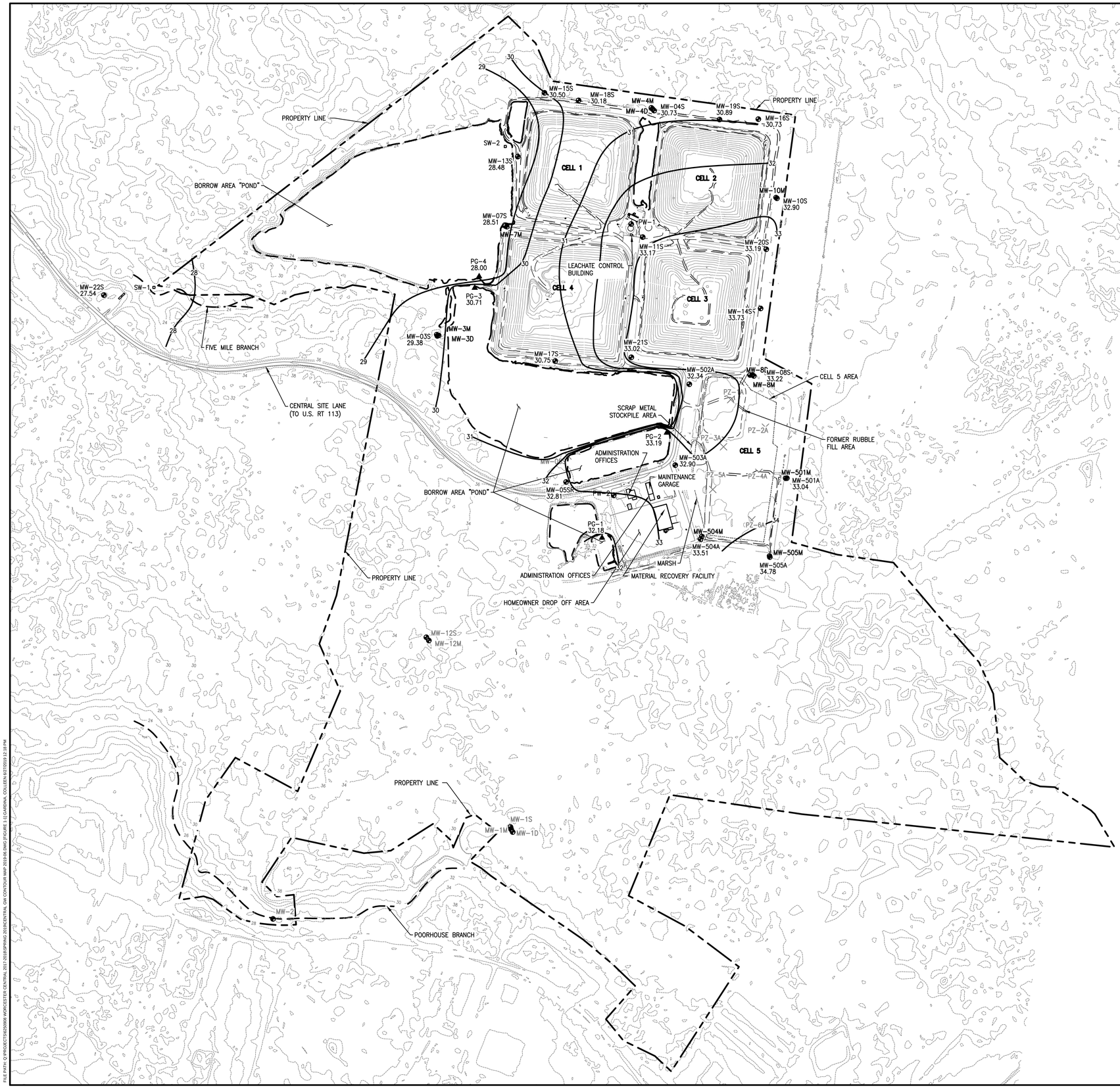

NOTES:

1. SURVEY WITHIN THE SURVEY DELINEATION LINE IS COMPOSED OF SURVEY PERFORMED ON 3/5/2018 BY AXIS GEOSPATIAL.
2. SURVEY CONTOURS OUTSIDE OF SURVEY DELINEATION LINE WERE OBTAINED FROM WORCESTER COUNTY GIS DEPARTMENT. DATE OF SURVEY IS UNKNOWN.
3. SURVEY CONTOURS OBTAINED FROM WORCESTER COUNTY WERE ROTATED 7.82 DEGREES (CLOCKWISE) AND PLACED IN THE ASSUMED DATUM DEPICTED BY THE GRID ON THIS SHEET.
4. REFERENCE ELEVATION WELL SURVEY WAS PERFORMED IN AUGUST 2010 AND DECEMBER 2014.
5. POND GAUGE REFERENCE ELEVATION RESURVEYED IN MARCH 2018 TO ACCOUNT FOR SETTLING.
6. GROUNDWATER ELEVATIONS OBTAINED FROM WORCESTER COUNTY WELL MARCH 2019 GAUGING EVENT
7. GROUNDWATER CONTOURS ARE SHOWN AT A 1 FT INTERVAL.
8. THE PIEZOMETERS WERE ABANDONED IN SPRING 2018 DUE TO CELL 5 CONSTRUCTION.

LEGEND

- M-8S 33.22 — EXISTING MONITORING WELL (S-SHALLOW/M-MEDIUM/D-DEEP) GROUNDWATER ELEVATION (IN FEET)
- M-1S — EXISTING MONITORING WELL (S-SHALLOW/M-MEDIUM/D-DEEP) (NOT IN GROUNDWATER MONITORING PLAN)
- PW-1 — EXISTING POTABLE WATER WELL
- SW-1 — EXISTING SURFACE WATER MONITORING LOCATION
- PZ-5A — ABANDONED PIEZOMETER
- PG-1 32.18 — EXISTING POND GAUGE
- M-5S — ABANDONED MONITORING WELL
- EXISTING CONTOUR
- GROUNDWATER CONTOUR
- PROJECTED GROUNDWATER CONTOUR
- PROPERTY LINE
- EXISTING SURFACE WATER FEATURES
- EXISTING RUBBLE FILL AREA
- EXISTING SCRAP METAL STOCKPILE AREA
- PROPOSED CELL 5 AREA

0 200 400 800
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
AJB	AJB	PL	GAT

SEAL

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. ?? EXPIRATION DATE: ??

SEMI-ANNUAL SAMPLING EVENT
CENTRAL LANDFILL FACILITY

WORCESTER COUNTY, MARYLAND

GROUNDWATER CONTOUR MAP MARCH 2019 GAUGING EVENT SHALLOW AQUIFER

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JUNE 2019

PROJECT NUMBER: 62509.03

Figure 1-1

SHEET: 1 OF 2

XX PLANS - NOT FOR CONSTRUCTION

FILE PATH: Q:\PROJECTS\62509\8 WORCESTER CENTRAL 2017-2018\SPRING 2019\CENTRAL GW CONTOUR MAP 2019-06 DWG [FIGURE 1-1] GARDINA, COLLEEN 6/27/2019 12:18 PM

N

NOTES:

1. SURVEY WITHIN THE SURVEY DELINEATION LINE IS COMPOSED OF SURVEY PERFORMED ON 3/5/2018 BY AXIS GEOSPATIAL.
2. SURVEY CONTOURS OUTSIDE OF SURVEY DELINEATION LINE WERE OBTAINED FROM WORCESTER COUNTY GIS DEPARTMENT. DATE OF SURVEY IS UNKNOWN.
3. SURVEY CONTOURS OBTAINED FROM WORCESTER COUNTY WERE ROTATED 7.82 DEGREES (CLOCKWISE) AND PLACED IN THE ASSUMED DATUM DEPICTED BY THE GRID ON THIS SHEET.
4. REFERENCE ELEVATION WELL SURVEY WAS PERFORMED IN AUGUST 2010 AND DECEMBER 2014.
5. POND GAUGE REFERENCE ELEVATION RESURVEYED IN MARCH 2018 TO ACCOUNT FOR SETTLING.
6. GROUNDWATER ELEVATIONS OBTAINED FROM WORCESTER COUNTY WELL MARCH 2019 GAUGING EVENT
7. GROUNDWATER CONTOURS ARE SHOWN AT A 0.2 FT INTERVAL.
8. THE PIEZOMETERS WERE ABANDONED IN SPRING 2018 DUE TO CELL 5 CONSTRUCTION.

LEGEND

- M-8S 33.22 — EXISTING MONITORING WELL (S=SHALLOW/M=MEDIUM/D=DEEP) GROUNDWATER ELEVATION (IN FEET)
- M-1S — EXISTING MONITORING WELL (S=SHALLOW/M=MEDIUM/D=DEEP) (NOT IN GROUNDWATER MONITORING PLAN)
- PW-1 — EXISTING POTABLE WATER WELL
- SW-1 — EXISTING SURFACE WATER MONITORING LOCATION
- PZ-5A — ABANDONED PIEZOMETER
- PG-1 32.18 — EXISTING POND GAUGE
- M-5S — ABANDONED MONITORING WELL
- 30 — EXISTING CONTOUR
- 30 — GROUNDWATER CONTOUR
- 30 — PROJECTED GROUNDWATER CONTOUR
- PROPERTY LINE
- EXISTING SURFACE WATER FEATURES
- EXISTING RUBBLE FILL AREA
- EXISTING SCRAP METAL STOCKPILE AREA
- PROPOSED CELL 5 AREA

0 200 400 800
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
AJB	AJB	PL	

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. ?? EXPIRATION DATE: ??

SEMI-ANNUAL SAMPLING EVENT
CENTRAL LANDFILL FACILITY

WORCESTER COUNTY, MARYLAND

GROUNDWATER CONTOUR MAP MARCH 2019 GAUGING EVENT INTERMEDIATE AQUIFER

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JUNE 2019

PROJECT NUMBER: 62509.03

Figure 1-2

SHEET: 2 OF 2

XX PLANS - NOT FOR CONSTRUCTION

047-0112

Maryland
Department of
the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary
Suzanne E. Dorsey, Deputy Secretary
Adam Ortiz, Deputy Secretary

Mr. David Candy, Superintendent
Solid Waste Division
Worcester County Department of Public Works
6113 Timmons Road
Snow Hill, MD 21863

APR 17 2025

Dear Mr. Candy:

Enclosed, please find your Permit to Construct for the installation of one (1) horizontal grinder powered by a 755 horsepower diesel engine to be located at 7091 Central Site Lane, Newark, MD 21841. The permit contains both general conditions, which apply to all air quality permit holders in Maryland, and specific conditions, which apply to the engines powering the horizontal grinder that you have proposed to install/construct.

The addition of the one (1) grinder powered by a diesel engine qualifies as an "Off-Permit" change to the facility's Part 70 operating permit. The Department recognizes the permit to construct application as written notification of the proposed change. Please include the grinder powered by a diesel engine in the application for the next renewal of the Part 70 permit.

If you have any questions regarding the issuance of this permit, please contact Mr. Nischal Subedi at (410) 537-3372.

Sincerely,

Suna Yi Sariscak, Manager
Air Quality Permits Program
Air & Radiation Administration

SYS/jm

Enclosure

KEEP PERMIT AT SITE

CONTROL NO. B - 07876

Wes Moore
Governor

State of Maryland

Serena McIlwain
Secretary

DEPARTMENT OF THE ENVIRONMENT

Air and Radiation Administration
1800 Washington Boulevard, Suite 720
Baltimore, MD 21230

[X] Construction Permit [ ] Operating Permit

PERMIT NO. As Listed on Page 2

DATE ISSUED APR 17 '25

PERMIT FEE $500.00 (Paid)

EXPIRATION DATE To be paid in accordance with COMAR 26.11.02.04B

LEGAL OWNER & ADDRESS

Worcester County Department of Public Works
6113 Timmons Road
Snow Hill, MD 21863
Attn: Mr. David Candy, Superintendent
Solid Waste Division

SITE

Worcester County Central Municipal Landfill
7091 Central Site Lane
Newark, MD 21841
Premises #047-0112
AI # 19217

SOURCE DESCRIPTION

This permit authorizes the installation of one (1) horizontal grinder, Peterson 2710, powered by a 755 Hp Cat C18 diesel-fired internal combustion engine.

This source is subject to the conditions described on the attached pages.

Program Manager

Director, Air and Radiation Administration

(NOT TRANSFERABLE)

INDEX

Part A – General Provisions

(1) The following Air and Radiation Administration (ARA) permit-to-construct applications and supplemental information are incorporated into this permit by reference:

Application for Internal Combustion Engines (Form 44) received on November 6, 2024 for one (1) horizontal grinder powered by a 755 Hp diesel engine.

If there are any conflicts between representations in this permit and representations in the applications, the representations in the permit shall govern. Estimates of dimensions, volumes, emissions rates, operating rates, feed rates and hours of operation included in the applications do not constitute enforceable numeric limits beyond the extent necessary for compliance with applicable requirements.

(2) Upon presentation of credentials, representatives of the Maryland Department of the Environment ("MDE" or the "Department") and the Worcester County Health Department shall at any reasonable time be granted, without delay and without prior notification, access to the Permittee's property and permitted to:

(a) inspect any construction authorized by this permit;

(b) sample, as necessary to determine compliance with requirements of this permit, any materials stored or processed on-site, any waste materials, and any discharge into the environment;

(c) inspect any monitoring equipment required by this permit;

(d) review and copy any records, including all documents required to be maintained by this permit, relevant to a determination of compliance with requirements of this permit;

(e) obtain any photographic documentation or evidence necessary to determine compliance with the requirements of this permit; and

(f) exercise its right of entry through use of an unmanned aircraft system to conduct inspections, collect samples, or make visual observations through photographic or video recordings to determine compliance with the requirements of this permit.

(3) The Permittee shall notify the Department prior to increasing quantities and/or changing the types of any materials referenced in the application or limited by this permit. If the Department determines that such increases or changes constitute a modification, the Permittee shall obtain a permit-to-construct prior to implementing the modification.

(4) Nothing in this permit authorizes the violation of any rule or regulation or the creation of a nuisance or air pollution.

(5) If any provision of this permit is declared by proper authority to be invalid, the remaining provisions of the permit shall remain in effect.

(6) The addition of the tub grinder powered by a 755 hp diesel engine qualifies as an "Off Permit" change to the facility's Part 70 Operating Permit. The Department recognizes the permit to construct application as written notification of the proposed change and should be included in the application for the next renewal of the Part 70 permit.

Part B – Applicable Regulations

(1) This source is subject to all applicable federal air pollution control requirements including, but not limited to, the following:

(a) All COMAR 26.11.02.09A – Sources subject to Permits to Construct and Approval.
"A person may not construct or modify or cause to be constructed or modified any of the following sources without first obtaining, and having in current effect, the specified permits to construct and approvals: (6) All sources, including installations and air pollution control equipment, except as listed in Regulation.10 of this chapter --- -- permit to construct required."

FOR ENGINE ONLY
(b) COMAR 26.11.09.05E – Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment.

(1) "Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(2) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(3) Exceptions.

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;
(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."

(c) COMAR 26.11.09.07A(1) – Control of Sulfur Oxides from Fuel Burning Equipment.
"A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations:

(c) Distillate fuel oils, 0.3 percent;"

(2) This source is subject to all applicable State-only enforceable air pollution control requirements including, but not limited to, the following regulations:

(a) COMAR 26.11.06.08 – Nuisance.
"An installation or premises may not be operated or maintained in such a manner that a nuisance or air pollution is created. Nothing in this regulation relating to the control of emissions may in any manner be construed as authorizing or permitting the creation of, or maintenance of, nuisance or air pollution."

(b) COMAR 26.11.06.09 – Odors.

"A person may not cause or permit the discharge into the atmosphere of gases, vapors, or odors beyond the property line in such a manner that a nuisance or air pollution is created.

Part C – Construction Conditions

Except as otherwise provided in this part, the horizontal grinder with engine shall be constructed in accordance with specifications included in the incorporated applications.

Part D – Operating Conditions

(1) Except as otherwise provided in this part, the horizontal grinder with engine shall be operated in accordance with specifications included in the application, and any operating procedures recommended by equipment vendors unless the Department provides written approval for alternative operating procedures.

(2) The engine shall be a nonroad engine, as defined in 40 CFR, §1068.30, unless the Permittee complies with the stationary engine requirements of 40 CFR 60, Subpart IIII or Subpart JJJJ and 40 CFR 63, Subpart ZZZZ, as applicable, for the engine.

(3) The Permittee shall only burn diesel fuel in the engine associated with the horizontal grinder unless the Permittee applies for and receives an approval or permit from the Department to burn an alternative fuel.

(4) The Permittee shall properly operate and maintain the engine associated with the horizontal grinder in a manner to prevent visible emissions.

Part E – Monitoring, Record Keeping and Reporting

(1) The Permittee shall maintain for at least five (5) years, and shall make available to the Department upon request, records of the following information:

(a) Operating hours for the engine powering the horizontal grinder.

(b) The Permittee shall report the amount of fuel oil combusted and engine operating hours as part of the annual emission certification.

(c) Fuel supplier certification or other fuel analyses showing the sulfur content of the fuel used in the engine.

(2) The Permittee shall report, in accordance with requirements under COMAR 26.11.01.07, occurrences of excess emissions to the Compliance Program of the Air and Radiation Administration.

Maryland
Department of the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary
Suzanne E. Dorsey, Deputy Secretary

Mr. Dallas Baker, Jr. Director
Department of Public Works
Worcester County
6113 Timmons Road
Snow Hill, MD 21863

RECEIVED 8/31/2023

AUG 0 1 2023

Dear Mr. Baker:

Re: Renewal Part 70/ Title V Operating Permit #24-047-0112

Enclosed, please find the renewal Part 70/Title V Operating Permit and Fact Sheet for the Worcester County Central Landfill located in Newark, MD. The Permit will expire on September 30, 2027.

The Code of Maryland Regulations (COMAR) 26.11.03.11 states the following:

If the Department denies a Part 70 permit or issues it with terms and conditions that are objectionable to the applicant, the applicant may request that a contested case hearing be held regarding the permit. This request shall be made to the Department in writing not later than 15 days after the applicant receives notice that the permit has been denied or of the objectionable terms and conditions. The request shall include the basis for the request and refer to any objectionable terms and conditions.

Please note the following revised condition in the Permit under Section II, General Conditions, Number 5, Permit Renewal:

The Permittee shall submit to the Department a completed application for renewal of this Part 70 permit 12 months before the expiration of the permit. Upon submitting a complete application, the Permittee may continue to operate this facility pending final action by the Department on the renewal.

If you have any questions, please feel free to contact Mr. Mario Cora, , Chief, Combustion and Metallurgical Division, at mario.cora@maryland.gov, or (410) 537-3230.

Sincerely,

Suna Yi Sariscak, Manager
Air Quality Permits Program
Air & Radiation Administration

SYS/jm

Enclosures

PART 70 OPERATING PERMIT 24-047-0112
WORCESTER COUNTY CENTRAL LANDFILL
7091 CENTRAL SITE LANE
NEWARK, MARYLAND 21863
FACT SHEET

BACKGROUND

The Worcester County Central Landfill Facility (WCCLF) is a municipal solid waste landfill serving Worcester County, Maryland. The WCCLF is located at 7091 Central Site Lane, off Route 13 in Newark, Maryland and occupies a site of approximately 725 acres. The facility is operated by the Worcester County Department of Public Works. The SIC code for the landfill is 4953.

The design capacity of the CFL is 3.3 million megagrams (3.6 million tons) of MSW. Operation of the CLF began in 1990 with the MSW placement in the first of eight (8) planned cells having begun on March 27, 1990. Cell 1 was filled and operation there ceased in October 1997. Placement of municipal waste in Cell 2 began October 1997 and ceased in October 2002. Placement of municipal waste in Cell 3 began immediately after operations at Cell 2 ceased in October 2002 and ceased in September 2007. Placement of municipal waste in Cell 4 has ceased and the cell now is filled. Cell 5 is currently being filled. During calendar year 2020, the CLF accepted approximately 34,551 tons of MSW.

The WCCLF employs leachate recirculation as a means of leachate pretreatment and to accelerate waste stabilization. Leachate from the operating cell drains by gravity to sumps at each corner of a square cell, and then is automatically pumped from these collection sumps to a 500,000-gallon holding tank. Another 433,000 gallon holding tank is also present and connected if backup storage is needed. A 1,500 gallon tank on flatbed truck is used to draw leachate from this storage tank and to refill recharge wells in the active cell each day.

The facility also maintains a few emissions sources that are listed as insignificant activities due to the seasonal use nature and low emission levels. The facility maintains two (2) emergency generators (EGs): one (1) 6 Hp gasoline powered small portable emergency generator, and one (1) grinder-shredder powered by a 425 Hp diesel (Caterpillar, C-12) engine. The facility also maintains various space heaters for comfort heat, various containers for the storage of fuels and lubricating oils.

The USEPA recently published the "Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills," [40 CFR, Subpart Cf] finalized on August 29, 2016. The WCCLF is subject to the provisions because it is an existing MSW landfill for which construction, reconstruction, or modification was commenced on or before July 17, 2014. Furthermore, a new set of emission guidelines regulations for existing landfills has not been published by the State of Maryland, therefore making the new federal rule applicable.

The most recent Tier 2 testing in March 2017 resulted in a projected non-methane

organic compounds (NMOC) generation rate of 22.26 Mg/yr NMOC for the year 2021. Furthermore, it is projected that the NMOC generation rates will remain below the 34 Mg/yr threshold under 40 CFR, Subpart Cf. This projection was estimated using the Landfill gas emission model (LandGEM) and the site specific NMOC concentration (232.04 ppm), assuming 220,000 tons of waste for each year between 2017 to 2020. The results showed that the estimated NMOC generation rates are below the threshold that requires the installation of a collection system. However, the facility installed and maintains a gas collection and control system, in which NMOCs are destroyed through burning at the enclosed flare station, owned by the landfill and located within its premises.

A landfill is automatically subject to Part 70 operating permit requirements if it has a design capacity of at least 2.5 million megagrams (2.75 million tons), regardless of whether it is a major stationary source. WCCLF has a design capacity which is greater than the 2.75 million tons threshold, making it subject to the Title V permitting requirements.

EPA promulgated national emission standards for hazardous air pollutants for existing and new municipal solid waste (MSW) landfills [40 CFR Part 63, Subpart AAAA]. WCCLF is subject to these MACT requirements because it is a MSW landfill that has accepted waste since November 8, 1987 and is an area source landfill that has a design capacity equal to or greater than 2.5 million cubic meters that was not permanently closed as of January 16, 2003. WCCLF must comply with the MACT requirements when the facility NMOC emissions exceed 50 Mg/year. Using the Landfill gas emission model (LandGEM) and the site specific (March 2017 test) NMOC concentration (232 ppm), it is shown that the projected NMOC uncontrolled emissions through 2026 will be around 23.15 Mg/yr (LandGEM Model analysis performed by the Permittee on April 20, 2017). However, the NMOCs are collected by a gas collection and control system and destroyed through burning at 1,500-standard cubic feet per minute (scfm) enclosed flare system, with 98 % destruction efficiency. WCCLF received ownership of the flare in May 2014, from Worcester Renewable Energy, LLC (no longer in operation).

The current Title V permit for WCCLF expired on September 30, 2021 and remains in effect. On November 30, 2020 the Department received a Part 70 renewal permit application for Worcester County Central Landfill. An administrative completeness review was conducted and the application was deemed to be complete. The completeness determination letter was sent on December 10, 2020 granting the facility an application shield.

Table 1 following summarizes the actual emissions from Worcester County Central Landfill based on its annual certification reports.

Table 1: Actual Emissions

Year	NOx (tpy)	SOx (tpyPY)	PM10 (TPY)	CO (TPY)	VOC (TPY)
2020	0.25	0.02	2.88	1.08	2.06
2019	0.23	0.02	2.89	1.14	2.04
2018	0.31	0.03	2.89	1.75	2.04
2017	0.39	0.03	2.90	1.25	1.55
2016	0.06	0.02	2.89	1.92	0.97
2015	0.06	0.02	2.89	1.92	0.96

Table 2: Summary of projected NMOC generation rates*

Year	NMOC (Mg/yr)
2022	23.94
2023	25.54
2024	25.59
2025	24.34
2026	23.15

*NMOC emissions are collected and burned in an enclosed flare.

CAM Analysis

Worcester County Central Landfill conducted a Compliance Assurance Monitoring (CAM) analysis for the facility and determined that the facility is not subject to the CAM Rule 40 CFR Subpart 64. CAM is not applicable because the WCCLF is subject to an emissions limitation that was proposed by the EPA administrator after November 15, 1990 pursuant to Sections 111 or 112 of the Clean Air Act (specifically the facility is subject to the Emissions Guidelines for Municipal Solid Waste Landfills- 40 CFR Subpart Cc).

GREENHOUSE GAS (GHG) EMISSION STATEMENT

There are no greenhouse gas related Clean Air Act requirements applicable to Worcester County Central Landfill. WCCLF has not triggered Prevention of Significant Deterioration (PSD) requirements for GHG emissions so therefore, there are no applicable GHG Clean Air Act requirements. Worcester County Central Landfill emits the following greenhouse gases (GHGs) related to Clean Air Act

requirements: carbon dioxide, methane, and nitrous oxide. These GHGs originate from various processes (i.e., waste decomposition and landfill gas fugitives, gas flaring, internal combustion engines, and garage boilers) contained within the facility premises applicable to Worcester County Central Landfill. The facility has not triggered Prevention of Significant Deterioration (PSD) requirements for GHG emissions; therefore, there are no applicable GHG Clean Air Act requirements. Emission certifications reports for the years 2018, 2019, and 2020, showed levels of GHGs at the Worcester County Central Landfill (see Table 3 shown below). The Permittee shall quantify facility wide GHGs emissions and report them in accordance with Section 3 of the Part 70 permit.

The following table summarizes the actual emissions from Worcester County Central Landfill based on its Annual Emission Certification Reports:

Table 3: Greenhouse Gases Emissions Summary

GHG	Conversion factor	2018 tpy CO2e	2019 tpy CO2e	2020 tpy CO2e
Carbon dioxide, CO_2	1	13,700	5,739	5,754
Methane, CH_4	25	52,475	52,000	52,350
Nitrous Oxide, N_2O	298			
Total GHG, CO_2eq		**66,175**	**57,739**	**58,104**

EMISSION UNIT IDENTIFICATION

The following emission units have been identified at the Worcester County Central Landfill as being subject to the Title V permitting requirements and having applicable requirements (Table 4).

Table 4: Emission Unit Identification

Emissions Unit Number	MDE Registration Number	Emissions Unit Name and Description	Date of Registration
EU-01	9-0024	MSW Landfill consisting of nine (9) cells.	1990
EU-02	None	Fugitive dust from the facility haul roads (both paved and unpaved)	1982
EU-03	9-0080	One (1) 1,500-standard cubic feet per	2008

		minute (scfm) enclosed flare with 98% destruction efficiency.	
EU-04	9-0102	One (1) Morbark tub grinder powered by a 540 Hp diesel engine (Caterpillar C-15).	2015

AN OVERVIEW OF THE PART 70 PERMIT

Section I of the Part 70 Permit contains a brief description of the facility and an inventory list of the emissions units for which applicable requirements are identified in Section IV of the permit.

Section II of the Part 70 Permit contains the general requirements that relate to administrative permit actions. This section includes the procedures for renewing, amending, reopening, and transferring permits, the relationship to permits to construct and approvals, and the general duty to provide information and to comply with all applicable requirements.

Section III of the Part 70 Permit contains the general requirements for testing, record keeping and reporting; and requirements that affect the facility as a whole, such as open burning, air pollution episodes, particulate matter from construction and demolition activities, asbestos provisions, ozone depleting substance provisions, general conformity, and acid rain permit. This section includes the requirement to report excess emissions and deviations, to submit an annual emissions certification report and an annual compliance certification report, and results of sampling and testing.

Section IV of the Part 70 Permit identifies the emissions standards, emissions limitations, operational limitations, and work practices applicable to each emissions unit located at the facility. For each standard, limitation, and work practice, the permit identifies the basis upon which the Permittee will demonstrate compliance. The basis will include testing, monitoring, record keeping, and reporting requirements. The demonstration may include one or more of these methods.

Section V of the Part 70 Permit contains a list of insignificant activities. These activities emit very small quantities of regulated air pollutants and do not require a permit to construct or registration with the Department. For insignificant activities that are subject to a requirement under the Clean Air Act, the requirement is listed under the activity.

Section VI of the Part 70 Permit contains State-only enforceable requirements.

Section VI identifies requirements that are not based on the Clean Air Act, but solely on Maryland air pollution regulations. These requirements generally relate to the prevention of nuisances and implementation of Maryland's Air Toxics Program.

REGULATORY AND TECHNICAL REVIEW/COMPLIANCE METHODOLOGY

Emission Unit: EU-01 Table IV-1

EU01 – MSW Landfill consists of nine (9) cells. Cell 1, Cell 2, Cell 3 and Cell 4 have been filled. Cell 5 is currently being filled. Landfill is provided with a gas collection and control system and gas is destroyed through burning at the enclosed flare station, now owned by the landfill and located within its premises. **[9-0024]**

Note: The most recent Tier 2 testing in March 2017 resulted in a projected non-methane organic compounds (NMOC) generation rate of 22.26 Mg/yr NMOC for the year 2021. Furthermore, it is projected that the NMOC generation rates will remain below the 34 Mg/yr threshold under 40 CFR, Subpart Cf. This projection was estimated using the Landfill gas emission model (LandGEM) and the site specific NMOC concentration (232.04 ppm), assuming 220,000 tons of waste for each year between 2017 to 2020. The results showed that the estimated NMOC generation rates are below the threshold that requires the installation of a collection system. However, the facility installed and maintains a gas collection and control system, in which NMOCs are destroyed through burning at the enclosed flare station, owned by the landfill and located within its premises.

Applicable Standards and Limits

Worcester County Central Landfill is subject to the testing, record keeping, and reporting requirements indicated below.

Compliance Demonstration

The Permittee shall retest the site-specific NMOC concentration every 5 years using the methods specified in 40 CFR §60.754(a)(3). **[Reference: COMAR 26.11.19.20D(6a)]** The Permittee shall submit to the Department a test protocol for review and approval at least 30 days prior to conducting the test. The Permittee shall submit test result to the Department within 45 days after completion of the test.

The Permittee shall keep all the records required under this permit for at least five years and shall make such records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**

If the Permittee increases the maximum design capacity of the Worcester County Central Landfill after November 1, 1997, the Permittee shall amend and resubmit the design capacity report within 90 days of the issuance of an air quality Permit to Construct or a permit from the MDE Land Management Administration that authorizes the increase or any other change that increases the maximum design capacity of the landfill. **[Reference: COMAR 26.11.19.20D(2)]**

The Permittee shall estimate the annual NMOC emission rate calculated using the formula and procedures as described in 40 CFR §60.754(a). The Permittee shall prepare and submit an updated NMOC emission rate report by November 1 of each year. A less frequent emission rate report may be submitted upon approval by the Department in accordance with COMAR 26.11.19.20D(6). **[Reference: COMAR 26.11.19.20D(3)(a) & COMAR 26.11.19.20D(6)]**

The Permittee may, upon approval by the Department, submit a combined report to satisfy the NMOC reporting requirements and the annual Emissions Certification requirements. Such report shall be submitted by April 1 of each year for the previous calendar year. **[Reference: COMAR 26.11.19.20D(7)]**

Emission Unit: EU-01 Table IV-1A

EU01 – MSW Landfill consists of nine (9) cells. Cell 1, Cell 2, Cell 3 and Cell 4 have been filled. Cell 5 is currently being filled. Landfill is provided with a gas collection and control system and gas is destroyed through burning at the enclosed flare station, now owned by the landfill and located within its premises. **[9-0024]**

Applicable Standards and Limits

A. Standard for Air Emissions from Municipal Solid Waste Landfills

40 CFR 60, Subpart Cf
§60.31f Designated facilities.
"(a) The designated facility to which these Emission Guidelines apply is each existing MSW landfill for which construction, reconstruction, or modification was commenced on or before July 17, 2014.

§60.32f Compliance times.
Planning, awarding of contracts, installing, and starting up MSW landfill air emission collection and control equipment that is capable of meeting the Emission Guidelines under §60.33f must be completed within 30 months after the date an NMOC emission rate report shows NMOC emissions equal or exceed 34 megagrams per year (50 megagrams per year for the closed landfill subcategory); or within 30 months after the date of the most recent NMOC emission rate report that shows NMOC emissions equal or exceed 34 megagrams per year (50 megagrams per year for the closed landfill subcategory), if Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater.

§60.33f Emission Guidelines for municipal solid waste landfill emissions.

Applicability

These emission guiles apply to "each owner or operator of an MSW landfill having a design capacity greater than or equal to 2.5 million megagrams by mass and 2.5 million cubic meters by volume to collect and control MSW landfill emissions at each MSW landfill that meets the following conditions:

(1) The landfill has accepted waste at any time since November 8, 1987, or has additional design capacity available for future waste deposition.
(2) The landfill commenced construction, reconstruction, or modification on or before July 17, 2014.
(3) The landfill has an NMOC emission rate greater than or equal to 34 megagrams per year or Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater.
(4) The landfill in the closed landfill subcategory and has an NMOC emission rate greater than or equal to 50 megagrams per year or Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater." **[Reference: 40 CFR §60.33f(a)]**

Collection System

The Permittee must install "a gas collection and control system meeting the requirements in paragraphs (b)(1) through (3) and (c) of this section at each MSW landfill meeting the conditions in paragraph (a) of this section.

(1) Collection system. Install and start up a collection and control system that captures the gas generated within the landfill within 30 months after:

(i) The first annual report in which the NMOC emission rate equals or exceeds 34 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 34 megagrams per year, as specified in §60.38f(d)(4); or
(ii) The first annual NMOC emission rate report for a landfill in the closed landfill subcategory in which the NMOC emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 50 megagrams per year, as specified in §60.38f(d)(4); or
(iii) The most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2, if the Tier 4 surface emissions monitoring shows a surface methane emission concentration of 500 parts per million methane or greater as specified in §60.38f(d)(4)(iii).

(2) Active. An active collection system must:
(i) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment.
(ii) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade.
(iii) Collect gas at a sufficient extraction rate.
(iv) Be designed to minimize off-site migration of subsurface gas.

(3) ....." **[Reference: 40 CFR §60.33f(b)]**

(c) Control system. The Permittee must "include provisions for the control of the gas collected from within the landfill through the use of control devices meeting the following requirements, except as provided in §60.24.

(1) A non-enclosed flare designed and operated in accordance with the parameters established in §60.18 except as noted in §60.37f(d); or

(2) A control system designed and operated to reduce NMOC by 98 weight percent; or when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen or less. The reduction efficiency or concentration in parts per million by volume must be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in §60.35f(d). The performance test is not required for boilers and process heaters with design heat input capacities

equal to or greater than 44 megawatts that burn landfill gas for compliance with this subpart.

(i) If a boiler or process heater is used as the control device, the landfill gas stream must be introduced into the flame zone.

(ii) The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in §60.37f.

(iii) For the closed landfill subcategory, the initial or most recent performance test conducted to comply with subpart WWW of this part; 40 CFR part 62, subpart GGG; or a state plan implementing subpart Cc of this part on or before July 17, 2014 is sufficient for compliance with this subpart." **[Reference: 40 CFR §60.33f(c)]**

(3) The Permittee must "route the collected gas to a treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the treated landfill gas must be controlled according to either paragraph (c)(1) or (2) of this section." **[Reference: 40 CFR §60.33f(c)]**

(4) All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (b) or (c) of this section. For purposes of this subpart, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (b) or (c) of this section. **[Reference: 40 CFR §60.33f(c)]**

(d) Design capacity.

(1) ....

(2) When an increase in the maximum design capacity of a landfill with an initial design capacity less than 2.5 million megagrams or 2.5 million cubic meters results in a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator must comply with paragraph (e) of this section. **[Reference: 40 CFR §60.33f(d)]**

(e) Emissions.

A Permittee with an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must "either install a collection and control system as provided in paragraphs (b) and (c) of this section or calculate an initial NMOC emission rate for the landfill using the procedures specified in §60.35f(a). The NMOC emission rate must be recalculated annually, except as provided in §60.38f(c)(3).

(1) If the calculated NMOC emission rate is less than 34 megagrams per year, the owner or operator must:

(i) Submit an annual NMOC emission rate report according to §60.38f(c), except as provided in §60.38f(c)(3); and

(ii) Recalculate the NMOC emission rate annually using the procedures specified in §60.35f(a) until such time as the calculated NMOC emission rate is equal to or greater than 34 megagrams per year, or the landfill is closed.

(A) If the calculated NMOC emission rate, upon initial calculation or annual recalculation required in paragraph (e)(1)(ii) of this section, is equal to or greater than 34 megagrams per year, the owner or operator must either: Comply with paragraphs (b) and (c) of this section; calculate NMOC emissions using the next higher tier in §60.35f; or conduct a surface emission monitoring demonstration using the procedures specified in §60.35f(a)(6).

(B) If the landfill is permanently closed, a closure report must be submitted to the Administrator as provided in §60.38f(f), except for exemption allowed under §60.31f(e)(4).

(C) For the closed landfill subcategory, if the most recently calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator must either: Submit a gas collection and control system design plan as specified in §60.38f(d), except for exemptions allowed under §60.31f(e)(3), and install a collection and control system as provided in paragraphs (b) and (c) of this section; calculate NMOC emissions using the next higher tier in §60.35f; or conduct a surface emission monitoring demonstration using the procedures specified in §60.35f(a)(6)." **[Reference: 40 CFR §60.33f(e)]**

(2) If the calculated NMOC emission rate is equal to or greater than 34 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator must either: submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year as specified in §60.38f(d), except for exemptions allowed under §60.31f(e)(3); calculate NMOC emissions using a higher tier in §60.35f; or conduct a surface emission monitoring demonstration using the procedures specified in §60.35f(a)(6). **[Reference: 40 CFR §60.33f(e)]**

Compliance Demonstration

The Permittee shall use the applicable testing methods and requirements listed in Section 1.2.A. The Permittee should follow the appropriate and applicable monitoring requirements listed in Section 1.3.A. As part of the record-keeping requirements, the Permittee shall follow the applicable recording requirements listed in Section 1.4.A. As part of the reporting requirements, the Permittee shall prepare and submit any of the applicable and appropriate reporting requirements listed Section 1.5.A.

B. Operational Standards for Collection and Control Systems – [40 CFR §60.34f]

The Permittee or operator "of an MSW landfill with a gas collection and control system used to comply with the provisions of §60.33f(b) and (c) must:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:
(1) Five (5) years or more if active; or
(2) Two (2) years or more if closed or at final grade.

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:
(1) A fire or increased well temperature. The owner or operator must record instances when positive pressure occurs in efforts to avoid a fire. These records must be submitted with the annual reports as provided in §60.38f(h)(1).
(2) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits in the design plan.
(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes must be approved by the Administrator as specified in §60.38f(d).

(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must satisfy both criteria in order to be approved (i.e., neither causing fires nor killing methanogens is acceptable).

(d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator must conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in §60.36(d). The owner or operator must conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations. Thus, the owner or operator must monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan must be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with §60.33f(c). In the event the collection or control system is not operating, the gas mover system must be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere must be closed within 1 hour of the collection or control system not operating.

(f) Operate the control system at all times when the collected gas is routed to the system.

(g) If monitoring demonstrates that the operational requirements in paragraph (b), (c), or (d) of this section are not met, corrective action must be taken as specified in §60.36f(a)(3) and (5) or (c). If corrective actions are taken as specified in §60.36f, the monitored exceedance is not a violation of the operational requirements in this section." **[Reference: 40 CFR §60.33f(e)]**

Compliance Demonstration

The Permittee shall use the specified testing methods in paragraphs (a) through (e) of §60.36f to determine compliance with §60.34f. **[Reference: 40 CFR §60.36f(a) thru (e)]** The Permittee should follow the appropriate monitoring requirements listed in §60.37, to demonstrate compliance with the standards in §60.36f. **[Reference: 40 CFR §60.37f(a) thru (h)]** As part of the record-keeping requirements, the Permittee shall follow the applicable recording requirements in

§60.39f. Except as provided in §60.38f(d)(2), each owner or operator of an MSW landfill subject to the provisions of §60.33f(e) must keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report that triggered §60.33f(e), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable. **[Reference: 40 CFR §60.39f(a) thru (j)]** As part of the reporting requirements, the Permittee shall prepare and submit any of the applicable and appropriate reporting requirements in §60.38(f). **[Reference: 40 CFR §60.38(f)(a) thru (l)]**

C. Standards for Particulate Matter from Materials Handling and Construction.

"A person may not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. These reasonable precautions shall include, but not be limited to, the following when appropriate as determined by the control officer: **(2)** Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can create airborne dusts." **[Reference: COMAR 26.11.06.03D]**

Compliance Demonstration

The Permittee shall maintain and update the current plan that contains an explanation of reasonable precautions or best management practices (BMPs) that will be used to prevent particulate matter from becoming airborne. The Permittee shall perform a semi-annual inspection of the operation to verify that the reasonable precautions (BMPs) are being implemented. The Permittee shall keep results of the semi-annual inspections for a period of five (5) years and shall maintain the written reasonable precautions (BMPs) at the facility. **[Reference: COMAR 26.11.03.06C]**

Emission Units: EU-01

EU01 – MSW Landfill consists of nine (9) cells. Cell 1, Cell 2, Cell 3 and Cell 4 have been filled. Cell 5 is currently being filled. Landfill is provided with a gas collection and control system and gas is destroyed through burning at the enclosed flare station, now owned by the landfill and located within its premises. **[9-0024]**

Applicable Standards/Limits
Subpart AAAA – National Emission Standard for Hazardous Air Pollutants: Municipal Solid Waste Landfills.

Applicability
"You are subject to this subpart if you own or operate a MSW landfill that has accepted since November 8, 1987 or has additional capacity for waste disposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section: (3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill." **[Reference: 40.CFR §63.1935(a)(3)]**

"If your landfill is an existing affected source and is an area source meeting the criteria in §63.1935(a)(3), you must comply with the requirements in §§63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 16, 2004, whichever occurs later." **[Reference: 40.CFR §63.1945(f)]**

Standards
"If you are required by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan to install a collection and control system, you must comply with the requirements in §§63.1960 through 63.1985 and with the general provisions of this part specified in table 1 of this subpart." **[Reference: 40.CFR §63.1955(b)]**

General and Continuing Compliance Requirements
"Compliance is determined in the same way it is determined for 40 CFR Part 60, subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data, collected under 40 CFR 60.756(b)(1), (c)(1), and (d) of subpart WWW, are used to demonstrate compliance with the operating conditions for control systems. If a deviation occurs, you have failed to meet the control device operating conditions described in this subpart and have deviated from the requirements of this subpart. Finally, you must develop and implement a written SSM plan according to the provisions in 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site.

Failure to write, implement, or maintain a copy of the SSM plan is a deviation from the requirements of this subpart." **[Reference: 40.CFR §63.1960]**

Compliance Demonstration
"Keep records and reports as specified in 40 CFR Part 60, Subpart WWW, or in the Federal plan, EPA approved State plan or tribal plan that implements 40 CFR Part 60, Subpart Cc, whichever applies to your landfill, with one exception: You must submit the annual report described in 40 CFR 60.757(f) **every 6 months**." **[Reference: 40.CFR §63.1980(a)]**
"You must also keep records and reports as specified in the general provisions of 40 CFR Part 60 and this part as shown in Table 1 of this subpart. Applicable records in the general provisions include items such as SSM plans and the SSM plan reports." **[Reference: 40.CFR §63.1980(b)]**

Emission Unit: EU-02

Fugitive dusts from facility haul roads (both paved and unpaved). Most of the traffic along the haul roads is from the movement of refuse disposal trucks to the landfill's active face, and to the waste transfer facility.

Applicable Standards and Limits
Control of Particulate Matter
COMAR 26.11.06.03D – Particulate Matter from Materials Handling and Construction.
"A person may not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne."

Compliance Demonstration
The Permittee shall continue implementing the existing preventive maintenance plan that is used to prevent particulate matter from becoming airborne. The Permittee shall perform maintenance activities within the time frames established in the plan and shall maintain a log with records of the dates and description of the maintenance that was performed. The Permittee shall perform a semi-annual (every 6 months) inspection of the operation to verify that the reasonable precautions (BMPs) are being implemented.

The Permittee shall maintain a copy of the preventive maintenance plan and a record of the dates of and description of maintenance activity performed. The Permittee shall maintain records of the inspections conducted for a period of at

least five years and make available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**

Emission Unit: EU-03
One (1) 1,500-standard cubic feet per minute (scfm) enclosed flare. **[MDE Reg. No. 9-0080]**

Applicable Standards and Limits

A. Control of Visible Emissions
Control of Visible Emissions for grinding process
[COMAR 26.11.06.02C(2)] – Visible Emission Standards.
"In Areas I, II, V and VI, a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is greater than 20 percent opacity."

[COMAR 26.11.06.02A(2)] – Exception.
"The visible emissions standards in C of this regulation do not apply to emissions during start-up and process modification or adjustments, or occasional cleaning of control equipment, if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period."

Compliance Demonstration
The Permittee shall properly operate and maintain the flare in a manner to minimize visible emissions. The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

B. Control of Particulate Matter
Particulate Matter from Confined Sources
[COMAR 26.11.06.03B(2)(a)] – "A person may not cause or permit to be discharged into the outdoor atmosphere from any other installation, particulate matter in excess of 0.03 gr/SCFD (68.7 mg/dscm)."

Particulate Matter from Materials Handling and Construction [COMAR 26.11.06.03D] – "A person may not cause or permit any material to be

handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne."

Compliance Demonstration

The Permittee shall properly operate and maintain engines in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** In addition, the Permittee "may not cause or permit to be discharged into the outdoor atmosphere from any other installation, particulate matter in excess of 0.03 gr/SCFD (68.7 mg/dscm)." **[COMAR 26.11.06.03B(2)(a)]** The Permittee "may not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne." **[COMAR 26.11.06.03D]** The Permittee shall perform preventive maintenance once per month or as recommended by the equipment manufacturer on the flare. **[Reference: COMAR 26.11.03.06C]** The Permittee shall maintain a log of the maintenance performed on the flare and make the logs available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**

C. Operational Limit

Air Standards

"A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in §60.754(d)." **[Reference: 40 CFR §60.752(b)(2)(iii)B]**

"The control device shall be operated with the parameter ranges established during initial or most recent performance test. The operating parameters to be monitored as specified in 60.756." **[Reference: 40 CFR §60.752(b)(2)(iii)B]**

Compliance Demonstration

The Permittee shall follow the testing procedures as stated in 40 CFR §60.754(d). As part of the monitoring requirement, the Permittee must comply with §60.752(b)(2)(iii) using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment." **[Reference: 40 CFR §60.756(b)]** As part of the Record keeping requirements,

the Permittee "shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in paragraphs (b)(1) through (b)(4) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal." **[Reference: 40 CFR §60.758(b)]**

Emission Unit: EU-04
One (1) Morbark tub grinder, powered by a 540 bhp diesel engine (Caterpillar C-15). **[Reg. No. 9-0102]**

The engine serving the tub grinder fall under the definition of "nonroad" internal combustion engine. The U.S. EPA defined a "stationary" internal combustion engine, as an engine that does not meet the definition of a "nonroad" engine. Nonroad engines are not subject to federal NSPS requirements under 40 CFR 60, Subpart IIII or Subpart JJJJ or federal NESAHP requirements under 40 CFR 63, Subpart ZZZZ.

The U.S. EPA defines a "nonroad" internal combustion engine in 40 CFR §1068.30, as an internal combustion engine that meets any of the following criteria:

(i) It is (or will be) used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers).

(ii) It is (or will be) used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers).

(iii) By itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

Applicable Standards and Limits

A. Control of Visible Emissions
Control of Visible Emissions for grinding process
[COMAR 26.11.06.02C(2)] – Visible Emission Standards.

"In Areas I, II, V and VI, a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is greater than 20 percent opacity."

[COMAR 26.11.06.02A(2)] – Exception.
"The visible emissions standards in C of this regulation do not apply to emissions during start-up and process modification or adjustments, or occasional cleaning of control equipment, if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period."

Compliance Demonstration
The Permittee shall properly operate and maintain the tub grinder in a manner to minimize visible emissions. **[Reference: COMAR 26.11.06.02C(2)]** The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

FOR ENGINE ONLY
(3) Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment
[COMAR 26.11.09.05E] – Visible Emission Standards.
"Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

Exceptions.

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:
  (i) Engines that are idled continuously when not in service: 30 minutes;
  (ii) All other engines: 15 minutes.

(c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."

Compliance Demonstration
The Permittee shall properly operate and maintain the tub grinder in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** The Permittee shall properly operate and maintain engines in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]**

FOR ENGINE ONLY

B. Control of Sulfur Oxides Emissions

[COMAR 26.11.09.07A(1)] – "A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations:

(c) Distillate fuel oils, 0.3 percent;"

Compliance Demonstration
The Permittee shall obtain a certification form the fuel supplier indicating that the fuel oil complies with the limitation on sulfur content of the fuel oil. **[Reference: COMAR 26.11.03.06C].** The Permittee shall retain annual fuel supplier certifications stating that the fuel oil is in compliance with this regulation must be maintained for at least five years. **[Reference: COMAR 26.11.09.07C]** The Permittee shall report annual fuel supplier certification to the Department upon request. **[Reference: COMAR 26.11.09.07C]**

C. Operational Limit

The engine powering the tub grinder shall operate no more than 1,000 hours for any 12-month rolling period.

Compliance Demonstration
As part of the monitoring requirements, the Permittee shall properly monitor the operating hours for each of the engines powering the tub grinder. The Permittee shall maintain for at least five (5) years, and shall make available to the Department upon request, records of the following information: (a) Operating hours for the engine that drives the tub grinder. (b) The Permittee shall report the amount of fuel oil combusted and engine operating hours as part of the annual emission certification. **[Reference: MDE PTC No. 047-0112-9-0102]** The Permittee shall report amount of fuel oil combusted and engine-operating hours as part of the annual emission certification. **[Reference: COMAR 26.11.06.03C]**

COMPLIANCE SCHEDULE

The Worcester County Central Landfill is currently in compliance with all applicable air quality regulations.

TITLE IV - ACID RAIN

The Worcester County Central Landfill is not subject to any Acid Rain requirements.

TITLE VI - OZONE DEPLETING SUBSTANCES

The Worcester County Central Landfill shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F.

SECTION 112 (r) - ACCIDENTAL RELEASE

The Worcester County Central Landfill is not subject to the requirements under Section 112(r) - Accidental Release.

PERMIT SHIELD

The Worcester County Central Landfill did not request a permit shield for its facility operation.

INSIGNIFICANT ACTIVITIES

This section provides a list of insignificant emissions units that were reported in the Title V permit application. The applicable Clean Air Act requirements, if any, are listed below the insignificant activity.

(1) No. 2 Stationary internal combustion engines with an output less than 500 brake horsepower (373 kilowatts) and which are not used to generate electricity for sale or for peak or load shaving;

The one (1) 6 Hp gasoline powered small portable emergency generator, and one (1) grinder-shredder powered by a 425 Hp

diesel (Caterpillar, C-12) engine are subject to the following requirements:

The two (2) are subject to the following requirements:

(A) COMAR 26.11.09.05E(2) – Emissions During Idle Mode. The Permittee may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(B) COMAR 26.11.09.05E(3) – Emissions During Operating Mode. The Permittee may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(C) Exceptions:

(i) COMAR 26.11.09.05E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(ii) COMAR 26.11.09.05E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(a) Engines that are idled continuously when not in service: 30 minutes
(b) all other engines: 15 minutes.

(iii) COMAR 26.11.09.05E(2) & (3) do not apply while maintenance, repair or testing is being performed by qualified mechanics.

(2) No. 10 Fuel burning equipment using gaseous fuels or no. 1 or no. 2 fuel oil, and having a heat input less than 1,000,000 Btu (1.06 gigajoules) per hour;

The fuel burning units are subject to the following requirements:
COMAR 26.11.09.05A(1) – Fuel Burning Equipment.
"In Areas I, II, V and VI, a person may not cause or permit the discharge of emissions form any fuel burning equipment, other

than water in an uncombined form, which is greater than 20 percent opacity."

COMAR 26.11.09.05A(3) Exceptions: "Sections A(1) and (2) of this regulation do not apply to emissions during load changing, soot blowing, start-up, or adjustments or occasional cleaning of control equipment if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any sixty minute period."

COMAR 26.11.09.07A(1) – Control of Sulfur Oxides from Fuel Burning Equipment.
"A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations: (c) Distillate fuel oils, 0.3 percent."

(3) Containers, reservoirs, or tanks used exclusively for:

(a) No. 1 Storage of Numbers 1, 2, 4, 5, and 6 fuel oil and aviation jet engine fuel;

(b) No. 2 Storage of lubricating oils

(4) X Space heaters utilizing direct heat transfer and used solely for comfort heat;

SECTION VI STATE-ONLY ENFORCEABLE CONDITIONS

The Permittee is subject to the following State-only enforceable requirements:

1. Applicable Regulations:

   (A) COMAR 26.11.06.08 and 26.11.06.09, which generally prohibit the discharge of emissions beyond the property line in such a manner that a nuisance or air pollution is created.

   (B) COMAR 26.11.15.06, which prohibits the discharge of toxic air pollutants to the extent that such emissions will unreasonably endanger human health

2. Record Keeping and Reporting:

   The Permittee shall submit to the Department, by April 1 of each year during the term of this permit, a written certification of the results of an analysis of emissions of toxic air pollutants from the Permittee's facility during the previous calendar year. The analysis shall include either:

   (a) a statement that previously submitted compliance demonstrations for emissions of toxic air pollutants remain valid; or

   (b) a revised compliance demonstration, developed in accordance with requirements included under COMAR 26.11.15 & 16, that accounts for changes in operations, analytical methods, emissions determinations, or other factors that have invalidated previous demonstrations.

KEEP PERMIT AT SITE

CONTROL NO. B - 07469

Wes Moore
Governor

State of Maryland

Serena McIlwain
Secretary

DEPARTMENT OF THE ENVIRONMENT

Air and Radiation Administration
1800 Washington Boulevard, Suite 720
Baltimore, MD 21230

[ ] Construction Permit

[X] Part 70 Operating Permit

AUG 0 1 2023

PERMIT NO. 24-047-00112

DATE ISSUED

PERMIT FEE To be paid in accordance with COMAR 26.11.02.19B

EXPIRATION DATE September 30, 2027

LEGAL OWNER & ADDRESS

Worcester County DPW
6113 Timmons Road
Snow Hill, MD 21863
Attn: Mr. Dallas Baker, Jr., P.E.
Director of Public Works

SITE

Worcester County Central Landfill
7091 Central Site Lane
Newark, MD 21863
Worcester County
AI # 19217

SOURCE DESCRIPTION

Municipal Solid Waste Landfill.

This source is subject to the conditions described on the attached pages.

Program Manager

Director, Air and Radiation Administration

WORCESTER COUNTY CENTRAL LANDFILL
7091 CENTRAL SITE LANE
NEWARK, MARYLAND 21863
PART 70 OPERATING PERMIT NO. 24-047-00112

SECTION I SOURCE IDENTIFICATION

1. DESCRIPTION OF FACILITY

The Worcester County Central Landfill Facility (WCCLF) is a municipal solid waste landfill serving the Worcester County, Maryland. The WCCLF is located at 7091 Central Site Lane, off Route 13 in Newark, Maryland and occupies a site of approximately 725 acres. The facility is operated by the Worcester County Department of Public Works. The SIC code for the landfill is 4953.

The design capacity of the CFL is 3.3 million megagrams (3.6 million tons) of MSW. Operation of the CLF began in 1990 with the MSW placement in the first of eight (8) planned cells having begun on March 27, 1990. Cell 1 was filled, and operation there ceased in October 1997. Placement of municipal waste in Cell 2 began October 1997 and ceased in October 2002. Placement of municipal waste in Cell 3 began immediately after operations at Cell 2 ceased in October 2002 and ceased in September 2007. Placement of municipal waste in Cell 4 has ceased and the cell is now filled. Cell 5 is currently being filled. The total accepted waste in place by December 31, 2021, was approximately 1,113,014 tons of MSW.

The WCCLF employs leachate recirculation as a means of leachate pretreatment and to accelerate waste stabilization. Leachate from the operating cell drains by gravity to sumps at each corner of the square cell, and then is automatically pumped from these collection sumps to a 500,000-gallon holding tank. Another 433,000 gallon holding tank is also present and connected if backup storage is needed. A 1,500 gallon tank on flatbed truck is used to draw leachate from this storage tank and to refill recharge wells in the active cell each day.

The facility also maintains a few emissions sources that are listed as insignificant activities due to the seasonal use nature and low emission levels. The facility maintains two (2) emergency generators (EGs): one (1) 6 Hp gasoline powered small portable emergency generator, and one (1) grinder-shredder powered by a 425 Hp diesel (Caterpillar, C-12) engine. The facility also maintains various space heaters for comfort heat, various containers for the storage of fuels and lubricating oils.

The USEPA recently published the "Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills," [40 CFR, Subpart Cf] finalized on August 29, 2016. The WCCLF is subject to the provisions because it is an existing MSW landfill for which construction, reconstruction, or modification was commenced on or before July 17, 2014. Furthermore, a new set of emission guidelines regulations for existing landfills has not been published by the State of Maryland, therefore making the new federal rule applicable.

The most recent Tier 2 testing in March 2017 resulted in a projected non-methane organic compounds (NMOC) generation rate of 22.26 Mg/yr NMOC for the year 2021. Furthermore, it is projected that the NMOC generation rates will remain below the 34 Mg/yr threshold. This projection was estimated using the Landfill gas emission model (LandGEM) and the site specific NMOC concentration (232.04 ppm), assuming 220,000 tons of waste for each year between 2017 to 2020. The results showed that the estimated NMOC generation rates are below the threshold that requires the installation of a collection system. However, the facility installed and maintains a gas collection and control system, in which NMOCs are destroyed through burning at the enclosed flare station, owned by the landfill and located within its premises.

A landfill is automatically subject to Part 70 operating permit requirements if it has a design capacity of at least 2.5 million megagrams (2.75 million tons), regardless of whether it is a major stationary source. WCCLF has a design capacity which is greater than the 2.75 million tons threshold, making it subject to the Title V permitting requirements. The refuse-in-place from waste accepted through December 31, 2021 was 1,113,014 tons.

The current Title V permit for WCCLF expired on September 30, 2021 and remains in effect. On November 30, 2020 the Department received a Part 70 renewal permit application for Worcester County Central Landfill. An administrative completeness review was conducted and the application was deemed to be complete. The completeness determination letter was sent on December 10, 2020 granting the facility an application shield.

2. FACILITY INVENTORY LIST

Emissions Unit Number	MDE Registration Number	Emissions Unit Name and Description	Date of Registration
EU01	9-0024	MSW Landfill consisting of nine (9) cells. Cells 1 thru 4 have been filled. Cell 5 is currently being filled.	1990
EU02	None	Fugitive dust from the facility's haul roads (both paved and unpaved)	1982
EU-03	9-0080	One (1) 1,500-standard cubic feet per minute (scfm) enclosed flare with 98% destruction efficiency.	2008
EU-04	9-0102	One (1) Morbark tub grinder powered by a 540 Hp diesel engine (Caterpillar C-15).	2015

SECTION II GENERAL CONDITIONS

1. DEFINITIONS

[COMAR 26.11.01.01] and [COMAR 26.11.02.01]

The words or terms in this Part 70 permit shall have the meanings established under COMAR 26.11.01 and .02 unless otherwise stated in this permit.

2. ACRONYMS

ARMA	Air and Radiation Management Administration
BACT	Best Available Control Technology
Btu	British thermal unit
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CEM	Continuous Emissions Monitor
CFR	Code of Federal Regulations
CO	Carbon Monoxide
COMAR	Code of Maryland Regulations
EPA	United States Environmental Protection Agency
FR	Federal Register
gr	grains
HAP	Hazardous Air Pollutant
MACT	Maximum Achievable Control Technology
MDE	Maryland Department of the Environment
MVAC	Motor Vehicle Air Conditioner
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NO_x	Nitrogen Oxides
NSPS	New Source Performance Standards
NSR	New Source Review
OTR	Ozone Transport Region
PM	Particulate Matter
PM10	Particulate Matter with Nominal Aerodynamic Diameter of 10 micrometers or less
ppm	parts per million
ppb	parts per billion
PSD	Prevention of Significant Deterioration
PTC	Permit to construct
PTO	Permit to operate (State)
SIC	Standard Industrial Classification
SO_2	Sulfur Dioxide

TAP	Toxic Air Pollutant
tpy	tons per year
VE	Visible Emissions
VOC	Volatile Organic Compounds

3. EFFECTIVE DATE

The effective date of the conditions in this Part 70 permit is the date of permit issuance, unless otherwise stated in the permit.

4. PERMIT EXPIRATION

[COMAR 26.11.03.13B(2)]

Upon expiration of this permit, the terms of the permit will automatically continue to remain in effect until a new Part 70 permit is issued for this facility provided that the Permittee has submitted a timely and complete application and has paid applicable fees under COMAR 26.11.02.16.

Otherwise, upon expiration of this permit the right of the Permittee to operate this facility is terminated.

5. PERMIT RENEWAL

[COMAR 26.11.03.02B(3)] and [COMAR 26.11.03.02E]

The Permittee shall submit to the Department a completed application for renewal of this Part 70 permit at least 12 months before the expiration of the permit. Upon submitting a completed application, the Permittee may continue to operate this facility pending final action by the Department on the renewal.

The Permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the permit application, shall submit such supplementary facts or corrected information no later than 10 days after becoming aware that this occurred. The Permittee shall also provide additional information as necessary to address any requirements that become applicable to the facility after the date a completed application was submitted, but prior to the release of a draft permit. This information shall be submitted to the Department no later than 20 days after a new requirement has been adopted.

6. CONFIDENTIAL INFORMATION

[COMAR 26.11.02.02G]

In accordance with the provisions of the State Government Article, Sec. 10-611 et seq., Annotated Code of Maryland, all information submitted in an application shall be considered part of the public record and available for inspection and copying, unless the Permittee claims that the information is confidential when it is submitted to the Department. At the time of the request for inspection or copying, the Department will make a determination with regard to the confidentiality of the information. The Permittee, when requesting confidentiality, shall identify the information in a manner specified by the Department and, when requested by the Department, promptly provide specific reasons supporting the claim of confidentiality. Information submitted to the Department without a request that the information be deemed confidential may be made available to the public. Subject to approval of the Department, the Permittee may provide a summary of confidential information that is suitable for public review. The content of this Part 70 permit is not subject to confidential treatment.

7. PERMIT ACTIONS

[COMAR 26.11.03.06E(3)] and [COMAR 26.11.03.20(A)]

This Part 70 permit may be revoked or reopened and revised for cause. The filing of an application by the Permittee for a permit revision or renewal; or a notification of termination, planned changes or anticipated noncompliance by the facility, does not stay a term or condition of this permit.

The Department shall reopen and revise, or revoke the Permittee's Part 70 permit under the following circumstances:

a. Additional requirements of the Clean Air Act become applicable to this facility and the remaining permit term is 3 years or more;

b. The Department or the EPA determines that this Part 70 permit contains a material mistake, or is based on false or inaccurate information supplied by or on behalf of the Permittee;

c. The Department or the EPA determines that this Part 70 permit must be revised or revoked to assure compliance with applicable requirements of the Clean Air Act; or

d. Additional requirements become applicable to an affected source under the Federal Acid Rain Program.

8. PERMIT AVAILABILITY

[COMAR 26.11.02.13G]

The Permittee shall maintain this Part 70 permit in the vicinity of the facility for which it was issued, unless it is not practical to do so, and make this permit immediately available to officials of the Department upon request.

9. REOPENING THE PART 70 PERMIT FOR CAUSE BY THE EPA

[COMAR 26.11.03.20B]

The EPA may terminate, modify, or revoke and reissue a permit for cause as prescribed in 40 CFR §70.7(g)

10. TRANSFER OF PERMIT

[COMAR 26.11.02.02E]

The Permittee shall not transfer this Part 70 permit except as provided in COMAR 26.11.03.15.

11. REVISION OF PART 70 PERMITS – GENERAL CONDITIONS

[COMAR 26.11.03.14] and [COMAR 26.11.03.06A(8)]

a. The Permittee shall submit an application to the Department to revise this Part 70 permit when required under COMAR 26.11.03.15 -.17.

b. When applying for a revision to a Part 70 permit, the Permittee shall comply with the requirements of COMAR 26.11.03.02 and .03 except that the application for a revision need include only information listed that is related to the proposed change to the source and revision to

the permit. This information shall be sufficient to evaluate the proposed change and to determine whether it will comply with all applicable requirements of the Clean Air Act.

c. The Permittee may not change any provision of a compliance plan or schedule in a Part 70 permit as an administrative permit amendment or as a minor permit modification unless the change has been approved by the Department in writing.

d. A permit revision is not required for a change that is provided for in this permit relating to approved economic incentives, marketable permits, emissions trading, and other similar programs.

12. SIGNIFICANT PART 70 OPERATING PERMIT MODIFICATIONS

[COMAR 26.11.03.17]

The Permittee may apply to the Department to make a significant modification to its Part 70 Permit as provided in COMAR 26.11.03.17 and in accordance with the following conditions:

a. A significant modification is a revision to the federally enforceable provisions in the permit that does not qualify as an administrative permit amendment under COMAR 26.11.03.15 or a minor permit modification as defined under COMAR 26.11.03.16.

b. This permit does not preclude the Permittee from making changes, consistent with the provisions of COMAR 26.11.03, that would make the permit or particular terms and conditions of the permit irrelevant, such as by shutting down or reducing the level of operation of a source or of an emissions unit within the source. Air pollution control equipment shall not be shut down or its level of operation reduced if doing so would violate any term of this permit.

c. Significant permit modifications are subject to all requirements of COMAR 26.11.03 as they apply to permit issuance and renewal, including the requirements for applications, public participation, and review by affected states and EPA, except:

(1) An application need include only information pertaining to the proposed change to the source and modification of this permit, including a description of the change and modification, and any

new applicable requirements of the Clean Air Act that will apply if the change occurs;

(2) Public participation, and review by affected states and EPA, is limited to only the application and those federally enforceable terms and conditions of the Part 70 permit that are affected by the significant permit modification.

d. As provided in COMAR 26.11.03.15B(5), an administrative permit amendment may be used to make a change that would otherwise require a significant permit modification if procedures for enhanced preconstruction review of the change are followed that satisfy the requirements of 40 CFR 70.7(d)(1)(v).

e. Before making a change that qualifies as a significant permit modification, the Permittee shall obtain all permits-to-construct and approvals required by COMAR 26.11.02.

f. The Permittee shall not make a significant permit modification that results in a violation of any applicable requirement of the Clean Air Act.

g. The permit shield in COMAR 26.11.03.23 applies to a final significant permit modification that has been issued by the Department, to the extent applicable under COMAR 26.11.03.23.

13. MINOR PERMIT MODIFICATIONS

[COMAR 26.11.03.16]

The Permittee may apply to the Department to make a minor modification to the federally enforceable provisions of this Part 70 permit as provided in COMAR 26.11.03.16 and in accordance with the following conditions:

a. A minor permit modification is a Part 70 permit revision that:

(1) Does not result in a violation of any applicable requirement of the Clean Air Act;

(2) Does not significantly revise existing federally enforceable monitoring, including test methods, reporting, record keeping, or compliance certification requirements except by:

(a) Adding new requirements,

(b) Eliminating the requirements if they are rendered meaningless because the emissions to which the requirements apply will no longer occur, or

(c) Changing from one approved test method for a pollutant and source category to another;

(3) Does not require or modify a:

(a) Case-by-case determination of a federally enforceable emissions standard,

(b) Source specific determination for temporary sources of ambient impacts, or

(c) Visibility or increment analysis;

(4) Does not seek to establish or modify a federally enforceable permit term or condition for which there is no corresponding underlying applicable requirement of the Clean Air Act, but that the Permittee has assumed to avoid an applicable requirement to which the source would otherwise be subject, including:

(a) A federally enforceable emissions standard applied to the source pursuant to COMAR 26.11.02.03 to avoid classification as a Title I modification; and

(b) An alternative emissions standard applied to an emissions unit pursuant to regulations promulgated under Section 112(i)(5) of the Clean Air Act

(5) Is not a Title I modification; and

(6) Is not required under COMAR 26.11.03.17 to be processed as a significant modification to this Part 70 permit.

b. Application for a Minor Permit Modification

The Permittee shall submit to the Department an application for a minor permit modification that satisfies the requirements of COMAR 26.11.03.03 which includes the following:

(1) A description of the proposed change, the emissions resulting from the change, and any new applicable requirements that will apply if the change is made;

(2) The proposed minor permit modification;

(3) Certification by a responsible official, in accordance with COMAR 26.11.02.02F, that:

(a) The proposed change meets the criteria for a minor permit modification, and

(b) The Permittee has obtained or applied for all required permits-to-construct required by COMAR 26.11.03.16 with respect to the proposed change;

(4) Completed forms for the Department to use to notify the EPA and affected states, as required by COMAR 26.11.03.07-.12.

c. Permittee's Ability to Make Change

(1) For changes proposed as minor permit modifications to this permit that will require the applicant to obtain a permit to construct, the permit to construct must be issued prior to the new change.

(2) During the period of time after the Permittee applies for a minor modification but before the Department acts in accordance with COMAR 26.11.03.16F(2):

(a) The Permittee shall comply with applicable requirements of the Clean Air Act related to the change and the permit terms and conditions described in the application for the minor modification.

(b) The Permittee is not required to comply with the terms and conditions in the permit it seeks to modify. If the Permittee fails to comply with the terms and conditions in the application during this time, the terms and conditions of both this permit and the application for modification may be enforced against it.

d. The Permittee is subject to enforcement action if it is determined at any time that a change made under COMAR 26.11.03.16 is not within the scope of this regulation.

e. Minor permit modification procedures may be used for Part 70 permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, but only to the extent that the minor permit modification procedures are explicitly provided for in regulations approved by the EPA as part of the Maryland SIP or in other applicable requirements of the Clean Air Act.

14. ADMINISTRATIVE PART 70 OPERATING PERMIT AMENDMENTS

[COMAR 26.11.03.15]

The Permittee may apply to the department to make an administrative permit amendment as provided in COMAR 26.11.03.15 and in accordance with the following conditions:

a. An application for an administrative permit amendment shall:

(1) Be in writing;

(2) Include a statement certified by a responsible official that the proposed amendment meets the criteria in COMAR 26.11.03.15 for an administrative permit amendment, and

(3) Identify those provisions of this part 70 permit for which the amendment is requested, including the basis for the request.

b. An administrative permit amendment:

(1) Is a correction of a typographical error;

(2) Identifies a change in the name, address, or phone number of a person identified in this permit, or a similar administrative change involving the Permittee or other matters which are not directly related to the control of air pollution;

(3) requires more frequent monitoring or reporting by the Permittee;

(4) Allows for a change in ownership or operational control of a source for which the Department determines that no other revision to the permit is necessary and is documented as per COMAR 26.11.03.15B(4);

(5) Incorporates into this permit the requirements from preconstruction review permits or approvals issued by the Department in accordance with COMAR 26.11.03.15B(5), but only if it satisfies 40 CFR 70.7(d)(1)(v);

(6) Incorporates any other type of change, as approved by the EPA, which is similar to those in COMAR 26.11.03.15B(1)—(4);

(7) Notwithstanding COMAR 26.11.03.15B(1)—(6), all modifications to acid rain control provisions included in this Part 70 permit are governed by applicable requirements promulgated under Title IV of the Clean Air Act; or

(8) Incorporates any change to a term or condition specified as State-only enforceable, if the Permittee has obtained all necessary permits-to-construct and approvals that apply to the change.

c. The Permittee may make the change addressed in the application for an administrative amendment upon receipt by the Department of the application, if all permits-to-construct or approvals otherwise required by COMAR 26.11.02 prior to making the change have first been obtained from the Department.

d. The permit shield in COMAR 26.11.03.23 applies to administrative permit amendments made under Section B(5) of COMAR 26.11.03.15 , but only after the Department takes final action to revise the permit.

e. The Permittee is subject to enforcement action if it is determined at any time that a change made under COMAR 26.11.03.15 is not within the scope of this regulation.

15. OFF-PERMIT CHANGES TO THIS SOURCE

[COMAR 26.11.03.19]

The Permittee may make off-permit changes to this facility as provided in COMAR 26.11.03.19 and in accordance with the following conditions:

a. The Permittee may make a change to this permitted facility that is not addressed or prohibited by the federally enforceable conditions of this Part 70 permit without obtaining a Part 70 permit revision if:

(1) The Permittee has obtained all permits and approvals required by COMAR 26.11.02 and .03;

(2) The change is not subject any requirements under Title IV of the Clean Air Act;

(3) The change is not a Title I modification; and

(4) The change does not violate an applicable requirement of the Clean Air Act or a federally enforceable term or condition of the permit.

b. For a change that qualifies under COMAR 26.11.03.19, the Permittee shall provide contemporaneous written notice to the Department and the EPA, except for a change to an emissions unit or activity that is exempt from the Part 70 permit application, as provided in COMAR 26.11.03.04. This written notice shall describe the change, including the date it was made, any change in emissions, including the pollutants emitted, and any new applicable requirements of the Clean Air Act that apply as a result of the change.

c. Upon satisfying the requirements of COMAR 26.11.03.19, the Permittee may make the proposed change.

d. The Permittee shall keep a record describing:

(1) Changes made at the facility that result in emissions of a regulated air pollutant subject to an applicable requirement of the Clean Air Act, but not otherwise regulated under this permit; and

(2) The emissions resulting from those changes.

e. Changes that qualify under COMAR 26.11.03.19 are not subject to the requirements for Part 70 revisions.

f. The Permittee shall include each off-permit change under COMAR 26.11.03.19 in the application for renewal of the part 70 permit.

g. The permit shield in COMAR 26.11.03.23 does not apply to off-permit changes made under COMAR 26.11.03.19.

h. The Permittee is subject to enforcement action if it is determined that an off-permit change made under COMAR 26.11.03.19 is not within the scope of this regulation.

16. ON-PERMIT CHANGES TO SOURCES

[COMAR 26.11.03.18]

The Permittee may make on-permit changes that are allowed under Section 502(b)(10) of the Clean Air Act as provided in COMAR 26.11.03.18 and in accordance with the following conditions:

a. The Permittee may make a change to this facility without obtaining a revision to this Part 70 permit if:

(1) The change is not a Title I modification;

(2) The change does not result in emissions in excess of those expressly allowed under the federally enforceable provisions of the Part 70 permit for the permitted facility or for an emissions unit within the facility, whether expressed as a rate of emissions or in terms of total emissions;

(3) The Permittee has obtained all permits and approvals required by COMAR 26.11.02 and .03;

(4) The change does not violate an applicable requirement of the Clean Air Act;

(5) The change does not violate a federally enforceable permit term or condition related to monitoring, including test methods, record keeping, reporting, or compliance certification requirements;

(6) The change does not violate a federally enforceable permit term or condition limiting hours of operation, work practices, fuel usage, raw material usage, or production levels if the term or condition has been established to limit emissions allowable under this permit;

(7) If applicable, the change does not modify a federally enforceable provision of a compliance plan or schedule in this Part 70 permit unless the Department has approved the change in writing; and

(8) This permit does not expressly prohibit the change under COMAR 26.11.03.18.

b. The Permittee shall notify the Department and the EPA in writing of a proposed on-permit change under COMAR 26.11.03.18 not later than 7 days before the change is made. The written information shall include the following information:

(1) A description of the proposed change;

(2) The date on which the change is proposed to be made;

(3) Any change in emissions resulting from the change, including the pollutants emitted;

(4) Any new applicable requirement of the Clean Air Act; and

(5) Any permit term or condition that would no longer apply.

c. The responsible official of this facility shall certify in accordance with COMAR 26.11.02.02F that the proposed change meets the criteria for the use of on-permit changes under COMAR 26.11.03.18.

d. The Permittee shall attach a copy of each notice required by condition b. above to this Part 70 permit.

e. On-permit changes that qualify under COMAR 26.11.03.18 are not subject to the requirements for part 70 permit revisions.

f. Upon satisfying the requirements under COMAR 26.11.03.18, the Permittee may make the proposed change.

g. The permit shield in COMAR 26.11.03.23 does not apply to on-permit changes under COMAR 26.11.03.18.

h. The Permittee is subject to enforcement action if it is determined that an on-permit change made under COMAR 26.11.03.18 is not within the scope of the regulation or violates any requirement of the State air pollution control law.

17. FEE PAYMENT

[COMAR 26.11.02.16A(2) & (5)(b)]

a. The fee for this Part 70 permit is as prescribed in Regulation.19 of COMAR 26.11.02.

b. The fee is due on and shall be paid on or before each 12-month anniversary date of the permit.

c. Failure to pay the annual permit fee constitutes cause for revocation of the permit by the Department.

18. REQUIREMENTS FOR PERMITS-TO-CONSTRUCT AND APPROVALS

[COMAR 26.11.02.09.]

The Permittee may not construct or modify or cause to be constructed or modified any of the following sources without first obtaining, and having in current effect, the specified permits-to-construct and approvals:

a. New Source Review source, as defined in COMAR 26.11.01.01, approval required, except for generating stations constructed by electric companies;

b. Prevention of Significant Deterioration source, as defined in COMAR 26.11.01.01, approval required, except for generating stations constructed by electric companies;

c. New Source Performance Standard source, as defined in COMAR 26.11.01.01, permit to construct required, except for generating stations constructed by electric companies;

d. National Emission Standards for Hazardous Air Pollutants source, as defined in COMAR 26.11.01.01, permit to construct required, except for generating stations constructed by electric companies;

e. A stationary source of lead that discharges one ton per year or more of lead or lead compounds measured as elemental lead, permit to construct required, except for generating stations constructed by electric companies;

f. All stationary sources of air pollution, including installations and air pollution control equipment, except as listed in COMAR 26.11.02.10, permit to construct required;

g. In the event of a conflict between the applicability of (a.— e.) above and an exemption listed in COMAR 26.11.02.10, the provision that requires a permit applies.

h. Approval of a PSD or NSR source by the Department does not relieve the Permittee obtaining an approval from also obtaining all permits-to-construct required b y (c.— g.) above.

19. CONSOLIDATION OF PROCEDURES FOR PUBLIC PARTICIPATION

[COMAR 26.11.02.11C] and [COMAR 26.11.03.01K]

The Permittee may request the Department to authorize special procedures for the Permittee to apply simultaneously, to the extent possible, for a permit to construct and a revision to this permit.

These procedures may provide for combined public notices, informational meetings, and public hearings for both permits but shall not adversely affect the rights of a person, including EPA and affected states, to obtain information about the application for a permit, to comment on an application, or to challenge a permit that is issued.

These procedures shall not alter any existing permit procedures or time frames.

20. PROPERTY RIGHTS

[COMAR 26.11.03.06E(4)]

This Part 70 permit does not convey any property rights of any sort, or any exclusive privileges.

21. SEVERABILITY

[COMAR 26.11.03.06A(5)]

If any portion of this Part 70 permit is challenged, or any term or condition deemed unenforceable, the remainder of the requirements of the permit continues to be valid.

22. INSPECTION AND ENTRY

[COMAR 26.11.03.06G(3)]

The Permittee shall allow employees and authorized representatives of the Department, the EPA, and local environmental health agencies, upon presentation of credentials or other documents as may be required by law, to:

a. Enter at a reasonable time without delay and without prior notification the Permittee's property where a Part 70 source is located, emissions-related activity is conducted, or records required by this permit are kept;

b. Have access to and make copies of records required by the permit;

c. Inspect all emissions units within the facility subject to the permit and all related monitoring systems, air pollution control equipment, and practices or operations regulated or required by the permit; and

d. Sample or monitor any substances or parameters at or related to the emissions units at the facility for the purpose of determining compliance with the permit.

23. DUTY TO PROVIDE INFORMATION

[COMAR 26.11.03.06E(5)]

The Permittee shall furnish to the Department, within a reasonable time specified by the Department, information requested in writing by the Department in order to determine whether the Permittee is in compliance with the federally enforceable conditions of this Part 70 permit, or whether cause exists for revising or revoking the permit. Upon request, the Permittee shall also furnish to the Department records required to be kept under the permit.

For information claimed by the Permittee to be confidential and therefore potentially not discloseable to the public, the Department may require the Permittee to provide a copy of the records directly to the EPA along with a claim of confidentiality.

The Permittee shall also furnish to the Department, within a reasonable time specified by the Department, information or records requested in writing by the Department in order to determine if the Permittee is in compliance with the State-only enforceable conditions of this permit.

24. COMPLIANCE REQUIREMENTS

[COMAR 26.11.03.06E(1)] and [COMAR 26.11.03.06A(11)] and [COMAR 26.11.02.05]

The Permittee shall comply with the conditions of this Part 70 permit. Noncompliance with the permit constitutes a violation of the Clean Air Act, and/or the Environment Article Title 2 of the Annotated Code of Maryland and may subject the Permittee to:

a. Enforcement action,

b. Permit revocation or revision,

c. Denial of the renewal of a Part 70 permit, or

d. Any combination of these actions.

The conditions in this Part 70 permit are enforceable by EPA and citizens under the Clean Air Act except for the State-only enforceable conditions.

Under Environment Article Section 2-609, Annotated Code of Maryland, the Department may seek immediate injunctive relief against a person who violates this permit in such a manner as to cause a threat to human health or the environment.

25. CREDIBLE EVIDENCE

Nothing in this permit shall be interpreted to preclude the use of credible evidence to demonstrate noncompliance with any term of this permit.

26. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE

[COMAR 26.11.03.06E(2)]

The need to halt or reduce activity in order to comply with the conditions of this permit may not be used as a defense in an enforcement action.

27. CIRCUMVENTION

[COMAR 26.11.01.06]

The Permittee may not install or use any article, machine, equipment or other contrivance, the use of which, without resulting in a reduction in the total weight of emissions, conceals or dilutes emissions which would otherwise constitute a violation of any applicable air pollution control regulation.

28. PERMIT SHIELD

[COMAR 26.11.03.23]

A permit shield as described in COMAR 26.11.03.23 shall apply only to terms and conditions in this Part 70 permit that have been specifically identified as covered by the permit shield. Neither this permit nor COMAR 26.11.03.23 alters the following:

a. The emergency order provisions in Section 303 of the Clean Air Act, including the authority of EPA under that section;

b. The liability of the Permittee for a violation of an applicable requirement of the Clean Air Act before or when this permit is issued or for a violation that continues after issuance;

c. The requirements of the Acid Rain Program, consistent with Section 408(a) of the Clean Air Act;

d. The ability of the Department or EPA to obtain information from a source pursuant to Maryland law and Section 114 of the Clean Air Act; or

e. The authority of the Department to enforce an applicable requirement of the State air pollution control law that is not an applicable requirement of the Clean Air Act.

29. ALTERNATE OPERATING SCENARIOS

[COMAR 26.11.03.06A(9)]

For all alternate operating scenarios approved by the Department and contained within this permit, the Permittee, while changing from one approved scenario to another, shall contemporaneously record in a log maintained at the facility each scenario under which the emissions unit is operating and the date and time the scenario started and ended.

SECTION III PLANT WIDE CONDITIONS

1. PARTICULATE MATTER FROM CONSTRUCTION AND DEMOLITION

[COMAR 26.11.06.03D]

The Permittee shall not cause or permit any building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne.

2. OPEN BURNING

[COMAR 26.11.07]

Except as provided in COMAR 26.11.07.04, the Permittee shall not cause or permit an open fire from June 1 through August 31 of any calendar year. Prior to any open burning, the Permittee shall request and receive approval from the Department.

3. AIR POLLUTION EPISODE

[COMAR 26.11.05.04]

When requested by the Department, the Permittee shall prepare in writing standby emissions reduction plans, consistent with good industrial practice and safe operating procedures, for reducing emissions creating air pollution during periods of Alert, Warning, and Emergency of an air pollution episode.

4. REPORT OF EXCESS EMISSIONS AND DEVIATIONS

[COMAR 26.11.01.07] and [COMAR 26.11.03.06C(7)]

The Permittee shall comply with the following conditions for occurrences of excess emissions and deviations from requirements of this permit, including those in Section VI – State-only Enforceable Conditions:

a. Report any deviation from permit requirements that could endanger human health or the environment, by orally notifying the Department immediately upon discovery of the deviation;

b. Promptly report all occurrences of excess emissions that are expected to last for one hour or longer by orally notifying the Department of the onset and termination of the occurrence;

c. When requested by the Department the Permittee shall report all deviations from permit conditions, including those attributed to malfunctions as defined in COMAR 26.11.01.07A, within 5 days of the request by submitting a written description of the deviation to the Department. The written report shall include the cause, dates and times of the onset and termination of the deviation, and an account of all actions planned or taken to reduce, eliminate, and prevent recurrence of the deviation;

d. The Permittee shall submit to the Department semi-annual monitoring reports that confirm that all required monitoring was performed, and that provide accounts of all deviations from permit requirements that occurred during the reporting periods. Reporting periods shall be January 1 through June 30 and July 1 through December 31, and reports shall be submitted within 30 days of the end of each reporting period. Each account of deviation shall include a description of the deviation, the dates and times of onset and termination, identification of the person who observed or discovered the deviation, causes and corrective actions taken, and actions taken to prevent recurrence. If no deviations from permit conditions occurred during a reporting period, the Permittee shall submit a written report that so states.

e. When requested by the Department, the Permittee shall submit a written report to the Department within 10 days of receiving the request concerning an occurrence of excess emissions. The report shall contain the information required in COMAR 26.11.01.07D(2).

5. ACCIDENTAL RELEASE PROVISIONS

[COMAR 26.11.03.03B(23)] and [40 CFR 68]

Should the Permittee become subject to 40 CFR 68 during the term of this permit, the Permittee shall submit risk management plans by the date specified in 40 CFR 68.150 and shall certify compliance with the requirements of 40 CFR 68 as part of the annual compliance certification as required by 40 CFR 70.

The Permittee shall initiate a permit revision or reopening according to the procedures of 40 CFR 70.7 to incorporate appropriate permit conditions into the Permittee's Part 70 permit.

6. GENERAL TESTING REQUIREMENTS

[COMAR 26.11.01.04]

The Department may require the Permittee to conduct, or have conducted, testing to determine compliance with this Part 70 permit. The Department, at its option, may witness or conduct these tests. This testing shall be done at a reasonable time, and all information gathered during a testing operation shall be provided to the Department.

7. EMISSIONS TEST METHODS

[COMAR 26.11.01.04]

Compliance with the emissions standards and limitations in this Part 70 permit shall be determined by the test methods designated and described below or other test methods submitted to and approved by the Department.

Reference documents of the test methods approved by the Department include the following:

a. 40 CFR 60, appendix A

b. 40 CFR 51, appendix M

c. The Department's Technical Memorandum 91-01 "Test Methods and Equipment Specifications for Stationary Sources", (January 1991), as amended through Supplement 3, (October 1, 1997)

8. EMISSIONS CERTIFICATION REPORT

[COMAR 26.11.01.05-1] and [COMAR 26.11.02.19C] and [COMAR 26.11.02.19D]

The Permittee shall certify actual annual emissions of regulated pollutants from the facility on a calendar year basis.

a. The certification shall be on forms obtained from the Department and submitted to the Department not later than April 1 of the year following the year for which the certification is required;

b. The individual making the certification shall certify that the information is accurate to the individual's best knowledge. The individual shall be:

(1) Familiar with each source for which the certifications forms are submitted, and

(2) Responsible for the accuracy of the emissions information;

c. The Permittee shall maintain records necessary to support the emissions certification including the following information if applicable:

(1) The total amount of actual emissions of each regulated pollutant and the total of all regulated pollutants;

(2) An explanation of the methods used to quantify the emissions and the operating schedules and production data that were used to determine emissions, including significant assumptions made;

(3) Amounts, types and analyses of all fuels used;

(4) Emissions data from continuous emissions monitors that are required by this permit, including monitor calibration and malfunction information;

(5) Identification, description, and use records of all air pollution control equipment and compliance monitoring equipment including:

(a) Significant maintenance performed,
(b) Malfunctions and downtime, and
(c) Episodes of reduced efficiency of all equipment;

(6) Limitations on source operation or any work practice standards that significantly affect emissions; and

(7) Other relevant information as required by the Department.

9. COMPLIANCE CERTIFICATION REPORT

[COMAR 26.11.03.06G(6) and (7)]

The Permittee shall submit to the Department and EPA Region III a report certifying compliance with each term of this Part 70 permit including each applicable standard, emissions limitation, and work practice for the previous calendar year by April 1 of each year.

a. The compliance certification shall include:

(1) The identification of each term or condition of this permit which is the basis of the certification;

(2) The compliance status;

(3) Whether the compliance was continuous or intermittent;

(4) The methods used for determining the compliance status of each source, currently and over the reporting period; and

(5) Any other information required to be reported to the Department that is necessary to determine the compliance status of the Permittee with this permit.

b. The Permittee shall submit the compliance certification reports to the Department and EPA simultaneously.

10. CERTIFICATION BY RESPONSIBLE OFFICIAL

[COMAR 26.11.02.02F]

All application forms, reports, and compliance certifications submitted pursuant to this permit shall be certified by a responsible official as to truth, accuracy, and completeness. The Permittee shall expeditiously notify the Department of an appointment of a new responsible official.

The certification shall be in the following form:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system

designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. SAMPLING AND EMISSIONS TESTING RECORD KEEPING

[COMAR 26.11.03.06C(5)]

The Permittee shall gather and retain the following information when sampling and testing for compliance demonstrations:

a. The location as specified in this permit, and the date and time that samples and measurements are taken;

b. All pertinent operating conditions existing at the time that samples and measurements are taken;

c. The date that each analysis of a sample or emissions test is performed and the name of the person taking the sample or performing the emissions test;

d. The identity of the Permittee, individual, or other entity that performed the analysis;

e. The analytical techniques and methods used; and

f. The results of each analysis.

12. GENERAL RECORDKEEPING

[COMAR 26.11.03.06C(6)]

The Permittee shall retain records of all monitoring data and information that support the compliance certification for a period of five (5) years from the date that the monitoring, sample measurement, application, report or emissions test was completed or submitted to the Department.

These records and support information shall include:

a. All calibration and maintenance records;

b. All original data collected from continuous monitoring instrumentation;

c. Records which support the annual emissions certification; and

d. Copies of all reports required by this permit.

13. GENERAL CONFORMITY

[COMAR 26.11.26.09]

The Permittee shall comply with the general conformity requirements of 40 CFR 93, Subpart B and COMAR 26.11.26.09.

14. ASBESTOS PROVISIONS

[40 CFR 61, Subpart M]

The Permittee shall comply with 40 CFR 61, Subpart M when conducting any renovation or demolition activities at the facility.

15. OZONE DEPLETING REGULATIONS

[40 CFR 82, Subpart F]

The Permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR 82, Subpart F, except as provided for MVACs in subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal shall comply with the prohibitions and required practices pursuant to 40 CFR 82.154 and 82.156.

b. Equipment used during the maintenance, service, repair or disposal of appliances shall comply with the standards for recycling and recovery equipment pursuant to 40 CFR 82.158.

c. Persons performing maintenance, service, repairs or disposal of appliances shall be certified by an approved technician certification program pursuant to 40 CFR 82.161.

d. Persons performing maintenance, service, repairs or disposal of appliances shall certify with the Administrator pursuant to 40 CFR 82.162.

e. Persons disposing of small appliances, MVACS, and MVAC-like appliances as defined in 40 CFR 82.152, shall comply with record keeping requirements pursuant to 40 CFR 82.166.

f. Persons owning commercial or industrial process refrigeration equipment shall comply with the leak repair requirements pursuant to 40 CFR 82.156.

g. Owners/operators of appliances normally containing 50 or more pounds of refrigerant shall keep records of refrigerant purchased and added to such appliances pursuant to 40 CFR 82.166.

16. ACID RAIN PERMIT

Not applicable

SECTION IV PLANT SPECIFIC CONDITIONS

This section provides tables that include the emissions standards, emissions limitations, and work practices applicable to each emissions unit located at this facility. The Permittee shall comply with all applicable emissions standards, emissions limitations and work practices included herein.

The tables also include testing, monitoring, record keeping and reporting requirements specific to each emissions unit. In addition to the requirements included here in **Section IV**, the Permittee is also subject to the general testing, monitoring, record keeping and reporting requirements included in **Section III – Plant Wide Conditions** of this permit.

Unless otherwise provided in the specific requirements for an emissions unit, the Permittee shall maintain at the facility for at least five (5) years, and shall make available to the Department upon request, all records that the Permittee is required under this section to establish. **[Authority: COMAR 26.11.03.06C(5)(g)]**

The WCCLF is currently subject to the following requirements:

Table IV – 1	
1.0	**Emissions Unit Number(s): EU01** **EU01** - MSW Landfill consists of nine (9) cells. Cell 1, Cell 2, Cell 3 and Cell 4 have been filled. Cell 5 is currently being filled. Landfill is provided with a gas collection and control system and gas is destroyed through burning at the enclosed flare station, now owned by the landfill and located within its premises. **[9-0024]**
1.1	**Applicable Standards/Limits:** Central Landfill Facility is subject to the testing, record keeping, and reporting requirements indicated below.
1.2	**Testing Requirements:** The Permittee shall retest the site-specific NMOC concentration every 5 years using the methods specified in 40 CFR §60.754(a)(3). **[Reference: COMAR 26.11.19.20D(6a)]** The Permittee shall submit to the Department a test protocol for review and approval at least 30 days prior to conducting the test. The Permittee shall submit test result to the Department within 45 days after completion of the test.

Table IV – 1	
1.3	**Monitoring Requirements:** See record keeping and reporting requirements.
1.4	**Record Keeping Requirements:** The Permittee shall keep all the records required under this permit for at least five years and shall make such records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**
1.5	**Reporting Requirements:** A. If the Permittee increases the maximum design capacity of the Central Landfill Facility after November 1, 1997, the Permittee shall amend and resubmit the design capacity report within 90 days of the issuance of an air quality Permit to Construct or a permit from the MDE Waste Management Administration that authorizes the increase or any other change that increases the maximum design capacity of the landfill. **[Reference: COMAR 26.11.19.20D(2)]** B. The Permittee shall estimate the annual NMOC emission rate calculated using the formula and procedures as described in 40 CFR §60.754(a). The Permittee shall prepare and submit an updated NMOC emission rate report by November 1 of each year. A less frequent emission rate report may be submitted upon approval by the Department in accordance with COMAR 26.11.19.20D(6). **[Reference: COMAR 26.11.19.20D(3)(a) & COMAR 26.11.19.20D(6)]** C. The Permittee may, upon approval by the Department, submit a combined report to satisfy the NMOC reporting requirements and the annual Emissions Certification requirements. Such report shall be submitted by April 1 of each year for the previous calendar year. **[Reference: COMAR 26.11.19.20D(7)]**

The WCCLF will be subject to the following requirements, if it's calculated NMOC emissions increase to 34 megagrams/yr or more:

Table IV – 1A	
1.0	**Emissions Unit Number(s): EU01** **EU01** - MSW Landfill consists of nine (9) cells. Cell 1, Cell 2, Cell 3 and Cell 4 have been filled. Cell 5 is currently being filled. Landfill is provided with a gas collection and control system and gas is destroyed

Table IV – 1A	
	through burning at the enclosed flare station, now owned by the landfill and located within its premises. **[9-0024]**
1A.1	**Applicable Standards/Limits:** **A. Standard for Air Emissions from Municipal Solid Waste Landfills** **40 CFR 60, Subpart Cf** **§60.31f Designated facilities.** "(a) The designated facility to which these Emission Guidelines apply is each existing MSW landfill for which construction, reconstruction, or modification was commenced on or before July 17, 2014. **§60.32f Compliance times.** Planning, awarding of contracts, installing, and starting up MSW landfill air emission collection and control equipment that is capable of meeting the Emission Guidelines under §60.33f must be completed within 30 months after the date an NMOC emission rate report shows NMOC emissions equal or exceed 34 megagrams per year (50 megagrams per year for the closed landfill subcategory); or within 30 months after the date of the most recent NMOC emission rate report that shows NMOC emissions equal or exceed 34 megagrams per year (50 megagrams per year for the closed landfill subcategory), if Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater. **§60.33f Emission Guidelines for municipal solid waste landfill emissions.** Applicability These emission guiles apply to "each owner or operator of an MSW landfill having a design capacity greater than or equal to 2.5 million megagrams by mass and 2.5 million cubic meters by volume to collect and control MSW landfill emissions at each MSW landfill that meets the following conditions: (1) The landfill has accepted waste at any time since November 8, 1987, or has additional design capacity available for future waste deposition. (2) The landfill commenced construction, reconstruction, or modification on or before July 17, 2014. (3) The landfill has an NMOC emission rate greater than or equal to

Table IV – 1A	
	34 megagrams per year or Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater. (4) The landfill in the closed landfill subcategory and has an NMOC emission rate greater than or equal to 50 megagrams per year or Tier 4 surface emissions monitoring shows a surface emission concentration of 500 parts per million methane or greater." **[Reference: 40 CFR §60.33f(a)]** <u>Collection System</u> The Permittee must install "a gas collection and control system meeting the requirements in paragraphs (b)(1) through (3) and (c) of this section at each MSW landfill meeting the conditions in paragraph (a) of this section. (1) Collection system. Install and start up a collection and control system that captures the gas generated within the landfill within 30 months after: (i) The first annual report in which the NMOC emission rate equals or exceeds 34 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 34 megagrams per year, as specified in §60.38f(d)(4); or (ii) The first annual NMOC emission rate report for a landfill in the closed landfill subcategory in which the NMOC emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 50 megagrams per year, as specified in §60.38f(d)(4); or (iii) The most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2, if the Tier 4 surface emissions monitoring shows a surface methane emission concentration of 500 parts per million methane or greater as specified in §60.38f(d)(4)(iii). (2) Active. An active collection system must: (i) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment. (ii) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade. (iii) Collect gas at a sufficient extraction rate.

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(iv) Be designed to minimize off-site migration of subsurface gas.

(3) ....." **[Reference: 40 CFR §60.33f(b)]**

(c) Control system. The Permittee must "include provisions for the control of the gas collected from within the landfill through the use of control devices meeting the following requirements, except as provided in §60.24.

(1) A non-enclosed flare designed and operated in accordance with the parameters established in §60.18 except as noted in §60.37f(d); or

(2) A control system designed and operated to reduce NMOC by 98 weight percent; or when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen or less. The reduction efficiency or concentration in parts per million by volume must be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in §60.35f(d). The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with this subpart.

(i) If a boiler or process heater is used as the control device, the landfill gas stream must be introduced into the flame zone.

(ii) The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in §60.37f.

(iii) For the closed landfill subcategory, the initial or most recent performance test conducted to comply with subpart WWW of this part; 40 CFR part 62, subpart GGG; or a state plan implementing subpart Cc of this part on or before July 17, 2014 is sufficient for compliance with this subpart." **[Reference: 40 CFR §60.33f(c)]**

(3) The Permittee must "route the collected gas to a treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the

Table IV – 1A	
	treated landfill gas must be controlled according to either paragraph (c)(1) or (2) of this section." **[Reference: 40 CFR §60.33f(c)]** (4) All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (b) or (c) of this section. For purposes of this subpart, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (b) or (c) of this section. **[Reference: 40 CFR §60.33f(c)]** (d) Design capacity. (1) .... (2) When an increase in the maximum design capacity of a landfill with an initial design capacity less than 2.5 million megagrams or 2.5 million cubic meters results in a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator must comply with paragraph (e) of this section. **[Reference: 40 CFR §60.33f(d)]** (e) Emissions. A Permittee with an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must "either install a collection and control system as provided in paragraphs (b) and (c) of this section or calculate an initial NMOC emission rate for the landfill using the procedures specified in §60.35f(a). The NMOC emission rate must be recalculated annually, except as provided in §60.38f(c)(3). (1) If the calculated NMOC emission rate is less than 34 megagrams per year, the owner or operator must: (i) Submit an annual NMOC emission rate report according to §60.38f(c), except as provided in §60.38f(c)(3); and (ii) Recalculate the NMOC emission rate annually using the procedures specified in §60.35f(a) until such time as the calculated NMOC emission rate is equal to or greater than 34 megagrams per year, or the landfill is closed. (A) If the calculated NMOC emission rate, upon initial calculation or annual recalculation required in paragraph (e)(1)(ii) of this section, is equal to or greater than 34 megagrams per year, the owner or operator must either: Comply with paragraphs (b) and (c) of this

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section; calculate NMOC emissions using the next higher tier in §60.35f; or conduct a surface emission monitoring demonstration using the procedures specified in §60.35f(a)(6).
(B) If the landfill is permanently closed, a closure report must be submitted to the Administrator as provided in §60.38f(f), except for exemption allowed under §60.31f(e)(4).
(C) For the closed landfill subcategory, if the most recently calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator must either: Submit a gas collection and control system design plan as specified in §60.38f(d), except for exemptions allowed under §60.31f(e)(3), and install a collection and control system as provided in paragraphs (b) and (c) of this section; calculate NMOC emissions using the next higher tier in §60.35f; or conduct a surface emission monitoring demonstration using the procedures specified in §60.35f(a)(6)." [Reference: 40 CFR §60.33f(e)]

(2) If the calculated NMOC emission rate is equal to or greater than 34 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator must either: submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year as specified in §60.38f(d), except for exemptions allowed under §60.31f(e)(3); calculate NMOC emissions using a higher tier in §60.35f; or conduct a surface emission monitoring demonstration using the procedures specified in §60.35f(a)(6). **[Reference: 40 CFR §60.33f(e)]**

B. <u>Operational Standards for Collection and Control Systems</u> – [40 CFR §60.34f]

The Permittee or operator "of an MSW landfill with a gas collection and control system used to comply with the provisions of §60.33f(b) and (c) must:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:
(1) Five (5) years or more if active; or
(2) Two (2) years or more if closed or at final grade.

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:
(1) A fire or increased well temperature. The owner or operator

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must record instances when positive pressure occurs in efforts to avoid a fire. These records must be submitted with the annual reports as provided in §60.38f(h)(1).

(2) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits in the design plan.

(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes must be approved by the Administrator as specified in §60.38f(d).

(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must satisfy both criteria in order to be approved (i.e., neither causing fires nor killing methanogens is acceptable).

(d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator must conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in §60.36(d). The owner or operator must conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations. Thus, the owner or operator must monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan must be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

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	(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with §60.33f(c). In the event the collection or control system is not operating, the gas mover system must be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere must be closed within 1 hour of the collection or control system not operating. (f) Operate the control system at all times when the collected gas is routed to the system. (g) If monitoring demonstrates that the operational requirements in paragraph (b), (c), or (d) of this section are not met, corrective action must be taken as specified in §60.36f(a)(3) and (5) or (c). If corrective actions are taken as specified in §60.36f, the monitored exceedance is not a violation of the operational requirements in this section." **[Reference: 40 CFR §60.33f(e)]** **C. <u>Particulate Matter from Materials Handling and Construction</u>** "A person may not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. These reasonable precautions shall include, but not be limited to, the following when appropriate as determined by the control officer: (**2**) Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can create airborne dusts." **[Reference: COMAR 26.11.06.03D]**
1A.2	**<u>Testing Requirements</u>:** **A. <u>Standards for Air Emissions from Municipal Solid Waste Landfills</u>** **§60.35f Test methods and procedures**. The Permittee must use the "provisions in this section to calculate the landfill NMOC emission rate or to conduct a surface emission monitoring demonstration.

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(a)(1) NMOC Emission Rate. The landfill owner or operator must calculate the NMOC emission rate using either Equation 1 provided in paragraph (a)(1)(i) of this section or Equation 2 provided in paragraph (a)(1)(ii) of this section. Both Equation 1 and Equation 2 may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i) of this section, for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in paragraph (a)(1)(ii) of this section, for part of the life of the landfill. The values to be used in both Equation 1 and Equation 2 are 0.05 per year for k, 170 cubic meters per megagram for Lo, and 4,000 parts per million by volume as hexane for the CNMOC. For landfills located in geographical areas with a 30-year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site, the k value to be used is 0.02 per year.

(i)(A) Equation 1 must be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{ni} = 2kL_oM_i\,(e^{-kt}i)\,(C_{NMOC})\,(3.6\times10^{-9}) \qquad \text{(Eq. 1)}$$

Where:

M_{NMOC} = Total NMOC emission rate from the landfill, megagrams per year.
k = Methane generation rate constant, $year^{-1}$.
L_o = Methane generation potential, cubic meters per megagram solid waste.
M^i = Mass of solid waste in the i^{th} section, megagrams.
t_i = Age of the i^{th} section, years.
C_{NMOC} = Concentration of NMOC, parts per million by volume as hexane.
3.6×10^{-9} = Conversion factor.

(B) The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for Mi if documentation of the nature and amount of such wastes is maintained.

(ii)(A) Equation 2 must be used if the actual year-to-year solid waste acceptance rate is unknown.

$$M_{NMOC} = 2\,L_o\,R\,(e^{-kc} - e^{-kt})\,C_{NMOC}\,(3.6\times10^{-9}) \qquad \text{(Eq. 2)}$$

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Where:

M_{NMOC} = Mass emission rate of NMOC, megagrams per year.
L_o = Methane generation potential, cubic meters per megagram solid waste.
R = Average annual acceptance rate, megagrams per year.
k = Methane generation rate constant, $year^{-1}$.
t = Age of landfill, years.
C_{NMOC} = Concentration of NMOC, parts per million by volume as hexane.
c = Time since closure, years; for active landfill c = 0 and $e^{-kc} = 1$.
3.6×10^{-9} = Conversion factor.

(B) The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value of R, if documentation of the nature and amount of such wastes is maintained.

(2) Tier 1. The owner or operator must compare the calculated NMOC mass emission rate to the standard of 34 megagrams per year.

(i) If the NMOC emission rate calculated in paragraph (a)(1) of this section is less than 34 megagrams per year, then the owner or operator must submit an NMOC emission rate report according to §60.38f(c) and must recalculate the NMOC mass emission rate annually as required under §60.33f(e).

(ii) If the NMOC emission rate calculated in paragraph (a)(1) of this section is equal to or greater than 34 megagrams per year, then the landfill owner or operator must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in §60.38f(d) and install and operate a gas collection and control system within 30 months according to §60.33f(b) and (c);

(B) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures provided in paragraph (a)(3) of this section; or

(C) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures provided in paragraph (a)(4) of this section.

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	(3) Tier 2. The landfill owner or operator must determine the site-specific NMOC concentration using the following sampling procedure. The landfill owner or operator must install at least two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The probes should be evenly distributed across the sample area. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator must collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25 or 25C of appendix A of this part. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes must be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements must be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If more than the required number of samples is taken, all samples must be used in the analysis. The landfill owner or operator must divide the NMOC concentration from Method 25 or 25C by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, Method 25 or 25C samples may be collected from these systems instead of surface probes provided the removal system can be shown to provide sampling as representative as the two sampling probe per hectare requirement. For active collection systems, samples may be collected from the common header pipe. The sample location on the common header pipe must be before any gas moving, condensate removal, or treatment system equipment. For active collection systems, a minimum of three samples must be collected from the header pipe. (i) Within 60 days after the date of determining the NMOC concentration and corresponding NMOC emission rate, the owner or operator must submit the results according to §60.38f(j)(2). (ii) The landfill owner or operator must recalculate the NMOC mass emission rate using Equation 1 or Equation 2 provided in paragraph (a)(1)(i) or (ii) of this section using the average site-

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specific NMOC concentration from the collected samples instead of the default value provided in paragraph (a)(1) of this section.

(iii) If the resulting NMOC mass emission rate is less than 34 megagrams per year, then the owner or operator must submit a periodic estimate of NMOC emissions in an NMOC emission rate report according to §60.38f(c), and must recalculate the NMOC mass emission rate annually as required under §60.33f(e). The site-specific NMOC concentration must be retested every 5 years using the methods specified in this section.

(iv) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration is equal to or greater than 34 megagrams per year, the owner or operator must either:
(A) Submit a gas collection and control system design plan within 1 year as specified in §60.38f(d) and install and operate a gas collection and control system within 30 months according to §60.33f(b) and (c);
(B) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the Tier 3 procedures specified in paragraph (a)(4) of this section; or
(C) Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph (a)(6) of this section.

(4) Tier 3. The site-specific methane generation rate constant must be determined using the procedures provided in Method 2E of appendix A of this part. The landfill owner or operator must estimate the NMOC mass emission rate using Equation 1 or Equation 2 in paragraph (a)(1)(i) or (ii) of this section and using a site-specific methane generation rate constant, and the site-specific NMOC concentration as determined in paragraph (a)(3) of this section instead of the default values provided in paragraph (a)(1) of this section. The landfill owner or operator must compare the resulting NMOC mass emission rate to the standard of 34 megagrams per year.

(i) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration and Tier 3 site-specific methane generation rate is equal to or greater than 34 megagrams per year, the owner or operator must either:
(A) Submit a gas collection and control system design plan within

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1 year as specified in §60.38f(d) and install and operate a gas collection and control system within 30 months according to §60.33f(b) and (c); or

(B) Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph (a)(6) of this section.

(ii) If the NMOC mass emission rate is less than 34 megagrams per year, then the owner or operator must recalculate the NMOC mass emission rate annually using Equation 1 or Equation 2 in paragraph (a)(1) of this section and using the site-specific Tier 2 NMOC concentration and Tier 3 methane generation rate constant and submit a periodic NMOC emission rate report as provided in §60.38f(c). The calculation of the methane generation rate constant is performed only once, and the value obtained from this test must be used in all subsequent annual NMOC emission rate calculations.

(5) Other methods. The owner or operator may use other methods to determine the NMOC concentration or a site-specific methane generation rate constant as an alternative to the methods required in paragraphs (a)(3) and (4) of this section if the method has been approved by the Administrator.

(6) Tier 4. The landfill owner or operator must demonstrate that surface methane emissions are below 500 parts per million. Surface emission monitoring must be conducted on a quarterly basis using the following procedures. Tier 4 is allowed only if the landfill owner or operator can demonstrate that NMOC emissions are greater than or equal to 34 Mg/yr but less than 50 Mg/yr using Tier 1 or Tier 2. If both Tier 1 and Tier 2 indicate NMOC emissions are 50 Mg/yr or greater, then Tier 4 cannot be used. In addition, the landfill must meet the criteria in paragraph (a)(6)(viii) of this section.

(i) The owner or operator must measure surface concentrations of methane along the entire perimeter of the landfill and along a pattern that traverses the landfill at no more than 30-meter intervals using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in §60.36f(d).

(ii) The background concentration must be determined by moving

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the probe inlet upwind and downwind at least 30 meters from the waste mass boundary of the landfill.

(iii) Surface emission monitoring must be performed in accordance with section 8.3.1 of Method 21 of appendix A of this part, except that the probe inlet must be placed no more than 5 centimeters above the landfill surface; the constant measurement of distance above the surface should be based on a mechanical device such as with a wheel on a pole.

(A) The owner or operator must use a wind barrier, similar to a funnel, when onsite average wind speed exceeds 4 miles per hour or 2 meters per second or gust exceeding 10 miles per hour. Average on-site wind speed must also be determined in an open area at 5-minute intervals using an on-site anemometer with a continuous recorder and data logger for the entire duration of the monitoring event. The wind barrier must surround the SEM monitor, and must be placed on the ground, to ensure wind turbulence is blocked. SEM cannot be conducted if average wind speed exceeds 25 miles per hour.

(B) Landfill surface areas where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover, and all cover penetrations must also be monitored using a device meeting the specifications provided in §60.36f(d).

(iv) Each owner or operator seeking to comply with the Tier 4 provisions in paragraph (a)(6) of this section must maintain records of surface emission monitoring as provided in §60.39f(g) and submit a Tier 4 surface emissions report as provided in §60.38f(d)(4)(iii).

(v) If there is any measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must submit a gas collection and control system design plan within 1 year of the first measured concentration of methane of 500 parts per million or greater from the surface of the landfill according to §60.38f(d) and install and operate a gas collection and control system according to §60.33f(b) and (c) within 30 months of the most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2.

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(vi) If after four consecutive quarterly monitoring periods at a landfill, other than a closed landfill, there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must continue quarterly surface emission monitoring using the methods specified in this section.

(vii) If after four consecutive quarterly monitoring periods at a closed landfill there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must conduct annual surface emission monitoring using the methods specified in this section.

(viii) If a landfill has installed and operates a collection and control system that is not required by this subpart, then the collection and control system must meet the following criteria:

(A) The gas collection and control system must have operated for at least 6,570 out of 8,760 hours preceding the Tier 4 surface emissions monitoring demonstration.

(B) During the Tier 4 surface emissions monitoring demonstration, the gas collection and control system must operate as it normally would to collect and control as much landfill gas as possible.

(b) After the installation and startup of a collection and control system in compliance with this subpart, the owner or operator must calculate the NMOC emission rate for purposes of determining when the system can be capped, removed, or decommissioned as provided in §60.33f(f), using Equation 3:

$$M_{NMOC} = 1.89 \times 10^{-3} Q_{LFG} C_{NMOC} \qquad \text{(Eq. 3)}$$

Where:

M_{NMOC} = Mass emission rate of NMOC, megagrams per year.
Q_{LFG} = Flow rate of landfill gas, cubic meters per minute.
C_{NMOC} = NMOC concentration, parts per million by volume as hexane.

(1) The flow rate of landfill gas, Q_{LFG}, must be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control system using a gas flow measuring device calibrated according to the provisions of section 10 of

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Method 2E of appendix A of this part.

(2) The average NMOC concentration, C_{NMOC}, must be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25 or Method 25C of appendix A of this part. The sample location on the common header pipe must be before any condensate removal or other gas refining units. The landfill owner or operator must divide the NMOC concentration from Method 25 or Method 25C by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.

(3) The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.

(i) Within 60 days after the date of calculating the NMOC emission rate for purposes of determining when the system can be capped or removed, the owner or operator must submit the results according to §60.38f(j)(2).

(ii) [Reserved]

(c) When calculating emissions for Prevention of Significant Deterioration purposes, the owner or operator of each MSW landfill subject to the provisions of this subpart must estimate the NMOC emission rate for comparison to the Prevention of Significant Deterioration major source and significance levels in §51.166 or §52.21 of this chapter using Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (AP-42) or other approved measurement procedures.

(d) For the performance test required in §60.33f(c)(1), the net heating value of the combusted landfill gas as determined in §60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under §60.18(f)(4).

(1) Within 60 days after the date of completing each performance test (as defined in §60.8), the owner or operator must submit the

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results of the performance tests required by paragraph (b) or (d) of this section, including any associated fuel analyses, according to §60.38f(j)(1).

(2) [Reserved]

(e) For the performance test required in §60.33f(c)(2), Method 25 or 25C (Method 25C may be used at the inlet only) of appendix A of this part must be used to determine compliance with the 98 weight-percent efficiency or the 20 parts per million by volume outlet NMOC concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by §60.38f(d)(2). Method 3, 3A, or 3C must be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. Method 18 may be used in conjunction with Method 25A on a limited basis (compound specific, e.g., methane) or Method 3C may be used to determine methane. The methane as carbon should be subtracted from the Method 25A total hydrocarbon value as carbon to give NMOC concentration as carbon. The landfill owner or operator must divide the NMOC concentration as carbon by 6 to convert the C_{NMOC} as carbon to C_{NMOC} as hexane. Equation 4 must be used to calculate efficiency:

Control Efficiency = $(NMOC_{in} - NMOC_{out}) / (NMOC_{in})$ (Eq. 4)

Where:

$NMOC^{in}$ = Mass of NMOC entering control device.
$NMOC^{out}$ = Mass of NMOC exiting control device.

(1) Within 60 days after the date of completing each performance test (as defined in §60.8), the owner or operator must submit the results of the performance tests, including any associated fuel analyses, according to §60.38f(j)(1)."

(2) [Reserved]
[Reference: 40 CFR §60.33f(e)]

B. <u>Operational Standards for Collection and Control Systems</u>

The Permittee must follow the appropriate "compliance provisions in

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this section.

(a) Except as provided in §60.38f(d)(2), the specified methods in paragraphs (a)(1) through (6) of this section must be used to determine whether the gas collection system is in compliance with §60.33f(b)(2).

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with §60.33f(b)(2)(i), either Equation 5 or Equation 6 in paragraph (a)(1)(i) or (ii) of this section must be used. The methane generation rate constant (k) and methane generation potential (Lo) kinetic factors should be those published in the most recent AP-42 or other site-specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in §60.35f(a)(4), the value of k determined from the test must be used. A value of no more than 15 years must be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

(i) For sites with unknown year-to-year solid waste acceptance rate:

$Q_m = 2\ L_O\ R\ (e^{-kc} - e^{-kt})$ (Eq. 5)

Where:

Q_m = Maximum expected gas generation flow rate, cubic meters per year.
L_O = Methane generation potential, cubic meters per megagram solid waste.
R = Average annual acceptance rate, megagrams per year.
k = Methane generation rate constant, $year^{-1}$.
t = Age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years.
c = Time since closure, years (for an active landfill c = 0 and e^{-kc} = 1).

(ii) For sites with known year-to-year solid waste acceptance rate:

$Q_M = \sum_{ni} = 2\ k\ L_o\ M_i\ (e^{-kti})$ (Eq. 6)

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Where:

Q_M = Maximum expected gas generation flow rate, cubic meters per year.
k = Methane generation rate constant, $year^{-1}$.
L_O = Methane generation potential, cubic meters per megagram solid waste.
M_i = Mass of solid waste in the ith section, megagrams.
t_i = Age of the ith section, years.

(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, Equation 5 or Equation 6 in paragraph (a)(1)(i) or (ii) of this section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using Equation 5 or Equation 6 or other methods must be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

(2) For the purposes of determining sufficient density of gas collectors for compliance with §60.33f(b)(2)(ii), the owner or operator must design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

(3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with §60.33f(b)(2)(iii), the owner or operator must measure gauge pressure in the gas collection header applied to each individual well monthly. If a positive pressure exists, action must be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under §60.34f(b). Any attempted corrective measure must not cause exceedances of other operational or performance standards.

(i) If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement of positive pressure, the owner or operator must conduct a root

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cause analysis and correct the exceedance as soon as practicable, but not later than 60 days after positive pressure was first measured. The owner or operator must keep records according to §60.39f(e)(3).

(ii) If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the positive pressure measurement. The owner or operator must submit the items listed in §60.38f(h)(7) as part of the next annual report. The owner or operator must keep records according to §60.39f(e)(4).

(iii) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to §60.38f(h)(7) and (k). The owner or operator must keep records according to §60.39f(e)(5).

(4) [Reserved]

(5) For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator must monitor each well monthly for temperature as provided in §60.34f(c). If a well exceeds the operating parameter for temperature, action must be initiated to correct the exceedance within 5 calendar days. Any attempted corrective measure must not cause exceedances of other operational or performance standards.

(i) If a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit) cannot be achieved within 15 calendar days of the first measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit), the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after a landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) was first measured. The owner or

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operator must keep records according to §60.39f(e)(3).

(ii) If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator must submit the items listed in §60.38f(h)(7) as part of the next annual report. The owner or operator must keep records according to §60.39f(e)(4).

(iii) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to §60.38f(h)(7) and (k). The owner or operator must keep records according to §60.39f(e)(5).

(6) An owner or operator seeking to demonstrate compliance with §60.33f(b)(2)(iv) through the use of a collection system not conforming to the specifications provided in §60.40f must provide information satisfactory to the Administrator as specified in §60.38f(d)(3) demonstrating that off-site migration is being controlled.

(b) For purposes of compliance with §60.34f(a), each owner or operator of a controlled landfill must place each well or design component as specified in the approved design plan as provided in §60.38f(d). Each well must be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

(1) Five (5) years or more if active; or

(2) Two (2) years or more if closed or at final grade.

(c) The following procedures must be used for compliance with the surface methane operational standard as provided in §60.34f(d):

(1) After installation and startup of the gas collection system, the

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owner or operator must monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.

(2) The background concentration must be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.

(3) Surface emission monitoring must be performed in accordance with section 8.3.1 of Method 21 of appendix A of this part, except that the probe inlet must be placed within 5 to 10 centimeters of the ground. Monitoring must be performed during typical meteorological conditions.

(4) Any reading of 500 parts per million or more above background at any location must be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4)(i) through (v) of this section must be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of §60.34f(d).

(i) The location of each monitored exceedance must be marked and the location and concentration recorded. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance must be made and the location must be re-monitored within 10 calendar days of detecting the exceedance.

(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken and the location must be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (c)(4)(v) of this section must be

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taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) of this section has been taken.

(iv) Any location that initially showed an exceedance but has a methane concentration less than 500 parts per million methane above background at the 10-day re-monitoring specified in paragraph (c)(4)(ii) or (iii) of this section must be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in paragraph (c)(4)(iii) or (v) of this section must be taken.

(v) For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device must be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.

(5) The owner or operator must implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

(d) Each owner or operator seeking to comply with the provisions in paragraph (c) of this section or §60.35f(a)(6) must comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

(1) The portable analyzer must meet the instrument specifications provided in section 6 of Method 21 of appendix A of this part, except that "methane" replaces all references to "VOC".

(2) The calibration gas must be methane, diluted to a nominal concentration of 500 parts per million in air.

(3) To meet the performance evaluation requirements in section 8.1 of Method 21 of appendix A of this part, the instrument evaluation procedures of section 8.1 of Method 21 must be used.

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	(4) The calibration procedures provided in sections 8 and 10 of Method 21 of appendix A of this part must be followed immediately before commencing a surface monitoring survey. (e) The provisions of this subpart apply at all times, including periods of startup, shutdown, or malfunction. During periods of startup, shutdown, and malfunction, you must comply with the work practice specified in §60.34f(e) in lieu of the compliance provisions in §60.36f." **[Reference: 40 CFR §60.36f(a) thru (e)]**
1A.3	**Monitoring Requirements:** **A. Standards for Air Emissions from Municipal Solid Waste Landfills** See Monitoring Requirements in Section 1.3.B. **B. Operational Standards for Collection and Control Systems** **§60.37f Monitoring of operations.** The Permittee must follow the appropriate "monitoring provisions in this section, except as provided in §60.38f(d)(2). (a) Each owner or operator seeking to comply with §60.33f(b)(2) for an active gas collection system must install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and: (1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in §60.36f(a)(3); and (2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as follows: (i) The nitrogen level must be determined using Method 3C, unless an alternative test method is established as allowed by §60.38f(d)(2). (ii) Unless an alternative test method is established as allowed by §60.38f(d)(2), the oxygen level must be determined by an oxygen meter using Method 3A, 3C, or ASTM D6522-11 (incorporated by

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reference, see §60.17). Determine the oxygen level by an oxygen meter using Method 3A, 3C, or ASTM D6522-11 (if sample location is prior to combustion) except that:

(A) The span must be set between 10 and 12 percent oxygen;
(B) A data recorder is not required;
(C) Only two calibration gases are required, a zero and span;
(D) A calibration error check is not required; and
(E) The allowable sample bias, zero drift, and calibration drift are ±10 percent.

(iii) A portable gas composition analyzer may be used to monitor the oxygen levels provided:

(A) The analyzer is calibrated; and
(B) The analyzer meets all quality assurance and quality control requirements for Method 3A or ASTM D6522-11 (incorporated by reference, see §60.17).

(3) Monitor temperature of the landfill gas on a monthly basis as provided in §60.36f(a)(5). The temperature measuring device must be calibrated annually using the procedure in this part 60, appendix A-1, Method 2, Section 10.3.

(b) Each owner or operator seeking to comply with §60.33f(c) using an enclosed combustor must calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.

(2) A device that records flow to the control device and bypass of the control device (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that must record the flow to the control device at least every 15 minutes; and

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(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(c) Each owner or operator seeking to comply with §60.33f(c) using a non-enclosed flare must install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.

(2) A device that records flow to the flare and bypass of the flare (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(d) Each owner or operator seeking to demonstrate compliance with §60.33f(c) using a device other than a non-enclosed flare or an enclosed combustor or a treatment system must provide information satisfactory to the Administrator as provided in §60.38f(d)(2) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator must review the information and either approve it, or request that additional information be submitted. The Administrator may specify additional appropriate monitoring procedures.

(e) Each owner or operator seeking to install a collection system that

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does not meet the specifications in §60.40f or seeking to monitor alternative parameters to those required by §§60.34f through 60.37f must provide information satisfactory to the Administrator as provided in §60.38f(d)(2) and (3) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.

(f) Each owner or operator seeking to demonstrate compliance with the 500 parts per million surface methane operational standard in §60.34f(d) must monitor surface concentrations of methane according to the procedures provided in §60.36f(c) and the instrument specifications in §60.36f(d). Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 parts per million or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

(g) Each owner or operator seeking to demonstrate compliance with the control system requirements in §60.33f(c) using a landfill gas treatment system must maintain and operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in §60.39f(b)(5)(ii) and must calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system (if applicable). The owner or operator must:

(1) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

(2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(h) The monitoring requirements of paragraphs (b), (c) (d) and (g) of this section apply at all times the affected source is operating, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities. A monitoring system

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	malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. You are required to complete monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable." **[Reference: 40 CFR §60.37f(a) thru (h)]** **C. <u>Particulate Matter from Materials Handling and Construction</u>**. Permittee shall maintain and update the current plan that contains an explanation of reasonable precautions or best management practices (BMPs) that will be used to prevent particulate matter from becoming airborne. The Permittee shall perform a semi-annual inspection of the operation to verify that the reasonable precautions (BMPs) are being implemented. **[Reference: COMAR 26.11.03.06C]**
1A.4	**<u>Record Keeping Requirements</u>:** **A. <u>Standards for Air Emissions from Municipal Solid Waste Landfills</u>** See Record Keeping Requirements in Section 1.4.B. **B. <u>Operational Standards for Collection and Control Systems</u>** **§60.39f Recordkeeping guidelines**. The Permittee must follow the appropriate "recordkeeping provisions in this section. (a) Except as provided in §60.38f(d)(2), each owner or operator of an MSW landfill subject to the provisions of §60.33f(e) must keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report that triggered §60.33f(e), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable. (b) Except as provided in §60.38f(d)(2), each owner or operator of a controlled landfill must keep up-to-date, readily accessible records for the life of the control system equipment of the data listed in paragraphs (b)(1) through (5) of this section as measured during the

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	initial performance test or compliance determination. Records of subsequent tests or monitoring must be maintained for a minimum of 5 years. Records of the control device vendor specifications must be maintained until removal. (1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.33f(b): (i) The maximum expected gas generation flow rate as calculated in §60.36f(a)(1). The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator. (ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in §60.40f(a)(1). (2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.33f(c) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts: (i) The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test. (ii) The percent reduction of NMOC determined as specified in §60.33f(c)(2) achieved by the control device. (3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.33f(c)(2)(i) through use of a boiler or process heater of any size: A description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing. (4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.33f(c)(1) through use of a non-enclosed flare, the flare type (i.e., steam-assisted, air-assisted, or non-assisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in §60.18; and continuous records

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of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame or the flare flame is absent.

(5) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.33f(c)(3) through use of a landfill gas treatment system:

(i) Bypass records. Records of the flow of landfill gas to, and bypass of, the treatment system.

(ii) Site-specific treatment monitoring plan, to include:

(A) Monitoring records of parameters that are identified in the treatment system monitoring plan and that ensure the treatment system is operating properly for each intended end use of the treated landfill gas. At a minimum, records should include records of filtration, de-watering, and compression parameters that ensure the treatment system is operating properly for each intended end use of the treated landfill gas.
(B) Monitoring methods, frequencies, and operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis for each intended end use of the treated landfill gas.
(C) Documentation of the monitoring methods and ranges, along with justification for their use.
(D) Identify who is responsible (by job title) for data collection.
(E) Processes and methods used to collect the necessary data.
(F) Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.

(c) Except as provided in §60.38f(d)(2), each owner or operator of a controlled landfill subject to the provisions of this subpart must keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in §60.37f as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

(1) The following constitute exceedances that must be recorded and reported under §60.38f:

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	(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of operation during which the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with §60.33f(c) was determined. (ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of this section. (2) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible continuous records of the indication of flow to the control system and the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under §60.37f. (3) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with §60.33f(c) must keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other state, local, tribal, or federal regulatory requirements.) (4) Each owner or operator seeking to comply with the provisions of this subpart by use of a non-enclosed flare must keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under §60.37f(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent. (5) Each owner or operator of a landfill seeking to comply with §60.33f(e) using an active collection system designed in accordance with §60.33f(b) must keep records of periods when the collection system or control device is not operating. (d) Except as provided in §60.38f(d)(2), each owner or operator subject to the provisions of this subpart must keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label on each collector that matches the labeling on the plot map.

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(1) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under §60.36f(b).
(2) Each owner or operator subject to the provisions of this subpart must keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in §60.40f(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in §60.40f(a)(3)(ii).

(e) Except as provided in §60.38f(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of the following:

(1) All collection and control system exceedances of the operational standards in §60.34f, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.
(2) Each owner or operator subject to the provisions of this subpart must also keep records of each wellhead temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above, each wellhead nitrogen level at or above 20 percent, and each wellhead oxygen level at or above 5 percent.
(3) For any root cause analysis for which corrective actions are required in §60.36f(a)(3) or (5), keep a record of the root cause analysis conducted, including a description of the recommended corrective action(s) taken, and the date(s) the corrective action(s) were completed.
(4) For any root cause analysis for which corrective actions are required in §60.36f(a)(3)(ii) or (a)(5)(ii), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.
(5) For any root cause analysis for which corrective actions are required in §60.36f(a)(3)(iii) or (a)(5)(iii), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, for action(s) not already completed, a schedule for implementation, including

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proposed commencement and completion dates, and a copy of any comments or final approval on the corrective action analysis or schedule from the regulatory agency.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of "design capacity", must keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(g) Landfill owners or operators seeking to demonstrate that site-specific surface methane emissions are below 500 parts per million by conducting surface emission monitoring under the Tier 4 procedures specified in §60.35f(a)(6) must keep for at least 5 years up-to-date, readily accessible records of all surface emissions monitoring and information related to monitoring instrument calibrations conducted according to sections 8 and 10 of Method 21 of appendix A of this part, including all of the following items:

(1) Calibration records:

(i) Date of calibration and initials of operator performing the calibration.

(ii) Calibration gas cylinder identification, certification date, and certified concentration.

(iii) Instrument scale(s) used.

(iv) A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value.

(v) If an owner or operator makes their own calibration gas, a description of the procedure used.

(2) Digital photographs of the instrument setup. The photographs must be time and date-stamped and taken at the first sampling location prior to sampling and at the last sampling location after sampling at the end of each sampling day, for the duration of the

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Tier 4 monitoring demonstration.

(3) Timestamp of each surface scan reading:

(i) Timestamp should be detailed to the nearest second, based on when the sample collection begins.

(ii) A log for the length of time each sample was taken using a stopwatch (e.g., the time the probe was held over the area).

(4) Location of each surface scan reading. The owner or operator must determine the coordinates using an instrument with an accuracy of at least 4 meters. Coordinates must be in decimal degrees with at least five decimal places.

(5) Monitored methane concentration (parts per million) of each reading.

(6) Background methane concentration (parts per million) after each instrument calibration test.

(7) Adjusted methane concentration using most recent calibration (parts per million).

(8) For readings taken at each surface penetration, the unique identification location label matching the label specified in paragraph (d) of this section.

(9) Records of the operating hours of the gas collection system for each destruction device.

(h) Except as provided in §60.38f(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in §60.37f(a)(1), (2), and (3).

(i) Any records required to be maintained by this subpart that are submitted electronically via the EPA's CDX may be maintained in electronic format.

(j) For each owner or operator reporting leachate or other liquids addition under §60.38f(l), keep records of any engineering

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	calculations or company records used to estimate the quantities of leachate or liquids added, the surface areas for which the leachate or liquids were applied, and the estimates of annual waste acceptance or total waste in place in the areas where leachate or liquids were applied." **[Reference: 40 CFR §60.39f]** **C. <u>Particulate Matter from Materials Handling and Construction</u>** The Permittee shall keep results of the semi-annual inspections for a period of five (5) years and shall maintain the written reasonable precautions (BMPs) at the facility. **[Reference: COMAR 26.11.03.06C]**
1A.5	**<u>Reporting Requirements</u>:** **A. <u>Standards for Air Emissions from Municipal Solid Waste Landfills</u>** See Reporting Requirements in Section 1.5.B. **B. <u>Operational Standards for Collection and Control Systems</u>** **§60.38f Reporting guidelines**. The Permittee must follow the "reporting provisions listed in this section, as applicable, except as provided under §§60.24 and 60.38f(d)(2). (a) Design capacity report. For existing MSW landfills subject to this subpart, the initial design capacity report must be submitted no later than 90 days after the effective date of EPA approval of the state's plan under section 111(d) of the Clean Air Act. The initial design capacity report must contain the following information: (1) A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the permit issued by the state, local, or tribal agency responsible for regulating the landfill. (2) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the permit issued by the state, local, or tribal agency responsible for regulating the landfill, a copy of the permit specifying the maximum design capacity may

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be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity must be calculated using good engineering practices. The calculations must be provided, along with the relevant parameters as part of the report. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site-specific density, which must be recalculated annually. Any density conversions must be documented and submitted with the design capacity report. The state, local, or tribal agency or the Administrator may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

(b) Amended design capacity report. An amended design capacity report must be submitted providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to meet or exceed 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in §60.39f(f).

(c) NMOC emission rate report. For existing MSW landfills covered by this subpart with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the NMOC emission rate report must be submitted following the procedure specified in paragraph (j)(2) of this section no later than 90 days after the effective date of EPA approval of the state's plan under section 111(d) of the Clean Air Act. The NMOC emission rate report must be submitted to the Administrator annually following the procedure specified in paragraph (j)(2) of this section, except as provided for in paragraph (c)(3) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.

(1) The NMOC emission rate report must contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in §60.35f(a) or (b), as applicable.
(2) The NMOC emission rate report must include all the data,

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	calculations, sample reports and measurements used to estimate the annual or 5-year emissions. (3) If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 34 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit, following the procedure specified in paragraph (j)(2) of this section, an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate must include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based must be provided to the Administrator. This estimate must be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate must be submitted to the Administrator. The revised estimate must cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate. (4) Each owner or operator subject to the requirements of this subpart is exempted from the requirements to submit an NMOC emission rate report, after installing a collection and control system that complies with §60.33f(b) and (c), during such time as the collection and control system is in operation and in compliance with §§60.34f and 60.36f. (d) Collection and control system design plan. The state plan must include a process for state review and approval of the site-specific design plan for each gas collection and control system. The collection and control system design plan must be prepared and approved by a professional engineer and must meet the following requirements: (1) The collection and control system as described in the design plan must meet the design requirements in §60.33f(b) and (c). (2) The collection and control system design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping, or reporting provisions of §§60.34f through 60.39f proposed by the owner or operator. (3) The collection and control system design plan must either conform to specifications for active collection systems in §60.40f or include a demonstration to the Administrator's satisfaction of

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	the sufficiency of the alternative provisions to §60.40f. (4) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must submit a copy of the collection and control system design plan cover page that contains the engineer's seal to the Administrator within 1 year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year, except as follows: (i) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in §60.35f(a)(3) and the resulting rate is less than 34 megagrams per year, annual periodic reporting must be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated NMOC emission rate is equal to or greater than 34 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated NMOC emission rate based on NMOC sampling and analysis, must be submitted, following the procedures in paragraph (j)(2) of this section, within 180 days of the first calculated exceedance of 34 megagrams per year. (ii) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant k, as provided in Tier 3 in §60.35f(a)(4), and the resulting NMOC emission rate is less than 34 megagrams per year, annual periodic reporting must be resumed. The resulting site-specific methane generation rate constant k must be used in the NMOC emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of §60.35f(a)(4) and the resulting site-specific methane generation rate constant k must be submitted, following the procedure specified in paragraph (j)(2) of this section, to the Administrator within 1 year of the first calculated NMOC emission rate equaling or exceeding 34 megagrams per year. (iii) If the owner or operator elects to demonstrate that site-specific surface methane emissions are below 500 parts per million methane, based on the provisions of §60.35f(a)(6), then the owner or operator must submit annually a Tier 4 surface emissions report as specified in this paragraph (d)(4)(iii) following the procedure specified in paragraph (j)(2) of this section until a

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surface emissions readings of 500 parts per million methane or greater is found. If the Tier 4 surface emissions report shows no surface emissions readings of 500 parts per million methane or greater for four consecutive quarters at a closed landfill, then the landfill owner or operator may reduce Tier 4 monitoring from a quarterly to an annual frequency. The Administrator may request such additional information as may be necessary to verify the reported instantaneous surface emission readings. The Tier 4 surface emissions report must clearly identify the location, date and time (to the nearest second), average wind speeds including wind gusts, and reading (in parts per million) of any value 500 parts per million methane or greater, other than non-repeatable, momentary readings. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places. The Tier 4 surface emission report should also include the results of the most recent Tier 1 and Tier 2 results in order to verify that the landfill does not exceed 50 Mg/yr of NMOC.

(A) The initial Tier 4 surface emissions report must be submitted annually, starting within 30 days of completing the fourth quarter of Tier 4 surface emissions monitoring that demonstrates that site-specific surface methane emissions are below 500 parts per million methane, and following the procedure specified in paragraph (j)(2) of this section.

(B) The Tier 4 surface emissions rate report must be submitted within 1 year of the first measured surface exceedance of 500 parts per million methane, following the procedure specified in paragraph (j)(2) of this section.

(iv) If the landfill is in the closed landfill subcategory, the owner or operator must submit a collection and control system design plan to the Administrator within 1 year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 50 megagrams per year, except as follows:

(A) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in §60.35f(a)(3) and the resulting rate is less than 50 megagrams per year, annual periodic reporting must be resumed, using the Tier 2 determined site-specific NMOC

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concentration, until the calculated NMOC emission rate is equal to or greater than 50 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated NMOC emission rate based on NMOC sampling and analysis, must be submitted, following the procedure specified in paragraph (j)(2) of this section, within 180 days of the first calculated exceedance of 50 megagrams per year.

(B) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant k, as provided in Tier 3 in §60.35f(a)(4), and the resulting NMOC emission rate is less than 50 megagrams per year, annual periodic reporting must be resumed. The resulting site-specific methane generation rate constant k must be used in the NMOC emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of §60.35f(a)(4) and the resulting site-specific methane generation rate constant k must be submitted, following the procedure specified in paragraph (j)(2) of this section, to the Administrator within 1 year of the first calculated NMOC emission rate equaling or exceeding 50 megagrams per year.

(C) The landfill owner or operator elects to demonstrate surface emissions are low, consistent with the provisions in paragraph (d)(4)(iii) of this section.

(D) The landfill has already submitted a gas collection and control system design plan consistent with the provisions of subpart WWW of this part; 40 CFR part 62, subpart GGG; or a state plan implementing subpart Cc of this part.

(5) The landfill owner or operator must notify the Administrator that the design plan is completed and submit a copy of the plan's signature page. The Administrator has 90 days to decide whether the design plan should be submitted for review. If the Administrator chooses to review the plan, the approval process continues as described in paragraph (c)(6) of this section. However, if the Administrator indicates that submission is not required or does not respond within 90 days, the landfill owner or operator can continue to implement the plan with the recognition that the owner or operator is proceeding at their own risk. In the

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event that the design plan is required to be modified to obtain approval, the owner or operator must take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

(6) Upon receipt of an initial or revised design plan, the Administrator must review the information submitted under paragraphs (d)(1) through (3) of this section and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems. If the Administrator does not approve or disapprove the design plan, or does not request that additional information be submitted within 90 days of receipt, then the owner or operator may continue with implementation of the design plan, recognizing they would be proceeding at their own risk.

(7) If the owner or operator chooses to demonstrate compliance with the emission control requirements of this subpart using a treatment system as defined in this subpart, then the owner or operator must prepare a site-specific treatment system monitoring plan as specified in §60.39f(b)(5).

(e) Revised design plan. The owner or operator who has already been required to submit a design plan under paragraph (d) of this section, or under subpart WWW of this part; 40 CFR part 62, subpart GGG; or a state plan implementing subpart Cc of this part, must submit a revised design plan to the Administrator for approval as follows:

(1) At least 90 days before expanding operations to an area not covered by the previously approved design plan.
(2) Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan that was submitted to the Administrator according to paragraph (d) of this section.

(f) *Closure report*. Each owner or operator of a controlled landfill must submit a closure report to the Administrator within 30 days of ceasing waste acceptance. The Administrator may request additional information as may be necessary to verify that permanent closure

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has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under §60.7(a)(4).

(g) *Equipment removal report*. Each owner or operator of a controlled landfill must submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.

(1) The equipment removal report must contain the following items:

(i) A copy of the closure report submitted in accordance with paragraph (f) of this section; and

(ii) A copy of the initial performance test report demonstrating that the 15-year minimum control period has expired, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX, or information that demonstrates that the GCCS will be unable to operate for 15 years due to declining gas flows. In the equipment removal report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX; and

(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 34 megagrams or greater of NMOC per year, unless the NMOC emission rate reports have been submitted to the EPA via the EPA's CDX. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports; or

(iv) For the closed landfill subcategory, dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year, unless the NMOC emission rate reports have been submitted to the EPA via the EPA's CDX. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a

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statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports.

(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in §60.33f(f) have been met.

(h) *Annual report*. The owner or operator of a landfill seeking to comply with §60.33f(e)(2) using an active collection system designed in accordance with §60.33f(b) must submit to the Administrator, following the procedures specified in paragraph (j)(2) of this section, an annual report of the recorded information in paragraphs (h)(1) through (7) of this section. The initial annual report must be submitted within 180 days of installation and startup of the collection and control system. The initial annual report must include the initial performance test report required under §60.8, as applicable, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX. In the initial annual report, the process unit(s) tested, the pollutant(s) tested and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX. The initial performance test report must be submitted, following the procedure specified in paragraph (j)(1) of this section, no later than the date that the initial annual report is submitted. For enclosed combustion devices and flares, reportable exceedances are defined under §60.39f(c)(1).

(1) Value and length of time for exceedance of applicable parameters monitored under §60.37f(a)(1), (b), (c), (d), and (g).
(2) Description and duration of all periods when the gas stream was diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified under §60.37f.
(3) Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.
(4) All periods when the collection system was not operating.
(5) The location of each exceedance of the 500 parts per million methane concentration as provided in §60.34f(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. For location, you must

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	determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places. (6) The date of installation and the location of each well or collection system expansion added pursuant to §60.36f(a)(3), (a)(5), (b), and (c)(4). (7) For any corrective action analysis for which corrective actions are required in §60.36f(a)(3) or (5) and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates. (i) *Initial performance test report.* Each owner or operator seeking to comply with §60.33f(c) must include the following information with the initial performance test report required under §60.8: (1) A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion; (2) The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based; (3) The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material; (4) The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area; (5) The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and (6) The provisions for the control of off-site migration. (j) *Electronic reporting.* The owner or operator must submit reports electronically according to paragraphs (j)(1) and (2) of this section.

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(1) Within 60 days after the date of completing each performance test (as defined in §60.8), the owner or operator must submit the results of each performance test according to the following procedures:

(i) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (https://www3.epa.gov/ttn/chief/ert/ert_info.html) at the time of the test, you must submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). CEDRI can be accessed through the EPA's Central Data Exchange (CDX) (https://cdx.epa.gov/). Performance test data must be submitted in a file format generated through the use of the EPA's ERT or an alternative file format consistent with the extensible markup language (XML) schema listed on the EPA's ERT Web site, once the XML schema is available. If you claim that some of the performance test information being submitted is confidential business information (CBI), you must submit a complete file generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT Web site, including information claimed to be CBI, on a compact disc, flash drive or other commonly used electronic storage media to the EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT or alternate file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described earlier in this paragraph (j)(1)(i).

(ii) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT Web site at the time of the test, you must submit the results of the performance test to the Administrator at the appropriate address listed in §60.4.

(2) Each owner or operator required to submit reports following the procedure specified in this paragraph must submit reports to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX.) The owner or operator must use the appropriate electronic report in CEDRI for this subpart or an alternate electronic file format consistent with the XML schema listed on the CEDRI Web site (https://www3.epa.gov/ttn/chief/cedri/index.html). If the

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reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the owner or operator must submit the report to the Administrator at the appropriate address listed in §60.4. Once the form has been available in CEDRI for 90 calendar days, the owner or operator must begin submitting all subsequent reports via CEDRI. The reports must be submitted by the deadlines specified in this subpart, regardless of the method in which the reports are submitted.

(k) *Corrective action and the corresponding timeline*. The owner or operator must submit according to paragraphs (k)(1) and (2) of this section.

(1) For corrective action that is required according to §60.36f(a)(3)(iii) or (a)(5)(iii) and is expected to take longer than 120 days after the initial exceedance to complete, you must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above. The Administrator must approve the plan for corrective action and the corresponding timeline.

(2) For corrective action that is required according to §60.36f(a)(3)(iii) or (a)(5)(iii) and is not completed within 60 days after the initial exceedance, you must submit a notification to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.

(l) *Liquids addition*. The owner or operator of an affected landfill with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters that has employed leachate recirculation or added liquids based on a Research, Development, and Demonstration permit (issued through Resource Conservation and Recovery Act, subtitle D, part 258) within the last 10 years must submit to the Administrator, annually, following the procedure specified in paragraph (j)(2) of this section, the following information:

(1) Volume of leachate recirculated (gallons per year) and the reported basis of those estimates (records or engineering estimates).
(2) Total volume of all other liquids added (gallons per year) and the

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reported basis of those estimates (records or engineering estimates).

(3) Surface area (acres) over which the leachate is recirculated (or otherwise applied).

(4) Surface area (acres) over which any other liquids are applied.

(5) The total waste disposed (megagrams) in the areas with recirculated leachate and/or added liquids based on on-site records to the extent data are available, or engineering estimates and the reported basis of those estimates.

(6) The annual waste acceptance rates (megagrams per year) in the areas with recirculated leachate and/or added liquids, based on on-site records to the extent data are available, or engineering estimates.

(7) The initial report must contain items in paragraph (l)(1) through (6) of this section per year for the most recent 365 days as well as for each of the previous 10 years, to the extent historical data are available in on-site records, and the report must be submitted no later than:

(i) September 27, 2017, for landfills that commenced construction, modification, or reconstruction after July 17, 2014 but before August 29, 2016; or

(ii) 365 days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction after August 29, 2016.

(8) Subsequent annual reports must contain items in paragraph (l)(1) through (6) of this section for the 365-day period following the 365-day period included in the previous annual report, and the report must be submitted no later than 365 days after the date the previous report was submitted.

(9) Landfills in the closed landfill subcategory are exempt from reporting requirements contained in paragraphs (l)(1) through (7) of this section.

(10) Landfills may cease annual reporting of items in paragraphs (l)(1) through (6) of this section once they have submitted the closure report in §60.38f(f).

(m) *Tier 4 notification.*

(1) The owner or operator of an affected landfill with a design capacity equal to or greater than 2.5 million megagrams and 2.5

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	million cubic meters must provide a notification of the date(s) upon which it intends to demonstrate site-specific surface methane emissions are below 500 parts per million methane, based on the Tier 4 provisions of §60.35f(a)(6). The landfill must also include a description of the wind barrier to be used during the SEM in the notification. Notification must be postmarked not less than 30 days prior to such date. (2) If there is a delay to the scheduled Tier 4 SEM date due to weather conditions, including not meeting the wind requirements in §60.35f (a)(6)(iii)(A), the owner or operator of a landfill shall notify the Administrator by email or telephone no later than 48 hours before any known delay in the original test date, and arrange an updated date with the Administrator by mutual agreement. **C. Particulate Matter from Materials Handling and Construction** See Reporting Section 1.4.C.

The WCCLF will be subject to the following requirements, if it's calculated NMOC emissions increase to 55 tons/yr or more:

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1B.1	**Applicable Standards/Limits:** **Subpart AAAA – National Emission Standard for Hazardous Air Pollutants: Municipal Solid Waste Landfills.** **Applicability** "You are subject to this subpart if you own or operate a MSW landfill that has accepted since November 8, 1987 or has additional capacity for waste disposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section: (3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill." **[Reference: 40.CFR §63.1935(a)(3)]**

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	"If your landfill is an existing affected source and is an area source meeting the criteria in §63.1935(a)(3), you must comply with the requirements in §§63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 16, 2004, whichever occurs later." **[Reference: 40.CFR §63.1945(f)]** **Standards** "If you are required by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan to install a collection and control system, you must comply with the requirements in §§63.1960 through 63.1985 and with the general provisions of this part specified in table 1 of this subpart." **[Reference: 40.CFR §63.1955(b)]** **General and Continuing Compliance Requirements** "Compliance is determined in the same way it is determined for 40 CFR Part 60, Subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data, collected under 40 CFR 60.756(b)(1), (c)(1), and (d) of Subpart WWW, are used to demonstrate compliance with the operating conditions for control systems. If a deviation occurs, you have failed to meet the control device operating conditions described in this subpart and have deviated from the requirements of this subpart. Finally, you must develop and implement a written SSM plan according to the provisions in 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write, implement or maintain a copy of the SSM plan is a deviation from the requirements of this subpart." **[Reference: 40.CFR §63.1960]**
1B.2	**Testing Requirements:** See **General and Continuing Compliance Requirements**
1B.3	**Monitoring Requirements:** See **General and Continuing Compliance Requirements**
1B.4	**Record Keeping Requirements:**

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	"Keep records and reports as specified in 40 CFR Part 60, Subpart WWW, or in the Federal plan, EPA approved State plan or tribal plan that implements 40 CFR Part 60, Subpart Cc, whichever applies to your landfill, with one exception: You must submit the annual report described in 40 CFR 60.757(f) **every 6 months**." **[Reference: 40.CFR §63.1980(a)]** "You must also keep records and reports as specified in the general provisions of 40 CFR Part 60 and this part as shown in Table 1 of this subpart. Applicable records in the general provisions include items such as SSM plans and the SSM plan reports." **[Reference: 40.CFR §63.1980(b)]**
1B.5	**Reporting Requirements**: See Record-keeping Requirements.

Table 1 to Subpart AAAA of Part 63 – Applicability of NESHAP General Provisions to Subpart AAAA.		
Part 63 Citation	Description	Explanation
63.1(a)	Applicability: general applicability of NESHAP in this subpart	Affected sources are already subject to the provisions of paragraphs (a)(10) - (12) through the same provisions under 40 CFR, Part 60, Subpart A.
63.1(b)	Applicability determination for stationary sources	
63.1(e)	Title V permitting	
63.2	Definitions	
63.4	Prohibited activities and circumvention	Affected sources are already subject to the provisions of paragraph (b) through the same provisions under 40 CFR, Part 60, Subpart A.
63.5(b)	Requirements for existing, newly constructed, and reconstructed sources	
63.6(e)	Operation and maintenance requirements, start-up, shutdown and malfunction plan provisions	
63.6(f)	Compliance with non opacity emission standards	Affected sources are already subject to the provisions of paragraphs (f)(1) and (2)(i) through the same provisions under 40 CFR, Part 60, Subpart A.
63.10(b)(2)(i) – (b)(2)(v)	General recordkeeping requirements	
63.10(d)(5)	If actions taken during start-up, shutdown and malfunction are consistent with the procedures in the startup, shutdown and malfunction plan, this information shall be included in a semi-annual startup, shutdown and malfunction plan report. Any time an action taken during a startup, shutdown and malfunction plan is not consistent with the startup, shutdown and malfunction plan, the source shall report actions taken with 2 working days after commencing such actions, followed by a letter 7 days after the event.	
63.12(a)	These provisions do not preclude the State from adopting and	

Table 1 to Subpart AAAA of Part 63 – Applicability of NESHAP General Provisions to Subpart AAAA.		
Part 63 Citation	Description	Explanation
	enforcing any standard, limitation, etc; requiring permits or requiring emissions reductions in excess of those specified.	
63.15	Availability of information and confidentiality.	

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2.0	**Emissions Unit Number(s): EU02** Fugitive dusts from facility haul roads (both paved and unpaved). Most of the traffic along the haul roads is from the movement of refuse disposal trucks to the landfill's active face, and to the waste transfer facility.
2.1	**Applicable Standards/Limits:** **Control of Particulate Matter** **Particulate Matter from Material Handling and Construction – [COMAR 26.11.06.03D]** "A person may not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne."
2.2	**Testing Requirements:** See monitoring requirements in Section 2.3.
2.3	**Monitoring Requirements:** The Permittee shall continue implementing the existing preventive maintenance plan that is used to prevent particulate matter from becoming airborne. The Permittee shall perform maintenance activities within the time frames established in the plan and shall maintain a log with records of the dates and description of the maintenance that was performed. The Permittee shall perform a semi-annual (every 6 months) inspection of the operation to verify that the reasonable precautions (BMPs) are being implemented. **[Reference: COMAR 26.11.03.06C]**.

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2.4	**Record Keeping Requirements:** The Permittee shall maintain a copy of the preventive maintenance plan and a record of the dates and the description of the maintenance activity performed. The Permittee shall maintain records of the inspections conducted for a period of at least five years and make available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**
2.5	**Reporting Requirements:** See Section 2.4.

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3.0	**Emissions Unit Number(s) – EU-02 Enclosed Flare** One (1) 1,500-standard cubic feet per minute (scfm) enclosed flare. **[MDE Reg. No. 9-0080]**
3.1	**Applicable Standards/Limits:** **A. Control of Visible Emissions – [COMAR 26.11.06.02C(2)]** "In Areas I, II, V and VI, a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is greater than 20 percent opacity." **Exception – [COMAR 26.11.06.02A(2)]** "The visible emissions standards in C of this regulation do not apply to emissions during start-up and process modification or adjustments, or occasional cleaning of control equipment, if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any 60-minute period." **B. Control of Particulate Matter** **Particulate Matter from Confined Sources – [COMAR 26.11.06.03B(2)(a)]** "A person may not cause or permit to be discharged into the outdoor

Table IV – 2	
	atmosphere from any other installation, particulate matter in excess of 0.03 gr/SCFD (68.7 mg/dscm)." **Particulate Matter from Materials Handling and Construction – [COMAR 26.11.06.03D]** "A person may not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne." **C. Operational Limit** Air Standards "A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in §60.754(d)." **[Reference: 40 CFR §60.752(b)(2)(iii)B]** "The control device shall be operated with the parameter ranges established during initial or most recent performance test. The operating parameters to be monitored as specified in 60.756." **[Reference: 40 CFR §60.752(b)(2)(iii)B]**
3.2	**Testing Requirements:** **A. Control of Visible Emissions** See monitoring requirements. **B. Control of Particulate Matter** See monitoring requirements. **C. Operational Limit** "For the performance test required in §60.752(b)(2)(iii)(B), Method 25, 25C, or Method 18 of Appendix A of this part must be used to determine compliance with the 98 weight-percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by §60.752(b)(2)(i)(B). Method 3 or 3A shall be used to determine oxygen

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	for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP–42). The following equation shall be used to calculate efficiency: Control Efficiency = $(NMOC_{in} - NMOC_{out})/(NMOC_{in})$ where, $NMOC_{in}$ = mass of NMOC entering control device $NMOC_{out}$ = mass of NMOC exiting control device" **[Reference: 40 CFR §60.754(d)]**
3.3	**Monitoring Requirements:** **A. Control of Visible Emissions** The Permittee shall properly operate and maintain the flare in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** **B. Control of Particulate Matter** The Permittee shall perform preventive maintenance once per month or as recommended by the equipment manufacturer on the flare. **[Reference: COMAR 26.11.03.06C]** **C. Operational Limit** Air Standards "Each owner or operator seeking to comply with §60.752(b)(2)(iii) using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment." **[Reference: 40 CFR §60.756(b)]**
3.4	**Record Keeping Requirements:** **A. Control of Visible Emissions** The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** **B. Control of Particulate Matter** The Permittee shall maintain a log of the maintenance performed on the flare and make the logs available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**

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	C. Operational Limit Air Standards "Except as provided in §60.752(b)(2)(i)(B), each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in paragraphs (b)(1) through (b)(4) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal." **[Reference: 40 CFR §60.758(b)]**
3.5	**Reporting Requirements:** **A. Control of Visible Emissions** The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations. **B. Control of Particulate Matter** Same as Section 3.5.A. **C. Operational Limit** Same as Section 3.5.A.

A permit shield shall cover the applicable requirements identified for the emission units listed in the table above.

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4.0	**Emissions Unit Number(s) – EU-04 Tub Grinder** EU-04 One (1) Morbark tub grinder, powered by a 540 bhp diesel engine (Caterpillar C-15). **[MDE Reg. No. 9-0102]**
4.1	**Applicable Standards/Limits:** **A. Control of Visible Emissions** **FOR GRINDING PROCESS ONLY** (1) **Visible Emissions Standards – [COMAR 26.11.06.02C(2)]** "In Areas I, II, V and VI, a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is greater than 20 percent

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opacity."

Exceptions – [COMAR 26.11.06.02A(2)]
"The emission standards in § C of this regulation do not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment, if:

i. The visible emissions are not greater than 40 percent opacity; and

ii. The visible emissions do not occur for more than 6 consecutive minutes in any 60 minutes period."

FOR ENGINE ONLY

(2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment – [COMAR 26.11. 09.05E]**

(1) "Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(2) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(3) Exceptions.

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;

(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."

FOR ENGINE ONLY

B. Control of Sulfur Oxides Emissions – [COMAR 26.11. 09.07A(1)]

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	"A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations: (c) Distillate fuel oils, 0.3 percent;" **C. Operational Limit** The engine powering the tub grinder shall operate no more than 1,000 hours for any 12-month rolling period.
4.2	**Testing Requirements:** **A. Control of Visible Emissions** **FOR GRINDING PROCESS ONLY** (1) **Visible Emissions Standards**. See Monitoring Requirements in Section 4.3. **FOR ENGINE ONLY** (2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment** See Monitoring Requirements in Section 4.3. **FOR ENGINE ONLY** **B. Control of Sulfur Oxides Emissions** See Monitoring Requirements in Section 4.3. **C. Operational Limit** See Monitoring Requirements in Section 4.3.
4.3	**Monitoring Requirements:** **A. Control of Visible Emissions** **FOR GRINDING PROCESS ONLY** (1) **Visible Emissions Standards** The Permittee shall properly operate and maintain the tub grinder in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** **FOR ENGINE ONLY** (2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment** The Permittee shall properly operate and maintain engines in a manner to minimize visible emissions. **[Reference: COMAR**

Table IV – 4	
	26.11.03.06C] **FOR ENGINE ONLY** **B. <u>Control of Sulfur Oxides Emissions</u>** The Permittee shall obtain a certification from the fuel supplier indicating that the fuel oil complies with the limitation on sulfur content of the fuel oil. **[Reference: COMAR 26.11.03.06C]**. **C. <u>Operational Limit</u>** The Permittee shall properly monitor the operating hours for the engine powering the tub grinder. **[Reference: PTC 047-00112-9-0102]**
4.4	**<u>Record Keeping Requirements</u>:** **A. <u>Control of Visible Emissions</u>** **FOR GRINDING PROCESS ONLY** (1) **<u>Visible Emissions Standards</u>** The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** **FOR ENGINE ONLY** (2) **<u>Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment</u>** The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** **FOR ENGINE ONLY** **B. <u>Control of Sulfur Oxides Emissions</u>** The Permittee shall retain annual fuel supplier certifications stating that the fuel oil is in compliance with this regulation must be maintained for at least five years. **[Reference: COMAR 26.11.09.07C]** **C. <u>Operational Limit</u>** The Permittee shall maintain for at least five (5) years, and shall make available to the Department upon request, records of the following information: (a) Operating hours for the engine that drives the tub grinder. (b) The Permittee shall report the amount of fuel oil combusted and engine operating hours as part of the annual emission certification.

Table IV – 4	
	[Reference: MDE PTC No. 047-0112-9-0102]
4.5	**Reporting Requirements:** **A. Control of Visible Emissions.** **FOR GRINDING PROCESS ONLY** (1) **Visible Emissions Standards** The Permittee shall retain report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emission and Deviations." **FOR ENGINE ONLY** (2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment** The Permittee shall retain report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emission and Deviations." **B. Control of Sulfur Oxides Emissions** The Permittee shall report annual fuel supplier certification to the Department upon request. **[Reference: COMAR 26.11.09.07C]** **C. Operational Limit** The Permittee shall report amount of fuel oil combusted and engine-operating hours as part of the annual emission certification. **[Reference: COMAR 26.11.06.03C]**

A permit shield shall cover the applicable requirements identified for the emission units listed in the table above.

SECTION V INSIGNIFICANT ACTIVITIES

This section provides a list of insignificant emissions units that were reported in the Title V permit application. The applicable Clean Air Act requirements, if any, are listed below the insignificant activity.

(1) No. 2 Stationary internal combustion engines with an output less than 500 brake horsepower (373 kilowatts) and which are not used to generate electricity for sale or for peak or load shaving;

The one (1) 6 Hp gasoline powered small portable emergency generator, and one (1) grinder-shredder powered by a 425 Hp diesel (Caterpillar, C-12) engine are subject to the following requirements:

The two (2) are subject to the following requirements:

(A) COMAR 26.11.09.05E(2) – Emissions During Idle Mode. The Permittee may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(B) COMAR 26.11.09.05E(3) – Emissions During Operating Mode. The Permittee may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(C) Exceptions:

(i) COMAR 26.11.09.05E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(ii) COMAR 26.11.09.05E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(a) Engines that are idled continuously when not in service: 30 minutes
(b) all other engines: 15 minutes.

(iii) COMAR 26.11.09.05E(2) & (3) do not apply while maintenance, repair or testing is being performed by qualified mechanics.

(2) No. 10 Fuel burning equipment using gaseous fuels or no. 1 or no. 2 fuel oil, and having a heat input less than 1,000,000 Btu (1.06 gigajoules) per hour;

The fuel burning units are subject to the following requirements:
COMAR 26.11.09.05A(1) – Fuel Burning Equipment.
"In Areas I, II, V and VI, a person may not cause or permit the discharge of emissions form any fuel burning equipment, other than water in an uncombined form, which is greater than 20 percent opacity."

COMAR 26.11.09.05A(3) Exceptions: "Sections A(1) and (2) of this regulation do not apply to emissions during load changing, soot blowing, start-up, or adjustments or occasional cleaning of control equipment if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any sixty minute period."

COMAR 26.11.09.07A(1) – Control of Sulfur Oxides from Fuel Burning Equipment.
"A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations: (c) Distillate fuel oils, 0.3 percent."

(3) Containers, reservoirs, or tanks used exclusively for:

(a) No. 1 Storage of Numbers 1, 2, 4, 5, and 6 fuel oil and aviation jet engine fuel;

(b) No. 2 Storage of lubricating oils

(4) X Space heaters utilizing direct heat transfer and used solely for comfort heat;

SECTION VI STATE-ONLY ENFORCEABLE CONDITIONS

The Permittee is subject to the following State-only enforceable requirements:

1. Applicable Regulations:

   (A) COMAR 26.11.06.08 and 26.11.06.09, which generally prohibit the discharge of emissions beyond the property line in such a manner that a nuisance or air pollution is created.

   (B) COMAR 26.11.15.06, which prohibits the discharge of toxic air pollutants to the extent that such emissions will unreasonably endanger human health

2. Record Keeping and Reporting:

   The Permittee shall submit to the Department, by April 1 of each year during the term of this permit, a written certification of the results of an analysis of emissions of toxic air pollutants from the Permittee's facility during the previous calendar year. The analysis shall include either:

   (a) a statement that previously submitted compliance demonstrations for emissions of toxic air pollutants remain valid; or

   (b) a revised compliance demonstration, developed in accordance with requirements included under COMAR 26.11.15 & 16, that accounts for changes in operations, analytical methods, emissions determinations, or other factors that have invalidated previous demonstrations.

Maryland
Department of
the Environment

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor

Ben Grumbles, Secretary
Horacio Tablada, Deputy Secretary

January 21, 2022

CERTIFIED MAIL
Return Receipt Requested

Mr. Dallas Baker Jr., Director
Worcester County Department of Public Works
6113 Timmons Road
Snow Hill, Maryland 21863

Dear Mr. Baker:

Enclosed herewith is the State of Maryland Refuse Disposal Permit No. 2021-WMF-0663, which is being renewed pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder for the continued construction and operation of the Central Municipal Landfill located at 7091 Central Site Lane, Newark in Worcester County, Maryland. This permit supersedes and replaces Refuse Disposal Permit No. 2012-WMF-0663.

Please note that this permit is subject to the terms and conditions, which are enclosed. No written response from the permittee regarding this permit ten days following receipt of this letter constitutes acceptance of the terms and conditions contained therein.

If you have any questions regarding this matter, please contact me or Mr. Andrew Grenzer at (410) 537-3315 or *andrew.grenzer@maryland.gov*.

Sincerely,

Edward M. Dexter, P.G., Administrator
Solid Waste Program (SWP)

Enclosure

cc: Kaley Laleker, Director, Land and Materials Administration (LMA) LMA/MDE
Andrew Grenzer, Chief, Solid Waste Operations Division, SWP/LMA (w/encl.)
Brian Coblentz, Chief, Compliance Division, SWP/LMA (w/encl.)
Sara Haile, Project Manager, Construction and Maintenance Section, SWP/LMA (w/encl.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Larry Hogan
Governor

Land and Materials Administration
Solid Waste Program
1800 Washington Boulevard, Suite 605, Baltimore, Maryland 21230-1719

Ben Grumbles
Secretary

Refuse Disposal Permit

No. 2021-WMF-0663

ISSUE DATE: January 21, 2022 ***EXPIRATION DATE:*** January 20, 2027

Issued to: Board of County Commissioners of Worcester County

Authorizing: the continued construction and operation of the Central Municipal Landfill

Located at: 7091 Central Site Lane, Newark in Worcester County, Maryland

This permit is renewed pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder, and is subject to the attached terms and conditions, and compliance with all applicable laws and regulations.

Edward M. Dexter, P.G., Administrator
Solid Waste Program

Kaley Laleker, Director
Land and Materials Administration

REFUSE DISPOSAL PERMIT
Permit No. 2021-WMF-0663
Issuance Date: January 21, 2022
Expiration Date: January 20, 2027

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard
Baltimore, Maryland 21230-1719

This Refuse Disposal Permit is renewed pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, by the Maryland Department of the Environment, Land and Materials Administration (MDE) to:

Board of County Commissioners of Worcester County (the "permittee")
Department of Public Works
7091 Central Site Lane
Newark, Maryland 21841

for the construction and operation of the

Central Municipal Landfill

encompassing a

230-acre fill area on a 724.5-acre site

located at

7091 Central Site Lane
Worcester County, Maryland

This permit is granted in accordance with the referenced documents in Part I, and subject to the terms and conditions specified in Parts II, III, and IV of this Permit as follows:

Part I: Referenced Materials - permit application, plans and specifications and other pertinent documents submitted to the Department.

Part II: Facility Specific Conditions - conditions which amend all other permit conditions applicable to this facility should any discrepancies or conflicts exist.

Part III: General Conditions - conditions which are generally applicable to solid waste acceptance facilities similar to this facility.

Part IV: Standard Conditions - conditions which are generally applicable to all solid waste acceptance facilities.

Part I: Referenced Materials:

A. Operating Documents:

1. A report entitled "Central Facility Site, Preliminary Site Evaluation in Support of Phase I Refuse Disposal Permit Application", prepared by EA Engineering, Science, and Technology, Inc., dated May 1986.

2. A report entitled "Phase II Geohydrologic Investigation, Central Facility Site, Snow Hill, Maryland", prepared by EA Engineering, Science, and Technology, Inc., dated May 1987.

3. A report entitled "Additional Phase II Investigation at Central Facility Site, Worcester County, Maryland", prepared by EA Engineering, Science, and Technology, Inc., dated August 1987.

4. A report entitled "Final Report of Phase III Engineering Design, Central Facility Site, Snow Hill, Maryland", prepared by EA Engineering, Science, and Technology, Inc., along with drawings sheet Nos. 1 of 12 through 12 of 12, dated June 1988 and received on June 16, 1988.

5. Engineering plans entitled "90% Design Submittal, Worcester County Central Landfill Facility Site, Landfill Cell Number Two", prepared by EA Engineering, Science, and Technology, Inc., consisting of sheet Nos. 1 of 13 through 13 of 13, dated October 30, 1995 and received on December 7, 1995.

6. A report entitled "Final Report of Phase III Engineering Design, Central Landfill Facility Site", prepared by EA Engineering, Science, and Technology, Inc., dated June 1988 and received on January 30, 1996.

7. Engineering drawings entitled "Revised Plan and Profile, addition of eight feet lift, Cell 1, Central Municipal Landfill", prepared by EA Engineering, Science, and Technology, Inc., consisting of pages 7 and 10 of 12, dated December 12, 1988 and received in October 1996.

8. A liner design plan for the construction of Cell 3 entitled "Worcester County Central Landfill Facility Site, Landfill Cell No. 3, Worcester County, Maryland", consisting of engineering drawing sheet Nos. 1 of 14 through 14 of 14, prepared by EA Engineering, Science, and Technology, Inc., dated March 2001 and received on April 13, 2001.

9. A document entitled "Central Facility Site, Compliance with 40 CFR §258. 10-16 Report, Worcester County, Maryland", prepared for Worcester County Department of Public Works by EA Engineering, Science, and Technology, Inc., dated May 2001 and received on May 7, 2001.

10. A document entitled "Worcester County Central Landfill Facility, Landfill Cell No. 2 eight feet Vertical Expansion", consisting of engineering drawing sheet Nos. 1 of 4 through 4 of 4 and the landfill's long term settlement analysis, prepared by EA Engineering, Science, and Technology, Inc., dated August 2002 and received on August 16, 2002.

11. A report entitled "Construction of Central Landfill Facility, Landfill Cell No. 3, Worcester County, Maryland", consisting of engineering drawing sheet Nos. 1 of 25 through 25 of 25, prepared by EA Engineering, Science, and Technology, Inc., dated January 2003 and received on February 4, 2003.

12. Document entitled "Worcester County Central Landfill Facility Site, Landfill Cell Number Four, Worcester County, Maryland", consisting of engineering drawing sheet Nos. 1 of 16 through 16 of 16, prepared by G.W. Griffin & Associates, dated September 14, 2005 and received on November 23, 2005.

13. A report entitled "Worcester County Landfill-Cell 4 QA/QC Plan", prepared by G.W. Griffin & Associates, LLC, dated November 22, 2005 and received on November 23, 2005.

14. A report entitled "Operations and Maintenance Manual, Worcester County Central Landfill Facility", prepared by EA Engineering, Science, and Technology, Inc., dated May 2006 and received on June 5, 2006.

15. Engineering plans & specifications entitled "Landfill Gas Recovery Facility, Worcester County, Maryland", for the construction of a Landfill Gas to Energy Facility at the Worcester County Central Municipal Landfill, prepared by IOTT Architecture, Engineering, Inc., received on October 12, 2007.

16. A report entitled "Construction of Central Landfill Facility, Landfill Cell No. 4, Worcester County, Maryland", prepared by EA Engineering, Science, and Technology, Inc., dated February 2008 and received on March 10, 2008.

17. A letter from Worcester County Department of Public Works requesting approval to use a woven polyolefin as an Alternative Daily Cover Material at Central Municipal Landfill, dated September 18, 2006 and approved on March 14, 2008.

18. Document entitled "Landfill Cell 1 Reclamation Plan, Worcester County Central Landfill Facility, Worcester County, Maryland", prepared by EA Engineering, Science, and Technology, Inc., dated November 2009 and received on November 12, 2009.

19. Engineering drawings entitled "Worcester County Central Landfill, Landfill Gas Collection System, Cell 4", consisting of sheet Nos. 1 of 5 through 5 of 5, prepared by EA Engineering, Science, and Technology, Inc., received on May 2, 2011.

20. Engineering drawings entitled "Worcester County Central Landfill, Landfill Gas Collection System, Cell 4", consisting of drawing Nos. C-1 through C-8, and two revised drawing Nos. C-5 and C-6, prepared by EA Engineering, Science, and Technology, Inc., dated February 20, 2012 and received on February 21, 2012.

21. Engineering drawings entitled "Leachate Storage Tank Replacement", consisting of sheet Nos. 1 of 9 through 9 of 9, prepared by EA Engineering, Science, and Technology, Inc., received on December 12, 2012.

22. Document entitled "Phase I Report for the Proposed Municipal Solid Waste Cell 5", prepared by EA Engineering, Science and Technology, Inc. dated December 2012, revised May 2013 and received on May 20, 2013.

23. Document entitled "Contract Documents and Construction Specifications, Central Landfill Facility Site, Leachate Storage Tank, Worcester County, Maryland", consisting of sheet Nos. 1 of 9 through 9 of 9, prepared by EA Engineering, Science, and Technology, Inc., received on July 11, 2013.

24. Document entitled "Phase II Hydrogeologic Investigation and Concept Design for the Proposed Municipal Solid Waste Cell 5", consisting of drawing Nos.C-1 through C-8, FIG-WA1 and FIG-WA2, prepared by EA Engineering, Science, and Technology, Inc., dated February 2014 and received on February 10, 2014.

25. Document entitled "Phase III Permit Application Design Report – Cell 5 Expansion", consisting of sheet Nos. 1 of 23 through 23 of 23, prepared by EA Engineering, Science, and Technology, Inc., dated September 2015, revised April 2016 and received on April 5, 2016.

26. Document entitled "Groundwater and Surface Water Monitoring Plan, Central Landfill Facility, Worcester County, Maryland", dated March 2014, revised December 2017 and received on December 19, 2017.

27. A Refuse Disposal Permit Renewal Application submitted by the Worcester County Department of Public Works, dated August 16, 2021 and received on August 20, 2021.

28. Document entitled "Leachate Forcemain and Cell 1 Pump Station Maintenance Worcester Central Landfill Facility Final Design Report" consisting of Drawings G-001, C-101, C-102, C-201 through C-204, C- C-

501, C-301 through C-303, C-501, C-502, C-701, E-1 through E-6 dated March 2024 and "Contract Documents and Construction Specifications" dated November 2023, prepared by EA Engineering, Science, and Technology, Inc and received on April 2, 2024.

B. Historical Facility Documents:

1. Engineering plans entitled "Erosion and Sediment (E & S) Control Plan for Worcester County, Central Facility Landfill", prepared by EA Engineering, Science, and Technology, Inc., consisting of sheet Nos. 1 of 4 through 4 of 4, dated May 1988 and received on August 2, 1994.

2. A Refuse Disposal Permit Renewal Application submitted by the Worcester County Department of Public Works, received on January 10, 2000.

3. A Refuse Disposal Permit Renewal Application submitted by the Worcester County Department of Public Works, dated May 3, 2006 and received on May 5, 2006.

4. A Refuse Disposal Permit Renewal Application submitted by the Worcester County Department of Public Works, dated March 28, 2011 and received on March 31, 2011.

5. A Refuse Disposal Permit Renewal Application submitted by the Worcester County Department of Public Works, dated April 15, 2016 and received on April 19, 2016.

Part II: Facility Specific Conditions:

A. Hours of Construction and Operation:

1. The permittee may construct and operate this facility during daylight only between the hours of 7:00 a.m. and 4:00 p.m., Monday through Sunday. Operations may be performed during these hours after sunset or before sunrise if artificial light adequate to perform the activity in a safe and acceptable manner is provided to the satisfaction of the Department.

2. These specified hours may be changed upon written approval by the Department. For approval, a letter requesting the change of hours and a letter from the appropriate local government office stating that the change is consistent with local zoning and land use requirements must be submitted with such a request.

3. A statement of the days and hours of operation shall be posted at the entrance to the facility.

4. Emergency conditions or unusual circumstances that require the performance of the activities authorized under A.1 after hours, shall be reported to the Department at (410) 537-3315 during normal business hours, or via the Department's Emergency line at (866) 633-4686 at other times.

5. The Department may authorize an extension of the facility's hours of operation in emergency conditions. This approval does not authorize any infringement of federal, State or local laws or regulations, such as local zoning and land-use requirements.

B. Alternative Daily Cover Material:

1. The permittee is authorized to use the Woven Polyolefin® tarp, or equal, as Alternative Daily Cover Material to be placed over the exposed waste at the end of each day's operation. At the end of the last workday of the week or before a holiday when the landfill will not be operating, the permittee must place 12 inches of uniformly compacted clean earth on the working face.

2. The permittee shall promptly repair or replace the tarp if it becomes frayed, torn, ripped or otherwise rendered unusable and is, therefore, no longer able to serve its' intended purpose.

3. If inclement weather conditions render the placement or use of the tarp ineffective or otherwise unsatisfactory, the permittee shall temporarily revert to using 6 inches of clean earth as daily soil cover until such conditions cease to exist.

C. Plans and Specifications:

Approved plans and specifications under Part I and Part II will satisfy the requirements under Part III General Conditions and Part IV Standard Conditions of the permit. The approved plans and specifications override the requirements under these conditions to the extent that they do not conflict with applicable laws or regulations unless a variance has been granted under the Code of Maryland Regulations (COMAR) 26.04.07.26. However, these conditions do remain valid and enforceable.

Part III: General Conditions (Applicable to Municipal Solid Waste Landfills):

A. Waste Restrictions:

1. The permittee may accept solid waste as specified in this facility's Refuse Disposal Permit Application and its supporting documents identified in Part I of this permit, except as restricted or prohibited in this condition.

2. If the permittee accepts the following classes of waste as defined below, the acceptance of these materials is subject to the exceptions noted:

   a. Household appliances and white goods may be accepted at the facility, provided that any refrigerant is removed from the appliances before burial and handled in accordance with Section 608 of the federal Clean Air Act; and

   b. Friable asbestos waste, provided that the material that is received is packaged and labeled as specified in Code of Maryland Regulations (COMAR) 26.11.21.08A and is managed in the following manner:

      i. Prior notification to the landfill supervisor is required;

      ii. The waste asbestos is unloaded carefully to prevent emission of fibers into the air as required in the NESHAPS 40 CFR Part 61, and specified in COMAR 26.11.21.06;

      iii. The area used for burial of asbestos shall be restricted to the working face of the landfill, or a separate cell dedicated solely to asbestos disposal;

      iv. The waste shall be completely covered with earth or other refuse and may not be compacted or driven over until sufficient cover has been applied to prevent the release of asbestos fibers to the atmosphere during compaction or application of other cover material; and

      v. When managing friable asbestos waste, operators at the landfill shall wear respiratory protection as specified in COMAR 26.11.21.05A, and wear protective clothing and use the equipment specified in COMAR 26.11.21.05D.

3. The following waste materials are specifically prohibited from being accepted at this site, regardless of their origin or type:

   a. Controlled hazardous substances, defined as hazardous waste in COMAR 26.13.02, unless specifically authorized by a valid permit issued under COMAR 26.13.07;

   b. Liquid waste or any waste containing free liquids, as determined by the EPA method 9095 Paint Filter Liquids test, as outlined in the EPA Publication SW-846 "Test Methods for Evaluating Solid Waste, Volume One, Section C: Laboratory Manual Physical/Chemical Methods", Third Edition, dated November 1986, except for small containers contained in household waste only;

   c. Special medical waste as defined in COMAR 26.13.11.02B(11);

   d. Radioactive hazardous substances as defined in COMAR 26.15.02;

   e. Automobiles, unless accepted under a plan approved by the Department;

   f. Drums or tanks, unless empty and flattened or crushed with the ends removed; drums or tanks that have held hazardous waste shall be emptied properly in accordance with COMAR 26.13.02.07;

   g. Animal carcasses resulting from medical research activities or destruction of diseased animals harboring diseases transmittable to humans, unless acceptance of the carcass(es) is ordered by the local county health officer, and the carcasses are covered with soil immediately upon deposition at the working face of the landfill;

   h. Untreated liquid septage or sewage scavenger waste;

   i. Chemical or petroleum cleanup material, unless:

      i. The nature of the spilled substance is known;

      ii. The spilled material is not a controlled hazardous substance as defined in COMAR 26.13.02;

      iii. The spilled material is not likely to adversely affect the landfill liner; and

iv. The spilled substance is contained in an absorbent material of sufficient excess volume so that the material deposited at the landfill does not exhibit free liquids as defined in Part III.A.3(b) of this permit.

j. Truckloads of separately collected yard waste for final disposal, unless the permittee provides for the composting or mulching of the yard waste;

k. Loads of separately collected food waste for final disposal unless the owner or operator provides for the organics recycling of the food waste; and

l. Scrap tires, unless the Department authorizes the acceptance and processing of scrap tires as required in COMAR 26.04.08

4. If sewage sludge, processed sewage sludge, or any other product containing these materials is proposed for storage, handling, or utilization at the landfill site, a separate application shall be submitted to the Biosolids Division for a sewage sludge utilization permit. That permit must be issued prior to the acceptance on site of any sewage sludge.

5. The Department, upon written request of the permittee, may amend the list in Part III.A. If the Department denies the permittee's request or unilaterally determines to limit or exclude a waste stream from being disposed of at the landfill, the permittee will be notified of the Department's decision in writing and will be provided an opportunity for a hearing in accordance with the Administrative Procedure Act.

B. Cell Floor Construction:

1. The permittee shall notify the Department in writing 5 working days prior to the anticipated start of each phase of floor construction including floor grading and compaction, liner installation, and leachate collection system installation.

2. No waste emplacement may commence in any area of the landfill, unless said area of the cell floor has been constructed and graded in accordance with the approved plans and specifications.

3. During construction of each area of the landfill, the edges of each landfill cell or subcell shall be marked to indicate where the edge of the permitted disposal area is located:

a. For the exterior edges of cells, which delineate the boundary of the area permitted for solid waste acceptance and disposal, a permanent means of marking such as durable posts set in concrete shall be placed around the boundary every 250 feet. The posts shall be placed as close to the solid waste boundary as is possible without causing damage to the liner or other pollution control systems, and if more than 1 foot away shall have a durable marking indicating the amount of offset from the permitted disposal area. In no case shall the post be more than 5 feet away from the solid waste boundary unless otherwise approved by the Department;

b. For the interior edges of subcells, where a new waste disposal area will eventually be constructed contiguous to an existing solid waste disposal area, a semipermanent method of demarking the prepared disposal area such as wooden or fiberglass stakes shall be installed no more than 100 feet apart, and at every corner or significant change in direction. These stakes shall be placed within 1 foot of the edge of the prepared area, and shall be checked and replaced as necessary. The marking may only be removed in accordance with an approved schedule for construction of the adjacent subcell. Care must be taken to insure that the liner, leachate collection system, and other pollution control systems are not damaged by the installation of the markers;

c. Posts, stakes or other approved methods must be maintained in a serviceable condition at all times, and repaired as necessary; and

d. Alternative means may be substituted if approved by the Department.

4. No liner and leachate collection system installation may commence in any cell unless the following requirements are fulfilled:

a. The design of the liner and leachate collection system shall comply with the minimum requirements specified under COMAR 26.04.07.07C(12) and the federal regulations specified in 40 CFR §258.40. The design of the liner and leachate collection system must be approved by the Department before installation begins;

b. A plan for the installation of synthetic membrane sections, illustrating overlap and seams, and sequence of installation shall be prepared and submitted to the Department at least ten days prior to the start of liner installation;

c. The sub-base for the synthetic membrane must be cleared of tree stumps, roots, vegetation, rubble, debris, angular rocks or stones, sharp-edged objects, and any material that may puncture or damage the overlying synthetic membrane to a maximum particle size established in accordance with the manufacturer's recommendations;

d. Sub-base construction must be conducted in lifts not to exceed 6 inches in thickness and compacted to the required density prior to addition of another lift; and

e. To ensure that the highest quality sub-base layer and synthetic membrane field seams are produced, continuous monitoring of all sub-base construction and synthetic membrane seaming operations shall be conducted by trained, experienced construction quality assurance monitors. In addition, undisturbed samples of the sub-base shall be tested for as-constructed permeability and 100 percent of all field seams shall be field tested (using an approved test method) as part of the liner installer's construction quality control activities. A quality assurance/quality control plan shall be submitted to the Department for review and approval. Quality assurance/quality control shall be performed by an independent contractor not associated with the construction contractor.

5. Synthetic membrane other than that specified in the approved plans and specifications may be used upon prior written approval from the Department.

6. The synthetic membrane sheets shall be properly seamed in accordance with the manufacturer's recommendations. All field seams shall be visually inspected and tested using the vacuum chamber method, air lance method or other nondestructive testing methods as recommended by the manufacturer. Construction verification tests including seam integrity verification, liner thickness, liner and seam strength, and other parameters shall be included in the quality assurance/quality control plan approved by the Department. Any imperfect seams, holes, punctures, and damaged areas shall be completely repaired or replaced as necessary to ensure the liner integrity. All factory seams shall be checked visually.

7. Any method of liner and leachate collection system construction which departs or varies in any way from those methods described in the approved plans and specifications or the procedures specified herein must be approved in writing by the Department before construction.

8. An independent engineer or the manufacturer of the perforated and un-perforated pipes and fittings used in construction of the leachate collection system shall certify that:

   a. The material meets the required standards and specifications as addressed in the approved plans and specifications;

   b. The pipes have a maximum 7.5% allowable ring deflection, unless otherwise specified in the approved plans;

   c. The pipes have factors of safety against crushing and buckling of 2 or greater under dynamic (short duration) loading and 24 hours stationary (long duration) loading from landfill equipment and vehicles; and

   d. The pipes are new and not defective.

9. All piping projections through the synthetic membrane liner shall be properly installed in accordance with the plans and specifications.

10. Each leachate collection pipe shall be inspected prior to installation, and tested to ensure that no clogging exists, that it is a properly manufactured pipe, and that it was not damaged in transit.

11. The leachate collection pipes, storage unit(s), and sumps shall be tested for leaks after installation.

12. The permittee must obtain certification from the manufacturer(s) that the synthetic membrane to be used as liner has thickness as specified in the approved plans and specifications with a permeability less than or equal to 1×10^{-10} cm/sec, and meets all of the applicable ASTM standards. A copy of the certification must be appended to the approved plan for the facility and provided to the Department within 60 days of receipt of the certification.

13. Following the satisfactory installation of the cell floor liners, the overlying layer shall be placed as soon as is practical for the protection of the liner.

14. No waste placement may commence in any cell unless and until the following requirements are fulfilled:

a. All monitoring wells have been installed, sampled and analyzed by the permittee in accordance with the approved monitoring program for the establishment of background water quality;

b. The cell floor liner and leachate collection system have been installed in accordance with the approved plans and specifications, and the requirements of this permit;

c. A minimum of 2 feet of pea gravel or other approved drainage material shall be placed to provide for the free passage of leachate to the liner and to serve as a protective layer for the liner and leachate collection system; and

d. Representatives of the Department have inspected and approved the construction of the cell floor.

C. Protection of Liner and Leachate Collection System:

A minimum of 4 feet of select waste containing no long pipes, boards, or other materials that could damage the liner and leachate collection system must be placed over the protective layer before compaction, to minimize the risk of damage to the liner and leachate collection system. No refuse hauling vehicles, equipment used for landfilling operations, or any heavy equipment shall operate over the leachate collection pipes and liner on the floor and side of the cell slopes until there is at least 4 feet of select waste placed upon the protective drainage layer. The permittee must notify the Department prior to the placement of the select waste.

D. Leachate:

1. All ponded leachate occurring in areas that are not part of an approved leachate collection or treatment system shall be collected and treated in accordance with this permit.

2. Untreated leachate or contaminated liquid may not be discharged to the waters of the State, without prior approval of the Department. The permittee must notify the Department within 1 hour of becoming aware of any leachate or contaminated liquid discharge leaving the site or having the potential of being released off-site.

3. All leachate collected in the leachate collection system shall be stored in the leachate storage unit(s) as specified in the approved engineering plans and specifications (also known as the Phase III Report) referenced in Part I of this permit. Leachate shall be discharged to the sanitary sewer system or

an approved waste water treatment plant in compliance with the provisions of COMAR 26.08.08 unless other methods of disposal are permitted by the Department.

4. Leachate or other contaminated liquids shall not be discharged, recirculated, or treated on site without prior approval of the Department. Leachate recirculation, treatment and/or discharge shall also comply with the federal regulation specified in 40 CFR §258.28(a)(2). Any approved modifications to plans and specifications will be incorporated by reference as part of this landfill's permit.

5. The permittee shall monitor the leak detection unit, if any, at least twice each month and include the results in the semiannual report on water quality referenced in this permit.

6. Except for a leachate collection system relying solely on free gravity drainage to prevent leachate from ponding on the cell floor, the level of leachate in the leachate collection system shall be monitored a minimum of twice each operating day except Sundays and holidays. The data shall be recorded and initialed by the person performing the monitoring. Results are to be included in each semiannual report on water quality referenced in this permit.

7. To ensure the integrity and proper operation of the landfill's leachate storage unit(s), all leachate storage unit(s):

   a. Shall be either tested annually, be equipped with a release detection system, or have some other method of determining leakage that is approved by the Department; and

   b. Shall be equipped with a level sensor that will, if the storage unit is nearly full, activate an audible alarm in the landfill office and a red light that is visible from the public road at all times of the year. The alarm and light shall be tested weekly and the results of these tests included in the semiannual report on water quality referenced in this permit. A sign shall be posted at the gate with instructions to notify the appropriate local and State emergency numbers, including the Department's phone number, if the light is on when the site is closed. Upon request, the Department may approve alternative alarm notification systems.

8. Commencing on the day that solid waste is received at the landfill, the permittee shall monitor the quantity of leachate and other contaminated liquids collected each and every calendar month. The results of this monitoring shall be included in the semiannual report on water quality as required by the landfill's permit. The report shall include:

   a. The volume of leachate or other contaminated liquid collected monthly. Quantities shall be reported in gallons or cubic feet;

   b. The method used to measure the quantities of leachate coming from the leachate collection systems;

   c. The volume of liquid discharged to a sanitary sewer. Quantities shall be reported in gallons or cubic feet;

   d. The volume of liquid disposed of by any means other than that specified in (c). Quantities shall be reported in gallons or cubic feet;

   e. The results of any chemical analyses performed on the collected liquid; and

   f. The estimated total amount of cumulative precipitation received at the landfill based on local climatological data. Quantities shall be reported in inches and the source of the data shall be stated in the report.

9. If applicable, means for separating and diverting uncontaminated storm water from the leachate collection system within lined landfill cells may be proposed by the permittee. If approved by the Department, the plans and specifications for the separation and diversion of uncontaminated storm water shall be incorporated into and become as part of this permit. Until such plans are approved, all water collected from cells containing refuse shall be treated as leachate.

10. Should a force main be constructed to convey leachate to a sewer system, the following conditions shall be met:

   a. All pretreatment requirements established in COMAR 26.08.08 shall be met;

   b. A flow meter shall be installed, with results to be recorded daily and included in the semiannual report on water quality referenced in this permit. Upon request, the Department may approve an

alternative accurate flow measurement method; and

c. The force main shall be pressure tested prior to use, by a method to be proposed to and approved by the Department.

E. Water Level Measurement:

1. The water elevations in all existing monitoring wells and piezometers shall be measured monthly and the readings shall be included in the semiannual water quality report referenced in this permit.

2. If examination of this information by either the permittee or the Department indicates that groundwater elevations have risen to encroach upon any existing or proposed cell floors, the bottom elevations of all subsequently constructed cells shall be raised. Except as permitted by the regulations, the increase in elevation shall be sufficient to insure a minimum buffer of 3 vertical feet between the base of any unconstructed fill areas, as well as the base of any unfilled areas of the waste cell currently being filled, and the highest observed or expected water level. A revised plan and specifications of all cell floors to be constructed, depicting these changes, must be submitted to the Department for review and approval prior to commencement of construction of any cell area.

F. Written Reports on Water Quality Analysis:

1. Within 90 days of the effective date of this permit, the permittee shall submit a hard copy and a searchable electronic/digital copy to the Department for review and approval a Groundwater and Surface Water Monitoring (G&SWM) Plan. The Plan shall be prepared in accordance with COMAR 26.04.07.08B(17), 26.04.07.09F, 40 CFR §258, and guidelines established by the Department.

2. a. The permittee shall submit to the Department a semiannual report on water quality containing summary and interpretative discussion of all analyses of the chemical quality of groundwater from all of the monitoring wells and all of the surface water monitoring points specified in the approved G&SWM Plan;

b. The semiannual report on water quality shall be submitted to the Department within 90 days of the close of every first and third calendar quarters unless an alternative schedule is specified in the approved G&SWM Plan;

c. Sampling shall occur during the period between January through

March and July through September of each year unless an alternative schedule is included in the G&SWM Plan and approved by the Department;

d. The permittee shall arrange for a qualified groundwater scientist to sample, or to oversee qualified environmental technicians who sample the wells twice annually at the intervals specified in the approved G&SWM Plan;

e. The parameters to be measured and their Practical Quantitation Limits (PQL) are listed in Tables I and II of this permit. The Department may approve an alternative list of parameters or an alternative PQL for any parameter;

f. The sampling, sample handling, analyses and reporting of analytical parameters shall be performed in accordance with the approved G&SWM Plan;

g. A qualified independent laboratory certified for water quality analysis by the Department or which is otherwise acceptable to the Department shall perform the analyses;

h. A qualified groundwater scientist or professional shall evaluate the results and advise the permittee of any changes in water quality or any exceedance of the State and federal Maximum Contaminant Level (MCL), Action Level or other health standard;

i. A complete copy of the laboratory data, and the qualified groundwater scientist or professional's interpretive findings shall be included in each semiannual report on water quality referenced in this permit;

j. If analytical results from samples collected from any sources associated with the landfill or surrounding properties exceed MCL, Action Level, or other health standard for the first time, the permittee must notify the Department in writing within 24 hours of receipt of the analytical data detecting this occurrence. Thereafter, if there are any significant increases above the MCL, Action Level, or other health standard, the permittee must notify the Department in writing within 24 hours of receipt of the analytical data detecting this occurrence;

k. Upon detection of the exceedance of an MCL, Action Level or other health standard for the first time, the monitoring point(s) in which the standard was exceeded must be immediately resampled to verify the initial detection. This resampling must occur as soon as possible, and no later than 30 days following receipt of the analytical data by the permittee or the qualified groundwater scientist or professional who is reviewing the analytical data which indicated the exceedance. If the permittee accepts the initial sampling result as a valid result, then the permittee can elect to not resample the monitoring point(s);

l. All data for each well must be summarized and presented in time series format. The data for each well must be presented in a spreadsheet so that the water quality data for each parameter for each well can be observed simultaneously; and

m. All "J" values must be reported. "J" values are analytical results that are below the PQL but can be estimated.

TABLE I
MONITORING PARAMETERS

VOLATILE ORGANIC COMPOUNDS	PQL (ppb)	VOLATILE ORGANIC COMPOUNDS	PQL (ppb)
Acetone	5.0	Cis-1,2-Dichloroethene	1.0
Acrylonitrile	5.0	Trans-1,2-Dichlorocthene	1.0
Benzene	1.0	Methylene Chloride	1.0
Bromochloromethane	1.0	1,2-Dichloropropane	1.0
Bromodichloromethane	1.0	Trans-1,3-Dichloropropene	1.0
Bromoform	1.0	Cis-1,3-Dichloropropene	1.0
Bromomethane	1.0	Ethylbenzene	1.0
2-Butanone	5.0	2-Hexanone	5.0
Carbon disulfide	1.0	Iodomethane	1.0
Carbon Tetrachloride	1.0	4-Methyl-2-pentanone	5.0
Chlorobenzene	1.0	Methyl Tertiary Butyl Ether	2.0
Chloroethane	1.0	Styrene	1.0
Chloroform	1.0	1,1,1,2-Tetrachloroethane	1.0
Chloromethane	1.0	1,1,2,2-Tetrachloroethane	1.0
Dibromochloromethane	1.0	Tetrachloroethene	1.0
1,2-Dibromo-3-chloropropane	0.04	Toluene	1.0
1,2 – Dibromoethane (EDB)	0.04	1,1,1-Trichloroethane	1.0
Dibromomethane	1.0	1,1,2-Trichloroethane	1.0
1,2 – Dichlorobenzene	1.0	Trichloroethene	1.0
1,4 – Dichlorobenzene	1.0	Trichlorofluoromethane	1.0
Trans-1,4-dichloro-2-butene	5.0	1,2,3-Trichloropropane	1.0
1,1-Dichloroethane	1.0	Vinyl Acetate	1.0
1,2-Dichloroethane	1.0	Vinyl Chloride	1.0
1,1-Dichloroethene	1.0	Xylene	1.0

TABLE II
MONITORING PARAMETERS

ELEMENTS AND INDICATOR PARAMETERS	PQL (ppm)	ELEMENTS AND INDICATOR PARAMETERS	PQL (ppm)
Total Antimony	0.0020	Total Silver	0.0100
Total Arsenic	0.0020	Total Sodium	0.2
Total Barium	0.0100	Total Thallium	0.0020
Total Beryllium	0.0020	Total Vanadium	0.0100
Total Cadmium	0.0040	Total Zinc	0.0100
Total Chromium	0.0100	PH	0.1 (SU)
Total Calcium	0.08	Alkalinity	1
Total Cobalt	0.0100	Hardness	0.5
Total Copper	0.0100	Chloride	0.39
Total Iron	0.005	Specific Conductance	1
Total Lead	0.0020	Nitrate	0.06
Total Nickel	0.0110	Chemical Oxygen Demand	10
Total Magnesium	0.004	Turbidity	0.11 (NTU)
Total Manganese	0.0100	Ammonia	1
Total Mercury	0.0002	Sulfate	0.38
Total Potassium	0.39	Total Dissolved Solids	10
Total Selenium	0.035		

3. The semiannual report on water quality must include a time series analysis of the data. The historical data from each well should be presented in a tabular form in each semiannual report. The discussion should emphasize historical trends in the data. Also, the report must include statistical analysis methods in evaluating groundwater monitoring data as required under the federal regulation 40 CFR §258.53(g)-(i).

4. A copy of the most current topographic map generated by a survey performed as required in this permit shall be included in each semiannual report on water quality and shall depict the location of all monitoring wells and piezometers in existence at the time of the survey.

5. A copy of a current groundwater contour map depicting the location of all monitoring wells from which groundwater data is collected shall be included in each semiannual report on water quality. Multiple aquifers shall be depicted on separate groundwater contour maps.

6. The requirements of 40 CFR §258 subpart E concerning groundwater monitoring and remediation must be followed to the satisfaction of the Department.

G. Spreading and Compaction:

Solid waste shall be spread in uniform layers and compacted to its smallest practicable volume before application of cover material.

H. Solid Waste Lifts:

A lift of solid waste may not exceed 8 feet in height, except as specifically authorized in writing by the Department.

I. Daily Cover:

A uniform compacted layer of clean earth at least 6 inches in depth, or an approved cover material of a thickness specified by the Department, shall be placed over exposed solid waste by the end of each day's operation, or more frequently as may be determined by the Department. To meet approval, the cover material may not:

1. Contain free liquids, putrescibles, or toxic materials. Moisture that is present in the cover material solely as a result of precipitation is not free liquid;

2. Create a dust or odor problem;

3. Attract or harbor vectors; and

4. Impede compaction of wastes by standard landfill equipment.

J. Intermediate Cover:

A uniform, compacted layer of clean earth not less than 1 foot in depth shall be placed over each portion of a lift not later than 1 month following completion of that lift. The intermediate cover layer may not be removed without written authorization from the Department.

K. Final Cover:

1. A uniform compacted layer of earthen material not less than 2 feet in depth shall be placed over any part of the final lift of refuse not later than 90 days following completion of that final lift.

2. Areas which have received final cover shall be mowed at least once a year, or more often if necessary, to control growth of woody vegetation and to allow facility personnel to inspect for signs of erosion, settlement, ponding of water, and leachate seeps.

L. Grading and Drainage:

The disposal site shall be graded and drained to:

1. Minimize runoff onto the fill area of the sanitary landfill;

2. Prevent erosion and ponding within the fill areas; and

3. Drain water from the surface of the sanitary landfill.

M. Erosion and Sediment Control Plan:

The permittee shall have a signed copy of a valid Erosion and Sediment Control Plan prepared in accordance with the requirements of COMAR 26.17.01 and approved by the appropriate approving authority prior to the construction of the landfill as authorized by this permit. An approved plan as required under COMAR 26.17.01 that covers all areas of the permitted facility must be maintained at all times during the life of this permit.

N. Storm Water Management Plan:

1. The permittee shall have a signed copy of a valid Storm Water Management Plan prepared in accordance with the requirement of COMAR 26.17.02 and approved by the appropriate approving authority prior to the construction of the landfill as authorized by this permit.

2. Means for separating and diverting uncontaminated storm water from the landfill cells may be proposed by the permittee. If approved by the Department, the plans and specifications for the separation and diversion of uncontaminated storm water shall be incorporated into and become as part of this permit.

O. Water Supply Contingency Plan:

1. If a risk to public health due to contamination of the groundwater by the landfill has developed to the extent that provision for an alternative water supply for offsite water users may become necessary, the Department will require the permittee to draft a detailed engineering design plan describing the manner in which alternative water supplies will be provided to potentially affected areas around the landfill. This plan must be developed and submitted to the Department for review and approval. The draft plan shall be submitted to the Department for review within 1 year of notification by the Department. The plan shall be revised in accordance with any reasonable requirement of the Department. The level of detail of the plan shall be sufficient to serve as construction and implementation documents for the proposed water supply. The plan shall also include a schedule of all activities necessary to implement the plan, including

activities to be performed by the permittee to bid, oversee, and implement the plan, and all activities by contractors.

2. The area which the plan must contemplate for water supplies must, at a minimum, include all areas within 1/2 mile of the property boundary of the landfill as depicted in the reports referenced in Part I of this permit, and any other groundwater use located downgradient of the landfill. The plan must also contain provisions for expansion of the area of impact should it become necessary to protect the public health. The plan may also contain provisions for partial or staggered implementation, based on specific information about the cause and extent of the triggering event, which is available at the time of implementation.

3. Upon approval by the Department, the water supply contingency plan shall become attached as a part of this permit, by reference.

4. Should the Department determine that migration of contaminants from the property on which the landfill is located has occurred or is likely to occur, the permittee shall immediately implement the water supply contingency plan in accordance with the approved schedule.

P. Closure and Post-Closure:

When the design capacity has been exhausted, the permittee shall cap the landfill in accordance with the requirements of COMAR 26.04.07.21 and the federal regulation under 40 CFR §258. Furthermore, at least 6 months prior to cessation of landfilling operations, a closure plan shall be submitted to the Department for review and approval. The plan shall contain the following elements:

1. A description of the methods to be used in closing out and capping the facility in an environmentally sound manner;

2. A description of the facility's post-closure activities including groundwater and gas monitoring and maintenance of the closed facility as specified in COMAR 26.04.07.22 and the federal regulation under 40 CFR §258;

3. A description of the future use of the facility upon closure; and

4. A deadline for the submission of a map based on an actual field survey, which depicts the final topography of the site upon closure.

Q. Gas Monitoring:

1. The permittee shall implement a gas monitoring program approved by the Department to comply with the lower explosive limit (LEL, 5 percent by volume in air) requirements for methane. To demonstrate compliance, the permittee shall sample air within facility structures where gas may accumulate, and in soil at the property boundary. Monitoring methods may include sampling gases from probes within the landfill units or leachate collection system and by sampling gases from monitoring probes or from gas monitoring wells installed in soil between the landfill unit and either the property boundary or structures where gas migration may pose a danger. Monitoring for gas migration shall occur within the most permeable (unsaturated) strata.

2. The type and frequency of monitoring shall be determined based on the soil conditions, the hydrogeologic and hydraulic conditions surrounding the facility, and the location of facility structures and property boundaries. The quantity and location of gas probes, gas monitoring wells, sampling equipment, and the monitoring frequencies shall be approved by the Department. The minimum frequency of monitoring shall be quarterly. The reports of gas monitoring shall be submitted to the Department on a semiannual basis along with the other environmental monitoring reports specified in the facility's permit. A copy of the most current topographic map generated by a survey performed as required in this permit and depicting the location of all gas monitoring probes and wells shall be included in each semiannual report.

3. If methane concentrations exceed 25 percent of the LEL in facility structures, excluding gas control or recovery system components, or exceed the LEL at the property boundary, immediate action shall be taken by the permittee to protect human health from potentially explosive conditions (e.g. personnel evacuation and venting the building). The permittee shall notify the Department as soon as a methane concentration in excess of 25 percent of the LEL is detected in the facility structures, excluding gas control or recovery system components, or when it exceeds the LEL at the property boundary.

4. Within 60 days after detection of the exceedance, the permittee shall prepare and submit a remediation plan for the Department's approval.

5. The remediation plan must describe the frequency and lateral and vertical extent of methane migration. The plan must describe possible causes of the increase in gas concentrations such as landfill operational conditions, gas control system failure or upset, climatic conditions, or closure activity. The plan must describe remedial action to be taken based on the cause, extent, and nature of the methane migration. The remediation plan must also include a schedule for implementation of the remediation.

6. If approved by the Department, the remediation plan must be implemented immediately with any changes to the plan or schedule reasonably required by the Department.

R. Location Restrictions and Design Demonstrations:

If not previously submitted, the permittee shall demonstrate to the Department compliance with the Location Restrictions specified under federal regulation 40 CFR 258.10 through 258.16 regarding airport safety, floodplains, wetlands, fault areas, seismic impact zones, and unstable areas. If not previously submitted, the permittee shall also demonstrate to the Department compliance with the Design Criteria specified under federal regulation 40 CFR §258.40. A copy of the required demonstrations shall be placed in a public repository, at or near the landfill site, where interested parties have access to them for review.

S. Wetlands and Wildlife Protection:

1. Landfill construction and operation may not impact any regulated wetlands area until necessary authorization is received from the applicable State and federal wetland authorities. This includes construction of access roads, landfill cells, or other land disturbance, and pertains to wetlands regulated by the State of Maryland and/or the U.S. Army Corps of Engineers.

2. Landfill construction and facility operations, which may impact upon State or federally regulated endangered species, may not begin unless all necessary permits or authorizations are obtained from the applicable State or federal wildlife regulatory agencies.

Part IV: Standard Conditions (Applicable to All Solid Waste Acceptance Facilities):

A. Supervision:

This facility shall be under the supervision of a responsible individual present at the disposal site at all times during the operation.

B. Right of Entry:

The permittee shall allow the Department's authorized representatives, at reasonable times and upon presentation of credentials:

1. To enter this facility covered under this permit or where any records are required to be kept under the terms and conditions of this permit.

2. To have access to and copy any records required to be kept under the terms and conditions of this permit.

3. To inspect any equipment or process required in this permit.

4. To inspect any collection, treatment, pollution management or control facilities, or transport vehicles, required by this permit.

5. To sample any waste, groundwater, surface water, soil or vegetation on the site.

6. To obtain photographic documentation or evidence.

C. Controlled Access:

Access to this facility shall be controlled at all times. Gates, fencing, and other ingress/egress controls around the perimeter of this facility shall be adequate to control access when this facility is not in operation. All gates shall be locked when this facility is unattended. Access shall be limited to those times when authorized personnel are on duty at this facility.

D. Overall Operation:

The permittee shall take all measures necessary to control pollution, health hazards or nuisances. This facility shall be operated and maintained in such a manner as to prevent air, land, or water pollution, public health hazards or nuisances.

E. As-Built Plans:

The permittee shall submit to the Department 2 hard copies and 1 electronic copy of certified as-built plans no later than 90 days after completion of the work under this permit.

F. Inspection of Incoming Waste:

1. The permittee shall inspect all incoming loads of solid waste material to insure that no unacceptable waste types, as herein defined in Part III of this permit, are included in the load. The permittee may conduct this inspection by observing wastes as they are deposited, transferred or processed.

2. If an unacceptable solid waste is identified during the tipping and/or inspection process, the permittee shall reject the unacceptable solid waste and advise the generator or hauler of the reason for rejection.

3. If the source of an unacceptable solid waste is unknown, the permittee shall dispose off-site all discovered unacceptable solid waste in a manner consistent with all applicable laws and/or regulations.

4. The permittee shall immediately (within 2 hours) report to the Department at (410) 537-3315 or (866) 633-4686 after working hours all incidents of discovery of any unacceptable hazardous waste materials in a load of waste. The permittee shall then submit to the Department a written report within 5 working days following the discovery. When the source of waste is known, the written report shall include the source of the waste, the transporter of the waste, the circumstances of discovery, a description of efforts to secure and control the waste and any release of pollutants from the waste, the current location and if known, the final disposition of the waste. If the source of waste is unknown, the written report shall include the circumstances of discovery, a description of efforts to secure and control the waste and any release of pollutants from the waste, and the current location and final disposition of the waste. If the source of unacceptable hazardous waste is known, the permittee shall reject the waste material and advise the generator or hauler of the reason of rejection. If the source of unacceptable hazardous waste is unknown, the permittee shall separate and handle the waste material in accordance with the applicable requirements of COMAR 26.13.02 "Disposal of Controlled Hazardous Substances".

G. Personnel, Equipment and Maintenance:

The permittee shall provide adequate personnel and equipment to insure proper construction and operation of this facility. Provisions shall be made for equipment repair or replacement as required. Substitute equipment shall be obtained when breakdown or maintenance renders essential operating equipment inoperative for a period in excess of 24 hours during days of operation.

H. Roads:

1. The permittee shall provide all-weather access roads to the disposal site or receiving area, and to all required pollution control and monitoring systems and devices.

2. Roads shall be maintained in a serviceable manner to allow passage by a waste hauling, emergency, or inspection vehicle, and to prevent the tracking of soil, ash, or waste onto any public road and/or to cause a public nuisance. If necessary, vehicles shall be cleaned prior to leaving this facility. Additional actions or facilities may be required at the discretion of the Department in order to control sediment tracking.

I. Dust and Noise Control:

1. Dust shall be controlled through the application of water to roads, operational procedures designed to limit disturbance of bare soils, and other practices approved by the Department. No chemical, oil or petroleum product shall be used for the control of dust without prior written approval from the Department.

2. Operations of the facility shall be conducted in a manner that conforms to the applicable noise provisions of COMAR 26.02.03. This permit does not authorize the violation of any local noise control laws or ordinances which may be enforced by the local government.

J. Litter Control:

1. Scattering of wastes by wind or other means shall be controlled by fencing or other barriers that are engineered and maintained in a manner that prevents litter from leaving the permitted facility.

2. The entire site shall be policed daily or more often, as needed, to prevent nuisance conditions. Litter that has scattered beyond the disposal site or receiving area, entered drainage features or surface water features, or has accumulated along litter fencing or other barriers, shall be picked up daily and placed in the disposal site or receiving area.

K. Liquids Management:

1. Under no circumstances may any collected contaminated liquids be discharged by any means, except to the sanitary sewerage system or any permitted treatment facility, without written authorization from the Department. Any discharge to a sanitary sewerage system shall comply with the applicable provisions of the state's pretreatment program, as described in COMAR 26.08.08.

2. Storm water management at this facility shall be in accordance with the requirements of COMAR 26.17.02. Any point source discharge of pollutants to waters of the state is prohibited unless permitted by the Department. Any pollutants from the handling, transfer, or storage of wastes, including accidental spills and rainfall events, shall be collected or disposed of in a manner approved by the Department.

L. Fuel Storage:

Fueling of equipment and vehicles shall be conducted with care to avoid spilling or overfilling. The storage tanks and fuel distribution facilities shall be installed and maintained in accordance with the applicable requirements of COMAR 26.10.01 through COMAR 26.10.11 inclusive, and with the requirements of local fire prevention agencies. Any spilled fuel shall be cleaned up immediately. Disposal of spilled fuel may only take place at an incinerator, municipal landfill or oil handling facility permitted to accept this material.

M. Fire Control:

1. Solid waste may not be burned at this facility except as permitted by the Department.

2. The permittee shall take suitable measures to control and prevent fires that may occur during the operation of this facility.

N. Removed Pollutant Substances:

Unless previous written approval for disposal has been given by the Department, wastes such as solids, sludge, or other materials removed from or resulting from the treatment or control of waste waters or facility operations, shall be disposed of at a facility approved to accept such materials, and in a manner to prevent any removed substances or runoff from such substances from entering or from being placed in a location where they may enter the waters of the state.

O. Pollution Monitoring and Control Device Requirements:

1. All pollution control and ground and surface water monitoring systems (including storm water management and sediment control systems) shall be installed in accordance with the manufacturer's recommendations and plans and specifications approved by the Department. All pollution control and ground and surface water monitoring systems shall remain operational and shall be maintained in accordance with the provisions of the approved plans and specifications.

2. Any incidence of damage to this facility's monitoring or pollution control systems shall be reported to the Department at (410) 537-3315 within 2 hours of the incident, or within 2 hours of the discovery of the damage if the damage occurred outside of working hours. All repairs needed to correct the damage shall be completed as soon as practical or as specified by the Department.

3. During construction and operation of this facility, the sediment and storm water basins shall be cleaned out whenever (a) a clean-out elevation is reached; (b) construction is completed; (c) the amount of sediment reaches 50% capacity, and/or (d) as specified by the approved Sediment and Erosion Control Plan.

P. Penalties for Tampering:

Section 9-343 of the Environment Article, Annotated Code of Maryland, provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by fines, or by imprisonment, or by both.

Q. Records Retention:

1. All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, original recordings from continuous monitoring instrumentation, and inspection results shall be retained by the permitee on-site or at another location upon written approval of the Department, for a minimum period of 5 years.

2. All documents listed in Part I: A. Operating Documents of this permit shall be retained by the permittee on-site for the life of the permit. Historical documents listed in Part I may be retained at an off-site location.

R. Annual Report:

An annual report shall be submitted to the Department concerning the operation and status of this facility for each calendar year that this facility is in operation. The annual report shall be for the calendar year ending December 31 and shall be submitted by March 1 of the following year on the form provided by the Department.

S. Duty to Provide Information:

The permittee shall furnish to the Department within a reasonable time, any information that the Department may request, to determine whether cause exists for modifying, revoking, reissuing, or terminating this permit, or to determine compliance with this permit.

T. Alterations:

Any modification to this facility or its operating plans must be approved in writing by the Department prior to implementation. Modifications include, but are not limited to, any changes that alter a significant structural feature, operational procedure, element of design, type of equipment or method of construction described in the approved plans and specifications for this facility and defined herein.

U. Operation and Maintenance Manual:

The permittee shall review the Operation and Maintenance Manual (O&M) for this facility prior to permit renewal. If a change has occurred to the operation or maintenance of the facility, the permittee shall submit to the Department an addendum to the O&M to reflect the change.

V. Application for Renewal:

1. At least 2 weeks before the expiration date of this permit, unless permission for a later date has been granted by the Department, the permittee shall submit a new application for renewal of the authorization to continue to operate under the provision of this permit or notify the Department of the intent to cease operating by the expiration date. In the case of landfill systems, the application shall be submitted in accordance with Section 9-213 of the Environment Article, Annotated Code of Maryland. In the event that a timely and sufficient reapplication has been submitted and the Department is unable, through no fault of the permittee, to renew this permit before its expiration date, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable.

2. The Department may refuse to renew this permit if the permittee violates the terms or conditions of this permit or state law and regulations, in accordance with Section 9-214 of the Environment Article, Annotated Code of Maryland.

W. Closure:

1. When operations end, the permittee shall close this facility in a manner that prevents erosion, health and safety hazards, nuisances, and pollution.

2. All remaining solid wastes, not properly disposed of, shall be transferred to a permitted facility for proper disposal.

3. If applicable, the surety bond for this facility as specified in Sections 9-211 or 9-211.1 of the Environment Article, Annotated Code of Maryland or other financial assurance required by State, federal, or local regulations, shall be utilized to the extent necessary to remediate the facility if the permittee does not close this facility in a proper manner, and the Department:

   a. Notifies the permittee and corporate surety on the bond that the facility is not properly closed;

   b. Specifies in the notice, the deficiencies that must be addressed;

   c. Gives the permittee and the corporate surety a reasonable opportunity to correct the deficiencies and close the facility in accordance with the regulations of the Department; and

   d. Authorizes the local governing body or other agency to use the surety bond to close the facility in accordance with the regulations of the Department.

X. Transfer of Permit or Ownership:

1. This permit is valid only for the permittee named and may not be transferred to another entity without first obtaining a new Refuse Disposal Permit from the Department for the new entity.

2. In the event of any change in control or ownership of the property, the permittee shall notify the succeeding owner by certified mail, of the existence of this permit and of any outstanding permit noncompliance, a minimum of 30 days prior to transfer. A copy of this notification shall also be forwarded to the Department at the same time.

Y. Compliance:

1. The permittee shall comply with the terms and conditions of this permit, and with all applicable federal, local and State laws and regulations.

2. If for any reason the permittee does not comply or is unable to comply with any of the terms and conditions of this permit, the permittee shall notify the Department at (410) 537-3315 on the same day or on the next working day, following any noncompliance. Within 5 working days after this notification, the permittee shall provide the Department with the following information in writing:

   a. Descriptions of the noncompliance, including dates, time, and type of noncompliance;

   b. Cause of noncompliance;

c. Anticipated time the noncompliance is expected to continue or if such condition has been corrected;

d. Steps taken by the permittee to correct the noncompliance; and

e. Steps to be taken by the permittee to prevent recurrence of the noncompliance.

Z. Local Solid Waste Management Plan/Zoning and Land Use Requirements:

1. Nothing in this permit authorizes the construction or the operation of this facility when it is not in conformance with the local solid waste management plan, or zoning or land use requirements. The issuance of this permit does not prevent any duly authorized local authority from taking action to enforce applicable zoning, planning and land use requirements, or provisions of the local solid waste management plan.

2. This permit may be suspended or revoked upon a final, unreviewable determination that the permittee lacks, or is in violation of, any federal, State or local approval necessary to conduct the activity authorized by this permit.

AA. Civil and Criminal Liability:

Nothing in this permit shall be construed to neither preclude the institution of any legal action nor relieve the permittee from civil or criminal responsibilities and/or penalties for non-compliance with Title 9 of the Environment Article, Annotated Code of Maryland, or any federal, local or other State laws or regulations.

BB. Penalties for Violations of Permit Conditions:

Section 9-268 of the Environment Article, Annotated Code of Maryland, provides that, except for violations of Part III of that subtitle and violations enforced under Section 9-267 of that subtitle, the provisions of Sections 9-334 through 9-342 of Subtitle 3 of that title shall be used and shall apply to enforce violations of:

1. That subtitle;

2. Any regulation adopted under that subtitle; or

3. Any permit issued under that subtitle.

CC. Property Rights:

The issuance of this permit does not intend to convey any property rights in either real or personal property, or any exclusive privilege or franchise, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations.

DD. Severability:

If any provision of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect, and such invalid provision shall be considered severed and deleted from this permit.

EE. Signatory Requirements:

All applications, request for alterations, renewal requests, or monitoring reports submitted to the Department shall be signed and verified in accordance with Section 1-201 of the Environment Article, Annotated Code of Maryland, by the permittee or authorized representative of this facility as being true.

Groundwater and Surface Water Monitoring Plan
Central Landfill Facility
Worcester County, Maryland

Landfill Permit No. 2021-WMF-0663

Prepared for:

Worcester County Department of Public Works
6113 Timmons Road
Snow Hill, Maryland 20863

Prepared by:

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031
(410) 584-7000

July 2023
EA Project Number: 10609.48

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°C	Degrees Celsius
µS/cm	Microsiemen(s) per centimeter
CFR	Code of Federal Regulations
CLF	Central Landfill Facility
cm/sec	Centimeter(s) per second
COD	Chemical oxygen demand
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
ft	Foot (feet)
gal	Gallon(s)
in.	Inch(es)
KM	Kaplan-Meier
L	Liter(s)
LPM	Liter(s) per minute
MCL	Maximum Contaminant Level
MDE	Maryland Department of the Environment
mg/L	Milligram(s) per liter
min.	Minute(s)
MSL	Mean sea level
mV	Millivolt(s)
NTU	Nephelometric turbidity units
ORP	Oxidation-reduction potential
PQL	Practical quantitation limit
QA/QC	Quality Assurance/Quality Control
RDP	Refuse Disposal Permit
SSI	Statistically significant increase
S.U.	Standard unit(s)
TOC	Total organic carbon
UPL	Upper Prediction Limit

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1. INTRODUCTION

The Worcester County Central Landfill Facility (CLF) is located approximately 3.5 miles northeast of Snow Hill, Maryland, and occupies an approximately 725-acre site. Two hundred and thirty acres of this site are currently permitted for landfilling (eight cells of 200 acres for municipal solid waste and one 30-acre rubble fill cell). The overall site was developed between 1986 and 1990, and the first landfill began accepting waste in April 1990.

Cells 1 through 4 are located in the northern portion of the property. There is an existing access road that serves the landfill. Cell 5 is located to the southeast of the property, within the footprint of a permitted former rubble fill. A portion of the Cell 5 area was utilized for scrap metal stockpiling activities. To the north, Cell 5 abuts the previously permitted operational area of the landfill. Construction of Cell 5 was completed and waste acceptance began on 29 January 2019.

Existing features at the Central Landfill Facility, Cells 1 through 5, include:

- The existing active landfill area
- Access roads to the existing landfill area
- Scale house facility
- Leachate facilities
- Recycling facility
- Landfill gas blower and flare station

The landfilling operations at the site are restricted to placement of municipal solid waste and cover soil material.

This monitoring plan has been developed to comply with the regulations set forth in 40 Code of Federal Regulations (CFR) 258, Subpart E, "Groundwater Monitoring and Corrective Action," and the facility's Refuse Disposal Permit (RDP), Permit No. 2021-WMF-0663 issued on 21 January 2022.

This monitoring plan addresses detection monitoring and assessment monitoring, as defined in 40 CFR 258.54 and 40 CFR 258.55, respectively. Should a statistically significant increase (SSI), as described in Chapter 6, over background conditions of the constituents tested in the detection monitoring program be detected, for which an alternate source or explanation is not able to be identified, an assessment monitoring program will be implemented.

Should an Assessment of Corrective Measures and a subsequent Remedial Plan be required, the County will prepare these documents and submit to the Maryland Department of the Environment (MDE) for review and approval. These documents will identify the proposed corrective measures, a schedule to identify notifications to MDE and certification. The plan will identify notification requirements at a minimum of 14 days both prior to the implementation of the control measures and upon completion/certification of the implementation of the control measures.

1.1 SITE GEOLOGY/HYDROLOGY

The CLF is located approximately 3.5 miles northeast of Snow Hill in Worcester County, Maryland. The regional geology of Worcester County is underlain by unconsolidated sedimentary strata of Holocene, Pleistocene, and Miocene epochs. These strata dip to the east and are generally alternating silt, sand, and clay. Geology at the site is consistent with the regional geology. According to the Geologic map of Worcester County (Owens and Denny 1978), the geologic formations underlying the site are the Omar Formation and the Beaverdam Sand. Additional information regarding site geology is provided in the 1987 Phase II Geohydrologic Investigation (EA Engineering, Science, and Technology, Inc. 1987) and Phase II Hydrogeologic Investigation and Concept Design for the Proposed Municipal Solid Waste Cell 5 (EA Engineering, Science, and Technology, Inc. 2014).

As part of the 1987 Phase II Geohydrologic Investigation (EA Engineering, Science, and Technology, Inc. 1987), a detailed plan for soil borings/well installations was developed and implemented in order to address the site-specific geology and the three underlying aquifers at the CLF. Based on the investigation, it was determined that the shallow geology at the CLF consists of relatively flat layers of a surficial silt overlying a silty-sand layer of Holocene age. The silty-sand layer contains the shallow groundwater aquifer, which overlies an impermeable clay layer approximately 12 to 21 feet (ft) below the ground surface with a permeability on the order of 2.5 to 3.80×10^{-8} centimeters per second (cm/sec). In addition, a deep clay layer was also identified approximately 90 to 100 ft below ground surface (60 to 70 ft below mean sea level [MSL]) with a permeability ranging from 1.47 to 2.4×10^{-7} cm/sec. The deep layer separates the Pleistocene (intermediate) and the Pocomoke (deep) aquifers. As described, the shallow and intermediate aquifers beneath the site are encountered within 50 ft of the bottom of the cell floors. The cells floors for Cells 1 through 4 are all approximately 33 to 35 ft above MSL.

1.2 SURFACE WATER HYDROLOGY AND TOPOGRAPHY

The landfill property is bordered to the south by Cedartown Road, to the northwest by railroad tracks, and elsewhere by wooded private property. The site lies within the Atlantic Coastal Plain Physiographic Province. With the exception of the landfill cells, the site is relatively flat with local relief approximately 5 to 7 ft over the site. The average site elevation, not including the landfill cells, is approximately 35 ft above MSL. Prior to landfilling, the land surface was mostly wooded, with several small fields used for farming in the vicinity of where the active portion of the site is located.

Standing water can be observed at the existing borrow areas on-site, which were historically used to obtain daily cover for landfill activities. Surface water also flows off-site via drainage ditches and tributaries to Five-Mile Creek and the Pocomoke River on the western side, and Waterworks Creek and Chincoteague Bay on the eastern side, as described in the 1987 Phase II Geohydrologic Investigation (EA Engineering, Science, and Technology, Inc. 1987).

Shallow groundwater flow direction in the area of Cells 1 through 4 is a result of mounding within those cells. Shallow groundwater in Cells 1 through 4 generally flows to the northwest area. Shallow groundwater in the Cell 5 area flows to the northwest and west. Groundwater

elevation data from the intermediate monitoring wells indicate groundwater flow to the southeast in the intermediate aquifer in both the Cells 1 through 4 and Cell 5 areas.

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2. LOCATION AND FREQUENCY OF MONITORING POINTS

There are 33 existing groundwater monitoring wells, 2 potable wells, 2 surface water locations, and 5 leachate sample locations sampled at the CLF (see Figure 2-1). These are divided between the northern (vicinity of Cells 1 through 4), southern (undeveloped portion of the CLF), and transitional groundwater zones (vicinity of Cell 5), based on historical groundwater flow patterns in the shallow aquifer (Figure 2-2). Twenty-two of the 33 monitoring wells are screened within the shallow aquifer, 8 monitoring wells within the intermediate aquifer, and 3 monitoring wells within the deep aquifer. The 22 shallow wells within the Cells 1 through 5 area and 3 intermediate wells within the Cell 5 area are sampled on a semi-annual basis. The 5 intermediate monitoring wells and 3 deep within the Cells 1 through 4 area are sampled on an annual basis. The off-site background monitoring well (MW-22S) is located at an active radio tower plot located less than ½ mile west of the site. Currently, landfilling activities occur over the transitional groundwater zones. This plan provides for monitoring of the northern and transitional groundwater drainage zones only.

Surface water is to be sampled from two locations, SW-1 and SW-2. SW-1 is collected from Five-Mile Branch, located west of the landfill. SW-2 is collected from the landfill borrow pond located west of Cell 1.

The following points shall be sampled:

Description	Number	Zone	Sampling Frequency
Surface water location	SW-1	Northern	Semi-Annual (Spring and Fall)
Surface water location	SW-2	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-3S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-3M	Northern	Annual (Fall)
Monitoring well	MW-3D	Northern	Annual (Fall)
Monitoring well	MW-4S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-4M	Northern	Annual (Fall)
Monitoring well	MW-4D	Northern	Annual (Fall)
Monitoring well	MW-5SR	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-7S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-7M	Northern	Annual (Fall)
Monitoring well	MW-8S	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-8M	Transitional	Annual (Fall)
Monitoring well	MW-8D	Transitional	Annual (Fall)
Monitoring well	MW-10S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-10M	Transitional	Annual (Fall)
Monitoring well	MW-11S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-13S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-14S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-15S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-16S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-17S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-18S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-19S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-20S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-21S	Northern	Semi-Annual (Spring and Fall)
Monitoring well	MW-22S	Off-site	Semi-Annual (Spring and Fall)

Description	Number	Zone	Sampling Frequency
Monitoring well	MW-501A	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-501M	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-502A	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-503A	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-504A	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-504M	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-505A	Transitional	Semi-Annual (Spring and Fall)
Monitoring well	MW-505M	Transitional	Semi-Annual (Spring and Fall)
Potable well	PW-1	Northern	Semi-Annual (Spring and Fall)
Potable well	PW-2	Transitional	Semi-Annual (Spring and Fall)
Leachate sample	LS-1	Northern	Semi-Annual (Spring and Fall)
Leachate sample	LS-2	Northern	Semi-Annual (Spring and Fall)
Leachate sample	LS-3	Northern	Semi-Annual (Spring and Fall)
Leachate sample	LS-4	Northern	Semi-Annual (Spring and Fall)

Wells which are screened in the intermediate aquifer are indicated as such with an "M" designation. Cell 5 intermediate wells (MW-501M, MW-504M, and MW-505M) shall be sampled semi-annually. All other site wells which are screened in the intermediate aquifer shall be sampled annually. All wells which are screened in the deep aquifer are indicated as such with a "D" designation and shall be sampled annually. The shallow aquifer monitoring wells ("S" and "A" designation) and remaining sample locations shall be sampled on a semi-annual basis. The groundwater elevation for all shallow monitoring wells and piezometers will be measured and recorded on a monthly basis. Historical groundwater elevations for all monitoring wells and piezometers are included in Table 2-1. Groundwater contour maps for the shallow aquifer (Figure 2-2) and intermediate aquifer (Figure 2-3) are included for reference. A groundwater contour map is not required for the deep aquifer, as it is more than 50 feet (ft) below the anticipated lowest elevation of the refuse cell floor.

In Spring 2015, elevation gauges were installed in four of the on-site borrow ponds. In addition to the shallow monitoring wells and piezometers, surface water elevations will be gauged in these four borrow ponds (see Figure 2-1).

After installation of a new well, notification of well installation certification and well completion reports will be provided within 14 days following review and receipt of well completion reports by a qualified groundwater scientist.

3. ANALYTES AND ANALYTICAL METHODS

3.1 DETECTION MONITORING

All samples collected will be analyzed for the following constituents, which comprise Appendix I of Subpart E of 40 CFR 258:

Analyte	Method
INORGANIC CONSTITUENTS	
Antimony, total	6020B
Arsenic, total	6020B
Barium, total	6020B
Beryllium, total	6020B
Cadmium, total	6020B
Chromium, total	6020B
Cobalt, total	6020B
Copper, total	6020B
Lead, total	6020B
Nickel, total	6020B
Selenium, total	6020B
Silver, total	6020B
Thallium, total	6020B
Vanadium, total	6020B
Zinc, total	6020B
ORGANIC CONSTITUENTS	
Acetone	8260B
Acrylonitrile	8260B
Benzene	8260B
Bromochloromethane	8260B
Bromodichloromethane	8260B
Bromoform	8260B
Carbon disulfide	8260B
Carbon tetrachloride	8260B
Chlorobenzene	8260B
Chloroethane; Ethyl chloride	8260B
Chloroform; Trichloromethane	8260B
Dibromochloromethane; Chlorodibromomethane	8260B
1,2-Dibromo-3-chloropropane; DBCP	8011
1,2-Dibromoethane; Ethylene dibromide; EDB	8011
o-Dichlorobenzene; 1-2-Dichlorobenzene	8260B
p-Dichlorobenzene; 1,4-Dichlorobenzene	8260B
trans-1,4-Dichloro-2-butene	8260B
1,1-Dichloroethane; Ethylidene chloride	8260B
1,2-Dichloroethane; Ethylene dichloride	8260B
1,1-Dichloroethylene; 1,1-Dichloroethene	8260B
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	8260B
trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	8260B
1,2-Dichloropropane; Propylene dichloride	8260B
cis-1,3-Dichloropropene	8260B
trans-1,3-Dichloropropene	8260B
Ethylbenzene	8260B
2-Hexanone; Methyl butyl ketone	8260B
Methyl bromide; Bromomethane	8260B
Methyl chloride; Chloromethane	8260B
Methylene bromide; Dibromomethane	8260B
Methylene chloride; Dichloromethane	8260B
Methyl ethyl ketone; MEK; 2-Butanone	8260B
Methyl iodide; Iodomethane	8260B

Analyte	Method
Methyl Tertiary Butyl Ether	8260B
4-Methyl-2-pentanone; Methyl isobutyl ketone	8260B
Styrene	8260B
1,1,1,2-Tetrachloroethane	8260B
1,1,2,2-Tetrachloroethane	8260B
Tetrachloroethylene; Tetrachloroethene	8260B
Toluene	8260B
1,1,1-Trichloroethane; Methylchloroform	8260B
1,1,2-Trichloroethane	8260B
Trichloroethylene; Trichloroethene	8260B
Trichlorofluoromethane; CFC-11	8260B
1,2,3-Trichloropropane	8260B
Vinyl acetate	8260B
Vinyl chloride	8260B
Xylenes	8260B

In addition, the following constituents will be analyzed per the RDP.

Analyte	Method
pH	Field measured
Specific conductance	Field measured
Temperature	Field measured
Oxidation-Reduction Potential (ORP)	Field measured
Turbidity	Field measured
Dissolved Oxygen (DO)	Field measured
Methyl Tertiary Butyl Ether	8260B
Alkalinity	SM2320B
Ammonia	350.1
Chemical oxygen demand (COD)	410.4
Chloride	300.0
Hardness	6020B
Nitrate	300.0
Sulfate	300.0
Total dissolved solids	SM2540 C
Turbidity	180.1
Calcium, total	6020B
Iron, total	6020B
Magnesium, total	6020B
Manganese, total	6020B
Mercury, total	6020B
Potassium, total	6020B
Sodium, total	6020B

3.2 ASSESSMENT MONITORING

In the event of an SSI, as described in Chapter 6, for which an alternate source or explanation is not able to be identified, an assessment monitoring program will be established. The first assessment monitoring event will analyze the shallow groundwater monitoring wells for all the Appendix II parameters, as directed by MDE (Hynson 2015). Following the first event, three baseline sampling events will analyze only detected parameters in the shallow wells with the associated detection, as per 40 CFR 258.55. Semi-annual monitoring events following the first

baseline sampling event will include the detection monitoring constituents as well as detected Appendix II parameters.

Appendix II parameters not detected in the first assessment monitoring event will not be analyzed in subsequent events. The detected Appendix II parameters will be analyzed only in shallow wells with the associated detection, as per 40 CFR 258.55.

All samples collected as part of the first assessment monitoring event will be analyzed for the following constituents, which comprise Appendix II of Subpart E of 40 CFR 258:

Analyte
Acenaphthene
Acenaphthylene
Acetone
Acetonitrile; Methyl cyanide
Acetophenone
2-Acetylaminofluorene; 2-AAF
Acrolein
Acrylonitrile
Aldrin
Allyl chloride
4-Aminobiphenyl
Anthracene
Antimony
Arsenic
Barium
Benzene
Benzo[a]anthracene; Benzanthracene
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[ghi]perylene
Benzo[a]pyrene
Benzyl alcohol
Beryllium
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC; Lindane
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl)ether; Dichloroethyl ether
Bis(2-chloro-1-methylethyl) ether; 2,2′-Dichlorodiisopropyl ether; DCIP
Bis(2-ethylhexyl) phthalate
Bromochloromethane; Chlorobromethane
Bromodichloromethane; Dibromochloromethane
Bromoform; Tribromomethane
4-Bromophenyl phenyl ether
Butyl benzyl phthalate; Benzyl butyl phthalate
Cadmium
Carbon disulfide
Carbon tetrachloride
Chlordane
p-Chloroaniline
Chlorobenzene
Chlorobenzilate
p-Chloro-m-cresol; 4-Chloro-3-methylphenol
Chloroethane; Ethyl chloride

Analyte
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethylbenzene
Ethyl methacrylate
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloropropene
2-Hexanone; Methyl butyl ketone
Indeno(1,2,3-cd)pyrene
Isobutyl alcohol
Isodrin
Isophorone
Isosafrole
Kepone
Lead
Mercury
Methacrylonitrile
Methapyrilene
Methoxychlor
Methyl bromide; Bromomethane
Methyl chloride; Chloromethane
3-Methylcholanthrene
Methyl ethyl ketone; MEK; 2-Butanone
Methyl iodide; Iodomethane
Methyl methacrylate
Methyl methanesulfonate
2-Methylnaphthalene
Methyl parathion; Parathion methyl
4-Methyl-2-pentanone; Methyl isobutyl ketone
Methylene bromide; Dibromomethane
Methylene chloride; Dichloromethane
Naphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine

Analyte
Chloroform; Trichloromethane
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chloroprene
Chromium
Chrysene
Cobalt
Copper
m-Cresol; 3-Methylphenol
o-Cresol; 2-Methylphenol
p-Cresol; 4-Methylphenol
Cyanide
2,4-D; 2,4-Dichlorophenoxyacetic acid
4,4′-DDD
4,4′-DDE
4,4′-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Dibromochloromethane; Chlorodibromomethane
1,2-Dibromo-3-chloropropane; DBCP
1,2-Dibromoethane; Ethylene dibromide; EDB
Di-n-butyl phthalate
o-Dichlorobenzene; 1,2-Dichlorobenzene
m-Dichlorobenzene; 1,3-Dichlorobenzene
p-Dichlorobenzene; 1,4-Dichlorobenzene
3,3′-Dichlorobenzidine
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane; CFC 12
1,1-Dichloroethane; Ethyldidene chloride
1,2-Dichloroethane; Ethylene dichloride
1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene
trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene
2,4-Dichlorophenol
2,6-Dichlorophenol
1,2-Dichloropropane
1,3-Dichloropropane; Trimethylene dichloride
2,2-Dichloropropane; Isopropylidene chloride
1,1-Dichloropropene
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Dieldrin
Diethyl phthalate
O,O-Diethyl O-2-pyrazinyl phosphorothioate; Thionazin
Dimethoate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3′-Dimethylbenzidine
alpha, alpha-Dimethylphenethylamine
2,4-Dimethylphenol; m-Xylenol
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol

Analyte
Nickel
o-Nitroaniline; 2-Nitroaniline
m-Nitroaniline; 3-Nitroaniline
p-Nitroaniline; 4-Nitroaniline
Nitrobenzene
o-Nitrophenol; 2-Nitrophenol
p-Nitrophenol; 4-Nitrophenol
N-Nitrosodi-n-butylamine
N-Nitrosodiethylamine
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine
N-Nitrosomethylethalamine
N-Nitrosopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine
Parathion
Pentachlorobenzene
Pentachloronitrobenzene
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Phorate
Polychlorinated biphenyls; PCBs
Pronamide
Propionitrile; Ethyl cyanide
Pyrene
Safrole
Selenium
Silver
Silvex; 2,4,5-TP
Styrene
Sulfide
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid
2,3,7,8-TCDD; 2,3,7,8-Tetrachlorodibenzo-p-dioxin
1,2,4,5-Tetrachlorobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene
2,3,4,6-Tetrachlorophenol
Thallium
Tin
Toluene
o-Toluidine
Toxaphene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane; Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene; Trichloroethene
Trichlorofluoromethane; CFC-11
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
1,2,3-Trichloropropane

Analyte
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol
Di-n-octyl phthalate
Diphenylamine
Disulfoton
Endosulfan I

Analyte
O,O,O-Triethyl phosphorothioate
sym-Trinitrobenzene
Vanadium
Vinyl acetate
Vinyl chloride; Chloroethene
Xylene (total)
Zinc

Due to statistically significant increases over background concentrations observed as part of semi-annual detection monitoring, an assessment monitoring program was established at the Central Landfill Facility beginning in April 2015. Four semivolatile organic compounds, tin, and sulfide were retained for four rounds of sampling as part of assessment monitoring. Results showed these parameters did not exceed background concentrations or groundwater protection standards in a downgradient well at the property boundary. As a result, the County requested the assessment monitoring parameters be reduced to those included on Tables I and II of the County's refuse disposal permit, which was approved by MDE in a letter dated 3 November 2017.

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4. FIELD COLLECTION AND SAMPLE MANAGEMENT TECHNIQUES

A qualified groundwater scientist will oversee experienced environmental technicians who will sample monitoring wells identified within this plan on a semi-annual or annual basis. The following procedures will be employed for well gauging and sampling, sample preservation and handling, and documentation.

4.1 PHYSICAL INSPECTION AND OBSERVATION

Upon arrival at each well, the condition of the well and surrounding area will be noted, using Form 4-1. This will include but should not be limited to security, evidence of tampering, evidence of physical damage, well integrity, evidence of breakage or heaving of the concrete pad, if present, and evidence of surface infiltration. If damage or impairment is observed, the condition of the well will be reported to Worcester County.

4.2 WATER LEVEL DETERMINATION

After the physical inspection has been completed, the static water levels will be determined for all wells to be sampled prior to initiation of any purging and sampling activities. The depth to water and the elevation at the top of well casing reference point will be used to calculate the groundwater elevation at the well. Because these data will be used to construct water table maps, it is essential that they be as accurate as possible. All water level determinations will be made to the nearest 0.01 ft and recorded on Form 4-1.

A water level indicator will be used and the depth to water measured by lowering the precleaned probe of the electronic sounder into the well slowly until the indicator (buzzer or meter) is activated. After an indication of water penetration has been achieved, the probe will be slowly raised and lowered until the indicator accurately registers the water surface. The water level will be referenced to the source point on the casing marked when the casing stick-up was measured. The water level will be determined to the nearest 0.01 ft. To be sure that cross-contamination via water-level sounding equipment does not occur, it is necessary to decontaminate equipment between each well. This will be done by wiping the sounding device with a paper towel saturated with a non-phosphate detergent as retrieved. Probes are rinsed with a non-phosphate detergent and spray-rinsed with deionized water between samplings.

4.3 WELL LOW FLOW PURGING AND SAMPLING

Low flow purging and sampling methods (less than 0.5 liter per minute) were performed beginning in Spring 2014 and have continued for each event thereafter. Sampling will be accomplished using a clean, stainless steel submersible pump and discharge hose that is lowered to the screened interval midpoint. Care shall be taken as to not disturb the well while lowering the non-dedicated pump and tubing into the well. The portable generator should be placed on level ground approximately 15 ft away from and downwind from the well. All generator maintenance (oil and fueling) is to be performed off-site.

A flow-through cell or a clean container containing the instrumentation header will be connected to the pump discharge and well purging will begin at a pumping rate of less than 0.5 liter per

minute, unless a different purge rate is established for the well. The flow cell will be filled completely, taking care not to cause entrapment of air in the system. The pumping rate will then be adjusted in order to stabilize the water level within the well, if necessary.

During the purging of the well, water quality parameters will be monitored and recorded every 3 to 5 minutes, as well as purge rate, volume purged, and depth to water. Water quality parameters monitored during purging are listed in Section 4.5. Purging of the standing water will be considered complete when three consecutive readings of the water quality indicator parameters agree within approximately 10 percent. No treatment or special disposal is required for purged well water at non-contaminated wells. Purged water from contaminated wells will be containerized and disposed of properly or run through a portable carbon vessel prior to discharge.

Information regarding low flow well purging is recorded on a Low Flow Sampling Record form, (Form 4-1).

4.4 EQUIPMENT DECONTAMINATION

All equipment used to collect samples and any equipment that might contact the sample will be cleaned to avoid cross-contamination and/or the introduction of outside contaminants into the sample. All non-dedicated equipment shall be decontaminated utilizing a non-phosphate detergent and grade deionized water prior to use in monitoring wells and between sampling at each of the wells. This will be done by wiping the pump device with a paper towel saturated with a non-phosphate detergent as retrieved. Non-phosphate detergent and deionized water must then be pumped through the pump. Equipment that is decontaminated using the liquids mentioned above will be containerized and disposed of properly. Materials used to clean and dry the equipment and containers will be collected in a trash bag and then disposed as municipal waste.

4.5 GROUNDWATER SAMPLE COLLECTION/DOCUMENTATION

Temperature, pH, oxidation-reduction potential (ORP), dissolved oxygen (DO), turbidity, and specific conductance will be determined in the field. These determinations will be made using individual meters or a single unit utilizing multiple probes. All instrumentation will be calibrated prior to transport to the field and, where provided for, recalibrated during usage. Field meters will be calibrated on a daily basis. All equipment shall be properly decontaminated prior to each use. Information shall be recorded on Form 4-1.

After sampling parameters have stabilized to within 10 percent of each other, sample containers will be filled by allowing the pump discharge to flow gently down the inside of the containers with as little agitation or aeration as possible. Samples for volatile organics will be collected in a manner that will minimize aeration and so that containers will be free of bubbles and headspace. The first sample aliquot will be used to fill the volatile organics parameter vials. Containers that contained preservative will not be filled to overflowing and will be thoroughly mixed after filling by upending. Each pre-labeled container will be placed in a cooler containing ice and a sample entry will be made on the chain-of-custody form.

Additionally, if needed as a result of mechanical equipment failure, groundwater sample collection will be accomplished with certified, pre-cleaned bottom-filling bailers. A new, clean section of line will be attached to the bailer and the bailer lowered into the well. Care will be exercised to ensure that the bailer and line do not contact the ground or other sources of contamination. The bailer will be lowered into the well to the depth of the screened interval avoiding stagnant water at the top of the well. The water from the first three bailers will be discarded. The first sample aliquot will be used to fill the volatile organics parameter vials. Samples for volatile organics will be collected in a manner that will minimize aeration and the containers will be free of bubbles and headspace. The bailer will then be filled and the other sample transferred to the sample containers. Containers that contain preservative will not be filled to overflowing and will be mixed after filling by upending. Each pre-labeled container will be placed in a cooler containing ice and a sample entry made on the chain-of-custody form.

The sampling locations and frequency of sampling are discussed in Chapter 2 of this monitoring plan.

4.6 SURFACE WATER SAMPLE COLLECTION/DOCUMENTATION

Two surface water samples will be collected per semi-annual event. The locations of the surface water samples are shown on Figure 2-1. Temperature, pH, and specific conductivity will be measured in the field and recorded. Each sample will be obtained using a clean, non-preserved bottle, which will be rinsed several times with the surface water from the sampling location and then transferred into the proper sample container.

4.7 POTABLE WELL SAMPLE COLLECTION

Samples should be collected from interior locations. It is most desirable to sample from an interior high-use tap such as a bathroom. If a sample is to be collected from an exterior tap, it should never be collected from a hose. Whenever possible, the tap should be sterilized with a sodium hypochlorite swab prior to sampling. The cold tap should be run 2–3 minutes prior to sampling. If the tap is a temperature mixing faucet, the hot water should be run for 2–3 minutes, followed by 2–3 minutes on cold, and then the sample should be collected. Water samples should not be collected from the bathtub/shower or kitchen faucet because of the high potential for bacteria. If samples are required from these locations, the outside of the tap should be sterilized prior to sample collection.

4.8 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Quality assurance (QA)/quality control (QC) protocols will be employed during all monitoring events to check the uniformity of the data and to ensure field QC criteria and laboratory QA criteria. Trip blanks will be prepared during each sampling event by the laboratory and will be delivered to the laboratory accompanying the field samples with the purpose of evaluating if volatile organic compound contamination from ambient air is introduced into the samples during sample handling or transportation. Each trip blank will be analyzed for volatile organics and will be prepared prior to field sampling. As an additional QC measure, analytical results of the deionized water utilized by the laboratory to prepare trip blanks will also be requested prior to

both the spring and fall sampling events. Trip blanks will be sealed and labeled and will never be opened during any sampling activities. In addition to the trip blanks, field blanks and a rinsate (equipment) blank will be collected and analyzed for the same groundwater parameters as the monitoring wells and surface water. The rinsate (equipment) blank will be prepared by running deionized water through and/or over decontaminated equipment and into the sample containers. The rinsate (equipment) blank will accompany the groundwater samples to the laboratory for analytical testing and will be used to determine the effectiveness of the decontamination process and procedures. The field blanks will be prepared by pouring deionized water directly into the sample containers while on-site and will be used to determine if there was ambient contamination in the field or in the laboratory. As an additional QC measure, the deionized water used for the field blanks and rinsate blank was analyzed for the same parameters as groundwater samples.

A trip blank and a field blank will be prepared for every day of sampling. One rinsate blank will be prepared for each sampling event. Duplicate samples will also be collected at a rate of approximately 1 per 10 samples.

4.9 FIELD FILTRATION

In accordance with 40 CFR 258, no samples will be field filtered.

4.10 SAMPLE HANDLING

When sampling has been completed, the sampling agent will maintain strict custody control over the samples and will deliver the samples to the analytical laboratory for proper analysis. Samples contained in glass bottles or vials will be bubble wrapped to protect them during shipping and receiving at the laboratory. All samples will be placed on ice to 4 degrees Celsius or less in an appropriate sample and shipping cooler. Each sampling effort will be done under strict chain-of-custody protocol, initiated by the sample technician, and updated each time a sample is collected and passed from one person to another. The completed chain-of-custody form will accompany the samples to the laboratory, where they will be relinquished from sampling personnel and given to appropriate lab personnel. Other documentation such as field data logs, etc., will be retained by responsible project personnel throughout the course of the monitoring event.

Chain-of-Custody Procedure:

- Give the site name and project number.
- Enter the sample identification number.
- Indicate the sampling date for all samples.
- List the sampling times in military format.
- Indicate “grab” or “composite” with an “X.”

- Specify the sample location.
- Enter the total number of containers per cooler.
- List the analyses and container volume.
- Obtain the signature of the sample team leader.
- State the carrier service and number, analytical laboratory, and custody seal numbers.
- Sign, time, and date the "relinquish by" section.
- Upon completion of the chain-of-custody form, retain the shipper copy, and affix the other copies to the inside of the cooler, in a zip-seal bag to protect from moisture, to be sent to the designated laboratory.
- Sample cooler shall be packaged with ice, for maintaining temperature and packed with bubble wrap, to prevent breakage of the sample containers.

4.11 MONITORING FREQUENCY

Per RDP No. 2021-WMF-0663 and 40 CFR 258.55.(d) (2), sampling is to be performed on at least a semi-annual basis, unless approved otherwise by MDE. Part III, General Conditions, Section F Written Reports on Water Quality Analysis (2) (c) directs that sampling events will occur during the periods of January through March, and July through September of each year, unless an alternate schedule is approved by MDE. Monitoring will typically be performed during the months of March and August and will include all the monitoring locations identified within Chapter 2 of this monitoring plan, with the exception of the intermediate and deep aquifer monitoring wells. The Cell 5 intermediate wells (MW-501M, MW-504M, and MW-505M) shall be sampled semi-annually. All other site intermediate aquifer monitoring wells (indicated as such with an "M" designation) shall be sampled on an annual basis, as approved by MDE in a letter dated 3 November 2017. Deep aquifer monitoring wells (indicated as such with a "D" designation) shall be sampled annually during the Fall sampling event. The surface water elevations at the borrow ponds and groundwater elevation for all shallow monitoring wells and piezometers will continue to be measured and recorded on a monthly basis per the RDP.

WELL PURGING AND SAMPLING RECORD (FORM 4-1)

WELL ID _____ SAMPLE NO. _____
WELL/SITE DESCRIPTION _____

DATE _____/_____/_____ TIME _____ AIR TEMP. _____

WELL DEPTH _____ ft WELL DIAMETER _____ in.
WATER DEPTH _____ ft WATER COL. HEIGHT _____ ft

EQUIVALENT VOL. OF STANDING WATER __ L
PUMP RATE _____ LPM PUMP TIME _____ min.
WELL WENT DRY? ( ) Yes ( ) No
VOL. REMOVED _____ L

Date	Time	Volume Removed	pH	Cond.	Temp.	ORP	Turb.	DO	Depth to Water	Pump Rate
		Unit: Gal	--	µS/cm	ºC	mV	NTU	mg/L	from TOC	LPM

COMMENTS _____

SIGNATURE _____

5. ANALYTICAL LABORATORY PROCEDURES

All analytical work shall be completed in accordance with standard U.S. Environmental Protection Agency (EPA) protocols where such exist, per 40 CFR 258. When necessary, procedures for performing a cation/anion balance equation shall be in accordance with "Standard Methods for the Examination of Water and Wastewater," latest edition.

A qualified independent laboratory certified for water quality analysis by the Maryland Department of Health and Mental Hygiene or which is otherwise acceptable to MDE will perform all analyses. Quality assurance and quality control shall be assured through the accredited laboratory's quality assurance manual.

The laboratory will report analytical results based on the practical quantitation limits (PQLs) as defined within the RDP and shown in Tables 5-1 and 5-2. All analytical results below the PQL that can be estimated by the laboratory will be reported with a J qualifier. Alternate PQLs are presented for total iron, total magnesium, alkalinity, and chloride due to elevated reporting limits. The reason for the elevated reporting limits relative to the MDE standard is due to the relatively high amount of these analytes naturally present in the environment. Historical data shows that most of the groundwater samples contain these analytes well above the proposed PQL adjustments. Achieving the very low concentrations required by the MDE standard is challenging as it would necessitate diluting almost every sample significantly, leading to higher reporting limits and longer analysis times. To meet the necessary limits for most other analytes, the samples must be run undiluted, and the high concentration of the specific analytes would raise concerns about data quality when attempting to meet those lower limits. The laboratory will continue to review options of performing these tests to assess the lab's ability to meet the MDE specified PQLs.

Table 5-1. Monitoring Parameters for Volatile Organic Compounds

Volatile Organic Compounds	PQL (parts per billion)
Acetone	5.0
Acrylonitrile	5.0
Benzene	1.0
Bromochloromethane	1.0
Bromodichloromethane	1.0
Bromoform	1.0
Bromomethane	1.0
2-Butanone	5.0
Carbon disulfide	1.0
Carbon tetrachloride	1.0
Chlorobenzene	1.0
Chloroethane	1.0
Chloroform	1.0
Chloromethane	1.0
Dibromochloromethane	1.0
1,2-Dibromo-3-chloropropane[1]	0.04
1,2-Dibromoethane (EDB)[1]	0.04
Dibromomethane	1.0
1,2 – Dichlorobenzene	1.0
1,4 – Dichlorobenzene	1.0
Trans-1,4-dichloro-2-butene	5.0
1,1-Dichloroethane	1.0
1,2-Dichloroethane	1.0
1,1-Dichloroethene	1.0
Cis-1,2-Dichloroethene	1.0
Trans-1,2-Dichloroethene	1.0
Methylene chloride	1.0
1,2-Dichloropropane	1.0
Trans-1,3-Dichloropropene	1.0
Cis-1,3-Dichloropropene	1.0
Ethylbenzene	1.0
2-Hexanone	5.0
Iodomethane	1.0
4-Methyl-2-pentanone	5.0
Methyl Tertiary Butyl Ether	2.0
Styrene	1.0
1,1,1,2-Tetrachloroethane	1.0
1,1,2,2-Tetrachloroethane	1.0
Tetrachloroethene	1.0
Toluene	1.0
1,1,1-Trichloroethane	1.0
1,1,2-Trichloroethane	1.0
Trichloroethene	1.0
Trichlorofluoromethane	1.0
1,2,3-Trichloropropane	1.0
Vinyl acetate	1.0
Vinyl chloride	1.0
Xylene	1.0

Note:
1. 1,2-Dibromo-3-chloropropane and 1,2-Dibromoethane have been analyzed by EPA method 8011 since Fall 2020.

Table 5-2. Monitoring Parameters for Elements and Indicator Parameters

Elements and Indicator Parameters	PQL (parts per million)
Total Antimony	0.0020
Total Arsenic	0.0020
Total Barium	0.0100
Total Beryllium	0.0020
Total Cadmium	0.0040
Total Chromium	0.0100
Total Calcium	0.08
Total Cobalt	0.0100
Total Copper	0.0100
Total Iron[1]	0.1
Total Lead	0.0020
Total Nickel	0.0110
Total Magnesium[1]	0.1
Total Manganese	0.0100
Total Mercury	0.0002
Total Potassium	0.39
Total Selenium	0.035
Total Silver	0.0100
Total Sodium	0.2
Total Thallium	0.0020
Total Vanadium	0.0100
Total Zinc	0.0100
pH	0.1 (S.U.)
Alkalinity[1]	5.0
Hardness	0.5
Chloride[1]	0.5
Specific conductance	1
Nitrate	0.06
Chemical oxygen demand	10
Turbidity	0.11 (NTU)
Ammonia	1
Sulfate	0.38
Total dissolved solids	10

Notes:
1. PQLs were revised for total iron, total magnesium, alkalinity, chloride, nitrate, sulfate, and turbidity.
NTU = Nephelometric turbidity unit(s)
S.U. = Standard units

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6. STATISTICAL ANALYSIS

Statistical analysis of the results from the groundwater monitoring will be performed using both interwell and intrawell statistical analysis, as directed by MDE (Hynson 2015). Interwell analysis will be used for the Cell 1 through Cell 4 groundwater monitoring wells and intrawell analysis will be used for the Cell 1 through Cell 5 groundwater monitoring wells. As directed by MDE (Grenzer 2022), a trend analysis will be performed for any parameter found to be a SSI over the GWPS.

6.1 TREATMENT OF SAMPLE RESULTS WITH LABORATORY QUALIFIERS

For the purposes of statistical analyses, "U" and "J" qualified data reported below the PQL will be treated as less than PQL values. Sample results with a "U" qualifier with a laboratory reporting limit that exceeds the PQL will not be included in statistical analyses.

6.2 INTERWELL MANN-WHITNEY U TEST

Interwell analysis will be used for the Cell 1 through Cell 4 shallow groundwater monitoring wells. The concentrations observed in the downgradient wells are compared to the concentrations observed in the background well (MW-22). If the downgradient samples show statistically significant higher concentrations than the background samples, then it will be concluded that an SSI has occurred. Identified SSIs will be investigated to determine if the likely cause of the SSI is a release from the landfill.

The groundwater data will be analyzed using the Mann-Whitney U test (also known as, Wilcoxon rank sum test) to determine whether the distribution of downgradient sample data tends to exceed the background well sample data. The Mann-Whitney test is nonparametric, i.e., assumes no underlying distribution (e.g., normal distribution), and compares two groups of data to test the null hypothesis that the distributions of both groups of data are identical.

Hypothesis tests, such as the Mann-Whitney U, are evaluated at a specified Type I error rate that represents the probability of incorrectly rejecting the null hypothesis when it is in fact true (i.e., a false positive error). When multiple tests are conducted (from different wells and different constituents), the probability of Type I error rate is compounded. A maximum network-wide Type I error rate of 5 percent is required by 40 CFR 258.53(h) (2); however, a Type I error rate no less than 1 percent shall be applied to any single test.

Statistical analyses shall be performed for over 60 parameters at each downgradient well. Using the Bonferroni adjustment to account for multiple statistical comparisons, a Type I error rate of much less than 1 percent per analysis would result, so the minimum allowable Type I error rate under 40 CFR 258.52(h) (2) of 1 percent was used to evaluate the null hypothesis.

The sum of the data ranks, the number of upgradient observations, and the number of downgradient observations will be used to calculate the Mann-Whitney test statistic U. The Gehan procedure (Gehan 1965) will be used to rank the data. When there are non-detects in a dataset, the Gehan rank assigns the average of the positions a value could take in the ordered dataset if the non-detect value are known. Thus, the Gehan procedure treats non-detects as less

than values as opposed to using a simple substitution such as one-half the detection limit. Sample concentrations below the PQL will be treated as <PQL in the ranking procedure. The calculated U for each well/analyte pair will be compared to a critical value (U_{crit}) at the 99 percent confidence level (i.e., 1 percent Type I error rate) obtained from Conover (1999). The null hypothesis will be rejected for tests with $U < U_{crit}$ indicating that downgradient sample concentrations tend to exceed the background sample concentrations.

6.3 INTRAWELL STATISTICAL ANALYSIS WITH RETESTING

An intrawell analysis compares data from a given compliance well against a background data set composed of its own historical data. The intrawell analysis does not require that the hydrogeologic conditions are homogeneous throughout the site and that all wells are sampled with equal intervals. This is because the intrawell analysis identifies changes over time at a given well instead of changes among different wells. Once a baseline data set has been established, future compliance monitoring samples are compared to the baseline data.

Intrawell analysis will be performed semi-annually for all the Cell 5 monitoring wells (MW-501A through MW-505A, MW-501M, MW-504M, and MW-505M) as well as all intermediate depth wells in Cells 1 through 4 on an annual basis. Statistical analysis will compare results from these wells to an intrawell upper prediction limit (UPL) specific to each well-analyte pair. If an analyte exceeds the UPL, it will be flagged for confirmatory retesting with the following round of sampling. In order to reduce the site-wide false positive error rate, two consecutive exceedances of the UPL are required to conclude the exceedance is an SSI.

The procedure for establishing intrawell UPLs is discussed in Section 6.3.1. Periodic reviews of intrawell background values every 5 years will evaluate the potential for revising the intrawell UPLs.

6.3.1 Establishing Intrawell Upper Prediction Limits

A UPL will be established for each well-analyte pair. In order to compute UPLs that are representative of baseline conditions, the data set must be free of outliers. Potential outliers will be identified as any result exceeding 3.0 times the standard deviation. The standard deviation will be estimated from the sample data for each well-analyte pair using the median absolute deviation, which is a robust statistic insensitive to extreme values. Potential outliers will be further evaluated but were only excluded from the baseline data set if there is a scientific rationale (e.g., method blank contamination) justifying their removal.

The methods used to compute the UPL statistics will account for the distributions of the data, the number of samples, and the existence of non-detect samples. A decision tree (Figure 6-1) summarizes the process that will be used to identify the best method for each data set. For data sets with no non-detect observations, goodness of fit tests conducted at the 95 percent significance level will be used to characterize the data distributed as normal, gamma, or nonparametric. UPLs for data sets with non-detect results will be computed using Kaplan-Meier estimates (at least eight detected results), or higher order statistics (less than eight detected results). All statistical computations will be performed using the ProUCL software version 5.1 (U.S. EPA 2014) using the methodology described below.

6.3.1.1 Computation of the Normal Upper Prediction Limit

The 95 percent UPL for a single future or independent observation of sample data that is normally distributed will be computed as

$$UPL_t = \bar{x} + t_{(1-0.05),(n-1)} s_x \sqrt{\frac{1}{n} + 1}$$

where:

$\bar{x}$	=	Sample arithmetic mean
n	=	Number of background data
$t_{(1-0.05),(n-1)}$	=	One-tailed Student's t critical value evaluated at α = 0.05 with (n-1) degrees of freedom
s_x	=	Sample standard deviation

6.3.1.2 Computation of a Gamma Upper Prediction Limit

For gamma distributed data, the 95 percent UPL will be computed using the Hawkins-Wixley normal approximation to the gamma distribution as

$$UPL_{gamma,t} = \left(\bar{y} + t_{(1-0.05),(n-1)} s_y \sqrt{\frac{1}{n} + 1}\right)^4$$

where:

$\bar{y}$	=	Sample arithmetic mean of fourth-root transformed data
n	=	Number of background data
$t_{(1-0.05),(n-1)}$	=	One-tailed Student's *t* critical value evaluated at α = 0.05 with (n-1) degrees of freedom
s_y	=	Sample standard deviation of fourth-root transformed data

6.3.1.3 Computation of a Kaplan-Meier Upper Prediction Limit for Data Sets with Non-detect Results

For data sets containing non-detect observations and at least 8 detected results, the Kaplan-Meier (KM) estimate assuming a Student's *t*-distribution will be used to compute the UPL. The KM approach can accommodate non-detect samples with multiple detection limits. KM estimates of the population mean and variance will be used to compute a Student's *t*-statistic-based UPL as follows:

$$UPL = \hat{\mu}_{KM} + t_{(1-0.05),(n-1)} \sqrt{\hat{\sigma}^2_{KM}\left(1 + \frac{1}{n}\right)}$$

where:

$\hat{\mu}_{KM}$	=	Estimate of the population mean

n = Number of background data

$t_{(1-0.05),(n-1)}$ = One-tailed Student's t critical value evaluated at α = 0.05 with (n-1) degrees of freedom

$\hat{\sigma}^2_{KM}$ = Estimate of the variance of the mean

6.3.1.4 Computation of a Nonparametric Upper Prediction Limit

For nonparametric data sets as defined in Figure 6-1 with at least one detected sample result above the PQL, a nonparametric 95 percent UPL will be computed as the mth higher order statistic given by

$$m = (n+1) \times (1-0.05)$$

where:

n = Sample size

For data sets containing non-detect observations and one to seven detected results, a nonparametric approach based on rank-ordered statistics will be sued to compute the UPL. Finally, the PQL will be used as a nonparametric UPL for data sets with no detected sample results above the PQL.

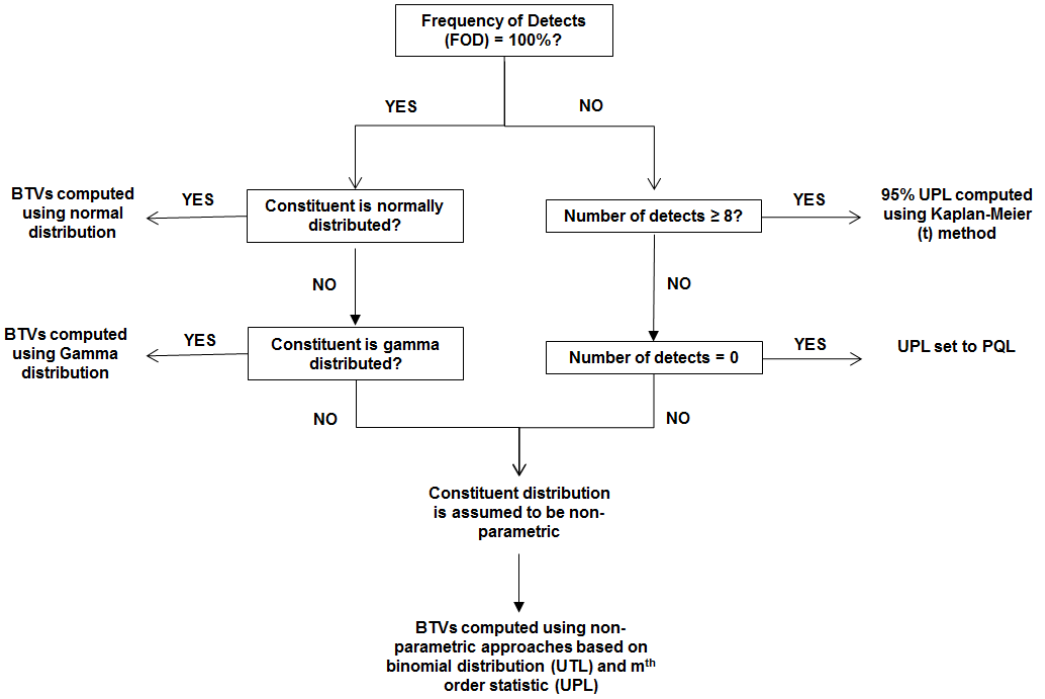

Figure 6-1. Decision Tree for Determining the Intrawell UPLs from Baseline Monitoring Data

6.4 GROUNDWATER PROTECTION STANDARDS

Statistically significant increases over background levels were observed as part of the semi-annual detection monitoring event conducted in Spring 2015. As a result, in accordance with this Groundwater Monitoring Program, assessment monitoring was initiated from 2015 to 2017 as described in the *Worcester County Central Landfill Facility Assessment Monitoring Results and Groundwater Protection Standards* (EA Engineering, Science, and Technology, Inc., PBC 2017). At the conclusion of the assessment monitoring event, groundwater protection standards were established for all constituents detected in the initial April 2015 baseline sampling event (Table 6-1). During the Fall 2017 semi-annual sampling event, all Appendix II constituents tested at the CLF were compared with the groundwater protection standards established during this assessment monitoring period for each semi-annual sampling event. Results showed that the parameters tested did not exceed background concentrations or groundwater protection standards in a downgradient well at the property boundary. As a result, the assessment monitoring parameters were reduced to those included on Tables I and II of the County's refuse disposal permit, per MDE's letter dated 3 November 2017.

If one or more Appendix II constituents are detected at statistically significant levels above the groundwater protections standards developed, the landfill must notify MDE and follow the protocol detailed in 40 CFR Part 258.55(g).

Table 6-1. Groundwater Protection Standards for Detected Appendix II Parameters

Parameter	GWPS	Source
General, (mg/L)		
Sulfide	4	4
Total Metals, (mg/L)		
Arsenic, total	0.010	1
Barium, total	2	1
Beryllium, total	0.004	1
Cadmium, total	0.005	1
Calcium, total	32.7	4
Chromium, total	0.1	1
Cobalt, total	0.006	3
Copper, total	1.3	1
Lead, total	0.015	1
Mercury, total	0.002	1
Nickel, total	0.073	2
Selenium, total	0.05	1
Silver, total	0.1	2
Tin, total	2.2	2
Vanadium, total	0.0037	2
Zinc, total	5	2
Semivolatile Organic Compounds, (µg/L)		
Bis(2-ethylhexyl) Phthalate	6	2
Dimethyl Phthalate	10	4
Hexachlorocyclopentadiene	0.05	1
2-Methyl-4,6-dinitrophenol	1.5	3
Volatile Organic Compounds, (µg/L)		
Acetone	550	2
Benzene	5	1

Carbon Disulfide	100	2
Chloroform	80	2
Methyl Tertiary Butyl Ether	20	2

Notes:
Groundwater Protection Standards (GWPS) sources:
1) U.S. EPA Maximum Contaminant Level or Action Level for Copper and Lead.
2) Maryland Department of the Environment Cleanup Standards for Soil and Groundwater.
3) U.S. EPA Region III Tapwater Risk Based Concentration.
4) 95 Percent upper confidence level of the mean statistical analysis.
µg/L = Microgram(s) per liter
mg/L = Milligram(s) per liter

The 95% lower confidence limits (LCLs) of the median concentrations for each analyte above the GWPS will be used to determine if the results are detected at statistically significant levels above the GWPS per 40 CFR 258.55(g), based on historical data since Spring 2014, when the low flow sampling techniques were implemented.

6.4.1 Mann-Kendall Trend Analysis on the SSIs Exceeding GWPSs

An evaluation for a monotonic (i.e., increasing or decreasing) trend will be conducted for parameters found to be an SSI over the GWPS using the Mann-Kendall (MK) test (Gilbert 1987) using all data collected after low-flow sampling was implemented. In the event that the trend analysis does not further support the identification of the source of the SSIs, the County may request the discontinuation of the trend analysis.

The MK test is a nonparametric trend test that looks for all possible differences between the relative magnitude of one sample result to another successive sample result in a time series. As a nonparametric test, the MK test does not require that the residuals be normally distributed as required by parametric regression analysis. The MK test will accommodates non-detect results by treating non-detects as an interval between 0 and the laboratory reporting limit (RL) as described in (Helsel 2012).

The test statistic S is the sum of these differences given by

$$S = \sum_{k=1}^{n-1} \sum_{j+k+1}^{n} sgn(x_j - x_k)$$

where $x_1, x_2, \ldots, x_n$ is the list of data in ascending order of the time they were collected, and $sgn(x_j - x_k)$ is the sign function of $x_j - x_k$ modified to handle non-detects with multiple RLs:

$$sgn(x_j - x_k) = \begin{cases} +1 & \text{if } (x_j - x_k) > 0, x_k \text{ can be a non-detect [0, RL)} \\ -1 & \text{if } (x_j - x_k) < 1, x_j \text{ can be a non-detect (RL,0]} \\ 0 & \text{if } (x_j - x_k) = 0, \text{or values of } x_j \text{ and } x_k \text{ overlap due to non-detects} \end{cases}$$

Large positive values of S indicate that samples collected later in time tend to have higher concentrations than samples taken earlier (i.e., increasing trend), whereas large negative values

of S indicate that samples collected later in time tend to have lower concentrations than samples taken earlier (i.e., decreasing trend).

The statistical significance of S will be determined by comparing the computed value of S to its distribution under the null hypothesis H_0 of no trend versus the alternative hypothesis H_a of either trend. Tabled one-sided probabilities for the null distribution of S will be obtained from Hollander and Wolfe (1973). The test will be conducted with a false positive error rate of $\alpha = 5\%$ corresponding to a confidence level of $1 - \alpha = 95\%$. To maximize the statistical power of the trend evaluation, tests for increasing and decreasing trends will be conducted independently at the 95% confidence level.

Although the monitoring program collects data semi-annually, the month of year that data have been collected varies from year to year. Therefore, the semi-annual data will be aggregated into an annual time series for purposes of the MK trend analysis.

7. REPORTING PROCEDURES

A semi-annual report on water quality will be submitted to MDE containing a summary and interpretation of the analytical results of the monitoring locations sampled and analyzed as defined in this plan. The report will be submitted to MDE within 90 days of the close of every first and third calendar quarters. In the report, a qualified groundwater scientist or professional will evaluate the results and advise of any changes in water quality or any exceedance of the state and federal Maximum Contaminant Level (MCL), Action Level, or other health standard. The report shall also include the following:

- A complete copy of the laboratory data, and the qualified groundwater scientist or professional's interpretive findings.

- The report will include a discussion of the data, including the identification of those monitoring locations that show influences attributable to the presence of landfill leachate and any results which exceed MCLs.

- The report will discuss the quality assessment and quality control procedures and data used to ensure that the data collected are reliable, if those procedures vary from those included in this monitoring plan.

- Historical data presented in a time series format and analysis of the data. Historical data from each well will be presented in a tabular format. The report discussion will include historical data trends.

- As described in Chapter 6 of this plan, statistical analysis of the groundwater monitoring network data will be performed and evaluated.

- The semi-annual report will include a site plan with the most current topographic map depicting the location of all monitoring wells and piezometers in existence at the time of survey. Water level readings from the semi-annual event will be used to generate an updated groundwater contour map for the site. Additionally, monthly water level data will be collected and will be provided as required by the facility's RDP.

7.1 FIRST TIME EXCEEDANCES

Worcester County will notify MDE of a first time MCL, Action Level, or other health standard exceedance in writing within 24 hours of receipt of the analytical data. Upon detection of the exceedance for the first time, the location will be re-sampled within 30 days and analyzed for the exceedance by the same analytical laboratory.

7.2 STATISTICALLY SIGNIFICANT INCREASE IN CONSTITUENT LEVELS

If Worcester County determines, pursuant to Chapter 6, "Statistical Analysis," that there is an SSI over background or an exceedance of the upper prediction limit for one or more of the constituents listed in the Appendix I list included in Section 3.1, "Analytes," at any monitoring

well, Worcester County will place notice to this effect in the operating record of the landfill and notify MDE within 14 days.

Worcester County would then establish an assessment monitoring program meeting the requirements of 40 CFR 258.55 and Section 3.2 within 90 days, unless the County demonstrates that a source other than the landfill caused the contamination, or that the SSI resulted from an error in sampling, analysis, statistical evaluation, or variation in groundwater quality. A report documenting this demonstration will be certified by a qualified groundwater scientist, or approved by MDE, and be placed in the operating record. If a successful demonstration is made and documented, Worcester County will continue detection monitoring in accordance with this plan, and not institute the assessment monitoring program.

The results of all monitoring and statistical analysis will be reported after each sampling event. This report will include a discussion of the data, including the identification of those monitoring locations that show influences attributable to the presence of landfill leachate and any results which exceed MCLs. The report will also discuss the quality assessment and quality control procedures and data used to ensure that the data collected are reliable, if those procedures vary from those included in this monitoring plan.

8. REFERENCES

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Tables and Figures

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TABLE 2-1 GROUNDWATER ELEVATION (FT)

Event	MW-03S	MW-3M	MW-04S	MW-4M	MW-05S	MW-05SR	MW-07S	MW-7M	MW-08S	MW-8M	MW-10S	MW-10M	MW-11S	MW-13S	MW-14S	MW-15S	MW-16S	MW-17S	MW-18S	MW-19S	MW-20S	MW-21S	MW-22S
01/91	--	--	31.92	--	18.27	--	25.97	--	33.64	--	33.57	--	36.60	27.54	--	--	--	--	--	--	--	--	--
04/91	32.07	--	32.32	--	20.51	--	29.39	--	33.95	--	34.32	--	36.20	30.94	--	--	--	--	--	--	--	--	--
07/91	30.12	--	30.77	--	18.42	--	24.04	--	33.27	--	30.56	--	36.03	29.51	--	--	--	--	--	--	--	--	--
10/91	30.67	--	29.75	--	15.72	--	23.28	--	31.25	--	29.36	--	35.21	29.73	--	--	--	--	--	--	--	--	--
07/92	30.43	--	30.60	--	19.34	--	26.74	--	33.21	--	30.79	--	35.92	31.03	--	--	--	--	--	--	--	--	--
01/93	31.81	--	33.34	--	22.77	--	29.24	--	34.42	--	34.53	--	36.30	31.73	--	--	--	--	--	--	--	--	--
07/93	27.79	--	29.30	--	19.52	--	25.07	--	30.13	--	29.10	--	34.23	30.31	--	--	--	--	--	--	--	--	--
01/94	31.41	--	33.98	--	21.34	--	26.86	--	34.59	--	34.15	--	36.48	27.65	--	--	--	--	--	--	--	--	--
07/94	28.31	--	29.37	--	19.08	--	24.10	--	30.27	--	28.44	--	35.12	27.06	--	--	--	--	--	--	--	--	--
01/95	30.15	--	32.92	--	20.82	--	25.20	--	34.47	--	33.65	--	36.20	26.85	--	--	--	--	--	--	--	--	--
08/95	26.34	--	28.27	--	22.50	--	22.94	--	29.21	--	28.43	--	32.88	25.12	--	--	--	--	--	--	--	--	--
03/96	30.84	--	32.42	--	24.32	--	26.69	--	34.65	--	34.57	--	36.52	25.63	--	--	--	--	--	--	--	--	--
07/96	--	--	30.02	--	21.92	--	26.89	--	33.89	--	30.21	--	36.11	27.28	--	--	--	--	--	--	--	--	--
01/97	30.14	--	30.51	--	23.82	--	27.50	--	34.41	--	33.37	--	36.26	27.77	--	--	--	--	--	--	--	--	--
07/97	--	--	29.12	--	17.79	--	28.69	--	30.02	--	29.36	--	35.60	29.09	--	--	--	--	--	--	--	--	--
01/98	--	--	29.92	--	22.67	--	26.79	--	34.57	--	33.17	--	36.37	27.50	--	--	--	--	--	--	--	--	--
10/99	--	--	29.48	--	20.10	--	26.39	--	--	--	30.77	--	--	24.43	--	--	--	--	--	--	--	--	--
06/00	27.26	--	27.50	--	16.22	--	26.28	--	30.45	--	28.81	--	33.86	24.78	--	--	--	--	--	--	--	--	--
01/01	28.64	--	28.72	--	23.62	--	25.44	--	32.27	--	29.67	--	33.40	24.53	--	--	--	--	--	--	--	--	--
08/01	27.49	--	27.10	--	20.55	--	25.92	--	30.65	--	28.47	--	34.60	25.38	--	--	--	--	--	--	--	--	--
03/02	29.07	--	27.40	--	19.97	--	26.30	--	33.35	--	29.71	--	33.32	24.48	--	--	--	--	--	--	--	--	--
08/02	26.15	--	26.31	--	19.91	--	24.66	--	29.15	--	27.78	--	33.54	23.55	--	--	--	--	--	--	--	--	--
02/03	30.27	--	29.26	--	24.72	--	26.12	--	33.67	--	32.88	--	36.19	25.47	--	--	--	--	--	--	--	--	--
08/03	27.55	--	27.33	--	23.40	--	25.10	--	33.25	--	29.46	--	35.15	25.01	--	--	--	--	--	--	--	--	--
01/04	29.27	--	29.71	--	25.41	--	27.99	--	34.01	--	32.75	--	35.44	27.50	--	--	--	--	--	--	--	--	--
08/04	27.83	--	28.22	--	23.54	--	25.87	--	33.81	--	30.43	--	35.78	25.89	--	--	--	--	--	--	--	--	--
03/05	29.47	--	29.36	--	24.75	--	28.39	--	33.96	--	32.53	--	34.78	28.34	--	--	--	--	--	--	--	--	--
10/05	25.79	15.42	27.68	15.97	21.11	--	27.66	10.65	32.41	15.36	28.21	--	34.88	28.22	--	--	--	--	--	--	--	--	--
04/06	27.91	--	29.09	--	22.57	--	28.36	--	32.75	--	29.79	--	35.13	29.11	--	--	--	--	--	--	--	--	--
10/06	28.40	18.25	29.02	18.15	21.71	--	28.40	18.31	34.33	17.64	31.66	--	32.10	28.38	--	--	--	--	--	--	--	--	--
04/07	30.16	--	32.12	--	--	--	30.04	--	33.97	--	33.24	--	32.70	30.03	--	--	--	--	--	--	--	--	--
11/07	25.11	14.40	28.27	14.10	20.27	--	28.34	14.41	30.77	13.92	28.12	--	30.62	28.93	--	--	--	--	--	--	--	--	--
04/08	27.44	--	30.92	--	22.42	--	29.99	--	34.07	--	32.52	--	32.60	30.53	--	--	--	--	--	--	--	--	--
10/08	25.48	14.32	28.64	15.30	23.77	--	29.09	15.33	30.86	14.71	28.50	--	31.52	29.83	--	--	--	--	--	--	--	--	--
05/09	--	--	27.44	--	22.47	--	26.47	--	30.29	--	27.44	--	31.38	28.88	--	--	--	--	--	--	--	--	--
10/09	27.59	16.95	29.38	16.44	15.77	--	28.39	17.74	31.19	16.77	29.13	--	31.31	27.51	--	--	--	--	--	--	--	--	--
04/10	28.86	--	30.59	--	23.72	--	30.10	--	32.97	--	31.13	--	33.60	29.44	--	--	--	--	--	--	--	--	--
05/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/10	24.20	18.07	29.22	18.02	20.22	--	28.99	18.13	31.37	17.67	28.90	--	32.83	29.78	--	--	--	--	--	--	--	--	--
07/10	23.30	16.31	27.90	16.29	19.62	--	28.34	16.34	29.92	15.86	27.97	--	32.10	29.23	--	--	--	--	--	--	--	--	--
07/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/10	22.89	14.10	28.37	14.11	18.68	--	28.04	14.16	30.04	13.67	28.02	--	31.10	29.03	--	--	--	--	--	--	--	--	--
12/10	23.40	13.90	28.54	13.94	18.60	--	28.31	13.96	30.17	13.52	28.17	--	30.95	28.93	--	--	--	--	--	--	--	--	--
01/11	24.38	14.50	30.67	14.59	18.69	--	29.60	14.55	34.11	14.20	30.67	--	32.80	29.51	--	--	--	--	--	--	--	--	--
02/11	24.54	14.82	30.00	14.94	18.55	--	29.27	14.94	32.97	14.49	29.70	--	31.98	29.71	--	--	--	--	--	--	--	--	--
03/11	25.44	15.61	30.82	15.79	18.53	--	29.53	15.75	34.07	15.32	32.65	--	32.77	29.90	--	--	--	--	--	--	--	--	--
04/11	25.05	15.70	29.82	15.82	18.60	--	29.14	15.78	33.12	15.37	30.44	--	32.66	29.71	--	--	--	--	--	--	--	--	--
05/11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/11	23.77	14.26	27.85	14.35	18.07	--	28.09	14.35	29.76	13.89	28.10	--	31.52	28.90	--	--	--	--	--	--	--	--	--
07/11	23.40	13.89	27.24	13.97	18.58	--	27.77	13.93	29.91	12.40	27.87	--	31.37	28.74	--	--	--	--	--	--	--	--	--
08/11	23.91	13.85	29.02	13.92	A	--	28.72	13.90	32.93	13.45	28.76	--	32.20	29.63	--	--	--	--	--	--	--	--	--
09/11	24.07	14.45	29.34	14.49	A	--	28.56	14.60	32.83	14.22	28.89	--	31.80	29.71	--	--	--	--	--	--	--	--	--
10/11	24.78	13.97	29.30	14.00	A	30.59	28.40	14.10	32.45	13.60	28.82	13.87	31.56	29.40	33.17	27.62	28.95	--	--	--	--	--	--
11/11	24.80	14.01	29.43	14.04	A	30.58	28.46	14.11	32.89	13.65	29.22	13.87	31.91	29.64	33.14	28.05	29.20	--	--	--	--	--	--
12/11	24.83	14.20	29.57	14.19	A	30.46	28.49	14.29	32.77	13.82	29.37	13.99	32.10	29.85	32.81	28.23	29.32	--	--	--	--	--	--
01/12	24.69	14.31	30.25	14.37	A	30.34	29.12	14.39	33.87	13.98	32.03	14.14	32.58	30.03	33.88	29.18	30.16	--	--	--	--	--	--
02/12	24.69	14.68	30.82	14.79	A	30.48	29.31	14.77	34.12	14.39	32.89	14.58	32.91	30.14	34.04	30.01	30.83	--	--	--	--	--	--
03/12	25.34	15.51	30.72	15.69	A	18.67	29.43	15.65	33.97	15.22	32.55	15.08	32.67	29.80	33.84	30.93	31.08	--	--	--	--	--	--
04/12	25.39	15.25	30.28	15.36	A	30.30	29.14	15.39	33.91	14.95	32.47	15.18	32.55	29.82	33.94	30.06	31.18	--	--	--	--	--	--

Notes:
1. MSL: Mean Sea Level
2. TOC: Top of Casing
3. TOC elev determined from a survey in August 2010
4. Pond Gauge TOC elev updated March 2018.
5. "--": Measurement Not Taken
6. “A”: Well Abandoned

TABLE 2-1 GROUNDWATER ELEVATION (FT)

Event	MW-03S	MW-3M	MW-04S	MW-4M	MW-05S	MW-05SR	MW-07S	MW-7M	MW-08S	MW-8M	MW-10S	MW-10M	MW-11S	MW-13S	MW-14S	MW-15S	MW-16S	MW-17S	MW-18S	MW-19S	MW-20S	MW-21S	MW-22S
05/12	25.19	16.25	30.57	16.37	A	30.56	29.31	16.44	32.94	15.95	31.42	--	33.20	30.11	34.00	29.85	31.18	--	--	--	--	--	--
06/12	24.19	15.83	29.40	15.79	A	29.56	28.81	15.86	31.44	15.45	29.42	--	32.95	30.03	30.92	28.60	29.43	--	--	--	--	--	--
07/12	23.61	14.92	28.24	14.87	A	27.81	28.31	14.94	30.10	14.45	28.25	14.62	32.20	29.45	29.42	27.43	28.18	--	--	--	--	--	--
08/12	24.77	14.08	29.40	15.21	A	30.89	29.14	15.19	33.77	14.79	28.92	15.04	32.95	30.11	33.92	29.93	31.43	--	--	--	--	--	--
09/12	25.11	16.50	29.82	16.37	A	31.39	28.97	17.53	32.35	16.04	29.92	15.04	31.53	29.95	32.17	29.35	30.18	--	--	--	--	--	--
10/12	26.61	17.67	32.82	7.62	A	32.56	29.89	17.69	34.60	17.12	33.25	17.12	33.45	30.70	34.67	32.18	29.51	--	--	--	--	--	--
11/12	26.69	18.17	30.07	17.96	A	31.73	29.14	18.11	33.10	17.54	31.34	17.79	32.20	29.95	33.50	30.10	30.51	--	--	--	--	--	--
12/12	26.69	18.92	31.74	18.79	A	32.14	29.89	18.94	34.27	18.29	33.00	18.54	32.70	30.45	34.34	31.51	30.51	--	--	--	--	--	--
01/13	27.11	19.58	30.90	19.46	A	32.31	29.97	19.61	34.35	19.04	33.34	18.20	33.12	30.28	34.17	31.35	31.35	--	--	--	--	--	--
02/13	27.94	19.17	32.32	20.37	A	32.56	30.31	20.78	34.60	19.04	33.75	20.04	34.03	30.53	34.50	32.01	32.10	--	--	--	--	--	--
03/13	27.44	20.50	31.15	20.37	A	32.23	29.97	20.53	34.35	19.95	33.50	18.54	33.62	30.20	34.34	31.51	31.76	--	--	--	--	--	--
04/13	27.09	19.75	30.65	19.71	A	31.46	29.87	19.78	34.06	19.20	32.73	19.66	34.54	30.13	34.07	30.82	31.54	--	--	--	--	--	--
05/13	25.94	19.00	29.90	18.79	A	30.64	29.47	19.11	33.02	17.62	30.50	18.79	33.28	30.03	32.84	29.68	30.26	--	--	--	--	--	--
07/13	25.19	18.25	29.57	18.29	A	30.23	29.22	18.28	32.10	18.45	29.75	18.04	33.12	29.95	31.75	29.43	29.68	--	--	--	--	--	--
07/13	24.77	18.17	29.40	18.04	A	30.06	28.22	18.19	31.85	17.62	29.50	17.87	32.95	29.86	31.34	29.18	29.60	--	--	--	--	--	--
08/13	24.44	17.25	28.99	17.21	A	29.56	28.81	17.28	31.10	16.79	29.00	16.95	32.53	29.78	30.42	28.93	29.01	--	--	--	--	--	--
09/13	23.27	16.17	28.15	16.12	A	28.98	28.56	16.11	29.85	15.62	28.25	15.87	30.70	29.45	29.34	28.10	28.18	--	--	--	--	--	--
10/13	23.13	15.98	28.74	16.02	A	30.09	28.84	16.07	31.74	15.55	28.63	15.77	32.76	29.69	30.19	28.48	27.94	--	--	--	--	--	--
11/13	23.94	15.50	28.74	15.54	A	29.39	28.56	15.53	30.60	15.04	27.25	15.29	31.53	29.36	29.84	28.26	27.43	--	--	--	--	--	--
12/13	24.86	15.67	29.07	15.71	A	29.81	28.81	15.69	31.85	15.29	28.67	15.37	32.20	28.61	30.34	28.68	28.93	--	--	--	--	--	--
01/14	26.36	16.75	30.57	17.79	A	31.14	29.72	17.78	34.19	17.20	32.84	17.54	32.70	30.20	34.50	30.76	31.35	--	--	--	--	--	--
02/14	27.11	19.17	31.15	19.21	A	31.73	30.06	18.44	34.52	18.62	33.34	18.87	33.70	30.36	34.25	31.51	31.43	--	--	--	--	--	--
03/14	27.52	19.25	32.65	19.37	A	32.31	30.14	20.36	34.85	18.70	33.75	19.04	34.12	30.45	34.42	32.18	31.93	--	--	--	--	--	--
04/14	27.61	19.83	32.07	19.87	A	32.56	30.06	20.03	34.94	18.29	33.75	19.62	34.12	30.36	34.50	31.51	32.01	--	--	--	--	--	--
06/14	25.77	18.92	29.74	18.54	A	31.23	29.39	18.61	33.02	18.20	30.25	18.37	33.45	29.95	32.59	19.60	30.18	30.99	29.66	29.49	31.42	32.78	24.17
06/14	24.61	17.17	28.57	17.21	A	30.14	28.89	30.28	30.77	16.79	28.75	17.04	33.03	29.53	30.17	28.51	28.68	30.66	28.49	28.07	29.67	32.03	21.17
07/14	25.27	16.42	28.99	16.46	A	31.81	29.06	16.44	33.52	16.04	28.75	16.54	33.12	29.70	31.92	29.60	29.01	30.82	28.74	28.82	30.17	34.28	21.26
08/14	23.77	16.00	16.07	15.87	A	30.81	28.72	15.94	28.60	14.45	28.42	15.62	32.28	28.70	29.67	27.93	28.68	31.91	27.99	26.57	28.25	31.94	20.67
08/14	23.72	15.81	28.90	15.79	A	30.76	28.74	15.92	30.39	15.50	28.42	15.53	32.18	29.73	29.90	28.38	29.08	31.24	28.06	28.54	29.25	31.96	20.69
09/14	24.27	15.58	29.07	15.54	A	31.39	28.89	15.61	31.19	15.12	28.59	15.37	32.62	29.78	30.84	28.43	29.43	30.91	28.41	28.99	29.75	32.53	20.26
10/14	24.27	13.25	28.90	15.12	A	30.98	30.89	15.11	30.10	14.70	28.42	14.87	32.03	29.78	29.25	28.26	28.76	30.91	28.16	28.82	29.25	31.86	19.67
12/14	24.77	14.67	29.24	14.71	A	31.56	28.72	14.78	28.85	15.29	28.50	14.54	31.78	29.86	29.34	29.01	28.93	30.82	28.49	29.07	29.42	31.94	19.09
01/15	27.69	16.42	30.90	16.54	A	32.48	29.39	18.11	33.10	16.95	33.00	16.37	33.12	30.11	34.17	31.43	31.26	30.99	31.33	30.91	32.75	32.86	20.09
03/15	28.19	17.50	32.40	17.71	A	32.89	29.81	17.61	33.44	17.32	33.34	17.95	33.37	30.36	34.34	32.18	33.10	31.16	32.24	31.74	32.59	32.94	22.17
03/15	28.69	19.08	31.15	19.12	A	32.39	29.72	19.11	34.44	19.54	33.50	18.87	34.03	30.03	34.34	31.51	31.26	31.24	31.08	32.07	33.50	33.69	25.67
04/15	27.81	19.81	32.60	19.88	A	32.41	29.89	19.89	34.39	19.37	33.14	19.57	34.70	30.21	34.32	32.20	31.27	31.24	32.65	31.44	33.56	33.79	27.83
06/15	26.02	17.83	29.49	17.79	A	32.39	29.22	17.86	31.52	18.04	29.34	17.62	33.37	29.78	32.75	29.43	28.51	30.82	29.49	29.24	30.34	32.69	23.01
07/15	24.36	17.17	26.74	17.62	A	31.73	28.89	17.86	25.60	17.45	27.67	16.12	32.12	26.36	28.00	26.85	27.68	31.82	28.49	27.07	26.50	32.78	27.01
07/15	18.77	16.42	26.65	16.62	A	31.73	30.56	--	28.85	15.54	27.09	15.79	32.95	27.70	30.34	27.35	26.76	30.74	29.33	26.41	26.25	32.61	21.34
08/15	24.04	15.55	27.94	15.63	A	30.54	28.52	15.55	30.47	15.21	28.22	15.22	32.35	29.63	29.71	27.96	28.46	30.56	27.63	27.93	29.19	31.73	20.61
10/15	25.36	15.67	29.57	15.79	A	32.56	29.47	15.78	29.60	16.04	29.25	15.54	33.53	27.45	33.84	29.26	29.68	32.66	28.99	29.74	31.67	32.69	20.34
10/15	25.02	16.00	27.15	15.12	A	31.48	26.64	17.78	28.10	15.79	28.84	15.79	32.03	26.78	29.42	26.51	27.43	30.74	28.74	27.24	28.00	31.78	20.34
11/15	27.27	17.00	28.99	17.21	A	32.81	29.47	17.19	34.52	16.70	31.84	16.95	32.70	30.20	34.17	29.85	30.76	32.07	29.08	30.57	33.25	32.78	21.09
12/15	34.86	15.83	32.57	16.71	A	33.06	34.39	17.61	33.02	18.04	33.17	18.20	33.53	32.20	34.50	32.51	31.26	33.24	32.99	31.16	32.17	33.28	23.67
01/16	28.19	19.67	32.32	19.62	A	32.98	30.14	19.69	34.52	18.95	33.42	19.29	35.45	28.11	34.25	28.10	31.68	31.41	32.33	31.91	33.84	33.19	26.84
02/16	33.52	18.33	33.49	19.54	A	32.64	34.72	19.78	33.60	20.62	33.09	20.20	35.37	32.70	35.00	32.68	31.26	33.24	34.66	31.24	33.42	33.28	27.17
03/16	28.49	19.57	30.40	20.01	A	32.26	29.53	19.81	33.63	19.35	31.82	19.47	32.80	29.41	33.63	29.51	31.53	30.70	28.74	31.31	32.78	32.83	26.19
04/16	28.02	19.08	29.82	19.04	A	32.14	29.72	19.11	33.94	18.62	29.50	19.37	32.70	29.86	33.75	29.76	30.51	31.74	30.16	30.66	29.59	32.78	25.92
04/16	27.27	17.58	29.24	18.46	A	32.23	29.47	18.44	29.85	18.87	29.67	18.54	32.70	29.70	30.75	29.51	29.85	30.82	28.16	29.66	29.34	32.44	24.26
06/16	33.44	17.33	33.40	17.54	A	32.73	34.97	19.28	33.77	18.20	33.67	17.79	36.78	32.86	34.67	32.93	33.68	33.24	34.74	33.49	33.25	33.36	26.26
07/16	26.52	19.67	30.15	19.71	A	32.64	30.06	19.78	33.85	19.04	31.75	19.37	33.37	30.20	33.67	29.68	31.10	31.07	28.91	30.82	32.84	32.94	25.17
07/16	29.94	16.67	29.57	17.12	A	32.64	30.47	18.28	30.27	17.37	29.09	17.20	32.78	28.70	30.67	28.85	29.93	32.41	30.66	29.24	29.34	32.69	22.76
08/16	24.61	16.75	27.82	16.54	A	31.14	28.72	16.78	27.10	17.04	28.42	16.54	31.95	29.36	29.17	27.10	28.18	31.57	27.49	25.99	25.92	31.86	21.51
09/16	24.19	15.68	27.02	16.17	A	30.91	27.56	16.21	29.65	15.62	27.97	27.53	31.12	28.58	29.58	27.84	28.98	30.01	26.44	27.69	28.87	31.02	30.62
10/16	32.36	16.17	30.99	18.46	A	32.73	33.97	18.44	34.10	18.79	29.67	18.12	33.03	30.28	34.25	31.43	31.43	30.32	31.66	31.66	32.84	32.53	26.26
10/16	26.02	19.25	29.15	18.96	A	31.98	29.06	19.11	29.27	19.45	29.92	18.79	31.87	25.95	31.09	28.93	29.76	30.82	28.74	28.66	30.92	31.78	24.67
11/16	26.44	18.00	26.49	18.46	A	31.89	28.81	17.94	30.02	17.95	29.34	17.62	31.53	26.86	31.34	27.85	28.85	30.82	27.99	29.24	30.34	31.53	22.84
12/16	28.19	18.42	30.65	18.37	A	32.98	29.39	18.53	34.60	18.04	32.84	18.20	32.62	29.86	34.17	31.35	31.43	31.24	30.49	31.41	33.42	32.61	23.51
01/17	27.77	19.42	31.32	19.29	A	32.64	29.56	19.44	33.85	18.87	32.92	19.04	32.70	30.11	33.84	31.43	31.35	30.99	31.08	31.32	33.25	32.53	18.51
02/17	27.94	18.67	29.49	18.62	A	32.48	29.39	18.69	33.52	18.20	31.42	18.37	32.37	29.70	33.34	29.26	30.26	30.82	28.74	29.91	32.42	32.44	23.59
03/17	28.52	18.47	29.12	18.77	A	32.27	29.12	18.65	32.88	18.32	31.19	18.08	32.12	28.53	33.07	28.95	29.68	30.71	28.40	29.79	32.12	32.14	25.10
04/17	28.02	18.08	29.07	18.04	A	32.56	29.22	18.11	33.10	17.87	30.67	17.87	32.37	29.36	33.09	28.35	29.93	30.82	28.08	29.66	31.92	32.36	23.92

Notes:
1. MSL: Mean Sea Level
2. TOC: Top of Casing
3. TOC elev determined from a survey in August 2010
4. Pond Gauge TOC elev updated March 2018.
5. "--": Measurement Not Taken
6. “A": Well Abandoned

TABLE 2-1 GROUNDWATER ELEVATION (FT)

Event	MW-03S	MW-3M	MW-04S	MW-4M	MW-05S	MW-05SR	MW-07S	MW-7M	MW-08S	MW-8M	MW-10S	MW-10M	MW-11S	MW-13S	MW-14S	MW-15S	MW-16S	MW-17S	MW-18S	MW-19S	MW-20S	MW-21S	MW-22S
05/17	26.86	16.92	27.15	17.46	A	32.48	29.22	18.03	31.10	17.79	30.34	17.79	32.37	29.53	33.00	29.35	29.68	30.82	28.91	29.49	31.42	32.36	23.67
06/17	25.19	16.92	25.40	17.29	A	31.39	28.72	17.03	25.35	17.45	27.75	15.70	31.95	29.28	30.34	28.68	29.10	30.57	28.58	28.57	29.75	31.78	22.01
07/17	24.86	16.75	25.24	17.04	A	31.89	28.97	16.78	32.69	16.29	28.92	16.54	32.03	26.86	31.50	27.76	29.18	30.91	27.58	28.91	30.17	32.03	21.51
08/17	29.77	16.17	32.99	16.62	A	32.81	30.14	18.19	32.85	18.45	30.09	17.04	32.95	32.70	33.84	32.10	30.35	32.57	33.99	29.99	32.84	32.61	22.51
09/17	26.23	19.35	29.26	19.00	A	32.63	29.24	19.29	33.47	18.77	31.37	18.82	32.60	29.62	32.47	29.20	30.66	31.26	28.86	30.49	32.52	32.52	24.42
10/17	26.94	17.17	27.24	18.04	A	32.89	29.22	18.11	30.44	18.04	30.59	17.79	32.45	27.20	33.84	29.60	30.68	31.16	29.49	30.32	32.50	32.11	22.59
12/17	27.27	18.17	28.82	18.04	A	32.31	28.89	18.19	32.19	17.62	30.09	17.87	31.70	29.11	32.50	28.01	29.68	30.82	27.83	29.41	31.34	31.86	16.59
12/18	27.19	17.83	29.15	17.79	A	32.31	29.06	35.86	16.44	17.37	30.50	17.54	31.78	29.45	32.92	29.18	29.76	30.99	28.91	29.49	31.59	31.86	22.59
01/17	28.44	19.00	31.74	18.96	A	33.14	29.64	19.03	34.10	18.45	33.42	18.70	32.95	29.78	34.25	31.10	31.26	31.16	30.83	31.49	33.84	32.69	25.01
02/18	28.69	19.58	30.86	19.29	A	32.89	29.64	19.36	34.30	19.24	33.09	19.23	33.00	29.63	34.02	31.25	31.09	31.44	30.46	31.21	33.58	33.40	25.44
04/18	33.52	18.00	29.82	19.87	A	33.06	34.06	20.11	19.69	19.54	31.50	19.70	32.37	32.70	34.50	31.85	31.10	31.32	29.16	30.57	33.17	33.19	27.01
05/18	28.45	20.75	31.15	20.62	A	33.06	29.64	20.78	32.52	21.37	30.50	20.12	33.53	30.61	34.50	30.26	30.68	32.99	29.74	30.99	33.25	33.19	27.84
07/18	27.11	19.42	29.32	19.71	A	32.81	30.47	20.28	33.19	20.04	30.84	20.20	32.87	28.36	32.42	30.51	33.43	31.41	30.16	28.66	28.59	32.78	25.84
08/18	25.81	17.88	28.27	17.84	A	31.56	28.73	18.05	30.89	17.58	28.93	17.28	32.00	28.50	30.92	27.27	28.88	30.74	27.58	28.62	29.71	31.78	22.46
09/18	25.86	18.42	28.57	18.71	A	32.23	27.39	20.03	29.44	19.04	30.00	17.95	32.62	27.95	32.50	28.51	29.60	30.99	28.33	29.32	31.09	32.53	22.84
11/18	29.19	20.67	29.65	20.29	A	32.98	29.64	20.61	32.94	19.12	31.00	19.54	33.03	28.03	33.92	31.18	32.10	31.41	30.83	31.07	33.34	32.78	25.84
12/18	32.52	18.33	29.07	19.54	A	33.06	29.81	20.69	33.60	19.54	30.34	19.54	33.20	28.20	33.50	29.93	30.85	32.91	31.49	29.99	29.84	32.94	26.34
01/19	34.02	21.08	33.15	19.04	A	32.89	33.97	20.78	33.77	20.54	32.92	20.62	33.12	31.86	33.84	31.85	33.10	34.07	33.49	32.32	33.42	32.94	29.67
02/19	29.61	21.50	31.65	21.29	A	33.31	29.22	21.53	33.69	21.20	33.25	21.04	33.62	29.45	34.92	31.26	30.93	31.41	31.49	31.16	33.50	33.36	27.92
03/19	29.38	20.93	30.73	21.26	A	32.81	28.51	21.09	33.22	20.55	32.90	20.67	33.17	28.48	33.73	30.50	30.73	30.75	30.18	30.89	33.19	33.02	27.54
03/19	29.11	20.83	29.74	19.62	A	32.48	30.72	22.61	30.02	20.45	33.25	20.37	33.12	29.03	31.50	29.10	30.51	32.24	30.74	30.24	28.92	32.86	26.09
04/19	28.52	19.33	29.74	19.79	A	32.39	30.06	21.86	30.02	20.45	32.17	19.87	33.03	28.78	33.00	28.68	30.51	32.41	29.91	30.16	30.09	32.69	25.92
05/19	28.61	18.00	29.15	15.96	A	31.89	30.06	19.53	28.69	18.45	28.67	19.29	32.70	27.70	30.17	28.35	29.18	29.91	30.08	28.41	28.34	32.44	23.34
06/19	29.52	16.00	28.74	16.29	A	31.31	30.14	17.61	28.60	16.62	29.09	16.70	33.12	28.20	30.00	28.10	29.26	30.74	29.99	28.57	28.59	31.94	22.09
07/19	25.36	16.83	27.57	16.79	A	31.39	27.81	16.86	28.69	16.95	28.25	16.54	31.87	28.20	29.92	27.51	28.51	30.74	27.41	27.82	29.34	31.78	21.01
08/19	25.69	16.90	27.97	16.29	A	31.76	28.09	16.95	30.82	16.42	28.32	13.87	32.00	30.13	30.37	27.78	28.68	32.64	27.56	28.04	29.62	31.66	20.90
09/19	29.94	15.75	28.65	15.96	A	31.14	27.97	15.44	27.94	17.37	26.42	16.12	31.28	26.20	29.42	26.10	27.35	31.24	29.66	28.24	28.00	31.36	19.76
10/19	25.69	16.00	28.40	15.96	A	32.39	27.22	17.69	29.77	17.29	29.00	16.12	31.70	26.61	31.09	27.76	29.10	31.07	29.91	28.57	29.25	31.78	19.51
11/19	28.02	15.92	28.24	15.79	A	32.56	29.47	17.19	29.02	16.37	28.50	15.95	31.95	26.95	30.25	28.18	29.10	31.91	30.08	28.24	28.59	31.94	28.51
12/19	32.61	14.17	29.07	14.04	A	32.81	32.89	15.86	33.27	16.12	29.42	16.29	32.53	28.36	31.09	30.35	29.93	32.49	30.99	29.49	29.34	32.53	20.17
01/20	29.61	15.33	29.07	15.12	A	32.81	30.47	16.94	33.52	17.27	32.25	16.95	33.37	28.03	32.09	30.01	30.93	32.49	29.24	27.91	28.00	32.53	21.17
02/20	29.36	18.50	29.57	18.46	A	32.89	28.47	18.61	33.60	16.95	30.50	18.79	32.95	27.70	28.75	29.85	30.51	31.32	29.33	29.99	33.25	32.78	23.51
03/20	28.95	18.70	30.31	18.34	A	33.11	28.49	18.76	34.22	18.10	33.20	18.31	33.40	28.61	34.07	30.50	30.96	34.04	29.64	30.67	33.68	33.25	23.98
04/20	33.19	16.42	30.65	15.46	A	32.89	28.89	18.36	33.69	17.95	30.09	17.20	33.20	30.45	35.00	30.51	31.43	33.74	31.33	29.82	33.42	32.86	25.17
05/20	28.61	15.75	28.49	14.87	A	31.64	27.89	17.86	27.94	16.87	27.84	16.54	32.20	27.78	30.42	28.35	29.10	31.91	30.08	27.66	28.75	32.03	22.59
06/20	25.69	16.58	27.57	16.62	A	31.06	27.56	16.69	27.44	14.62	28.42	16.37	31.78	27.86	29.84	27.35	28.51	30.66	27.41	27.91	29.25	31.53	21.34
07/20	25.61	16.33	27.49	16.37	A	31.81	27.97	16.36	27.10	17.04	28.17	16.12	31.87	28.03	29.84	27.51	28.43	30.91	27.16	27.74	29.34	31.69	34.84
08/20	25.59	15.80	27.42	16.39	A	31.46	27.69	16.01	29.87	15.57	27.82	15.67	31.55	27.53	30.17	27.38	28.38	30.59	27.01	28.19	29.07	31.46	20.24
09/20	24.86	16.17	27.99	15.96	A	32.06	28.06	16.11	28.10	16.29	28.00	15.87	31.78	28.20	30.17	27.68	28.60	30.91	27.41	25.99	29.42	31.78	20.09
10/20	27.77	17.33	27.99	17.54	A	32.39	29.97	19.28	29.69	18.20	28.84	18.37	32.03	26.95	30.34	28.85	29.18	32.07	27.91	29.07	28.84	32.11	23.09
11/20	33.52	16.83	32.74	17.37	A	32.89	33.31	18.78	33.60	18.45	31.75	18.54	32.87	30.95	32.84	31.10	30.60	32.57	31.08	30.07	31.00	32.69	23.09
01/21	30.02	19.58	30.32	20.54	A	32.81	31.97	21.86	33.52	20.45	31.75	20.04	32.87	32.70	32.84	29.60	30.76	34.66	32.74	31.32	32.50	34.69	25.84
02/21	30.44	21.42	30.57	21.71	A	32.98	28.81	21.36	33.35	20.45	31.67	20.20	33.37	27.53	34.75	30.76	31.76	34.32	31.41	29.32	29.25	33.11	27.76
03/21	29.64	20.86	30.47	20.87	A	33.08	28.66	20.89	33.97	20.36	33.27	20.57	33.83	29.01	34.17	30.48	30.84	31.32	29.41	30.79	33.90	33.66	27.19
04/21	28.94	20.25	29.15	20.21	A	31.31	30.39	21.78	29.02	20.70	31.59	19.79	33.20	28.70	33.34	29.43	30.51	33.07	28.91	29.66	32.67	33.11	25.84
05/21	26.69	18.17	26.82	18.54	A	31.39	27.81	18.19	26.94	18.45	27.34	18.54	32.28	28.03	28.92	26.85	27.76	30.66	27.24	25.82	27.59	32.11	22.59
06/21	25.69	17.35	25.99	16.96	A	31.39	27.22	18.86	25.94	17.97	28.25	17.79	32.12	27.95	29.59	27.60	28.35	31.82	30.24	27.74	28.17	31.78	21.34
07/21	25.55	17.01	27.87	16.71	A	31.10	28.03	16.99	30.54	16.47	28.83	16.47	32.21	28.07	30.71	27.70	28.92	30.71	27.56	28.29	29.30	31.99	21.29
08/21	25.69	16.75	27.99	16.71	A	31.23	28.06	16.78	30.69	16.37	28.92	16.54	32.03	28.11	31.09	27.76	29.18	30.74	27.41	28.49	29.67	31.86	20.59
09/21	27.02	16.08	27.32	16.37	A	31.23	28.81	17.69	28.85	16.62	27.75	16.45	31.28	27.95	30.34	27.35	28.35	31.24	29.66	28.24	28.92	31.28	20.01
10/21	25.02	15.50	27.57	15.54	A	31.06	27.64	15.53	29.77	15.12	28.17	15.29	30.95	27.95	29.84	27.18	28.35	30.41	27.01	27.82	28.84	31.03	19.26
11/21	26.86	15.25	26.99	15.54	A	31.06	28.64	15.28	28.27	14.29	28.09	15.79	30.78	27.86	29.67	26.51	27.51	30.41	26.91	27.57	28.75	30.86	18.59
12/21	28.02	15.33	29.15	15.46	A	32.48	28.14	15.44	32.27	15.04	28.59	15.29	32.03	28.36	33.09	27.76	29.18	30.91	27.58	28.82	29.50	32.11	18.01
01/22	28.19	15.42	29.32	15.54	A	32.64	28.31	15.69	32.44	15.29	28.75	15.45	32.28	28.53	33.25	27.76	29.35	31.07	27.74	28.99	29.67	32.28	18.17
02/22	28.94	16.25	28.74	16.37	A	32.23	28.14	16.78	33.27	15.95	31.09	16.12	32.53	28.36	33.42	28.60	30.93	30.99	27.99	29.41	30.84	32.53	19.17
03/22	29.01	16.56	29.31	16.78	A	32.38	28.32	16.78	33.66	16.31	32.28	16.59	32.89	28.46	33.76	29.35	30.78	31.13	28.57	29.64	32.37	32.75	19.62
04/22	33.27	14.67	33.15	14.62	A	32.06	28.14	17.19	28.02	15.29	29.50	15.20	33.78	28.86	30.92	28.68	29.76	31.07	29.66	29.24	28.50	32.53	21.17
05/22	33.11	14.58	33.07	14.54	A	31.73	34.22	15.36	27.94	15.12	29.34	14.79	33.70	28.70	30.75	28.60	29.76	30.91	29.58	29.16	28.34	32.61	21.17
06/22	25.19	16.08	27.82	16.12	A	30.98	27.39	16.19	30.27	15.70	28.59	15.95	32.03	27.78	30.34	28.35	28.68	30.66	27.33	28.16	29.17	31.61	20.17
07/22	24.94	15.67	27.32	15.79	A	30.48	27.14	15.78	29.69	15.29	28.25	15.54	31.70	27.70	29.75	26.93	28.35	30.49	26.99	27.66	28.84	31.36	19.42
08/22	24.62	14.78	26.33	14.68	A	29.96	26.84	14.89	28.62	13.19	27.60	14.28	30.68	27.45	28.87	26.21	27.42	30.05	26.32	26.72	28.21	30.52	18.32
09/22	14.52	14.00	25.07	14.29	A	30.73	27.64	14.45	24.94	14.95	27.34	14.70	30.95	27.36	28.34	26.35	27.26	30.07	28.58	27.16	27.84	31.11	17.34
10/22	26.36	13.50	26.49	13.87	A	30.48	26.64	13.69	17.10	13.29	27.09	13.37	30.62	26.70	28.92	26.01	27.51	29.57	30.99	27.07	28.34	30.69	15.51
11/22	26.44	13.42	26.99	14.04	A	31.14	26.81	13.61	30.19	13.79	27.59	13.54	31.28	26.70	29.50	16.51	28.10	30.41	26.49	27.49	28.67	30.69	16.09
12/22	27.86	14.42	27.57	14.79	A	31.73	27.22	14.28	31.52	13.70	28.67	14.04	31.62	27.28	32.67	27.35	28.60	30.49	26.83	28.41	29.25	31.69	17.34
01/23	28.36	14.83	28.49	15.46	A	31.98	27.81	15.11	32.85	14.79	31.59	14.87	32.28	27.53	31.92	28.85	30.18	30.41	27.33	29.16	29.34	32.28	17.84
02/23	28.11	15.25	27.99	16.62	A	32.14	27.81	16.69	33.27	16.04	31.17	15.37	32.37	27.45	33.25	28.60	30.18	30.74	27.66	28.99	31.25	32.69	18.84
03/23	26.77	15.00	27.99	15.62	A	31.39	27.47	15.28	31.44	14.70	29.59	14.87	31.70	26.61	32.34	26.51	29.18	30.24	27.66	28.57	30.09	31.53	19.17
04/23	27.88	15.57	28.90	15.95	A	31.65	28.06	15.77	32.77	15.52	30.91	15.73	32.56	28.18	33.15	28.80	30.04	30.91	28.40	29.36	31.32	32.38	19.82
05/23	26.27	14.75	27.65	15.79	A	31.81	27.56	15.11	32.44	15.04	29.59	15.29	31.62	27.36	32.75	27.85	29.35	30.16	27.66	28.74	29.59	31.53	20.01

Notes:
1. MSL: Mean Sea Level
2. TOC: Top of Casing
3. TOC elev determined from a survey in August 2010
4. Pond Gauge TOC elev updated March 2018.
5. "--": Measurement Not Taken
6. “A": Well Abandoned

TABLE 2-1 GROUNDWATER ELEVATION (FT)

Event	MW-501A	MW-501M	MW-502A	MW-503A	MW-504A	MW-504M	MW-505A	MW-505M	PZ-1A	PZ-2A	PZ-3A	PZ-4A	PZ-5A	PZ-6A	PG-1	PG-2	PG-3	PG-4
01/91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/99	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/10	32.23	--	31.24	32.08	33.12	--	32.38	--	--	--	--	--	--	--	--	--	--	--
05/10	31.14	--	32.74	30.58	32.47	--	31.63	--	32.73	31.46	32.40	31.33	31.65	31.57	--	--	--	--
06/10	30.83	--	31.09	31.88	32.37	--	31.13	--	32.93	31.60	32.55	31.40	31.80	31.50	--	--	--	--
07/10	29.34	--	30.04	31.68	31.19	--	29.41	--	31.51	29.91	31.10	29.63	30.06	29.94	--	--	--	--
07/10	29.29	--	28.74	29.92	30.51	--	29.26	--	31.51	29.82	30.80	29.64	30.03	30.02	--	--	--	--
08/10	29.44	--	31.14	31.89	32.02	--	28.78	--	31.38	31.41	32.80	31.13	31.95	30.52	--	--	--	--
10/10	30.13	--	32.04	32.46	33.21	--	28.35	--	31.69	32.22	33.12	32.52	33.05	32.10	--	--	--	--
11/10	30.24	--	31.39	31.53	32.47	--	28.33	--	30.88	31.17	32.27	31.03	31.78	31.22	--	--	--	--
12/10	30.49	--	31.88	32.53	33.05	--	28.28	--	30.83	32.01	32.60	32.18	32.65	32.12	--	--	--	--
01/11	33.49	--	34.22	33.51	33.24	--	29.54	--	33.61	33.79	33.77	34.11	34.10	34.98	--	--	--	--
02/11	32.11	--	32.59	32.66	33.34	--	30.29	--	33.43	32.56	33.00	32.66	33.20	32.87	--	--	--	--
03/11	33.96	--	33.45	33.31	33.82	--	32.38	--	34.04	33.45	33.40	33.76	33.72	34.42	--	--	--	--
04/11	32.03	--	32.19	32.21	33.08	--	31.63	--	33.88	32.65	33.11	32.63	32.95	31.89	--	--	--	--
05/11	30.52	--	30.88	31.37	31.63	--	30.56	--	32.55	31.11	32.03	30.94	31.25	31.17	--	--	--	--
06/11	29.15	--	29.73	30.84	30.56	--	29.09	--	31.23	29.74	30.58	29.70	29.99	30.00	--	--	--	--
07/11	29.15	--	30.70	30.87	30.77	--	28.59	--	31.70	30.63	31.77	30.30	30.91	30.25	--	--	--	--
08/11	30.55	--	32.28	32.67	33.13	--	29.87	--	36.04	31.51	33.06	32.92	33.37	32.63	--	--	--	--
09/11	30.93	--	32.82	32.96	33.32	--	29.63	--	32.97	33.09	33.50	33.48	33.71	32.94	--	--	--	--
10/11	30.44	13.29	32.35	32.91	33.15	13.42	29.12	13.26	32.11	32.58	32.90	26.93	33.20	32.87	--	--	--	--
11/11	31.24	13.45	33.04	33.03	32.91	13.52	29.18	13.44	32.73	32.92	33.25	33.38	33.51	33.55	--	--	--	--
12/11	31.35	13.62	32.89	32.74	32.79	13.68	29.34	13.60	33.13	33.01	33.34	33.21	33.53	33.18	--	--	--	--
01/12	32.40	13.76	33.44	33.15	32.99	13.86	30.08	13.69	33.98	33.36	33.42	33.64	33.76	34.16	--	--	--	--
02/12	33.34	14.08	33.50	33.15	33.09	14.17	31.23	14.04	34.08	33.48	33.40	33.86	33.90	34.35	--	--	--	--
03/12	33.79	14.57	33.35	33.21	33.72	14.63	34.88	14.52	33.94	33.35	33.30	33.66	33.62	34.32	--	--	--	--
04/12	33.04	14.67	33.32	33.23	33.82	14.73	34.78	14.62	33.18	33.41	33.39	33.79	33.72	34.27	--	--	--	--

Notes:
1. MSL: Mean Sea Level
2. TOC: Top of Casing
3. TOC elev determined from a survey in August 2010
4. Pond Gauge TOC elev updated March 2018.
5. "--": Measurement Not Taken
6. “A": Well Abandoned

TABLE 2-1 GROUNDWATER ELEVATION (FT)

Event	MW-501A	MW-501M	MW-502A	MW-503A	MW-504A	MW-504M	MW-505A	MW-505M	PZ-1A	PZ-2A	PZ-3A	PZ-4A	PZ-5A	PZ-6A	PG-1	PG-2	PG-3	PG-4
05/12	32.87	--	32.79	33.45	33.65	15.78	34.53	15.63	32.16	33.31	33.34	33.63	33.20	33.70	--	--	--	--
06/12	30.62	--	31.04	31.45	32.24	15.53	31.28	15.13	33.00	31.23	32.25	31.13	31.53	31.29	--	--	--	--
07/12	29.29	--	32.96	33.11	30.99	14.28	29.61	14.21	31.58	29.73	30.50	29.63	29.87	30.12	--	--	--	--
08/12	32.79	14.57	32.62	33.20	34.15	14.53	33.11	14.46	33.08	33.14	33.00	33.80	33.87	33.79	--	--	--	--
09/12	15.12	14.91	33.12	32.70	32.82	15.86	32.28	15.29	33.08	31.98	32.67	32.13	32.37	32.12	--	--	--	--
10/12	34.96	16.74	33.96	34.03	34.65	16.78	35.70	16.63	34.08	34.39	35.00	34.63	34.87	35.20	--	--	--	--
11/12	33.62	17.40	32.54	33.03	33.57	17.44	34.53	17.29	33.08	33.06	33.17	33.13	33.37	33.37	--	--	--	--
12/12	34.54	18.07	33.71	33.70	33.90	17.28	35.53	17.96	33.25	33.98	34.00	33.96	34.20	34.70	--	--	--	--
01/13	35.29	18.90	33.62	33.61	33.82	18.86	35.45	19.54	34.41	33.98	34.00	34.13	34.20	34.45	--	--	--	--
02/13	34.62	19.65	34.29	34.20	34.24	19.86	35.70	19.63	35.50	34.48	34.25	34.46	34.37	35.04	--	--	--	--
03/13	34.21	19.74	33.87	33.86	33.90	19.86	35.45	19.71	35.08	33.98	33.92	34.05	34.03	34.70	--	--	--	--
04/13	33.98	19.31	33.29	33.48	33.64	19.37	35.06	19.31	34.96	33.90	33.95	34.30	34.37	35.00	--	--	--	--
05/13	32.37	18.40	32.29	32.36	32.57	18.44	32.78	18.29	34.50	32.64	33.17	32.63	32.70	32.79	--	--	--	--
07/13	31.46	17.57	32.04	32.78	32.15	17.61	31.70	17.46	33.66	32.48	32.75	31.71	31.95	31.87	--	--	--	--
07/13	30.12	17.40	31.54	31.78	31.65	17.44	31.11	17.79	33.66	31.48	32.33	31.38	31.45	31.62	--	--	--	--
08/13	30.62	16.57	31.29	31.78	31.24	16.61	30.70	16.46	32.91	31.14	32.00	31.96	31.03	31.12	--	--	--	--
09/13	29.71	15.40	30.12	30.95	29.49	15.53	29.61	15.38	31.33	29.98	30.92	29.71	29.45	30.12	--	--	--	--
10/13	29.64	15.30	31.52	33.50	33.05	15.43	29.18	15.34	31.27	29.67	30.59	29.77	29.66	30.10	--	--	--	--
11/13	30.37	14.74	31.29	31.70	31.49	14.86	29.28	14.79	31.91	31.14	32.25	31.05	31.12	31.04	--	--	--	--
12/13	31.04	15.07	32.54	33.20	33.07	15.11	29.20	14.96	33.16	32.81	33.42	33.21	33.53	33.45	--	--	--	--
01/14	33.87	16.99	33.46	33.53	33.65	16.94	35.20	16.79	34.91	33.81	33.67	34.05	33.95	34.62	--	--	--	--
02/14	34.29	18.24	33.79	33.70	33.82	18.36	35.45	18.21	36.00	33.89	33.83	34.63	34.12	35.20	--	--	--	--
03/14	34.96	18.49	33.87	34.03	34.24	18.53	35.70	18.38	36.00	34.56	34.75	34.71	34.53	35.04	--	--	--	--
04/14	34.54	19.15	34.29	33.20	34.15	19.19	35.61	19.04	35.83	34.06	34.08	34.80	34.87	34.95	--	--	--	--
06/14	32.46	17.99	32.12	32.78	32.82	18.03	32.78	17.88	34.50	32.89	33.33	33.30	32.62	33.95	--	--	--	--
06/14	30.29	16.57	35.62	31.36	30.65	16.61	30.61	16.54	32.66	30.14	30.75	30.13	30.20	30.62	--	--	--	--
07/14	31.04	15.82	32.04	33.61	33.15	15.86	30.11	15.79	33.16	33.31	33.25	33.71	33.78	34.70	--	--	--	--
08/14	29.79	16.32	30.46	31.20	28.65	13.69	29.45	15.29	32.08	30.39	30.33	31.46	30.95	32.04	--	--	--	--
08/14	30.02	15.36	30.95	31.22	30.85	15.59	29.58	15.46	32.08	30.31	30.33	31.46	30.95	32.04	--	--	--	--
09/14	30.37	15.90	31.54	32.61	30.15	15.86	30.53	16.13	32.83	32.48	33.33	33.71	33.03	33.87	--	--	--	--
10/14	30.04	14.07	30.54	31.45	29.07	13.53	29.95	15.04	32.08	31.14	31.42	31.80	31.70	33.04	--	--	--	--
12/14	29.54	15.74	31.46	32.86	28.99	15.03	29.86	15.46	31.75	32.64	32.75	33.55	33.28	33.95	--	--	--	--
01/15	34.12	15.74	34.04	33.61	33.74	34.86	32.45	15.71	35.41	33.81	34.17	34.46	34.12	35.20	--	--	--	--
03/15	33.71	16.82	34.21	34.03	33.32	15.94	34.11	17.46	35.66	34.14	34.50	34.96	30.37	35.37	--	--	--	--
03/15	34.54	17.99	33.46	33.78	33.82	18.19	35.45	18.21	36.25	33.98	34.42	34.80	34.28	34.79	--	--	--	--
04/15	34.45	18.05	33.19	33.71	33.88	19.14	35.48	19.01	36.41	33.99	33.97	34.12	34.24	34.67	32.16	33.02	30.53	29.62
06/15	31.54	16.15	31.96	33.70	31.90	15.36	32.45	16.71	32.25	32.56	33.08	33.46	33.12	34.29	32.26	33.04	30.38	29.50
07/15	30.71	16.49	30.96	32.03	29.65	15.94	30.53	16.71	32.66	31.73	32.00	32.46	31.95	32.79	32.43	33.04	30.46	29.67
07/15	30.12	16.90	34.37	33.45	29.49	16.53	30.28	17.63	33.00	32.23	32.50	33.71	32.87	33.45	32.34	32.95	30.38	29.50
08/15	29.61	14.85	29.82	31.44	29.95	14.99	29.13	14.81	32.08	30.23	30.34	30.88	30.62	31.46	32.34	32.85	30.38	29.50
10/15	31.21	14.99	33.62	33.95	30.40	14.53	31.28	15.46	14.41	33.48	33.92	34.38	34.03	34.95	32.59	33.12	30.96	30.25
10/15	29.21	15.07	33.21	32.86	28.65	14.53	28.86	15.29	31.58	31.64	32.08	32.80	32.37	33.37	32.26	31.87	30.38	29.67
11/15	33.46	16.40	33.96	34.03	30.40	15.11	31.53	16.38	35.16	--	--	--	--	--	32.43	33.37	30.71	30.17
12/15	34.54	17.57	34.04	34.45	33.32	16.78	34.45	18.04	36.00	33.98	34.33	34.88	34.53	35.29	32.68	33.27	30.96	30.34
01/16	34.71	18.65	33.79	33.86	34.15	18.78	35.20	18.63	35.91	34.23	34.50	34.80	34.45	35.37	32.76	33.27	31.05	30.34
02/16	34.21	19.65	33.12	33.61	33.15	19.03	34.36	20.13	35.25	33.81	34.17	34.63	34.28	35.20	32.43	33.19	30.88	30.25
03/16	33.25	19.17	32.17	32.13	33.54	18.96	34.83	19.83	34.96	33.65	33.51	33.91	33.61	34.23	32.26	33.19	30.80	30.00
04/16	34.29	18.40	32.96	33.11	32.82	17.36	35.45	18.29	34.50	33.81	34.08	34.63	34.20	35.29	32.26	33.02	30.55	29.92
04/16	33.04	17.82	32.12	33.70	31.99	17.19	33.11	18.21	34.08	32.89	33.25	33.80	33.37	34.37	32.76	33.27	30.96	30.34
06/16	34.37	18.49	32.96	33.70	33.40	17.86	34.36	19.04	35.58	33.89	34.33	34.96	34.45	35.45	32.43	33.19	30.80	30.25
07/16	32.96	18.74	32.54	33.45	33.57	18.86	34.95	18.71	35.58	33.64	33.75	33.96	34.03	34.37	32.43	33.10	30.71	29.67
07/16	31.04	17.90	31.12	34.11	30.65	17.36	30.70	18.29	33.75	32.56	33.08	33.55	33.12	33.95	32.01	32.77	30.30	29.34
08/16	27.12	17.49	30.12	30.53	26.24	15.86	27.20	17.63	32.33	30.48	31.00	30.55	30.62	30.79	32.68	33.27	31.13	30.25
09/16	29.79	15.42	28.22	30.75	30.10	15.11	29.71	15.61	34.91	33.98	34.33	34.63	34.12	35.04	--	--	--	--
10/16	34.46	17.49	33.29	33.95	33.74	16.78	34.70	17.96	--	--	--	--	--	--	32.01	33.10	30.71	29.42
10/16	32.21	18.40	31.54	32.45	31.07	17.86	32.11	18.88	33.41	32.14	32.50	32.21	32.20	33.29	32.01	33.02	30.38	29.42
11/16	31.12	17.40	31.04	33.95	30.24	16.53	31.03	17.71	32.41	31.31	32.33	31.21	21.20	31.54	32.01	33.02	29.58	31.12
12/16	34.62	17.82	34.12	34.20	34.07	17.86	35.70	17.71	34.91	34.06	34.00	34.21	34.12	35.04	32.51	33.19	29.08	30.95
01/17	34.12	18.65	32.96	33.61	33.57	18.78	35.36	18.63	34.66	33.56	33.50	33.71	33.70	34.29	--	--	--	--
02/17	33.54	17.99	32.37	33.45	33.32	18.11	34.95	17.96	34.08	33.14	33.17	33.30	33.37	34.04	32.43	33.19	29.25	31.04
03/17	33.00	18.22	31.16	30.84	32.86	17.85	34.34	17.92	35.88	33.28	33.23	33.51	33.51	33.93	32.79	33.19	30.71	29.50
04/17	33.54	17.49	32.29	33.45	33.07	17.53	34.95	17.46	33.58	33.14	33.08	33.46	33.28	34.04	--	--	--	--

Notes:
1. MSL: Mean Sea Level
2. TOC: Top of Casing
3. TOC elev determined from a survey in August 2010
4. Pond Gauge TOC elev updated March 2018.
5. "--": Measurement Not Taken
6. “A": Well Abandoned

TABLE 2-1 GROUNDWATER ELEVATION (FT)

Event	MW-501A	MW-501M	MW-502A	MW-503A	MW-504A	MW-504M	MW-505A	MW-505M	PZ-1A	PZ-2A	PZ-3A	PZ-4A	PZ-5A	PZ-6A	PG-1	PG-2	PG-3	PG-4
05/17	33.54	17.24	31.96	33.61	32.49	16.44	33.45	17.71	33.91	33.39	33.42	33.55	33.28	34.29	--	--	--	--
06/17	30.54	16.32	30.62	31.45	29.57	15.61	30.61	16.79	32.50	30.73	31.17	30.71	30.62	31.45	--	--	--	--
07/17	30.54	16.15	31.12	32.03	31.32	16.19	31.28	16.13	32.75	31.39	32.08	31.88	31.78	32.37	--	--	--	--
08/17	34.12	17.40	34.46	33.61	33.49	16.61	34.28	17.79	A	33.39	33.17	33.71	33.37	34.29	32.59	33.27	30.96	29.59
09/17	33.25	18.49	31.26	32.96	32.70	18.62	33.23	18.47	A	31.52	31.83	32.63	31.49	31.83	32.68	33.10	30.88	29.34
10/17	33.96	17.49	32.54	33.95	32.99	16.94	34.03	34.21	A	33.31	32.92	33.63	33.37	34.04	32.34	26.97	28.91	30.95
12/17	32.71	17.57	31.62	32.61	32.40	17.61	34.03	17.54	A	32.23	32.50	32.55	32.53	33.12	--	--	--	--
12/18	32.62	17.24	31.62	32.74	25.49	17.28	34.70	17.21	A	31.14	31.58	32.55	31.70	32.12	--	--	--	--
01/17	33.54	18.24	33.87	34.03	33.99	18.28	33.70	18.63	A	34.64	34.67	35.30	34.87	35.87	32.76	33.37	30.88	29.50
02/18	33.89	18.87	33.49	34.04	33.55	18.81	35.53	18.66	A	--	--	34.01	33.66	34.48	32.76	33.27	31.05	29.42
04/18	33.87	19.32	32.87	33.53	33.32	19.36	33.95	19.88	A	--	--	--	--	--	33.01	33.19	30.80	29.17
05/18	34.54	19.99	33.04	33.78	33.40	19.36	34.61	20.46	A	--	--	--	--	--	32.43	33.27	31.05	29.34
07/18	33.71	20.90	34.66	33.95	33.15	19.78	34.03	20.79	A	34.64	34.67	35.30	34.87	35.87	31.93	33.02	30.71	29.09
08/18	31.08	18.43	29.83	31.78	31.67	17.19	--	--	A	--	--	--	--	--	32.43	33.19	30.88	29.17
09/18	32.04	18.49	31.96	33.20	33.32	17.69	31.95	19.04	A	--	--	--	--	--	--	--	--	--
11/18	34.62	19.74	33.21	34.11	33.74	19.19	34.53	10.96	A	--	--	--	--	--	--	--	--	--
12/18	34.46	20.90	34.62	33.95	33.65	20.28	34.45	21.46	A	--	--	--	--	--	--	--	--	--
01/19	34.46	20.32	33.79	33.70	33.57	19.78	34.53	20.88	A	--	--	--	--	--	--	--	--	--
02/19	34.46	20.65	33.37	32.70	32.40	20.86	34.53	21.13	A	--	--	--	--	--	--	--	--	--
03/19	33.04	20.47	32.34	32.90	33.51	20.26	34.78	20.20	A	--	--	--	--	--	32.18	33.19	30.71	28.00
03/19	34.79	20.07	32.46	33.36	32.90	19.44	33.95	20.38	A	--	--	--	--	--	--	--	--	--
04/19	32.62	19.49	32.54	33.36	31.57	18.86	32.61	19.88	A	--	--	--	--	--	--	--	--	--
05/19	32.12	20.32	31.62	32.53	30.74	19.61	32.03	20.79	A	--	--	--	--	--	--	--	--	--
06/19	32.12	17.90	32.37	31.70	31.40	16.19	32.03	17.29	A	--	--	--	--	--	--	--	--	--
07/19	30.21	16.15	30.62	32.95	31.49	16.28	32.36	17.29	A	--	--	--	--	--	--	--	--	--
08/19	30.30	16.25	31.29	32.53	31.32	16.77	30.37	16.21	A	--	--	--	--	--	32.01	32.94	30.88	31.00
09/19	32.29	18.07	32.12	31.45	31.07	17.28	32.03	18.29	A	--	--	--	--	--	32.18	33.19	30.80	28.00
10/19	29.96	16.07	31.79	31.03	31.90	15.69	31.70	16.46	A	--	--	--	--	--	32.26	33.10	30.88	28.09
11/19	30.12	15.57	32.21	33.70	29.07	15.03	30.03	16.04	A	--	--	--	--	--	32.34	33.19	30.96	28.09
12/19	33.04	15.82	35.71	34.03	32.07	15.19	33.11	35.21	A	--	--	--	--	--	32.43	33.27	31.13	28.42
01/20	33.54	17.40	33.04	33.61	32.57	16.78	33.45	17.88	A	--	--	--	--	--	32.59	33.27	31.13	28.25
02/20	35.37	17.49	33.21	33.70	34.40	16.61	35.28	17.79	A	--	--	--	--	--	32.34	33.27	31.05	28.17
03/20	33.85	18.15	33.89	34.63	33.91	14.53	34.83	18.00	A	--	--	--	--	--	32.34	33.19	30.96	28.00
04/20	34.54	18.24	34.62	33.78	33.49	17.53	34.53	18.71	A	--	--	--	--	--	32.68	33.19	31.05	28.25
05/20	31.62	17.24	32.71	32.03	30.65	17.36	31.53	17.71	A	--	--	--	--	--	32.18	33.02	30.71	27.92
06/20	30.12	15.99	29.96	31.95	30.40	16.11	32.53	15.96	A	--	--	--	--	--	33.46	27.22	29.41	27.62
07/20	29.79	15.74	30.21	34.36	31.65	15.86	29.95	15.71	A	--	--	--	--	--	33.63	27.30	29.16	25.62
08/20	28.99	15.57	29.59	31.53	32.32	15.31	29.23	15.26	A	--	--	--	--	--	32.43	33.19	30.96	28.09
09/20	29.46	15.65	31.12	33.61	31.82	15.61	29.70	15.46	A	--	--	--	--	--	32.26	33.19	30.88	28.00
10/20	30.12	16.57	34.04	33.20	29.32	16.11	30.20	17.04	A	--	--	--	--	--	32.43	33.27	30.96	28.00
11/20	34.71	19.24	33.46	34.20	33.99	18.36	34.78	19.38	A	--	--	--	--	--	32.59	33.27	31.05	28.17
01/21	34.29	20.49	34.54	33.70	33.49	19.69	32.20	20.88	A	--	--	--	--	--	33.01	33.27	30.96	28.17
02/21	33.87	20.57	33.12	33.78	33.82	20.69	33.95	20.88	A	--	--	--	--	--	30.59	33.27	30.88	28.42
03/21	34.25	20.52	33.24	33.88	34.02	20.46	35.62	20.31	A	--	--	--	--	--	32.51	33.19	30.96	28.09
04/21	33.04	19.49	34.12	33.45	33.15	19.69	33.03	20.04	A	--	--	--	--	--	32.51	33.19	30.96	28.09
05/21	31.04	17.57	30.62	32.11	31.24	17.69	31.86	18.54	A	--	--	--	--	--	31.93	32.85	30.30	27.59
06/21	31.29	17.49	32.46	31.61	30.82	16.86	31.61	17.79	A	--	--	--	--	--	32.26	32.94	30.63	27.59
07/21	30.33	16.20	30.59	32.19	31.37	16.36	30.78	16.23	A	--	--	--	--	--	31.93	32.77	30.30	27.59
08/21	29.96	16.15	30.37	31.78	30.99	16.19	31.11	16.13	A	--	--	--	--	--	32.26	32.94	30.71	31.84
09/21	29.46	15.57	32.21	31.36	28.57	15.03	29.36	16.04	A	--	--	--	--	--	32.26	33.10	30.55	27.84
10/21	29.21	14.90	29.96	32.78	27.82	13.71	28.78	14.88	A	--	--	--	--	--	32.41	33.02	30.38	27.59
11/21	32.29	15.82	32.62	31.70	30.32	14.53	32.28	16.04	A	--	--	--	--	--	32.43	33.10	30.38	27.50
12/21	29.71	14.74	32.12	33.61	32.99	14.86	29.45	15.79	A	--	--	--	--	--	32.59	33.10	30.38	27.50
01/22	29.79	14.90	32.29	33.78	33.15	15.03	29.61	15.88	A	--	--	--	--	--	32.43	33.10	30.88	28.00
02/22	30.71	15.74	32.54	33.45	32.82	15.69	34.03	15.63	A	--	--	--	--	--	32.43	33.02	30.80	27.92
03/22	31.99	16.03	32.59	33.28	32.80	16.04	35.06	15.94	A	--	--	--	--	--	32.51	33.02	30.71	27.84
04/22	33.29	17.24	33.87	33.20	32.49	16.44	33.53	17.88	A	--	--	--	--	--	32.34	32.94	30.80	27.84
05/22	33.29	17.24	33.87	33.11	32.57	16.28	33.36	17.71	A	--	--	--	--	--	32.34	32.94	30.80	27.75
06/22	29.87	15.40	30.12	33.28	30.74	15.53	31.78	15.38	A	--	--	--	--	--	32.26	32.85	30.63	27.50
07/22	29.46	15.07	29.37	31.20	29.99	15.11	30.11	15.04	A	--	--	--	--	--	--	--	--	--
08/22	28.52	14.02	28.67	30.12	29.10	14.17	28.94	14.03	A	--	--	--	--	--	32.34	32.85	30.55	27.50
09/22	28.62	14.40	29.37	33.61	27.65	13.78	28.53	15.04	A	--	--	--	--	--	32.59	32.44	29.88	27.00
10/22	27.46	13.14	28.79	32.53	30.90	12.86	27.70	12.71	A	--	--	--	--	--	32.51	32.77	30.05	27.09
11/22	28.71	13.24	30.12	32.45	31.90	13.03	27.61	12.96	A	--	--	--	--	--	32.43	32.94	30.13	27.17
12/22	29.62	13.82	31.46	32.28	32.49	12.11	28.45	13.29	A	--	--	--	--	--	32.01	32.44	30.88	28.59
01/23	31.21	14.57	31.79	32.36	32.90	12.11	30.78	14.29	A	--	--	--	--	--	32.26	32.44	29.63	30.92
02/23	31.62	14.57	31.62	33.11	32.99	14.69	33.45	14.88	A	--	--	--	--	--	32.43	32.44	30.88	28.00
03/23	30.79	14.82	30.54	31.95	31.90	14.44	32.61	14.38	A	--	--	--	--	--	32.34	32.44	30.71	27.67
04/23	31.89	15.34	32.16	33.01	32.30	15.37	33.26	15.46	A	--	--	--	--	--	31.26	--	30.71	27.92
05/23	30.54	14.99	30.21	32.70	32.40	14.69	32.70	14.63	A	--	--	--	--	--	32.51	--	30.63	28.84

Notes:
1. MSL: Mean Sea Level
2. TOC: Top of Casing
3. TOC elev determined from a survey in August 2010
4. Pond Gauge TOC elev updated March 2018.
5. "--": Measurement Not Taken
6. “A": Well Abandoned

N

NOTES:

1. SURVEY WITHIN THE SURVEY DELINEATION LINE IS COMPOSED OF SURVEY PERFORMED 9/14/2017, 9/18/2017, 9/19/2017, 3/5/2018, 4/30/2019, 4/20/2020, 3/13/2021, 3/21/2022 BY AXIS GEOSPATIAL.
2. SURVEY CONTOURS OUTSIDE OF SURVEY DELINEATION LINE WERE OBTAINED FROM WORCESTER COUNTY GIS DEPARTMENT. DATE OF SURVEY IS UNKNOWN.
3. SURVEY CONTOURS OBTAINED FROM WORCESTER COUNTY WERE ROTATED 7.82 DEGREES (CLOCKWISE) AND PLACED IN THE ASSUMED DATUM DEPICTED BY THE GRID ON THIS SHEET.
4. REFERENCE ELEVATION WELL SURVEY WAS PERFORMED IN AUGUST 2010 AND DECEMBER 2014.
5. POND GAUGE REFERENCE ELEVATION RESURVEYED IN MARCH 2018 TO ACCOUNT FOR SETTLING.
6. GROUNDWATER ELEVATIONS OBTAINED BY EA DURING WORCESTER COUNTY MARCH 2022 GAUGING EVENT.
7. GROUNDWATER CONTOURS ARE SHOWN AT A 0.2 FT INTERVAL.
8. THE PIEZOMETERS WERE ABANDONED IN SPRING 2018 DUE TO CELL 5 CONSTRUCTION.

LEGEND

- M-8S 30.82 — EXISTING MONITORING WELL (S=SHALLOW/M=MEDIUM/D=DEEP) GROUNDWATER ELEVATION (IN FEET)
- M-1S — EXISTING MONITORING WELL (S=SHALLOW/M=MEDIUM/D=DEEP) (NOT IN GROUNDWATER MONITORING PLAN)
- PW-1 — EXISTING POTABLE WATER WELL
- SW-1 — EXISTING SURFACE WATER MONITORING LOCATION
- PZ-5A — ABANDONED PIEZOMETER
- PG-1 XX — EXISTING POND GAUGE
- M-5S — ABANDONED MONITORING WELL
- 30 — EXISTING CONTOUR
- 30 — GROUNDWATER CONTOUR
- 30 — PROJECTED GROUNDWATER CONTOUR
- PROPERTY LINE
- EXISTING SURFACE WATER FEATURES
- EXISTING RUBBLE FILL AREA
- EXISTING SCRAP METAL STOCKPILE AREA
- PROPOSED CELL 5 AREA

0 200 400 800
GRAPHIC SCALE IN FEET

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION				
DESIGNED BY: AJB	DRAWN BY: CVH/SS	CHECKED BY: PL	PROJECT MANAGER: GAT	

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. EXPIRATION DATE:

SEMI-ANNUAL SAMPLING EVENT
CENTRAL LANDFILL FACILITY
WORCESTER COUNTY, MARYLAND

GROUNDWATER AND SURFACE WATER MONITORING LOCATIONS

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle
Hunt Valley, Maryland 21031
(410) 584-7000

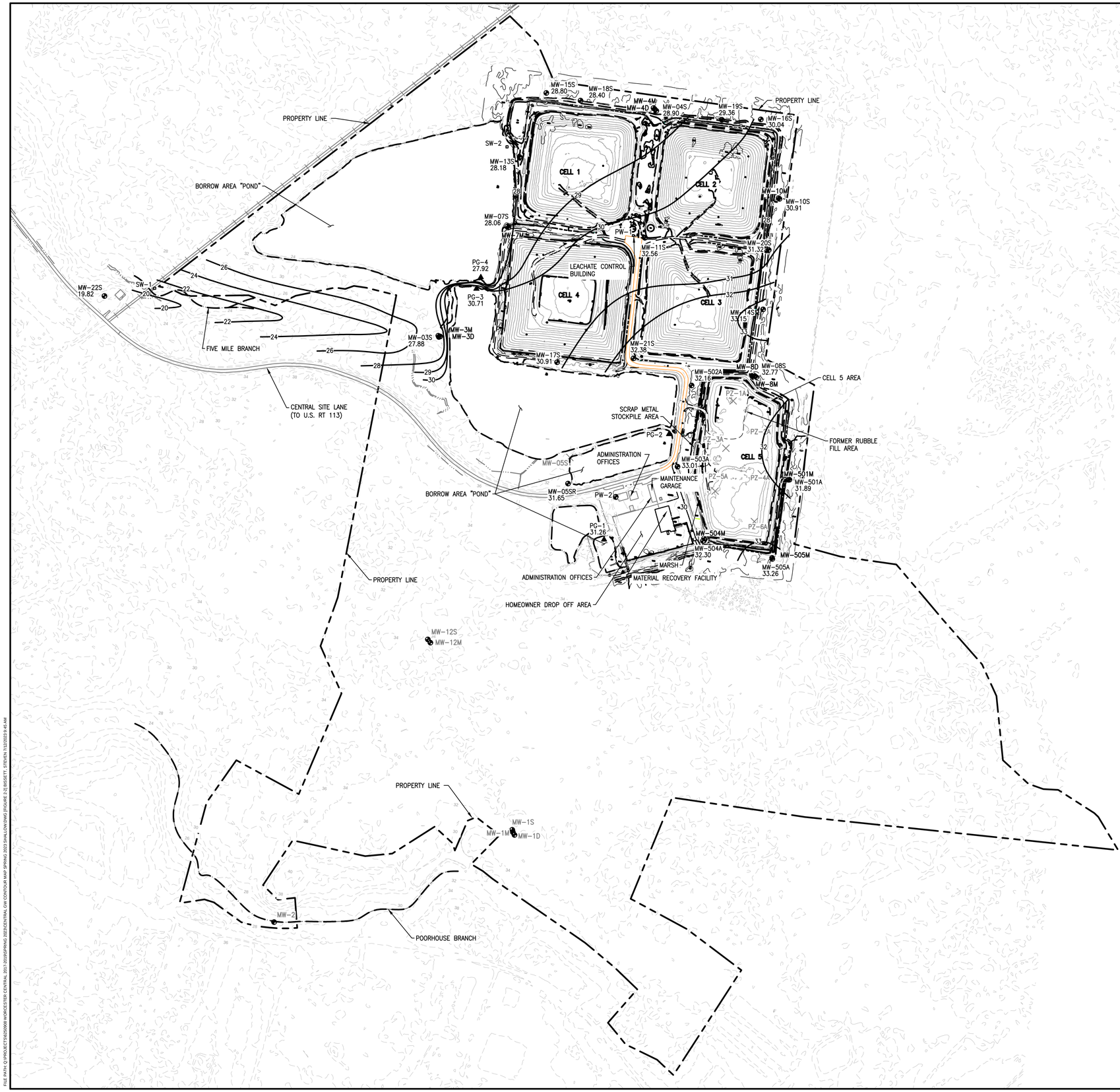
DATE: JUNE 2022

PROJECT NUMBER: 10609.48

Figure 2-1

SHEET: 2 OF 2

NOT FOR CONSTRUCTION



NOTES:

1. SURVEY WITHIN THE SURVEY DELINEATION LINE IS COMPOSED OF SURVEY PERFORMED 9/14/2017, 9/18/2017, 9/19/2017, 3/5/2018, 4/30/2019, 4/20/2020, 3/13/2021, 3/21/2022, AND 12/2022 BY AXIS GEOSPATIAL.
2. SURVEY CONTOURS OUTSIDE OF SURVEY DELINEATION LINE WERE OBTAINED FROM WORCESTER COUNTY GIS DEPARTMENT. DATE OF SURVEY IS UNKNOWN.
3. SURVEY CONTOURS OBTAINED FROM WORCESTER COUNTY WERE ROTATED 7.82 DEGREES (CLOCKWISE) AND PLACED IN THE ASSUMED DATUM DEPICTED BY THE GRID ON THIS SHEET.
4. REFERENCE ELEVATION WELL SURVEY WAS PERFORMED IN AUGUST 2010 AND DECEMBER 2014.
5. POND GAUGE REFERENCE ELEVATION RESURVEYED IN MARCH 2018 TO ACCOUNT FOR SETTLING.
6. GROUNDWATER ELEVATIONS OBTAINED BY EA DURING WORCESTER COUNTY APRIL 2023 GAUGING EVENT.
7. GROUNDWATER CONTOURS ARE SHOWN AT A 1 FT INTERVAL IN THE EASTERN PORTION OF THE SITE AND AT A 2 FT INTERVAL IN THE WESTERN PORTION OF THE SITE.
8. THE PIEZOMETERS WERE ABANDONED IN SPRING 2018 DUE TO CELL 5 CONSTRUCTION.
9. THE ELEVATION FOR PG-2 IS NOT AVAILABLE SO THERE ARE NOT ANY CONTOURS IN THE AREA

LEGEND

- MW-8S 30.82 — EXISTING MONITORING WELL (S-SHALLOW/M-MEDIUM/D-DEEP) GROUNDWATER ELEVATION (IN FEET)
- M-1S — EXISTING MONITORING WELL (S-SHALLOW/M-MEDIUM/D-DEEP) (NOT IN GROUNDWATER MONITORING PLAN)
- PW-1 — EXISTING POTABLE WATER WELL
- SW-1 — EXISTING SURFACE WATER MONITORING LOCATION
- PZ-5A — ABANDONED PIEZOMETER
- PG-1 XX — EXISTING POND GAUGE
- M-5S — ABANDONED MONITORING WELL
- EXISTING CONTOUR
- GROUNDWATER CONTOUR
- PROJECTED GROUNDWATER CONTOUR
- PROPERTY LINE
- EXISTING SURFACE WATER FEATURES
- EXISTING RUBBLE FILL AREA
- EXISTING SCRAP METAL STOCKPILE AREA
- PROPOSED CELL 5 AREA

0 200 400 800
GRAPHIC SCALE IN FEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
AJB	JNS	PL	GAT

SEAL

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. EXPIRATION DATE:

SEMI-ANNUAL SAMPLING EVENT
CENTRAL LANDFILL FACILITY

WORCESTER COUNTY, MARYLAND

GROUNDWATER CONTOUR MAP APRIL 2023 GAUGING EVENT SHALLOW AQUIFER

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle
Hunt Valley, Maryland 21031
(410) 584-7000

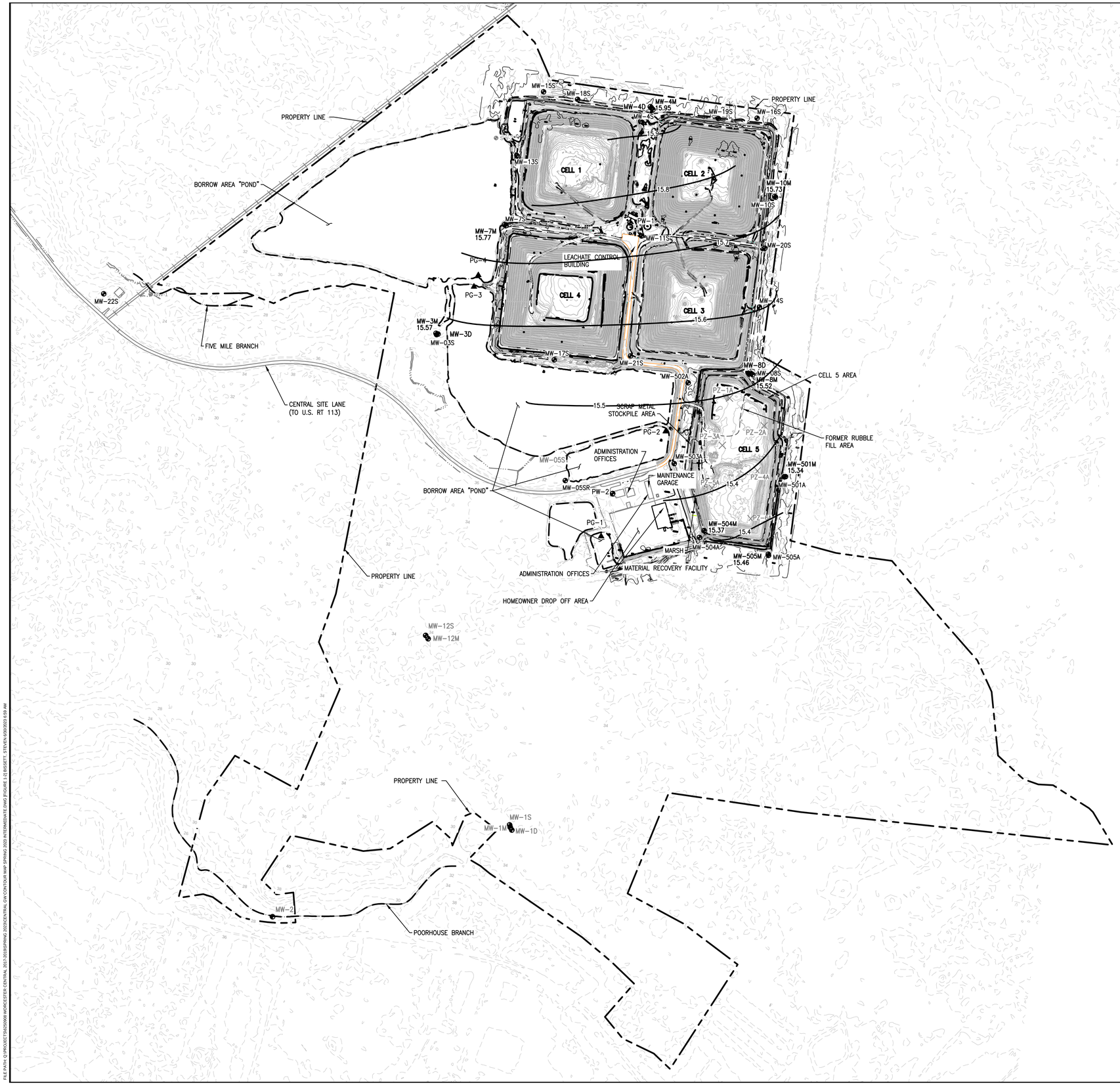
DATE: JUNE 2023

PROJECT NUMBER: 10609.48

Figure 2-2

SHEET: 1 OF 2

NOT FOR CONSTRUCTION



NOTES:

1. SURVEY WITHIN THE SURVEY DELINEATION LINE IS COMPOSED OF SURVEY PERFORMED 9/14/2017, 9/18/2017, 9/19/2017, 3/5/2018, 4/30/2019, 4/20/2020, 3/13/2021, 3/21/2022, AND 12/2022 BY AXIS GEOSPATIAL.
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7. GROUNDWATER CONTOURS ARE SHOWN AT A 0.2 FT INTERVAL.
8. THE PIEZOMETERS WERE ABANDONED IN SPRING 2018 DUE TO CELL 5 CONSTRUCTION.

LEGEND

- M-8S 30.82 — EXISTING MONITORING WELL (S-SHALLOW/M-MEDIUM/D-DEEP) GROUNDWATER ELEVATION (IN FEET)
- M-1S — EXISTING MONITORING WELL (S-SHALLOW/M-MEDIUM/D-DEEP) (NOT IN GROUNDWATER MONITORING PLAN)
- PW-1 — EXISTING POTABLE WATER WELL
- SW-1 — EXISTING SURFACE WATER MONITORING LOCATION
- PZ-5A — ABANDONED PIEZOMETER
- PG-1 XX — EXISTING POND GAUGE
- M-5S — ABANDONED MONITORING WELL
- EXISTING CONTOUR
- GROUNDWATER CONTOUR
- PROJECTED GROUNDWATER CONTOUR
- PROPERTY LINE
- EXISTING SURFACE WATER FEATURES
- EXISTING RUBBLE FILL AREA
- EXISTING SCRAP METAL STOCKPILE AREA
- PROPOSED CELL 5 AREA

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGN INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT MANAGER:
AJB	JNS	PL	GAT

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. EXPIRATION DATE:

SEMI-ANNUAL SAMPLING EVENT
CENTRAL LANDFILL FACILITY

WORCESTER COUNTY, MARYLAND

GROUNDWATER CONTOUR MAP APRIL 2023 GAUGING EVENT INTERMEDIATE AQUIFER

EA Engineering, Science, and Technology, Inc., PBC
Hunt Valley Center
225 Schilling Circle
Hunt Valley, Maryland 21031
(410) 584-7000

DATE: JUNE 2023

PROJECT NUMBER: 62509.08

Figure 2-3

SHEET: 2 OF 2

NOT FOR CONSTRUCTION

N 95,500 | N 95,250 | N 95,000 | N 94,750 | N 94,500 | N 94,250 | N 94,000 | N 93,750 | N 93,500 | N 93,250 | N 93,000 | N 93,250

E 1,222,750 | E 1,223,000 | E 1,222,750 | E 1,222,500 | E 1,222,250 | E 1,222,000 | E 1,221,750

N

MW-3

MW-4

MW-2

MW-1

LIMIT OF WASTE

EXISTING CONCRETE ACCESS ROAD

EXISTING ROLLOFF CONTAINERS

EXISTING DIRT ACCESS ROAD

EXISTING DIRT ACCESS ROAD

EXISTING BORROW AREA

DENSE WOODLAND

NSC WOODLAND

DIRT

BOULDER RIPRAP

W.L. 3.6

LEGEND

- EXISTING TOPOGRAPHIC CONTOUR
- EXISTING WETLAND
- APPROXIMATE PROPERTY LINE
- LIMIT OF WASTE
- EXISTING MONITORING WELL LOCATION — MW-4

200 100 0 200

GRAPHIC SCALE IN FEET

FILE PATH: Q:\PROJECTS\6250902 WORCESTER CLOSED GW\2012 SPRING\POCOMOKE\POCOMOKE 2012-03.DWG [SITE MAP] 6/26/12

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

POCOMOKE SANITARY LANDFILL
WORCESTER COUNTY, MARYLAND

SITE MAP

DESIGNED BY	DRAWN BY	DATE	PROJECT NO.
LJO	JSP	JUNE 2012	10609.32
CHECKED BY	PROJECT MGR.	DRAWING NO.	FIGURE
DOK	GAT	–	1

LEGEND

- EXISTING CONTOUR
- PROPERTY LINE
- EXISTING SPOT ELEVATION (IN FEET) x 7.7
- EXISTING MONITORING WELL WITH GROUNDWATER ELEVATION (IN FEET) EA-6 5.72
- EXISTING PAVED ROAD
- EXISTING EARTH ROAD
- EXISTING STREAM/WATERBODY
- TREES
- TREE LINE
- EXISTING FENCE
- EXISTING STRUCTURES
- LIMIT OF CLOSURE CAP LINER
- EXISTING ELECTRIC POLE

200 100 0 200

GRAPHIC SCALE IN FEET

FILE PATH: C:\PROJECTS\6250902 WORCESTER CLOSED GW\2012 SPRING\SNOW HILL\SNOW HILL - BOUNDARY.DWG [LAYOUT1] 6/29/12

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

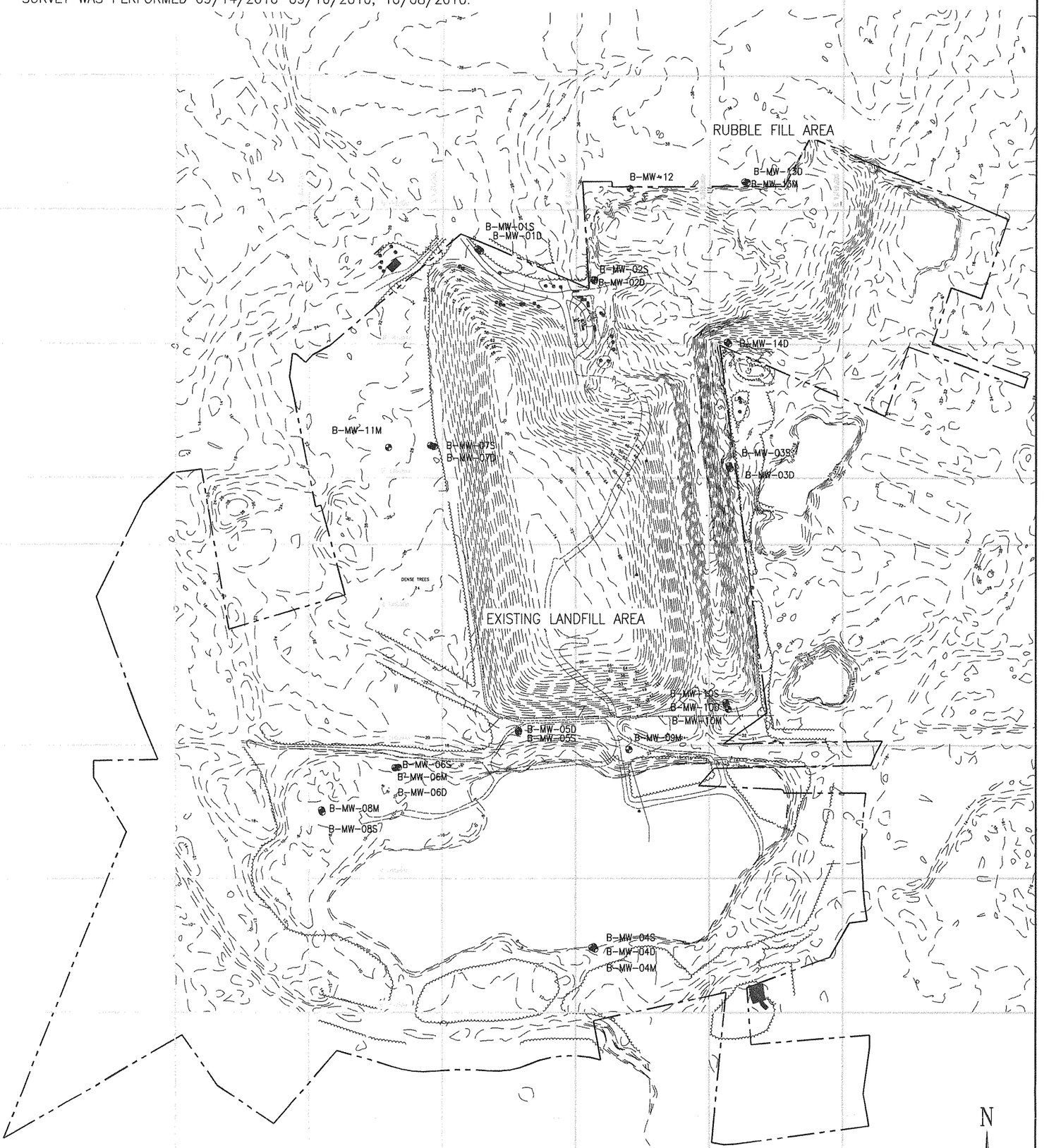
SNOW HILL SANITARY LANDFILL
WORCESTER COUNTY, MARYLAND

SITE MAP

DESIGNED BY	DRAWN BY	DATE	PROJECT NO.
LJO	JSP	JUNE 2012	10609.32
CHECKED BY	PROJECT MGR.	DRAWING NO.	FIGURE
DOK	GAT	–	1

FILE PATH: (LOVETON) G:\PROJECTS\6250902 WORCESTER CLOSED GW\2012 SPRING\BERLIN\BERLIN 2011-09-01 6-29-12.DWG [2-4] 6/29/12

NOTE: RUBBLE FILL TOPOGRAPHY IS PRESENTED AS DETERMINED DURING A FIELD SURVEY DURING 11/20/2008-12/18/2008. REMAINING TOPOGRAPHY WAS PROVIDED VIA AERIAL PHOTOGRAMMETRY BY HARFORD AERIAL SURVEYS INC. IN MARCH 1991. MONITORING WELL SURVEY WAS PERFORMED 09/14/2010-09/16/2010, 10/08/2010.



LEGEND

- B-MW-05 EXISTING MONITORING WELL
- -30- EXISTING CONTOUR
- EXISTING ROAD
- PROPERTY LINE

400 200 0 400 800

GRAPHIC SCALE IN FEET

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BERLIN SANITARY LANDFILL
WORCESTER COUNTY, MARYLAND

SITE MAP

PROJECT MGR.	DESIGNED BY	DRAWN BY	CHECKED BY	DATE	SCALE	PROJECT NO.	FILE NAME	DRAWING NO.	FIGURE
GAT	LJO	NJH	DOK	JUNE 2012	AS SHOWN	62509.02	--	--	1