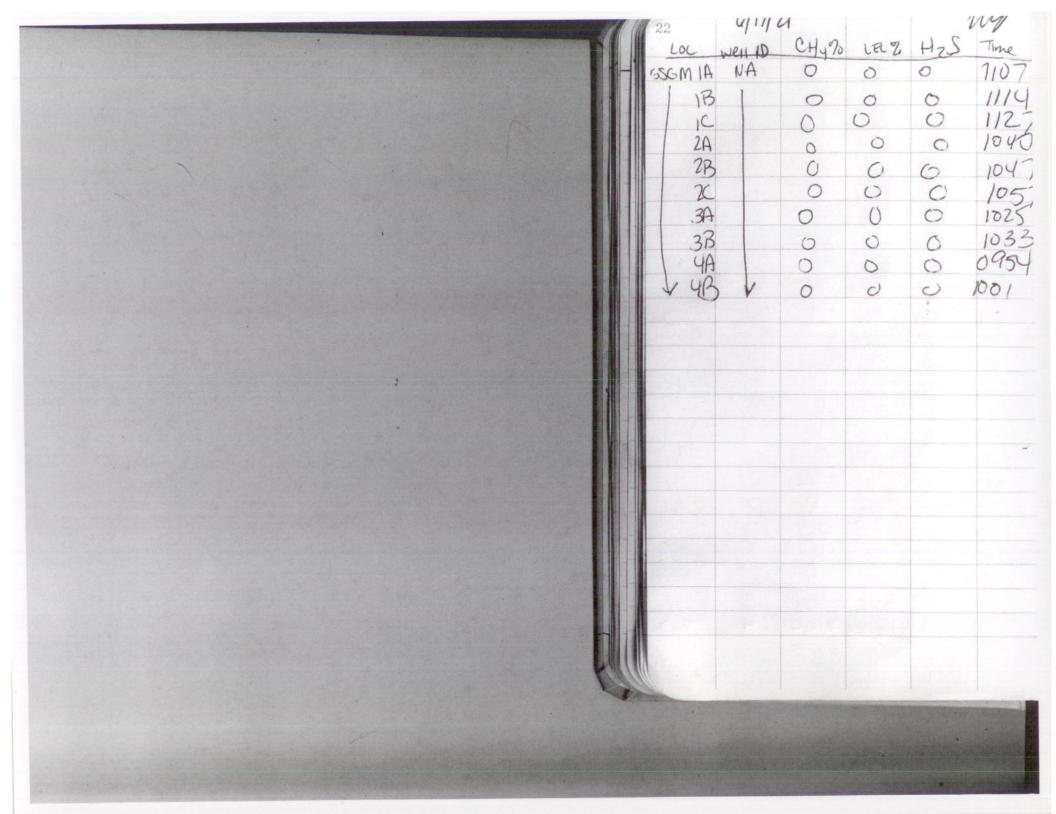
#### Appendix A

Soil-gas Sampling Field Notes

	1. 500.01 1	01001011	7	-
3 24 21 C	wrent (	ananij	SCD	
50 cloudy press			180	m Time/connect
Location WELLID		Lel %	H25 pp	m Tronger
SGM - 1A 687-62	- 6			1006
1 B 087-78	8.8			1113
IC 087-79	9.2	2100 184		1123
2A 087-63	42.	>100 842	0	1129
2B 087-80		7100 724		1136
1 2C 087 81	36.1	>100 722		1146
3A 087 64				1344
3/24/24 33 087 82		2100 822	8	1351
-1 36087 83		HIS 0015	16	1409
4A 087 65	36.7	> 100 734	0	1414
43 087 84	33.8	2100000	3	1421
40 087 85	26.0	>100 520	3	1432
5A 087 66		>10054		1438
5B 087 86		2100 924	14 580	1444
5087 87	19.8	210034	0	1454
6A 087 67	8.8	7100 00	0	1501
68 067 - 88	28.6	>100 512	1	1508
± 6C 087 89		2100524	2	1518
7A 087 68	0	0	0	1131
73 087 90	0	0	0	1137
JS 76087 91	0	0	0	1.0
34 8A 087 69	0	O	3	1147
88087 42	O	1	0	(H)2
1 8 087 93		0	0	(178
2007 95	0	0	0	1208
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18		curren	it lands	I U		3	125/2	U - C	urrent (	andfill	2 1019	19
	WELLIO	CHU TO	18170	4.5	time Commo		170	7/0 1/001	undity CH-70	let 2	His	Time/comot
igm - 9A		0	0	0	1320 1			NA	. 0	O	0	1029
	087 94	0	0	0	1327	0.001	13		O	0	0	1035
90	087 95	0	d	0	1338		10		0	0	O	1046
10A	087 71	2.5	50	0	1343		2A		0	0	0	1556
103	087 96	6.7	\$100 134	0	1351		28		0	0	0	1603
	087 97		7100,20		1400		20		0	0	0	1812
	087 72		82	0	1405		3 A		0	0	0 1	543
118	087 98	2.1	42	0	1413		3B		0	0	0	1550
12A	087 73	35.7	>100 mg	11	1418	1	4A		0	0,	0	1530
12B	087 99	28.6	>1005°	0	1425		4B	1	0	0	0	1538
13A	087 74	.2	5 4		1430							
133	087 100	22.7	110045	0	1437							
	081 75	0	0	0	1442							
	087 101	1.0	21 20	0	1448							
15A	088 111	0	O)	0	6959				le de la constante de la const			
158	088 114	0	0	0	1006 38							
16A		0	U	0	0943							
16B	088 115	0	0	0	0950 1					,	7.50	
	088 113	. (	2	0	15521						E(0)	-
178		. (	2	0	16001							
1814	088 76	0	0	0	15383/2							, i
18B	088 102	0	20	0	15117							1
19/4	088 77	8.00	17 14	0	1525	-						
1 1913	088 103	7.3	Nr. 001<	0	15321	-				4.6		
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20 press 29.72 Hg current landfull 6/26/21	6/17/21 - 730	my my
Location WELLID CH420 LEL % H2S time comm	oressue 29.89 HD	LELTO H2 Sport Time
SGM 1A 087-67 10.1 >100202 1 1000	SGM- 84 087-70 0	0 0 1349
1 9B 087-78 9.5 > 100,00 0 1010	F 19B 087-94 0	0 0 1356
AC 087-79 8.2 >1000 0 1021	90 087-95 0	0 0 1406
20A 08763 43.7 >100 414 3 1324	10A 087-71 15.8	2100316 19 414
28 087-80 42.0 > 100 8 40 27 1330	108 087-96 14.8	7100201 7 1421
BC 087-81 39.9, 2100AD 0, 1340	100 087-97 12.7	210029 4 1432
3A087-64 51.4 21041 29 1155	\$ 11A 087-72 14.2	>100284 12 1438
BB 087-82 48,4 >100 aus 21 1200	11B 087-98 14.4	7100288 0 1445
3 42 087-65 420 >100° 0 7 1210 42 087-65 420 >100° 5 1125 42 087-84 29 7 >100° 0 1133	12B087-99 32.6	1100 5255 1451
5 40 087-65 420 >100 5 1125	111100	700
4B 087-65 420 >100 5 1125 4B 087-84 39 70 >100 0 1133	13A 087-74 1.2 13B 087-100 29,6	125 0 125
	14A 087-75 001	100 0 1515
SHOO 100 01 72	14B 087-07 00.1	
5B087.86 25.7 >100514 0 1104 5087-87 20,9 >100418 0 1114	15A087-11 0	0 0 1527
(A08767, 0 0 0 1028	KB088-114.1	1 0 1534
6A 08767. 0 0 0 1028 6B 087-88 30.4 >10041 1 1035	16A 088-112 O	0 0 1544
6 087-89 29, 1>100582 4 1045	LB 088-115,	2 0 /55)
7A 087-68. O 2008 00 0001411		0 0 1556
1 7B 08790 Q.2 0 1408	173 088-114 1.0	20 0 6034
2 70 087-91 0 0 0 1419	18A 087-76 O	0 0 1609
S CA NET G G G B 11/25	1 2 2	0 0 1613
1 88 087-92 0 0 0 1432	1 19A 087-T7 3,4	1808.8 G 0937
86 087-92 0 0 0 1432 8 087-93 0 0 0 1442	1 18 B 087-102 C 191A 087-17 3,4 4921 PB 087-103 15,6	71003 4 0945
	MAIN	
PALL		Rete in the Rain

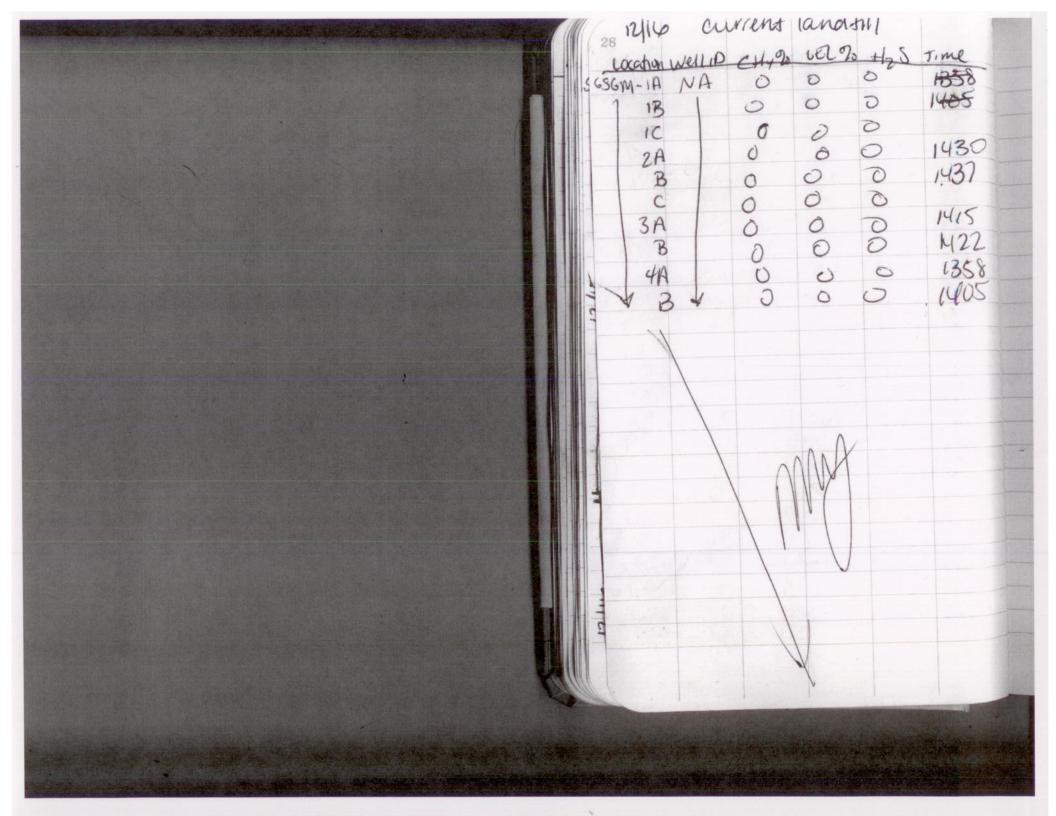


192121 ° Hg	curr	ent lane	1411	Cloudy 23
LOCATION WELLD			à +125	
SGM-1A 087-62	7.3	710014	6	1014/
9/24 1B 087-78	6.8	>100 13	6 1	1021
11.1C 687-79	5.5	7100	0	1030
2A 087-63	45.1	710090	3	1036
1 23 087 80		> 100 944	23	1042
20 087 81		>100 958	5	1952
3A 087 W	37.6	2100/2	25/	1058
13 087 82		700 1010	27	1105
- C 087 83	51,2	>100 1024	13	1121
1 4A 087 656	40,9	2100818	6	1128
1 B 087 84:	37.6	2100 752	11	1134
1 °C 087 85	29.2	7100 SY	18	1148
5A 087 66 2	18.0	>100900	1	1154
B 087 86 7	26,6	>100532	3	1200
rc 087 87	19.1	>100382	1	12/1
6 A 087 67	1.5	31	0	1416
13 087 88		2100584	7	1422
JC 087 89.	25,7	100 94	4	1432
7A 087 600	609	3 000	6 1	1436
3 1 3 087 90	0	0		1450
10 087 91	0	0	0	1500
8 A 087 69	()	0	0	1506
18087 92	0	2	0	1512
1 CU87 93	0	2	0	1524
			0	.01

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11	M(24	MITEIN	· ·······	1	123/21 C/0 C/0 C/0 WILLIO	ndy .	29.8	39 11 4	lg 25
M.	location WELLIA	CHY 20 LEL 20	H2S	time	Location well in	CH470	LEL 20	H2S	times 1119
Щ	19232 9A 087 70	. 0 0	0	0951	GSGM IA NA	0	2	0	()) 1
	BOS7 94	0 0		958	18	0	0	0	1129
	, 087 95	0 0 0	0	1007	IC	0	0	0	1135
	10A087 71	19.0 >1000	32	1013	24	0	0	0	1350
	3087 96	177 11000	1/	1019	В	0	0	0	1357
	C087 47	13,9 >10020	,0	1029	C	0	0	0	1407
	11 A 087 72	20.1 71000	27	1034	3A	0	0	0	1337
	B087 98	13,9 >100 mg 20.1 >100 mg 18.7 >100 mg	4	1941	B	0	0	0	1344
	12A 087 73	42.8 71000	41	1041	4A	0	0	0	1324
	3087 99	1/3 1/2 1/4		1056	3 *	0	0	()	1331
		27/1- 2100	6	1100					
		27.4 21000		1107					
	92421 14 A 087 75	0.3 6	0	1558					
	BO87 101		-	1605					
	15 A 088 111		0	1609					
	3088 114		0	1615					-
	16 A 088 102		0	1545 Note:					
	3 % 115	_	0	552 justin					
	17A 088 103	0 0	0	154 m					
	B 287 114		0	15 cg 17					
	18 A p87-76	0 0	0	1456					
	10087 107	9.0 d 100 9.0 x00 100 5 15.9 >10038	0	1502		1			
	194087 77	. 9.0 xco	0	1439					
	1 (308) 103	15,4 >1000	0	1445		-			
13								D	to in the Rain
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	26 11/	SI Uppy wie	101 ~	A-3111	4834	)7	415-1	पान्य				27
	Mybcah 838	Ways CHy 70	101%	H2S	June   Course	10	notion	Mellip	CHYT		H2S	timekomi
- 13	SOM- HA O	87-62 8.9	3100 178	1	1022	SOM	- 9A	087-70	0	0	0	1136
	13	1-78 7.8	>100,90	2	1030	3	18	1 94	0	D	0	1143
	1111	- 79 6.0	>10000	1	loup	117	40	1 95	0,	0	0	1153
	2A	-63 45.9	510090	0	1045	1412116	10A		. 0	坞口	D	1354
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	1 +0	-81 43,1	3100gur	6	1102	1	de	1 97	6.3	200 in	5	1411
	3A	-64 23.6	21002	311	1108		IIA	1 72	9.0	061 OQ1C	5	1416
	11 18	-82 48.3	MODOL	H			43	98	4.1	83 22	0	1423
	11 rc	1-83 44.5	710040	8	1115 500		MA	13	29.8	X00 596		1427
	\$ 4A	-65 32.0	المال محملا	D	1133		LB	99	35.1	20002		1434
	7 18	-84 285	710050	6	1141		13A	1 74	22.2	2100444		1439
	7 18 C	1-85 18.7	>1000	3	1151	in	13	100		2100 534		1446
	5A	1- We 2.7		0	1156	यमि	IYA	1 75	0	0	0	1451
	13	-86 15.1	Si00 302	6	1202	4	UB		.1	1 2	0	1428
	VC	-87 13.8	200276	1	121202			088-111	0	0	0	1503
	1 6A	-67 5.9	2100 118	0	133)		43	1 114	0	0 (	)	1509
	1 18	-88 27.7	3100554	4	1337		16A	112		0	0	15.39
	1 VC	-89 23.9	>100 450	2	1347		,13		Ó	0	0	1545
	TOA	-68 0		0	1111		CONTRACTOR OF THE PARTY OF THE	100	0	1)	0	1550
	13	-90 0		0	1117		73	4 116		0	O	15578
	Vc	1-910		O	1128		19 A	087-76		0	9	1603
	8A	-69 0	- 1		1049		中在	1.10)		Ó	0	1609
	= 18	-92 0	0	0	1055		(9A	177	0	0	0	1614
	21/10	1-93 0	0	U	1105		13	2103	Ó	O	6	1620
		1 10 0			11.	V	. 0	, ,			U	
The state of the s						4					-	lite in the Rain
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	1. Yost	former	Landtill	8/26/	1020 mb 5% humidity	(con	1.)				(0)
	on [ WELL 10	CH4 1/0	Lel %		Comments	Location	Lucuio	CH490	Lel 90	H2Sppn	Conne
SGMI		0			0944	- comments	A 1097-60	0 0	0	0	1148
114	B 096-42	4.40	824	0	1011		B 097 61	1-0	0	0	1154
	2A 1096-43	0	d	0	1027	11	A 097-62	0	0	0	406
	2B1096-44	0	0	0	1034		B 097 63		0	0	1414
	3A091"45	00	Ruen 8	2818	1045 130	12	A 094-49	0	0	0	1437
	3B 096-40	0 40		00	10552130	1 12	B1096-50	0	0	0	1444
AND ADDRESS OF THE PARTY OF THE	4A 1096 47	1	0	0	1318	1					
	4B 094-48		0	0	1325		1				
	5A 097-50	0	0	0	1054						
AND THE RESERVE OF THE PARTY OF	5B 097-51		0	0	1105		1				
Control of the Contro	6A 097-52		0	0	1107	1	,				
	OB 097-53	0	0	0	1122			1			
	7A 097-54	0 0	0	0	1122			1			
	7B 097-55	1	0	0	1129						
	8A 097-56		0	00	1135		1		1		-
	8B 097- 57 11A 097- 58	0	0	0	1338		//	11,	1		
	9B 097-59			0	1345		//	M	1		
	10017-3	0	10	0	1373		/	,	1	1	
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										4	5,540

#### Appendix B

Monthly Landfill Site Inspection Forms

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Mod	me of Inspector(s): Eric Kram	ec.				*	
Date	e of Ingresti	at the second	<del>-</del> -	12.			•
Purp	DORE of Ingrestion	Se Strain and an arrangement	-				
Time	e on Site:	vy Rainfall R	Reported Incid	lent			
Time	e off Site:			.011			w.
Weat	ther Conditions:						
							6-1
	-			- -			
А. Ц	nspection Checklist	*	r.				
	Component	-					
<b>1.</b> 0	Londen C	Excellent	bserved Con Fair			Further Ac	tion Required
	Landfill Cap:		rair	Poor		Yes	No No
	Vegetation Cap		<del></del>			-	110
							-/-
	Gas Vents						-/,
2.0	Drainage Structures:						
	Toe Drain	/			Ş		
	Drainage Channels	11					,
	French Drains/Outfalls	1			_		1,
	Subgraface Design De	1,					7
•	Subsurface Drainage Pipes/Outfalls Manholes						/,
	Recharge Areas						1,
	Troiming Alegy				<u> </u>		//
$\mathcal{A}_{I}$	Monitoring System:						1.
	Soil Gas Wells	,					
	Groundwater Wells			-			
٠.	Wells				-		1
1.0	Site Access:						
	Asphalt Access Road				z	8 ,-	
	Crushed-Concrete Access Road	1					<u> </u>
3. Descr.	iption of Further Action Requirements:				-		/
. Locatio							
, LUCRIIC	Conditions:						
DSCIVED (	Conditions:						
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Maan	e of Inspector(s):	Mer				•
_		0161				
Date	of Inspection: 2-26-21	· · · · · · · · · · · · · · · · · · ·		•		
Purp	ose of Inspection:	and the little and th			•	£
Time	on Site:  Routine H	eavy Rainfall	Reported Incid	lant		
Time	off Site:		1 200	TOTAL		
West	ner Conditions:				W.	
• • • • • • • • • • • • • • • • • •	er conditions:				8	
		-		4.		•
Δ T				-		
24, 111	spection Checklist		*			
L	Component		01-			
1.0	T	Excellent	Observed Con			Further A -45
1.0	Landfill Cap:	Lacenent	Fair	Poor		Further Action Required Yes No
	Vegetation		T :			210
	Сар				1	
	Gas Vents		To a second		·  -	
				·	  -	
2.0	Drainage Structures:	-			L_	
	Toe Drain	/		¥	5	
	Drainage Channels					
	French Drains/Outfalls					1
	Subgrafice D	7,				
•	Subsurface Drainage Pipes/Outfalls Manholes					
	Maimoles		•			
11	Recharge Areas				W.	
(( ),	Manuel		—— <u> </u>			
,	Monitoring System:					
	Soil Gas Wells					-
	Groundwater Wells					
	<b></b>	L.			. —	
4.0	Site Access:			•		
	Asphalt Access Road				•	
	Crushed-Concrete Access Road	1				
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B. Descri	ction of Further Action Requirements:				-	
		180			-	
1. Location	n:	$\nu$				
Observed C	onditions:	<u> </u>	- Annual of a			
	-					
• /	·					
Recommend	ations:					
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PIE	dene of Inspector(s): Eric K	ramer		,	
Da	ate of Inspection:		150		
Pu	TDOSE of Ingression	19	7.	ž V	100
Lu	me on Site:	Heavy Rainfall Reported Inc	cident		
_ 110	ne off Site:	-			
Υe	eather Conditions:				
		· · · · · · · · · · · · · · · · · · ·		,	
<b>A.</b>	Inspection Checklist				
		* .			
1	Component	OL.			
1.0	Landfill Cap:	Observed Co Excellent Fair		Further Action Re	
	Vegetation	Pau	Poor	Yes N	quirec
	Cap		T		0
	Gas Vents		+		
2.0	Drainage Structures:			9	
	Loe Drain		¥i .		
	Drainage Channels	-1/		/	
	French Drains/Outfalla	4			
<u>\$</u>	Subsurface Drainage Dipos/Outs 11			1	<u> </u>
		1			
	Recharge Areas				
<u></u>				1,	1
	Monitoring System:				
	Soil Gas Wells		•		
	Groundwater Wells	1			
4.0	G*4			,	
4.0	Site Access:				
	Asphalt Access Road		2	9 8	
	Crushed-Concrete Access Road				
3. Descr		. V.			
	ription of Further Action Requirements	:	26 <u>1</u>		
. Locati					
bserved	Conditions:	Road, CAP		* * ×	
147	1/2 #25	, , , , , , , , , , , , , , , , , , , ,		-	
•	Vese la lion	Growth on Road.	C-01 11	1	
		715000,	GOPHER Holes	14/ON CAP	
commen	dations:				
	CONTACT G		·		
	(A) ( )	rounds to Remove,	West Time	1/ /20	
	1.0 Golfher He	0/45	ejejation al	Of Fill	
				8	
				7	
				8	
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المار ا	6 /	/	• •		
PYOAL	ne of Inspector(s):	TA M.C			
Date	of Inc.		ω.		
Pur	of Inspection: 4-29-2	1	. , .		
Tim	cose of Inspection: Routine H	leavy Rainfall Reported	•		
Time	off Site:	leavy Rainfall Reported	Incident		
West	her Conditions:				
пощ	mer Conditions:				
A. Ti	reportion Cl. 1	· · · · · · · · · · · · · · · · · · ·	·		
	aspection Checklist				
	Component				
-	Component	Observed	Condition		
1.0	Landfill Cap:	Excellent Fair	Poor		Further Action Required
•	Vegetation		FOOF		Yes No
	Cap			7 ~	
	Gas Vents			1 · L	
	·		<del></del>		
2.0	Drainage Structures:				
	Toe Drain		*	₿e	
	Drainage Channels		T		
	French Drains/Outfalls	1			
	Subsurface Drainage Pipes/Outfalls				
	Manholes	1			
	Recharge Areas	4			//
1	Monitoring System:				
	Soil Gas Wells	1			
	Groundwater Wells	1/			
4.0	Site Access:			. L.	
	Asphalt Access Road	- X		9	
	Crushed-Concrete Access Road	W.			
- D.				-	1 6
B. Descri	ption of Further Action Requirements:				
				L	
1. Locatio		and Cal			
Observed (	Conditions:	DAG CAT			
	Veretati	of Growing on R			
	) - 19/1	BLOMING ON B	oads, CAP		<del></del>
Recommend	loti-	0	/		
·	will of will of	Contact Grounds	F 0		
		in Growes	70 KeMOU	le Vegeta	Tion
	GoPher	Holes were Filler	1	0	1
		Joseph Pilled	IN From	-AST MONT	1
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Note	ne of Inspector(s): Eric K	rap	1.e.C				12	
			141					1
Date	of Inspection: 5-26-21	<u> </u>	· · · · · · · · · · · · · · · · · · ·	-	•			
Ригр	ose of Inspection.		·					
Time	on Site:	eavy	Rainfall	Reported Inc	cident			
Time	off Site:							
Weatl	her Conditions:							
								*
A. In	spection Checklist				_			
	- Post Checking		×					
	Company		v *					
<u> </u>	Component		-	Throward C	- 2			
1.0	T - Year -		Excellent	Observed Co			Further	Antina D
2.0	Landfill Cap:		DACCHEIL	Fair	Poor		Yes	Action Required
	Vegetation		/	-			163	No
	Сар		1			7 .		/
	Gas Vents			1		7 '	-	1
				,	1	-		/)
2.0	Drainage Structures:						·	
	Toe Drain				E	•		
	Drainage Channels				T	٦ ,		3.0% (S)
	French Drains/Outfalls				<del> </del>	-		1
	Subgrafice D		7			L		· /
•	Subsurface Drainage Pipes/Outfalls Manholes				<del> </del>	1 1		
	mannoles .					1 . [		
	Recharge Areas		7			] [		
	36-1					J F		
.,,	Monitoring System:	1						
	Soil Gas Wells	ŀ	/			1		*
	Groundwater Wells	ŀ	-/	· .		Г		
		L				l  -		
4.0	Site Access:	Г			18			
	Asphalt Access Road	-	~ <u> </u>			•	** ***	
	Crushed-Concrete Access Road	-	/	V. 1		Ċ.		
		Į.	V .			<u> </u>	/	
B. Descrip	ption of Further Action Requirements:				·			
			¥					/ .
1. Location	onditions: Ashalt	1).	1					
Observed C	onditions:	Ko	ad		3 <b>.</b>	•		
	And the second s				-			
•	Vegetation Gro	Win	us Throve	h Asah	17			
	V		0	·	211		•	
Recommend	ations.							· ·
	ations: Contact Gro	UNI	25		<u> </u>			
<del></del>	Note: LANd	Fil	CAP Mai	1-11	7 00			
		- 1	JA 1100	ved /a	ST MON	Th.		
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#### BROOKHAVEN NATIONAL LABORATORY LTRA SITE INSPECTION FORM

Date o	ion (AOC): of Inspection: of Inspector(s): ose of Inspection:	Current Landfill and V 6/15/21						Reported In	cident	
A.	Inspection Che	ecklist								
Req	Component		Ob	serve	d Con	dition	Fu	Further Action		
		Excell. Fair Poor Not Applic. Landfill Cap/Soil Covers/Wetlands:					Yes (describe)			
1.	Vegetation (e.g. Soil (Cap/Cove	grass)	X					rows evident	X	
2.	Drainage Struct Standing Water Toe Drain Drainage Chant French Drains/G	nels	X X	X		X	None Some vo	eg. in channels	X   X   X   X   X   X   X   X   X   X	
	Manholes Berms Roof Drains Recharge Areas Other:	-	X			X X X			X X X X	
3.	Monitoring Systems Soil Gas Wells Groundwater Wells Gas Vents Other:		X X X				Cleare	d recently d	X X X	
4.	Site Access: Asphalt Access Crushed-concre Fence Gates/locks LUIC Signs Other: Stairs acc	te Access Road	X X X X			X	Gates la 3 signs	ocked in place	X	
5.		nuthorized work activitie	s and/or u	ınauth	orized	access has o	occurred?	☐ Yes	⊠ No	

#### **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.

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- / 1	T 1/		• 1		
Propin	e of Inspector(s):	Mer		(A)	•
_		410			
Date	of Inspection: 6-30-2/				₹
Purpo	ore of Income			18.	e e
Time	on Site: Routine Heav	ry Rainfall Reported ]	Incide_4		
Time	off Site:	10001001	шенави		
Wast	on site:				
11 CHILD	ner Conditions:				
		·			
			-		
A. Ins	spection Checklist			. 9	
	Component	6			
	component	Observed	Q 7111		
1.0	T	Observed ( Excellent Fair		Furth	on Asti n
, ,,,,,	Landfill Cap:	Excellent Fair	Poor	Ve	er Action Required
	Vegetation			Yes	No
	Сар				
	Gas Vents				
	·				/
2.0	Duo! a				/
	Drainage Structures:		926	1	
	10e Drain				. Service
	Drainage Channels				
	French Drains/Outfalls	1			
2.7	Subsurface Drainage Pipes/Outfalls				1/1
	Manholes				1,
	Recharge Areas				1
	Areas				1
-2x	Manite				1
,	Monitoring System:				
	Soil Gas Wells				
-	Groundwater Wells	-			1
•					1
4.0	Site Access:				
	Asphalt Access Road		1	8	
	Crished C				
	Crushed-Concrete Access Road				T
Pagani-			1		
. Descrip	tion of Further Action Requirements:				/
	A .	•			
. Location	ezawafill CAP, /	00/1/201			
bserved Co	onditions:	Sphalt Roads			
	Caraca	1			
•	Grass getting a li Vegetation Growing t	the love on CAP.	0.11		
		· · · · ·	rossisty M	OW IN AUGUST	
noomma- I	vogetation Growing t	hooved Acide II	ct /	0	
commenda	uions:	h Asphalt	Edges of Roa	of Need to be in	and whacked.
				E TO TO W	ad whacked.
		ę		· · · · · · · · · · · · · · · · · · ·	
•					- National Control
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Matin	e of Inspector(8): Eric Kra	M ~		
	Tild	10	*	
Date			. *	5
Purne	CT		•	
Time	on Site: Routine Hea	vy Rainfall Reported In	4.	
111110		vy Rainfall Reported In	cident	
_ lime	off Site:			
Weath	ner Conditions:			
		· · · · · · · · · · · · · · · · · · ·		
			<del></del>	, -
A. In	spection Checklist		<del></del>	
3881	Special Checklist	· v		
	C			
	Component	OI- I T		
40.		Observed Co	ondition	Fronthan
1.0	Landfill Cap:	Excellent Fair	Poor	Further Action Required
•	Vegetation			Yes No
	Cap			
	Gas Vents		<del>                                     </del>	
	Cas vents		-	
2.0				
2.0	Drainage Structures:			
	Loe Drain			
	Drainage Channels			
	French Drains/Outfalls	1		
	Subgreface Design		<del></del>	
•	Subsurface Drainage Pipes/Outfalls Manholes		<del>                                     </del>	
	Recharge Areas			
( ).	1			
J.	Monitoring System:			
	Soil Gas Wells			137
	Groundwater Wells			
•	. World			
4.0	Site Access:	,		
	Agabalt A			
	Asphalt Access Road			
	Crushed-Concrete Access Road	/		
- n -				
B. Descrip	ction of Further Action Requirements:	,		
		e e		
. Location	:CAP			
bserved C	Cri			
	orditions: Grass getting	A Lit Hist m		
<del></del>	<i>f</i> ()	() 1. 1700	W IN AUGUST O	R September
	Asphalt Road - 1:	2001/11/25		- Li
	11 11 10 10 W	Deeds/vegetation	on Road	
ecommenda	ations:			
	(-15			
1	CONTACT (	rounds .		
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all a	E /		· 1	a a	
by of THE	of Inspector(s): Lric Kr	aner			
Date of	f Inspection: $\chi$ - $\chi$ 7-21				
Purpos	a of I				
Time o	e of Inspection: Routine H	Ieavy Rainfall Reporte	ed Incident		
	ff Site:		- Lordoni		
	r Conditions:				
	2 CORRECTORS:				**
A. Insi	pection Checklist		·		
		*			
	Component	Observe	ed Condition		
1.0	Landfill Cap:	Excellent F:	air Poor	Further	Action Required
e -	Vegetation		7.001	Yes	No
	Cap				
	Gas Vents			'	
	Cus venus		-		1
2.0	Drainage Structures:				
	Toe Drain		*		
	Drainage Channels	1			1
	French Drains/Outfalls				
	Subsurface Drainage Pipes/Outfalls	4			/
	Manholes	-			1
	Recharge Areas	1			
1.					1
J	Monitoring System:				
	Soil Gas Wells	1			
*	Groundwater Wells		·		
4.0	Site Access:				
	Asphalt Access Road			· •	
	Crushed-Concrete Access Road				
B. Descrip	tion of Further Action Requirements:		2		
. Location		Road			
Observed Co	, , , , , , , , , , , , , , , , , , ,		<del>-</del>		e e
<del></del>	Grass getting A &	it high on LAND Fi	11 11 11		
	O Asph	alt and Edges .	Fla ACII	crowing through	h
commenda	ations:		Canpiril C		
	- C'UNTACT (	Grounds Again			· · · · · · · · · · · · · · · · · · ·
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Note	ne of Inspector(s):	Erick	TAMED		-1			
Purp Time Time	of Inspection: cose of Inspection: on Site: off Site: her Conditions:	9-28-21 / Routine I	and the state of t	Reported Inc	ident			
A. In	Spection Checklist							
-	Component			Observed Co	ndition		T	
1.0	Landfill Cap:		Excellent	Fair	Poor		Yes	Action Required No
	Vegetation		-	T . / -		_		110
	Cap Gas Vents			1,		,		
2.0	Drainage Stru	ctures.			L	_ [		
	Toe Drain	umu.						
	Drainage Chan	nels				Г		
	French Drains/	Outfalla				ŀ		
	Subsurface Dra	inage Pipes/Outfalls	-					
•	Manholes	mage ripes/Outlalls	1	4				
	Recharge Areas					-		1
	and a little					-		
-11	Monitoring Sys	form.				L		
.)	Soil Gas Wells	æm:						8
						Γ-		
	Groundwater We	:lls				_		),
4.0	Cita A							
4. V	Site Access:					10		
	Asphalt Access R	load		7.		-		5€0
	Crushed-Concrete	e Access Road				L		
. Descri	iption of Further Ac						/	7 :
		- A -		<u></u>				
. Locatio		···(A)	95/halt Ro	pad				
bserved (	Conditions:		7.10		,			
<del>.                                    </del>		Grass or	CAP CETTING	Hich				
		17 + 2	1.					
commen	dations:	Vegelali	ON COMING 7	Through A	sphalt			
		CONTACT	CAP CETTING TO Ground to 1	Mary / 0	7			· · · · · · · · · · · · · · · · · · ·
<del></del>			0700 4 70 7	1000 Ker	7000 Veg	eTation		
		·						
<u> </u>				·				
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	ACCIONAL P							
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#### BROOKHAVEN NATIONAL LABORATORY LTRA SITE INSPECTION FORM

tation (e.g. Cap/Cover Cap	oil Covers/Wetlands: grass) /Fill) tures:			Condition Poor Not Applic	Yes Gras Burr	s cut early Oct. ows evident  veg. in channels	q'd No
fill Cap/So tation (e.g. Cap/Cover :: nage Struc ling Water Drain tage Chann th Drains/Ourface Drain	grass) (Fill) tures: els outfalls	Excell.	Fair I	Poor Not Applic	Yes Gras Burr	s (describe) s cut early Oct. ows evident	No X X X
tation (e.g. Cap/Cover Cap	grass) (Fill) tures: els outfalls	X	X	Applic	Gras Burr	s cut early Oct. ows evident	X X X
tation (e.g. Cap/Cover Cap	grass) (Fill) tures: els outfalls	X	X		Gras Burr	ows evident	X
Cap/Cover ::	tures: els putfalls	X	X	X	None	ows evident	X
nage Struc ling Water Drain lage Chann th Drains/Ourface Drain	tures: els utfalls		X	X	None		X
nage Struc ling Water Drain lage Chann ch Drains/Ourface Drain	<b>tures:</b> els utfalls			X			X
Drain lage Chann lh Drains/Ourface Drain loles	utfalls			X			X
age Chann h Drains/O urface Drain	utfalls	X		X	Some	veg. in channels	
ch Drains/Ourface Drainoles	utfalls			X	Some	veg. in channels	X
ırface Draii ıoles			X	Λ	-		/ <b>1</b>
noles	hage Pipes/Outlans		21				X
				X			X
S				X			X
S Drains				X			X
arge Areas		X					X
::							
itoring Sys	tem•						
Gas Wells	•••••	X			Rece	ently cleared of veg	X
	ells	X			Loc	ked	X
/ents		X			Goo	d condition	X
:							
Access:							
	Road	X			Gras	s/veg in west road	
ned-concret	e Access Road			X			X
e		X					X
/locks		X			Gate	s locked	X
Signs		X			3 sig	ns in place	X
:: Stairs acc	ess to cap	X					X
	toring Sys fas Wells adwater Wo fents  Lecess: alt Access led-concret flocks Signs Stairs accence of una	toring System:  das Wells dwater Wells fents  Loccess: alt Access Road ed-concrete Access Road flocks Signs Stairs access to cap	toring System:  tas Wells  adwater Wells  Yents  Access:  Alt Access Road  ed-concrete Access Road  Vlocks  Signs  Stairs access to cap  Access:  X  X  X  X  X  X  X  X  X  X  X  X  X	toring System:  Sas Wells Adwater Wells Sents Secrets Secrets Sents Secrets Secrets Secrets Sents Secrets Sents Secrets Sents Secrets Sents Secrets Sents Secrets Sents	toring System:  Sas Wells Adwater Wells Sents Sents Sents Sents Sents Sents Sents Sents Sents Secrets Sents Secrets Sents Secrets Secrets Secrets Secrets Sents Sent	Storing System:   Gas Wells	toring System:  tas Wells  adwater Wells  tents  that Access Road  ed-concrete Access Road  Vlocks  Signs  Stairs access to cap  Recently cleared of veg  Locked  Good condition  Grass/veg in west road  Grass/veg in west road  Gates locked  3 signs in place  The concrete Access has occurred?  The concrete Access has occurred?  The concrete Access has occurred?

#### **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.

Dat Pur <sub>l</sub> Tim Tim	pose of Inspection: e on Site: off Site:	<u></u>	Rainfall ]			marten, o	Janns	
A. I	nspection Checklist				_			
	Component							
40.			Excellent	bserved Con			Further A	ction Required
1.0	Landfill Cap:		ZACEBEH!	Fair	Poor		Yes	No
	Vegetation					_	_	110
	Сар		1					
	Gas Vents	9						
<b>a</b> 0								
2.0	Drainage Structures	s <b>:</b>				4,		
	Toe Drain						**	
	Drainage Channels		-					
	French Drains/Outfal	ls	1			2.		
	Subsurface Drainage	Pipes/Outfalla	-					
	Manholes	1	-					
	Recharge Areas	¥	<del></del>					
			<u></u>					
	Monitoring System:					<u> </u>		
	Soil Gas Wells		1					9
	Groundwater Wells	=	/					
*	110113	,				-		
4.0	Site Access:	(	·			٠ ـــ		
	Asphalt Access Road					*	ě	
	Crushed Consess					_		
	Crushed-Concrete Acce	ess Road		7		<u> </u>		
B. Descr	iption of Further Action I	Requirements:			*			1
		ž.						
1. Location		+ access	Rock					
Observed		tation als	1000	<del></del>				
	Fort	Gaple hore	- Roc	dway -				<del></del>
· .	Grass Mowed	Tale Male	th.	Luc Fill.				
		001200 6	1",					<del></del>
Recommen	dations:	· L						
*		it growed	about	Vesitatus	1 and	aspher	604.6	
			ę			0-01/10	hores.	
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Nome of Inspector(s):	Janes Milliger	<b>\</b>	•			
Date of Inspection: Purpose of Inspection: Time on Site: Time off Site: Weather Conditions:	1130	y Rainfall Re	ported Incider	αt		
A. Inspection Checklist						
Component		Oh	served Condi	e tion		
1.0 Landfill Cap:	on.	Excellent	Fair	Poor	Further Act Yes	ion Required No
Vegetation Cap Gas Vents		V	1,			
Manholes Recharge Areas  Monitoring Sys Soil Gas Wells Groundwater We  1.0 Site Access: Asphalt Access F Crushed-Concret	nels Outfalls inage Pipes/Outfalls tem: ells Road e Access Road	grands. ag	W. Vesi	taky in Robbin	8	
scommendations:	e fower Brown	. De Road 1	way to	C		
PHOTO Take		2	and he	servore Dist	are Vegitah	۸

1 / 1	p.			• 1			
Non	e of Inspector(s):	James Mill	16us		a .		
Date Purpo Timo Timo	of Inspection: ose of Inspection: on Site: off Site: her Conditions:	12/15/2021	vy Rainfall R	- - Reported Incident			•
	9						
A. In	spection Checklist		¥			2	
	Component		0	haarral G. Wil			
. 10	-		Excellent	bserved Condition		Further A	ction Required
1.0	Landfill Cap:	:	Excenent	Fair P	oor	Yes	No No
	Vegetation			<del></del>			110
	Cap		7.				
	Gas Vents		/				
2.0							
2.0	Drainage Stru	ctures:			1.		<del></del>
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	Drainage Chan	nels					
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	Recharge Areas		1				
1)	Monitoring Sys	tem:					
	Soil Gas Wells	-can,	4				
	Groundwater We	Alla	V				
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4.0	Site Access:					L	
	Asphalt Access F	Pood				•	
	Crushed-Concret	o A D	/	V			
B. Descri		tion Requirements:			-		
1. Location		quitements.					
Observed C	Corditions:		*				
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Recommend			(a)				
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Name	of Inspector(s):	Eric Krame	es C	_				
Date o	f Inspection:	1-29-21	7	•			(8) 2	
	e of Inspection:		D-1-6-11 D					.5 f∎3
	on Site:	Z Routille Heav	y Rainfall R	eported Incid	lent			
	ff Site:							
Weathe	er Conditions:							
(a)					-			
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A. Ins	pection Checklist							
	Component	;	0	bserved Con	dition		Freedless	
	e e		Excellent	Fair	Poor		Yes	Action Required
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	Gas Vents	· ·						
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2.0	Toe Drain	uctures:				,		
	Drainage Ch	annels						J,
	French Drain							1
		rainage Pipes/Outfalls						<i></i>
	Manholes	8 F	1			-	<u> </u>	·
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0	Monitoring S							7
	Soil Gas Well					ſ		<del></del> ,
	Groundwater	Wells		25				
4.0	Site Access:					8		
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		rete Access Road			,	L		/
		Total Model				-		/,
B. Descr	iption of Further	Action Requirements:				L		
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Observed	Conditions:						:	
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Name	of Inspector(s): Eric Kran	ier				٠
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	on Site:	y Rainfall R	eported Incid	ent		
	off Site:			*	ê	
	er Conditions:			*	E E	
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A. In	spection Checklist					*
	Component	0	bserved Con	dition	3.	
		Excellent	Fair	Poor	Yes	Action Required
1.0	Landfill Cap:			, 1001	res	No
	Vegetation	1			` [	T /
(8)	Сар	/,				-
	Gas Vents					-
2.0	Drainage Structures:					
2.0	Toe Drain					
	Drainage Channels		/			
	French Drains/Outfalls	/				/,
	Subsurface Drainage Pipes/Outfalls	1				//.
	Manholes				·	/,
	Recharge Areas					/
)	9		L			
0	Monitoring System:				*	
	Soil Gas Wells	1,				/.
	Groundwater Wells					-
1.0	C'A A					
<b>*.</b> U	Site Access:			6		• *
	Asphalt Access Road	1				
	Crushed-Concrete Access Road					1.
B. Descr	iption of Further Action Requirements:					
. Dwa	-poor of ruther Action Requirements:		9			•
. Locati	on: Drainage Chan	INDE!				_ *
	Conditions:	,,,,,,,		<del></del>		·
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ecomme	ndations: HAVE remove	ed or spray.	ed in so	ring/Sunm	05	
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) Name o	of Inspector(s):	Eric Krame	√-					
Purpose Time or	e of Inspection: n Site:	3-30-21		eported Incide	dent			
					<del>-</del>			y •
A. Insp	ection Checklist	*						
Ė	Component		0	bserved Co	ndition		Further A	otion Domina
1.0	Landfill Car	):	Excellent	Fair	Poor		Yes	No No
£	Vegetation	•	1	· · · · · · · · · · · · · · · · · · ·		•8	<u> </u>	
¥								<del></del>
	Gas Vents	• .						1
2.0	Drainage Str	uctures:						
	Toe Drain	#						
								<i></i>
								7
	Subsurface D	rainage Pipes/Outfalls	1				Further Action Required Yes No	
			-			Yes No		
	Recharge Are	on:						
	Monitoring S	ystem:					*	21
								-1
	Groundwater '	Wells			-		<b></b>	
4.0	Sita Associ							
7.0		a Dand	<del></del>					
			1		,			,
	Clusticu-Colic	Tele Access Road						11.
B. Descri	ption of Further	Action Requirements:			*			
Date of Inspection: Purpose of Inspection: Purpose of Inspection: Purpose of Inspection: Prime on Site: Time of Site: Weather Conditions:  A. Inspection Checklist  Component  Excellent  Fair Poor  Yes No  Yes No  Cap  Cap  Cap  Cap  Cap  Cap  Cap  Ca			• · · · · · · · · · · · · · · · · · · ·					
	Date of Inspection: Purpose of Inspection: Routine   Heavy Rainfall   Reported Incident  Time on Site: Weather Conditions:  A. Inspection Checklist  Component   Observed Condition   Further Action Required Cap   Cap   Gas Vents   Cap   Cap   Gas Vents   Cap   Cap							
Date of Inspection: Purpose of Inspection: Purpose of Inspection: Time on Site: Time of Site: Weather Conditions:  A. Inspection Checklist  Component  Component  Component  Described Condition  Excellent  Excellent  Fair  Poor  Yes  No  Cap  Gas Vents  2.0 Drainage Structures: Toe Drain Drainage Channels French Drains/Outfalls Subsurface Drains/Outfalls Manboles Recharge Areas  Monitoring System: Soil Gas Wells Groundwater Wells  4.0 Site Access: Aiphalt Access Road Aiphalt Access Road Crushed-Concrete Access Road Aiphalt Access Road Crushed-Concrete Access Roa								
	ate of Inspection:  Tropos of Inspection:  The on Site:  Stather Conditions:  Inspection Checklist  Component  Component							
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7				•				•
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Name	of Inspector(s):		Mer				*
	f Inspection: e of Inspection:	4-29-21 Routine Heavy	Rainfall R	eported Incid	ent	* .	•
Time o					, , , , , , , , , , , , , , , , , , ,	•	
A. Ins	pection Checklist		2		-		
	Component			bserved Con	dition	Further	Action Required
1.0	Landfill Cap: Vegetation Cap		Excellent	Fair	Poor	Yes	No No
	Gas Vents	E	7			· · · · · · · · · · · · · · · · · · ·	1
2.0 4.0 3. Descr	Drainage Structu Toe Drain Drainage Channel French Drains/Ou Subsurface Draina Manholes Recharge Areas  Monitoring Syster Soil Gas Wells Groundwater Wells Site Access: Asphalt Access Roc Crushed-Concrete	s tfalls ge Pipes/Outfalls n: s Access Road					
. Locatio	on:	Prainage	channele				·
bserved	Conditions:		INC SAPliN	ss in ch	hannels		•
ecommer	dations:	CONTAC	T Grounds	to remo	ve		
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<i>)</i>								
Name	of Inspector(s):	Eric Kran	100					
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		-26-21		•				*
	e of Inspection: / I	Routine Heavy	Rainfall R	eported Incid	ent			100
Time or				•				
Time of						2		
Weathe	r Conditions:				_			
	-				-			
A Inci	pection Checklist							
· · · ·	pección Checkist	•						, (40)
	Component		0	bserved Con	dition		Thurst	·
200			Excellent	Fair	Poor		Yes	action Required
1.0	Landfill Cap:		,		, 2001		ຸ 1 ເລ	No
	Vegetation					7		
	Сар		7,			1		<del>-//,</del>
	Gas Vents					1		
2.0	Duoimana Stanton					-		
2.0	Drainage Structure Toe Drain	S:				<b>-</b>		
	Drainage Channels		/	/		1		
	French Drains/Outfa	II.		<i>V</i> .		1		
	Subsurface Drainage		7			4		/, .
	Manholes	r ipes/Outlans	<del></del>			}	-	
	Recharge Areas		1-			1		4
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0 .	<b>Monitoring System:</b>					]	v	
	Soil Gas Wells					-		/
	Groundwater Wells	*						<del>-/</del>
4.0	Site Access:							·
,	Asphalt Access Road							,
	Crushed-Concrete Ac	cess Road	/					/,
Dogoni	intion of Thurshau Author							. / .
o. Descri	ption of Further Action	Requirements:		4			•	
. Locatio	ın.	17-5-10-5	. Channels	*		2000 G		
	Conditions:				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
		Small Pin	c. Callina					
		-1/2/1 1110	2 SATTINGS			•		
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ecommen	dations:	CONTact G	rounde to	remove.	SAPLINES			
				1 - 7 - 50	111111111111111111111111111111111111111			
2.4		NOTE: CAP	Mowed					
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•			2000-000					
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## BROOKHAVEN NATIONAL LABORATORY SITE INSPECTION FORM

Date Name	cion (AOC): of Inspection: e of Inspector(s): ose of Inspection:	Former Landfill Area 6/15/21					andfills and slit trench)  Rainfall   Reported Incident	dent
A.	Inspection Che	ecklist						
Req	Component		Ok	serve	d Con	dition	Further Action	
			Excell.	Fair	Poor	Not Applic.	Yes (describe)	No
1.	Landfill Cap/S Vegetation (e.g. Soil (Cap/Cover Other:	r/Fill)	X	X			Grass recently cut	X
2.	Drainage Struct Standing Water Toe Drain Drainage Chant French Drains/C Subsurface Drain Manholes Berms Roof Drains Recharge Areas Other:	nels Outfalls inage Pipes/Outfalls	X X X X	X		X X X	None  Need vegetation removal	X
3.	Monitoring Systems Soil Gas Wells Groundwater Wells Gas Vents Other:	<b>stem:</b> Vells	X X X	X			Weeds cut recently	X X X
4.	Site Access: Asphalt Access Crushed-concre Fence Gates/locks Radiological Po Other: LUIC S	te Access Road		X X		X X X	4 signs in place	X X X X X
5.		nuthorized work activitie evidence:					occurred? Yes	☑ No

#### 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.

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:  Consequence Service S						
Name	of Inspector(s): Kraner	- -				
	-		-			
	Inspection: $6-30-21$		-			
	se of Inspection:	y Rainfall F	Reported Incid	ent		¥
	n one.		Forting Mold	CIII		
Weathe	er Conditions:	2				
				-		
				-		4.7
A. Ins	pection Checklist					
	Component		bserved Con	3141		
			Fair	Poor	Further	Action Required
1.0			2 411	1001	Yes	No
*	Vegetation	7				
*	Сар					4.
	Gas Vents		•		<u> </u>	1,
No. 1000					<u> </u>	
2.0						
						,
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		1,				/
	Subsurface Drainage Pipes/Outfalls					
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	Recharge Areas					
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0	Monitoring System:				ĸ	
	Groundwater Wells					
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4.0						•
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	Crushed-Concrete Access Road		1		<del></del>	
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	on:	III Vraina	ce Char	INc/s, As,	Phalt Road	•
oserved (	Conditions:					
	Grass getting	a liTHe lo	NO DN LAI	Wfill		
	Some Veretait	ion, PiNC 5	alliaco	in Cul Ve	As .	
	OGT V	eretation ,	founds -	through ASI	Phalt	
ecommen	dations.			0	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	ConTac	7 Grounds				
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Name	of Inspector(s):	_Eric Kra	Mar					٠
<b>.</b>	C.Y.							
		7-29-21						
		Routine Heav	y Rainfall F	Reported Incid	dent			\$ 0
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weathe	r Conditions:				<u>-</u>			
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A. Ins	pection Checklist							
	no 100	,						÷
	Component		0	bserved Cor	ndition	Fı	urther Ac	tion Required
1.0	I and Ell C	,	Excellent	Fair	Poor	Y	es .	No
1.0	Landfill Cap	p:		<u> </u>				/
2	Vegetation		//					1/1
•	Cap							-/-
	Gas Vents	¥						
2.0 .	Drainage Str	Trotumace:						7.
2.0	Toe Drain	uctures:						
						0		
	Drainage Cha							
Date of Inspect Purpose of Insp Time on Site: Time off Site: Weather Condi  A. Inspection  C  1.0 La Ve Ca Ga  2.0 Dr Too Dra Fre Sub Ma Rec  Mo Soil Gro  4.0 Site Asp	French Drain		1					1
	Subsurface D	rainage Pipes/Outfalls						<del>-/</del>
	Manholes		11			<del></del>		/
	Recharge Are	as						<del>//</del>
	9							
0	Monitoring S	ystem:	, .			- 8		
	Soil Gas Well	S						
	Groundwater '	Wells		,				<del>-/</del>
4.0	Site Access:						*	
	Asphalt Acces	s Road	/ .					
	Crushed-Conc	rete Access Road	<del></del>					
		Tools Road				<u> </u>		J.
B. Descri	ption of Further	Action Requirements				L.,		J
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. Locatio	n:	Prainare	Charles			*		
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		VegeTations	PLDMING. 4	PINE J	uplings.			
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Name of	Inspector(s):	Eric Kro	ano	_				*
Deta of 1	Inspection:			<u>-</u>			¥	
	of Inspection:	8-27-21 \( \int \text{Routine} \) Heavy	D					• ,
Time on		Noutine Heavy	y Rainfall R	eported Incide	ent			
Time off								
	Conditions:							
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A. Inspe	ection Checklist							ž
	Component		0	bserved Con	dition		Further A	otion Domi
	_		Excellent	Fair	Poor		Yes	Action Required No
1.0	Landfill Cap	p:				, T4	. 163	140
	Vegetation		//					1
•	Cap		1					1,
	Gas Vents							
2.0	Drainage Str	netures.						
	Toe Drain	uctures.						
	Drainage Cha	innels		1/				
	French Drain		/-					
	Subsurface D	rainage Pipes/Outfalls						
	Manholes	t.					· ·	
	Recharge Are	as				İ		<del>-</del>
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0	Monitoring S					_		
	Soil Gas Well Groundwater		1/				0	
	Groundwater	AA CITR				L		
1.0	Site Access:		· r					
	Asphalt Acces	s Road	/			Г		<del></del>
3.45	Crushed-Conc	rete Access Road		<del></del>		H		
		*						
<ol> <li>Descrip</li> </ol>	tion of Further	Action Requirements:			200	Ĺ	<u>-</u>	
Location		Drainage (	Channels					
bserved Co	onditions:	0						
		Vegelo	ation in	Charrel	5			
	74							
ecommend	ations:	Carl	act Ground	/				
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Name	of Inspector(s): Eric Kranco						
D-44			-				
	f Inspection:  e of Inspection:  Routine  Heav						
Time of	e of Inspection: Routine Heav	y Rainfall R	eported Incid	lent			3 <b>4</b> 0 (2
Time of							
	r Conditions:	2					
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A. Insp	pection Checklist						,•
r.	Component						a .
	Component	Excellent O	bserved Con Fair			Further A	Action Required
1.0	Landfill Cap:	Excenent	rair	Poor		Yes	No
	Vegetation	/	· · ·				
¥	Cap	1			<u> </u>		_/, .
	Gas Vents		· ·		-	<u> </u>	//
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2.0	Drainage Structures:	,					5
	Toe Drain				Г		
	Drainage Channels		/	•	-		
	French Drains/Outfalls		•		-		
	Subsurface Drainage Pipes/Outfalls				<u> </u> -		
	Manholes				<u> </u>	·	
	Recharge Areas						
	8				L		. /
0 '	Monitoring System:					3ř	
	Soil Gas Wells				_		
	Groundwater Wells			*	<u> </u>		
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1.0	Site Access:	İ					•
	Asphalt Access Road	1					
	Crushed-Concrete Access Road				-		
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B. Descri	ption of Further Action Requirements:	· i.		-			·/·
. Location	n:	Drainage C	hannels		•		r
bserved C	Conditions:	• ()	,			. ——	
	Some Z	Excess Ve	getation	· .		· · ·	
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ecommend	dations:	Tact Ground	ds				
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# BROOKHAVEN NATIONAL LABORATORY SITE INSPECTION FORM

	tion (AOC): of Inspection:	Former Landfill Area 10/25/21	(includes	the fo	rmer aı	nd interim la	andfills and slit trench)	
	e of Inspector(s):	R. Howe, J. Milligan,	K. Schwa	ager				
Purpo	ose of Inspection:	Routine (Schedule	ed Freque	ncy of	2x/yr)	☐Heavy	Rainfall Reported Incident	dent
A.	Inspection Che	ecklist						
	Component		Ol	bserve	d Con	dition	Further Action Req'd	ı
	-		Excell.	Fair	Poor	Not	Yes (describe)	No
						Applic.		
1.		oil Covers/Wetlands:			1	<del></del> 1		1 1
	Vegetation (e.g.		X				Grass cut early Oct.	X
	Soil (Cap/Cove		X					X
	Other:							
2.	Drainage Struc	etures•						
	Standing Water		X				None	X
	Toe Drain		X					X
	Drainage Chanr	nels		X			Need vegetation removal	
	French Drains/0		X					X
	Subsurface Dra	inage Pipes/Outfalls	X					X
	Manholes					X		X
	Berms					X		X
	Roof Drains					X		X
	Recharge Areas		X					X
	Other:							
3.	Monitoring Sys	stem•						
<i>J</i> .	Soil Gas Wells	stem.		X				X
	Groundwater W	ells.	X					X
	Gas Vents		X				Good condition	X
	Other:		X					X
			<u> </u>			<u> </u>		
4.	Site Access:				1	T 1		37
	Asphalt Access			X				X
	Crushed-concre	te Access Road		X				X
	Fence					X		
	Gates/locks					X		X
	Radiological Po					X		X
	Other: LUIC S	igns		X			A 4 signs in place	X
5.		nuthorized work activitient evidence:				access has o	occurred? Yes	☑ No

#### **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.

Name o	of Inspector(s): Jim Miligan Bo B	Hare Nat	14 C.L.	ac mort	Man D Com		
Date of	Inspection: 10/25/20 VI  of Inspection: Routine Heaven 1 Site: \$430	y Rainfall R	•		5011 2 36V	3	
Weather	Conditions: 65° ONE	ast.				103	
A. Insp	ection Checklist						
	Component	O	bserved Con	dition	Fr	rther Activ	on Required
1.0	Landfill Cap:	Excellent	Fair	Poor	Y	es	No No
1.0	Vegetation		· · · · · ·				
	Cap						
	Gas Vents		· ·				U
					<u></u>		/
2.0	Drainage Structures:					v	
	Toe Drain						```
	Drainage Channels						2
	French Drains/Outfalls						Y
	Subsurface Drainage Pipes/Outfalls						\$
	Manholes	/					8
7.	Recharge Areas						-
	Monitoring System:						
	Soil Gas Wells						
	Groundwater Wells						8
	2 0000 E00 - 0000 0 0 0 0 0 0 0 0 0 0 0 0						aa
.0	Site Access:						
	Asphalt Access Road	/					
	Crushed-Concrete Access Road						~
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. Descrip	ption of Further Action Requirements:				L		<del></del>
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B. Descr	iption of Further Action Requirements:			_	L_		· · · · · · · · · · · · · · · · · · ·
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