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**Technical Support Document
 Proposed Title V Permit Renewal
 Sierra Estrella Landfill
 Permit #V20696.000**

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1. BACKGROUND

1.1 Applicant/Application History

This permit renewal pertains to an existing solid waste landfill facility, owned and operated by Sierra Estrella Landfill, Inc., a subsidiary of Waste Management Arizona Landfills, an Arizona corporation. The facility opened in 1994, with an overall site area of about 300 acres. The facility, commonly known as the Sierra Estrella Landfill, is located on 22087 North Ralston Road, Maricopa, Arizona, upon a parcel also identified by Pinal County Assessor's Parcel #510-79-002C4.

1.2 Attainment Classification

This facility is located in an area designated as non-attainment for PM10 and PM2.5.

1.3 Permitting History

The following is a list of permits applied for and/or issued since 1990 with respect to the Sierra Estrella Landfill:

Permit #	Permit Type	Issued Date	Changes
A20500	Installation Permit	4/22/94	
V20605.000	Title V	6/15/98	Initial Title V
V20618.000	Renewal	8/22/03	Addition to the list of allowed "daily covers", and non-road engines.
V20634.000	Renewal	7/2/08	
V20655.000	Renewal	7/31/13	Renewal V20655.000 made the following changes: Fugitive emissions from the paved and unpaved roads were revised based upon a lower expected waste acceptance for future years of operations.
V20673.000	Renewal		Added the West Pinal Fugitive Dust rule requirements, NSPS 40 CFR Part 60 Subpart IIII for engines and NESHAP ZZZZ 40 CFR Part 63 Subpart ZZZZ for engines and updates references.

V20696.000	Renewal	4/27/23	Adds the requirements of Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills, 40 CFR Part 60, Subpart Cf and National Emission Standards for Hazardous Air Pollutants for existing and new municipal solid waste (MSW) landfills, Subpart AAAA.
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1.4 Compliance/Enforcement History

Sierra Estrella landfill has been inactive since 2000, and inspections have not been conducted during this shutdown period.

Annual NMOC report have been submitted in accordance with NSPS requirements, and the initial Tier 2 modeling was conducted in 2011 to determine site-specific parameters to analyze when the landfill will reach 50 Mg/yr of NMOC emissions, the threshold for the requirement to install controls. The Landfill completed its most recent landfill New Source Performance Standard (NSPS) Tier 2 sampling and analysis in January 2016 which was reported to the PCAQCD in March 2016. The results of the test showed an average non-methane organic compound (NMOC) concentration of approximately 249 parts per million volume as hexane (ppmv), and the resulting NMOC emission rate for 2016 was 3.0 Mg/yr. The 2016 Tier 2 analysis has expired and the facility has opted to use the Tier 1 default NMOC concentration of 4,000 ppmv for NMOC calculations. Based upon this concentration and the low waste acceptance rate, the Landfill would not exceed 34 Mg/yr. during the next permit term (2023-2028).

2. PROCESS DESCRIPTION

2.1 General Process

The principal business activity consists of providing a controlled and managed repository for solid wastes. Examples of such wastes include municipal solid waste, construction debris, demolition material, dead animals, auto shredder fluff, incinerator ash, non-infectious medical wastes, dried waste water treatment plant sludge and petroleum contaminated soils. Asbestos materials are independently managed and segregated in a controlled area.

The natural decomposition of the waste materials, and to some extent the evaporation of volatile compounds in the waste materials, constitutes the primary sources of emissions.

Traffic delivering waste materials generates particulate emissions (PM₁₀) or dust. In addition, the daily application of a cover layer of soil also produces PM₁₀ emissions, resulting from soil stockpiling, cover layer distribution, and wind erosion. Soil is typically used as a daily cover material; however, other alternatives as expressly approved under this permit may also be used. Diesel-driven equipment also emit oxides of nitrogen (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), particulate matter (PM_{2.5}), and sulfur dioxide (SO₂) and may operate at the facility.

The facility design includes a liner system, which collects any liquids, or leachate, that drains from the mass of waste materials. A collection system and pump allows the leachate to be extracted,

collected, and eventually sprayed back onto lined cells in the facility, effectively amounting to a leachate drying system. Eventually, any volatile fraction will evaporate or decompose, and those compounds will escape as emissions.

3. EMISSIONS

3.1 General Methodology

3.1.1 Landfill Gas Emissions (40 CFR 60, Subpart Cf)

The natural decomposition of waste materials produces surface emissions of VOCs, HAPs and NMOCs. EPA policy memorandum from 10/21/1994 indicates that landfill gas emissions which are reasonably collectable are to be considered non-fugitive regardless of whether a gas system is in-place. AP-42 suggests that 65-85% of the landfill gas should be considered collectable. Therefore, permittee has used the industry acceptable 75% for purposes of calculations. The remaining 25% are considered fugitive.

Landfill gas generation estimates were developed using a landfill gas model which mimics EPA's LandGEM 3.02, using the parameters recommended¹ in AP-42. The facility has a peak disposal capacity of 24,647,000 tons. At the end of the next permit period, in 2028, the forecasted waste-in-place will be 396,300.

- Collectable Emissions:

Once the estimated NMOC emission rate exceeds 34 Mg/yr. threshold, the permittee will design and install an active gas collection and control system (GCCS). The GCCS will be designed to collect the 75% of the landfill gas considered collectable. The date of installation of this system will be determined by when the 34 Mg/yr. level is triggered. The NMOCs, VOCs, and HAPs from the flare will be estimated based on a 98% control efficiency. Emissions of PM10 and Sox will be based on emission factors from AP-42, Section 2.4. And emissions of CO and NOx will be based on manufacturer's guarantees.

- Fugitive Emissions:

NMOC emissions are based on the regulatory Tier 1 default NMOC concentration (4,000 ppmv). VOC emissions were estimated by assuming 39% of the NMOCs are VOCs, as indicated in AP-42, Table 2.4-2. For the next permit period, the maximum NMOC generated will occur in 2023 and is modeled to be 21 M/yr.

Concentrations of HAPs were taken from the Waste Industry Air Coalition (WIAC) study of constituents of landfill gas.

3.1.2 Particulate Matter from Landfill Operations

The following activities on-site generate fugitive particulate matter (PM10 and PM2.5) emissions: the use of paved and unpaved roads by vehicles (refuse and others); construction activities including heavy equipment traffic; and, the excavation, transportation, stockpiling, deposition of cover materials. PM10 and PM2.5 emissions have been calculated using AP-42 methodologies.

¹k = 0.02, L_o = 100 m³/Mg

3.1.3 Leachate Management

Leachate is generated by precipitation and other moisture that percolates through the refuse mass and is collected in the leachate collection system and is sent to a tank for temporary storage prior to being used for dust control. The collection and storage of leachate generates emissions of VOCs and HAPs. Emissions from the leachate management were calculated using mass balance, assuming 100% volatilization.

3.1.4 Internal Combustion Engines

The permit allows the use of a tipper engine, a light plant engine, a steam cleaner engine, a water pump and other sources defined as insignificant. Renewal V20673.000 added NSPS 40 CFR Part 60 Subpart IIII for 2007 and newer engines and NESHAP ZZZZ 40 CFR Part 63 Subpart ZZZZ for 2006 and older engines. AP-42 emission factors have been used for calculating emissions from these equipment.

3.1.5 Underground Storage Tanks (USTs)

While no USTs are present on site, the permit allows the installation of up to 2 diesel and gasoline tanks on site, which due to their capacities will be considered Insignificant Activities. Most likely these tanks will be above ground storage tanks.

3.1.6 Asbestos

The landfill is permitted for disposal of both friable and non-friable asbestos-containing waste in accordance with the applicable regulations, and in a separate area of the facility.

3.2 Actual and Potential Emissions

Pollutant	2021 Actual (tpy)	PTE (tpy)
PM _{2.5}	0.44	2.86
PM ₁₀ ³	0.89	5.72
CO	0.00	0.00
NOX	0.00	0.00
SO ₂	0.00	0.00
VOCs	5.6	5.32
NMOCs	14.35	13.63
HAPs	0.29	0.28

Notes: Actual and potential emissions are provided for informational purposes and are not compliance limits. Potential emissions are based on V20696.000 renewal application emission estimates plus potential emission from the stationary engines (on site more than 12 months) that were listed in the application.

4. REGULATORY REQUIREMENTS AND MONITORING

³This includes fugitive emissions, which are not counted towards the major source or significance thresholds.

4.1 TITLE V/PSD Applicability

In accordance with PCAQCD §1-3-140.80, this source is not a major source since all the emissions are below 100 tons per year, and 10 tons per year of any single HAP or 25 tons per year of combined HAPs. While not a major source, landfills with a design capacity equal or greater than 2.5 million Megagrams are subject to 40 CFR Part 60, Subpart WWW and also subject to Part 70 permitting requirements. This facility first obtained a Title V permit in 1998.

4.2 NSPS/NESHAP Applicability

1. NSPS Cf and Control System Requirements

On July 8, 2019, the EPA approved a section 111(d) plan submitted by the department with respect to the promulgation of Federal NSPS and emission guidelines requirements for MSW landfills, 40 CFR Part 60, Subpart XXX and Cf respectively. The plan became effective March 20, 2020.

This facility is subject to the requirements of 40 CFR 60 Subpart Cf, Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills. This Subpart requires that 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. This standard requires that a calculation of NMOC emissions be made annually to determine applicability. For the next permit period, the NMOC generation is modeled to be 21.1 Mg/yr. Since the NMOC emission rate is less than the regulatory threshold of 34 Mg/yr., the facility is not required to submit a design for a collection and control system. In an event the NMOC emission of 34 Mg/yr. is exceeded, then either a collection and control system is required in accordance with Sections §60.33f.(b) and (c) of the Subpart Cf, ~~WWW~~, or Permittee has an option to determine a site-specific NMOC concentration and recalculate the NMOC emission rate using either the Tier 1 methodology as listed in Section §60.35f.(a).(2), Tier 2 methodology as listed in Section §60.35f.(a).(3), or Tier 3 methodology listed in Section §60.35f.(a).(4) 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 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 via CEDRI except 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, 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. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.

2. NESHAP, AAAA Requirements

This facility is also subject to the requirements of 40 CFR Part 63 Subpart AAAA, National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills. Once the landfill exceeds the NESHAP NMOC threshold of 50 Mg/yr., the facility is subject to the operational requirements of the regulation. This includes startup, shutdown, malfunction (SSM) requirements, and additional reporting requirements. The SSM plan is effective upon the installation of collection and control system.

3. Renewal V20673.000 add NSPS 40 CFR Part 60 Subpart IIII for 2007 and newer engines and NESHAP ZZZZ 40 CFR Part 63 Subpart ZZZZ for 2006 and older engines.

4.3 GHG Emissions

A Supreme Court ruling in 2014 determined that a facility determined that a source must trigger PSD or NNSR applicability for other pollutants in order to trigger regulatory applicability for GHG emissions. Since this source is not a major source under the PSD or NNSR program the permit does not contain GHG regulatory provisions.

4.4 Regulatory Emission Limitations and Compliance/Monitoring

1 Compliance Assurance Monitoring (CAM)

The requirements of 40 CFR Part 64, CAM, do not apply to this source since it is not a major source for any pollutants.

5. AMBIENT IMPACT ASSESSMENT - PM10

The changes to the permit do not include significant increases in emissions of PM10, therefore, no additional impact assessments have been conducted for this revision.

6. LIST OF ABBREVIATIONS

AOS.....	Alternative Operating Scenario
AP-42
“Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources”, 5 th Edition	
CAA	Clean Air Act
CAM.....	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CO	Carbon Monoxide
EPA	Environmental Protection Agency
HAP	Hazardous Air Pollutant
hr	Hour
lb.....	Pound
MACT	Maximum Achievable Control Technology
MMBTU.....	Million British Thermal Units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMOC.....	Non-Methane Organic Compounds
NO _x	Nitrogen Oxides
NSPS	New Source Performance Standard
NSR	New Source Review
PCAQCD.....	Pinal County Air Quality Control District
PGCAQCD.....	Pinal-Gila Counties Air Quality Control District
PM ₁₀	Particulate Matter nominally less than 10 Micrometers
PM _{2.5}	Particulate Matter nominally less than 2.5 Micrometers
PSD	Prevention of Significant Deterioration
PTE.....	Potential to Emit
SIC	Standard Industrial Code
SO _x	Sulfur Dioxide
tpy.....	tons per year
TSD	Technical Support Document
UST	Underground Storage Tank
VOC	Volatile Organic Compound
yr	Year