Title V Renewal Application
Caja del Rio Landfill

Santa Fe Solid Waste Management Agency
149 Wildlife Way
Santa Fe, New Mexico 87506
(505) 424-1850

SCS ENGINEERS

SCS File No. 16218001.00.T9 | August 2021

1901 Central Drive, Suite 550
Bedford, Texas 76021
(817) 571-2288

SCS ENGINEERS Environmental Consultants & Contractors

August 20, 2021
File No. 16218001.00.T9

Ms. Melinda Owens
New Mexico Environmental Department
Title V Permit Program Manager
525 Camino de los Marquez, Suite 1
Santa, Fe, NM 87505

Subject: Title V Permit Renewal Application
Operating Permit No. P185LR3M1
Caja del Rio Landfill
Santa Fe, New Mexico

Dear Ms. Owens:

On behalf of the Santa Fe Solid Waste Management Agency (SFSWMA), SCS Engineers is pleased to submit this Title V permit renewal application for the Caja del Rio Landfill. The landfill currently operates under Title V Operating Permit P185LR3M1. This renewal is timely in that is has been submitted prior to the required August 30, 2021 renewal application due date.

Both hard copy and electronic copies are being included as set forth on the Universal Air Quality Permit Application form for a Title V Permit renewal.

If you have any questions, please do not hesitate to contact Joseph Krasner, P.E. at (817) 358-6110.

Sincerely,

Joey Krasner

Joseph D. Krasner, P.E.
Project Manager
SCS Engineers

David J. Mezzacappa 8/20/2021

DAVID J. MEZZACAPPA NEW MEXICO 15236 PROFESSIONAL ENGINEER

David J. Mezzacappa, P.E.
Vice President
SCS Engineers

Attachment

cc: Randall Kippenbrock, P.E., SFSWMA (e-copy)
Danita Boettner, P.E., SFSWMA

RECEIVED
AUG 30 2021
Air Quality Bureau

Mail Application To: New Mexico Environment Department Air Quality Bureau Permits Section 525 Camino de los Marquez, Suite 1 Santa Fe, New Mexico, 87505 Phone: (505) 476-4300 Fax: (505) 476-4375 www.env.nm.gov/aqb	NEW MEXICO ENVIRONMENT DEPARTMENT	**For Department use only:** RECEIVED AUG 3 0 2021 Air Quality Bureau AIRS No.:

Universal Air Quality Permit Application

Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well. See Section 1-I for submittal instructions for other permits.

This application is submitted as (check all that apply): ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☐ Existing Permitted (or NOI) Facility ☒ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ a NOI 20.2.73 NMAC ☐ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☒ Title V renewal ☐ TV minor mod. ☐ TV significant mod. TV Acid Rain: ☐ New ☐ Renewal
PSD Major Source: ☐ PSD major source (new) ☐ minor modification to a PSD source ☐ a PSD major modification

Acknowledgements:
☑ I acknowledge that a pre-application meeting is available to me upon request.
☑ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.
☐ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).
☐ Check No.: in the amount of
☑ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.
☑ I acknowledge there is an annual fee for permits in addition to the permit review fee: www.env.nm.gov/air-quality/permit-fees-2/.
☐ This facility qualifies for the small business fee reduction per 20.2.75.11.C. NMAC. The full $500.00 filing fee is included with this application and I understand the fee reduction will be calculated in the balance due invoice. The Small Business Certification Form has been previously submitted or is included with this application. (Small Business Environmental Assistance Program Information: www.env.nm.gov/air-quality/small-biz-eap-2/.)

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.70.201.A.2 NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

Section 1 – Facility Information

Section 1-A: Company Information

		AI # if known (see 1st 3 to 5 #s of permit IDEA ID No.): 1484	Updating Permit/NOI #: P185LR3M1
1	Facility Name: Caja del Rio Landfill	Plant primary SIC Code (4 digits): 4953	
		Plant NAIC code (6 digits): 562212	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): 149 Wildlife Way, Santa Fe, NM 87506		
2	Plant Operator Company Name: Santa Fe Solid Waste Management Agency	Phone/Fax: (505) 424-1850/ (505) 424-1839	
a	Plant Operator Address: 149 Wildlife Way, Santa Fe, NM 87506		

b	Plant Operator's New Mexico Corporate ID or Tax ID: State Tax ID 02-331303-000	
3	Plant Owner(s) name(s): Santa Fe Solid Waste Management Agency	Phone/Fax: (505) 424-1850/ (505) 424-1839
a	Plant Owner(s) Mailing Address(s): 149 Wildlife Way, Santa Fe, NM 87506	
4	Bill To (Company): Santa Fe Solid Waste Management Agency	Phone/Fax: (505) 424-1850/ (505) 424-1839
a	Mailing Address: 149 Wildlife Way, Santa Fe, NM 87506	E-mail: RKippenbrock@sfswma.org
5	☒ Consultant: SCS Engineers, Inc., Joseph Krasner, PE; Air Quality Services, Inc, Bruce Nicholson, PE	Phone/Fax: 817.358.6108/ 817.571-2188 Phone/Fax: (505) 982-2737
a	Mailing Address: SCS Engineers,1901 Central Dr., Suite 550, Bedford, TX 76021 Air Quality Services, PO Box 6324, Santa Fe, NM 87502	E-mail: JKrasner@SCSEngineers.com, Brucnichol@aol.com
6	Plant Operator Contact: Mr. Randall Kippenbrock, P.E.	Phone/Fax: (505) 424-1850 x100/(505) 424-1839
a	Address: 149 Wildlife Way, Santa Fe, NM 87506	E-mail: RKippenbrock@sfswma.org
7	Air Permit Contact: Mr. Randall Kippenbrock, P.E.	Title: Executive Director
a	E-mail: RKippenbrock@sfswma.org	Phone/Fax: (505) 424-1850 x100/(505) 424-1839
b	Mailing Address: 149 Wildlife Way, Santa Fe, NM 87506	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ☒ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☒ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☒ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☐ Yes ☒ No
3	Is the facility currently shut down? ☐ Yes ☒ No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☒ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐Yes ☐No ☐N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☒ Yes ☐ No	If yes, the permit No. is: P-185LR3M1
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☒ No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☒ No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☐ Yes ☒ No	If yes, the permit No. is:
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ☒ No	If yes, the register No. is:

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: See Section 21	Daily:	Annually:
b	Proposed	Hourly:	Daily:	Annually:
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: See Section 21	Daily:	Annually:

b	Proposed	Hourly:	Daily:	Annually:

Section 1-D: Facility Location Information

1	Section: portions of 21,22,27,28	Range: 8E	Township: 17N	County: Santa Fe	Elevation (ft): 6430
2	UTM Zone: ☐ 12 or ☒ 13			Datum: ☒ NAD 27 ☐ NAD 83 ☐ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 401148 m			UTM N (in meters, to nearest 10 meters): 3949023 m	
b	**AND** Latitude (deg., min., sec.): 35 40 55.04			Longitude (deg., min., sec.): 106 5 32.55	
3	Name and zip code of nearest New Mexico town: Santa Fe NM 87506				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): from 599 turn onto the north frontage road and follow west to Caja del Rio Rd., proceed north to Wildlife Way, turn left onto Wildlife Way and proceed to the entrance of the landfill.				
5	The facility is 3.3 miles NW (direction) of Santa Fe (nearest town).				
6	Status of land at facility (check one): ☐ Private ☐ Indian/Pueblo ☐ Federal BLM ☐ Federal Forest Service ☒ Other (specify) Government				
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: City of Santa Fe, Santa Fe County, Tesuque Pueblo 6.3 mi				
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/aqb/modeling/class1areas.html)? ☐ Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers:				
9	Name nearest Class I area: Bandelier Wilderness				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 16.4 km				
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: Approx. 2/3 miles (1070m) – Golf Course club house				
12	Method(s) used to delineate the Restricted Area: Bermed and natural barriers plus fenced and gated. "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.				
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ☒ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.				
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☐ No ☒ Yes If yes, what is the name and permit number (if known) of the other facility? **Del Hur Industries, NSR permit #GCP2-2976**				

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{\text{hours}}{\text{day}}$): See Sec 21	($\frac{\text{days}}{\text{week}}$): See Sec 21	($\frac{\text{weeks}}{\text{year}}$):See Sec 21	($\frac{\text{hours}}{\text{year}}$):See Sec 21		
2	Facility's maximum daily operating schedule (if less than 24 $\frac{\text{hours}}{\text{day}}$)?	Start: See sec 21	☐AM ☐PM	End:	☐AM ☐PM	
3	Month and year of anticipated start of construction:					
4	Month and year of anticipated construction completion:					
5	Month and year of anticipated startup of new or modified facility:					

6	Will this facility operate at this site for more than one year? ☐ Yes ☐ No

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes ☒ No If yes, specify: Area of concern to correct permit from Journey Nolan (pump HP)		
a	If yes, NOV date or description of issue: N/A		NOV Tracking No: N/A
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☒ No If Yes, provide the 1c & 1d info below:		
c	Document Title:	Date:	Requirement # (or page # and paragraph #):
d	Provide the required text to be inserted in this permit:		
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? ☒ Yes ☐ No		
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes ☒ No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☒ Yes ☐ No		
a	If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☒ **Minor** (☒ <10 tpy of any single HAP **AND** ☒ <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☒ No		
a	If yes, include the name of company providing commercial electric power to the facility: ___________________ Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

Section 1-G: Streamline Application

(This section applies to 20.2.72.300 NMAC Streamline applications only)

1	☐ I have filled out Section 18, "Addendum for Streamline Applications."	☐ N/A (This is not a Streamline application.)

Section 1-H: Current Title V Information - Required for all applications from TV Sources

(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC): Mr. Randall Kippenbrock, P.E.	Phone: (505) 424-1850 x100
a	R.O. Title: Executive Director	R.O. e-mail: RKippenbrock@sfswma.org
b	R. O. Address: 149 Wildlife Way, Santa Fe, NM 87506	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):	Phone:
a	A. R.O. Title:	A. R.O. e-mail:
b	A. R. O. Address:	
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship): None	
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.): N/A	
a	Address of Parent Company: N/A	
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.): N/A	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations: Mr. Randall Kippenbrock, (505) 424-1850 x100	
7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers: **Yes – See section 19.8**	

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package printed double sided 'head-to-toe' 2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Please include a copy of the check on a separate page.

2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy should be printed in book form, 3-hole punched, and **must be double sided**. Note that this is in addition to the head-to-to 2-hole punched copy required in 1) above. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.

3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically. Electronic files for applications for NOIs, any type of General Construction Permit (GCP), or technical revisions to NSRs must be submitted with compact disk (CD) or digital versatile disc (DVD). For these permit application submittals, **two** CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal. Electronic files for other New Source Review (construction) permits/permit modifications or Title V permits/permit modifications can be submitted on CD/DVD or sent through AQB's secure file transfer service.

Electronic files sent by (check one):

☒ CD/DVD attached to paper application

☐ secure electronic transfer. Air Permit Contact Name____________________________

Email______________________________

Phone number _______________________

a. If the file transfer service is chosen by the applicant, after receipt of the application, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Submission of the electronic files through the file transfer service needs to be completed within 3 business days after the invitation is received, so the applicant should ensure that the files are ready when sending the hard copy of the application. The applicant will not need a password to complete the transfer. **Do not use the file transfer service for NOIs, any type of GCP, or technical revisions to NSR permits.**

4) Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD) following the instructions above and the instructions in 5 for applications subject to PSD review.

5) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver** and/or electronic air dispersion modeling report, input, and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau.

6) If the applicant submits the electronic files on CD and the application is subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

   If the application is submitted electronically through the secure file transfer service, these extra CDs do not need to be submitted.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted as 2 separate CDs or submitted through the AQB secure file transfer service. Submit a single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible

format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 4 electronic files (3 MSWord docs: Universal Application section 1 [UA1], Universal Application section 3-19 [UA3], and Universal Application 4, the modeling report [UA4]) and 1 Excel file of the tables (Universal Application section 2 [UA2]). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: “A-3423-FacilityName”. The “A” distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with “A-”. Modifications to existing facilities should use the core permit number (i.e. ‘3423’) the Department assigned to the facility as the next 4 digits. Use ‘XXXX’ for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: “A-3423-9-description”, where “9” stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision number (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. Do not use special symbols (#, @, etc.) in file names. The footer information should not be modified by the applicant.

Table of Contents

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Manufacturer	Model #	Serial #	Maximum or Rated Capacity (Specify Units)	Requested Permitted Capacity (Specify Units)	Date of Manufacture or Reconstruction[2] Date of Installation /Construction[2]	Controlled by Unit # Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	Applicable State & Federal Regulation(s) (i.e. 20.2.X, JJJJ, …)	Replacing Unit No.
Flare	Enclosed Gas Collection flare	John Zink	ZTOF	BF-9099773	120-1200 cfm	500 cfm	1-Apr-10 10-Apr-10	none F-1	50100410	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	NSPS XXX, NESHAP AAAA	NA
PCS	Petroleum contaminated soil landfarming	NA	NA	NA		10,000 cuyd/yr	NA NA	NA NA		☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced		
ACC	Active customer disposal cell, compaction, face cover	NA	NA	NA	NA	NA	NA NA	NA NA	50100402	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
ACG	Active customer disposal cell, grading	NA	NA	NA	NA	NA	NA NA	NA NA	50100402	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
R2B	Customer travel within active cell	NA	NA	NA	NA	NA	NA NA	NA NA	50100401	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
C2	Cell construction	NA	NA	NA	NA	NA	NA NA	NA NA	50100402	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
R1	Customer paved road	NA	NA	NA	NA	NA	NA NA	NA NA	50100401	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
R2	Customer unpaved road	NA	NA	NA	NA	NA	NA NA	NA NA	50100401	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
R3	Green waste cold mill road	NA	NA	NA	NA	NA	NA NA	NA NA	50100401	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
R4	Green waste unpaved road	NA	NA	NA	NA	NA	NA NA	NA NA	50100401	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	none	NA
G0	Green waste chipper	Morbark	3400XT	194-1111	1000 cu yd/hr	1000 cu yd/hr	11/30/2020 6/1/2021	NA NA	50100402	☐ Existing (unchanged) To be Removed New/Additional X Replacement Unit To Be Modified To be Replaced	none	NA

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.

[2] Specify dates required to determine regulatory applicability.

[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Manufacturer	Model #	Serial #	Maximum or Rated Capacity (Specify Units)	Requested Permitted Capacity (Specify Units)	Date of Manufacture or Reconstruction[2] / Date of Installation /Construction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	Applicable State & Federal Regulation(s) (i.e. 20.2.X, JJJJ, …)	Replacing Unit No.
C3	Cell top cover, load & unload	NA	NA	NA	NA	NA	NA / NA	NA / NA	50100402	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	None	NA
HS	Scraper haul roads, face cover, stockpile top cover	NA	NA	NA	NA	NA	NA / NA	NA / NA	50100401	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	None	NA
W1	Wind erosion all active areas	NA	NA	NA	NA	NA	NA / NA	NA / NA	50100402	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	None	NA
Trom	Duratech Trommel Screen	Duratech	7216	30-6-FI-0111	15 tph	15 tph	/ 6/23/2003	/ NA	50100402	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced	None	NA
										☐ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced		
										Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced		
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										Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced		
										Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced		
										Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced		
										Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced		

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.
[2] Specify dates required to determine regulatory applicability.
[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.nmenv.state.nm.us/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.300.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at http://www.nmenv.state.nm.us/aqb/forms/InsignificantListTitleV.pdf . TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
Diesel Fuel Tank	Diesel fuel storage tank(vp= 0.38 mm Hg)			6000			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5		
Gasoline Fuel Dispensing Tank	gasoline fuel dispensing tank			500			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	8		
Lube Oil Tank	lube oil tank(Vp= 0.003 mm Hg)			275			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5		
Antifreeze Tank	Antifreeze tank(vp = 0.047mm Hg)			275			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5		
Hydraulic Oil	Hydraulic oil tank(vp=0.003mm Hg)			275			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5		
Used Motor Oil Tank	Used motor oil tank(vp=0.003 mmHg)			500 or 1000			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5		
Flare Condensate tank	Tank for flare condensate (vp= 0.38 mm Hg)	Core-Rosion Products	41103000	3000		17-Nov-09	☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5	11-Dec-09	
Trom-Eng	Trommel screen drive engine	Isuzu	4JB1	70			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				hp	6	23-Jun-03	
individual closed 55 gal drums new motor oil or antifreeze	individual closed 55 gal drums new motor oil or antifreeze	NA		55			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5		
Solvent Closed Tanks	solvent closed tanks	NA		5			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				gallons	5 or trivial 24		
Godwin Pump Diesel Eng	water pump engine	John Deere		80			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				hp	6	27-Jun-05	
Maint Bldg Space Heating	Maint bldg space heating			0.11			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				million BTU/hr	3		
Maint bldg hot water heter	Maint bldg hot water heter			0.7			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				million BTU/hr	3		

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated March 24, 2005. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify dates required to determine regulatory applicability.

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.nmenv.state.nm.us/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.300.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at http://www.nmenv.state.nm.us/aqb/forms/InsignificantListTitleV.pdf . TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
Scale house heat/AC	Scale house heat/AC			0.115			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				million BTU/hr	3		
Scale house domestic hot water	Scale house domestic hot water			0.03			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				million BTU/hr	3		
Admin bldg-space heater	Admin bldg-space heater			0.065			☒ Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
				million BTU/hr	3		
G1	Green waste chipper engine	Morbark	3400XT	800		11/30/2020	Existing (unchanged) To be Removed New/Additional ☑ Replacement Unit To Be Modified To be Replaced
			BDN04837	HP	6	6/1/2021	
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced
							Existing (unchanged) To be Removed New/Additional Replacement Unit To Be Modified To be Replaced

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated March 24, 2005. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify dates required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions.

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
Flare	Enclosed Flare to combust collected landfill gas	April 10, 2010	collected landfill gases	NA	est 98%-99.2% combustion effy	Source test

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

Table 2-D: Maximum Uncontrolled Emissions (under normal operating conditions)[1]

This Table was intentionally left blank because it would be identical to Table 2-E.

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed with a minimum of two significant figures[1] If there are any significant figures to the left of a decimal point, there shall be no more than one significant figure to the right of the decimal point.

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		NMOC	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Flare	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G1	3.91	17.13	0.01	0.04	0.01	0.04	0.28	1.23	0.04	0.18	0.04	0.18	0.04	0.18				
Landfill Operations (ACC, ACG, R2B, C2, C3, HS, W1)									182.00	797.16	46.83	205.11	4.68	20.51				
Customer Roads (R1-R4)									227.57	996.77	58.00	254.04	5.80	25.40				
Green Waste (G0, Trom)									1.75	7.66	0.84	3.70	0.22	0.95				
Landfill					8.43	36.93									0.24	1.05	21.62	94.70
PCS[3]					3.59	15.74												
Totals	3.91	17.13	0.01	0.04	12.03	52.71	0.28	1.23	411.36	1801.76	105.71	463.02	10.74	47.04	0.24	1.05	21.62	94.70

[1] **Significant Figures Examples:** One significant figure – 0.03, 3, 0.3. Two significant figures – 0.34, 34, 3400, 3.4

[2] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations.

[3] VOC as total petroleum hydrocarbons

Table 2-E: Requested Allowable Emissions[1]

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this tablewith the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed with a minimum of two significant figures[1]. If there are any significant figures to the left of a decimal point, there shall be no more than one significant figure to the right of the decimal point. Please do not change the column widths on this table.

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		NMOC	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Flare	0.90	3.94	3.00	13.14	0.03	0.15	2.00	8.74	0.25	1.11	0.25	1.11	0.25	1.11			0.09	0.38
G1	3.91	8.56	0.01	0.02	0.01	0.02	0.28	0.62	0.04	0.09	0.04	0.09	0.04	0.09				
Landfill Operations (ACC,ACG, R2B,C2,C3, HS,W1)									81.51	222.31	21.22	58.27	2.12	5.80				
Customer Roads (R1-R4)									17.12	37.50	4.36	9.56	0.44	0.96				
Green Waste (G0, Trom)									1.75	3.83	0.84	1.85	0.22	0.48				
Landfill					4.22	18.47									0.12	0.53	10.81	47.35
PCS[3]					3.59	15.74												
Totals	4.81	12.50	3.01	13.16	7.85	34.37	2.28	9.36	100.68	264.85	26.72	70.88	3.07	8.43	0.12	0.53	10.90	47.73

[1] **Significant Figures Examples**: One significant figure – 0.03, 3, 0.3. Two significant figures – 0.34, 34, 3400, 3.4

[2] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations.

3 VOC as total petroleum hydrocarbons

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)[1]

☒ This table is intentionally left blank as all SSM emissions at this facility do not require an increase in Requested Allowables greater than those listed in Table 2-E. If you are required to report GHG emissions as described in Section 21, include any GHG emissions due Startup, Shutdown, and/or Scheduled Maintenance in Table 2-P. Provide explanation in Section 6.

All applications, including NOI applications, must fill out this table, reporting Maximum Emissions during Startup, Shutdown and Scheduled Maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). Only report SSM emissions greater than the cooresponding Table 2-E emissions[1]. Not providing emissions for a unit indicates that SSM emissions for this unit are less than the Requested Allowables for that unit in Table 2-E. In Section 6, provide emissions calculations for any emissions listed in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.nmenv.state.nm.us/aqb/permit/app_form.html) for more detailed instructions. List all units and SSM fugitives, except GHGs, in this table. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals																		

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in the table below. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[2] **Condensables**: Include condensable particulate matter emissions in particulate matter calculations.

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

☒ I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		TSP		PM10		PM2.5		H_2S or Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package.

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter or L x W (ft)
						(acfs)	(dscfs)			
F-1	Flare	V	No	30	1173 F	460	109	5.76	11.96	7.00
G-1	G1	V	No	13	718	55	21	0.0915	278.8	0.50

1 Flow does not include pilot. The pilot is only on during startup and not continuously.

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A “-” symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

Stack No.	Unit No.(s)	Total HAPs		Largest HAP, HCL ☒ HAP or TAP		Largest HAP, formaldehyde ☒ HAP or TAP		Benzene ☒HAP or TAP		Ethylbenzene ☒ HAP or TAP		Toluene ☒ HAP or TAP		Xylene ☒ HAP or TAP		Provide Pollutant Name Here HAP or TAP		Provide Pollutant Name Here HAP or TAP	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
F-1	flare	0.122	0.536	0.119	0.522														
G-1	G1	0.021	"-"			0.007	"-"												
PCS[1]	PCS	0.753	3.297					0.021	0.090	0.082	0.360	0.240	1.049	0.411	1.798				
Totals:		0.897	3.833	0.119	0.522	0.007	0.000	0.021	0.090	0.082	0.360	0.240	1.049	0.411	1.798				

1 PCS landfarming emissions. These are not emissions from stacks but are fugitive emissions. Landfarming does not presently occur at the landfill.

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (No. 2 Diesel, Natural Gas, Coal, …)	Specify Units				
		Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
G1	#2 diesel	141,000 btu/gal	39.7 gal/hr	173,886 gal/yr	0.05	nil

Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
		All tanks are insignificant by vapor pressure, activity, or emissions per the Trivial or insignificant lists of Title V.							

Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary. See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
	Mechanical Shoe Seal	**Liquid-mounted resilient seal**	**Vapor-mounted resilient seal**	**Seal Type**		
FX: Fixed Roof					**WH**: White	Good
IF: Internal Floating Roof	**A**: Primary only	**A**: Primary only	**A**: Primary only	**A**: Mechanical shoe, primary only	**AS**: Aluminum (specular)	Poor
EF: External Floating Roof	**B**: Shoe-mounted secondary	**B**: Weather shield	**B**: Weather shield	**B**: Shoe-mounted secondary	**AD**: Aluminum (diffuse)	
P: Pressure	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**LG**: Light Gray	
					MG: Medium Gray	
					BL: Black	
					OT: Other (specify)	

Note: 1.00 bbl = 0.159 M^3 = 42.0 gal

Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Green waste, chipping and composting	Green vegation, wood branches, etc	solid	approximately 10,000 tons/yr	Composted mulch	composted wood	solid	10,000 tons/yr approx
Commercial/residential solid waste	various solid wastes	solid	variable was approximately 166,000 tons in 2020	None	NA	NA	NA
Petroleum Contaminated Soil (PCS)[1]	soil	solid	10,000 cu yd/yr	Remediated soil	soil	solid	10,000 cu yd/yr

1. This is a placeholder. PCS landfarming is approved but not currently conducted.

Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
	There is no CEM equipment.								

Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Unit No.	Parameter/Pollutant Measured	Location of Measurement	Unit of Measure	Acceptable Range	Frequency of Maintenance	Nature of Maintenance	Method of Recording	Averaging Time
Flare	Landfill gas volume to enclosed flare	At Flare	cfm	accuracy +- 2% typical	annual or as needed	inspection&clean and if needed recalibration	continuous recorder	15 minutes
Flare	Continuous temperature of flare combustion gases	At flare enclosure	deg F	accuracy +- 1% or +- 0.5C	annual or as needed	inspection and if needed recalibration	continuous recorder	3 hour averages

Table 2-P: Green House Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	**N_2O** ton/yr	**CH_4** ton/yr	**SF_6** ton/yr	**PFC/HFC** ton/yr[2]									**Total GHG** Mass Basis ton/yr[4]	**Total CO_2e** ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**298**	**25**	**23,900**	**footnote 3**										
Flare	**mass GHG**	0.00	0.092	0.469	0	0									0.56	
	CO_2e	0.00	27.52	11.73	0	0										39.25
Admin bldg	**mass GHG**	6.72	6.56E-05	3.28E-04	0	0									6.72	
	CO_2e	6.72	0.02	0.01	0	0										6.75
Maint bldg	**mass GHG**	60.49	5.91E-04	2.95E-03	0	0									60.49	
	CO_2e	60.49	0.18	0.07	0	0										60.74
Scale bldg	**mass GHG**	30.25	2.95E-04	1.48E-03	0	0									30.25	
	CO_2e	30.25	0.09	0.04	0	0										30.37
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis** is the ton per year green house gas emission before adjustment with its GWP.

[5] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

Section 3

Application Summary

The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

The **Process Summary** shall include a brief description of the facility and its processes.

Startup, Shutdown, and Maintenance (SSM) routine or predictable emissions: Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

Application Summary: This submittal is for the Title V renewal of the Caja del Rio Landfill (20.2.70.201.A.2 NMAC). The landfill currently operates under Title V Permit No. P185LR3M1. The facility is a municipal solid waste landfill that may also accept certain types of special wastes. All air sources associated with this permit are support operations for the landfill, or to process various waste streams. The landfill is subject to NSPS and NESHAP requirements and, as such, control the landfill gas by collecting it and destroying it in an enclosed flare on-site. Del Hur Industries operates a rock and materials crushing/processing operation within the landfill's property/permit boundary (NSR permit # GCP-2-2976); Section 11 of this application discusses how this is a separate source form the landfill.

The landfill remains a minor source with respect to both PSD and Title V although it is required to hold a Title V permit by the landfill NSPS rule (originally by Subpart WWW and now by Subpart XXX).

The main revisions to this application included the following:

- Updating the emissions calculations for the next five-year potential-to-emit permit period (and possibly for longer-term potential-to-emit through conservative assumptions);
- Updating the modeling for emissions calculations;
- Updating the NSPS/NESHAP rules for the landfill, which have undergone several iterations of revisions recently. Some of this was addressed in the most recent Title V significant revision;
- Shifting the Godwin water pump to be a mobile source (it not only winterized and stored for the winter months, but it is trailer-mounted and on wheels); and
- Including the dust control plan as an attachment to the Title V permit, slight changes were made to this document to account for periods when equipment may be down for short periods of time.

Process Summary: This facility is a landfill that accepts municipal solid waste from commercial and residential customers to be disposed of in the currently active cell(s). Activities at the landfill include truck weighing of incoming loads, truck travel to the active landfill cell on a paved road up to the edge of the active cell fill area, truck travel on unpaved surfaces into and on the active cell area, dumping of waste, compaction of waste, and end of day earth covering of the day's waste material (operations using various heavy equipment). Periodic watering is conducted to control particulate emissions and the facility maintains and follows a dust control plan. Other operations at the property support landfilling operations such as possible brush grinding operations and possible PCS landfarming (although this is not currently being conducted).

The landfill operations include a gas collection system as required by 40 CFR 60, Subpart XXX the New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills. The landfill is also subject to National Emissions Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR 63, Subpart AAAA – which was revised March 20, 2021. The March 20, 2020 version of Subpart AAAA takes effect on September 27, 2021 – replacing the pre March 20, 2020 version of Subpart AAAA.

The gas collection system uses an enclosed flare to combust the collected landfill gas. The enclosed flare operates intermittently and will continue to until there is sufficient collected gas to operate it continuously. The Bureau has approved intermittent operation through the landfill's Landfill Gas Collection and Control System Design Plan (most recently submitted November 2017 as required by 40 CFR 60, Subpart XXX).

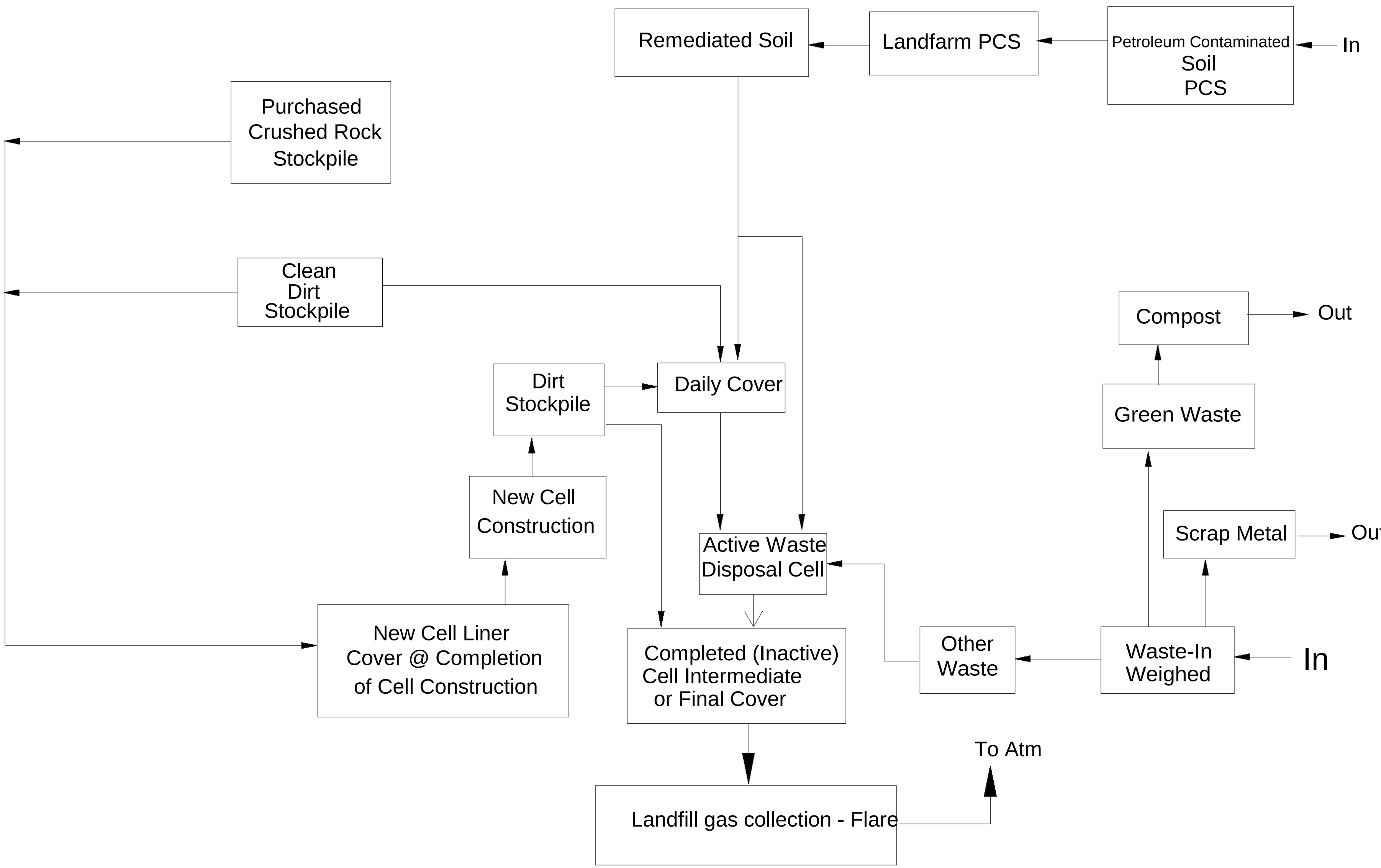
Startup, Shutdown, and Maintenance (SSM) routine or predictable emissions: Regarding Startup, Shutdown, and Maintenance (SSM) emissions, the potential-to-emit emissions calculations' assumptions are conservative enough such that any such minor SSM emissions that might occur are encompassed within them. As noted in Section 14, the landfill is also subject to a work practice standard under 40 CFR 63, Subpart AAAA to help minimize hazardous air pollutant emissions during SSM.

Section 4

Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

See the attached process flow sheet. This is the same process flow as was included in the prior permit renewal since the processes taking place at the landfill have not changed since that time. The landfill’s operation is generally simple with incoming waste being landfilled, and earthmoving operations being conducted to support cell construction and cover operations. Periodic watering is conducted to control particulate emissions and the facility maintains and follows a dust control plan. Different waste streams may require some processing (i.e. if PCS landfarming occurs or brush grinding is conducted on-site) as shown on the flow sheet as well).



→ The Active cell will eventually cease operation and become inactive as a new cell commences

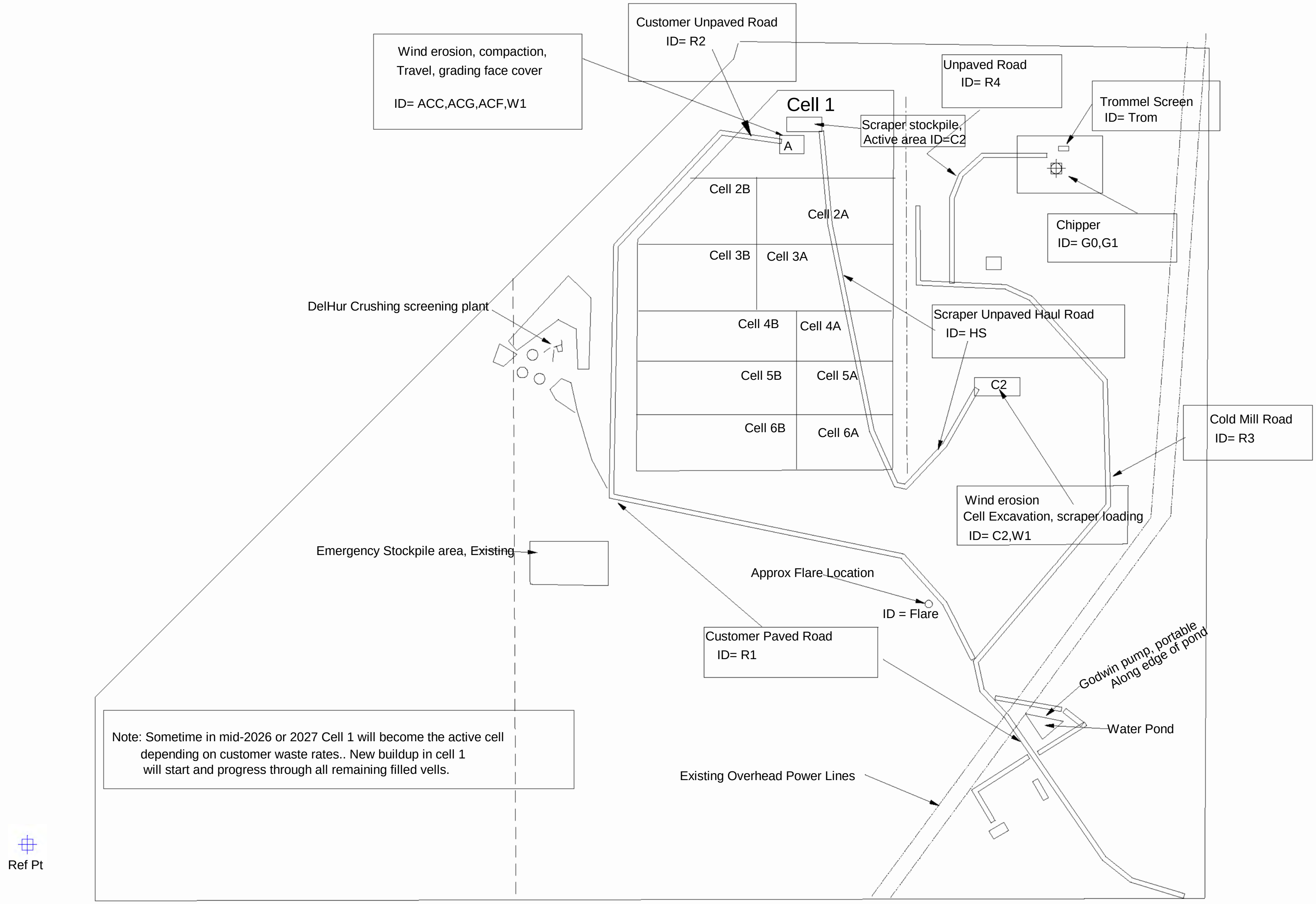
SFSWMA - Caja del Rio Landfill Flow Sheet

Section 5

Plot Plan Drawn To Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

A scaled map (Plot Plan) of Caja Del Rio Landfill showing emission points, structures, tanks, and fences is included in this Section.



Site Layout Schematic - West Operations

Cell 1 Buildup   Caja Del Rio Landfill

July 13, 2021

Section 6

All Calculations

<u>Show all calculations</u> used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

Tank Flashing Calculations: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

SSM Calculations: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

Glycol Dehydrator Calculations: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

Road Calculations: Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

Significant Figures:
A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.
B. At least 5 significant figures shall be retained in all intermediate calculations.
C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

- **(1)** If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;
- **(2)** If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**
- **(3)** If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.
- **(4)** The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

Emissions calculations are provided for the following sources and were prepared to conform to the requirements listed above:

- Road Particulate Emissions inclusive of customer paved and unpaved routes and green waste paved and unpaved routes (Unit Number 1);
- Landfill Earthmoving Particulate Emissions inclusive of bulldozing operations, grading operations, scraper operations, and wind erosion (Unit Number 2);
- Landfill Gas Emissions (Unit Number 3);
- Petroleum Hydrocarbon Landfill (Unit Number 4);
- Landfill Gas Flare inclusive of flare combustion by-products (Unit Number 5); and
- Green Waste Chipper (Unit 6);

The emissions calculations themselves are included in the following tables.

No potential emissions during startup, shutdown, and routine maintenance (SSM) are included in this application. A backup water wagon is available for the primary control system water wagon for Units 1 and 2 in case of an SSM event. Any potential SSM event for the controls system of Unit 3 (Unit 5 being the control unit) would be covered by the existing emissions reported. No SSM events are expected for Unit 4 as emissions from operations since all emissions from this unit are from a continual process, of which neither are subject to malfunction nor “started up” or “shut down” at will. SSM events for Unit 6 will be minimized to reduce any SSM emissions that may occur.

To match the recent NSR permit application, the flare’s emissions were estimated assuming that the flare’s full capacity was utilized, while the landfill’s emissions were estimates assuming a lower gas system capture efficiency. These assumptions effectively bracket the possible extremes of high and moderate gas collection.

Table 6-1
SFSWMA Caja Del Rio
Pollutant Emissions Summary

ID	Description	hr/dy	dy/yr	Control	TSP		PM10		PM2.5		NOx		CO		SO2		VOC		Tables
					lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	
Flare	Landfill Control Flare[5]	24	365	0%	**0.254**	1.115	**0.254**	1.115	**0.254**	1.115	**0.900**	3.942	**3.000**	13.140	**1.996**	8.744	**0.034**	0.148	6-2
Landfill	Landfill	24	365	98%	**-**	-	**-**	-	**-**	-	**-**	-	**-**	-	**-**	-	**4.216**	18.466	6-2
PCS	Petroleum Contaminated Soil				**-**	-	**-**	-	**-**	-	**-**	-	**-**	-	**-**	-	**3.593**	15.736	6-16
Total Flare/Landfill/PCS					*0.254*	*1.115*	*0.254*	*1.115*	*0.254*	*1.115*	*0.900*	*3.942*	*3.000*	*13.140*	*1.996*	*8.744*	*7.842*	*34.350*	
Cell Construction																			
C2	scraper loading, C2a	15	365	0%	11.600	31.755	3.550	9.717	0.355	0.972	-	-	-	-	-	-	-	-	6-4
	scraper unloading stockpile, C2b	15	365	0%	0.400	1.095	0.122	0.335	0.012	0.034	-	-	-	-	-	-	-	-	6-4
	Total Cell Construction =				*12.00*	*32.85*	*3.67*	*10.05*	*0.37*	*1.01*	-	-	-	-	-	-	-	-	
Active cell activity, USERTOP																			
ACC	Compacting	12	365	0%	2.015	4.413	0.201	0.440	0.031	0.067	-	-	-	-	-	-	-	-	6-5
ACG	Grading	15	365	0%	0.027	0.075	0.015	0.041	0.001	0.002	-	-	-	-	-	-	-	-	6-5
R2b	Customer travel within cell top	12	365	60%	0.913	1.999	0.233	0.510	0.023	0.051	-	-	-	-	-	-	-	-	6-6
	Total USERTOP =				*2.956*	*6.488*	*0.448*	*0.990*	*0.055*	*0.121*	-	-	-	-	-	-	-	-	
Inactive Cell Top Cover																			
Occurs only when cell goes inactive; annual emissions included in C2. Hourly emissions based on one scraper (using same calculations as C2); hourly emissions not included in total.																			
C3	scraper loading[1]	0	365	0%	5.800	0.000	1.780	0.000	0.178	0.000	-	-	-	-	-	-	-	-	6-4
	scraper unloading[1]	0	365	0%	0.200	0.000	0.061	0.000	0.006	0.000	-	-	-	-	-	-	-	-	6-4
	Total Inactive Cell Top Cover =				*6.000*	*0.000*	*1.841*	*0.000*	*0.184*	*0.000*	-	-	-	-	-	-	-	-	
Scraper Haul Roads																			
HR1	Haul road leg 1 201-215	15	365	60%	21.816	59.721	5.560	15.221	0.556	1.522	-	-	-	-	-	-	-	-	6-7
HR2	Haul road leg2 216-252	15	365	60%	44.264	121.172	11.281	30.882	1.128	3.088	-	-	-	-	-	-	-	-	6-7
	Total Scraper Haul Roads =				*66.080*	*180.893*	*16.841*	*46.103*	*1.684*	*4.610*	-	-	-	-	-	-	-	-	
Wind Erosion																			
W1	active cell,W1a	24	365	0%	0.037	0.163	0.020	0.088	0.001	0.005	-	-	-	-	-	-	-	-	6-8
	Stockpile, W1b	24	365	0%	0.048	0.209	0.026	0.113	0.001	0.006	-	-	-	-	-	-	-	-	6-8
	Cell construction, W1c	24	365	0%	0.130	0.570	0.070	0.308	0.004	0.018	-	-	-	-	-	-	-	-	6-8
	Top cover borrow area[1]	24	365	0%	0.130	0.570	0.070	0.308	0.004	0.018	-	-	-	-	-	-	-	-	6-8
	top cover area[1]	24	365	0%	0.130	0.570	0.070	0.308	0.004	0.018	-	-	-	-	-	-	-	-	6-8
	Total Wind Erosion=				0.48	2.08	0.26	1.12	0.01	0.06	-	-	-	-	-	-	-	-	
Total Landfill Operations					**81.51**	**222.31**	**21.22**	**58.27**	**2.12**	**5.80**	-	-	-	-	-	-	-	-	
Customer travel																			
R1	Paved rd to active cell	12	365	95%	10.334	22.630	2.634	5.768	0.263	0.577	-	-	-	-	-	-	-	-	6-9
R2	Unpaved road to cell top area	12	365	60%	4.364	9.557	1.112	2.436	0.111	0.244	-	-	-	-	-	-	-	-	6-10
R3	green waste cold mill road	12	365	80%	1.571	3.441	0.400	0.877	0.040	0.088	-	-	-	-	-	-	-	-	6-11
R4	green waste unpaved road	12	365	60%	0.855	1.872	0.218	0.477	0.022	0.048	-	-	-	-	-	-	-	-	6-11
Total Customer Travel PM					**17.12**	**37.50**	**4.36**	**9.56**	**0.44**	**0.96**	-	-	-	-	-	-	-	-	
Green waste chipper and Composting																			
G0	chipper	12	365	0%	1.240	2.716	0.587	1.285	0.185	0.405	-	-	-	-	-	-	-	-	6-11
TROM	Compost screening operation	12	365	0%	0.508	1.114	0.257	0.563	0.032	0.071	-	-	-	-	-	-	-	-	6-12
Total Green Waste PM					**1.75**	**3.83**	**0.84**	**1.85**	**0.22**	**0.48**	-	-	-	-	-	-	-	-	

Table 6-1
SFSWMA Caja Del Rio
Pollutant Emissions Summary

ID	Description	hr/dy	dy/yr	Control	TSP		PM10		PM2.5		NOx		CO		SO2		VOC		Tables
					lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	
Engines																			
G1	green waste chipper engine[3]	12	365	0%	0.040	0.088	0.040	0.088	0.040	0.088	3.910	8.563	0.010	0.022	0.282	0.617	0.010	0.022	6-13
Tire-1	tire cutter engine[2]	8	80	0%	0.051	0.016	0.051	0.016	0.051	0.016	0.713	0.228	0.154	0.049	0.009	0.003	0.057	0.018	6-14
Tire-2	tire bailer engine[2]	8	80	0%	0.077	0.025	0.077	0.025	0.077	0.025	1.085	0.347	0.234	0.075	0.014	0.004	0.086	0.028	6-14
Godwin	Water pump engine[4]	15	365	0%	0.070	0.193	0.070	0.193	0.070	0.193	1.322	3.618	0.881	2.412	0.033	0.091	0.198	0.541	6-13
Trom-en	Trommel drive engine	12	365	0%	0.154	0.337	0.154	0.337	0.154	0.337	1.419	3.107	0.468	1.024	0.025	0.056	0.173	0.379	6-13
Total Engines					**0.392**	**0.659**	**0.392**	**0.659**	**0.392**	**0.659**	**8.448**	**15.863**	**1.746**	**3.582**	**0.363**	**0.771**	**0.524**	**0.987**	
	Grand Total Emissions[6] ==>				**101.03**	**265.42**	**27.07**	**71.45**	**3.42**	**9.01**	**9.35**	**19.80**	**4.75**	**16.72**	**2.36**	**9.52**	**8.37**	**35.34**	

Footnotes:

[1] Activities for top cover of inactive cells only occur when a cell first becomes inactive. When top cover emissions occur, the corresponding active cell emissions do not occur.

[2] The tire cutter/bailer is an insignificant source and annual emissions are small due to the infrequent use of the equipment. It currently is not located at the landfill.

[3] The green waste chipper is no longer located at the landfill, but conceivably could return. The emissions are a placeholder in case it does return. Emissions based on Mfg Data.

[4] The Godwin water jump engine is insignificant and is used in the warm weather months and stored during winter and for maintenance. Emissions are listed because they occur.

[5] The flare hourly emissions were calculated from the annual amount based on 8760 hours per year operation, but the flare operates only on an intermittant basis.

[6] The grand total emissions are overstated as noted in the above footnotes #1, 3, 4, 5.

Table 6-2

AIR POLLUTANT EMISSIONS ESTIMATES FROM LANDFILL AND FLARE
CAJA DEL RIO LANDFILL
SANTA FE COUNTY, NEW MEXICO

			Estimated Emissions						
Pollutant	Molecular Weight (g/Mol)	Average Concentration Found In LFG (ppmv) (2)	LFG Generation (tons/yr) (3)	Non-Fugitive LFG Emissions (tons/year) (3)	Fugitive LFG Emissions (tons/year) (3)	Total LFG Emissions (tons/year)	LFG to Flare (tons/yr) (4)	Flare Control Efficiency (5)	Emissions from Flare (tons/yr) (6)
Hazardous Air Pollutants (HAPs) (1)									
1,1,1-Trichloroethane (methyl chloroform)	133.41	0.168	0.015	0.004	0.004	0.008	0.008	98.0%	1.53E-04
1,1,2,2-Tetrachloroethane	167.85	0.070	0.008	0.002	0.002	0.004	0.004	98.0%	8.02E-05
1,1-Dichloroethane (ethylidene dichloride)	98.97	0.741	0.050	0.013	0.013	0.025	0.025	98.0%	5.01E-04
1,1-Dichloroethene (vinylidene chloride)	96.94	0.092	0.006	0.002	0.002	0.003	0.003	98.0%	6.09E-05
1,2-Dichloroethane (ethylene dichloride)	98.96	0.120	0.008	0.002	0.002	0.004	0.004	98.0%	8.10E-05
1,2-Dichloropropane (propylene dichloride)	112.99	0.023	0.002	0.0004	0.0004	0.001	0.001	98.0%	1.77E-05
Acrylonitrile	53.06	0.036	0.001	0.0003	0.0003	0.001	0.001	99.7%	1.96E-06
Benzene	78.11	0.972	0.052	0.013	0.013	0.026	0.026	99.7%	7.77E-05
Carbon disulfide	76.13	0.320	0.017	0.004	0.004	0.008	0.008	99.7%	2.49E-05
Carbon tetrachloride	153.84	0.007	0.0007	0.000	0.0002	0.0004	0.0004	98.0%	7.35E-06
Carbonyl sulfide	60.07	0.183	0.008	0.002	0.002	0.004	0.004	99.7%	1.13E-05
Chlorobenzene	112.56	0.227	0.017	0.004	0.004	0.009	0.009	98.0%	1.74E-04
Chloroethane (ethyl chloride)	64.52	0.239	0.011	0.003	0.003	0.005	0.005	98.0%	1.05E-04
Chloroform	119.39	0.021	0.002	0.0004	0.0004	0.001	0.001	98.0%	1.71E-05
Chloromethane (methyl chloride)	50.49	0.249	0.009	0.002	0.002	0.004	0.004	98.0%	8.58E-05
Dichlorobenzene (1,4-Dichlorobenzene)	147.00	1.607	0.161	0.040	0.040	0.081	0.081	98.0%	1.61E-03
Dichloromethane (Methylene Chloride)	84.94	3.395	0.197	0.049	0.049	0.098	0.098	98.0%	1.97E-03
Ethylbenzene	106.16	6.789	0.492	0.123	0.123	0.246	0.246	99.7%	7.38E-04
Ethylene dibromide (1,2-Dibromoethane)	187.88	0.046	0.006	0.001	0.001	0.003	0.003	98.0%	5.90E-05
Hexane	86.18	2.324	0.137	0.034	0.034	0.068	0.068	99.7%	2.05E-04
Mercury (total)*	200.61	2.92E-04	4.00E-05	0.00001	0.00001	0.00002	-	-	2.00E-05
Methyl ethyl ketone	72.11	10.557	0.520	0.130	0.130	0.260	0.260	99.7%	7.79E-04
Methyl isobutyl ketone	100.16	0.750	0.051	0.013	0.013	0.026	0.026	99.7%	7.69E-05
Perchloroethylene (tetrachloroethylene)	165.83	1.193	0.135	0.034	0.034	0.068	0.068	98.0%	1.35E-03
Toluene	92.13	25.400	1.597	0.399	0.399	0.799	0.799	99.7%	2.40E-03
Trichloroethylene (trichloroethene)	131.40	0.681	0.061	0.015	0.015	0.031	0.031	98.0%	6.11E-04
Vinyl chloride	62.50	1.077	0.046	0.011	0.011	0.023	0.023	98.0%	4.59E-04
Xylenes	106.16	16.582	1.201	0.300	0.300	0.601	0.601	99.7%	1.80E-03
Hydrochloric Acid (HCl)*	36.45	42.000	-	-	-	-	-	-	0.522
Total HAPs			4.81	1.20	1.20	2.40	2.40		0.54
Criteria Air Pollutants									
Total VOCs (8)	86.18	627.9	36.93	9.23	9.23	18.47	18.47	99.2%	0.15
Unclassified VOCs	-	-	-	-	-	-	-	-	-
Sulfur Dioxide (SO_2) (7)	64.1	400.0	-	-	-	-	-	-	8.74
Carbon Monoxide (CO) (10)	-	-	-	-	-	-	-	-	13.14
Nitrogen Oxides (NO_x) (10)	-	-	-	-	-	-	-	-	3.94
Particulates (PM_{10}) (10)	-	-	-	-	-	-	-	-	1.11
Other Regulated Air Pollutants									
Ethane (7)	30.07	889	18.25	4.56	4.56	9.12	9.12	99.7%	0.027
NMOCs as Hexane (9)	86.18	1,610	94.70	23.67	23.67	47.35	47.35	99.2%	0.379

NOTES:

(1) Listed Hazardous Air Pollutants (HAPs) are among compounds commonly found in landfill gas (LFG), as presented in AP-42, Tables 2.4-1and 2.4-2

(2) Average concentrations of pollutants in LFG are based on Waste Industry Air Coalition Values, except Mercury and HCl (marked with an *), which use values listed on AP-42, Tables 2.4-1 and 2.4-

(3) The landfill gas generation for this calculation has been set assuming that overall generation is equivalent to the 500 scfm to the flare representing a 50 percent collection efficiency. In reality, whatever goes to the flare will represent more than this collection efficiency since this is an NSPS site and has to control LFG as specified by the rule. Also, per AP-42, the maximum collection efficiency for a landfill gas collection and control system is 75%; as such the final 25% of the generated LFG is considered to be fugitive.

(4) Assumed to be 50% for conservativeness (so that landfill fugitive PTE emissions will not be underestimated).

(5) Typical control efficiency for flares, as found in AP-42, Table 2.4-3.

(6) (LFG to flare) * (1-control efficiency) = LFG emissions from flare.

(7) Concentration of Ethane and HCl are from AP-42, Section 2.4.4. Total reduced sulfur concentration to the flare was set at 400 ppm (AP-42 is 46.9) for conservativeness since landfills can sometimes see spikes from storm debris or other waste types.

(8) According to AP-42, Table 2.4-2, Note C, VOC content at MSW sites with no co-disposal equals 39% by weight of total NMOC concentration.

(9) NMOC concentration is based on a site-specific Tier II testing program conducted in 2007 for conservativeness (AP-42 value is 595 ppm).

(10) Enclosed flare emissions factor for PM_{10} (in lb/hr/dscfm CH_4) is from AP-42, Table 2.4-5. Emissions factors for CO and NOx (in lb/mmBtu) are from manufacturer's specifications.

MODEL INPUT VARIABLES

Methane Content of LFG to Flare	50.0%	Assume typical MSW methane content (AP-42)
Collection Efficiency (4)	50%	Collection efficiency set at 50% for conservativeness (will be higher since this site controls LFG under the NSPS rule)
Landfill Gas Generation Rate (3)	1,000	scfm (at 50% methane) based on the assumption that the 500 cfm to the flare represents a 50% collection efficiency
Landfill Gas To Open Flare during Operation	500	scfm
Open Flare Operating Hours	8,760	hrs (assume a normal calendar year for permitting purposes)

Table 6-2

AIR POLLUTANT EMISSIONS ESTIMATES FROM LANDFILL AND FLARE
CAJA DEL RIO LANDFILL
SANTA FE COUNTY, NEW MEXICO

ENCLOSED FLARE EMISSIONS FACTORS:

Pollutant	Emissions factor (10)	
CO	0.2000	lb/MMBtu
NO_x	0.0600	lb/MMBtu
PM	0.0010	lb/hr/dscfm

EXAMPLE CALCULATIONS

(HAPs, VOCs, NMOCs)
LFG Generation [tons/year] = (Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(LFG Generation Rate [cfm])
(525,600 min/yr)(1ton/2,000lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

LFG To Flare = (Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(LFG to Flare [cfm])
(Flare Operating Time [min/yr])(1ton/2,000lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

LFG Emissions From Flare = (LFG To Flare [tons/yr])*(1 - Control Efficiency)

(Mercury, HCl)
LFG Emissions from Flare = (Molecular Weight of Compound[g/mol])*(Concentration of Compound[ppm]/1,000,000)*(LFG to Flare [cfm])
(Flare Operating Time [min/yr])(1ton/2,000lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf)

(SO_2)
Emissions from the Flare [/hr]=(Molecular Weight of SO2[g/mol])*(Concentration of Compound[ppmv]/1,000,000)*(LFG Flow to Flare [cfm])
Flare [cfm])*(1440 min/day)*(1ton/2000lb)*(1lb/453.6g)*(1mol/24.04L @ STP)*(28.32L/1cf))

(CO, NO_x)
LFG Emissions from Flare = (Methane Flow Rate to Flare [cfm])*(Emissions Factor)*(1000 Btu / cubic ft of methane)

(PM)
LFG Emissions from Flare = (Methane Flow Rate to Flare [cfm])*(Emissions Factor)

Table 6-4

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Pollutants:	**PM**				
Category:	**Cell Construction Activities**				
			Scraper Weight Data		
			Empty weight	130000	lbs
			Loaded weight	170000	lbs
			Avg Weight	150000	lbs
Weekday Operation				75	tons
Mean Vehicle Weight	75	tons			
Material Moisture content:	2	%			
Length of Haul Road		feet			
Avg. number round trips/hour	10	for two scrapers			
Hours of Operation:	7	day/wk		365	**day/yr**
unload and stockpile--->	15	hr/day		5475	**Hours/year**
	52	wk/yr			

Category:	**Cell Construction**					
	Scraper Loading					
			Scraper Weight Data			
			Empty weight	130000	lbs	
			Loaded weight	170000	lbs	
			Net Load Weight	40000	lbs	
Operation Data				20	tons	
Mean Vehicle Load	20	tons				
Material Moisture content:	2	%				
Avg. number loads per hour	10					
Hours of Operation:				365	**day/yr**	
	7	day/wk		5475	**Hours/year**	loading
Loading only--->	15	hr/day				
	52	wk/yr				
PM10/TSP correction	0.306	Ratio of unpaved road k factors				
PM2.5/TSP correction	0.0306	Ratio of unpaved road k factors				
Scraper topsoil removal, Etsp=	0.058	lb/ton	Table 11.9-4			

Table 6-4

Scraper Emissions - Loading	AP-42, 7/98, Table 11.9-4			
				C2a

Using:
PMtsp emission = Etsp(lb/ton) * scraper load(tons)*Loads per hour
PM10 emission = PMtsp * PM10/Tsp ratio
PM2.5 emission = PMtsp * PM2.5/Tsp ratio

Loads per hour	10		
Scraper load (tons)	20		
Etsp (lb/ton)	0.058	AP-42, Table 11.9-4 Scraper load topsoil	
Uncontrolled TSP (lb/hr)	**11.600**	**lb/hr**	31.76 tons/yr
Uncontrolled PM10	**3.55**	**lb/hr**	9.72 tons/yr
Uncontrolled PM2.5	**0.355**	**lb/hr**	0.972 tons/yr

Scraper Emissions - Unloading	AP-42, 7/98, Table 11.9-4 and 13.2.4			
				C2b

Scraper Unloading: 15 hours/day
Using Bottom dump truck overburden factor:

Estp(lb/ton) = 0.002	E Tsp	0.002	lb/ton	
	PM10/TSP ratio	0.306		
	PM10/TSP ratio	0.0306		
	TSP	**0.400**	**lb/hr**	1.10 tons/yr
	PM-10	**0.122**	**lb/hr**	0.34 tons/yr
	PM2.5	**0.012**	**lb/hr**	0.034 tons/yr

Table 6-5

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Pollutants: **PM**

Category: **Grading Active Cell Face Area**

Face Cover Distance	120 ft	Operating Hours			
Face Width	80 ft		7 day/wk	365 day/yr	
Grader width	15 ft		15 hr/day	5475 hours/yr	
Grader Passes	5.3		52 wk/yr		
Distance traveled by grader	640 ft=		0.12 mile		
Speed	2 mph				

Grading — AP-42, 10/98, Section 11.9, Table 11.9-1 Grading

	Controlled Emissions			
	g/s	lb/hr	tons/yr	ACG
TSP	**0.0034558**	**0.0274**	0.0751	
PM-10	**0.0018694**	**0.0148**	0.0406	
PM2.5	**0.0001071**	**0.00085**	0.0023	

USING:

E= k*b* (s)^a — lb/VMT

PM emission = E(lb/VMT) * Total Distance (mi)

k = particle size mutlipler	1	AP-42, Tsp
k = particle size mutlipler	0.6	PM10
k = particle size mutlipler	0.031	PM2.5
a = empirical constant	2.5	Tsp
a = empirical constant	2	PM10
b = empirical constant	0.04	Tsp
b = empirical constant	0.051	PM10
Speed	2	mph

Emission factor - no controls	**0.2263**	lb/VMT, TSP	
Emission factor - no controls	**0.1224**	lb/VMT, PM-10	PM10 = 0.6*[0.051*s^2]=0.6*PM15
Emission factor - no controls	**0.0070**	lb/VMT, PM2.5	PM2.5 = 0.031 * tsp

Table 6-5

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Pollutants: **PM**

Category: **Compactors on Active Cell Top - No soil Cover**

Compactor Activity

number of compactors	2	
Silt Content	0.5	% Probably a high value
Material Moisture content:	2	% minimum value for overburden
Hours of Operation:		
(6 a.m. - 7 p.m.)	7	day/wk
	12	hr/day
	52	wk/yr

Operating Hours
365 days/yr
4380 hours/yr

Bull Dozer (fugitive) **AP-42, 7/98, Table 11.9-1**

	Controlled Emissions			
	g/s	lb/hr	tons/yr	
TSP	**0.25**	**2.015**	**4.41**	ACC
PM-10	**0.03**	**0.2010**	**0.44**	
PM2.5	**0.004**	**0.0308**	**0.07**	

USING:

E tsp = k X (s)^a / (M)^b = lbs/hr
E PM-10 = k X (s)^c / (M)^d = lbs/hr
PM Emissions (lb/hr) = E (lb/hr) x number of compactors

k1 = particle size mutlipler	**5.7**	**AP-42, TSP**
k2 = particle size mutlipler	0.75	AP-42, PM-10
a = empirical constant	1.2	AP-42

Unpaved Road k-factors

k PM10=	1.5
kPM2.5 =	0.23
PM2.5/PM10=	0.153

Table 6-5

b = empirical constant	**1.3**	**AP-42, TSP**	
c = empirical constant	1.5	AP-42, PM-10	
d = empirical constant	**1.4**	**AP-42, TSP**	
s = surface silt content (%)	0.5	Estimated at 1/10 of default unpaved road	
M = surface moisture content, (%)	2	Water application	
Emission factor	**2.02**	lb/hr, TSP	2 compactors
Emission factor	**0.20**	lb/hr, PM-10	
Emission factor	**0.031**	lb/hr, PM2.5	Using road k ratio

Table 6-6

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Category: **Commercial and Residential Vehicles**
Unpaved Travel on Cell Top Area to Dump Waste

Unpaved Road Emissions	**Weekday Operation**	
User and Commercial	Fleet Mix	
Vehicle Speed	5	mph

Weekday Operation

Mean Vehicle Weight	22.04	tons	**Vehicle data based on scale data - 2014**	
Material Moisture content:	2	%	44080	lbs Fleet average
Length of Haul Road	100	feet one-way		
Avg. number round trips/hour	9.52			
Hours of Operation:			365	**day/yr**
	7	day/wk	4380	**Hours/year**
	12	hr/day		
	52	wk/yr		

Unpaved Roads (Fugitive)	**AP-42, 11/2006, Section 13.2.2, Equation 1a**		**Controlled Emissions**			
Cell Top Travel			g/s	lb/hr	tons/yr	**R2b**
Average Operation	**Two way emission --->**	TSP	**0.12**	**0.913**	**2.00**	
	Two way emission --->	PM-10	**0.03**	**0.233**	**0.51**	
		PM2.5	**0.00**	**0.023**	**0.05**	
			Uncontrolled Emissions			
USING:			g/s	lb/hr	tons/yr	
		TSP	**0.29**	**2.28**	**5.00**	
E = k X (s/12)^a X (W/3)^b = lbs/VMT		PM-10	**0.07**	**0.58**	**1.27**	
		PM2.5	**0.01**	**0.06**	**0.13**	

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x Twice Length of Haul Road

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365

Table 6-6

x Round Trips per Hour

k = particle size mutlipler	**4.9**	**AP-42, TSP**
k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5
a = empirical constant	**0.7**	**AP-42,TSP**
a = empirical constant	0.9	AP-42
b = empirical constant	**0.45**	**AP-42, TSP**
b = empirical constant	0.45	AP-42, PM-10
s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)
W = mean vehicle weight (tons)	22.0	Application
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1
Average no. of round trips per hour	9.5	2004 data
Length of Haul Road (one way)	100	feet
Emission factor with no controls	**6.33**	lb/VMT, TSP
Emission factor with no controls	**1.61**	lb/VMT, PM-10
Emission factor with no controls	**0.16**	lb/VMT, PM2.5
Control Efficiency	**60**	%
Emission Factor w/Controls	**2.53**	lb/VMT, TSP
Emission Factor w/Controls	**0.65**	lb/VMT, PM-10
Emission Factor w/Controls	**0.06**	lb/VMT, PM2.5

Table 6-7

SFSWMA Caja Landfill
Scraper operation excavation to active cell stockpile
Particulate Emission Calculations

Pollutants: **PM**

Category: **Scraper Haul Road - Water**

Unpaved Road Emissions

Weekday Operation			**Vehicle weights**			
			Avg Empty weight	130000	lbs	trips/hr
			Avg Loaded weight	170000	lbs	w 2 scrapers
Mean Vehicle Weight	75	tons	Avg Weight	150000	lbs	10.00
Material Moisture content:	2	%	Avg Weight	75	tons	
Length Road1- Ex to rd turn start, 201-215	1311	feet				
Length Road2 - 2-way full, 216-252	2660	feet				
Length Road3 - not used	0	feet				
Road1 Trip, One-way=1, round=2	2	average wt.				
Road2 Trip, One-way=1, round=2	2	average wt.				
Road3 Trip, One-way=1, round=2	0	empty Wt.				
Avg. number trips/hour	10.00		(for two scrapers, otherwise 5 round trips for face cover)			
Hours of Operation:	7	day/wk				
	15	hr/day		365	**day/yr**	
	52	wk/yr		5475	**Hours/year**	

Unpaved Roads (Fugitive)	**AP-42, 11/2006, Section 13.2.2, Equation 1a**		**Controlled Emissions**		
			g/s	lb/hr	tons/yr
Excavation/Borrow Pit to Loop intersection	**2-way Emission --->**	TSP	**2.75**	**21.816**	**59.72**
Entry Section-Average Load		PM-10	**0.70**	**5.560**	**15.22**
model ID: 201-215		PM2.5	**0.07**	**0.5560**	**1.522**
2 scrapers			**Uncontrolled Emissions**		
USING:			g/s	lb/hr	tons/yr
E = k X (s/12)^a X (W/3)^b = lbs/VMT		TSP	**6.88**	**54.54**	**149.301**
		PM-10	**1.75**	**13.90**	**38.051**
		PM2.5	**0.18**	**1.39**	**3.805**

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x Twice Length of Haul Road

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365
x Round Trips per Hour

k = particle size mutlipler	**4.9**	**AP-42, TSP**
k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5

Table 6-7

a = empirical constant	**0.7**	**AP-42,TSP**	
a = empirical constant	0.9	AP-42	
b = empirical constant	**0.45**	**AP-42, TSP**	
b = empirical constant	0.45	AP-42, PM-10	
s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)	
W = mean vehicle weight (tons)	75.0		
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1	
Average no. of trips per hour	10.0	2 scrapers	
Length of Haul Road	1311	feet 1-way	
Emission factor with no controls	**10.98**	lb/VMT, TSP	
Emission factor with no controls	**2.80**	lb/VMT, PM-10	
Emission factor with no controls	**0.28**	lb/VMT, PM2.5	
Control Efficiency	**60**	%	Water
Emission Factor w/Controls	**4.39**	lb/VMT, TSP	
Emission Factor w/Controls	**1.12**	lb/VMT, PM-10	
Emission Factor w/Controls	**0.11**	lb/VMT, PM2.5	

Unpaved Roads (Fugitive) **AP-42, 11/2006, Section 13.2.2, Equation 1a**

2-Way Emission --->

216-252

	Controlled Emissions		
	g/s	lb/hr	tons/yr
TSP	**5.58**	**44.264**	**121.172**
PM-10	**1.42**	**11.281**	**30.882**
PM2.5	**0.14**	**1.1281**	**3.088**
	Uncontrolled Emissions		
	g/s	lb/hr	tons/yr
TSP	**13.95**	**110.66**	**302.930**
PM-10	**3.56**	**28.20**	**77.206**
PM2.5	**0.36**	**2.82**	**7.721**

USING:

E = k X (s/12)^a X (W/3)^b = lbs/VMT

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x 1-way Length of Haul Road

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365
x Round Trips per Hour

k = particle size mutlipler	**4.9**	**AP-42, TSP**
k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5
a = empirical constant	**0.7**	**AP-42,TSP**
a = empirical constant	0.9	AP-42
b = empirical constant	**0.45**	**AP-42, TSP**
b = empirical constant	0.45	AP-42, PM-10
s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)

Table 6-7

W = mean vehicle weight (tons)	75.0		
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1	
Average no. of round per hour	10.0	one scraper	
Length of Haul Road	2660	feet 1-way	
Emission factor with no controls	**10.98**	lb/VMT, TSP	
Emission factor with no controls	**2.80**	lb/VMT, PM-10	
Emission factor with no controls	**0.28**	lb/VMT, PM-10	
Control Efficiency	**60**	%	Water
Emission Factor w/Controls	**4.39**	lb/VMT, TSP	
Emission Factor w/Controls	**1.12**	lb/VMT, PM-10	
Emission Factor w/Controls	**0.11**	lb/VMT, PM-10	

Table 6-8

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Pollutants: **PM**

Category: **Wind Erosion (Common to all Runs)**

Active Disturbed Areas				
Active Customer Cell Area	18700	Sq ft=	0.429	Acre
Stockpile Area	24000	Sq ft=	0.551	Acre
Cell Construction Area	65340	Sq ft=	1.500	Acre
Completed Cell Top Cover	65340	Sq ft=	1.500	Acre

E factor	0.38	ton/ac-yr	Tsp	
Hours per day	**24.0**			
Days operated per week	7.0	Construction Annual hours=	**8760**	hours/year
Weeks operated per year	52.0			

Wind Erosion, Active Cell Area AP-42, 10/98, Section 11.9, Table 11.9-4 Wind Erosion

USING:

PM emission = k*E(ton/ac-yr) * Area*2000(lb/ton)*(1-control/100%)

k = particle size mutlipler	1	AP-42, Tsp
k = particle size mutlipler	0.54	PM10 **[see note a]**
k = particle size mutlipler	0.031	PM2.5 **[see note a]**
Area	0.429	acre
Control	**0**	percent

User Active Cell Area (Face)	Tsp	**326.263**	lb/yr=	0.03724	lb/hr	0.16	tons/yr	W1a
	PM10	**176.182**	lb/yr=	0.02011	lb/hr	0.09	tons/yr	
	PM2.5	**10.114**	lb/yr=	0.00115	lb/hr	0.01	tons/yr	

Stockpile Area

k = particle size mutlipler	1	AP-42, Tsp

Table 6-8

k = particle size mutlipler	0.54 PM10			
k = particle size mutlipler	0.031 PM2.5			
Area	0.551 Acre			
Control	**0** percent			
Tsp	**418.733** lb/yr=	0.0478 lb/hr	0.21 tons/yr	**W1b**
PM10	**226.116** lb/yr=	0.0258 lb/hr	0.11 tons/yr	
PM2.5	**12.981** lb/yr=	0.00148 lb/hr	0.01 tons/yr	

Cell Construction Area

k = particle size mutlipler	1 AP-42, Tsp			
k = particle size mutlipler	0.54 PM10			
k = particle size mutlipler	0.031 PM2.5			
Area	1.500 Acre			
Control	**0** percent			
Tsp	**1140.000** lb/yr=	0.130 lb/hr	0.57 tons/yr	**W1c**
PM10	**615.600** lb/yr=	0.0703 lb/hr	0.31 tons/yr	
PM2.5	**35.340** lb/yr=	0.0040 lb/hr	0.02 tons/yr	

Completed Cell Top Cover

k = particle size mutlipler	1 AP-42, Tsp			
k = particle size mutlipler	0.54 PM10			
k = particle size mutlipler	0.031 PM2.5			
Area	1.500 Acre			
Control	**0** percent			
Tsp	**1140.000** lb/yr=	0.130 lb/hr	0.57 tons/yr	**W1d**
PM10	**615.600** lb/yr=	0.0703 lb/hr	0.31 tons/yr	
PM2.5	**35.340** lb/yr=	0.0040 lb/hr	0.02 tons/yr	

Note a - There are no factors to adjust wind erosion for PM10 or PM2.5. These were obtained by taking the ratio of emission factors for grading of topsoil and should be conservative since grading is an active disturbance while wind erosion is not active for some activities. Example: k PM-2.5 = 0.007/ 0.2263 = 0.031 = k PM2.5 in Table 11.9-1.

Table 6-9

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Category: **Commercial and Residential Vehicles**
Paved Travel from Gate to Active Cell Area

Unpaved Road Emissions **Weekday Operation**
User and Commercial Fleet Mix

Weekday Operation			**Vehicle data based on scale data - 2014**	
Mean Vehicle Weight	22.04	tons	Plus Del Hur	
Material Moisture content:	2	%		44080 lbs Fleet average
Length of Haul Road(28-72)	3704	feet one-way	To DelHur intersection	
Length of Haul Road(73-104)	2557	feet one-way	Intersection to pave end	
Avg. number round trips/hour	9.52		Intersection to pave end	
Avg. number round trips/hour	16.7		To DelHur intersection	
Hours of Operation:				365 **day/yr**
	7	day/wk		4380 **Hours/year**
	12	hr/day		
	52	wk/yr		

Unpaved Roads (Fugitive) AP-42, 11/2006, Section 13.2.2, Equation 1a

Paved User Road

Average Operation

		Controlled Emissions			
		g/s	lb/hr	tons/yr	R1a
Two way emission --->	TSP	**0.93**	**7.42**	**16.24**	
Two way emission --->	PM-10	**0.24**	**1.89**	**4.14**	
	PM2.5	**0.02**	**0.19**	**0.41**	
		Uncontrolled Emissions			
USING:		g/s	lb/hr	tons/yr	
	TSP	**18.70**	**148.31**	**324.79**	
E = k X (s/12)^a X (W/3)^b = lbs/VMT	PM-10	**4.77**	**37.80**	**82.78**	
	PM2.5	**0.48**	**3.78**	**8.28**	

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x Twice Length of Haul Road

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365

Table 6-9

x Round Trips per Hour

k = particle size mutlipler	**4.9**	**AP-42, TSP**
k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5
a = empirical constant	**0.7**	**AP-42,TSP**
a = empirical constant	0.9	AP-42
b = empirical constant	**0.45**	**AP-42, TSP**
b = empirical constant	0.45	AP-42, PM-10
s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)
W = mean vehicle weight (tons)	22.04	
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1
Average no. of round trips per hour	16.7	2004 data
Length of Haul Road (one way)	3704	feet
Emission factor with no controls	**6.33**	lb/VMT, TSP
Emission factor with no controls	**1.61**	lb/VMT, PM-10
Emission factor with no controls	**0.16**	lb/VMT, PM2.5
Control Efficiency	**95**	% **Paved Road**
Emission Factor w/Controls	**0.32**	lb/VMT, TSP
Emission Factor w/Controls	**0.08**	lb/VMT, PM-10
Emission Factor w/Controls	**0.01**	lb/VMT, PM2.5

Unpaved Roads (Fugitive) **AP-42, 11/2006, Section 13.2.2, Equation 1a**

Paved User Road

Average Operation

		Controlled Emissions			
		g/s	lb/hr	tons/yr	**R1b**
Two way emission --->	TSP	**0.37**	**2.92**	**6.39**	
Two way emission --->	PM-10	**0.09**	**0.74**	**1.63**	
	PM2.5	**0.01**	**0.07**	**0.16**	
		Uncontrolled Emissions			
USING:		g/s	lb/hr	tons/yr	
	TSP	**7.36**	**58.36**	**127.82**	
E = k X (s/12)^a X (W/3)^b = lbs/VMT	PM-10	**1.88**	**14.87**	**32.58**	
	PM2.5	**0.19**	**1.49**	**3.26**	

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x Twice Length of Haul Road

Table 6-9

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365
x Round Trips per Hour

k = particle size mutlipler	**4.9**	**AP-42, TSP**
k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5
a = empirical constant	**0.7**	**AP-42,TSP**
a = empirical constant	0.9	AP-42
b = empirical constant	**0.45**	**AP-42, TSP**
b = empirical constant	0.45	AP-42, PM-10
s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)
W = mean vehicle weight (tons)	22.0	
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1
Average no. of round trips per hour	9.5	2004 data
Length of Haul Road (one way)	2557	feet
Emission factor with no controls	**6.33**	lb/VMT, TSP
Emission factor with no controls	**1.61**	lb/VMT, PM-10
Emission factor with no controls	**0.16**	lb/VMT, PM2.5
Control Efficiency	**95**	% **Paved Road**
Emission Factor w/Controls	**0.32**	lb/VMT, TSP
Emission Factor w/Controls	**0.08**	lb/VMT, PM-10
Emission Factor w/Controls	**0.01**	lb/VMT, PM2.5

Table 6-10

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Pollutant: **PM**

Category: **Commercial and Residential Vehicles**
Unpaved Road to Top of Cell Area

Unpaved Road Emissions **Weekday Operation**
User and Commercial Fleet Mix

Weekday Operation

Mean Vehicle Weight	22.04	tons	**Vehicle data based on current data- 2014**	
Material Moisture content:	2	%	44080	lbs fleet average
Length of Haul Road(105-108)	478	feet one way		
Avg. number round trips/hour	9.52			
Hours of Operation:			365	**day/yr**
	7	day/wk	4380	**Hours/year**
	12	hr/day		
	52	wk/yr		

Unpaved Roads (Fugitive) **AP-42, 11/2006, Section 13.2.2, Equation 1a**

Road to Cell Top

			Controlled Emissions			
			g/s	lb/hr	tons/yr	
Average Operation	**Two way emission --->**	TSP	**0.55**	**4.36**	**9.56**	R2a
	Two way emission --->	PM-10	**0.14**	**1.11**	**2.44**	
		PM2.5	**0.01**	**0.111**	**0.24**	
			Uncontrolled Emissions			
	USING:		g/s	lb/hr	tons/yr	
		TSP	**1.38**	**10.91**	**23.89**	
E = k X (s/12)^a X (W/3)^b = lbs/VMT		PM-10	**0.35**	**2.78**	**6.09**	
		PM2.5	**0.04**	**0.28**	**0.61**	

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x Twice Length of Haul Road

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365
x Round Trips per Hour

k = particle size mutlipler **4.9** **AP-42, TSP**

Table 6-10

k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5
a = empirical constant	**0.7**	**AP-42,TSP**
a = empirical constant	0.9	AP-42, PM-10
b = empirical constant	**0.45**	**AP-42, TSP**
b = empirical constant	0.45	AP-42, PM-10
s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)
W = mean vehicle weight (tons)	22.0	Application
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1
Average no. of round trips per hour	9.5	2014 data
Length of Haul Road (one way)	478	feet
Emission factor with no controls	**6.33**	lb/VMT, TSP
Emission factor with no controls	**1.61**	lb/VMT, PM-10
Emission factor with no controls	**0.16**	lb/VMT, PM2.5
Control Efficiency	**60**	%
Emission Factor w/Controls	**2.53**	lb/VMT, TSP
Emission Factor w/Controls	**0.65**	lb/VMT, PM-10
Emission Factor w/Controls	**0.06**	lb/VMT, PM2.5

Table 6-11

Santa Fe Solid Waste Management Agency
Caja Del Rio Landfill
Particulate Emission Calculations

Pollutants: **PM**

Category: **Green Waste Area**

Unpaved Road Emissions

Green Waste Vehicle weights

Empty weight	28500	lbs
Loaded weight	50000	lbs
Avg Weight	39250	lbs
	19.625	tons

Weekday Operation

Mean Vehicle Weight	19.625	tons		
Material Moisture content:	2	%		
Length of Haul Road - Cold Mill	3452	feet		
Length of Haul Road - Unpaved	939	feet		
Avg. number round trips/hour	1			
Hours of Operation:	7	day/wk	365	**day/yr**
	12	hr/day	4380	**Hours/year**
	52	wk/yr		

Unpaved Roads (Fugitive) **AP-42, 11/2006, Section 13.2.2, Equation 1a**

			Controlled Emissions			
			g/s	lb/hr	tons/yr	**R3**
Cold Mill Road	**Two way emission --->**	TSP	**0.20**	**1.57**	**3.44**	
	Two way emission --->	PM-10	**0.05**	**0.40**	**0.88**	
		PM2.5	**0.01**	**0.040**	**0.09**	
			Uncontrolled Emissions			
	USING:		g/s	lb/hr	tons/yr	
E = k X (s/12)^a X (W/3)^b = lbs/VMT		TSP	**0.99**	**7.86**	**17.20**	
		PM-10	**0.25**	**2.00**	**4.38**	
		PM2.5	**0.03**	**0.20**	**0.44**	

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x Twice Length of Haul Road

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365
x Round Trips per Hour

k = particle size mutlipler	**4.9**	**AP-42, TSP**
k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5
a = empirical constant	**0.7**	**AP-42,TSP**

Table 6-11

a = empirical constant	0.9	AP-42
b = empirical constant	**0.45**	**AP-42, TSP**
b = empirical constant	0.45	AP-42, PM-10
s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)
W = mean vehicle weight (tons)	19.6	Application
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1
Average no. of round trips per hour	1.0	
Length of Haul Road (one way)	3452	feet
Emission factor with no controls	**6.01**	lb/VMT, TSP
Emission factor with no controls	**1.53**	lb/VMT, PM-10
Emission factor with no controls	**0.15**	lb/VMT, PM2.5
Control Efficiency	**80**	%
Emission Factor w/Controls	**1.20**	lb/VMT, TSP
Emission Factor w/Controls	**0.31**	lb/VMT, PM-10
Emission Factor w/Controls	**0.03**	lb/VMT, PM2.5

Unpaved Roads (Fugitive) **AP-42, 11/2006, Section 13.2.2, Equation 1a**

Unpaved to Green dump area

R4

			Controlled Emissions		
			g/s	lb/hr	tons/yr
Two way emission --->	TSP		**0.11**	**0.855**	**1.872**
Two way emission --->	PM-10		**0.03**	**0.218**	**0.477**
	PM-10		**0.00**	**0.022**	**0.048**
			Uncontrolled Emissions		
			g/s	lb/hr	tons/yr
	TSP		**0.27**	**2.14**	**4.68**
	PM-10		**0.07**	**0.54**	**1.19**
	PM-10		**0.01**	**0.05**	**0.12**

USING:

E = k X (s/12)^a X (W/3)^b = lbs/VMT

PM Emissions (lb/hr) = E (lb/VMT) x Control Efficiency x Twice Length of Haul Road

PM Emissions (ton/yr) = PM Emissions (lb/hr) x Operating hours (hr/yr) x (365-P)/365 x Round Trips per Hour

k = particle size mutlipler	**4.9**	**AP-42, TSP**
k = particle size mutlipler	1.5	AP-42, PM-10
k = particle size mutlipler	0.15	AP-42, PM2.5
a = empirical constant	**0.7**	**AP-42,TSP**
a = empirical constant	0.9	AP-42
b = empirical constant	**0.45**	**AP-42, TSP**
b = empirical constant	0.45	AP-42, PM-10

Table 6-11

s = surface silt content (%)	4.8	AP-42, Table 13.2.2-1 (Sand and gravel processing mean)
W = mean vehicle weight (tons)	19.6	Application
P = no. of day w precip. > 0.01	70	Figure 13.2.2-1
Average no. of round trips per hour	1.0	
Length of Haul Road (one way)	939	feet
Emission factor with no controls	**6.01**	lb/VMT, TSP
Emission factor with no controls	**1.53**	lb/VMT, PM-10
Emission factor with no controls	**0.15**	lb/VMT, PM-10
Control Efficiency	**60**	%
Emission Factor w/Controls	**2.40**	lb/VMT, TSP
Emission Factor w/Controls	**0.61**	lb/VMT, PM-10
Emission Factor w/Controls	**0.06**	lb/VMT, PM-10

Category: **Chipper Operation**

G0

Operation Data

Hours of Operation: 365 **day/yr**

	7	day/wk		4380 **Hours/year**		
	12	hr/day				
	52	wk/yr				
Ktsp=	0.65					
PM10/TSP correction	0.473	Ratio of unpaved road k factors				
PM2.5/TSP correction	0.149	Ratio of unpaved road k factors				
K=	2	cm3/m2				
Rho=	2	gm/cm3				
l=	1	m				
Opac=	40	%				
I=100-opac=	60					
Io=	100					
W=-K*(rho/l)*ln(I/I0)	2.043302495	gm/m3	per "Calculation of Smoke Plume Opacity from Particulate Air Pollutant Properties			
Area=	0.785	m2	by D.S. Ensor and M.J. Pilat August, 1971			
Vel=	0.15	m/s				
TSP=	0.156389265	gm/s	**1.240**	lb/hr	2.72	tons/yr
PM10 = tsp*PM10/TSP ratio=	0.073972122	gm/s	**0.587**	lb/hr	1.28	tons/yr
PM2.5 = TSP* PM2.5/TSP ratio =	0.023302	gm/s	**0.185**	lb/hr	0.40	tons/yr

Maximum Short-Term lb/hr and Annual Ton/year Emissions
Uncaptured Fugitive and Stack Particulate Emissions from the Duratech Trommel Green Waste Screening Operations

Revised: July. 13, 2021

Permit Identification ID	Process/Source Description	Throughput (TPH)	TSP (PM30) Emission Factor lb/ton	PM10 Emission Factor lb/ton	PM2.5 Emission Factor lb/ton	Uncontrolled TSP (PM30) Emission Rate lb/hr	Uncontrolled PM10 Emission Rate lb/hr	Uncontrolled PM2.5 Emission Rate lb/hr	Control Measure	Control Efficiency (%)	TSP (PM30) Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	PM2.5 Emission Rate (lb/hr)	Annual TSP (PM30) (ton/yr)	Annual PM10 (ton/yr)	Annual PM2.5 (ton/yr)
	Green Waste Screen Operations															
T-Load	Screen loading	15	0.00660	0.00312	0.00047	0.0990	0.0468	0.0071	None	0	0.099	0.047	0.0071	0.217	0.103	0.0155
T-SCN	Trommel screen	15	0.01650	0.00870	0.00059	0.25	0.13	0.01	None	0	0.248	0.131	0.0089	0.542	0.286	0.0194
T-STK	Stackers - 2-Total	15	0.00210	0.00110	0.00031	0.0315	0.0165	0.0047	None	0	0.032	0.0165	0.0047	0.0690	0.0361	0.0102
T-Tfr	Transfers - 2 total	15	0.00210	0.00110	0.00031	0.0315	0.0165	0.0047	None	0	0.032	0.0165	0.0047	0.0690	0.0361	0.0102
T-loadout	Loaout to truck	15	0.00660	0.00312	0.00047	0.0990	0.0468	0.0071	None	0	0.0990	0.0468	0.0071	0.2168	0.1025	0.0155
							PM30/PM10/PM2.5 Uncaptured plus Stack Emissions				**0.508**	**0.257**	**0.032**	**1.114**	**0.563**	**0.071**

Operating Hours for Annual Emissions

Operation	Days/week	Weeks per year	Hours/day	Annual Hours/year
Duratech Trommel Green Compost screen	7	52	12	4380

Duratech Trommel Emission Factors

Activity	Emission Factors (lb/Ton) TSP (PM-30)	PM-10	PM-2.5
Loading[2]	0.006600	0.00312	0.00047
Conveyor transfer[1]	0.0021	0.0011	0.00031
Screening[1]	0.0165	0.0087	0.00059

Table Footnotes Notes:
[1] AP-42 Chapter 11.19.2 Uncontrolled Emissions from Table 11.19.2-2. TSP (PM30) is interpolated from Total PM and PM-10 values.
[2] AP-42 Chapter 13.2.4, 11/06

Trommel Screen
Aggregate Handling Emission Factors
(Loading)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lb per ton   AP-42 Chapter 13.2.4, 11/06

k = particle size mutlipler	0.74	AP-42, TSP
k = particle size mutlipler	0.35	AP-42, PM-10
k = particle size mutlipler	0.053	AP-42, PM-2.5
U = mean wind speed	11	mph (default)
M = material moisture content	2	% (default)

Base Emission Factor

E =	0.006600	TSP	**lb/ton**
E =	0.003122	PM-10	**lb/ton**
E =	0.000473	PM-2.5	**lb/ton**

Table 6-13

Santa Fe Waste Management Agency
Caja Del Rio Landfill
Diesel Engine Emissions

Pollutants: **PM,SO2, CO,NOx, VOC**

Category: **Trommel screen, Godwin pump and green waste chipper drive engines**

Operation

Hours of Operation:

Chipper engine				Godwin engine			
7	day/wk	365	**day/yr**	7	day/wk	365	**day/yr**
12	hr/day	4380	**Hours/year**	15	hr/day	5475	**Hours/year**
52	wk/yr			52	wk/yr		

Trommel engine			
7	day/wk	365	**day/yr**
12	hr/day	4380	**Hours/year**
52	wk/yr		

Diesel Engine Emissions

Diesel Engine-Trommel Screen[1]			**AP-42 Factors** * lb/hp-hr	lb/hr	ton/yr	**Tier I factors** gm/hp-hr	lb/hr	ton/yr
make	Isuzu	TSP	0.0022	**0.154**	**0.337**		0.000	
model	4JB1-Tier 1	PM-10	0.0022	**0.154**	**0.337**		0.000	
horsepower	70	NOx	0.0310	**2.17**	**4.752**	9.2	1.419	3.107
weight % sulfur in fuel	0.05	CO	0.0067	**0.468**	**1.024**		0.000	
fuel consumption, lb/hr	25.4	VOC	0.0025	**0.173**	**0.379**		0.000	
		SO_2					0.0254	0.056

Continuous power = 61 hp, Standby power = 70 hp
Fuel rate = 0.363 lb fuel/hp-hr * 70 hp = 25.4 lb fuel/hr
* Emission Factors for Industrial Diesel Engines, AP-42, Table 3.3-1 for engines up to 600 hp

Diesel Engine-green waste chipper - G1[2]			* lb/hp-hr	lb/hr	ton/yr	gm/hp-hr	**MFG Data** lb/hr	ton/yr
make	Cat	TSP	0.0022	**1.76**		NA	0.040	0.09
model	C-18	PM-10	0.0022	**1.76**		NA	0.040	0.09
horsepower	800	NOx	0.0310	**24.80**		NA	3.910	8.56
weight % sulfur in fuel	0.05	CO	0.0067	**5.34**		NA	0.010	0.02
fuel consumption, gal/hr	39.7	VOC	0.0025	**1.98**		NA	0.010	0.02
		SO_2		**0.00**		NA	0.282	0.62

* Emission Factors for Industrial Diesel Engines, AP-42, Table 3.4-1, for engines over 600 hp

** Caterpillar data for this engine

Table 6-13

Diesel Engine - Godwin water pump engine [3]			* lb/hp-hr	lb/hr	ton/yr	Tier II factors gm/hp-hr	lb/hr	ton/yr
make	John Deere	TSP	**0.0022**	**0.18**	**0.48**	**0.4**	**0.070**	**0.193**
model	4045DF270B-Tier 2	PM-10	**0.0022**	**0.18**	**0.48**	**0.4**	**0.070**	**0.193**
horsepower	80	NOx	**0.0310**	**2.48**	**6.79**	**7.5**	**1.32**	**3.618**
weight % sulfur in fuel	0.05	CO	**0.0067**	**0.53**	**1.46**	**5**	**0.88**	**2.412**
fuel consumption, lb fuel/hr [4]	33.36	VOC	**0.0025**	**0.198**	**0.54**		0.00	0.000
		SO_2					**0.033**	**0.091**

* Emission Factors for Industrial Diesel Engines, AP-42, Table 3.3-1 for engines up to 600 hp

Footnotes:

[1] The Trommel engine is a Tier 1 engine. Refer to the Isuzu J Series Engine sheet for fuel rate.

[2] The green waste chipper is not currently used at the landfill but might be used in the future.

[3] While the Godwin pump engine emissions are calculated based on 52 weeks per year, the Godwin pump is generally not used in the winter months (snow season). The Godwin pump fills the water trucks that are used for dust suppression at the landfill.

[4] Fuel rate based on the John Deere 4045DF270 engine sheet at bsfc=0.417 lb/bhp-hr).

Tier 2 Nox value is for Nox + NMHC. NOX will be less than this value.

Table 6-14

Santa Fe Waste Management Agency
Caja Del Rio Landfill
Diesel Tire Cutter/Bailer Emissions

Pollutants: **PM,SO2, CO,NOx**

Category: **Tires, scrap tire cutter/bailer Drive Engines**

Operation

Hours of Operation:		day/wk	80	**day/yr**
	8	hr/day	640	**Hours/year**
		wk/yr		

Diesel Engine Emissions

Diesel Engine #1-tire cutter			AP-42 Factors * lb/hp-hr	lb/hr	**Calculated** lb/hr
make	Isuzu	TSP	0.0022	**0.05**	
model		PM-10	0.0022	**0.05**	
horsepower	23	NOx	0.0310	**0.71**	
weight % sulfur in fuel	0.05	CO	0.0067	**0.15**	
fuel consumption, gal/hr	1.25	VOC	0.0025	**0.06**	
lb/hr = lb/hp-hr X horsepower		SO_2			0.009

* Emission Factors for Industrial Diesel Engines, AP-42 Table 3.3-1 for engines up to 600 hp

Diesel Engine #2- tire bailer			* lb/hp-hr	lb/hr	**Calculated** lb/hr
make	Isuzu	TSP	0.0022	**0.08**	
model		PM-10	0.0022	**0.08**	
horsepower	35	NOx	0.0310	**1.09**	
weight % sulfur in fuel	0.05	CO	0.0067	**0.23**	
fuel consumption, gal/hr	1.9	VOC	0.0025	**0.09**	
lb/hr = lb/hp-hr X horsepower		SO_2			0.014

* Emission Factors for Industrial Diesel Engines, AP-42 Table 3.3-1 for engines up to 600 hp

Table 6-15a
SFSWMA HAP Emissions (Green Waste Eng)

Santa Fe Solid Waste Management Agency Title 5 Emission Applicability - HAP Emissions

Instructions:
Enter or update the total diesel engine driver fuel data and the numeric operating hours fields [B17-B19] and the remaining table will automatically update the annual operating hours, and the Title 5 Emission summary table. If more than one engine, be sure to enter the total for all engines.

Engine Fuel Operating Data			
Diesel Driver Engines, Total HP	800	hp	**(Chipper Engine)**
Diesel Engine Fuel Rate	281.6	lb/hr	
Fuel density	7.0932	lb/gal	
Diesel Fuel Rate	39.700	Gal/hr	
Fuel HHV	141000	Btu/gal	
Diesel Engine Heat Input	5.5977	MMBtu/hr	
7am-6pm	**12**	hr/day	
M-SU	**7**	d/wk	
All weeks	**52**	wk/yr	
Annual Process Hours per Year	**4380**	hours/year	<==(hr/d x d/wk x wk/yr)

Title 5 HAP Emission Summary

	Tons/year	Major Limit
Largest HAP	**0.0145**	10
Total HAP	**0.0470**	25

Short Term Emission Summary — **AP-42, 10/96, Table 3.3-2 Gasoline and Diesel Industrial Engines**

HAP Pollutant	Diesel Engine lb/Mmbtu	lb/hr
non-PAH HAPs		
Acetaldehyde	7.67E-04	4.29E-03
Acrolein	9.25E-05	5.18E-04
Benzene	9.33E-04	5.22E-03
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	6.61E-03
Propylene	2.58E-03	
Toluene	4.09E-04	2.29E-03
Xylenes	2.85E-04	1.60E-03
Total non-PAH HAPs	6.29E-03	2.05E-02
Max non-PAH HAPs		6.61E-03
PAH HAPs		
2-Methylnaphthalene		
Acenaphthene	1.42E-06	7.95E-06
Acenaphtylene	5.06E-06	2.83E-05
Anthracene	1.87E-06	1.05E-05
Benzo(a)anthracene	1.68E-06	9.40E-06
Benzo(a)pyrene	1.88E-07	1.05E-06
Benzo(b)fluoranthene	9.91E-08	5.55E-07
Benzo(e)pyrene		
Benzo(g,h,i)perylene	4.89E-07	2.74E-06
Benzo(k)fluoranthene	1.55E-07	8.68E-07
Chrysene	3.53E-07	1.98E-06
Dibenz(a,h)anthracene	5.83E-07	3.26E-06
Fluoranthene	7.61E-06	4.26E-05
Fluorene	2.92E-05	1.63E-04
Indeno(1,2,3-cd)pyrene	3.75E-07	2.10E-06
Naphthalene	8.48E-05	4.75E-04
Perylene		
Phenanthrene	2.94E-05	1.65E-04
Pyrene	4.78E-06	2.68E-05
Total PAH Haps	1.68E-04	9.41E-04

Table 6-15a
SFSWMA HAP Emissions (Green Waste Eng)

Total HAPs	2.15E-02
Max PAH Haps	0.000475

Table 6-15b
SFSWMA HAP Emissions (Green Waste Eng)

Santa Fe Solid Waste Management Agency Title 5 Emission Applicability - HAP Emissions

Instructions:
Enter or update the total diesel engine driver fuel data and the numeric operating hours fields [B17-B19] and the remaining table will automatically update the annual operating hours, and the Title 5 Emission summary table. If more than one engine, be sure to enter the total for all engines.

Engine Fuel Operating Data

Diesel Driver Engines, Total HP	80	hp	**(Godwin water pump)**
Diesel Engine Fuel Rate	33.36	lb/hr	
Fuel density	7.0932	lb/gal	
Diesel Fuel Rate	4.703	Gal/hr	
Fuel HHV	141000	Btu/gal	
Diesel Engine Heat Input	0.6631	MMBtu/hr	
7am-6pm	**15**	hr/day	
M-SU	**7**	d/wk	
All weeks	**52**	wk/yr	
Annual Process Hours per Year	**5475**	hours/year	<==(hr/d x d/wk x wk/yr)

Title 5 HAP Emission Summary

	Tons/year	Major Limit
Largest HAP	**0.0021**	10
Total HAP	**0.0070**	25

Short Term Emission Summary — **AP-42, 10/96, Table 3.3-2 Gasoline and Diesel Industrial Engines**

HAP Pollutant	Diesel Engine lb/Mmbtu	lb/hr
non-PAH HAPs		
Acetaldehyde	7.67E-04	5.09E-04
Acrolein	9.25E-05	6.13E-05
Benzene	9.33E-04	6.19E-04
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	7.83E-04
Propylene	2.58E-03	
Toluene	4.09E-04	2.71E-04
Xylenes	2.85E-04	1.89E-04
Total non-PAH HAPs	6.29E-03	2.43E-03
Max non-PAH HAPs		0.000783
PAH HAPs		
2-Methylnaphthalene		
Acenaphthene	1.42E-06	9.42E-07
Acenaphtylene	5.06E-06	3.36E-06
Anthracene	1.87E-06	1.24E-06
Benzo(a)anthracene	1.68E-06	1.11E-06
Benzo(a)pyrene	1.88E-07	1.25E-07
Benzo(b)fluoranthene	9.91E-08	6.57E-08
Benzo(e)pyrene		
Benzo(g,h,i)perylene	4.89E-07	3.24E-07
Benzo(k)fluoranthene	1.55E-07	1.03E-07
Chrysene	3.53E-07	2.34E-07
Dibenz(a,h)anthracene	5.83E-07	3.87E-07
Fluoranthene	7.61E-06	5.05E-06
Fluorene	2.92E-05	1.94E-05
Indeno(1,2,3-cd)pyrene	3.75E-07	2.49E-07
Naphthalene	8.48E-05	5.62E-05
Perylene		
Phenanthrene	2.94E-05	1.95E-05
Pyrene	4.78E-06	3.17E-06
Total PAH Haps	1.68E-04	1.11E-04

Table 6-15b
SFSWMA HAP Emissions (Green Waste Eng)

Total HAPs	2.54E-03
Max PAH Haps	5.62E-05

Table 6-15c
SFSWMA HAP Emissions (Green Waste Eng)

Santa Fe Solid Waste Management Agency Title 5 Emission Applicability - HAP Emissions

Instructions:
Enter or update the total diesel engine driver fuel data and the numeric operating hours fields [B17-B19] and the remaining table will automatically update the annual operating hours, and the Title 5 Emission summary table. If more than one engine, be sure to enter the total for all engines.

Engine Fuel Operating Data			
Diesel Driver Engines, Total HP	70	hp	**(Trommel Engine)**
Diesel Engine Fuel Rate	26.24	lb/hr	
Fuel density	7.0932	lb/gal	
Diesel Fuel Rate	3.699	Gal/hr	
Fuel HHV	141000	Btu/gal	
Diesel Engine Heat Input	0.5216	MMBtu/hr	
7am-6pm	**12**	hr/day	
M-SU	**7**	d/wk	
All weeks	**52**	wk/yr	
Annual Process Hours per Year	**4380**	hours/year	<==(hr/d x d/wk x wk/yr)

Title 5 HAP Emission Summary

	Tons/year	Major Limit
Largest HAP	**0.0013**	10
Total HAP	**0.0044**	25

Short Term Emission Summary — **AP-42, 10/96, Table 3.3-2 Gasoline and Diesel Industrial Engines**

HAP Pollutant	Diesel Engine lb/Mmbtu	lb/hr
non-PAH HAPs		
Acetaldehyde	7.67E-04	4.00E-04
Acrolein	9.25E-05	4.82E-05
Benzene	9.33E-04	4.87E-04
1,3-Butadiene	3.91E-05	
Formaldehyde	1.18E-03	6.15E-04
Propylene	2.58E-03	
Toluene	4.09E-04	2.13E-04
Xylenes	2.85E-04	1.49E-04
Total non-PAH HAPs	6.29E-03	1.91E-03
Max non-PAH HAPs		0.000615
PAH HAPs		
2-Methylnaphthalene		
Acenaphthene	1.42E-06	7.41E-07
Acenaphtylene	5.06E-06	2.64E-06
Anthracene	1.87E-06	9.75E-07
Benzo(a)anthracene	1.68E-06	8.76E-07
Benzo(a)pyrene	1.88E-07	9.81E-08
Benzo(b)fluoranthene	9.91E-08	5.17E-08
Benzo(e)pyrene		
Benzo(g,h,i)perylene	4.89E-07	2.55E-07
Benzo(k)fluoranthene	1.55E-07	8.08E-08
Chrysene	3.53E-07	1.84E-07
Dibenz(a,h)anthracene	5.83E-07	3.04E-07
Fluoranthene	7.61E-06	3.97E-06
Fluorene	2.92E-05	1.52E-05
Indeno(1,2,3-cd)pyrene	3.75E-07	1.96E-07
Naphthalene	8.48E-05	4.42E-05
Perylene		
Phenanthrene	2.94E-05	1.53E-05
Pyrene	4.78E-06	2.49E-06
Total PAH Haps	1.68E-04	8.77E-05

Table 6-15c
SFSWMA HAP Emissions (Green Waste Eng)

Total HAPs	2.00E-03
Max PAH Haps	4.42E-05

Table 6-16

Table 1. Maximum Estimated Petroleum Vapor Emission from Landfarming Petroleum Contaminated Soil

Contaminant	Yards of dirt	Ton of dirt[1]	Kg of dirt	Level, pretreatment[2]	Level, post treatment[3]	Total of Contaminant[4,5,6]		
	Cu. Yds	Tons	Kg	mg/kg	mg/kg	gm	lb	Tons
VOC as TPH	10000	15000	13607700	2000	950	14288085	31472	15.7
BTEX	10000	15000	13607700	445	225	2993694	6594	3.3
Benzene	10000	15000	13607700	16	10	81646.2	180	0.1
Toluene	10000	15000	13607700	140	70	952539	2098	1.0
Ethylbenzene	10000	15000	13607700	49	25	326584.8	719	0.4
Xylene	10000	15000	13607700	240	120	1632924	3597	1.8

Notes:
1 Assumes PCS density of 1.5 tons per cubic yard. The total yards of soil is based on projected amounts from the Judicial Complex building site. Other PCS will likely be far lower in quantity.
2 Upper to average values of Petroleum Hydrocarbons and constituents in soil on arrival at the Landfill.
3 The level for solid waste that can be used in the landfill is 1000 mg/kg for TPH, 500 mg/kg for BTEX and 10 mg/KG for benzene. At TPH levels below this value, the soil is considered solid waste and can be disposed of in the landfill.
4 It is assumed that all truck loads of PCS soil will be at this level. Many loads of soil will be lower than the solid waste permit value.
5 This represents an upper limit released from landfarming.
6 After soil is remediated, it will be used as cover and will ultimately be buried. Once buried, its ability to emit to the atmosphere will essentially cease. Since the soil is part of the landfill and there will be a NMOC vapor capture system in place, any petroleum vapors captured by the system will be flared along with NMOC vapors.

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC) applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e emissions from your facility.
2. GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Emissions from routine or predictable start up, shut down, and maintenance must be included.
4. Report GHG mass and GHG CO_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

Global Warming Potentials (GWP):
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO_2 over a specified time period.

"Greenhouse gas" for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

Metric to Short Ton Conversion:
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.
1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

Table 6.6 includes GHG emissions calculations for both the flare and landfill. The calculations are conservative in that, for the landfill, a low GCCS collection efficiency is assumed, but for the flare, the full flare's capacity is assumed. These two operating scenarios would not occur concurrently.

Table 6-3a

Caja del Rio Landfill GHG Emissions

Assumptions:

LFG = 50% CH_4 and 50% CO_2
*when calculating potential-to-emit for criteria pollutants, 50 % CH_4 and 50 % CO_2 are typically used, therefore use these numbers when calculating GHG emissions

Heating value of LFG = 506 BTU/scf
*Pure methane has a heating value of 1012 BTU/scf and the model assumes that Landfill gas is 50% methane, therefore a heating value of 506 BTU/scf for landfill gas. This will need to be adjusted if use a different percent methane content than 50%.

Devices are run for 8,760 hours/year
Global Warming Potential CH_4 = 25
Global Warming Potential N_2O = 298
*Global Warming Potential Taken from TABLE A–1 to Subpart A of Part 98-Global Warming Potentials
40 CFR Parts 86, 87, 89 et al. Mandatory Reporting of Greenhouse Gases; Final Rule

Emission factors:

CO_2 = 52.07 kg /MMBTU
*Taken from TABLE C–1 to Subpart C of Part 98 -Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel,
40 CFR Parts 86, 87, 89 et al. Mandatory Reporting of Greenhouse Gases; Final Rule

CH_4 = 3.20E-03 kg/MMBTU
N_2O = 6.30E-04 kg/MMBTU
*Taken from TABLE C–2 to Subpart C of Part 98 - Default CH_4 and N_2O Emission Factors for Various Types of Fuel,
40 CFR Parts 86, 87, 89 et al. Mandatory Reporting of Greenhouse Gases; Final Rule

Calculations:

Annual throughput (mmscf) = Unit rated throughput (scfm) X 60 min./hour X 24 hr./day X 365 days/year X 0.000001

Annual Methane and CO_2 generation (mmscf) = annual throughput (mmscf) x 0.50 (50 %)

Heat Rate (MMBTU/hr) = Unit rated throughput (scfm) X 60 min/hr. X 506 BTU/scf (heating value of LFG) X 0.000001

Total CO_2 = metric tons of CO_2 generated by combustion of LFG plus passthrough metric tons of CO_2
metric tons of CO_2 due to combustion = heat rate (MMBTU/hr) X 8760 hr/year X emission factor CO_2 (52.07) x 0.001

passthrough metric tons = CO_2 generation (mmscf) X 1,000,000 scf/1mmscf X 1 m3/35.31 scf X 1000 L/1 m3
X 1 mole gas/23.689 L X 44.01 gm/1 mole CO_2 X 1.00 E-6 metric tons/ 1gm.

Total N_2O (metric tons CO_2 eq.) = heat rate (MMBTU/hr) X 8760 hr/year X emission factor N_2O (6.30E-04 kg/MMBTU) x 0.001 X 298 GWP

Total CH_4 (metric tons CO_2 eq.) = heat rate (MMBTU/hr) X 8760 hr/year X emission factor CH_4 (3.20E-03 kg/MMBTU) x 0.001 X 25 GWP

Total metric tons (CO_2 and CO_2 eq.) = Total CO_2 + N_2O metric tons CO_2 eq. + CH_4 metric tons CO_2 eq. X 1.1023

Converstion Factors:

1 gram	=	1.000E-06 metric tons
1 mmscf	=	1000000 scf
1 mol CO_2	=	44.01 g
1 m3	=	35.31 scf
1 m3	=	1000 L
1 mol gas	=	23.69 L

* 23.689 is molar volume of gas at standard pressure of 1 atmosphere at 60 degrees Farenheit

pressure = 1 atmosphere as published in the Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air and the Compendium of Method for the Determination of Toxic Organic Compounds in Ambient Air.

temperature = 60 degrees Farenheit as cited in 40 CFR Parts 86, 87, 89 et al. Mandatory Reporting of Greenhouse Gases; Final Rule

Table 6-3b

Caja del Rio Landfill GHG Emissions (Flare Only)

General Information

Unit Type	Unit Rated Throughput (scfm)	Annual Potential Throughput (mmscf)	Annual Potential Methane Generation (mmscf)	Annual Potential CO2 Generation (mmscf)
Flare (500 scfm)	500	262.80	131.40	131.40

Biogenic Emissions (Neutral from a GHG Perspective)

Unit Type	Heat Rate (MMBTU/Hr)	Combustion CO2 (metric tons)	Passthrough CO2 (metric tons)	Total Biogenic CO2 (metric tons)	Total Biogenic CO2 (US tons)
Flare (500 scfm)	15.180	6,924.10	6,913.57	13,837.67	15,253.26

Anthropogenic Emissions

Unit Type	N2O (metric tons)	CH4 (metric tons)	N2O (metric tons CO2 eq.)	CH4 (metric tons CO2 eq.)	Total Anthropogenic (metric tons CO2 eq.)	**Total Anthropogenic (US tons CO2 eq.)**
Flare (500 scfm)	0.08	0.43	24.97	10.64	35.60	**39.25**
U.S. TONS =>	0.0923	0.469	27.52	11.73		

Table 6-3c

Caja del Rio Landfill Combustion GHG Emissions

Emission Source:

Administration Building

Mass Emissions for Propane	Gallons used	High Heat Value (mmBtu/gallon) (1)	Emission Factor (kg/mmBtu) (1)	Emissions (metric tons/yr)	Emissions (US tons/yr)
CO_2	1,090	9.10E-02	6.15E+01	6.097	6.721
CH_4	1,090	9.10E-02	3.00E-03	2.98E-04	3.28E-04
N_2O	1,090	9.10E-02	6.00E-04	5.95E-05	6.56E-05
CO_2e (2)				6.12	**6.75**

1 High Heat Value and Emissions Factors are from 40 CFR §98 Tables C-1 and C-2.
2 CO_2e (1 ton CO_2 = 1 ton CO_2e), (1 ton CH_4 = 25 tons CO_2e), (1 ton N_2O = 298 tons CO_2e)

Emission Source:

Maintenance Building

Mass Emissions for Propane	Gallons used	High Heat Value (mmBtu/gallon) (1)	Emission Factor (kg/mmBtu) (1)	Emissions (metric tons/yr)	Emissions (US tons/yr)
CO_2	9,812	9.10E-02	6.15E+01	54.876	60.491
CH_4	9,812	9.10E-02	3.00E-03	2.68E-03	2.95E-03
N_2O	9,812	9.10E-02	6.00E-04	5.36E-04	5.91E-04
CO_2e (2)				55.10	**60.74**

1 High Heat Value and Emissions Factors are from 40 CFR §98 Tables C-1 and C-2.
2 CO_2e (1 ton CO_2 = 1 ton CO_2e), (1 ton CH_4 = 25 tons CO_2e), (1 ton N_2O = 298 tons CO_2e)

Emission Source:

Scalehouse Building

Mass Emissions for Propane	Gallons used	High Heat Value (mmBtu/gallon) (1)	Emission Factor (kg/mmBtu) (1)	Emissions (metric tons/yr)	Emissions (US tons/yr)
CO_2	4,906	9.10E-02	6.15E+01	27.438	30.245
CH_4	4,906	9.10E-02	3.00E-03	1.34E-03	1.48E-03
N_2O	4,906	9.10E-02	6.00E-04	2.68E-04	2.95E-04
CO_2e (2)				27.55	**30.37**

1 High Heat Value and Emissions Factors are from 40 CFR §98 Tables C-1 and C-2.
2 CO_2e (1 ton CO_2 = 1 ton CO_2e), (1 ton CH_4 = 25 tons CO_2e), (1 ton N_2O = 298 tons CO_2e)

EXAMPLE CALCULATION

(CO_2, CH_4)

Emissions (metric tons/yr) = (Fuel Usage [gallons])*(High Heat Value [mmBtu/gallon])*(Emission Factor [kg/mmBtu])
(1 lb/0.4536 kg)(1 ton/2000 lbs)

Section 7

Information Used To Determine Emissions

<u>Information Used to Determine Emissions</u> shall include the following:

- ☑If manufacturer data are used, include specifications for emissions units <u>and</u> control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- ☐ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- ☑ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- ☐ If an older version of AP-42 is used, include a complete copy of the section.
- ☐ If an EPA document or other material is referenced, include a complete copy.
- ☐ Fuel specifications sheet.
- ☑ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

Waste Industry Air Coalition
Comparison of Recent Landfill Gas Analyses with Historic AP-42 Values

by

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January 2001

Table 2. WIAC results compared with AP-42 defaults. WIAC-1 values use AP-42 averaging methods. Some WIAC-2 values, grayed in column 2, use different methods (see text).

Compound	WIAC Sites	Concentration, ppmv AP-42	WIAC-1	WIAC-2
1,1,1-Trichloroethane (methyl chloroform)	46	0.48	0.168	0.168
1,1,2,2-Tetrachloroethane	19	1.11	0.070	0.005
1,1-Dichloroethane (ethylidene dichloride)	45	2.35	0.741	0.741
1,1-Dichloroethene (vinylidene chloride)	45	0.2	0.092	0.092
1,2-Dichloroethane (ethylene dichloride)	47	0.41	0.120	0.120
1,2-Dichloropropane (propylene dichloride)	17	0.18	0.023	0.023
2-Propanol (isopropyl alcohol)	3	50.1	7.908	7.908
Acetone	8	7.01	6.126	7.075
Acrylonitrile	3	6.33	<0.036	<0.036
Benzene (Co-Disposal)	3	11.1	10.376	10.376
Benzene (No Co-Disposal)	44	1.91	0.972	0.972
Bromodichloromethane	7	3.13	<0.311	<0.264
Carbon disulfide	31	0.58	0.320	0.221
Carbon tetrachloride	37	0.004	<0.007*	<0.007*
Carbonyl sulfide	29	0.49	0.183	0.183
Chlorobenzene	46	0.25	0.227	0.227
Chlorodifluoromethane (Freon 22)	1	1.3	0.355	0.355
Chloroethane (ethyl chloride)	21	1.25	0.239	0.448
Chloroform	45	0.03	0.021	0.010
Chloromethane	8	1.21	0.249	0.136
Dichlorobenzene	34	0.21	1.607	1.448
Dichlorodifluoromethane (Freon 12)	19	15.7	1.751	0.964
Dichloromethane (Methylene Chloride)	47	14.3	3.395	3.395
Dimethyl sulfide (methyl sulfide)	34	7.82	6.809	6.809
Ethane	1	889	7.943	7.943
Ethanol	4	27.2	118.618	64.425
Ethyl mercaptan (Ethanethiol)	36	2.28	1.356	0.226
Ethylbenzene	26	4.61	6.789	6.789
Ethylene dibromide	30	0.001	<0.046	<0.005
Fluorotrichloromethane (Freon 11)	25	0.76	0.327	0.327
Hexane	4	6.57	2.324	2.063
Hydrogen sulfide	40	35.5	23.578	23.578
Methyl ethyl ketone	8	7.09	10.557	12.694
Methyl isobutyl ketone	7	1.87	0.750	0.750
Methyl mercaptan	36	2.49	1.292	1.266
Perchloroethylene (tetrachloroethylene)	48	3.73	1.193	1.193
Propane	1	11.1	14.757	19.858
Toluene (Co-Disposal)	3	165	37.456	37.456
Toluene (No Co-Disposal)	43	39.3	25.405	25.405
trans-1,2 Dichlorethene	1	2.84	0.051	0.051
Trichloroethylene (trichloroethene)	48	2.82	0.681	0.681
Vinyl Chloride	46	7.34	1.077	1.077
Xylenes	45	12.1	16.582	16.582

Note: “<” indicates that the compound was detected at none of the WIAC sites.

[*] Carbon Tetrachloride was detected at one codisposal site but at none of 35 MSW-only disposal sites.

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01) Emission Factor (lb/hp-hr) (power output)	Gasoline Fuel Emission Factor (lb/MMBtu) (fuel input)	Diesel Fuel (SCC 2-02-001-02, 2-03-001-01) Emission Factor (lb/hp-hr) (power output)	Diesel Fuel Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING
NO_x	0.011	1.63	0.031	4.41	D
CO	0.439	62.7	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 µm aerodynamic diameter. All particulate is assumed to be ≤ 1 µm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

Table 3.3-2. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR UNCONTROLLED DIESEL ENGINES[a]

EMISSION FACTOR RATING: E

Pollutant	Emission Factor (Fuel Input) (lb/MMBtu)
Benzene[b]	9.33 E-04
Toluene[b]	4.09 E-04
Xylenes[b]	2.85 E-04
Propylene[b]	2.58 E-03
1,3-Butadiene[b,c]	<3.91 E-05
Formaldehyde[b]	1.18 E-03
Acetaldehyde[b]	7.67 E-04
Acrolein[b]	<9.25 E-05
Polycyclic aromatic hydrocarbons (PAH)	
Naphthalene[b]	8.48 E-05
Acenaphthylene	<5.06 E-06
Acenaphthene	<1.42 E-06
Fluorene	2.92 E-05
Phenanthrene	2.94 E-05
Anthracene	1.87 E-06
Fluoranthene	7.61 E-06
Pyrene	4.78 E-06
Benzo(a)anthracene	1.68 E-06
Chrysene	3.53 E-07
Benzo(b)fluoranthene	<9.91 E-08
Benzo(k)fluoranthene	<1.55 E-07
Benzo(a)pyrene	<1.88 E-07
Indeno(1,2,3-cd)pyrene	<3.75 E-07
Dibenz(a,h)anthracene	<5.83 E-07
Benzo(g,h,l)perylene	<4.89 E-07
TOTAL PAH	1.68 E-04

[a] Based on the uncontrolled levels of 2 diesel engines from References 6-7. Source Classification Codes 2-02-001-02, 2-03-001-01. To convert from lb/MMBtu to ng/J, multiply by 430.
[b] Hazardous air pollutant listed in the *Clean Air Act*.
[c] Based on data from 1 engine.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a (W/3)^b \qquad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\,(s/12)^a (S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range

The quantity of particulate emissions generated by either type of drop operation, per kilogram (kg) (ton) of material transferred, may be estimated, with a rating of A, using the following empirical expression:[11]

$$E = k(0.0016)\ \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\ \text{(kg/megagram [Mg])}$$

$$E = k(0.0032)\ \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\ \text{(pound [lb]/ton)} \qquad (1)$$

where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1				
< 30 μm	< 15 μm	< 10 μm	< 5 μm	< 2.5 μm
0.74	0.48	0.35	0.20	0.053 [a]

[a] Multiplier for < 2.5 μm taken from Reference 14.

The equation retains the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equation, as follows. Note that silt content is included, even though silt content does not appear as a correction parameter in the equation. While it is reasonable to expect that silt content and emission factors are interrelated, no significant correlation between the 2 was found during the derivation of the equation, probably because most tests with high silt contents were conducted under lower winds, and vice versa. It is recommended that estimates from the equation be reduced 1 quality rating level if the silt content used in a particular application falls outside the range given:

Ranges Of Source Conditions For Equation 1			
Silt Content (%)	Moisture Content (%)	Wind Speed	
		m/s	mph
0.44 - 19	0.25 - 4.8	0.6 - 6.7	1.3 - 15

To retain the quality rating of the equation when it is applied to a specific facility, reliable correction parameters must be determined for specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site-specific values for

Table 11.9-1 (English Units). EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES[a]

Operation	Material	Emissions By Particle Size Range (Aerodynamic Diameter)[b,c]				Units	EMISSION FACTOR RATING
		Emission Factor Equations		Scaling Factors			
		TSP ≤30 µm	≤15 µm	≤10 µm[d]	≤2.5 µm/TSP[e]		
Blasting[f]	Coal or overburden	$0.000014(A)^{1.5}$	ND	0.52[e]	0.03	lb/blast	C_DD
Truck loading	Coal	$\frac{1.16}{(M)^{1.2}}$	$\frac{0.119}{(M)^{0.9}}$	0.75	0.019	lb/ton	BBCC
Bulldozing	Coal	$\frac{78.4\ (s)^{1.2}}{(M)^{1.3}}$	$\frac{18.6\ (s)^{1.5}}{(M)^{1.4}}$	0.75	0.022	lb/hr	CCDD
	Overburden	$\frac{5.7\ (s)^{1.2}}{(M)^{1.3}}$	$\frac{1.0\ (s)^{1.5}}{(M)^{1.4}}$	0.75	0.105	lb/hr	BCDD
Dragline	Overburden	$\frac{0.0021\ (d)^{1.1}}{(M)^{0.3}}$	$\frac{0.0021\ (d)^{0.7}}{(M)^{0.3}}$	0.75	0.017	lb/yd^3	BCDD
Vehicle traffic[g]							
Grading		$0.040\ (S)^{2.5}$	$0.051\ (S)^{2.0}$	0.60	0.031	lb/VMT	CCDD
Active storage pile[h] (wind erosion and maintenance)	Coal	0.72 u	ND	ND	ND	$\frac{lb}{(acre)(hr)}$	C[i]_ _ _

[a] Reference 1, except as noted. VMT = vehicle miles traveled. ND = no data. Quality ratings coded where "Q, X, Y, Z" are ratings for ≤30 µm, ≤15 µm, ≤10 µm, and ≤2.5 µm, respectively. See also note below.

[b] Particulate matter less than or equal to 30 µm in aerodynamic diameter is sometimes termed "suspendable particulate" and is often used as a surrogate for TSP (total suspended particulate). TSP denotes what is measured by a standard high volume sampler (see Section 13.2).

[c] Symbols for equations:

A = horizontal area (ft^2), with blasting depth ≤ 70 ft. Not for vertical face of a bench.
M = material moisture content (%)
s = material silt content (%)
u = wind speed (mph)
d = drop height (ft)
W = mean vehicle weight (tons)
S = mean vehicle speed (mph)
w = mean number of wheels

Table 11.9-1 (cont.).

[d] Multiply the $\leq$15-µm equation by this fraction to determine emissions, except as noted.
[e] Multiply the TSP predictive equation by this fraction to determine emissions.
[f] Blasting factor taken from a reexamination of field test data reported in Reference 1. See Reference 4.
[g] To estimate emissions from traffic on unpaved surfaces by vehicles such as haul trucks, light-to-medium duty vehicles, or scrapers in the travel mode, see the unpaved road emission factor equation in AP-42 Section 13.2.2.
[h] Coal storage pile factor taken from Reference 5. To estimate emissions on a shorter time scale (e. g., worst-case day), see the procedure presented in Section 13.2.5.
[i] Rating applicable to mine types I, II, and IV (see Tables 11.9-5 and 11.9-6).

Note: Section 234 of the Clean Air Act of 1990 required EPA to review and revise the emission factors in this Section (and models used to evaluate ambient air quality impact), to ensure that they did not overestimate emissions from western surface coal mines. Due to resource and technical limitations, the haul road emission factors were isolated to receive the most attention during these studies, as the largest contributor to emissions. Resultant model evaluation with revised emission factors have improved model prediction for total suspended particulate (TSP); however, there is still a tendency for overprediction of particulate matter impact for PM-10, for as yet undetermined causes, prompting the Agency to make a policy decision not to use them for regulatory applications to these sources. However, the technical consideration exists that no better alternative data are currently available and the information should be made known. Users should accordingly use these factors with caution and awareness of their likely limitations.

Table 11.9-4 (English And Metric Units). UNCONTROLLED PARTICULATE EMISSION FACTORS FOR OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES

Source	Material	Mine Location[a]	TSP Emission Factor[b]	Units	EMISSION FACTOR RATING
Drilling	Overburden	Any	1.3 0.59	lb/hole kg/hole	C C
	Coal	V	0.22 0.10	lb/hole kg/hole	E E
Topsoil removal by scraper	Topsoil	Any	0.058 0.029	lb/ton kg/Mg	E E
		IV	0.44 0.22	lb/ton kg/Mg	E E
Overburden replacement	Overburden	Any	0.012 0.0060	lb/ton kg/Mg	C C
Truck loading by power shovel (batch drop)[c]	Overburden	V	0.037 0.018	lb/ton kg/Mg	E E
Train loading (batch or continuous drop)[c]	Coal	Any	0.028 0.014	lb/ton kg/Mg	E E
		III	0.0002 0.0001	lb/ton kg/Mg	E E
Bottom dump truck unloading (batch drop)[c]	Overburden	V	0.002 0.001	lb/ton kg/Mg	E E
	Coal	IV	0.027 0.014	lb/ton kg/Mg	E E
		III	0.005 0.002	lb/ton kg/Mg	E E
		II	0.020 0.010	lb/ton kg/Mg	E E
		I	0.014 0.0070	lb/T kg/Mg	E E
		Any	0.066 0.033	lb/T kg/Mg	D D

Table 11.9-4 (cont.).

Source	Material	Mine Location[a]	TSP Emission Factor[b]	Units	EMISSION FACTOR RATING
End dump truck unloading (batch drop)[c]	Coal	V	0.007 0.004	lb/T kg/Mg	E E
Scraper unloading (batch drop)[c]	Topsoil	IV	0.04 0.02	lb/T kg/Mg	E E
Wind erosion of exposed areas[d]	Seeded land, stripped overburden, graded overburden	Any	0.38	$\frac{T}{(acre)(yr)}$	C
			0.85	$\frac{Mg}{(hectare)(yr)}$	C

[a] Roman numerals I through V refer to specific mine locations for which the corresponding emission factors were developed (Reference 5). Tables 11.9-4 and 11.9-5 present characteristics of each of these mines. See text for correct use of these "mine-specific" emission factors. The other factors (from Reference 7, except for overburden drilling from Reference 1) can be applied to any western surface coal mine.

[b] Total suspended particulate (TSP) denotes what is measured by a standard high volume sampler (see Section 13.2).

[c] Predictive emission factor equations, which generally provide more accurate estimates of emissions, are presented in Chapter 13.

[d] To estimate wind erosion on a shorter time scale (e. g., worst-case day), see Section 13.2.5.

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Title 40 → Chapter I → Subchapter C → Part 98 → Subpart A → Appendix

Title 40: Protection of Environment
PART 98—MANDATORY GREENHOUSE GAS REPORTING
Subpart A—General Provision

TABLE A-1 TO SUBPART A OF PART 98—GLOBAL WARMING POTENTIALS

[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Chemical-Specific GWPs			
Carbon dioxide	124-38-9	CO_2	1
Methane	74-82-8	CH_4	[a]25
Nitrous oxide	10024-97-2	N_2O	[a]298
Fully Fluorinated GHGs			
Sulfur hexafluoride	2551-62-4	SF_6	[a]22,800
Trifluoromethyl sulphur pentafluoride	373-80-8	SF_5CF_3	17,700
Nitrogen trifluoride	7783-54-2	NF_3	17,200
PFC-14 (Perfluoromethane)	75-73-0	CF_4	[a]7,390
PFC-116 (Perfluoroethane)	76-16-4	C_2F_6	[a]12,200
PFC-218 (Perfluoropropane)	76-19-7	C_3F_8	[a]8,830
Perfluorocyclopropane	931-91-9	$C\text{-}C_3F_6$	17,340
PFC-3-1-10 (Perfluorobutane)	355-25-9	C_4F_{10}	[a]8,860
PFC-318 (Perfluorocyclobutane)	115-25-3	$C\text{-}C_4F_8$	[a]10,300
PFC-4-1-12 (Perfluoropentane)	678-26-2	C_5F_{12}	[a]9,160
PFC-5-1-14 (Perfluorohexane, FC-72)	355-42-0	C_6F_{14}	[a]9,300
PFC-6-1-12	335-57-9	C_7F_{16}; $CF_3(CF_2)_5CF_3$	[b]7,820
PFC-7-1-18	307-34-6	C_8F_{18}; $CF_3(CF_2)_6CF_3$	[b]7,620
PFC-9-1-18	306-94-5	$C_{10}F_{18}$	7,500
PFPMIE (HT-70)	NA	$CF_3OCF(CF_3)CF_2OCF_2OCF_3$	10,300
Perfluorodecalin (cis)	60433-11-6	$Z\text{-}C_{10}F_{18}$	[b]7,236
Perfluorodecalin (trans)	60433-12-7	$E\text{-}C_{10}F_{18}$	[b]6,288
Saturated Hydrofluorocarbons (HFCs) With Two or Fewer Carbon-Hydrogen Bonds			
HFC-23	75-46-7	CHF_3	[a]14,800
HFC-32	75-10-5	CH_2F_2	[a]675
HFC-125	354-33-6	C_2HF_5	[a]3,500

Unsaturated Halogenated Ethers			
PMVE; HFE-216	1187-93-5	$CF_3OCF{=}CF_2$	[b]0.17
Fluoroxene	406-90-6	$CF_3CH_2OCH{=}CH_2$	[b]0.05
Fluorinated Aldehydes			
3,3,3-Trifluoro-propanal	460-40-2	CF_3CH_2CHO	[b]0.01
Fluorinated Ketones			
Novec 1230 (perfluoro (2-methyl-3-pentanone))	756-13-8	$CF_3CF_2C(O)CF\ (CF3)_2$	[b]0.1
Fluorotelomer Alcohols			
3,3,4,4,5,5,6,6,7,7,7-Undecafluoroheptan-1-ol	185689-57-0	$CF_3(CF_2)_4CH_2CH_2OH$	[b]0.43
3,3,3-Trifluoropropan-1-ol	2240-88-2	$CF_3CH_2CH_2OH$	[b]0.35
3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-Pentadecafluorononan-1-ol	755-02-2	$CF_3(CF_2)_6CH_2CH_2OH$	[b]0.33
3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-Nonadecafluoroundecan-1-ol	87017-97-8	$CF_3(CF_2)_8CH_2CH_2OH$	[b]0.19
Fluorinated GHGs With Carbon-Iodine Bond(s)			
Trifluoroiodomethane	2314-97-8	CF_3I	[b]0.4
Other Fluorinated Compounds			
Dibromodifluoromethane (Halon 1202)	75-61-6	CBR_2F_2	[b]231
2-Bromo-2-chloro-1,1,1-trifluoroethane (Halon-2311/Halothane)	151-67-7	$CHBrClCF_3$	[b]41

Fluorinated GHG Group[d]	Global warming potential (100 yr.)
Default GWPs for Compounds for Which Chemical-Specific GWPs Are Not Listed Above	
Fully fluorinated GHGs	10,000
Saturated hydrofluorocarbons (HFCs) with 2 or fewer carbon-hydrogen bonds	3,700
Saturated HFCs with 3 or more carbon-hydrogen bonds	930
Saturated hydrofluoroethers (HFEs) and hydrochlorofluoroethers (HCFEs) with 1 carbon-hydrogen bond	5,700
Saturated HFEs and HCFEs with 2 carbon-hydrogen bonds	2,600
Saturated HFEs and HCFEs with 3 or more carbon-hydrogen bonds	270
Fluorinated formates	350
Fluorinated acetates, carbonofluoridates, and fluorinated alcohols other than fluorotelomer alcohols	30
Unsaturated perfluorocarbons (PFCs), unsaturated HFCs, unsaturated hydrochlorofluorocarbons (HCFCs), unsaturated halogenated ethers, unsaturated halogenated esters, fluorinated aldehydes, and fluorinated ketones	1
Fluorotelomer alcohols	1
Fluorinated GHGs with carbon-iodine bond(s)	1
Other fluorinated GHGs	2,000

[a]The GWP for this compound was updated in the final rule published on November 29, 2013 [78 FR 71904] and effective on January 1, 2014.

[b]This compound was added to Table A-1 in the final rule published on December 11, 2014, and effective on January 1, 2015.

[c]The GWP for this compound was updated in the final rule published on December 11, 2014, and effective on January 1, 2015 .

[d]For electronics manufacturing (as defined in §98.90), the term "fluorinated GHGs" in the definition of each fluorinated GHG group in §98.6 shall include fluorinated heat transfer fluids (as defined in §98.98), whether or not they are also fluorinated GHGs.

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Title 40: Protection of Environment
PART 98—MANDATORY GREENHOUSE GAS REPORTING
Subpart C—General Stationary Fuel Combustion Sources

Table C-1 to Subpart C of Part 98—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Fuel type	Default high heat value	Default CO_2 emission factor
Coal and coke	mmBtu/short ton	kg CO_2/mmBtu
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	mmBtu/scf	kg CO_2/mmBtu
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products	mmBtu/gallon	kg CO_2/mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG)[1]	0.092	61.71
Propane[1]	0.091	62.87
Propylene[2]	0.091	67.77
Ethane[1]	0.068	59.60
Ethanol	0.084	68.44
Ethylene[2]	0.058	65.96
Isobutane[1]	0.099	64.94
Isobutylene[1]	0.103	68.86
Butane[1]	0.103	64.77

Butylene[1]	0.105	68.72
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.88
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02
Petrochemical Feedstocks	0.125	71.02
Petroleum Coke	0.143	102.41
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.54
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.54
Other fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Municipal Solid Waste	9.95[3]	90.7
Tires	28.00	85.97
Plastics	38.00	75.00
Petroleum Coke	30.00	102.41
Other fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu
Blast Furnace Gas	0.092×10^{-3}	274.32
Coke Oven Gas	0.599×10^{-3}	46.85
Propane Gas	2.516×10^{-3}	61.46
Fuel Gas[4]	1.388×10^{-3}	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Wood and Wood Residuals (dry basis)[5]	17.48	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	10.39	105.51
Biomass fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu
Landfill Gas	0.485×10^{-3}	52.07
Other Biomass Gases	0.655×10^{-3}	52.07
Biomass Fuels—Liquid	mmBtu/gallon	kg CO_2/mmBtu
Ethanol	0.084	68.44
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

[1]The HHV for components of LPG determined at 60 °F and saturation pressure with the exception of ethylene.

[2]Ethylene HHV determined at 41 °F (5 °C) and saturation pressure.

[3]Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

[4]Reporters subject to subpart X of this part that are complying with §98.243(d) or subpart Y of this part may only use the default HHV and the default CO_2 emission factor for fuel gas combustion under the conditions prescribed in §98.243(d)(2)(i) and (d)(2)(ii) and §98.252(a)(1) and (a)(2), respectively.

Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C-5) or Tier 4.

[5]Use the following formula to calculate a wet basis HHV for use in Equation C-1: $HHV_w = ((100 - M)/100)*HHV_d$ where HHV_w = wet basis HHV, M = moisture content (percent) and HHV_d = dry basis HHV from Table C-1.

[78 FR 71950, Nov. 29, 2013]

ELECTRONIC CODE OF FEDERAL REGULATIONS

e-CFR data is current as of April 6, 2015

Title 40 → Chapter I → Subchapter C → Part 98 → Subpart C → Appendix

Title 40: Protection of Environment
PART 98—MANDATORY GREENHOUSE GAS REPORTING
Subpart C—General Stationary Fuel Combustion Sources

TABLE C-2 TO SUBPART C OF PART 98—DEFAULT CH_4 AND N_2O EMISSION FACTORS FOR VARIOUS TYPES OF FUEL

Fuel type	Default CH_4 emission factor (kg CH_4/mmBtu)	Default N_2O emission factor (kg N_2O/mmBtu)
Coal and Coke (All fuel types in Table C-1)	1.1×10^{-02}	1.6×10^{-03}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum (All fuel types in Table C-1)	3.0×10^{-03}	6.0×10^{-04}
Fuel Gas	3.0×10^{-03}	6.0×10^{-04}
Municipal Solid Waste	3.2×10^{-02}	4.2×10^{-03}
Tires	3.2×10^{-02}	4.2×10^{-03}
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels—Solid (All fuel types in Table C-1, except wood and wood residuals)	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals	7.2×10^{-03}	3.6×10^{-03}
Biomass Fuels—Gaseous (All fuel types in Table C-1)	3.2×10^{-03}	6.3×10^{-04}
Biomass Fuels—Liquid (All fuel types in Table C-1)	1.1×10^{-03}	1.1×10^{-04}

Note: Those employing this table are assumed to fall under the IPCC definitions of the "Energy Industry" or "Manufacturing Industries and Construction". In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC "Energy Industry" category may employ a value of 1g of CH_4/mmBtu.

[78 FR 71952, Nov. 29, 2013]

Need assistance?

JOHN DEERE

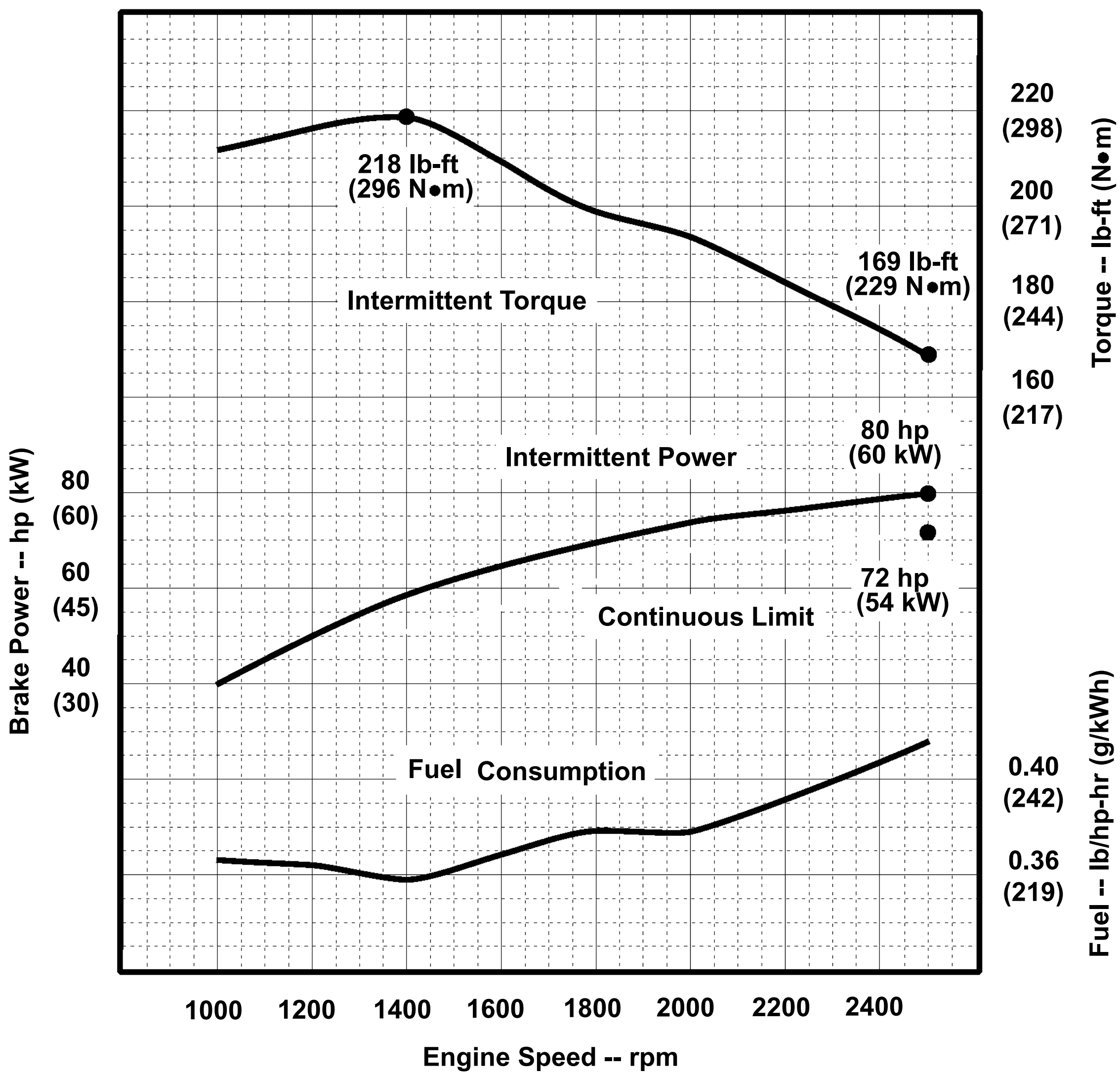
ENGINE PERFORMANCE CURVE

Rating: Gross Power

Application: Industrial
Intermittent / Continuous

PowerTech 4.5 L Engine
Model: **4045DF270**

80 hp @ 2500 rpm
60 kW @ 2500 rpm



Air Intake Restriction ....12 in.H_2O (3 kPa)
Exhaust Back Pressure .... 30 in.H_2O (7.5 kPa)

Gross power guaranteed within + or - 5% at SAE J1995 and ISO 3046 conditions:
- 77 °F (25 °C) air inlet temperature
- 29.31 in.Hg (99 kPa) barometer
- 104 °F (40 °C) fuel inlet temperature
- 0.853 fuel specific gravity @ 60 °F (15.5 °C)

Conversion factors:
- Power: kW = hp x 0.746
- Fuel: 1 gal = 7.1 lb, 1 L = 0.85 kg
- Torque: N•m = lb-ft x 1.356

All values are from currently available data and are subject to change without notice.

Notes:

Tier-2 Emission Certifications:	Certified by:
CARB; EPA; EU Ref: Engine Emission Label	Brian L. Carlson 16 Jan 03

* Revised Data
Curve: 4045DF27080I ....Sheet 1 of 2
January 2003

Engine Specification Data

Common Specifications:

General Data

Model 4045DF270
Number of Cylinders 4
Bore and Stroke--in. (mm)........ 4.20 x 5.00 (106 x 127)
Displacement--in.^{3} (L) 275 (4.5)
Compression Ratio .... 17.6 : 1
Valves per Cylinder--Intake/Exhaust........ 1 / 1
Firing Order........ 1-3-4-2
Combustion System........ Direct Injection
Engine Type .... In-line, 4-Cycle
Aspiration ....Naturally Aspirated
Engine Crankcase Vent System .... Open
Maximum Crankcase Pressure--in. H_2O (kPa) 2 (0.5)

Physical Data

Length--in. (mm) .... 33.9 (861)*
Width--in. (mm) 24.1 (612)
Height--in. (mm) .... 33.7 (856)*
Weight, dry--lb (kg)........851 (387)
(Includes flywheel housing, flywheel & electrics)
Center of Gravity Location
From Rear Face of Block (X-axis)--in. (mm)....9.3 (235)
Right of Crankshaft (Y-axis)--in. (mm) 0.3 (7)
Above Crankshaft (Z-axis)--in. (mm)........5.7 (144)
Max. Allow. Static Bending Moment at Rear
Face of Flywhl Hsg w/ 5-G Load--lb-ft (N•m) ...600 (814)
Thrust Bearing Load Limit (Forward)--lb (N)[I] ...900 (4003)
[C]...500 (2224)

Air System

Maximum Allowable Temp Rise--Ambient Air to
Engine Inlet--°F (°C)........15 (8)
Maximum Air Intake Restriction
Dirty Air Cleaner--in. H_2O (kPa)........25 (6.25)
Clean Air Cleaner--in. H_2O (kPa)........12 (3)
Engine Air Flow--ft^3/min (m^3/min) [I]........162 (4.6)
[C]........162 (4.6)
Intake Manifold Pressure--psi (kPa) [I]........Ambient
[C]........Ambient
Recommended Intake Pipe Diameter--in. (mm)......3 (76.2)

Cooling System

Engine Heat Rejection--BTU/min (kW) [I]........ 2277* (40*)
[C]........ 1878 (33)
Coolant Flow--gal/min (L/min) 54 (204)
Thermostat Start to Open--°F (°C)........ 180 (82)
Thermostat Fully Open--°F (°C)........ 201 (94)
Engine Coolant Capacity--qt (L) 9 (8.5)
Recommended Pressure Cap--psi (kPa)........ 10 (69)
Maximum Top Tank Temp--°F (°C) 221 (105)
Minimum Coolant Fill Rate--gal/min (L/min) 3 (11)
Minimum Air-to-Boil Temperature--°F (°C)........ 117 (47)

Electrical System

	12 Volt	24 Volt
Rec'md. Battery Capacity (CCA)--amp	640	570
Max. Allow. Starting Circuit Resist.--Ohm	0.0012	0.002
Starter Rolling Current		
At 32 °F (0 °C)--amp	780	600
At -22 °F (-30 °C)--amp	1000	700

Exhaust System

Exhaust Flow--ft^3/min (m^3/min) [I] 505 (14.3)
[C]........ 480 (13.6)
Exhaust Temperature--°F (°C) [I] 1256 (680)
[C]........ 1157 (625)
Max. Allowable Back Pressure--in. H_2O (kPa) 30 (7.5)
Rec'd. Exhaust Pipe Diameter--in. (mm) 4.0 (101.6)

Fuel System

Fuel Injection Pump .... Stanadyne DB2
Governor Regulation........ 7-10 %
Governor Type .... Mechanical
Total Fuel Flow--lb/hr (kg/hr) [I] 159 (72.0)
Fuel Consumption--lb/hr (kg/hr) [I]........ 34 (15.2)
[C]........ 31 (13.9)
Maximum Fuel Transfer Pump Suction--ft (m) fuel... 3 (0.9)
Maximum Fuel Inlet Temp.--°F (°C) 212 (100)
Fuel Filter Micron Size @ 98% Efficiency........ 2

Lubrication System

Oil Pressure at Rated Speed--psi (kPa) 50 (345)
Oil Pressure at Low Idle-psi (kPa) 15 (105)
In Pan Oil Temperature--°F (°C) 240.8 (116)
Engine Angularity Limits any direction--degrees
Intermittent........ 45
Continuous........ 20

Performance Data

Rated Power--hp (kW) [I]........ 80 (60)
[C]........ 72 (54)
Rated Speed--rpm 2500
Peak Torque--lb-ft (N•m) [I]........ 218 (296)
[C]........ 196 (266)
Peak Torque Speed--rpm........ 1400
Low Idle Speed--rpm 850
BMEP--psi (kPa) [I]........ 92 (635)
[C]........ 83 (575)
Friction Power @ Rated Speed--hp (kW) .... N/A
Altitude Capability -- ft (m) ....2000 (600)*
Ratio--Air : Fuel [I]........ 20.0:1
[C]........ 23.0:1
Smoke @ Rated Speed--Bosch No. [I]........ 2.1
[C]........ 1.5
Noise--dB(A) @ 1 m [I] 93.5*
[C]........ 93.1*

Engine Speed rpm	Contin. Limit hp(kW)	Intermit. Power hp(kW)	Intermit. Torque lb-ft(N•m)	BSFC lb/hp-hr (g/kWh)
2500	72 (54)	80 (60)	169 (229)	0.417 (254)
2200	68 (51)	76 (57)	184 (249)	0.391 (238)
2000	67 (50)	74 (55)	194 (263)	0.378 (230)
1800	62 (46)	68 (51)	198 (269)	0.379 (231)
1600	56 (42)	63 (47)	209 (284)	0.369 (225)
1400	52 (39)	58 (43)	218 (296)	0.359 (219)
1200	- - - - - -	50 (37)	215 (291)	0.364 (222)
1000	- - - - - -	40 (30)	212 (288)	0.366 (223)

All values at rated speed and power with standard options unless otherwise noted.

* Revised Data
Curve: 4045DF27080I .... Sheet 2 of 2
January 2003

Trommel screen

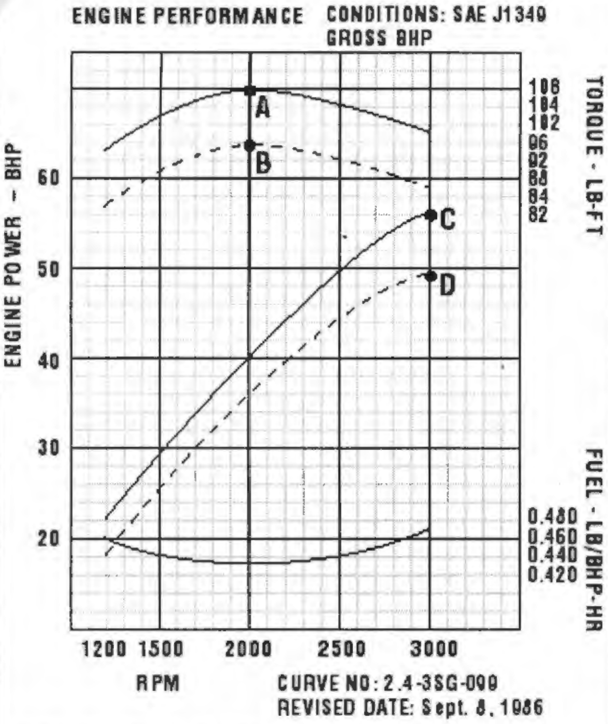
Isuzu J Series Engines

Introduction | C240, 4JB1

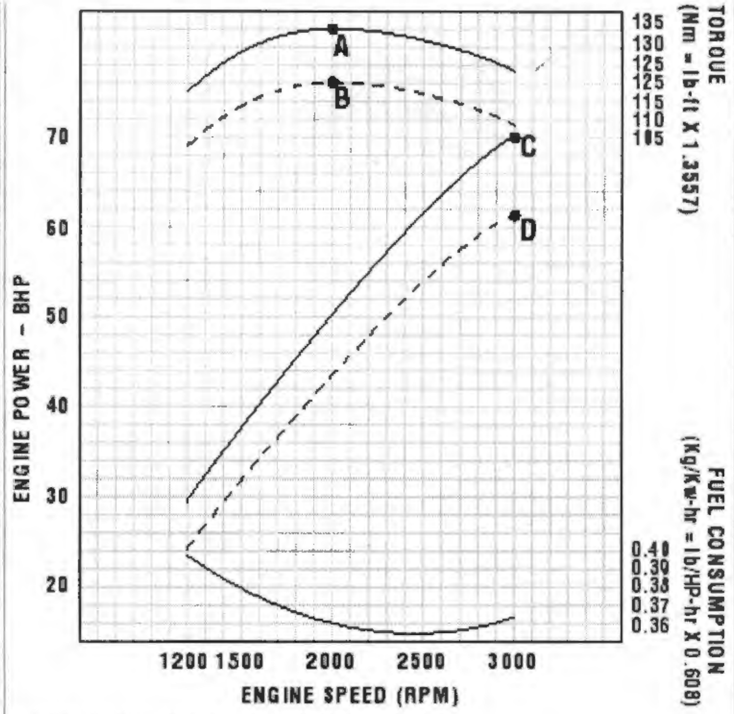
Engine Model	**C240**	**4JB1**
Engine Characteristics	4 Cycle, Water Cooled	
Valvetrain Configuration	Overhead Valve	
Type of Aspiration	Naturally Aspirated	
Type of Injection	Indirect	Direct
Number of Cylinders	4	4
Bore x Stroke	3.39 x 4.02 in (86mm x 102mm)	3.70 x 4.00 in (93mm x 102mm)
Displacement	144 cu in (2.4 liter)	169 cu in (2.8 liter)
Compression Ratio	20:1	18.2:1
Overall Dimensions		
Length	31.5" (800mm)	31.7" (805mm)
Width	21.1" (535mm)	23.3" (590mm)
Height	27.3" (694mm)	29.5" (750mm)
Dry Weight	491 lbs (223 kg)	524 lbs (238 kg)
Industrial Rating		
Intermittent	56 HP @ 3000 RPM	70 HP @ 3000 RPM
Continuous	49 HP @ 3000 RPM	61 HP @ 3000 RPM
Maximum Torque	108 lb-ft @ 2000 RPM	132 lb-ft @ 2000 RPM

Performace Curve

Isuzu C240	Isuzu 4JB1
A - 108 LB-FT INTERMITTENT B - 94 LB-FT CONTINUOUS C - 56 BHP INTERMITTENT D - 49 BHP CONTINUOUS	A - 132 LB-FT INTERMITTENT B - 116 LB-FT CONTINUOUS C - 70 BHP INTERMITTENT D - 61 BHP CONTINUOUS



Rated within 5% at ambient conditions of:
Temperature: 77° F (25° C)
Pressure: 29.31 "Hg (99kPa) DRY
Fuel Specific Gravity: 0.825
Intermittent Rating: (Solid Line)
Continuous Rating: (Dashed Line)
NOTE: Muffler & Air Cleaner not installed



Rated within 5% at ambient conditions of:
Temperature: 77° F (25° C)
Pressure: 29.31 "Hg (99kPa) DRY
Fuel Specific Gravity: 0.825
Intermittent Rating: (Solid Line)
Continuous Rating: (Dashed Line)
NOTE: Muffler & Air Cleaner not installed

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Section 8

Map(s)

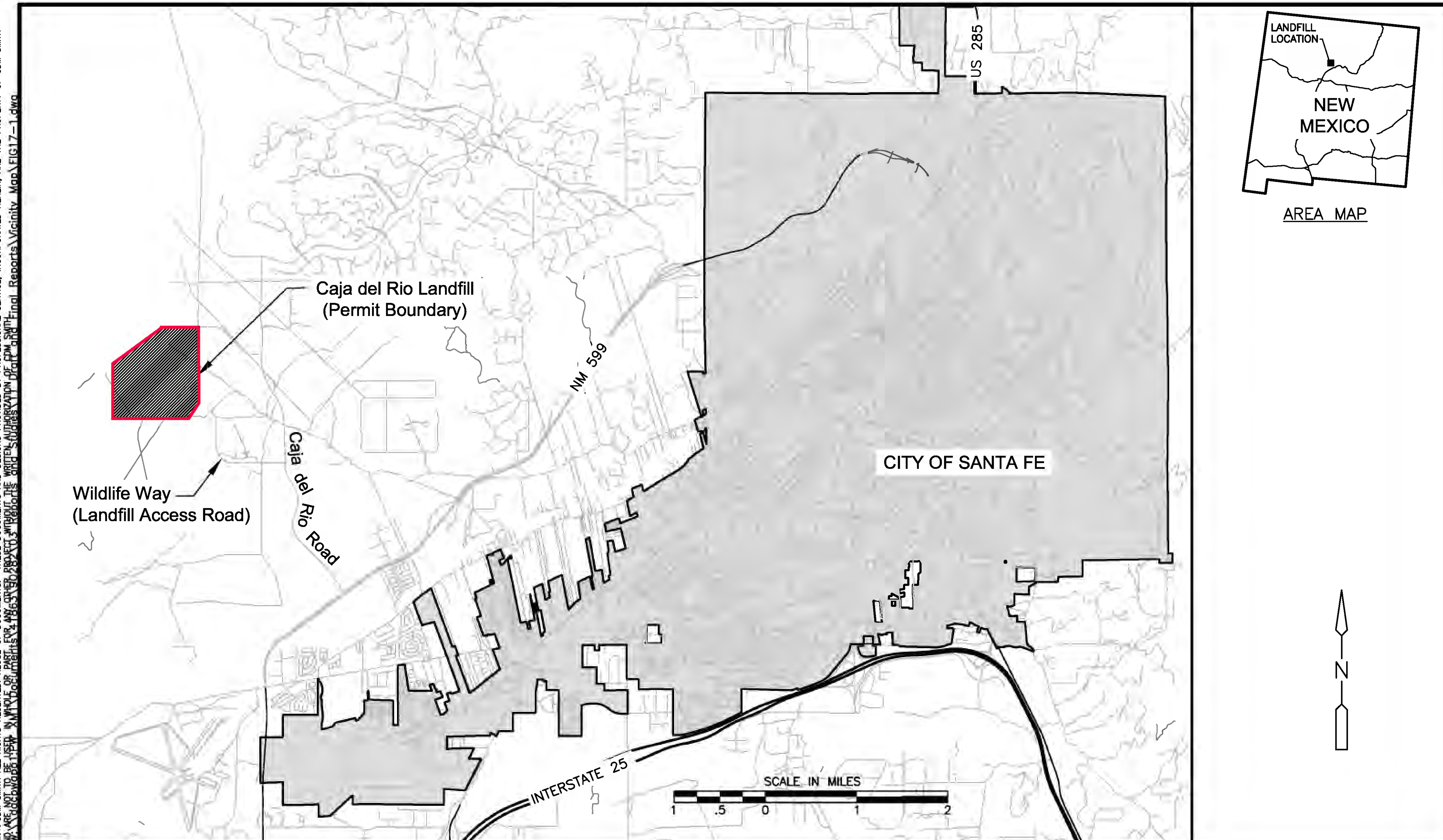
A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

Four drawings as follows are included which encompass the content listed above. A current drawing showing the gas collection and control system is also included. These drawings are as follows:

Figure 18-1 Vicinity Map;
Figure 12-1 Overall Site Plan;
Figure 26-1 USGS Map; and
Drawing 8.4 Current Gas System Layout.

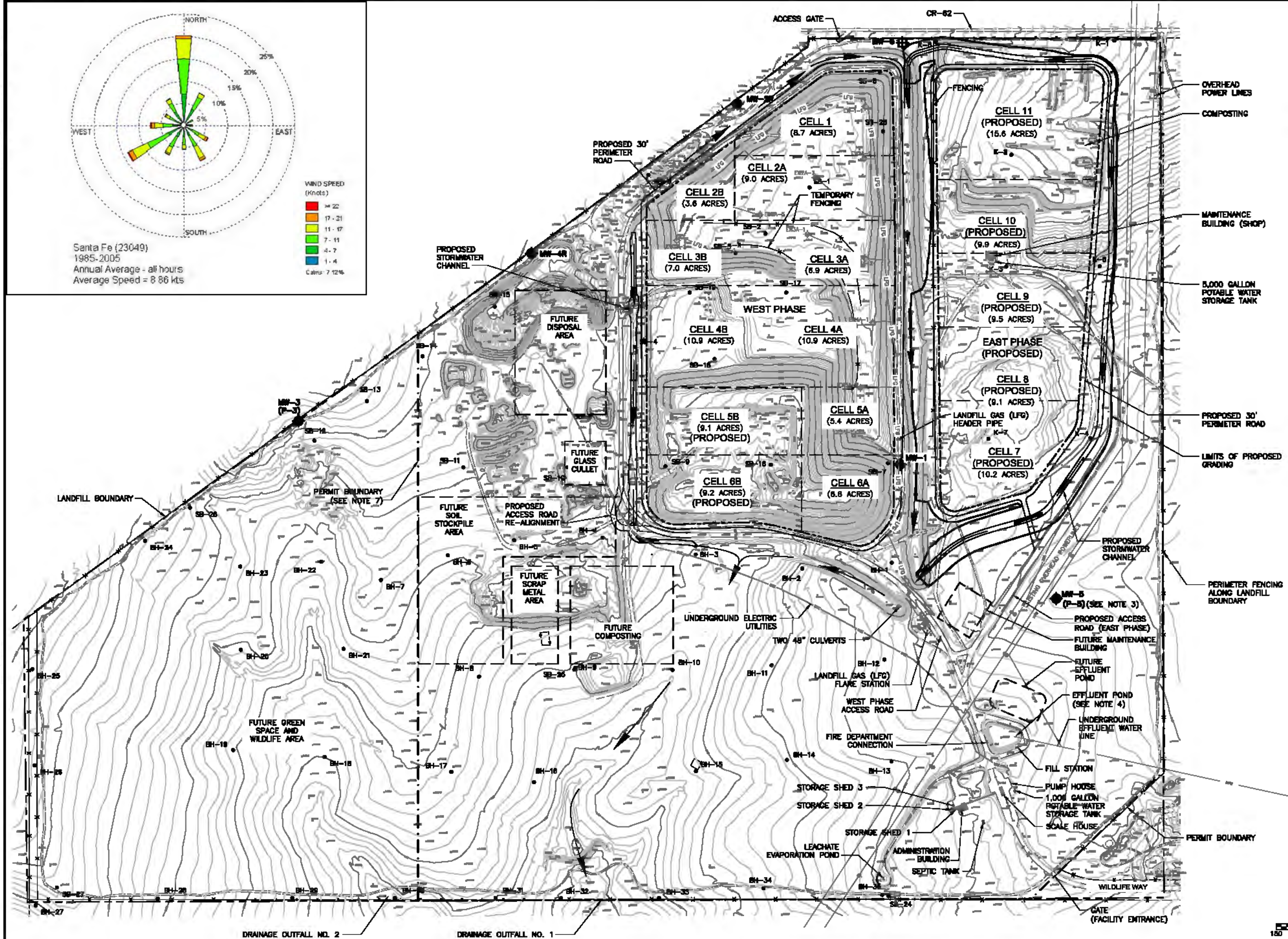
It should be noted that several of these maps were prepared by CDM for the landfill's most recent solid waste permit modification/renewal. The Overall Site Plan shows the fenced property for access control as well as the smaller landfill permit boundary.



SANTA FE SOLID WASTE MANAGEMENT AGENCY
CAJA DEL RIO LANDFILL
SANTA FE, NEW MEXICO

Figure No. 18-1
Vicinity Map

CDM Smith



LEGEND

- SECTION/PROPERTY LINE
- 2' CONTOURS
- UNPAVED ROAD
- PAVED ROAD
- FENCING
- PERMIT BOUNDARY
- CELL BOUNDARY
- LIMITS OF TRASH
- LANDFILL BOUNDARY
- FUTURE USE BOUNDARY
- SOIL BORING
- STORMWATER FLOW DIRECTION
- HIGH POINT IN STORMWATER CHANNEL
- EXISTING GROUNDWATER MONITORING WELL
- PROPOSED GROUNDWATER MONITORING WELL
- EXISTING LANDFILL GAS EXTRACTION WELL

NOTES:

1. ALL FEATURES NOT LABELED AS "PROPOSED" OR "FUTURE" ARE EXISTING.
2. PROPOSED LANDFILL MODIFICATIONS INCLUDE:

   PROPOSED VERTICAL GRADE INCREASE OF 40 FEET FOR WEST PHASE LANDFILL (CELLS 1–6B)

   PROPOSED EAST PHASE (CELLS 7–11) EXPANSION AREA
3. MW-5 (P-5) IS CURRENTLY A PIEZOMETER. MW-5 (P-5) IS A PROPOSED GROUNDWATER MONITORING WELL.
4. AN EXISTING FILL STATION IS LOCATED AT THE EFFLUENT POND. FILL STATION SUPPLIES EFFLUENT WATER FOR LANDFILL OPERATIONS.
5. DRAWING COORDINATES BASED UPON CAJA DEL RIO LANDFILL LOCAL COORDINATE SYSTEM MODIFIED GROUND COORDINATES.
6. THE GEOGRAPHIC CENTER OF THE LANDFILL IS W106° 05' 23.7", N35° 41' 05.2".
7. THE PERMIT BOUNDARY INCLUDES AN AREA OF 495 ACRES.

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GREGORY STEVE LARSON NEW MEXICO 20620 PROFESSIONAL ENGINEER 11-5-13

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: G. LARSON
DRAWN BY: C. ANDERSON
SHEET CHK'D BY: G. LARSON
CROSS CHK'D BY: T. PARKER
APPROVED BY: G. LARSON
DATE: NOVEMBER 2013

CDM Smith
6000 Uptown Boulevard, N.E., Suite 300
Albuquerque, New Mexico 87110
Tel: (505) 243-3200

SANTA FE SOLID WASTE MANAGEMENT AGENCY

APPLICATION FOR PERMIT MODIFICATION/RENEWAL ENGINEERING PLANS FOR THE CAJA DEL RIO LANDFILL

OVERALL SITE PLAN

PROJECT NO. 10679-91151
FILE NAME: 12-01_STPL
SHEET NO. 12-1

PERMIT DRAWINGS - NOT FOR CONSTRUCTION

Figure 26-1 USGS Map

SCALE IN FEET

0 200 400

LEGEND

	EXTENT OF 2020 SURVEY (SEE NOTE 1)
	PERMIT BOUNDARY
	LANDFILL CELL LIMITS
	APPROXIMATE LIMITS OF WASTE
BM 224	EXISTING BENCHMARKS
	EXISTING CONTOURS (SEE NOTE 1)
	EXISTING LFG COLLECTION PIPING
EW-25	EXISTING LFG EXTRACTION WELL
CS-2	EXISTING CONDENSATE SUMP
	EXISTING LFG ISOLATION VALVE
	EXISTING AIR SUPPLY LINE/CONDENSATE FORCEMAIN ISOLATION VALVES
HP	EXISTING HIGH POINT
	EXISTING DRIPLEG
	EXISTING LEACHATE CLEANOUT RISER
	EXISTING BLIND FLANGE
	EXISTING HDPE CAP

NOTES:

1. TOPOGRAPHIC MAPPING WAS COMPILED USING PHOTOGRAMMETRIC METHODS FROM TOPOGRAPHIC MAP INFORMATION PROVIDED BY PRECISION SURVEYS, INC., ALBUQUERQUE, NM. ON DECEMBER 21, 2016, AND FROM AERIAL PHOTOGRAPHY PERFORMED BY DALLAS AERIAL SURVEYS, INC. ON SEPTEMBER 10, 2020.

REV | DATE | DESCRIPTION | BY

PROJECT TITLE

CURRENT GAS SYSTEM

CAJA DEL RIO LANDFILL
TITLE V RENEWAL

CLIENT

SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
(505) 421-1850

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2188

CADD FILE:

DATE: 5/2021

SCALE: AS SHOWN

FIGURE NO.

8.4

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)
(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

☑ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. ☐ A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. ☐ A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. ☐ A copy of the property tax record (20.2.72.203.B NMAC).
4. ☐ A sample of the letters sent to the owners of record.
5. ☐ A sample of the letters sent to counties, municipalities, and Indian tribes.
6. ☐ A sample of the public notice posted and a verification of the local postings.
7. ☐ A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. ☐ A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. ☐ A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. ☐ A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. ☐ A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

Public notification is not required since this is a Title V Renewal Application.

Section 10

Written Description of the Routine Operations of the Facility

<u>A written description of the routine operations of the facility</u>. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

This facility is a landfill that accepts municipal solid waste from commercial and residential customers. Activities at the landfill include truck weighing of incoming loads, truck travel to the active fill area on a paved road up to the edge of the active cell fill area, truck travel on unpaved surfaces into and on the active cell area, dumping of waste, compaction of waste, and end of day earth or approved alternate daily covering of the day's waste material. Use of intermittent watering as reflected in this application is utilized to control particulate emissions per the dust control plan from these various activities. There are periodic new cell construction activities. New cell construction involves excavation and overburden stockpiling. There may be temporary landfill work that includes road maintenance, creating new roads, drainage diversion to direct rainwater runoff and similar types of work. Almost all emissions occurring at the landfill are fugitive emissions. There may be petroleum contaminated soil land farming at this landfill, as this activity is approved in their solid waste permit. Currently, there is no green waste chipping, tire cutting/baling, scrap metal acceptance or PCS activities at the landfill. Previously chipped green waste is transported to the landfill's composting area where a contractor conducts composting, compost screening and transports composted material from the landfill. Chipping is included in the permit in the event that it cannot be accomplished, as it is normally done, at the Agency’s Buckman Road Recycling and Transfer Station facility.

The landfill includes a landfill gas collection system as required under 20.2.64 NMAC (the State of New Mexico Emission Guideline Rule which implemented 40 CFR 60, Subpart Cf), which was included in the last permit revision. The gas system is also subject to federal NESHAP requirements under 40 CFR 63, Subpart AAAA (the March 20, 2020 version of this rule becoming effective on September 27, 2021).

The current Title V permit number is P185L-R3M1. The gas collection system uses an enclosed flare with a 10:1 turndown ratio to combust the collected landfill gas. The flare currently operates intermittently due to the available landfill gas, but will operate continuously once enough gas can be generated and collected. The gas system is periodically expanded as required by the NSPS rule as new fill is placed. The flare destroys methane, VOC's, NMOC's, H_2S and HAPS in the landfill gas while producing PM, NOx, CO, SO2, and certain HAPs as products of combustion.

Leachate and landfill gas condensate from the landfill are managed per the landfill’s solid waste permit authorization.

There are no inherent bottlenecks to operation. The amount of material brought into the landfill for management, the traffic, etc. is a function of the public’s generation of waste and outside of the landfills’ control.

Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:**

The Caja Del Rio Landfill as described in Tables 2A and 2B of this application, plus Del Hur Industries (NSR permit # GCP-2-2976).

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☐ **Yes** ☑ **No**

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

☐ **Yes** ☑ **No**

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

☑ **Yes** ☐ **No**

C. Make a determination:

☑ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

Section 12

Section 12.A
PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

This is a Title V permit renewal for a municipal solid waste landfill. No PSD applicability determination is required. The proposed potential emissions are well under this permitting threshold.

Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

Required Information for Specific Equipment:
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

Required Information for Regulations that Apply to the Entire Facility:
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

Regulatory Citations for Regulations That Do Not, but Could Apply:
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

Regulatory Citations for Emission Standards:
For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard. Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

Federally Enforceable Conditions:
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc: http://cfpub.epa.gov/adi/

STATE REGULATIONS:

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply to Notice of Intent, Construction, and Title V permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	No		20.2.3 NMAC is a SIP approved regulation that limits the maximum allowable concentration of Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide. Title V applications, see exemption at 20.2.3.9 NMAC
20.2.7 NMAC	Excess Emissions	Yes	Facility	All Title V major sources are subject to Air Quality Control Regulations, as defined in 20.2.7 NMAC, and are thus subject to the requirements of this regulation. Records kept of any excess emission periods and notifications will be provided to NMED. Verbal (< 24 hours) and written (< 10 days) notice of excess emissions.
20.2.23 NMAC	Fugitive Dust Control	No		Facility is exempt since it is permitted.
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	No		The facility's does not have gas burning equipment with a rating greater than 1,000,000 million British Thermal Units per year per unit. As such this rule is not applicable.
20.2.34 NMAC	Oil Burning Equipment: NO_2	No		This facility does not include oil burning equipment with a heat input of greater than 1,000,000 million British Thermal Units per year per unit.
20.2.60 NMAC	Open Burning	No		Open burning does not occur at and is prohibited.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	Flare	Currently, only the Flare is subject to this rule, all other engines are portable or the sources are insignificant and exempt per 20.2.61.111.D.
20.2.60 NMAC	Open Burning	Yes	Facility	Although applicable to this and other landfills in New Mexico, Open burning does not occur at and is prohibited at the facility.
20.2.62 NMAC	Municipal Waste Combustion	No		No affected facilities at the landfill.
20.2.63 NMAC	Biomedical Waste Combustion	No		No affected facilities at the landfill.
20.2.64 NMAC	Municipal Solid Waste Landfills	Yes	Landfill	20.2.64.110(A) requires that Title V permit be obtained for "new" or "existing" facilities over 2.5 million megagrams or 2.5 million cubic meters. The landfill is over this design capacity trigger. The landfill is also "new" with respect to this rule and therefore, past the Title V Permit requirement, it is subject to 40 CFR 60, Subpart XXX and incorporated by reference in 20.2.77 NMAC (20.2.64.109.B).
20.2.70 NMAC	Operating Permits	Yes	Facility	Although this is a minor Title V source, 40 CFR 60, Subpart WWW originally required that a Title V permit be maintained due to the landfill's overall capacity. This requirement has also been brought forward into the subsequent NSPS-related rules (20.2.64 NMAC; 40 CFR 60, Subpart XXX; and 40 CFR 63, Subpart AAAA).
20.2.71 NMAC	Operating Permit Fees	Yes	Facility	This facility is subject to 20.2.70 NMAC and is in turn subject to 20.2.71 NMAC
20.2.72 NMAC	Construction Permits	No		This facility is not subject to 20.2.72 NMAC.

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	The facility is subject to emissions-related requirements to complete an annual emissions inventory (20.2.73.300 NMAC) based on emissions rates. Would also possibly be subject to notice of intent requirements under 20.2.73.200 if a modification met the thresholds included in 20.2.73.200(A)(2) NMAC.
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No		The facility is not an existing PSD major source.
20.2.75 NMAC	Construction Permit Fees	No		This facility is not subject to 20.2.72 NMAC.
20.2.77 NMAC	New Source Performance	Yes	Landfill , Flare	The landfill and the flare, which is the only NSPS control device, are subject to the NSPS requirements of 40 CFR 60, Subpart XXX and incorporated by reference in 20.2.77 NMAC.
20.2.78 NMAC	Emission Standards for HAPS	No		This facility emits hazardous air pollutants but which are not subject to the requirements of 40 CFR Part 61, as amended through December 31, 2010. Asbestos disposal is the most common type of 40 CFR 61 requirement that some landfills are subject to. However, this landfill does not accept any form of asbestos.
20.2.79 NMAC	Permits – Nonattainment Areas	No		The landfill (all sources) is not a major source nor is a major modification being proposed at this time.
20.2.80 NMAC	Stack Heights	No		No affected facilities since this section involves specifics related to new or modified permitting that involves stack heights related to 20.2.72 NMAC (Construction Permits); 20.2.74 NMAC (Prevention of Significant Deterioration (PSD)); or 20.2.79 NMAC (Permits - Nonattainment Areas).
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	Landfill , Flare	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63. The flare and landfill are subject to provisions in 40 CFR 63.

FEDERAL REGULATIONS:

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	NAAQS	Yes	Facility	Defined as applicable at 20.2.70.7.E.11, Any national ambient air quality standard.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	Landfill, Flare	Applies since the landfill is subject to 40 CFR 60, Subpart XXX. The new 40 CFR 63, Subpart AAAA rule finalized on March 20, 2020 will bring in requirements effective September 27, 2021 that will replace some general conditions of 40 CFR 60. For example, the flare operation will become subject to 40 CFR §63.11 as opposed to §60.18; however, 40 CFR 60, Subpart A is still applicable.
NSPS 40 CFR 60 Subpart Cc	NSPS – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills	No		The facility is subject to 40 CFR 60, Subpart XXX since it meets the definition of a “new” or “modified” landfill under that rule. It is not an “existing” facility as defined in 40 CFR 60, Subpart Cc. This rule has also been replaced in total by 40 CFR 60, Subpart Cf for “existing” landfills.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
NSPS 40 CFR 60 Subpart Cf	NSPS – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills	No		The facility is subject to 40 CFR 60, Subpart XXX since it meets the definition of a "new" or "modified" landfill under that rule. It is not an "existing" facility as defined in 40 CFR 60, Subpart Cc.
NSPS 40 CFR60.40a, Subpart Da	Subpart Da, Performance Standards for **Electric Utility Steam Generating Units**	No		No steam generating units are present at the landfill.
NSPS 40 CFR60.40b Subpart Db	**Electric Utility Steam Generating Units**	No		No steam generating units are present at the landfill.
40 CFR 60.40c, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	No		No steam generating units are present at the landfill.
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for **Storage Vessels for Petroleum Liquids** for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and **Prior** to July 23, 1984	No		No applicable storage vessels are present on-site.
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** July 23, 1984	No		The landfill has no storage vessels with a capacity greater than or equal to 75 cubic meters (m^3) (19,813 US gallons) that are used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.
NSPS 40 CFR 60.330 Subpart GG	**Stationary Gas Turbines**	No		The landfill has no stationary gas turbines.
NSPS 40 CFR 60,	Leaks of VOC from **Onshore**	No		This rule is not applicable to this facility.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
Subpart KKK	**Gas Plants**			
NSPS 40 CFR Part 60 Subpart LLL	Standards of Performance for **Onshore Natural Gas Processing**: SO_2 Emissions	No		This rule is not applicable to this facility.
NSPS 40 CFR 60 Subpart WWW	NSPS – Standards of Performance for Municipal Waste Solid Landfills	No		This was the original NSPS rule applicable to the landfill. However, this rule was replaced by 40 CFR 60, Subpart XXX for new landfills and Subpart WWW ceased to apply in any way in 2020 when the rule was amended to clearly state than when a landfill becomes subject to a newer NSPS rule, Subpart WWW no longer applies.
NSPS 40 CFR 60 Subpart XXX	NSPS – Standards of Performance for Municipal Waste Solid Landfills	Yes		The landfill meets the definition of being a "new" landfill under 40 CFR 60, subpart XXX. The landfill is in full compliance with Subpart XXX. Until, the implementation of the new 40 CFR 63, Subpart AAAA rule which was finalized on March 20, 2020 will augment parts of Subpart XXX effective September 27, 2021.
NSPS 40 CFR 60 Subpart AAAA	Standards of Performance for Small Municipal Waste Combustion Units for Which Commenced After August 30, 1999 or for Which Modifications or Reconstruction is Commenced After June 6, 2001	No		The landfill includes no applicable incineration units on-site (no incineration of any kind takes place on-site).
NSPS 40 CFR 60 Subpart CCCC	Standards of Performance for Commercial and Industrial Solid Waste Incineration Units for Which Construction is Commenced After November 30, 1999 or for Which Modification or Reconstruction is Commenced After June 1, 2001	No		The landfill includes no applicable incineration units on-site (no incineration of any kind takes place on-site).
NSPS 40 CFR 60 Subpart EEEE	Standards of Performance for Other Solid Waste Incineration Units for Which Construction is Commenced After December 9, 2004, or for Which Modification or Reconstruction is Commenced on or After June 16, 2006	No		The landfill includes no applicable incineration units on-site (no incineration of any kind takes place on-site).
NSPS 40 CFR 60 Subpart IIII	Standards of Performance for Stationary Compression	No		The landfill has no applicable stationary compression ignition internal combustion engines.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
	Ignition Internal Combustion Engines			
NSPS 40 CFR 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	No		The landfill has no applicable stationary spark ignition engines.
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction commenced after August 23, 2011 and before September 18, 2015	No		The rule applies to "affected" facilities that are constructed, modified, or reconstructed after Aug 23, 2011 (40 CFR 60.5365): gas wells, including fractured and hydraulically refractured wells, centrifugal compressors, reciprocating compressors, pneumatic controllers, certain equipment at natural gas processing plants, sweetening units at natural gas processing plants, and storage vessels. No such facilities exist at the Caja Del Rio Landfill.
NSPS 40 CFR Part 60 Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015	No		No such facilities exist at the Caja Del Rio Landfill.
NSPS 40 CFR 60 Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units	No		There are no such units at the landfill.
NSPS 40 CFR 60 Subpart UUUU	Emissions Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units	No		There are no such units at the landfill.
NESHAP 40 CFR 61 Subpart A	General Provisions	No		Applies if any other Subpart in 40 CFR 61 applies.
NESHAP 40 CFR 61 Subpart E	National Emission Standards for **Mercury**	No		The landfill does not contain a stationary source that process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge.
NESHAP 40 CFR 61 Subpart M	National Emissions Standards for	No		The landfill does not accept any form of asbestos.

FEDERAL REGU-LATIONS CITATION	**Title**	**Applies? Enter Yes or No**	**Unit(s) or Facility**	**JUSTIFICATION:**
	Asbestos			
NESHAP 40 CFR 61 Subpart V	National Emission Standards for **Equipment Leaks** (Fugitive Emission Sources)	No		The provisions of this subpart apply to each of the following sources that are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart. VHAP service means a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight of VHAP. VHAP means a substance regulated under this subpart for which a standard for equipment leaks of the substance has been promulgated. Benzene is a VHAP (See 40 CFR 61 Subpart J). The landfill has no such applicable sources.
40 CFR 62, Subpart OOO	Federal Plan Requirements for Municipal Solid Waste Landfills	No		This is the Federal Emission Guideline rule for MSW landfills that was finalized in May 2021. This does not apply to landfills in New Mexico since the State of New Mexico finalized its own EG rule under 20.2.64 NMAC, and since the landfill is not "existing" in any case, but "new" under these rules and subject to 40 CFR 60, Subpart XXX.
MACT 40 CFR 63, Subpart A	General Provisions	Yes	Landfill, Flare	Applies if any other subpart under 40 CFR 63 applies. Since there is a NESHAP rule for MSW landfills (40 CFR 63, Subpart AAAA), this rule applies to the landfill. Since the landfill's NMOC emissions are over 50 Mg/yr, the flare and landfill are fully subject to this rule. This status did not change with the March 20, 2020 revisions to Subpart AAAA, which become effective September 27, 2021, although this newer version removed the SSM Plan portions and provided a new summary of which portions of Subpart A are applicable.
MACT 40 CFR 63.760 Subpart HH	**Oil and Natural Gas Production Facilities**	**No**		This facility is a landfill and does not produce natural gas.
MACT 40 CFR 63 Subpart HHH		No		This subpart applies to owners and operators of natural gas transmission and storage facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company), and that are major sources of hazardous air pollutants (HAP) emissions as defined in §63.1271. The facility is not subject to this rule.
40 CFR 63, Subpart AAAA	NESHAP for MSW Landfills	Yes	Landfill, Flare	Per 40 CFR §63.1935(a)(3), this rule applies since the landfill has accepted waste since November 8, 1987, is an area source, exceeds the NSPS capacity limits shown in Subpart AAAA, and was shown to emit in excess of 50 Mg/yr of NMOCs during NSPS compliance. The landfill will follow its SSM Plan and the pre-March 20, 2020 version of this rule through September 26, 2021. The landfill is also not classified as a bioreactor as defined in this subpart. This rule was revised on March 20, 2020; however, the triggers for compliance (area source, over the NSPS capacity limits, and emits over 50 Mg/yr of uncontrolled NMOC emissions) were retained such that the landfill is still subject to the new rule effective September 27, 2021. The new rule suspends the SSM Plan requirements and moves to a work practice standard. The new rule also has three subchapters that will replace subchapters in 40 CFR 60, Subpart XXX.
40 CFR 63, Subpart MMMM	National Emission Standard for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products	No		The landfill does not conduct surface coating operations that would trigger requirements in this subpart.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)			The landfill has no applicable reciprocating internal combustion engines. The engines listed in this application, including the Godwin pump, are portable.
MACT 40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters	No		The facility does not include any sources applicable to this rule.
MACT 40 CFR 63 Subpart UUUUU	National Emission Standards for Hazardous Air Pollutants Coal & Oil Fire Electric Utility Steam Generating Unit	No		The facility does not include any sources applicable to this rule.
40 CFR 63 Subpart CCCCCC	NESHAP for Gasoline Dispensing Facilities	No		The facility does not include a stationary gasoline tank.
40 CFR 63, Subpart HHHHHH	National Emission Standard for Hazardous Air Pollutants: Miscellaneous Coating Manufacturing	No		Surface coating operations that would trigger requirements in this subpart are not conducted on-site.
40 CFR 64	**Compliance Assurance Monitoring**	No		No affected facilities.
40 CFR 68	**Chemical Accident Prevention**	No		The landfill has no substances that are above threshold quantities and therefore is not subject to this rule.
40 CFR 70	Operating Permit	Yes	Facility	This Application satisfies applicable requirements.
40 CFR 71	Federal Operating Permit Program	Yes	Facility	Facility regulated by SIP.
Title IV – Acid Rain 40 CFR 72	**Acid Rain**	No		Not an affected source under 40 CFR §75. This facility does not generate commercial electric power or electric power for sale.
Title IV – Acid Rain 40 CFR 73	**Sulfur Dioxide** Allowance Emissions	No		Not an affected source under 40 CFR §73. This facility does not generate commercial electric power or electric power for sale.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
Title IV-Acid Rain 40 CFR 75	**Continuous Emissions Monitoring**	No		Not an affected source under 40 CFR §75. This facility does not generate commercial electric power or electric power for sale.
Title IV – Acid Rain 40 CFR 76	**Acid Rain** Nitrogen Oxides **Emission Reduction Program**			This facility does not generate commercial electric power or electric power for sale.
Title VI – 40 CFR 82	Protection of **Stratospheric Ozone**	No		The landfill does not “service”, “maintain” or “repair” class I or class II appliances nor “disposes” of the appliances. Technicians do service vehicle air conditioners and are certified for this purpose.
40 CFR 98 Subpart HH	Greenhouse Gas Reporting Requirements	Yes	Landfill, Flare	Annual GHG emissions are reported under this rule since the landfill generates GHGs over the reporting threshold.
CAA Section 112(r)	Chemical Accident Prevention Provisions	No		The facility does not store or use any of the chemicals listed in Section 112(r) in or above the threshold quantities specified in this section.

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☐ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☑ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

A dust control plan is in place to mitigate particulate emissions.

Regarding landfill gas-related emissions, in the past the landfill was required to maintain an SSM Plan under 40 CFR 63, Subpart AAAA; however, this requirement has been removed and will no longer be effective on September 27, 2021 moving forward. At that time, the landfill and gas system shifts to a work practice standard under the March 20, 2020 version of 40 CFR 63, Subpart AAAA. The work practice statement was checked above, however it should be noted that, it is our understanding that a written plan is not required since the landfill will be complying with the provisions of 40 CFR 63, Subpart AAAA, which includes following NSPS requirements, the preparation and implementation of a Continuous Monitoring System (CMS) protocol, and reporting requirements, which in total represent the implementation "plan" noted above.

Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

Construction Scenarios: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: https://www.env.nm.gov/aqb/permit/aqb_pol.html. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title "Construction Scenarios", specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

The gas collection system is designed with a ten to one (10:1) turndown ratio for operation from 120 to 1200 cfm of collected landfill gas. In the early stages of operation of the collection system, if the gas flow drops to lower than 120 cfm, the flare will be shut off until sufficient pressure is established to resume flaring. If the flare is off, there will be no combustion products to the atmosphere. This alternative procedure for intermittent operation was previously submitted and approved by the Air Quality Bureau most recently through the approval of the GCCS Design Plan submitted per 40 CFR 60, Subpart XXX (since intermittent gas system and flare operation required flexibilities under this rule's requirements). The flare therefore will collect varying amounts of landfill gas for destruction during the permit period. So, although this is not precisely an alternate operating scenario, the possible variation in flare and landfill emissions has been set to encompass this variability.

Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	X
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

☐ See attached, approved modeling **waiver for all** pollutants from the facility.
☐ See attached, approved modeling **waiver for some** pollutants from the facility.
☑ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.
☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.
☐ No modeling is required.

Section 19

Requirements for Title V Program

Who Must Use this Attachment:

* Any major source as defined in 20.2.70 NMAC.
* Any source, including an area source, subject to a standard or other requirement promulgated under Section 111 - Standards of Performance for New Stationary Sources, or Section 112 Hazardous Air Pollutants, of the 1990 federal Clean Air Act ("federal Act"). Non-major sources subject to Sections 111 or 112 of the federal Act are exempt from the obligation to obtain an 20.2.70 NMAC operating permit until such time that the EPA Administrator completes rulemakings that require such sources to obtain operating permits. In addition, sources that would be required to obtain an operating permit solely because they are subject to regulations or requirements under Section 112(r) of the federal Act are exempt from the requirement to obtain an Operating Permit.
* Any Acid Rain source as defined under title IV of the federal Act. The Acid Rain program has additional forms. See http://www.env.nm.gov/aqb/index.html. Sources that are subject to both the Title V and Acid Rain regulations are encouraged to submit both applications simultaneously.
* Any source in a source category designated by the EPA Administrator ("Administrator"), in whole or in part, by regulation, after notice and comment.

19.1 - 40 CFR 64, Compliance Assurance Monitoring (CAM) (20.2.70.300.D.10.e NMAC)

Any source subject to 40CFR, Part 64 (Compliance Assurance Monitoring) must submit all the information required by section 64.7 with the operating permit application. The applicant must prepare a separate section of the application package for this purpose; if the information is already listed elsewhere in the application package, make reference to that location. Facilities not subject to Part 64 are invited to submit periodic monitoring protocols with the application to help the AQB to comply with 20.2.70 NMAC. Sources subject to 40 CFR Part 64, must submit a statement indicating your source's compliance status with any enhanced monitoring and compliance certification requirements of the federal Act.

The landfill is not subject to the CAM requirements.

19.2 - Compliance Status (20.2.70.300.D.10.a & 10.b NMAC)

Describe the facility's compliance status with each applicable requirement at the time this permit application is submitted. This statement should include descriptions of or references to all methods used for determining compliance. This statement should include descriptions of monitoring, recordkeeping and reporting requirements and test methods used to determine compliance with all applicable requirements. Refer to Section 2, Tables 2-N and 2-O of the Application Form as necessary. (20.2.70.300.D.11 NMAC) For facilities with existing Title V permits, refer to most recent Compliance Certification for existing requirements. Address new requirements such as CAM, here, including steps being taken to achieve compliance.

The landfill is in compliance with all requirements of its Title V permit.

19.3 - Continued Compliance (20.2.70.300.D.10.c NMAC)

Provide a statement that your facility will continue to be in compliance with requirements for which it is in compliance at the time of permit application. This statement must also include a commitment to comply with other applicable requirements as they come into effect during the permit term. This compliance must occur in a timely manner or be consistent with such schedule expressly required by the applicable requirement.

The landfill will continue to be in compliance with all requirements of its Title V permit and will comply with all requirements contained in the NSPS-XXX and MACT-AAAA relative to the gas collection system.

19.4 - Schedule for Submission of Compliance (20.2.70.300.D.10.d NMAC)

You must provide a proposed schedule for submission to the department of compliance certifications during the permit term. This certification must be submitted annually unless the applicable requirement or the department specifies a more frequent period. A sample form for these certifications will be attached to the permit.

The landfill does not propose any changes to its schedule of compliance certifications.

19.5 - Stratospheric Ozone and Climate Protection

In addition to completing the four (4) questions below, you must submit a statement indicating your source's compliance status with requirements of Title VI, Section 608 (National Recycling and Emissions Reduction Program) and Section 609 (Servicing of Motor Vehicle Air Conditioners).

---

1. Does your facility have any air conditioners or refrigeration equipment that uses CFCs, HCFCs or other ozone-depleting substances? ☒ **Yes** ☐ **No**
2. Does any air conditioner(s) or any piece(s) of refrigeration equipment contain a refrigeration charge greater than 50 lbs? ☐ **Yes** ☒ **No**

   (If the answer is yes, describe the type of equipment and how many units are at the facility.)
3. Do your facility personnel maintain, service, repair, or dispose of any motor vehicle air conditioners (MVACs) or appliances ("appliance" and "MVAC" as defined at 82. 152)? ☒ **Yes** ☐ **No (MVAC's only)**
4. Cite and describe which Title VI requirements are applicable to your facility (i.e. 40 CFR Part 82, Subpart A through G.) **40 CFR Part 82, Subpart F**

The SFSWMA-Caja del Rio Landfill is in compliance with Sections 608 and 609 of the Clean Air Act.

19.6 - Compliance Plan and Schedule

Applications for sources, which are not in compliance with all applicable requirements at the time the permit application is submitted to the department, must include a proposed compliance plan as part of the permit application package. This plan shall include the information requested below:

A. Description of Compliance Status: (20.2.70.300.D.11.a NMAC)
A narrative description of your facility's compliance status with respect to all applicable requirements (as defined in 20.2.70 NMAC) at the time this permit application is submitted to the department.

B. Compliance plan: (20.2.70.300.D.11.B NMAC)
A narrative description of the means by which your facility will achieve compliance with applicable requirements with which it is not in compliance at the time you submit your permit application package.

C. Compliance schedule: (20.2.70.300D.11.c NMAC)

A schedule of remedial measures that you plan to take, including an enforceable sequence of actions with milestones, which will lead to compliance with all applicable requirements for your source. This schedule of compliance must be at least as stringent as that contained in any consent decree or administrative order to which your source is subject. The obligations of any consent decree or administrative order are not in any way diminished by the schedule of compliance.

D. Schedule of Certified Progress Reports: (20.2.70.300.D.11.d NMAC)
A proposed schedule for submission to the department of certified progress reports must also be included in the compliance schedule. The proposed schedule must call for these reports to be submitted at least every six (6) months.

E. Acid Rain Sources: (20.2.70.300.D.11.e NMAC)
If your source is an acid rain source as defined by EPA, the following applies to you. For the portion of your acid rain source subject to the acid rain provisions of title IV of the federal Act, the compliance plan must also include any additional requirements under the acid rain provisions of title IV of the federal Act. Some requirements of title IV regarding the schedule and methods the source will use to achieve compliance with the acid rain emissions limitations may supersede the requirements of title V and 20.2.70 NMAC. You will need to consult with the Air Quality Bureau permitting staff concerning how to properly meet this requirement.

NOTE: The Acid Rain program has additional forms. See http://www.env.nm.gov/aqb/index.html. Sources that are subject to both the Title V and Acid Rain regulations are **encouraged** to submit both applications **simultaneously**.

The landfill and all sources are in full compliance with all requirements, these provisions are not applicable.

19.7 - 112(r) Risk Management Plan (RMP)

Any major sources subject to section 112(r) of the Clean Air Act must list all substances that cause the source to be subject to section 112(r) in the application. The permittee must state when the RMP was submitted to and approved by EPA.

The landfill is not a major source nor does it have any substances on the 112(r) list above the reportable quantities.

19.8 - Distance to Other States, Bernalillo, Indian Tribes and Pueblos

Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B NMAC)?

(If the answer is yes, state which apply and provide the distances.)

Bandelier Wilderness 10.13 mi, Pecos Wilderness 15.7 mi, San Pedro Parks Wilderness 44.8 mi, Tesuque Pueblo 6.3 mi, Santo Domingo pueblo 15 mi, San Filipe Indian Reservation 22.6 mi, Nambe pueblo 15.5 mi , Pojoaque pueblo 11.6 mi, Cochiti Indian Reservation 10.7 mi, San Ildefonso Pueblo 11.5 mi, Santa Clara Indian Reservation 18.5 mi, San Juan Indian Reservation, 22.7 mi, Jemez Indian Reservation 19.9 mi, Zia Indian Reservation 24.7 mi, Santa Ana Indian Reservation 27.4 mi, Sandia Indian Reservation 35.3 mi

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19.9 - Responsible Official

Provide the Responsible Official as defined in 20.2.70.7.AD NMAC: **Mr. Randall Kippenbrock, PE, Executive Director**

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

Table 2-A2, Green Waste Chipper: The new green waste chipper included here does not currently operate at the landfill, but may be brought to, and utilized at the landfill if needed on a temporary basis. It has been included in the application and emissions have been included as a placeholder.

Tables 2-D and 2-E, Landfill: Per footnote to calculations, the maximum amount of landfill gas assumed to the flare represents 50% of the generated landfill gas. As noted in the description of the flare operation, the flare operates intermittently, therefore the NMOC and VOC emissions will be like those of Table 2-D when the flare is not operating and those in Table 2-E when the flare operates.

Since collected landfill gases account for only about 50% of the total amounts, there will remain H_2S fugitive amounts from the uncollected landfill gases. The landfill H_2S concentrations will naturally vary over time.

Table 2-D, 2-E, PCS: There have been no PCS activities at the landfill in the past five-year permit period. This activity has been approved in the Title V and solid waste permits, and is retained in this renewal in case PCS land farming should occur in the future.

Dust Control Plan: The dust control plan is also attached. If it is subsequently modified during the permit period for any reason, a copy will be retained and available on-site for inspection.

Santa Fe Solid Waste Management Agency

Dust and Litter Control Plan

Operational and Administrative Control Measures and Documentation

for the

Title V Operating Permit

P185L-R4

Caja del Rio Landfill

Santa Fe, New Mexico

Prepared by: Danita Boettner, P.E.
Santa Fe Solid Waste Management Agency

August 20, 2021

Table of Contents

Section 1 Introduction and Purpose

1.1 Purpose of Dust and Litter Control Plan

This Dust and Litter Control Plan (Plan) has been developed as part of the renewal process for the Caja del Rio Landfill (Landfill) Title V Permit (Operating Permit No. P185L-R3). This Plan defines the operational and administrative process and mitigating measures used for dust and litter control at the Landfill. All particulate matter (PM) concentrations are within the National Ambient Air Quality Standards (NAAQS) and all the combustion modeled pollutants (SO2, CO and NO2) are within the NAAQS for the worst-case operational scenario (operation over Cells 1 – 6 for the New Mexico Environment Department (NMED) Solid Waste Bureau (SWB) approved vertical expansion). Therefore, dust and litter control measures are performed for general public and operational safety purposes.

1.2 Site Description

The Landfill is owned and operated by the Santa Fe Solid Waste Management Agency (Agency) and is located approximately 7 miles west of Santa Fe, New Mexico, in Township 17 North, Range 8 East, and Sections 21, 22, 27 and 28, in Santa Fe County.

The MSW/C&D Landfill is divided into two areas, the East and West Phase. The West Phase is currently being used for disposal of waste. The entire East and West Phases will be comprised of 11 cells upon completion. The current West Phase occupies an area of approximately 87 acres (Cells 1 through 6 A/B). This area will provide approximately 17 years (as of 2021) of airspace for waste disposal for the surrounding region based upon current tonnages being received at the Landfill.

The East Phase disposal area will occupy an approximate area of 54 acres and be comprised of 4 cells (Cells 7 through 11). The East Phase will provide up to approximately 23 years of additional airspace for the surrounding region.

The original Solid Waste [operations] Permit was approved in June 1995 and subsequently a Title V Operating permit in 2002. We are currently undergoing the fourth renewal for the Title V Operating Permit for the Landfill.

The contents of this Plan provides an overview of the operations, describes routine weather monitoring procedures, mitigating measures, shutdown procedures, training requirements, and documentation.

- **Section 1: Introduction and Purpose**
- **Section 2: Landfill Operation Overview**
- **Section 3: Management and Control of Dust and Litter**
- **Section 4: Training**
- **Section 5: Recordkeeping and Documentation**

Section 2 Landfill Operation Overview

Figure No. 1 (Site Plan) has been provided in Appendix A for reference as it relates to the description of the landfill operation.

2.1 Vehicle Access and Weighing

Vehicles will access the Landfill by turning west from Caja del Rio Road onto Wildlife Way (Landfill Access Road). These roads are fully paved. Once on the access road, vehicles will proceed to the scale house. Upon arriving at the scale house, vehicles will stop on the scale and their gross weights will be recorded by solid waste personnel.

2.2 Vehicle Unloading

After the gross weight is recorded at the scale house, all solid waste hauling and collection vehicles will proceed directly to the working face within the active cell area. The vehicle will be directed by landfill personnel to the appropriate unloading point at the working face. Vehicles are properly positioned at the waste lift to facilitate the spreading of refuse and the subsequent compaction, covering and cleanup activities.

Vehicles transporting refuse (as well as earth moving equipment transporting cover material) to the working face from the paved access road will be routed over previously filled areas (unpaved surface). Effort is made based upon disposal location to minimize the use of unpaved areas. Earth moving equipment generally utilizes unpaved roads (off-road equipment) to minimize wear and tear on the paved roads (e.g., overweight, track style equipment, compaction equipment). A water wagon is used to wet down unpaved roadways to minimize dust generation.

2.3 Working Face Operations

Waste is placed and compacted in the active cell area within the permitted cell boundaries and to a maximum height approved in the Solid Waste Facility [Operations] Permit issued through the NMED SWB in 5 – 20-foot lifts using a compactor (e.g., CAT 836K, etc.) and dozer (e.g., CAT D8, etc.) Solid waste is compacted to the smallest practical volume. During waste spreading and compaction operations, landfill personnel monitor and control cell width, height and slope of the working face. Soil is stockpiled or excavated for use as daily and intermediate cover.

At the end of each day's operation, all exposed solid waste will be covered with a minimum of six-inches of daily cover or approved alternative daily cover (ADC)(e.g., tarps, etc.). However, soil is used at the end of the day in lieu of ADC during high wind events or for other weather-related reasons. Twelve inches of soil material, identified as intermediate cover, will be applied on areas that have not or will not receive waste for 60 days or as necessary to provide an adequate working deck for disposal operations and customer access to the working face.

2.4 Solid Waste Hauling and Collection Vehicle Exiting the Site

After depositing waste material at the working face, all drivers will inspect their vehicles for loose debris that remains attached to the vehicle. The debris will be removed within a designated area on site. At the end of each day, the debris is collected and disposed within the working face and covered with six-inches of daily cover or approved alternative daily cover as with all other waste disposed at the site. Once the vehicle inspection is completed, the solid waste hauling and collection vehicles will proceed to the scale house along a combination of paved and unpaved roads to obtain vehicle tare weights, if required.

2.5 Sequence of Operations

The West Phase of the Landfill (Cells 1 – 6 A/B) was permitted for waste disposal in 1995. Since 1997, waste has been disposed and covered within Cells 1 – 6 A/B. The Agency underwent a permit renewal for the 20-year Solid Waste Facility [Operations] Permit that was approved on May 15, 2015. This permit allows the Agency to dispose of material in a new East Phase of the Landfill (Cells 7 – 11), as well as increasing the height for the West Phase of the Landfill. Cells 1 – 5 A/B, 5A and 6A have been constructed to the 1995 approved elevation. Cell 6B began receiving waste in 2020. Upon filling Cells 1-6 to the 1995 approved elevation, solid waste will be placed to increase the elevation of the West Phase as a whole to the newly permitted height.

Waste is placed and compacted in 5- to 20-foot lifts that progress within the lined cells. Twelve inches of intermediate cover is placed to promote storm water runoff and Landfill access during the filling operation. Lift sequencing plans are developed during various stages of development for each cell that considers access road location, prevailing wind direction, final grades, storm water management and waste volumes. Intermediate cover will be placed in accordance with the Solid Waste Facility [Operations] Permit, the Solid Waste Act NMSA 1978 Section 74-9-1 through 74-9-43, and the Solid Waste Management Rules 20.9.2 through 20.9.10 NMAC.

No area of the Landfill has been through final closure which requires a final cover to be constructed and vegetation established or other erosion control measure (e.g., mulch, desert pavement, etc.) to be installed. However, inactive areas have not been used for disposal purposes for between 2 – 22 years. Areas that have not been used for disposal purposes for two years or more are stabilized with vegetation or mulch, or by another method approved by the NMED SWB. A minimum 4-inch layer of mulch will be used for stabilization purposes. Stabilization not only reduces the potential for storm water erosion, but also wind erosion.

2.6 Landfill Life Estimates

Air space and landfill life estimates for the Landfill (West and East Phases) has been calculated for the total remaining area approved during the most recent renewal of the 20-year Solid Waste Facility [Operations] Permit that was approved on May 15, 2015. As of 2013 when the application was submitted to the NMED SWB, the total estimated life for the West and East Phases are 28 and 32 years, respectively. However, it is estimated that the 20-year permit life will only consume airspace within the West Phase (Cells 1 – 6). It is estimated that Cell 6B will be filled in 2024 to the 1995 approved elevation. These dates are considered estimates, as it is dependent upon the actual tonnage received, soil usage, and compaction obtained at the Landfill over the course of time. For purposes of the renewal of the 5-year Title V Permit in 2021, the airspace consumed will be within Cell 6B of the West Phase, with the vertical expansion over Cells 1 – 6 possibly being initiated towards the end to the 5-year permit renewal.

2.7 Cell Development

Although the area filled over the next 17 years will be within the West Phase (Cells 1 – 6), excavation of this area is complete. Excavation of the East Phase began in 2018 for soil to be used as daily and intermediate cover (Cells 1 – 6), including preparation for the development (e.g., liner installation) of these future cells (e.g., Cells 7 – 11). Excavation is from south to north within the East Phase.

Section 3 Management and Control of Dust and Litter

3.1 Monitoring

Weather conditions are monitored daily for the potential of high wind events via weather outlets (e.g., AccuWeather, NOAA, etc.). Localized daily monitoring of temperature, wind speed, and precipitation occurs at the Landfill scale house using the facility's weather station and rain gauge. High wind conditions are communicated via a radio and/or phone between the executive director, managers, superintendents, operators and scale house staff.

Dust generation is monitored visually by the superintendent, operators and management throughout the day to determine the need for distribution of effluent on the haul roads and around the working face. This includes visual observations from the administration building (looking to the north and east) and on the ground in the field.

3.2 Dust Mitigation

The Agency mitigates dust by the best means possible through the use of effluent water that is distributed via a water wagon throughout the day on a daily basis, as needed. Effluent is only applied to active areas of the Landfill and haul roads. Effluent is not applied when rain, snow, residual moisture, freezing temperatures are a factor. Additionally, there may be reasons beyond the Agency's control that may prohibit the ability to water roads such as equipment failure (e.g., water wagons, Godwin Pump, effluent pump), inability to obtain parts in a timely manner, inability for effluent to be pumped to the effluent pond (e.g., winter/break down of effluent pump station at the Marty Sanchez Links de Santa Fe Golf Course, effluent limits at the wastewater plant not being met, etc.), and any other acts of God that may occur (e.g., staff shortage, pandemic, etc.).

Effluent water usage is triggered when conditions are such that dust is being kicked up by traffic on haul roads, around the working face, and when scrapers are hauling dirt from the stock pile to the working face for placement of daily and intermediate cover material, as needed. Dust is also minimized when wind conditions are such that the facility shuts down to the receipt of solid waste. As such, dust generation is less likely as a result of removing customer traffic from the roads. Operations must continue during high winds to secure the facility after shut down, which may require the use of scrapers to haul dirt for cover material in lieu of use of ADC (e.g., tarps).

3.3 Litter Control

Specific operational procedures are implemented at the Landfill to minimize the potential of litter and debris being blown off-site. The Agency has instituted a combination of permanent and temporary litter control fences to catch wind-blown litter and debris. This fencing is placed according to highest potential wind direction documented on the facility's wind rose diagram. During periods of high winds, the disposal operations is controlled by applying cover soils in an accelerated manner or the material will be disposed in areas with minimal wind impact.

3.4 Administrative Control

Physical observation is made by management or designated alternate before shutting down the operation to receiving solid waste. Depending upon wind direction and other factors (e.g., how wet or dry the material is, working face conditions, etc.), the Landfill may shut down to receipt of solid waste when winds are anticipated to be sustained at ~25 mph and gusts to ~35 mph. This criterion is simply a guideline which triggers consideration by management and/or a designated alternate to anticipate the need for closure of the Landfill to receipt of solid waste.

If winds are not causing solid waste (e.g., associated plastic bags, paper, cardboard, etc.) to blow away from the working face, across the Landfill property and towards the SFSWMA property boundary or compromising wind fences, which are placed according to highest potential wind direction documented on the wind rose diagram, the facility does not shut down. Shutdown is based upon whether litter is moving along the ground surface towards the SFSWMA property boundary of the facility, which can happen at wind speeds both lower and higher than the established guideline.

In the event the facility shuts down due to litter, account holders and regular customers of the facility are typically notified a minimum of one (1) hour in advance so that they are able to get to the facility and unload prior to shut down. Typically, the facility makes every effort possible to remain open to at least accept the first loads from regular customers, such as the City of Santa Fe, Waste Management, etc. This is done in order for them to be able to continue to pick up solid waste from residential routes. Shut down due to high winds (or other extreme weather conditions) are documented as part of the operating record.

Section 4 Training

4.1 Operations Permit

The superintendent, operators and management are trained annually and upon hire on the operational requirements established in the facility's operating permit issued by the NMED SWB and AQB. This includes the requirement to control dust by the best means possible through the use of effluent which is distributed via a water wagon on a daily basis. The Agency trains new and existing employees on the requirements for logging effluent water usage and when to apply effluent for dust control. The Superintendent, designated alternate and/or management give the directive to apply water based upon weather conditions, ability to apply or pump effluent, availability of effluent for dust control.

4.2 Operator Certification

Becoming a certified operator is a requirement of the job description for the manager, superintendent and operators at the Landfill. To become a certified operator, operators must have a minimum of 1 year of operational experience, take the Landfill Operator Certification Course and pass the testing requirements administered by the NMED SWB. This class provides information on how to operate and the regulatory requirements related to operating a landfill, which includes requirements associated with dust and litter control. Upon certification, operators are required to renew their certification through NMED-approved coursework every three years to remain a certified landfill operator. This is typically accomplished by retaking the Landfill Operator Certification Course every three years, where dust and litter control measures are reinforced.

Section 5 Recordkeeping and Documentation

5.1 Recordkeeping

Recordkeeping is performed in accordance with *20.9.5.16 NMAC* and the Title V permit. Landfill personnel maintain written operating records at the administration building for a period of one year and then the records are placed in a weather-proof shed for storage. These records include daily operations records, reports and permits. Metrological records are maintained in the scale house for a period of one year before storage in the weather-proof shed.

Should the Agency choose to convert or store records in electronic format, the reports, forms, inspections, monitoring and other operating records will be retained on site in hard copy form for a minimum of thirteen months prior to storing solely in electronic format. Electronic files will be maintained on site in a manner that provides viewing accessible for site personnel and inspectors.

Electronic files will be stored in PDF format or other widely recognized format. Should the PDF format become outdated or incompatible with current computer hardware, electronic files will be converted to a compatible format for viewing purposes to ensure their availability for review throughout the post-closure care period. Electronic files on the primary server are continuously backed up to a backup server in a separate building or to a cloud backup..

5.2 Documentation

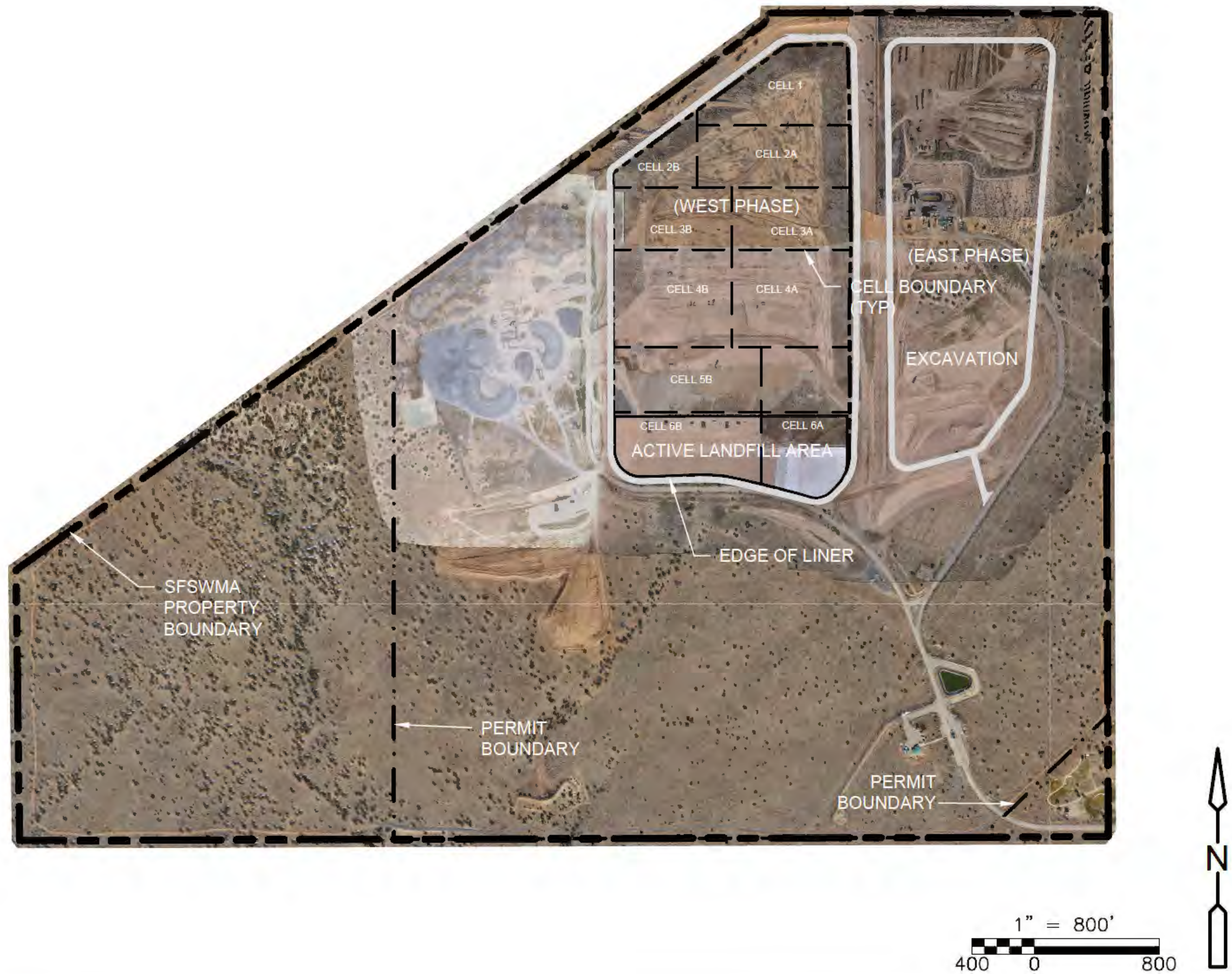
Metrological data (e.g., wind speed, direction, precipitation, etc.) is obtained and recorded at the scale house daily, when the facility is open. The superintendent and/or operators document the usage of effluent for dust control on a daily load-by-load basis on an established “Effluent Load Log.” This log indicates: unit used, time, weather conditions, documents usage of effluent for purposes other than traffic dust, what the ground condition is prior to be watered, where the water is distributed and how much.

In the event that water is not needed, operators complete a “No Water Application” form which defines the conditions for which water is not applied, which includes: rain, snow, residual moisture, freezing temperatures, inactive road, equipment failure, effluent unavailable, or staff shortages and includes an explanation of the conditions (e.g., muddy roads, snow packed roads, etc.). These “Effluent Load Logs” and/or “No Water Application” forms are placed in the operating record for each day the facility is open (Monday – Saturday, 7am – 5pm). Copies of these forms have been included in Appendix B.

Appendix A

Figure No. 1 – Site Plan

pw:\\cdmsmith-az02-pw.bentley.com:PW_PL1\10679\234219\03 Reports and Studies\09 CADD Figures and Graphics\FIGURE_1 FOR CAJA USE.dwg



NOTE:

1. CURRENT IMAGES PROVIDED BY VOLO PERVIDI LLC, OCTOBER, 2019, OVERLAYED ON OLDER IMAGES PROVIDED BY VOLO PERVIDI LLC, DECEMBER 2017.

CDM Smith

CAJA DEL RIO LANDFILL

Figure No. 1
Site Plan
AUGUST 2021

Appendix B

Effluent Usage Documentation

EFFLUENT LOAD LOG

Air Quality Permit No: P185LR4
Groundwater Quality Discharge Permit No. DP-1120

Water Wagon

Date:_________________

Unit: 1328 (5,000 gallons) 1345 (5,000 gallons) 1357 (8,000 gallons)

Time of effluent distribution? ________________ A.M. P.M.

<u>Weather Conditions</u> (contact Scalehouse for data)

Temperature ________________ Degrees Fahrenheit

Visual Clear Cloudy Light Rain Heavy Rain Light Snow Heavy Snow

Wind Calm Breezy (5-15) Moderate Wind (15 – 40) High Wind (40+)

If using effluent for a purpose other than controlling traffic dust (i.e. – equipment washing, fire suppression), what is the purpose? ____

____

What is the condition of the ground surface before being watered?

Very Dry Dry Damp Muddy Snow Ice

Where is effluent load being applied and in what proportion (in gallons)?

Haul Road __________ Cell Construction __________

Working Face __________ Compost/Landscaping __________

____ __________
Name of Heavy Equipment Operator (Print) Initials

No Water Application

Air Quality Permit No: P185LR4
Groundwater Quality Discharge Permit No. DP-1120

Effluent not distributed for road dust with explanation

Date: __________________ Initials: ____________

Condition: Rain Snow Residual Moisture Freezing Temperatures

Inactive Roads Equipment Failure Effluent Unavailable Staff Shortage

Explanation: ____

____

____

____

____

____

Section 21

Addendum for Landfill Applications

Landfill Applications are not required to complete Sections 1-C Input Capacity and Production Rate, 1-E Operating Schedule, 17 Compliance Test History, and 18 Streamline Applications. Section 12 – PSD Applicability is required only for Landfills with Gas Collection and Control Systems and/or landfills with other non-fugitive stationary sources of air emissions such as engines, turbines, boilers, heaters. All other Sections of the Universal Application Form are required.

EPA Background Information for MSW Landfill Air Quality Regulations:
https://www3.epa.gov/airtoxics/landfill/landflpg.html

NM Solid Waste Bureau Website: https://www.env.nm.gov/swb/

21-A: Municipal Solid Waste Landfill Information

1	How long will the landfill be operated? **Approximately 2053 (may vary depending on future capacity/expansions and waste intake)**			
2	Maximum operational hours per year: **Public: 4,015 hrs/yr and Landfill Operations: 5,475 hrs/yr**			
3	Landfill Operating Hours (Open to the Public) M-F:7**am-6pm**		Sat. **6am-6pm**	Sun. **6am-6pm**
	Landfill Operating Hours (Landfill Operations) M-F:**6am-9pm**		Sat. **6am-9pm**	Sun. **6am-9pm**
	Green Waste Operation Hours M-F: **7am-7pm**		Sat. 7**am-7pm**	Sun. **7am-7pm**
4	To determine to what NSPS and emissions guidelines the landfill is subject, what is the date that the landfill was constructed, modified, or reconstructed as defined at 40 CFR 60, Subparts A, WWW, XXX, Cc, and Cf. **Per the landfill's reporting to the Bureau dated November 23, 2016, an expansion did commence construction after July 17, 2014 such that the landfill is subject to 40 CFR 60, Subpart XXX requirements. Since the landfill is subject to an NSPS rule, portions of 40 CFR 60, Subpart A apply. The landfill is not subject to NSPS Subparts WWW, Cc, or Cf. Please refer to Section 13 for a further breakdown of the various NSPS-related rules and requirements.**			
5	Landfill Design Capacity. Enter all 3	Tons: **12,868,800**	Megagrams (Mg): **11,674,379**	Cubic meters: **8,104,281**
6	Landfill NMOC Emission Rate (NSPS XXX)	☐ Less than 34 Mg/year using Tiers 1-3	☒ Equal to or Greater than 34 Mg/year using Tiers 1-3	
	Landfill NMOC Emission Rate (NSPS XXX) **(N/A) the Agency did not perform a Tier 4**	☐ Less than 500 ppm using Tier 4	☐ Equal to or Greater than 500 ppm using Tier 4	
	Landfill NMOC Emission Rate (NSPS WWW)	☐ Less than 50 Mg/yr	☒ Equal to or Greater than 50 Mg/yr	
7	Annual Waste Acceptance Rate: **varies annually and was reported as 165,747 tons in 2020; will vary in the future through landfill closure**			
8	Is Petroleum Contaminated Soil Accepted? **Not currently**	If so, what is the annual acceptance rate? **N/A**		
9	NM Solid Waste Bureau (SWB) Permit No.: **SWM-226357 and SWB-0226358(SP)**	SWB Permit Date: June 27, 1995 and November 25, 2015		
10	Describe the NM Solid Waste Bureau Permit, Status, and Type of waste deposited at the landfill. **The NMED Solid Waste Permits listed above cover the landfill's operations, were issued on November 25, 2015, and expire (must be renewed within) in twenty years (through November 25, 2035).** **The landfill is permitted to accept municipal/commercial solid waste and construction/demolition debris. It is also formally permitted to accept the following special wastes:** • **Industrial Solid Waste**			

	• **Petroleum Contaminated Soil** • **Sludge** • **Spills of a Chemical Substance or Commercial Product** • **Treated Formerly Characterized at Hazardous Waste** • **Vehicle Wash Sump Waste**
11	Describe briefly any process(es) or any other operations conducted at the landfill. **SFSWMA allows Del Hur Industries, an independent operation, to crush and sell rock material. The Del Hur Industries operation is permitted through NMED Air Quality Permit GCP-2-2976. Composting of green waste is conducted by a contractor in the green waste area. Chipped green waste is brought into this area, composted, screened and periodically transported out for sale.**

21-B: NMOC Emissions Determined Pursuant to 40 CFR 60, Subparts WWW or XXX

	Enter the regulatory citation of all Tier 1, 2, 3, and/or 4 procedures used to determine NMOC emission rates and the date(s) that each Tier procedure was conducted. In Section 7 of the application, include the input data and results.
1	Tier 1 equations (e.g. LandGEM): **N/A**
2	Tier 2 Sampling: **Reported over 50 Mg/yr in 2007 after a Tier 2 test.**
3	Tier 3 Rate Constant:
4	Tier 4 Surface Emissions Monitoring:
5	Attach all Tier Procedure calculations, procedures, and results used to determine the Gas Collection and Control System (GCCS) requirements.

Facilities that have a landfill GCCS must complete Section 21-C.

21-C: Landfill Gas Collection and Control System (GCCS) Design Plan

1	Was the GCCS design certified by a Professional Engineer? **Yes**
2	Attach a copy of the GCCS Design Plan and enter the submittal date of the Plan pursuant to the deadlines in either NSPS WWW or NSPS XXX. The NMOC applicability threshold requiring a GCCS plan is 50Mg/yr for NSPS WWW and 34 Mg/yr or 500 ppm for NSPS XXX. **The most recent GCCS Design Plan is attached immediately after this section. It superseded and replaced the prior Subpart WWW Plan.**
3	Is/Was the GCCS planned to be operational within 30 months of reporting NMOC emission rates equal to or greater than 50 Mg/yr, 34 Mg/yr, or 500 ppm pursuant to the deadlines specified in NSPS WWW or NSPS XXX? **Yes**
4	Does the GCCS comply with the design and operational requirements found at 60.752, 60.753, and 69.759 (NSPS WWW) or at 60.762, 60.763, and 60.769 (NSPS XXX)? **Yes, both did.**
5	Enter the control device(s) to which the landfill gas will be/is routed such as an open flare, enclosed combustion device, boiler, process heater, or other. **Enclosed combustion device (enclosed flare) only at this time.**
6	Do the control device(s) meet the operational requirements at 60.752 and 60.756 (NSPS WWW) or 60.762, 60.763, 60.766 (NSPS XXX)? **Yes**

New Mexico
ENVIRONMENT DEPARTMENT

525 Camino de los Marquez, Suite 1
Santa Fe, NM 87505-1816
Phone (505) 476-4300
Fax (505) 476-4375
www.env.nm.gov

SUSANA MARTINEZ
GOVERNOR

JOHN A. SANCHEZ
LT. GOVERNOR

BUTCH TONGATE
CABINET SECRETARY

BRUCE YURDIN
ACTING DEPUTY SECRETARY

October 10, 2018

<u>CERTIFIED MAIL NO. 7018 1130 0001 5003 6169</u>
<u>RETURN RECEIPT REQUESTED</u>

Randall Kippenbrock
Executive Director
Santa Fe (City of) Solid Waste
149 Wildlife Way
Santa Fe, NM 87506

Re: Landfill Gas Collection and Control System Design Plan
Facility: Caja Del Rio Landfill
Air Quality Operating Permit No: P185L-R3
TEMPO/Idea ID Number 1484 - PRT20160001

Dear Mr. Kippenbrock:

This letter acknowledges the receipt of the gas collection and control system design plan for the Caja Del Rio Landfill. This facility is located approximately 3.3 miles NW of Santa Fe in Santa Fe County, New Mexico. The Air Quality Bureau of the New Mexico Environment Department ("Department") received this design plan on November 27, 2017.

The Department has determined that the information submitted in the design plan addresses the requirements of 40 CFR Section 60.767(c) of Subpart XXX that pertain to the design of a gas collection and control system. Specifically, the Department has determined that the design plan was prepared by a professional engineer and addresses the applicable design requirements. Therefore, the Department administratively approves this design plan.

This approval does not constitute approval of the engineering analysis contained in the plan and does not remove the responsibility from the landfill owner to meet all technical and operational requirements of 40 CFR 60 Subpart XXX.

Section 6 and 7 Alternatives: Pursuant to 40 CFR 60.767(c)(2), the request for NSPS alternatives/flexibilities to Subparts 60.763 through 60.768 in Sections 6 and 7 of the Plan is approved.

If you have any questions, please contact me in Santa Fe at 505-476-4371.

Sincerely,

Linsey Hurst
Air Permitting Specialist
Major Source Unit
Air Quality Bureau

cc via email: David Mezzacappa, P.E. and Joseph D. Krasner, P.E.
SCS Engineers

Ralph Gruebel
AQB Compliance and Enforcement Section Manager

New Mexico Environment Department
Air Quality Bureau
Compliance and Enforcement Section
525 Camino de los Marquez, Suite 1
Santa Fe, NM 87505
Phone (505) 476-4300 Fax (505) 476-4375

Version 05.02.13

NMED USE ONLY	
TEMPO	

REPORTING SUBMITTAL FORM

NMED USE ONLY	
Staff	
Admin	

PLEASE NOTE: ® - Indicates required field

SECTION I - GENERAL COMPANY AND FACILITY INFORMATION

A. ® Company Name: Santa Fe Solid Waste Management Agency			D. ® Facility Name: Caja del Rio Landfill		
B.1 ® Company Address: 149 Wildlife Way			E.1 ® Facility Address: 149 Wildlife Way		
B.2 ® City: Santa Fe	B.3 ® State: NM	B.4 ® Zip: 87506	E.2 ® City: Santa Fe	E.3 ® State: NM	E.4 ® Zip: 87506
C.1 ® Company Environmental Contact: Randall Kippenbrock	C.2 ® Title: Executive Director		F.1 ® Facility Contact: Randall Kippenbrock	F.2 ® Title: Executive Director	
C.3 ® Phone Number: (505) 424-1850	C.4 ® Fax Number: (505) 424-1839		F.3 ® Phone Number: (505) 424-1850	F.4 ® Fax Number: (505) 424-1839	
C.5 ® Email Address: rkippenbrock@sfswma.org			F.5 ® Email Address: rkippenbrock@sfswma.org		
G. Responsible Official: (Title V only): Randall Kippenbrock	H. Title: Executive Director		I. Phone Number: (505) 424-1850	J. Fax Number: (505) 424-1839	

K. ® AI Number:	L. Title V Permit Number:	M. Title V Permit Issue Date:	N. NSR Permit Number:	O. NSR Permit Issue Date:
1484	P185LR3	8/30/2017		

P. Reporting Period:
From: To:

SECTION II – TYPE OF SUBMITTAL (check one that applies)

A. ☐	Title V Annual Compliance Certification	Permit Condition(s):	Description:	
B. ☐	Title V Semi-annual Monitoring Report	Permit Condition(s):	Description:	
C. ☒	NSPS Requirement (40CFR60)	Regulation: Subpart XXX	Section(s): 60.767(c)	Description: Gas Collection and Control System Design Plan
D. ☐	MACT Requirement (40CFR63)	Regulation:	Section(s):	Description:
E. ☐	NMAC Requirement (20.2.xx) or NESHAP Requirement (40CFR61)	Regulation:	Section(s):	Description:
F. ☐	Permit or Notice of Intent (NOI) Requirement	Permit No.☐: or NOI No.☐:	Condition(s):	Description:
G. ☐	Requirement of an Enforcement Action	NOV No. ☐: or SFO No. ☐: or CD No. ☐: or Other ☐:	Section(s):	Description:

SECTION IV - CERTIFICATION

After reasonable inquiry, I Randall Kippenbrock (name of reporting official) certify that the information in this submittal is true, accurate and complete.

® Signature of Reporting Official:	® Title:	® Date	® Responsible Official for Title V?
Randall Kippenbrock	Executive Director	11/21/17	☒ Yes ☐ No

Reviewed By: ______________________ Date Reviewed: ______________

November 21, 2017
SCS Project No. 160214041.00

Mrs. Kristina Sullivan
Compliance and Enforcement Section
NMED, Air Quality Bureau
525 Camino de los Marquez
Santa Fe, New Mexico 87505-1816

Re: New Source Performance Standards (NSPS) 40 CFR 60, Subpart XXX
Landfill Gas Collection and Control System (GCCS) Design Plan & Engineering Calculations
Caja del Rio Landfill, Santa Fe, New Mexico
Title V Operating Permit No. P185L-R3

Dear Mrs. Sullivan:

In accordance with 40 Code of Federal Regulations (CFR) §60, Subpart XXX – Standards of Performance for Municipal Solid Waste Landfills (NSPS), which became effective on October 28, 2016, SCS Engineers is submitting the attached NSPS Subpart XXX Landfill Gas Collection and Control (GCCS) Design Plan for the Caja del Rio Landfill (Site) on behalf of the Santa Fe Solid Waste Management Agency (SFSWMA).

This new rule required that an Initial Design Capacity Report and a Non-Methane Organic Compound (NMOC) Emission Rate Report be submitted later than November 28, 2016. These reports, for this site, were submitted on November 23, 2016. The new rule also requires that a GCCS Design Plan be submitted no more than one year from submittal of the NMOC report showing NMOC emissions equal to or greater than 34 Megagrams (Mg) per year. As such, the attached NSPS XXX GCCS Design Plan is being submitted.

In accordance with the NSPS XXX, the site will initiate GCCS operation, including associated monitoring, recordkeeping and reporting, 30-months after the date of the first annual NMOC Emission Rate report which indicates the NMOC emission rate equals or exceeds 34 Mg/yr which will occur on May 23, 2019. In the interim, the site will continue to comply with NSPS Subpart WWW requirements for GCCS operations, including associated monitoring, recordkeeping and reporting.

A copy of this notification has been sent to the United States Environmental Protection Agency (EPA) also; less the GCCS Design Plan attachment. Please do not hesitate to contact David Mezzacappa, P.E. with any questions at (505) 559-4124.

Sincerely,

Joseph D. Krasner
Project Engineer
SCS ENGINEERS

David J. Mezzacappa, P.E.
Vice President
SCS ENGINEERS

Attachments

cc: Mr. Jeff Robinson, EPA Region 6 (6PD-R)
Mr. Steve Thompson, EPA Region 6 (6EN-AA)
Danita Boettner, P.E., SFSWMA
Randall Kippenbrock, P.E., SFSWMA (via email)

Attachment
40 CFR NSPS Subpart XXX
GCCS Design Plan

SCS ENGINEERS

New Source Performance Standards (NSPS), Subpart XXX Landfill Gas Collection and Control System Design Plan

Caja del Rio Landfill
Santa Fe, New Mexico

SFSWMA
SANTA FE SOLID WASTE MANAGEMENT AGENCY

Prepared for:

SANTA FE SOLID WASTE MANAGEMENT AGENCY
Caja del Rio Landfill
149 Wildlife Way
Santa Fe, New Mexico 87506
(505) 424-1850

Prepared by:

SCS ENGINEERS
500 Marquette Ave. NW, Suite 1200
Albuquerque, NM 87102
(505) 559-4124

For Compliance Purposes
DAVID J. MEZZACAPPA 11/21/17
NEW MEXICO
15236
Exp. 12/31/18
PROFESSIONAL ENGINEER

November 2017
SCS File No. 16214041.00

Offices Nationwide
www.scsengineers.com

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For Compliance Purposes 11/21/17

DAVID J. MEZZACAPPA NEW MEXICO 15236 Exp. 12/31/18 PROFESSIONAL ENGINEER

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For Compliance Purposes
11/21/17
DAVID J. MEZZACAPPA
NEW MEXICO
15236
Exp. 12/31/18
PROFESSIONAL ENGINEER

1 CERTIFICATION STATEMENT

I certify that this document fulfills the requirements for a landfill gas collection and control system design plan (GCCS Design Plan) under the Standards of Performance for New Stationary Sources (NSPS) for Municipal Solid Waste (MSW) Landfills 40 Code of Federal Regulations (CFR) Part 60, Subpart XXX. I further certify that this GCCS Design Plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of New Mexico.

For Compliance Purposes

Signed,

11/21/17

David J. Mezzacappa, P.E.
New Mexico P.E. #15236

DAVID J. MEZZACAPPA
NEW MEXICO
15236
Exp. 12/31/18
PROFESSIONAL ENGINEER

2 INTRODUCTION

2.1 Purpose of Document

This Landfill Gas Collection and Control System (GCCS) Design Plan (Plan) was prepared by SCS Engineers on behalf of the Santa Fe Solid Waste Management Agency (SFSWMA). It fulfills the requirements of the New Source Performance Standards (NSPS) under 40 Code of Federal Regulations (CFR) Part 60, Subpart XXX, for a GCCS Design Plan for the Caja del Rio Landfill (Site) in Santa Fe, New Mexico.

The Site is subject to the NSPS for Municipal Solid Waste (MSW) Landfills, 40 CFR Part 60 Subpart XXX, since the Site commenced construction, reconstruction, or modification after July 17, 2014. The Site is regulated under the NSPS, based upon a design capacity exceeding 2.5 million Megagrams (Mg) and 2.5 million cubic meters; and based upon a non-methane organic compounds (NMOC) emission rate calculation that demonstrated an annual NMOC emission rate exceeding 34 Mg per year.

The purpose of this Plan is to provide details of the proposed modification of the existing GCCS at the Site and a plan for future modifications to upgrade the GCCS to achieve compliance with the Subpart XXX regulation. The following Plan fulfills the requirements of a GCCS Plan, as set forth in 40 CFR §60.762 through §60.769, as described herein. As required by the NSPS, the Plan addresses those areas defined as active areas where the first refuse deposited in the area has reached an age of 5 years or more, or those areas closed or at final grade where the first refuse deposited in the areas has reached an age of 2 years or more (§60.762(b)(2)(ii)(C)(2)).

Upon approval of this GCCS Design Plan by the Administrator/NMED Air Quality Bureau (AQB) or as necessary to meet regulatory deadlines, SFSWMA will design, install and operate the necessary upgrades to the existing GCCS as outlined in Section 4, in accordance with the implementation schedule shown on Table 1.

This Plan is organized into the following sections:

- Section 1 - Certification;
- Section 2 - Introduction;
- Section 3 - Existing Site Conditions;
- Section 4 - Site Development;
- Section 5 - Compliance Review and Evaluation;
- Section 6 - NSPS Proposed Alternatives;
- Section 7 - Operating Under XXX; and
- Section 8 - Limitations.

Supporting documents included in Appendix A are as follows:

- Current GCCS Layout;

- Conceptual build-out of GCCS;
- Previously approved NSPS flexibilities under 40 CFR 60, Subpart WWW; and
- Previously completed flare source test.

Appendix B includes the Surface Emissions Monitoring Plan. Appendix C includes LandGEM model outputs as well as header sizing calculation spreadsheets and a discussion of header sizing methodology.

The Site has an existing GCCS Design Plan under NSPS, Subpart WWW.

2.2 Compliance Schedule

As shown in Table 1, SFSWMA will initiate Subpart XXX GCCS operation, including associated monitoring, recordkeeping and reporting, 30-months after the date of the first annual NMOC Emission Rate report which indicates the NMOC emission rate equals or exceeds 34 Mg/yr. In the interim, the site will continue to comply with Subpart WWW requirements for GCCS operations, including associated monitoring, recordkeeping and reporting.

Table 1 below illustrates the implementation/compliance schedule for GCCS operations. If AQB requires the Site to modify this Plan, the modification(s) will apply prospectively and not retroactively.

TABLE 1 – NSPS XXX IMPLEMENTATION SCHEDULE*

Regulatory Milestone	Date
NMOC Emission Rate Report submitted (NMOC equals or exceeds 34/Mg/yr)	11/23/2016
GCCS Design Plan submitted	11/21/2017
NSPS XXX GCCS operations commence	05/23/2019
NSPS XXX Monitoring, and Recordkeeping and Reporting (MRR) commences	05/23/2019
NSPS XXX Initial Annual Report **	11/19/2019

* SFSWMA may elect to conduct additional Tier 2 testing until the date the site commences operation of the GCCS per this Plan. Therefore, this timeline may be revised if a Tier 2 demonstrates that the site is less than 34 Mg before NSPS XXX operation commences. AQB will be notified should additional Tier 2 testing be performed at the Site, which demonstrates the resulting NMOC emissions are below 34 Mg/yr.
** The Initial NSPS XXX annual report required by 40 CFR 60.767(g) will contain the performance test results as required by 60.8 for initial start-up of the collection and control system.

3 EXISTING SITE CONDITIONS

3.1 Landfill Description

Site Background

The Site is owned and operated by SFSWMA and began accepting waste in May 1997. The total acreage of the property is approximately 646 acres, however, only 495 acres of the property is designated for the Site, of which, 141 acres are reserved for waste disposal cells. Of this 141 acres, approximately 87 acres is reserved for the west phase (which is included in total as part of this Plan), while approximately 54 acres are approved for a future east phase. This Plan will be updated prior to expansion of the GCCS into the east phase in accordance with the 40 CFR §60, Subpart XXX rules.

The entire existing fill area is composite-lined (Cells 1 and 2A with a 2-foot clay liner soil component and subsequent cells with a geosynthetic clay liner (GCL) in lieu of compacted clay overlain by an HDPE liner) since it was opened after Subtitle D regulations requiring liners were in place. The Site is permitted by the New Mexico Environmental Department (NMED) Solid Waste Bureau under permit No. SWB-0226357 and special waste disposal permit No. SWB-0226358 (SP).

Landfill Configuration and Depths of Waste

Cell depths vary from approximately 40 to 160 feet below grade, while the highest proposed fill grade (6,530 feet peak elevation) is approximately 130 feet above grade (depending on where grade is measured). The average waste thickness varies between the different phases, but exceeds 100 feet in many areas.

The approximate 87-acres permitted for waste disposal in the western phase is divided into 6 main cells and a “wedge” cell area. Several of the cells are also further divided into subsections (i.e. Cell 3 is divided into Cells 3A and 3B). Currently liner construction has been completed in the following cells: 1, 2A, 2B, 3A, 3B, 4A, 4B, 5A, 5B, and 6A. Cells 6B and the wedge cell area in the southwestern corner of the Site have yet to be completed.

Cover Properties

The approved final cover system is a three-foot thick soil-only final cover. These three feet of final cover will be placed for the entire disposal area using this approved alternate final cover design described in Permit Modification and Renewal Application SWB 15-24 (P), approved by the NMED on November 25, 2015.

Condensate and Leachate Management

Condensate and leachate management is discussed in Section 5.5.6.

3.2 Existing Gas Collection and Control System

A site plan depicting the current layout of the GCCS is included on Drawing A.1 in Appendix A.1. The current GCCS system consists of vertical landfill gas (LFG) extraction wells, a piping network, condensate management system, and LFG control equipment (an enclosed flare). The existing perimeter and interior wells have an average spacing of approximately 250 to 400 feet. Each LFG extraction well is equipped with an adjustment valve for regulating the applied vacuum and sample ports for monitoring well performance. The wells are connected to high-density polyethylene (HDPE) LFG header and lateral piping systems installed below ground surface, which conveys the extracted LFG from the extraction wells to the control equipment. Isolation valves installed along the LFG collection piping will provide for the ability to isolate individual LFG system components or sections for repair or troubleshooting without shutting down the entire LFG collection system.

Condensate forming in the GCCS piping drains into condensate collection sumps located at low points along the perimeter piping. The condensate gravity drains from the collection piping into the sumps. The condensate is then pumped into a storage tank and is recirculated back into the fill area when the tank is near capacity. Other management methods may be utilized in the future if approved through the NMED Solid Waste Bureau.

The extracted LFG from the collection points is conveyed to the Site's existing blower/flare facility. The existing blower/flare facility includes an enclosed flare and two blowers. The flare's capacity is approximately 900 standard cubic feet per minute (scfm).

As the LFG extraction rate increases with future GCCS installation into the areas of the landfill, an additional or larger capacity blower/flare may be needed as described in Section 5.1.3. In addition, the site may send the gas to an LFG-to-energy (LFGE) facility in the future, which may be owned and operated by a third-party energy developer.

4 SITE DEVELOPMENT

4.1 Landfill Development Plan

Drawing A.2 in Appendix A.1 shows the built-out western phase (permitted final grades). There are approximately 20 more years of site life remaining in this phase as of the writing of this Plan. At this time, there is no planned end-use for this phase once closed, past open space, that would impact the gas system or collection of LFG.

The western phase has been developed from essentially a north to south fashion, and will continue to be in the future as the remaining cells are built. From that point forward, filling will progress to bring all cells to the newly permitted final grades. This sequencing will be compatible with the GCCS since the perimeter header pipe runs along the outer portions of the landfill, and extraction wells will be extended should filling occurs over their location. These wells can be redrilled if necessary to sufficiently collect LFG.

4.2 Future Gas Collection and Control System

This section identifies components proposed for future expansion of the GCCS. These items are shown in green on Drawing A.2 in Appendix A.1. A phased GCCS design will be implemented in order to comply with the NSPS requirements for GCCS expansions stipulated in §60.762(b)(2)(ii)(C)(2). Standard details are included in the Appendix A.1 drawings.

As the site develops, additional LFG extraction wells will be installed as needed to control migration and surface emissions of methane. The locations and details of the anticipated final proposed LFG extraction wells for the currently permitted Site are shown in Appendix A.1. Where needed, interim horizontal collection trenches may also be installed in areas that are not yet at final grade. Once the Site achieves its final elevation, vertical wells will be likely installed to replace any interim horizontal collection trenches. The future LFG extraction well layout was developed with both perimeter and internal extraction wells with the average spacing of approximately 250 feet and 300 to 400 feet, respectively. Each LFG extraction well will be equipped with a control valve and monitoring ports similar to Detail 2 on Drawing A.3 in Appendix A.1. These control valves and monitoring ports, used in conjunction with controls on the blower, will allow the site operator to regulate vacuum and LFG levels at each individual LFG extraction well. This will allow the operator to make adjustments in order to effectively reduce the potential for air intrusion, subsurface migration and odors, as well as to protect the integrity of the final cover system. The LFG extraction wells will be installed as the landfill develops in accordance with the NSPS requirements.

The proposed GCCS components will serve to expand the existing system and will be installed in phases as needed.

Future LFG transmission piping will be sized to accommodate the maximum expected LFG flow rate as estimated by LFG generation rate modeling. The results of the KYGas Model that was used to determine the future pipe sizing are included in Appendix C of this Plan.

4.3 Interim GCCS Condition

Interim operating conditions occur when the Site is still actively accepting waste, and before it is closed or reaches final grade. During these interim conditions, the GCCS is typically being installed or expanded to comply with NSPS requirements, while SFSWMA is also balancing the requirements of the day-to-day activities of an active landfill. Interim GCCS components will be installed as needed. Drawing A.2 in Appendix A.1 depicts the GCCS following closure of the landfill and may not be representative of interim GCCS construction details during the Site's active landfill operations. However, the GCCS will at all times be constructed or expanded to maintain compliance with NSPS requirements. Due to possible future landfill operational changes, the GCCS design may also be altered to maintain compliance with the provisions of the NSPS and to accommodate actual field conditions at the time of construction. Several provisions have been included in the GCCS design to accommodate future system expansion such as:

- Extendable LFG extraction wells and details for horizontal collection trenches (if needed) to be installed as filling progresses;
- Reserve excess LFG collection capacity in the LFG conveyance piping system based on future projected flow conditions;
- Pre-installed isolation valves and blind flanges where needed in the LFG conveyance system to allow for ease of isolation and making new header and lateral piping connections without having to shut down the entire GCCS;
- Reserve excess design capacity in the blower/flare equipment to handle incremental increases in operating capacity and pressure as the system is expanded;
- Overall GCCS design that is developed to be incrementally expanded over time as the landfill grows as additional LFG generation occurs.

5 COMPLIANCE REVIEW AND EVALUATION

The purpose of this section is to describe and document information required to certify compliance of the GCCS with the applicable sections of 40 CFR 60.760 through 60.769.

5.1 Compliance with §60.763: Operational Standards for Collection and Control Systems

The Site will be equipped with an operational GCCS to control LFG in all areas of the landfill where wastes have been or will be placed.

5.1.1 Compliance with §60.763(a)

§60.763(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) 5 years or more if active; or
(2) 2 years or more if closed or at final grade.

The GCCS will be installed to collect gas from areas of waste in accordance with NSPS §60.763(a). Future expansions of the GCCS will also comply with §60.763(a). Interim system expansions will be included in the required NSPS reports.

5.1.2 Compliance with §60.763(b)

§60.763(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 §60.767(g)(1);*

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

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 §60.767(c).*

The GCCS will be operated in accordance with the above stated rule provision.

5.1.3 Compliance with §60.763(c)

§60.763(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).*

This regulation describes the operational requirements at the wellhead to minimize the potential for subsurface oxidation events. The GCCS will be operated in accordance with above stated rule provision. However, on an as-needed basis, the Site may make a higher operating value (HOV) demonstration. Existing HOVs that were previously approved will continue to apply and will not require further approval. Please refer to Section 6 for details on previously approved HOVs/procedures.

5.1.4 Compliance with §60.763(d)

§60.763(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 specification provided in §60.765(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 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.*

The GCCS will be designed to minimize both subsurface lateral migration and surface emissions of LFG. Surface emissions monitoring data for the Site will ensure that the Site is able to maintain compliance with surface emissions standards.

In accordance with NSPS, the landfill surface will be monitored for emissions in accordance with this Plan and in full compliance with the rules. If the GCCS does not meet the measures of performance for the surface emissions as required by NSPS, the GCCS will be adjusted or modified accordingly.

Drawing B.1 in Appendix B includes the proposed route for surface emissions monitoring upon closure of the west phase. Prior to each monitoring event, route planning will be conducted where the best route for that round of monitoring will be decided. This will be decided based on Site operating conditions and topographical features at the time of each monitoring event. This may result in revisions to the proposed plan in Appendix B on a continual basis.

Excluded areas will include dangerous areas with roads, truck traffic areas, paved areas excluding cracks, steep slopes, areas covered with snow or ice, and active filling areas of the landfill due to the health and safety risk of working around heavy equipment traffic. Prior to each monitoring event, SFSWMA or the GCCS Operator will complete route planning where excluded areas will be delineated and any modifications to the route will be recorded. Any deviations to the proposed plan will be recorded and included in the NSPS reports.

5.2 Compliance with §60.765: Compliance Provisions

5.2.1 Compliance with §60.765(a)(1)

§60.765(a)(1) *For purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with §60.762(b)(2)(ii)(C)(1), either Equation 5 or Equation 6 must be used. The methane generation rate constant (k) and methane generation potential (L_o) kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42) or other site-specific values demonstrated to be appropriate and approved by the Administrator.*

LFG generation for the site was estimated using the United States (U.S.) Environmental Protection Agency (EPA) NSPS-based model (LandGEM). Inputs to the model included:

- An ultimate methane generation potential ("L_0" value) of 100 m^3/Mg, which is the AP-42 default.
- A refuse decay co-efficient ("k" value) of 0.02, as recommended by AP-42 for arid areas.
- For converting methane to LFG, a methane content of 50 percent was assumed.
- Historic and current disposal rates are based on disposal records covering 1997 to 2016. Disposal in the future years is based on predications from the Site as to expected disposal volumes and approximately 20 remaining years of life in the west phase. As such, based on these calculations and discussions, the western phase of the Site will reach its permitted maximum capacity in the year 2037, with approximately 12.59 millions of tons of refuse in-place. Annual waste disposal quantities are included in the model output provided in Appendix C.1.

Based on the model outputs provided in Appendix C.1, the peak LFG generation occurs in 2037 with a generation rate of approximately 1,284 standard cubic feet per minute (scfm). However, based on current flows to help calibrate the LandGEM model, the current GCCS is only able to run intermittently due to low flows at only one-third of what the LandGEM model predicts. Based on the years of operation at this level, SCS does not believe there is any reason to not assume that this will continue into the future. As such, the projected flow was multiplied manually in the GCCS sizing calculations by a factor of 0.5 to give a more accurate reading of anticipated flows. A GCCS collection efficiency of 95 percent (for conservative design purposes) was applied to the overall adjusted generation as well, such that the peak estimated LFG extraction rate that the GCCS will need to accommodate for the west phase will be approximately 610 scfm. The final GCCS piping system has been sized to handle this maximum estimated LFG extraction rate while maintaining vacuum throughout the header pipe. Design computations for sizing the GCCS piping and determining system vacuum requirements were performed using a Spitzglass spreadsheet. This table is included in Appendix C.2 along with a second table showing the contributions of flow to each assumed pipe segment. Appendix C.3 includes information on the Spitzglass equation and more on the header pipe sizing procedures. The pipe segments shown in the Appendix C.2 table are also labelled on Drawing A.2 in Appendix A.1.

5.2.2 Compliance with §60.765(a)(3)

§60.765(a)(3) *For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with §60.762(b)(2)(ii)(C)(3), the owner or operator must measure gauge pressure in the gas collection header at 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 §60.763(b). Any attempted corrective measure must not cause exceedances of other operational or performance standards.*

§60.765(a)(3)(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-cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after positive pressure was first measured. The owner or operator must keep records according to §60.768(e)(3).*

§60.765(a)(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 §60.767(g)(7) as part of the next annual report. The owner or operator must keep records according to §60.768(e)(4).*

§60.765(a)(3)(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 §60.767(g)(7) and §60.767(j). The owner or operator must keep records according to §60.768(e)(5).*

The GCCS will be operated in a manner for maintaining compliance with this provision.

Monthly monitoring and wellfield balancing will be performed which will include monitoring for pressure. Exceedances will be mitigated in accordance with this rule and reported in NSPS reports. If corrective actions are taken as set forth in §60.765, the monitoring exceedance is not a violation; and therefore will not be considered a deviation.

Future GCCS expansions will be designed to accommodate additional LFG flow from the extraction wells and pressure drop through the piping in order to maintain a negative pressure as stated in the above rule. If this condition cannot be maintained, modifications to the GCCS will be made in accordance with NSPS requirements. If warranted, certain alternatives to the negative pressure requirement will be sought as allowed by the NSPS and set forth in this Plan.

5.2.3 Compliance with §60.765(a)(5)

§60.765(a)(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 §60.763(c). If a well exceeds the operating parameter, action must be initiated to correct the exceedance within 5 calendar days. Any attempted corrective measure must not cause exceedance of other operational or performance standards.*

§60.765(a)(5)(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 operator must keep records according to §60.768(e)(3).*

§60.765(a)(5)(ii) *If corrective actions cannot be fully implemented within 60 days following the landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) 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 correction 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 §60.768(g)(7) as part of the next annual report. The owner or operator must keep records according to §60.768(e)(4).*

§60.765(a)(5)(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 §60.767(g)(7) and §60.767(j). The owner or operator must keep records according to §60.768(e)(5).*

The system will be operated in a manner maintaining compliance with this provision.

Monthly monitoring and wellfield balancing will be performed which includes monitoring for temperature. Exceedances will be mitigated in accordance with this rule and Plan, and reported in NSPS reports. In addition, the GCCS design criteria will be followed to minimize surface air infiltration. If corrective actions are taken as set forth in §60.765, the monitoring exceedance is not a violation; and therefore will not be considered a deviation.

5.2.4 Compliance with §60.765 (c) and (d)

This provision lists specific requirements for surface emission monitoring and is similar to the provision specific in §60.763(d) (Section 5.1.4 of this Plan).

5.3 Compliance with §60.766: Monitoring of Operations

§60.766(a) *Each owner or operator seeking to comply with §60.762(b)(2)(ii)(C) 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 §60.765(a)(3);

(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 §60.767(c)(2);

ii. Unless an alternative test method is established as allowed by §60.767(c)(2), the oxygen content level must be determined by an oxygen meter using Method 3A, 3C, or ASTM D6522-11 (incorporated by 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;

(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 §60.765(a)(5). The temperature measuring device must be calibrated annually using the procedure in 40 CFR part 60, appendix A-1, Method 2 Section 10.3.

§60.766(b) *Each owner or operator seeking to comply with §60.762(b)(2)(iii) 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 or 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 *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.*

§60.766(f) *Each owner or operator seeking to demonstrate compliance with the 500 parts per million surface methane operational standard in §60.763(d) must monitor surface concentrations of methane according to the procedures in §60.765(c) and the instrument specifications in §60.765(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 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.*

The existing GCCS includes an enclosed flare for the combustion of LFG at the Site. Therefore, the provisions that apply from §60.766 are (a), (b), and (f) for the GCCS, enclosed flare, and surface emission monitoring, respectively. The GCCS includes the required temperature monitoring device and a device that records flow in accordance to provisions of (b). Lastly, there is no treatment system present at this time.

5.4 Compliance with §60.767: Design Plan Requirements

§60.767(c) *Collection and control system design plan. Each owner or operator subject to the provisions of §60.762(b)(2) must submit a collection and control system design plan to the Administrator for approval according to the schedule in paragraph (c)(4) of this section. 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 §60.762(b)(2).

(2) The collection and control system design plan must include any alternatives to the operational standards, test methods, monitoring, recordkeeping or reporting provisions of §60.763 through §60.768 proposed by the owner or operator

(3) The collection and control system design plan must either conform with specifications for active collection system in §60.769 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to §60.769.

(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 collection plan to the Administrator for approval 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 specified in (c)(4)(i through iii).

(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 event the design plan is required to be modified to obtain approval, the own 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 (c)(1) through of this section and either approve it, disapprove it, or request that additional information be submitted…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 §60.768(b)(5).*

This Plan fulfills the requirements of a collection and control system design plan as required by §60.767(c). The previously conducted performance test for the enclosed flare (included in Appendix A.2), which passed previously under Subpart WWW, is valid and is being applied here under NSPS, Subpart XXX.

5.5 Compliance with §60.769(a)(1)

§60.769(a)(1) *The collection devices within the interior must be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues must be addressed in the design: Depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, resistance to the refuse decomposition heat and ability to isolate individual components or sections for repair or troubleshooting without shutting down the entire collection system.*

The following sections address compliance with the applicable sections of §60.769(a)(1).

5.5.1 Control of Surface Emissions

The proposed GCCS and future expansions will be designed to minimize subsurface lateral migration and surface emissions of LFG. Surface emissions monitoring as set forth in Appendix B will be conducted under applicable sections of 40 CFR Part 60 Subpart XXX to show that the proposed GCCS will be able to comply with NSPS criteria for surface emissions control. If the GCCS does not meet the measures of performance for the surface emissions as required by NSPS, the GCCS will be adjusted or modified accordingly.

5.5.2 Depths of Refuse

Depths of refuse and liner elevations are calculated prior to installation of vertical LFG extraction wells, condensate sumps, and other infrastructure based record documentation of landfill cell liner elevations.

5.5.3 Refuse Gas Rates and Flow Characteristics

In compliance with §60.762(b)(2)(ii) and (iii), the maximum expected LFG flow rate for the western phase of the Site was used for sizing the GCCS final closure conditions. As a basis of design, estimates of the LFG generation were determined using the EPA's LandGEM first-order kinetic model. Input data for the LandGEM included annual historical and projected waste acceptance rates over the operating life of the site and LFG generation parameters. For the western phase of the Site, default LFG generation parameter values published by the EPA in Chapter 2 of AP-42 were used for the LandGEM. These parameters include the methane generation rate constant, "k"; and the methane generation rate potential, "Lo". As specified in §60.762(a)(1), a "k" value for dry sites of 0.02 per year was used.

Based on the model outputs provided in Appendix C.1, the peak LFG generation is expected to occur in 2037 with a generation rate of approximately 1,284 standard cubic feet per minute (scfm). However, as discussed in Section 5.2.1, to calibrate this to actual flows being seen currently, the generation was reduced by half although a 10 percent increase was subsequently added for GCCS pipe sizing calculations.

5.5.4 Landfill Cover Properties

Materials excavated on-site are suitable for use as cover and to adequately control LFG surface emissions when used with a GCCS. Soil for these activities is obtained on-site from borrow areas. Cover soils are placed to perform the following functions:

- To separate the waste from the environment;
- Adjust the landfill surface topography to provide appropriate slopes to promote run-off and controlled drainage of surface water;
- Control erosion by conveying run-off at non-scouring flow rates;
- Minimize infiltration of surface water into the waste; and
- Control and contain LFG.

5.5.5 Gas System Expandability

Blind flanges will be incorporated into the collection system as it is being built in interim phases to facilitate future gas system expansions. Additionally, the header and lateral will be HDPE which is easily tied-into with branch saddles or new fittings for future expansion and/or the addition of additional collectors. The header system will meet the following requirements: GCCS expandability, accessibility, corrosion resistance, fill settlement, required materials of construction, and ability to withstand planned overburden or traffic loads.

5.5.6 Leachate and Condensate Management

Each landfill cell has a sump (6 sumps total in the west phase). When the sumps require pumping, the collected leachate is managed through use for dust control on-site as approved by the NMED Solid Waste Bureau. It is not believed that leachate management will have an impact on the GCCS or condensate management due to the low quantities currently generated and the fact that the condensate removal should further decrease the amount of leachate generated.

Condensate is generated in the GCCS since LFG is essentially saturated with moisture which drops out as the gas cools and the LFG temperature drops between the warmer landfill waste mass and the collection piping. Condensate generated through the collection and control of LFG is stored in a dedicated tank near the blower/flare. When the tank is full, condensate will be discharged into the waste mass through a leach field. Although not currently approved, if SFSWMA ever gains NMED approval or other management methods, such as using it as a dust suppression agent, to send it to a POTW, these will also be acceptable management practices.

5.5.7 Compatibility with Filling

It is most desirable to place wells in areas which have reached their maximum permitted grades; and NSPS requires control within 2 years of waste reaching final grades, however, due to the Site's development sequence, there will likely be wells installed at "interim" grades in order to meet the NSPS requirement to collect gas from areas not at final grade within 5 years of waste placement. These interim wells may be raised with additional lifts of waste unless they are deemed to have reduced functionality, at which time they will be replaced. As an additional option for wells installed at interim grades, if a reasonably small amount of filling is necessary, the well may be filled over. If this is done, a lateral with a remote wellhead must first be constructed so that control and monitoring of the well can continue. Horizontal collectors may also be used for control over areas as needed until vertical wells can be drilled or to capture LFG from areas where vertical wells may not be utilized.

5.5.8 Integration with Closure End Use and Accessibility

No future land use other than open space has currently been designated for this Site. If an alternate end use plan is pursued in the future, SFSWMA realizes that this end use must be compatible with the integrity of the gas control system, final cover system, or any other components of the containment or monitoring system. SFSWMA also realizes that the specification of a certain type of end use will in no way relieve them of the landfill gas collection requirements contained in the NSPS.

SFSWMA will maintain accessibility to the landfill gas collection and control system throughout the site's life and throughout the post-closure period for maintenance and monitoring until the system is decommissioned with the understanding that decommissioning cannot occur until all NSPS requirements are met.

5.5.9 Air Intrusion Control

Air intrusion will be controlled through maintenance of the landfill cover and periodic monitoring and adjustment of the GCCS, in accordance with NSPS requirements. Air intrusion control measures will include the following:

- Timely placement and maintenance of cover materials in applicable areas;
- Deeper extraction zones and effective well seal designs for vertical extraction wells; and
- Regular collector monitoring and balancing operations to meet routine NSPS compliance requirements.

Following the installation of final cover over the waste areas, the final cover system will reduce the potential for air intrusion during GCCS operation. The final cover system will also assist in inhibiting surface emissions of LFG into the atmosphere. Air intrusion will also be controlled by installing low-permeability soils and/or bentonite seals as backfill materials when constructing the extraction wells. Within interim waste fill areas, the placement of daily and intermediate cover will assist in preventing air intrusion.

This will be confirmed by the periodic monitoring of the GCCS wells to identify potential air intrusion in accordance with NSPS operating and recordkeeping requirements.

5.5.10 Corrosion Resistance

Corrosion resistance of the GCCS components will be achieved through the use of corrosion resistant materials, or materials that have a corrosion resistant coating. All GCCS and condensate piping will be constructed mostly of HDPE; however, PVC materials may also be used for the vertical well casings, or at other system locations where this material may be deemed more appropriate. Thermoplastic materials are inherently resistant to corrosion from chemicals commonly found in LFG and LFG condensate. Polyethylene pipe pigments (carbon black) also are inherently resistant to ultraviolet (UV) degradation. Metal components (steel or iron flanges, etc.) will be stainless steel, galvanized or epoxy-coated.

The GCCS components described within this plan represent "state-of-the-practice" materials, and have proven to be resistant to corrosion with proper installation, operation, and maintenance in GCCS applications across the United States.

5.5.11 Fill Settlement

Settlement or subsidence of waste fill can affect a GCCS in numerous ways, including:

- Damage or destruction of below-grade header and lateral piping systems;
- Blockage of header and lateral piping systems as a result of condensate collecting in the piping; and
- Damage, displacement or destruction of well casings, seals, and filter materials, as a result of settlement in the landfill mass adjacent to the well.

The potential for significant refuse settlement is somewhat mitigated at the Site through the use of standard compaction practices during site operations. However, some settlement will still occur over time due to decomposition and consolidation of the refuse materials. The GCCS components are designed and installed with several features to account for expected settlement including:

- The wellhead assembly connecting the LFG extraction well casing to the LFG collection piping will be installed using flexible couplings and a flexible hose. This design feature will accommodate differential movement between the well casing and the collection piping connection before significant stress or strain begins to form on the connection points. This design will also enable the wellhead assembly to be easily disconnected and height adjustments made to the well lateral piping to relieve stress or strain on the connections and to compensate for the settlement.
- HDPE piping which is used for header and lateral piping is somewhat flexible and has the ability to withstand deformation from some settlement.
- All GCCS collection piping installed within the limits of waste will be installed with sufficient grade to compensate for settlement that could hinder condensate drainage.
- Buried LFG components will be constructed using piping of sufficient wall thickness to reduce significant deformations due to settlement loads, which would hinder system operation. Buried pipe will be installed with higher grades that above ground pipe.

5.5.12 Resistance to Decomposition Heat

Resistance of the GCCS to the heat generated as a result of refuse decomposition will be achieved through the use of materials tested and proven to withstand temperatures well above those typically found in landfills. The exposed GCCS components will be inspected for heat damage, and wellhead gas temperatures will be recorded during routine monitoring. If heat damage of the GCCS components or abnormally high gas temperatures are observed, the cause of the damage or high temperatures will be investigated and the GCCS will be repaired, adjusted, or modified in accordance with NSPS requirements and sound industry practices.

5.5.13 Ability to Isolate Individual GCCS Components/Troubleshooting

Isolation valves are and will continue to be located at key locations in the collection header network. These valves can manually shut-off the applied vacuum to a particular section of header pipe. This will allow portions of the wellfield to be isolated for monitoring and maintenance purposes.

Individual wells can also be shut down for troubleshooting. The site includes two blowers which are alternated in operation and for redundancy. Lastly, the condensate sumps are designed to allow for pump removal without disturbing the overall system vacuum and the condensate forcemain and air supply lines within the condensate removal system include isolation and blow-off valves, respectively to help diagnose issues more effectively.

5.6 Compliance with §60.769(a)(2)

5.6.1 Density of Gas Collection Devices

§60.769(a)(2) *The sufficient density of gas collection devices determined in paragraph (a)(1) of this section must address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.*

In accordance with the NSPS, LFG extraction wells/horizontal collection trenches will be installed in active areas where waste has been in-place for five (5) years or more, or two (2) years or more in areas that are closed or at final grade. Per the definition stated in §60.761, "sufficient density" means "any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control, as determined by measures of performance set forth in this part."

The spacing of GCCS wells ranges from 250 to 400 feet, while future wells will be spaced between about 200 to 300 feet apart. Based on historical GCCS operation this should be more than sufficient; however, if there is not sufficient coverage to meet the NSPS requirements based on monitoring, procedures will be implemented to correct this, such as installing additional wells, cover repairs, or repairs to existing wells.

5.7 Compliance with §60.769(a)(3) Collection Devices Placement

§60.769(a)(3) *The placement of gas collection devices determined in paragraph (a)(1) of this section must control all gas producing areas, except as provided by paragraphs (a)(3)(i) and(ii) of this section.*

§60.769(a)(3)(i) *Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under §60.768(d). The documentation must provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and must be provided to the Administrator upon request.*

§60.769(a)(3)(ii) *Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material must be documented and provided to the Administrator upon request. A separate NMOC emissions estimate must be made for each section proposed for exclusion, and the sum of all such sections must be compared to the NMOC emissions estimate for the entire landfill.*

§60.769(a)(3)(iii) *The values for k and CNMOC determined in field testing must be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (this distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, Lo and CNMOC provided in §60.764(a)(1) or the alternative values from §60.764(a)(5) must be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of this section.*

The proposed LFG collection devices will be installed in all gas-producing areas of the landfill where waste is in place. Additional vertical wells, and /or horizontal collection trenches will be added, as required, to the GCCS to ensure compliance with NSPS.

5.7.1 Exclusion

§60.769(a)(3)(ii)(A) *The NMOC emissions from each section proposed for exclusion must be computed using Equation 7:*

$$Q_i = 2\ k\ L_o M_i (e^{-kt_i})\ (C_{NMOC})\ (3.6 * 10^{-9}) \qquad (Eq.7)$$

Where:
Qi = NMOC emission rate from the i th section, megagrams per year.
k = Methane generation rate constant, year−1.
Lo = Methane generation potential, cubic meters per megagram solid waste.
Mi = Mass of the degradable solid waste in the ith section, megagram.
ti = Age of the solid waste in the ith section, years.
CNMOC = Concentration of non-methane organic compounds, parts per million by volume.
3.6 × 10−9 = Conversion factor.

§60.769(a)(3)(ii)(B) *If the owner/operator is proposing to exclude, or cease gas collection and control from, nonproductive physically separated (e.g., separately lined) closed areas that already have gas collection systems, NMOC emissions from each physically separated closed area must be computed using either Equation 3 in § 60.764(b) or Equation 7 in paragraph (a)(3)(ii)(A) of this section.*

No areas of the landfill are proposed for exclusion per this portion of the rule.

5.8 Compliance with §60.769(b)(1), (2) and (3)

§60.769(b)(1) *Each owner or operator seeking to comply with §60.762(b)(2)(ii)(C) shall construct the gas collection devices using the following equipment or procedures:*

5.8.1 Construction of System Components

§60.769(b)(1) *The landfill gas extraction components must be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system must extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors must be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations must be situated with regard to the need to prevent excessive air infiltration.*

As described in previous sections of this Plan, the GCCS components will be constructed of materials suitable for LFG applications.

5.8.1.1 Materials

All GCCS components have been and will be constructed of materials such as HDPE, PVC, fiberglass, stainless steel, and other nonporous, corrosion-resistant materials, in accordance with NSPS and whose compatibility is discussed in other sections of this Plan.

5.8.1.2 Component Sizing

The final GCCS piping network was sized for the peak potential LFG extraction rate expected from the Site as described in Section 5.2.1 of this Plan and a design blower vacuum of at least 40 inches of water column. The 40 inches accommodates up to 10 inches of vacuum loss in the GCCS, providing for 15 inches of vacuum for well tuning, and up to 15 inches for positive displacement to the control device. Design computations for the GCCS piping network are included in Appendix C. However, as the Site and GCCS are developed over time, component sizing may change based on actual LFG flow conditions.

5.8.1.3 Component Loading

Below-grade GCCS components consist primarily of LFG wells and laterals. Road crossings are and will be constructed at a sufficient depth to protect the pipe from vehicle loading where needed. Applied loads on GCCS components within the landfill, as well as settlement forces, vary within the landfill due to non-homogeneous nature of the refuse. However, below-grade components within the landfill have been designed to be consistent with industry accepted GCCS design and construction practices. Lastly, piping subject to loading is designed to be HDPE, which has good compatibility, strength, and flexibility at the wall strengths designed for the expected loadings based on decades of use in hundreds of landfills throughout the United States.

The loading of condensate into the gas system will also be considered in the design and handled through the use of sufficiently numerous sumps and pumps. Since the system has been operating for years, the number of sumps included in the design are certified to be sufficient to handle the amount of condensate that will be generated.

5.8.1.4 System Expansion

The existing and future portions of the GCCS are and will be designed and expanded over the life of the Site to handle the extracted LFG quantities as described in this Plan. In addition, areas where the landfill is at or near final elevation, new vertical wells may be installed as required to provide comprehensive coverage.

If the GCCS does not meet the measures of performance set forth in the NSPS, the GCCS will be adjusted or modified as required.

5.8.1.5 Component Perforation

When initially drilled, vertical landfill gas collection wells over 40 feet in total depth are generally designed to have a minimum of 20 feet and a maximum of 40 feet of solid pipe from the landfill surface down. After this, the pipe is perforated to allow the gas to flow into the pipe for collection. For wells greater than 40 feet in depth, if the perforated sections are placed at depths shallower than 20 feet from the landfill surface, the induced vacuum on the well can draw excessive amounts of air (specifically oxygen) into the waste and potentially cause a condition of subsurface oxidation or landfill fire. If the perforated pipe is started deeper than 40 feet, the applied vacuum on the upper layers of waste is minimized, which reduces gas collection efficiency. For wells less than 40 feet in total length the solid depth is typically set at no less than 15 feet. For such shallow wells, it is assumed that they would be needed for coverage, and that a shorter solid length is justified (and will be operated at lower vacuum than normal to limit air infiltration). Current gas wells meet this general criteria.

The solid/perforated ratio may be further adjusted prior to construction depending on the quality of the landfill gas that is required. However, in any case, the ratio will always fully accommodate NSPS operational requirements and allow for air intrusion to be limited while sufficient landfill gas collection occurs.

Existing wells that are extended with solid pipe as waste is filled around them may vary from these solid/perforated ratios. At some point in the future these may be replaced with new redrills to more effectively capture waste above the extended well’s perforations.

Horizontal collectors placed near sideslopes will have perforations set away from the sideslope to avoid air infiltration. Also for horizontal collectors, vacuum will not be applied until sufficient waste has been placed over them to allow for vacuum application without air infiltration.

5.8.1.6 Air Infiltration

Air infiltration control is discussed in Section 5.6.10 of this plan and 5.8.1.5. Although these discussions are not repeated here, components will be designed and the GCCS operated to avoid air infiltration, which can cause a host of problems.

5.8.1.7 Installation of System Components and Placement

§60.769(b)(2) *Vertical wells must be placed so as not to endanger underlying liners and must address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors must be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices must be designed so as not to allow indirect short-circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.*

Waste depths for the Site will be determined based on both; (1) the as-built plan for the top of the landfill's base or intermediate liner elevations; and (2) the most recent site topography for the active areas and the proposed final grading for the future undeveloped areas. The proposed vertical LFG extraction wells/sumps or horizontal collectors for the Site will be installed to depths ranging from a minimum of 15 to 20 feet. This should be sufficient to control the deepest LFG generated at the site. Generally, vertical wells are not drilled to more than 140 feet in depth due to the cost, specialized equipment needed, and diminishing collection of gas at these depths. In no instance will any well boring extend to within 15 feet of the landfill's base liner.

Prior to commencing any well drilling activities, all proposed vertical well locations, sumps, and any horizontal collector locations will be staked and surveyed to confirm their actual surface elevations. The proposed well schedule/sump locations will be modified to reflect the actual surface elevations at the time of construction and to adjust drilling/excavation depths accordingly.

5.8.1.8 Water

The occurrence of water within the fill area will be addressed by the leachate and condensate management systems as stated in Section 5.5.6 of this Plan. This landfill has operated its gas system for years with no impacts from liquids, leachate, or condensate.

5.8.1.9 Holes and Trenches

Vertical boreholes or horizontal trenches constructed for LFG collection elements will be of sufficient cross-section to allow for their proper construction and completion, including centering of pipes and placement of gravel backfill.

5.8.1.10 Component Short Circuiting

LFG collection elements will be designed to prevent air infiltration through the cover, refuse contamination of the collection elements, and direct venting of LFG to the atmosphere. For example, vertical well perforations will not be set too close to the cover surface so that a good vacuum can be applied at the well without excess air infiltration.

Direct venting of the LFG to the atmosphere will be avoided by operating the GCCS under vacuum. Any leaks will, therefore, result in air entering the GCCS, as opposed to LFG being released into the atmosphere. Also, surface scans as set forth in Appendix B will identify areas where LFG may be escaping through the landfill surface which should also be a route for short-circuiting

5.8.1.11 Gravel Backfill

Gravel of sufficient size will be used to prevent penetration or blockages of the LFG collector pipe perforations. The gravel will also be specified such that it does not have calcium carbonate content to the extent that it might dissolve and clog well perforations.

5.8.2 System Component Connections to LFG Transmission Piping

§60.769(b)(3) *Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly must include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices must be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.*

The collection devices will be connected to the collection header pipes via lateral piping. Connections to lateral piping will be through a wellhead assembly including, a control valve, a flow-measuring device such as a pitot tube or an orifice plate, a thermometer, and associated sample ports. The lateral piping will be connected to the above grade header using a positive closing throttle valve, necessary seals and couplings, and a sampling port. The collection devices will be constructed of PVC, HDPE, fiberglass, stainless steel, and other nonporous material of suitable thickness. The GCCS components will be designed and installed to withstand installation, static, settlement forces, and overburden or traffic loads.

5.9 Conveyance System

§60.769(c) *Each owner or operator seeking to comply with* ***§60.762(b)(2)(iii)*** *must convey the landfill gas to a control system in compliance with* ***§60.762(b)(2)(iii)*** *through the collection header pipe(s). The gas mover equipment must be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment.*

§60.769(c)(1) *For existing collection systems, the flow data must be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section must be used.*

Gas conveyance is currently sufficient to provide gas management for the entire coverage area, and future GCCS expansions will be designed to accommodate future additional wells or other collection methods, should they be required, based upon monitoring parameters and LFG control. Since the existing GCCS was sized with appropriate factors-of-safety, it has more than enough capacity to accommodate any possible flows that should be encountered during the life of the Site, as discussed in Section 5.5.3. Design modifications required to accommodate collection of LFG generated by future waste disposal and subsequent expansions of the GCCS coverage area will be submitted with the Annual Compliance Reports prepared for the Site.

Review of individual GCCS components indicates they are consistent with current “state-of-the-practice” designs.

6 ALTERNATIVES TO THE NSPS

The following requirement allows for alternatives to the operational standards, test methods, procedures, compliance requirements, monitoring, recordkeeping, and reporting provisions to be requested in the design plan.

§60.767(c)(2) *The collection and control system design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, record keeping or reporting provisions of §60.763 through §60.768 proposed by the owner or operator.*

6.1 Previously Approved/Submitted Flexibilities

The previously approved flexibilities under NSPS (40 CFR §60, Subpart WWW) are included in Appendix A of this Plan. These previously approved flexibilities will continue to be applied at this Site for compliance with 40 CFR §60, Subpart WWW. These have also been integrated into Sections 6 and 7 of this Plan along with some new provisions.

6.2 Proposed Alternatives

The following are alternatives to the NSPS XXX that are proposed for this Site.

6.2.1 GCCS Components and Monitoring

The following alternatives to the NSPS relate to GCCS components and monitoring.

6.2.1.1 Monthly Well Monitoring Device

The requirements of 40 CFR §60.766(a)(2) allow for the monitoring of nitrogen or oxygen concentrations in the landfill gas monthly. 40 CFR §60.766(a)(2)(i) and (ii), allow for the use of EPA Method 3C to measure the nitrogen levels and the use of either EPA Method 3A, 3C, or ASTM D6522-11 to establish the oxygen content. In accordance with the general state-of-the-practice procedures, the landfill proposes to use a portable monitoring instrument (e.g., Landtec GEM 500, Landtec GEM 2000, LMS, Envision, or equivalent instrument) to perform this monitoring. The monitoring equipment will be calibrated in accordance with manufacturer's recommendations to ensure accurate measurement of all parameters for which it is used to monitor.

6.2.1.2 Monthly Monitoring and Associated Corrective Actions

§60.767(j)(1) and (2) *For corrective action that is required according to §60.765(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)... For corrective action that is required according to §60.765(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.*

If SFSWMA receives no response within 40-days of submittal, SFSWMA will assume the implementation timeline is approved and the exceedance and corresponding alternative timeline will not be considered a reportable deviation in subsequent Title V reports.

6.2.1.3 Early Installation of Collection Devices

The requirements of 40 CFR 60.765(b) state that each collection device shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of 5 years or more in active areas or 2 years or more if closed or at final grade. However, there may be occasions when SFSWMA will decide to install collection devices prior to the onset of NSPS requirements. Based on the foregoing regulatory citation, any collection device installed prior to the requirements of NSPS will not be subject to the operational and/or record-keeping requirements of NSPS until the age of the initial waste placed reaches 5 years old if in an active area or 2 years old if closed or at final grade. To make certain that the Administrator/NMED is made fully aware of these special circumstances, information on these collectors will be included in the Annual NSPS report required by NSPS, including the date of initial collection device installation and the NSPS compliance date.

6.2.1.4 Monitoring of Collection Device during Well Raising

New vertical gas extraction wells may be placed in an active area of the landfill several years before the waste has reached final grades to comply with NSPS requirements. Similarly, there may be wells located in areas where landfilling or future cover construction will take place. Since these wells are placed in active and construction areas, they will periodically need to be “raised” and/or temporarily disconnected (i.e. the well casing extended 15 to 25 feet vertically) in order to not be buried under lifts of trash. When they are raised, the HDPE lateral line, which provides the applied vacuum, is temporarily disconnected until the surrounding lift of trash or final cover is brought high enough to reconnect the well. The timeframe between when a well is disconnected and raised, and when the waste height and/or final cover is high enough to reconnect the lateral, can often range from a few weeks to a few months. This can result in missed monthly readings at the well, since the well casing is too high for the technician to safely reach.

Since the NSPS allows for exclusion of surface monitoring in “dangerous areas” of the Site, it is reasonable to request an alternative to monitoring wells that are deemed dangerous for personnel to access (i.e., raised, active and construction areas). As such, this provision proposes that monthly readings be taken only at wells that can be safely accessed. This request is in accordance with Section 60.767(c)(2), which allows the facility to propose alternatives to the monitoring procedures in the NSPS.

6.2.1.5 Exclusion of Odor Control Wells Not in Waste or Not Used for XXX Compliance

Any wells placed outside limits of waste will not be subject to NSPS operation, monitoring, record keeping, and reporting requirements as they are not interior wells as defined in NSPS. As such, if any existing and future LFG extraction wells installed outside limits of waste for migration control purposes will be excluded from the NSPS operation, monitoring, record keeping, and reporting requirements.

6.2.2 Surface Emissions Monitoring

The following variances are related to SEM events.

6.2.2.1 Alternative Remedy for SEM Events

NSPS rules require that, if a surface scan exceedance occurs three times within a quarter, that a new well or collection device (or other constructed gas system improvement) must be in place within 120 days; however, in some cases the construction cannot be completed in this timeframe or other methods may be used in an attempt to mitigate the exceedance (i.e. upgrading the blower).

When an extension to the 120-day NSPS timeframe is necessary or another alternative remedy proposed, a notification to the file for the alternate remedy and installation timeline will be prepared. Each notification will be prepared for SFSWMA’s files by the end of the month following the third exceedance within the quarter. Each notification will be provided to the Administrator/NMED in the first semi-annual NSPS report after the time for which the notification was prepared. Each notification will contain a detailed explanation of the proposed alternate remedy and/or timeline, with a plan of action and dates for anticipated final action. If this procedure is followed, no deviation or exceedance will have occurred if the 120-day timeframe is not met.

It should be noted that throughout any requested remedy period, quarterly surface scans will continue and the location for which the exceedance occurred will be included in the scan. However, once an alternate remedy is filed, that particular location will not require 10 or 30-day re-monitoring for any exceedances during quarterly surface scans during the alternate remedy period.

6.2.2.2 SEM for Closed Portions of the Landfill

This provision requests that any portions of the landfill that have been certified closed or have been closed and capped in accordance with the cover conditions contained according to the NSPS XXX or Subtitle D be treated as a closed landfill for SEM events. These closed portions of the landfill will be monitored in accordance with the following section of the NSPS:

§60.766(f) *...Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for the landfill to quarterly monitoring.*

In accordance with this requirement, SFSWMA is requesting that SEM be performed on all closed areas of the landfill in accordance with the requirements of §60.766(f).

7 OPERATING UNDER XXX

Per 40 CFR §60.767(c)(2), the design plan shall include proposed alternatives to the prescriptive monitoring, recordkeeping and reporting requirements in the NSPS. Section 6 addresses such items. Section 7, however, is for requests that should be viewed as the proposed implementation of the NSPS XXX for this Site.

7.1 Operational Standards

Section 60.763(a) Operational Standards for Collection and Control Systems: *"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:*

- *5 years or more if active; or*
- *2 years or more if closed or at final grade."*

In some cases, SFSWMA may need or wish to install wells at an accelerated pace compared to NSPS installation requirements. Since these wells will have been installed in advance of NSPS requirements, SFSWMA proposes that surface scans not be performed over such areas and that the monitoring results from such wells not be subject to NSPS requirements or reported with other NSPS data for wells that were installed in areas where waste has been in place for less than 5 years (active areas) or 2 years (closed areas or areas at final grade) until these time periods have expired.

It should be noted, however, that although the monitoring data for such wells will not be subject to NSPS requirements or reported with other NSPS data, such well will still be monitored for pressure, temperature, and oxygen content on a minimum monthly basis. These monitoring readings will be recorded and available for inspection on-site for a minimum of 5 years to match the records retention requirements for typical NSPS wellfield monitoring data.

7.2 Decommissioning of a Collection Device

Section 60.763(b)(3) Operational Standards for Collection and Control Systems: *"A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows."*

NSPS rules contain no special procedures for decommissioning an NSPS collection point. However, the EPA Applicability Determination Index (ADI) Control No. 0600062 addressed this issue and provides a procedure for the decommissioning of low-producing extraction wells. This procedure, listed below, will be followed by the operator for low producing collection points. It will also be used generally for when an NSPS collection point requires decommissioning for any other reason.

It should be noted that decommissioning is not meant to be used in the same way as the term "abandonment" here (which is covered in "Collection Device Abandonment" of this section). A decommissioned collection point is simply a shutdown for a period of time (by fully closing the well valve or by disconnecting the collection point from the collection lateral), but is maintained for potential future use. This might be necessary if, for example, the collection point is shutdown as a remedial method for a period of time, or if a collection point is shutdown based on poor gas quality until the gas is able to recharge sufficiently. The decommissioning procedure will be as follows:

- For NSPS collection points where oxygen concentrations do not decline to acceptable levels after more than one hour following a valve adjustment, the wellhead valve may be fully closed until the gas quality recovers.

- The monthly monitoring required by 40 CFR §60.765 will be conducted for collection points that have been shutdown, but positive pressure will not be considered exceedances of the operating limits in 40 CFR §60.763.

- If monthly monitoring indicates that pressure has built up in the collection point, the collection point will be opened to relieve the pressure, and then will be shutdown until it is monitored the following month.

When a collection point needs to be decommissioned for any reason, this reason will be noted in the monthly monitoring report and the collection point shutdown. Additionally, quarterly surface scans will still be conducted as if the collection point was still active to make sure fugitive landfill gas emissions are still controlled.

If a collection point remains decommissioned for six consecutive months, then a notification will be included in the first NSPS report after this six-month consecutive period of decommissioning. This notification will describe whether the collection point is proposed for abandonment or redrilling or will provide a plan as to how this collection point will eventually be brought back online. This notification will allow the Administrator/NMED the option to respond with a request for further follow-up or additional information, etc.

Section 60.763(d) Operational Standards for Collection and Control Systems: *"...A surface monitoring design plan shall be developed...Areas with steep slopes or other dangerous areas may be excluded from surface testing."*

It is proposed to exclude dangerous areas such as active roads, the active working face area, truck traffic areas, and slopes steeper than 4H:1V and/or dangerous slopes due to surface features/conditions from surface testing as set forth here and in the surface monitoring section of this plan. Any such areas will be noted on a map including the reason that the area was considered dangerous during the monitoring event. Such information will be submitted with the quarterly surface monitoring report which will be included in the NSPS reports.

7.3 Compliance Provisions

Section 60.765(a)(3) Compliance Provisions: *"...shall measure gauge pressure in the gas collection header at each individual well, monthly."*

This would seem to indicate that the pressure is to be measured on the header side of the wellhead valve instead of the well side of the wellhead valve (landfill side). Other sections of the NSPS rule simply state "at the wellhead." In order to prevent confusion between regulators and operators, the facility proposes to measure gauge pressure on the landfill side. This represents a more conservative approach.

Section 60.765(a)(3) and (5) Compliance Provisions: *"…action must be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under §60.763(b)…If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement…" and "…action must be initiated to correct the exceedance within 5 calendar days. If a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit) cannot be achieved within 15 calendar days of the first measurement…"*

NSPS rules require that, if an NSPS collection point shows an exceedance in pressure or temperature, action must be taken within 5 days and that re-monitoring must show that within 15 days that the well is within compliance. If compliance is not achieved within 15 days, a root cause analysis must be conducted and correct the exceedance no later than 60 days after the initial exceedance. If compliance is not achieved within 60 days, a corrective action analysis and an implementation schedule must be conducted and submit the items listed in §60.767(g)(7) as part of the next annual report and correct the exceedance no later than 120 days after the initial exceedance. If compliance is not achieved within 120 days, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator according to §60.767(g)(7) and §60.767(j). Some exceedances cannot be remedied within the allowable 15-day timeframe or remedied within the 120-day timeframe. An example of this would be if a lateral needs repair and pipe must be ordered. Weather or drilling equipment availability may also be a limiting factor; especially during the winter months. Table 2 below provides general procedures that will be followed when an initial exceedance of the NSPS-required parameters for oxygen, pressure, or temperature is measured. These procedures are listed for each parameter in the order that they might typically be implemented.

Table 2
General Actions to be Taken for Landfill Gas Well Exceedances

NSPS Parameter	General Response to Exceedance
Pressure	• Increase vacuum to well in an attempt to achieve negative pressure and allow for more landfill gas collection. • Measure lateral vacuum to ensure that adequate vacuum is available to well and confirm that lateral pipe is not watered-in or damaged. If blockage of lateral pipe is determined, then schedule and implement repair or replacement of lateral. • If no blockage is found check to make sure piping and blowers are not undersized. This can be done by tracking the vacuum throughout the wellfield and looking for trends as portions of the wellfield become more remote.

Temperature	• Reduce vacuum to well to prevent over-pulling which may introduce air and increase temperature. • Inspect well and surrounding landfill surface for damage (e.g., broken hose or surface cracks) that could introduce air into the well and repair. • If high temperature persists decommission well to see if temperature drops. • Evaluate potential for a fire. If data in addition to temperature indicates the likelihood of fire, notify NMED promptly and decommission well while additional steps are assessed. • Some wells operate at higher temperatures with no evidence of a fire. If this appears to be the case after a thorough investigation, consider preparing a high operating value (HOV) request for that well to submit to NMED. This request should include historical monitoring data along with the results from all investigations of possible fire-related causes.

It should be noted that throughout any requested extended timeline period, monthly well monitoring and recording of these values will continue. However, once an extended timeline is filed because of a specific parameter, the 5-day action period and 15-day re-monitoring period for that parameter would not be required for subsequent months until the end of the extended timeframe request.

In addition, this item is a clarification that there are no submittal requirements unless the exceedance goes beyond 120 days from the initial exceedance. Therefore, the root cause analysis, corrective action analysis, and implementation schedule prior to 120 days will be maintained onsite.

7.4 Surface Emissions Monitoring

Section 60.765(c)(4)(v) Compliance Provisions: *"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."*

NSPS rules require that, if a surface scan exceedance occurs three times within a quarter, that a new well or collection device (or other constructed gas system improvement) must be in place within 120 days; however, in some cases the construction cannot be completed in this timeframe or other methods may be used in an attempt to mitigate the exceedance (i.e. upgrading the blower).

When an extension to the 120-day NSPS timeframe is necessary or another alternative remedy proposed, a notification to the file for alternate remedy and installation timeline will be prepared. Each notification will be prepared for the landfill files by the end of the month following the third exceedance within the quarter. Each notification will be provided in the first NSPS report after the time for which the notification was prepared. Each notification will contain a detailed explanation of the proposed alternate remedy and/or timeline, with a plan of action and dates for anticipated final action. If this procedure is followed, no deviation or exceedance will have occurred if the 120-day timeframe is not met.

It should be noted that throughout any requested remedy period, quarterly surface scans will continue and the location for which the exceedance occurred will be included in the scan. However, once an alternate remedy is filed, that particular location will not require 10 or 30-day re-monitoring for any exceedances during quarterly surface scans during the alternate remedy period.

7.5 Reporting Requirements

Section 60.767(g)(3) Reporting Requirements: *"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."*

This item is actually a clarification included in this Plan based upon experience from submitting numerous NSPS annual and semi-annual reports. The provision listed here is separate from §60.767(g)(4) which requires reporting of all periods when the collection system was not operating. It should be noted that these two requirements differ in that one references the control device and the other references the collection system. These NSPS provisions were purposely written this way because §60.767(g)(3) is meant to refer only to cases where the control device is down but the overall collection system is still operating.

Therefore, this request is included here to clarify that, for NSPS reporting purposes, it will be assumed that this reporting requirement is for the case where the collection system is operating but the control device is not operating such that uncombusted LFG is being vented.

7.6 Miscellaneous

7.6.1 Alternative Control Device (Intermittent Operation)

The GCCS at this Site has been operating intermittently due to low LFG quantities on-site for years. As such, this section (as was approved previously) is included to allow for intermittent operation.

Wellhead Standards and Surface Scan Requirements
Alternatives to the standards for wellheads set forth in 40 CFR 60.763(b) and (c). These rules require that wellheads must maintain temperatures less than 55^{o} C (131^{o} F), and operate at negative pressures at all times. When a control device that operates in cycles, it may not be possible to achieve compliance with these rules at all times. Therefore, when SFSWMA elects to use a control device that operates under timed cycles, SFSWMA requests to be exempt from these requirements when the control device is off-line.

Please note that the request for exemption from these rules would not affect the Site's compliance with 40 CFR 60.763(d), which states that the GCCS must be operated such that the methane concentration is less than 500 parts per million (ppm) above background at the surface of the landfill.

Monitoring of Operations
Pursuant to 40 CFR 60.766, any owner or operator using an enclosed combustor shall maintain and operate a temperature monitoring device equipped with a continuous recorder as well as a gas flow rate measuring device that records the flow to the control device at least every 15 minutes. When SFSWMA elects to operate a control device that operates in timed, intermittent cycles, the GCCS will not be operating full-time. Therefore, SFSWMA requests to be exempt from these requirements during off-line hours.

Recordkeeping Requirements
Annual reports are to be submitted to the Administrator pursuant to 40 CFR 60.767, which includes a description and duration of all periods when the control device was not operating for a period exceeding 1 hour during which time the control device was not operating. These records, including scheduled downtimes due to intermittent flare operation will be documented and reported as required.

7.6.2 Collection Device Abandonment

Due to changing conditions such as damage to a well during operations or long term nonproductive areas, NSPS collection points may need to ultimately be abandoned (without replacement). This is different from the term "decommissioning," which is meant to be temporary, and is described in flexibility request "Decommissioning of a Collection Device" in Section 7.2. Abandonments may occur after decommissioning or the decommissioning prior may be skipped altogether if there is no chance to rehabilitate/repair a collection point.

For any abandonment, unless SFSWMA requests otherwise, normal procedure will be to re-drill any abandoned well within 6 months. Otherwise, a notification of a different proposed course of action will be submitted for approval.

As with a decommissioned collection point, the area around any abandoned collection point will still be subject to surface emissions monitoring requirements.

7.6.3 Monitoring in Dangerous Areas

NSPS regulations do not address individual well monitoring which takes place in potentially dangerous areas. Daily conditions exist, especially for active landfills, which pose safety concerns for field technicians such as waste filling/compacting operations, cap construction operations, raised wells, and seasonal weather-related dangers, etc. Because the health and safety of personnel must be considered tantamount, the facility must be given wide latitude in making dangerous area determinations.

Therefore, SFSWMA proposes to temporarily exclude any dangerous areas from individual well monitoring. Such unsafe areas will be documented by site personnel in the wellfield monitoring records as reasons for not monitoring individual wells. It is proposed that the facility be allowed up to 30 days from cessation of filling activity or other dangerous activity in a designated area to bring new or disconnected/decommissioned infrastructure back online. If additional time is needed the well will be decommissioned or abandoned per the procedures set forth in this Plan until normal operation can proceed.

7.6.4 Penetrations and Openings

Section 60.763(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."*

> *A* ***"penetration"*** *under this GCCS Design Plan will be defined as any landfill gas collection well or landfill gas collection device included in the GCCS Design Plan that completely passes through the landfill cover into waste and is located within an area of the landfill where waste has been placed and a gas collection system is required. Cover penetrations do not include items such as survey stakes, fencing or litter fencing, flags, signs, trees, and utility poles.*

For the purposes of monitoring "any openings," "openings" is defined under this Plan to mean any cover penetration as defined above and any area where waste has been placed, and a GCCS is required by NSPS XXX, that visually exhibits distressed vegetation and cracks and seeps in the cover.

7.6.5 Reduced Monitoring Frequency for Closed Landfills/Areas

Section 60.766(f) *"Each owner or operator seeking to demonstrate compliance with the 500 parts per million surface methane operational standard in §60.763(d) must monitor surface concentrations of methane according to the procedures in §60.765(c) and the instrument specifications in §60.765(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 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring."*

Any methane reading of 500 ppm or more above background detected during the annual monitoring still allows for corrective action in accordance to §60.765(c)(4). If the exceedance can be corrected under the timeframe in accordance to §60.765(c)(4), monitoring will not revert back to a quarterly basis.

Any closed or inactive landfill, or any closed or inactive areas on an active landfill that has no monitored exceedances of the 500 ppm limit above background in three consecutive quarterly monitored periods after landfill closure may reduce the monitoring frequency to annual monitoring. Any methane reading of 500 ppm or more above the background detected during an annual monitoring event shall automatically return the frequency back to a quarterly frequency. If the exceedance can be corrected under the timeframe in accordance to §60.765(c)(4), monitoring will not revert back to a quarterly basis.

7.6.6 Removal Criteria

Section 60.762(b)(2)(v)(B) *"The collection and control system has been in operation a minimum of 15 years or the landfill owner or operator demonstrates that the GCCS will be unable to operate for 15 years due to declining gas flow."*

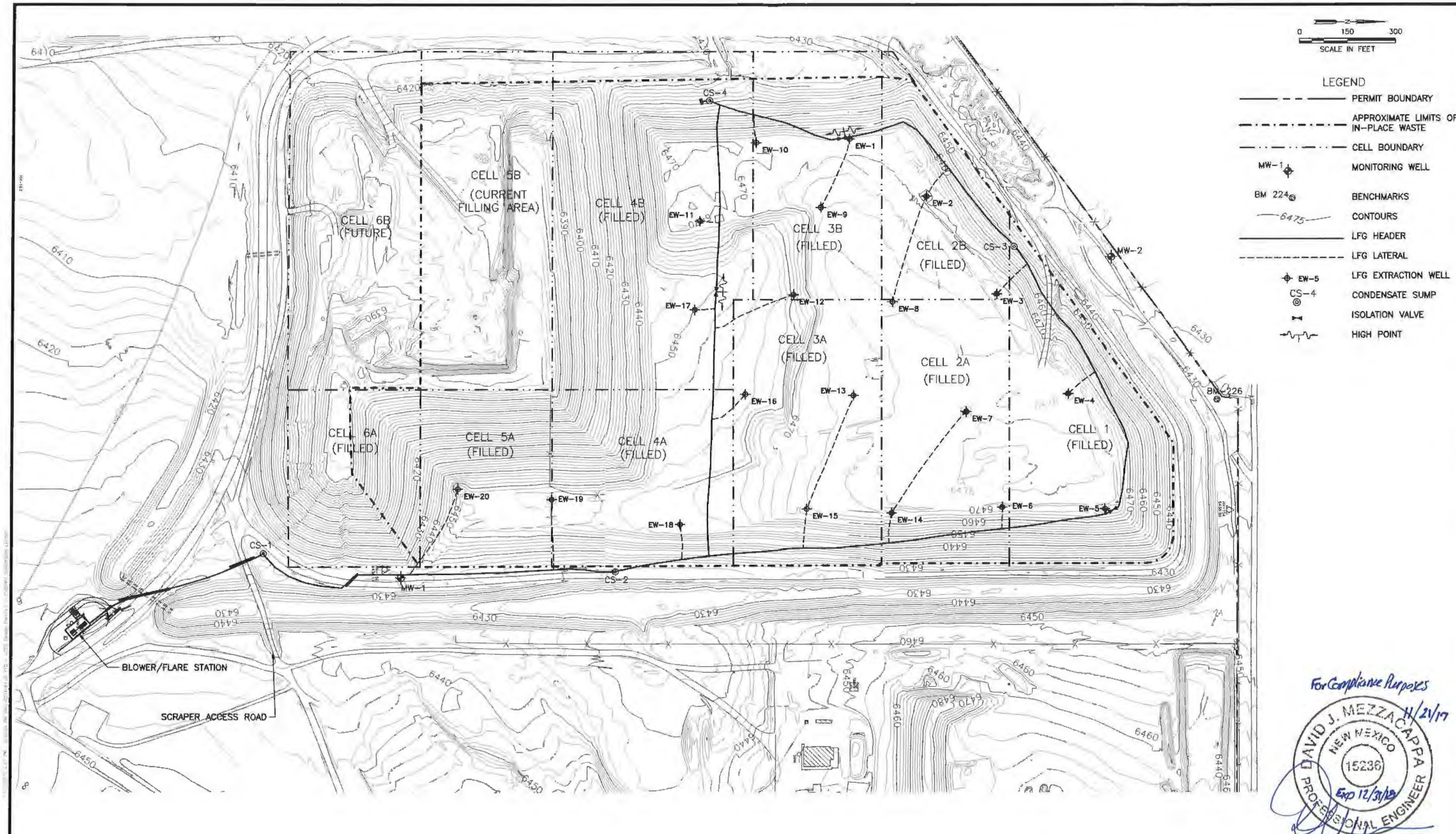
The 15-year period for qualifying for removal of the GCCS commences at the date of the initial performance tests under 40 CFR 60 Subpart WWW.

8 LIMITATIONS

This Plan has been prepared specifically for the Caja del Rio Landfill located in Santa Fe, New Mexico. The report has been prepared in accordance with the care and skill generally exercised by reputable professionals, under similar circumstances, in this, or similar localities. No other warranty, expressed or implied, is made as to the professional opinions presented herein.

APPENDIX A
CONCEPTUAL GCCS PLAN DESIGN AND RELATED INFORMATION

APPENDIX A.1
DRAWINGS



NOTES:

1. EXISTING CONTOURS SHOWN ARE REPRESENTATIVE OF AN AERIAL SURVEY FLOWN IN AUGUST 2012 AND A GROUND SURVEY PERFORMED BY MORRIS SURVEYING IN JANUARY 2015 FOR CELLS 3A, 3B, 4A, AND 4B.

DRAWING TITLE: CURRENT GCCS LAYOUT

PROJECT TITLE: LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN

CLIENT: SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
PH: (505) 421-1850

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS

CADD FILE: A.1 - EXISTING CONDITIONS LAYOUT

DATE: 11/2017

SCALE: AS SHOWN

DRAWING NO. A.1

For Compliance Purposes 11/21/17

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NEW MEXICO
15236
PROFESSIONAL ENGINEER
Exp. 12/31/18

LEGEND:

- LANDFILL PROPERTY BOUNDARY
- PERMITTED WASTE DISPOSAL LIMIT
- CELL BOUNDARIES
- 6450 EXISTING CONTOURS (SEE NOTE 1)
- 6500 PERMITTED FINAL GRADES (SEE NOTE 1)
- EXISTING GAS COLLECTION HEADER/LATERAL
- EW-5 EXISTING GAS EXTRACTION WELL
- EXISTING CONTROL VALVE
- CS-1 EXISTING CONDENSATE SUMP
- 8" FUTURE GAS COLLECTION HEADER AND MINIMUM PIPE SIZE
- EW5B-4 FUTURE GAS EXTRACTION WELL
- FUTURE CONTROL VALVE
- CS-5 FUTURE CONDENSATE SUMP
- HIGH POINT IN HEADER
- Ⓐ SEGMENT NAME FOR HEADER SIZING CALCULATIONS

NOTES:

1. SURROUNDING AERIAL TOPOGRAPHIC MAP INFORMATION PROVIDED BY PRECISION SURVEYS, INC., ALBUQUERQUE, NM. DATE OF FLIGHT DECEMBER 21, 2016. PERMITTED FINAL COVER GRADES PROVIDED BY CDM SMITH. ALL GRADES ARE FEET ABOVE MEAN SEA LEVEL.
2. THIS NSPS-REQUIRED COLLECTION AND CONTROL SYSTEM DESIGN PLAN IS BASED ON THE FINAL GRADES CURRENTLY PERMITTED. THE FACILITY IS CURRENTLY AT INTERIM GRADES. THE EVOLUTION OF THE COLLECTION AND CONTROL SYSTEM AS THE LANDFILL IS FILLED WILL ULTIMATELY PRODUCE A DESIGN CONSISTENT WITH THIS PLAN. UNTIL THE LANDFILL HAS ATTAINED THE FINAL GRADES, THE COLLECTION AND CONTROL OF LANDFILL GAS PURSUANT TO THE NSPS MAY BE ACCOMPLISHED USING VARIOUS METHODS NOT SPECIFICALLY INCLUDED AS PART OF THE FINAL DESIGN. HOWEVER, ONCE THE FACILITY HAS REACHED THE FINAL GRADES, THE COLLECTION AND CONTROL SYSTEM WILL MEET THE CRITERIA SPECIFIED WITHIN THIS DESIGN PLAN.
3. LOCATION AND INSTALLATION OF THE PROPOSED GAS EXTRACTION WELLS, HEADER AND LATERAL ALIGNMENT, CONDENSATE MANAGEMENT FACILITIES, AND CONTROL DEVICE MAY VARY TO ACCOMMODATE FINAL CONSTRUCTED LANDFILL SLOPE OR SITE OPERATIONS. WELL LOCATIONS MAY CHANGE IF OBSTRUCTIONS ARE ENCOUNTERED DURING DRILLING.
4. MINIMUM ACCEPTABLE COLLECTION HEADER SLOPE IS 2% WHEN LOCATED IN WASTE DISPOSAL AREAS AND 1% WHEN LOCATED OUT OF WASTE DISPOSAL AREAS.
5. ALL PIPE SIZES SHOWN ON THIS DRAWING ARE MINIMUM SIZES. ALL GAS EXTRACTION WELL LATERALS ARE FOUR (4) INCH DIAMETER UNLESS OTHERWISE SPECIFIED.
6. ROAD CROSSINGS TO BE COORDINATED WITH SITE PERSONNEL PRIOR TO CONSTRUCTION.

REV	DATE	DESCRIPTION	BY
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DRAWING TITLE: LFG COLLECTION SYSTEM SITE LAYOUT PLAN

PROJECT TITLE: LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN

CLIENT: SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87508-8342
PH: (505) 421-1850

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 424-1850

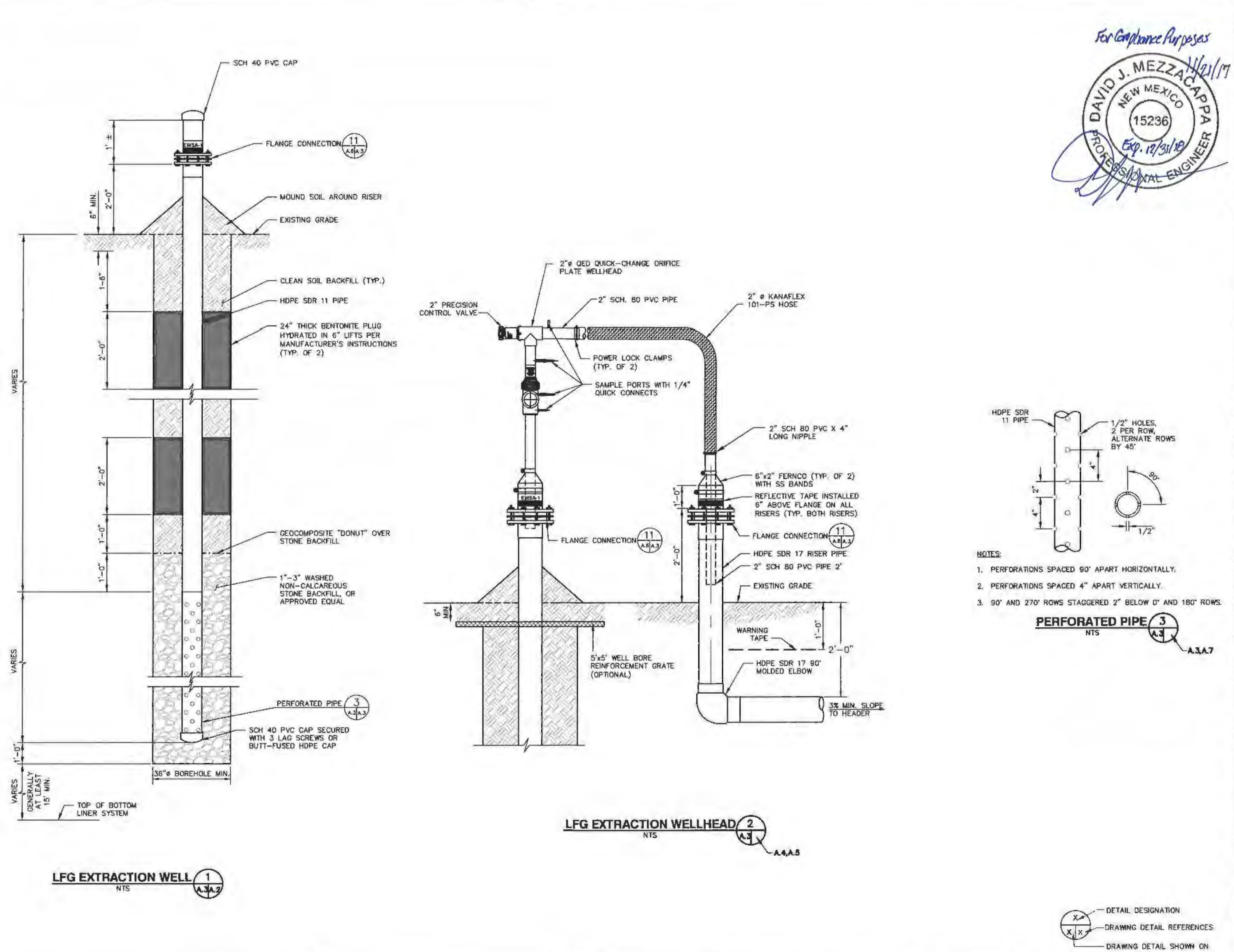
PROJ. NO. 16214041.00	DWN. BY: AGA	Q/A RVW BY: RRK
DSN. BY: DJM	CHK. BY: DJM	APP. BY: DJM

CADD FILE: A.2 - GCCS LAYOUT

DATE: 11/2017

SCALE: AS SHOWN

DRAWING NO. A.2



REV | DATE | DESCRIPTION | BY

DRAWING TITLE: VERTICAL EXTRACTION WELL DETAILS - 1

PROJECT TITLE: LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN

CLIENT: SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
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SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 424-1850

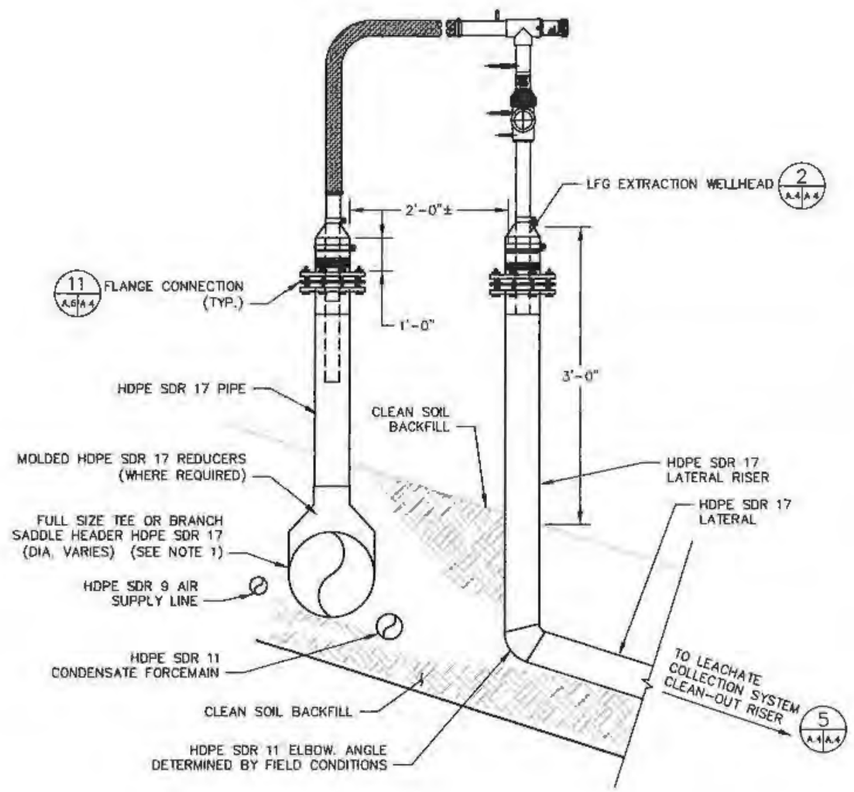
PROJ. NO. 16214041.00 | DSN. BY: DJM | DWN. BY: AGA | CHK. BY: DJM | Q/A RVW BY: BRK | APP. BY: DJM

CADD FILE: A.3 - A.5 GCCS DETAILS

DATE: 11/2017

SCALE: AS SHOWN

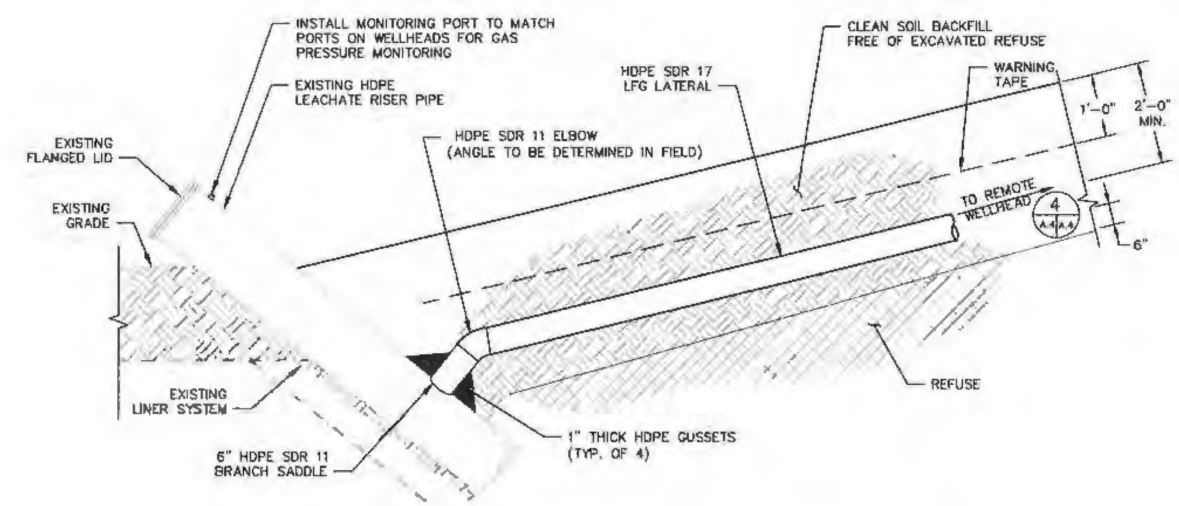
DRAWING NO. A.3



NOTES:

1. HDPE BRANCH SADDLES SHALL BE USED IN HEADER PIPING 14-INCHES IN DIAMETER AND LARGER. BRANCH SADDLES TO BE SHOP FABRICATED AND FOUR (4) HDPE GUSSETS TO BE INSTALLED ON PART SIDE WHEN BRANCH SADDLES ARE USED. HDPE GUSSETS TO BE 1-INCH THICK.

REMOTE WELLHEAD (4 A.4 A.4)
NOT TO SCALE



NOTES:

1. CONTRACTOR SHALL CAREFULLY EXCAVATE AROUND THE LEACHATE RISER PIPING. ANY DAMAGE TO EXISTING FEATURES SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
2. CONTRACTOR SHALL VERIFY LEACHATE COLLECTION RISER CONFIGURATION AND SIZE IN FIELD.

TIE-IN TO LEACHATE CLEAN-OUT RISER (5 A.4 A.4)
NOT TO SCALE

X — DETAIL DESIGNATION
X X — DRAWING DETAIL REFERENCES
— DRAWING DETAIL SHOWN ON

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Exp. 12/31/18

REV.	DATE	DESCRIPTION	BY

DRAWING TITLE: VERTICAL EXTRACTION WELL DETAILS - 2

PROJECT TITLE: LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN

CLIENT: SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
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SCS ENGINEERS
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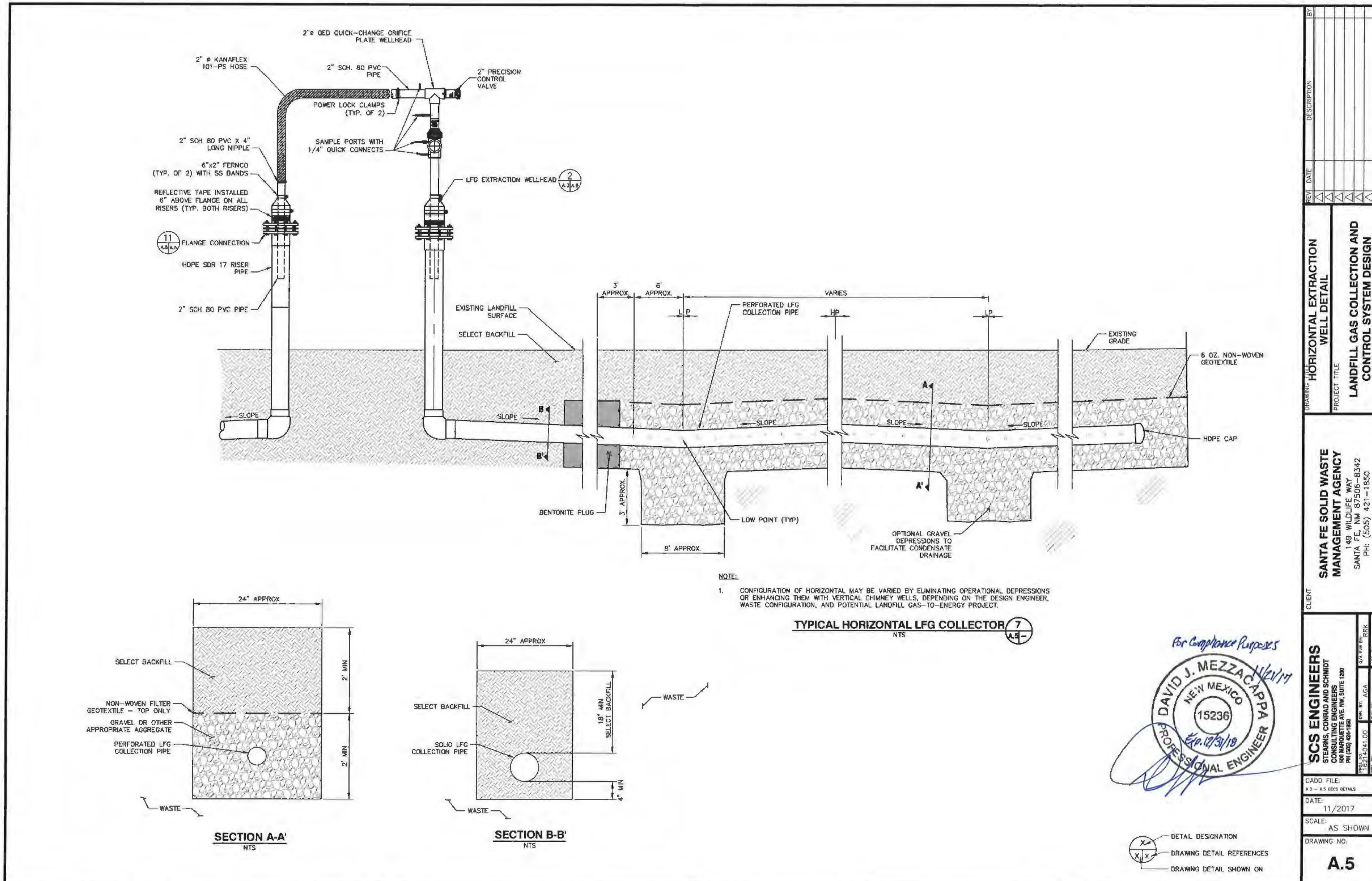
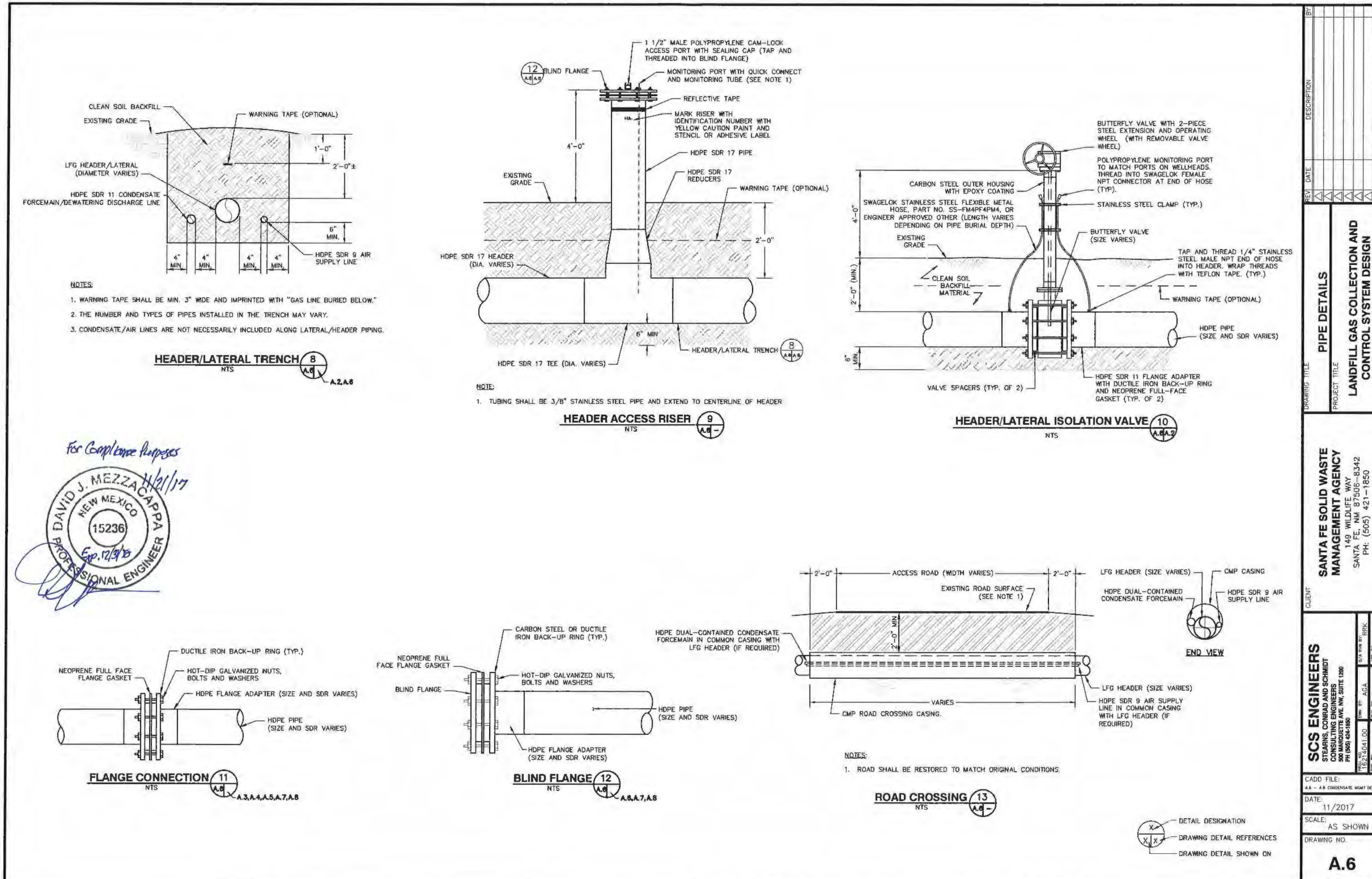
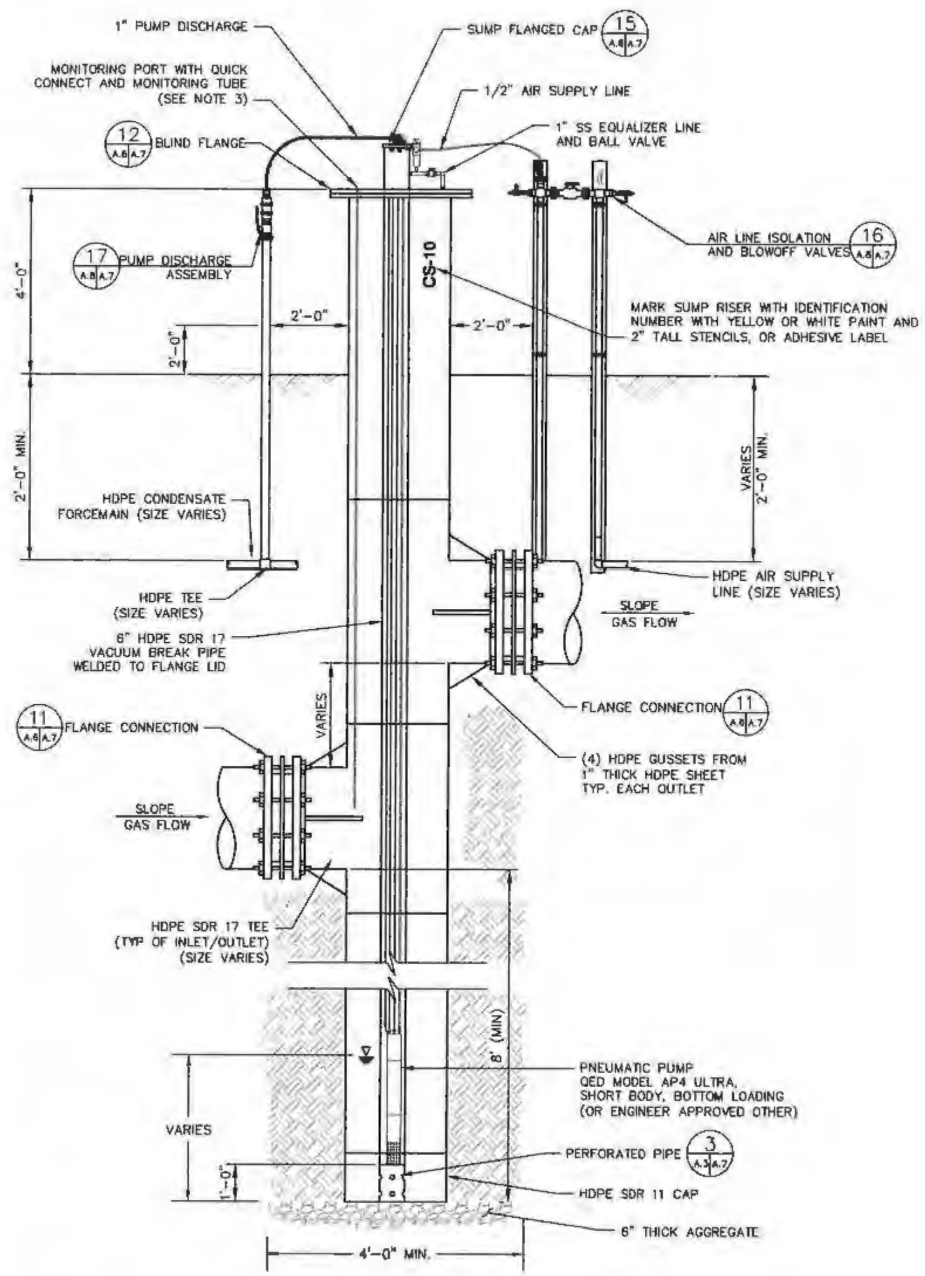
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 424-1850

PROJ. NO. 16214041.00 | DWN. BY: AGA | Q/A RVW BY: RRK
DSN. BY: DJM | CHK. BY: DJM | APP. BY: DJM

CADD FILE: A.3 - A.5 GCCS DETAILS
DATE: 11/2017
SCALE: AS SHOWN
DRAWING NO. **A.4**


2"ø QED QUICK-CHANGE ORIFICE PLATE WELLHEAD
2" ø KANAFLEX 101-PS HOSE
2" SCH. 80 PVC PIPE
2" PRECISION CONTROL VALVE
POWER LOCK CLAMPS (TYP. OF 2)
2" SCH 80 PVC X 4" LONG NIPPLE
SAMPLE PORTS WITH 1/4" QUICK CONNECTS
6"x2" FERNCO (TYP. OF 2) WITH SS BANDS
LFG EXTRACTION WELLHEAD
REFLECTIVE TAPE INSTALLED 6" ABOVE FLANGE ON ALL RISERS (TYP. BOTH RISERS)
FLANGE CONNECTION
HDPE SDR 17 RISER PIPE
2" SCH 80 PVC PIPE
EXISTING LANDFILL SURFACE
SELECT BACKFILL
3' APPROX.
6' APPROX.
VARIES
PERFORATED LFG COLLECTION PIPE
LP
HP
LP
EXISTING GRADE
8 OZ. NON-WOVEN GEOTEXTILE
SLOPE
B
B'
A
A'
HDPE CAP
BENTONITE PLUG
3' APPROX.
LOW POINT (TYP)
8' APPROX.
OPTIONAL GRAVEL DEPRESSIONS TO FACILITATE CONDENSATE DRAINAGE
NOTE:
1. CONFIGURATION OF HORIZONTAL MAY BE VARIED BY ELIMINATING OPERATIONAL DEPRESSIONS OR ENHANCING THEM WITH VERTICAL CHIMNEY WELLS, DEPENDING ON THE DESIGN ENGINEER, WASTE CONFIGURATION, AND POTENTIAL LANDFILL GAS-TO-ENERGY PROJECT.
TYPICAL HORIZONTAL LFG COLLECTOR
NTS
24" APPROX
SELECT BACKFILL
2' MIN
NON-WOVEN FILTER GEOTEXTILE - TOP ONLY
GRAVEL OR OTHER APPROPRIATE AGGREGATE
PERFORATED LFG COLLECTION PIPE
2' MIN
WASTE
SECTION A-A'
NTS
24" APPROX
SELECT BACKFILL
18" MIN SELECT BACKFILL
SOLID LFG COLLECTION PIPE
4" MIN
WASTE
SECTION B-B'
NTS
For Compliance Purposes
DAVID J. MEZZACAPPA
NEW MEXICO
15236
PROFESSIONAL ENGINEER
11/21/17
Exp. 12/31/18
DETAIL DESIGNATION
DRAWING DETAIL REFERENCES
DRAWING DETAIL SHOWN ON
REV DATE DESCRIPTION BY
DRAWING TITLE HORIZONTAL EXTRACTION WELL DETAIL
PROJECT TITLE LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN
CLIENT SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
PH: (505) 421-1850
SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 424-1850
PROJ. NO. 16214041.00
DSN. BY: DJM
DWN. BY: AGA
CHK. BY: DJM
Q/A RVW BY: RRK
APP. BY: DJM
CADD FILE: A.3 - A.5 GCCS DETAILS
DATE: 11/2017
SCALE: AS SHOWN
DRAWING NO. A.5


CLEAN SOIL BACKFILL
EXISTING GRADE
WARNING TAPE (OPTIONAL)
1'-0"
2'-0"±
LFG HEADER/LATERAL (DIAMETER VARIES)
HDPE SDR 11 CONDENSATE FORCEMAIN/DEWATERING DISCHARGE LINE
6" MIN.
4" MIN.
4" MIN.
4" MIN.
4" MIN.
HDPE SDR 9 AIR SUPPLY LINE
NOTES:
1. WARNING TAPE SHALL BE MIN. 3" WIDE AND IMPRINTED WITH "GAS LINE BURIED BELOW."
2. THE NUMBER AND TYPES OF PIPES INSTALLED IN THE TRENCH MAY VARY.
3. CONDENSATE/AIR LINES ARE NOT NECESSARILY INCLUDED ALONG LATERAL/HEADER PIPING.
HEADER/LATERAL TRENCH 8 A.6
NTS
A.2,A.6
1 1/2" MALE POLYPROPYLENE CAM-LOCK ACCESS PORT WITH SEALING CAP (TAP AND THREADED INTO BLIND FLANGE)
12 A.6 A.6 BLIND FLANGE
MONITORING PORT WITH QUICK CONNECT AND MONITORING TUBE (SEE NOTE 1)
REFLECTIVE TAPE
MARK RISER WITH IDENTIFICATION NUMBER WITH YELLOW CAUTION PAINT AND STENCIL OR ADHESIVE LABEL
4'-0"
HDPE SDR 17 PIPE
EXISTING GRADE
HDPE SDR 17 REDUCERS
WARNING TAPE (OPTIONAL)
2'-0"
HDPE SDR 17 HEADER (DIA. VARIES)
6" MIN
HEADER/LATERAL TRENCH 8 A.6 A.6
HDPE SDR 17 TEE (DIA. VARIES)
NOTE:
1. TUBING SHALL BE 3/8" STAINLESS STEEL PIPE AND EXTEND TO CENTERLINE OF HEADER
HEADER ACCESS RISER 9 A.6 -
NTS
BUTTERFLY VALVE WITH 2-PIECE STEEL EXTENSION AND OPERATING WHEEL (WITH REMOVABLE VALVE WHEEL)
POLYPROPYLENE MONITORING PORT TO MATCH PORTS ON WELLHEADS. THREAD INTO SWAGELOK FEMALE NPT CONNECTOR AT END OF HOSE (TYP).
CARBON STEEL OUTER HOUSING WITH EPOXY COATING
SWAGELOK STAINLESS STEEL FLEXIBLE METAL HOSE, PART NO. SS-FM4PF4PM4, OR ENGINEER APPROVED OTHER (LENGTH VARIES DEPENDING ON PIPE BURIAL DEPTH)
STAINLESS STEEL CLAMP (TYP.)
4'-0"
EXISTING GRADE
BUTTERFLY VALVE (SIZE VARIES)
TAP AND THREAD 1/4" STAINLESS STEEL MALE NPT END OF HOSE INTO HEADER. WRAP THREADS WITH TEFLON TAPE. (TYP.)
2'-0" (MIN.)
CLEAN SOIL BACKFILL MATERIAL
WARNING TAPE (OPTIONAL)
HDPE PIPE (SIZE AND SDR VARIES)
6" MIN.
HDPE SDR 11 FLANGE ADAPTER WITH DUCTILE IRON BACK-UP RING AND NEOPRENE FULL-FACE GASKET (TYP. OF 2)
VALVE SPACERS (TYP. OF 2)
HEADER/LATERAL ISOLATION VALVE 10 A.6 A.2
NTS
For Compliance Purposes
11/21/17
DAVID J. MEZZACAPPA
NEW MEXICO
15236
PROFESSIONAL ENGINEER
Exp. 12/31/18
2'-0"
ACCESS ROAD (WIDTH VARIES)
2'-0"
EXISTING ROAD SURFACE (SEE NOTE 1)
LFG HEADER (SIZE VARIES)
CMP CASING
HDPE DUAL-CONTAINED CONDENSATE FORCEMAIN
HDPE SDR 9 AIR SUPPLY LINE
2'-0" MIN
END VIEW
HDPE DUAL-CONTAINED CONDENSATE FORCEMAIN IN COMMON CASING WITH LFG HEADER (IF REQUIRED)
LFG HEADER (SIZE VARIES)
VARIES
HDPE SDR 9 AIR SUPPLY LINE IN COMMON CASING WITH LFG HEADER (IF REQUIRED)
CMP ROAD CROSSING CASING.
NOTES:
1. ROAD SHALL BE RESTORED TO MATCH ORIGINAL CONDITIONS.
ROAD CROSSING 13 A.6 -
NTS
DUCTILE IRON BACK-UP RING (TYP.)
NEOPRENE FULL FACE FLANGE GASKET
HOT-DIP GALVANIZED NUTS, BOLTS AND WASHERS
HDPE FLANGE ADAPTER (SIZE AND SDR VARIES)
HDPE PIPE (SIZE AND SDR VARIES)
FLANGE CONNECTION 11 A.6
NTS
A.3,A.4,A.5,A.7,A.8
CARBON STEEL OR DUCTILE IRON BACK-UP RING (TYP.)
NEOPRENE FULL FACE FLANGE GASKET
BLIND FLANGE
HOT-DIP GALVANIZED NUTS, BOLTS AND WASHERS
HDPE PIPE (SIZE AND SDR VARIES)
HDPE FLANGE ADAPTER (SIZE AND SDR VARIES)
BLIND FLANGE 12 A.6
NTS
A.6,A.7,A.8
X X X
DETAIL DESIGNATION
DRAWING DETAIL REFERENCES
DRAWING DETAIL SHOWN ON
REV DATE DESCRIPTION BY
DRAWING TITLE
PIPE DETAILS
PROJECT TITLE
LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN
CLIENT
SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
PH: (505) 421-1850
SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 424-1850
PROJ. NO. 16214041.00
DSN BY: DJM
DWN BY: AGA
CHK BY: DJM
Q/A RVW BY: RRK
APP BY: DJM
CADD FILE:
A.6 - A.8 CONDENSATE MGMT DETAIL
DATE:
11/2017
SCALE:
AS SHOWN
DRAWING NO.
A.6



NOTES:

1. SUMP SHALL BE FABRICATED FROM HDPE SDR 17 PIPE AND FITTINGS (SIZE VARIES), CORRESPONDING TO ADJOINING HEADER. CONTRACTOR SHALL CONFIRM ORIENTATION OF TEES PRIOR TO SUMP FABRICATION.
2. 6"ø HDPE SDR 17 VACUUM BREAK PIPE EXTRUSION WELDED TO FLANGE LID. 1'-0" OF PIPE TO PROTRUDE THROUGH TOP OF FLANGE. CENTER OF PIPE LOCATED 2" OFF CENTER OF BLIND FLANGE.
3. TUBING SHALL BE 3/8" STAINLESS STEEL PIPE EXTENDED TO CENTERLINE OF INLET PIPE.
4. PUMP SHALL BE CONNECTED TO PUMP WITH QED EASY FITTINGS OR ENGINEER APPROVED OTHER.
5. IF SUMP IS IN WASTE, DESIGN ENGINEER/CQA SHALL CONFIRM THAT BOTTOM OF SUMP HAS SUFFICIENT SEPARATION FROM THE LANDFILL LINER.

CONDENSATE SUMP 14 A.7 A.2

NTS

For Compliance Purposes 11/21/17

DAVID J. MEZZACAPPA NEW MEXICO 15236 PROFESSIONAL ENGINEER

Exp. 12/31/18

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X — DRAWING DETAIL REFERENCES

X — DRAWING DETAIL SHOWN ON

REV	DATE	DESCRIPTION	BY
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△			
△			
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DRAWING TITLE: CONDENSATE MANAGEMENT DETAILS - 1

PROJECT TITLE: LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN

CLIENT: SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
PH: (505) 421-1850

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 424-1850

PROJ. NO. 16214041.00 | DWN. BY: AGA | Q/A RVW BY: RRK
DSN. BY: DJM | CHK. BY: DJM | APP. BY: DJM

CADD FILE: A.6 – A.8 CONDENSATE MGMT DETAIL

DATE: 11/2017

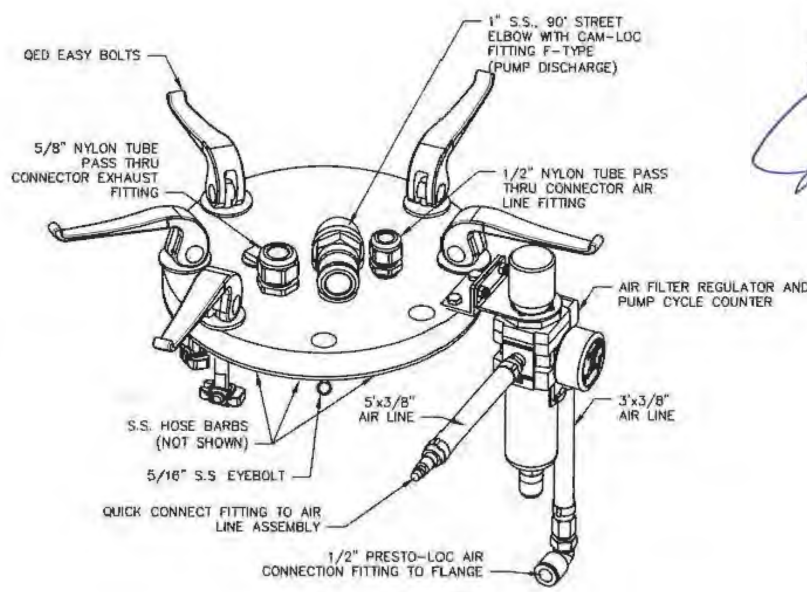
SCALE: AS SHOWN

DRAWING NO. **A.7**

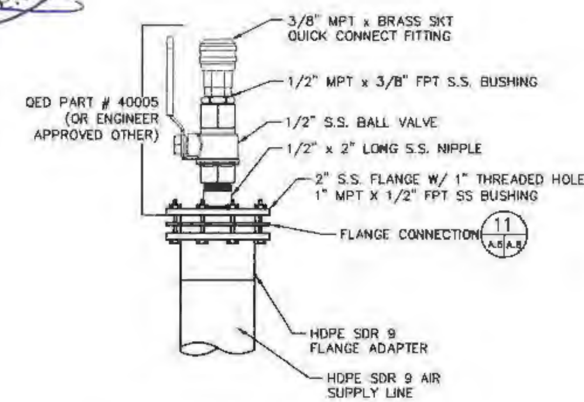
For Compliance Purposes

DAVID J. MEZZACAPPA
NEW MEXICO
15236
PROFESSIONAL ENGINEER
11/21/17
Exp 12/31/18

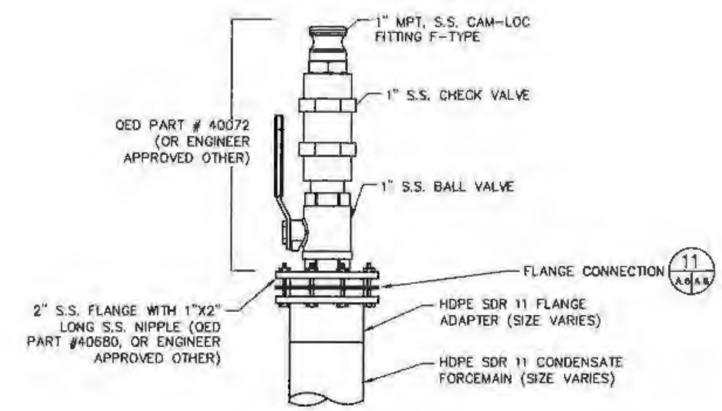
DETAIL DESIGNATION
DRAWING DETAIL REFERENCES
DRAWING DETAIL SHOWN ON



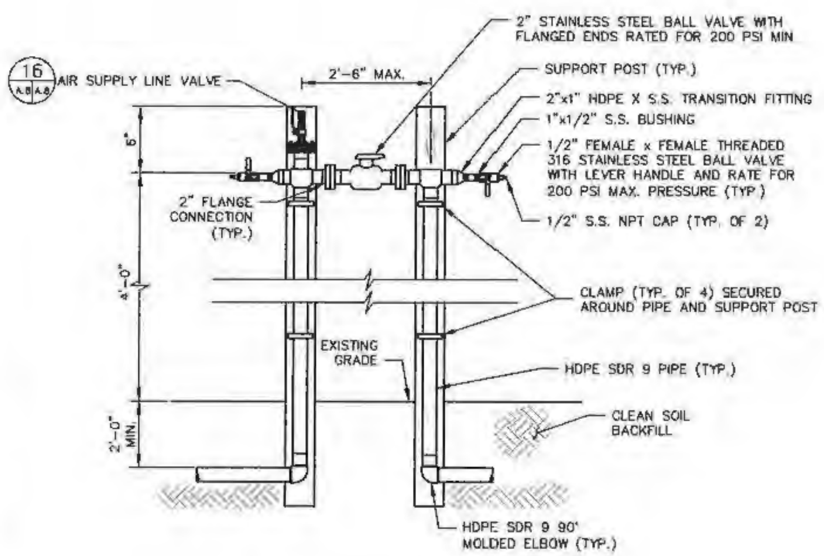
SUMP FLANGE CAP 15 (A.8, A.7)
NTS



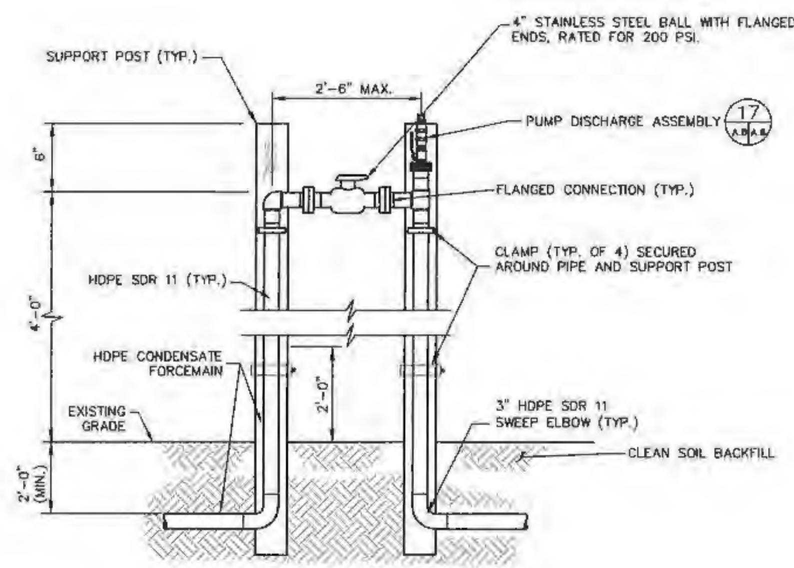
AIR SUPPLY LINE VALVE 16 (A.8) A.3,A.7,A.8
NTS



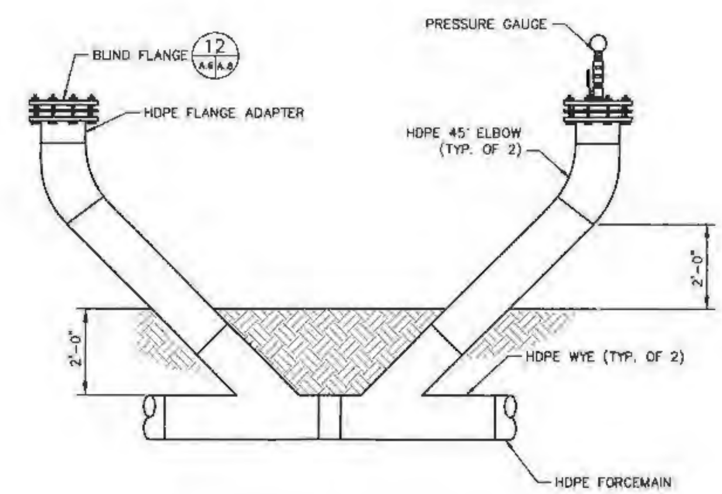
PUMP DISCHARGE ASSEMBLY 17 (A.8) A.3,A.7,A.8
NTS



AIR LINE ISOLATION AND BLOWOFF VALVES 18 (A.8) -
NTS



CONDENSATE FORCEMAIN ISOLATION VALVE 19 (A.8) -
NTS



FORCEMAIN CLEANOUT 20 (A.8) -
NTS

REV	DATE	DESCRIPTION	BY

DRAWING TITLE: CONDENSATE MANAGEMENT DETAILS - 2

PROJECT TITLE: LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN

CLIENT: SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
PH: (505) 421-1850

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 484-1650

PROJ. NO. 6214041.00 | DWN. BY: AGA | Q/A RVW BY: RRK
DSN. BY: DJM | CHK. BY: DJM | APP. BY: DJM

CADD FILE: A.6 - A.8 CONDENSATE MGMT DETAIL
DATE: 11/2017
SCALE: AS SHOWN
DRAWING NO. A.8

APPENDIX A.2
NMED SOURCE TEST

New Mexico Environment Department
Air Quality Bureau
1301 Siler Road Building B
Santa Fe, NM 87507
Phone (505) 476-4300 Fax (505) 476-4375

Version 1/1/2010

NMED USE ONLY	
DTS	
TEMPO	

UNIVERSAL STACK TEST NOTIFICATION, PROTOCOL AND REPORT FORM

NMED USE ONLY	
Staff	
Admin	

Submit to: Stacktest.aqb@state.nm.us

I. DATABASE HEADER INFORMATION (drop down menus in bold)

a. AI# **1484**	**Test Report**	**Initial Compliance Test**
d. Company Name: **Santa Fe Solid Waste Management Agency**	e. Facility Name: **Caja del Rio Landfill**	
f. Emission Unit Numbers: **Flare**	g. Emission Unit Description (boiler, Waukesha 7042, etc) **Enclosed Landfill Gas Flare**	
h. Reports - Tracking Number from notification response: **CMT**	i. Proposed Test Date: **September 1, 2010**	j. Actual test date: **September 1, 2010**
k. Reason for test (name permit requirement, NSPS, MACT, consent decree, etc. Indicate here is this notification is a revised test date only) **NSPS WWW, Title V Permit Provision A504**		

II. GENERAL COMPANY AND FACILITY INFORMATION

a.Company Address: **149 Wildlife Way**			k.. Facility Address: **149 Wildlife Way**		
b. City: **Santa Fe**	c. State: **NM**	d. Zip: **87506**	l. City: **Santa Fe**	m. State: **NM**	n. Zip: **87506**
e. Environmental Contact: **Randy Watkins**	f. Title: **Landfill Manager**		o. Facility Contact: **Randy Watkins**	p. Title: **Landfill Manager**	
g. Phone Number: **505.424.1850**	h. Cell Number: **505.780.0609**		q. Phone Number: **505.424.1850**	r. Cell Number: **505.780.0609**	
i. Email Address: **RWatkins@sfswma.org**			s. Email Address: **RWatkins@sfswma.org**		
j. Title V Permit Number: **P185LR1M1**			t. NSR Permit Number: **N/A**		

u. Detailed driving directions from nearest New Mexico town:
The facility is located at Latitude of 35.6820 N and Longitude of 106.0924 W, and UTM Zone 13, UTMH 401 km, UTMV 3,949 km, in Township 17N, Range 8E, Section portions of 21, 22, 27, 28, approximatley 3.3 miles northwest of Santa Fe, New Mexico in Santa Fe county.

III. TESTING FIRM

a. Company: **Applied Environmental Consultants**			g. Contact: **Richard Walston, QSTI**	
b. Address 1: **1553 W. Elna Rae**			h. Title: **Sr. Scientist/Project Manager**	
c. Address 2:			i. Office Phone: **480.829.0457**	j. Cell Phone: **623.210.8130**
d. City: **Tempe**	e. State: **AZ**	f. Zip: **85281**	k. Email Address: **rwalston@jbrenv.com**	

IV. EMISSION UNIT

a. Emission Unit Number: **Flare**	b. Make & Model Number **John ZinK Co.**
c. Serial Number: **N/A**	d. Permitted Capacity: **Permit did not list capacity**

e Exceptions: Explain if test is late, rescheduled, related to an enforcement action:
N/A

g. Emission Unit Description and brief process name or description:

Caja Del Rio Landfill utilizes an enclosed landfill gas flare to combust collected landfill gas.

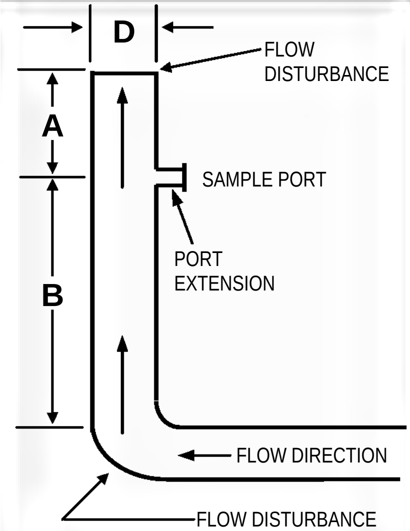
John Zink manufactured and installed the enclosed landfill gas flare. The unit has a diameter of 7 feet and is 30 feet in height. The flare is rated at burning 900 scfm of landfill gas (LFG). The thermal capacity of the flare is ~60 Million British thermal units per hour (MMBtu/hr).

h. Installation Date:	i. Startup Date:	k. Date Reached Max. Capacity:
03/04/10	**04/15/10**	**08/24/10**

l. Control Equipment Description as listed in permit (model, ser. # etc. if applicable):
Was listed as “TBD” in permit application

STACK PARAMETERS

m. Velocity (ft/sec):	**1.5**
n. Temperature (ºC):	Not Measured
o. Stack Diameter, D (in.):	**84**
p. Distance to Stack Bends or Obstructions:	
Upstream, Distance A (in.):	**42**
Downstream, Distance B (in.):	**318**



EXAMPLE VIEW SHOWING DISTANCES FROM SAMPLE PORT TO FLOW DISTURBANCES

Attach an explanation or drawing to explain any difficult or unusual stack geometry or parameters.

V. POLLUTANTS AND PROPOSED TEST METHODS

Pollutant or Parameter:		Proposed Test Methods (Deviations from approved methods require supporting documentation and prior authorization)	Deviation to Test Method Requested
☐	**Portable Analyzer Methods for NOx, CO, SO_2**		☐
☐	**NOx**	**EPA Method 7E**	☐
☐	**CO**	**EPA Method 10**	☐
☐	**SO2**	**EPA Method 6**	☐
☒	**VOCs**	**(Specify) EPA Methods 18, 25A, & 25C**	☐
☐	**HAPs**	**(Specify)**	☐
☐	**PM (TSP)**	**EPA Method 5**	☐
☐	**PM10**	**EPA Method 201**	☐
☐	**PM2.5**	**(Specify)**	☐
☐	**Opacity**	**EPA Method 9**	☐
☐	**Visual E.**	**EPA Method 22**	☐
☐	**Stack Flow**	**EPA Methods 1 - 3**	☐
☐	**Moisture**	**EPA Method 4**	☐
☒	**Other**	**(Specify) Stack Flow Rates by EPA Methods 2D & 19**	☐
☒	**Other**	**(Specify)**	☐

List Specific VOC’s and HAP’s: 20 ppm @ 3% O2 as hexane or 98% destruction efficiency

VI. PROPOSED TEST RUN AND TEST LOAD INFORMATION

a. Number of Test Runs:	b. Run Duration	c. Required by (regulation or permit number):	d. Specific Condition or Section:
3	**60 min**	**NSPS WWW**	**40CFR§60.752(b)(2)(iii)(B)**

PLEASE NOTE – Default run duration is 60 minutes, unless otherwise specified by an applicable regulation.

e. Expected Load:	f. Percent of Permitted Capacity:	g. Is this an opacity test?	h. If yes, no. of observation pts.:
		Yes ☐ **No** ☒	**N/A**

i. If expected load during test is less than 90% of capacity, explain:

NOTE – Failure to test at 90-100% of permitted load will limit unit operation to 110% of tested load until a new initial compliance test is conducted.

PLANT OR UNIT OPERATING PARAMETERS TO BE MONITORED

j. List and explain the plant operating parameters that will be monitored and applicable permit conditions or regulatory standards.

Flare combustion temperature and operation shall be monitored per NSPS requirements.

VII. ADDITIONAL DETAILS (where applicable)

RATA and INSTRUMENTAL ANALYZER CALIBRATION PROCEDURES

a. Do any of the methods you are proposing utilize instrumental analyzers (i.e.; EPA Methods 3A, 6C, 7E, 10, 18, 25/25A, 320 etc.)? If yes, briefly describe analyzer calibration procedures and/or calibration standard procedures. Enter the highest pollutant concentration expected and the proposed concentrations of calibration gases.	☒ Yes	☐ No

VOC Testing - Stack gas is extracted through a stainless steel in-stack probe with a single opening located within the 10 percent area of the stack cross-section, heated Teflon® tubing, and filter, and directed into the hydrocarbon analyzer. Excess stack gas is vented to the outside air. Zero and calibration gases are introduced into the sample line at the probe tip. Highest pollutant concentration 15 ppm, proposed concentrations of calibration gases 0-50 range.

CEM O_2/CO_2 Testing - Stack gas is extracted through a stainless steel in-stack probe, heated Teflon tubing, and on-stack condenser that cools and dries the gas sample. Conditioned sample gas continues through Teflon tubing to the gas manifold where it is distributed to the analyzers. Excess stack gas is vented to the outside air. Zero and calibration gases can be introduced directly into each analyzer via the manifold, or directed to the probe tip for bias checks. The gas manifold is constructed of Teflon tubing and stainless steel solenoids and fittings. A constant sample and calibration gas pressure is provided to each analyzer to avoid pressure variable response errors.

The entire sampling system is leak checked before the test program by obstructing the sample probe opening(s) and pulling ≈25" Hg vacuum. Once the manifold rotometers indicate a zero flow, the system is proven to be leak-free.

Each analyzer linearity is checked with zero, mid-, and high-level calibration gases. The AEC sampling and analytical system is calibrated at the beginning and end of each test run. System bias is determined by pulling calibration gas through the entire sampling system. Individual test run calibrations will use the calibration gas that most closely matches the stack gas effluent.

SAMPLING TRAIN LEAK CHECK PROCEDURES

b. Do any of the methods you are proposing utilize the EPA Method 5 sampling train (i.e.; EPA Methods 1-4, 5, 17, 26/26A, 29, etc.)? If yes, briefly describe sampling train and pitot tube leak check procedures:	☐ Yes	☒ No

N/A		
EPA METHOD 19 IN LIEU OF EPA METHODS 1-4		
c. Are you proposing to utilize EPA Method 19 in lieu of EPA Methods 1-4? If yes, explain why you believe this proposal is justified:	☒ Yes	☐ No
The mass emission flow rate for the inlet was based on the waste gas consumption rates in scfm determined by EPA Method 2D and the TGNMO ppm value which was determined from the laboratory analysis of the LFG. The volumetric flow rate for the outlet was based upon EPA Method 19 assuming that contributions to fuel flow from the pilot burner were negligible (pilot only briefly fires at flare startup). Additionally, the flow meter manufacturer confirmed that the calibration was valid for a period of one year.		
PLEASE NOTE – EPA Method 19 may be utilized in lieu of EPA Methods 1-4, subject to the approval of the Department. If you are proposing to utilize EPA Method 19 in lieu of EPA Methods 1-4, you MUST include a recent fuel gas heating value analysis as well as a recent fuel flow meter calibration certificate, preferably conducted on the day of the test, but no earlier than three months prior to the test date. If the analyses have been conducted prior to the test date, you MUST append the certificates to the protocol. If conducted on the day of the test, you MUST append the certificates to the final test report.		

VIII. ATTACHMENTS (as needed to support proposed test; check all that apply)	
NOTIFICATION/PROTOCOL ATTACHMENTS	
☐	Road Map Indicating Directions from Nearest New Mexico Town to Facility
☐	Schematic of process being tested showing emission points, sampling sites and stack cross-section
☐	Copy of proposed test methods (except for those promulgated test methods found in 40 CFR 51, 60, 61 and 63)
☒	Fuel Heating Value Analysis
☐	Fuel Flow Meter Calibration Certificate
☐	Other:
☐	Other:
TEST REPORT ATTACHMENTS	
☒	**Section 2. Tables of Results**
☒	**Supporting Documents (Specify) – Attached Compliance Test Report**
Retain Report Section 3 - Test Procedures, Data, Calculations, Appendices – 2 years NSR permits, 5 years TV	

IX. CERTIFICATION		
This document has been prepared under my supervision and is accurate and complete to the best of my knowledge. I understand that acceptance of this protocol does not waive the requirements of any permit or regulation. I understand that any procedural errors or omissions are the sole responsibility of the permit holder.		
Signature: Randall Kippenbrock	Print Name and Title: **Randall Kippenbrock, P.E., Executive Director**	Date: **October 11, 2010**
Responsible Official for Title V? **X** Yes	☐ No (R.O signature not required for routine periodic testing)	

Solid Waste Management Consultants
and Contractors

1901 Central Drive
Suite 550
Bedford, Texas 76021- 5872

817 571-2288
FAX 817 571-2188
www.scsengineers.com

SCS ENGINEERS

October 11, 2010
SCS File No. 16209118.00.T20

Program Manager, Compliance & Enforcement Section
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113

Subject: Initial Performance Test Submittal
Enclosed Landfill Gas Flare - Caja del Rio Landfill

Dear Program Manager:

On behalf of the Santa Fe Solid Waste Management Agency (SFSWMA), SCS is submitting an Enclosed Flare Performance Test for the Caja del Rio Landfill (Landfill) as a follow-up to the protocol provided July 26, 2010. The Landfill currently operates under Title V Operating Permit P185LR1M1, issued July 16, 2010 and does not hold a New Source Review (NSR) permit.

The Landfill is subject to New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills. Specifically, 40 CFR §60.752(b)(2)(iii)(B) requires that a source test be performed and submitted to NMED within 180 days of NSPS startup (which was on April 15, 2010). This submittal is being included as an attachment within the initial semi-annual NSPS report as required by the NSPS rule. However, per NMED requirements, a copy of this submittal was also emailed to stacktest.aqb@state.nm.us.

The initial performance test itself is included at Attachment A to this letter. The NSPS rule 40 CFR §60.757(g) requires some additional information with this initial performance test. The required information is as follows:

- §60.757(g)(1) - Attachment B provides a diagram of the existing collection system from the as-built construction drawings. It should be noted that no areas of the landfill meeting the NSPS collection requirements were excluded from collection. Future collection system expansion will proceed southward as landfilling progresses per the GCCS Design Plan, which was submitted to NMED on October 15, 2008.

- §60.757(g)(2) - The design for the current gas system, specifically, pipe sizes and well spacing/placement, were taken directly from the GCCS Design Plan that was submitted to NMED on October 15, 2010.

- §60.757(g)(3) - No areas have been excluded from collection due to asbestos or nondegradable materials.

- §60.757(g)(4) - No areas have been excluded from collection based on nonproductivity or the calculation of gas generation flow rate.

- §60.757(g)(5) - The provisions for increasing gas mover equipment with increased gas generation flow rate over the life of the facility are as follows:

  - The equipment skid near the flare has two blowers. Each blower has up to 1,200 cubic feet per minute (cfm) capacity. Since the flare's capacity is 900 cfm, no more than one blower operates at one time. If additional capacity were ever needed for any reason, both blowers could be operated in tandem. Therefore, no further need to augment gas moving capacity is anticipated.

- §60.757(g)(6) – Off-site migration will be controlled through the collection of landfill gas in all landfill areas. Additionally, all areas of the landfill are lined, which will provide a barrier to subsurface migration.

Should you have additional questions or concerns, please do not hesitate to contact David Mezzacappa, P.E., at dmezzacappa@scsengineers.com or on his direct line at (817) 358-6108.

Sincerely,

Marcia A. Pincus, P.E.
Project Manager
SCS FIELD SERVICES

David Mezzacappa, P.E.
Project Director
SCS ENGINEERS

cc Randall Kippenbrock, P.E., SFSWMA
Randy Watkins, SFSWMA
Marcia Pincus, P.E., SCS Field Services

Enclosures

ATTACHMENT A

INITIAL PERFORMANCE TEST REPORT

Caja Del Rio Landfill

Compliance Test Report
Enclosed Landfill Gas Flare
Santa Fe, New Mexico
Operating Permit No. P185LR1M1
September 1, 2010

Agency:
State of New Mexico, Environment Department
Air Quality Bureau
2048 Galisteo Street
Santa Fe, New Mexico 87505

Prepared for:
Santa Fe Solid Waste Management Agency
149 Wildlife Way
Santa Fe, New Mexico 87506

Prepared by:
Applied Environmental Consultants, a JBR company
1553 W. Elna Rae, Ste. 101
Tempe, Arizona 85281

September 27, 2010

CERTIFICATION

This certifies that the data collected and presented herein is true and accurate to the best of our knowledge. All attempts were made to collect and analyze the data within the applicable guidelines established by the United States Environmental Protection Agency and the New Mexico Environment Department, Air Quality Bureau.

Richard F. Walston, QSTI
Senior Scientist/Project Manager
Test Team Leader

Mannie L. Carpenter, P.E.
Senior Engineer
Quality Assurance Supervisor

QSTI Application No. 2010-391

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1.0 INTRODUCTION

Source emission testing was conducted by Applied Environmental Consultants (AEC) for SCS Engineers (SCS) at the Caja del Rio Landfill, located in Santa Fe, New Mexico. Testing is required by New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills to demonstrate compliance with applicable emission limits. Emissions of non-methane organic compounds (NMOC) expressed as hexane, along with the destruction efficiency of the enclosed flare were measured. The emissions unit and pollutants that were tested for during the compliance program along with the applicable emission limits are presented in Table 1.0-1.

This report summarizes data from the compliance program conducted on September 1, 2010. Richard Walston and Geoff Baldwin of AEC conducted the testing. Mr. Walston served as test team leader.

Table 1.0-1 Emission Unit, Emission Species and Emission Limits

EMISSION UNIT	EMISSION SPECIES	EMISSION LIMITS
Enclosed Flare	CO_2/O_2	N/A
	NMOC	20 parts per million by volume (ppm) @ 3% O_2 as hexane or 98% destruction efficiency

1.1 Facility Description

The Caja del Rio Landfill is a facility that accepts municipal solid waste from commercial and residential customers. Clean green waste is accepted but does not enter the landfill. Instead, the green waste is chipped, composted, and periodically sold.

Activities at the landfill include truck weighing of incoming loads, truck travel to the active landfill cell on paved and unpaved roads, dumping of waste, compaction of waste, and end of day earth covering of the day's waste material using an earth scraper.

Additionally, there may be coincidental new cell construction activities. New cell construction involves excavation and overburden stockpiling. Soil may be screened to eliminate rocks to produce a more suitable lining material.

The Caja Del Rio Landfill utilizes an enclosed flare to combust landfill gas (LFG) as required by federal NSPS rules. John Zink manufactured the enclosed flare. The unit has a diameter of 7 feet and is 30 feet in height. The flare is rated to combust up to 900 standard cubic feet per minute (scfm) of LFG.

As the refuse in the landfill decomposes, LFG is generated, which contains methane and other decomposition byproducts. The LFG is collected using vertical gas wells located in the landfill. A gas collection header connects all gas wells to the flare. The header is designed to slope continuously to low points throughout the system in order to collect and remove condensate, thus preventing condensate from accumulating in the pipe.

The LFG is delivered to the flare utilizing two blowers, each rated to process more than 900 scfm of LFG. The blowers are used in an alternating fashion in order to avoid over-using either blower. The collected LFG is combusted in the enclosed flare. During the combustion, the temperature is controlled to ensure efficient destruction of pollutants, thus preventing their release into the atmosphere. Due to limited LFG collection quantities the flare is currently operated on an intermittent basis as approved in the NSPS-required Gas Collection and Control System Design Plan.

The flare consists of a vertical, round, blanket refractory-lined shell with main and ignition burners located near the base. The ignition burner fires propane gas during startup. The main burner fires only LFG. The flare is equipped with inlet air dampers to control the flow of combustion air to the burners. Thermocouples are installed at various heights to provide temperature indication for control of combustion temperature. A flow meter monitors the flow rate of the LFG at the inlet of the flare, just prior to the main burner.

1.2 Facility and Test Firm Information

Information on the facility's location and firms involved with the emissions testing program is provided in Table 1.2-1.

Table 1.2-1 Facility and Test Firm Information

FACILITY	CONTACT
Caja Del Rio Landfill Santa Fe Solid Waste Management Agency 149 Wildlife Way Santa Fe, New Mexico 87509	Mr. Randy Watkins Landfill Manager 505.424.1850
CONSULTANT	CONTACT
SCS Engineers 1901 Central Drive, Suite 550 Bedford, Texas 76021	Mr. David J. Mezzacappa, P.E. Project Manager 817.358.6108
TEST FIRM	CONTACT
Applied Environmental Consultants 1553 West Elna Rae Street, Ste 101 Tempe, Arizona 85281	Mr. Richard Walston, QSTI Sr. Scientist / Project Manager 480.829.0457
ANALYTICAL LABORATORY	CONTACT
AtmAA Lab 23917 Craftsman Rd Calabasas, California 91302	Mr. Mike Porter Laboratory Director 818.223.3277

1.3 Test Firm Project Specific Personnel

Project Manager: Richard Walston served as AEC's primary contact with SCS personnel. Mr. Walston was in charge of all testing activities, daily quality assurance and quality checks (QA/QC), data reduction and validation, and final report preparation. Mr. Walston also operated the Reference Method (RM) gaseous monitoring system, and performed pré- and post-test calibrations.

QA/QC Officer: Mannie Carpenter, P.E. was responsible for ensuring that all field QA/QC procedures were followed. Mr. Carpenter was also responsible for the final report review.

Laboratory Manager: Sam Stefanoff coordinated all in-house laboratory operations. Mr. Stefanoff was also responsible for ensuring that all QA/QC procedures were followed with the lab samples shipped to the designated laboratories for analysis, upon completion of each phase of testing.

Support Staff: Geoff Baldwin provided assistance with the project.

2.0 TEST CHRONOLOGY AND RESULTS SUMMARY

2.1 Test Chronology

The chronology of tests performed during the testing program is presented in Table 2.1-1.

Table 2.1-1 Source Testing Chronology

DATE	TIME	TESTS PERFORMED
9/01/10	1526-1625	EPA Methods 3A, 18, 19, 25A and 25C; Run 1
9/01/10	1643-1742	EPA Methods 3A, 18, 19, 25A and 25C; Run 2
9/01/10	1758-1857	EPA Methods 3A, 18, 19, 25A and 25C; Run 3

2.2 Test Results

Results of tests conducted during the compliance program are presented in Table 2.2-1 through 2.2-3.

Test results demonstrated compliance with permit emission limits and may be used in the future in adjusted emission factors used for emissions reporting. No claims of confidentiality with respect to this report are being made.

Table 2.2-1 Outlet NMOC Emissions Results

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Date	9/01/10	9/01/10	9/01/10	
Time	1526-1625	1643-1742	1758-1857	
Stack Gas Parameters				
Oxygen (%)	15.2	14.9	14.7	15
Flow Rate (dscfm) (EPA Method 19)	1,119	1,087	913	1,040

Table 2.2-1 Outlet NMOC Emissions Results

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Non-Methane Organic Compounds (NMOC)				
THC as C_3H_8 (ppm)	2.39	2.17	1.63	2.1
CH_4 from Lab Report (ppm)	5.12	5.81	4.82	5.3
CH_4 from Lab Report Expressed as C_3H_8 (ppm)	1.71	1.94	1.61	1.8
NMOC as C_3H_8 (ppm)	0.685	0.232	0.0222	0.31
NMOC as C_6H_{14} (ppm)	0.342	0.116	0.0111	0.16
NMOC as C_6H_{14} (ppm @ 3 % O_2)	1.07	0.345	0.0318	**0.48**
Emission Rate Expressed as C_6H_{14} (lbs/hr)	0.00514	0.00169	0.000136	0.0023
Emission Limit: 20 ppm @ 3% O_2 (Expressed as C_6H_{14})				

Table 2.2-2 Inlet NMOC Emissions Results

PARAMETER	RUN 1	RUN 4	RUN 5	AVERAGE
Date	9/01/10	9/01/10	9/01/10	
Time	1526-1625	1643-1742	1758-1857	
Stack Gas Parameters				
Flow Rate (scfm)	76.3	78.3	78.8	78
Non-Methane Organic Compounds (NMOC)				
TGNMO from Lab Report (ppm)	1113	1101	1139	1118
Emission Rate (lbs/hr)	1.14	1.16	1.20	1.2
Emission Limit: N/A				
TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmv C_6H_{14}.				

Table 2.2-3 NMOC Destruction Efficiency Results

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Outlet Emission Rate (lbs/hr)	0.00514	0.00169	0.000136	0.0023
Inlet Emission Rate (lbs/hr)	1.14	1.16	1.20	1.2
Destruction Efficiency (%)	99.549	99.854	99.989	**99.80**
				Emission Limit: 98% DRE

3.0 EMISSION UNIT INFORMATION

3.1 Emission and Control Unit Descriptions

The applicable information regarding the pollution control equipment is presented in Table 3.1-1.

Table 3.1-1 Control Equipment Information

ITEM	DESCRIPTION
Type of Control	Enclosed Flare
Manufacturer	John Zink Co.
Rated Capacity	900 scfm
Serial Number	N/A

3.2 Process Conditions and Estimated Stack Gas Parameters

The applicable operational parameters recorded during the testing program are presented in Table 3.2-1. Plant process data are presented in Appendix C.

Table 3.2-1 Applicable Process Rates and Operational Parameters

PARAMETER	RUN 1	RUN 2	RUN 3	AVERAGE
Gas Flow Rate (scfm)	76	78	79	78
Flare Temperature (°F)	1,170	1,176	1,172	1,173
Blower Inlet Temperature (°F)	92	93	91	92
Blower Outlet Temperature (°F)	105	106	105	105

3.3 Emission Point Information

The sample port locations and appropriate stack dimensions of the unit tested are shown in Figure 3.3-1.

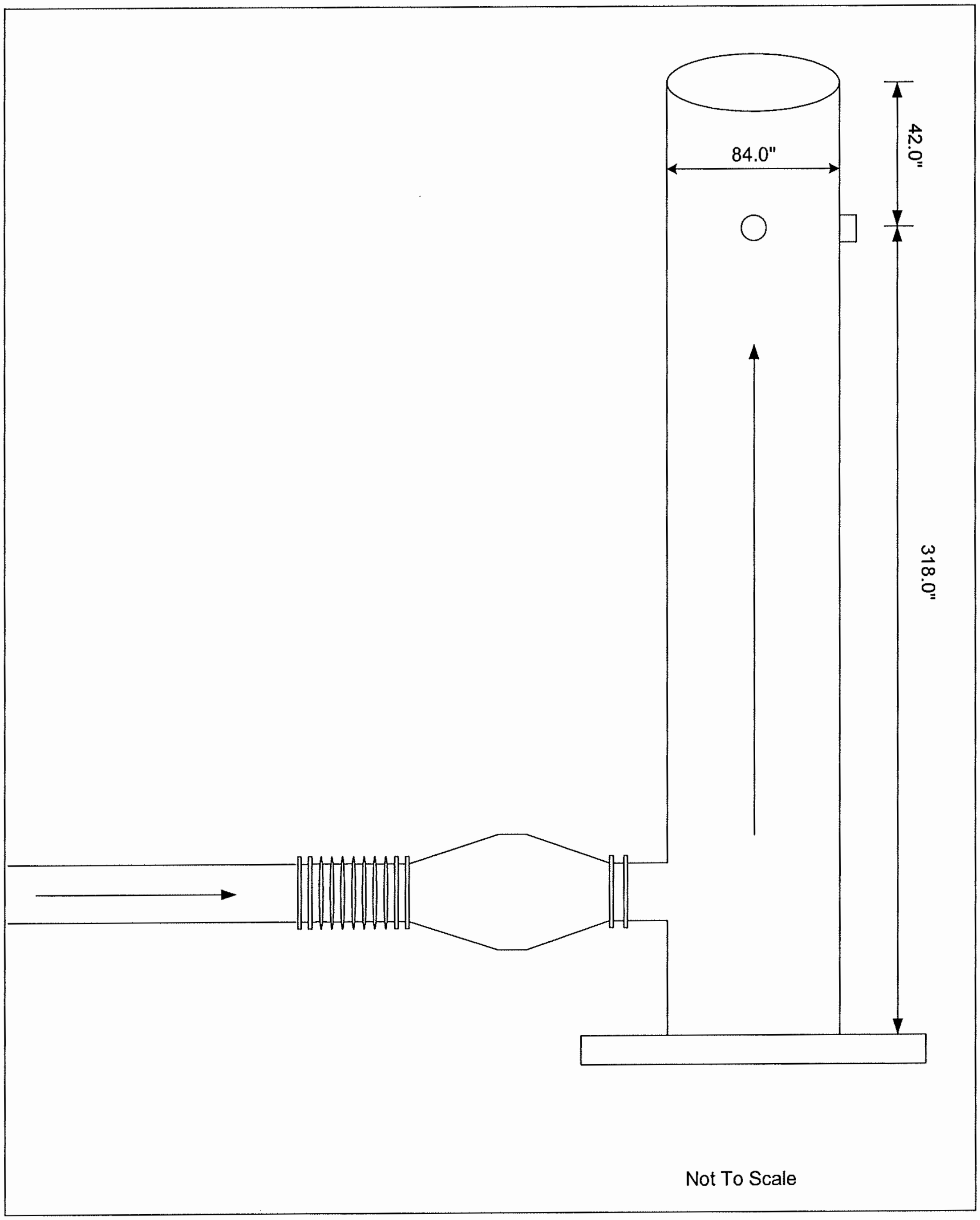

Figure 3.3-1 Stack sample port locations for the enclosed flare.

4.0 TESTING METHODS AND PROCEDURES

4.1 Testing Methods

The test methods used during the testing program are specified in Table 4.1-1. All tests conformed to the applicable methodologies specified in the appendices to 40 CFR Part 60. Testing consisted of three, 60 minute, RM test runs conducted simultaneously at the inlet and the outlet of the flare. Emissions were calculated as the average of the three test runs for destruction efficiency calculations and comparison with applicable emission limits. Destruction efficiency was calculated on a pound per hour mass basis.

Table 4.1-1 Test Methods

EMISSION UNITS	EMISSION SPECIES	TEST METHOD
Enclosed Flare Outlet	CO_2/O_2	EPA Method 3A
	NMOC	EPA Method 18/25A
	Flow Rate	EPA Method 19
Enclosed Flare Inlet	NMOC	EPA Method 18/25C
	Flow Rate	EPA Method 2D

The mass emission flow rate for the inlet was based on the waste gas consumption rates in scfm determined by EPA Method 2D and the TGNMO ppm value which was determined from the laboratory analysis of the LFG. The volumetric flow rate for the outlet was based upon EPA Method 19 assuming that contributions to fuel flow from the pilot burner were negligible (pilot only briefly fires at flare startup).

Since the flare was fired on LFG, differentiation of the organic compounds reporting methane and non-methane concentrations on the stack outlet was required. In order to achieve this, AEC collected integrated samples via tedlar bags and had them analyzed by a certified lab based on EPA Method 18. The difference between the total organic compounds (determined based on EPA Method 25A) and the methane (determined based on the composite sample analysis) was reported as total NMOC.

Methane and NMOC samples at the flare inlet were collected following the sampling procedures outlined in EPA Methods 18 and 25C. The LFG samples were collected over a sixty-minute period in Summa® canisters. The samples were collected using a stainless steel probe connected by Teflon tubing to the canister. The canisters were pre-treated and evacuated at the lab. Samples were collected using a calibrated orifice set to collect at a constant rate over a pre-determined period of time, in this case one-hour. The probe and sample line were purged with inlet gas continuously for approximately 5 minutes before sampling.

4.2 Sampling Equipment Description

The analyzers used during the test are presented in Table 4.2-1.

Table 4.2-1 Monitoring Equipment Descriptions

PARAMETER	ANALYZER MANUFACTURER	INSTRUMENT MODEL	OPERATING PRINCIPLE
O_2/CO_2	Servomex	Model 4900	Paramagnetic/Non-Dispersive IR
VOC	VIG Industries	Model 20/2	Flame Ionization Detector

4.2.1 Total Hydrocarbon Emission Sampling Equipment

Stack gas was extracted through a stainless steel in-stack probe with a single opening located within the 10 percent area of the stack cross-section, heated Teflon® tubing, and filter, and directed into the hydrocarbon analyzer. Excess stack gas was vented to the outside air. Zero and calibration gases were introduced into the sample line at the probe tip. A diagram of the total hydrocarbon gaseous sample train used during the test program is presented in Figure 4.2-1.

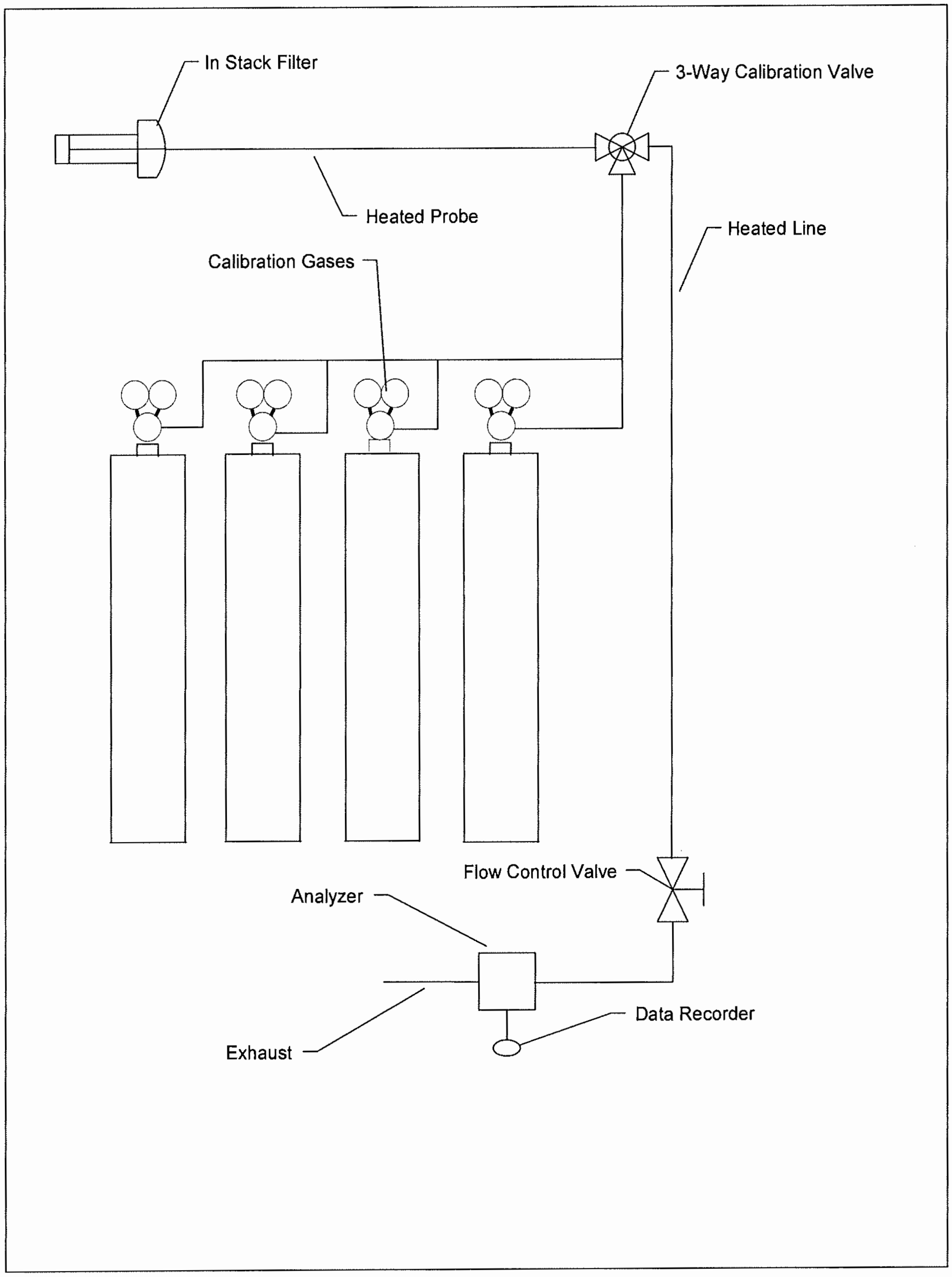

Figure 4.2-1 Schematic of VOC sampling system.

4.2.2 Gaseous Emission Sampling Equipment

Stack gas was extracted through a stainless steel in-stack probe, heated Teflon® tubing, and on-stack condenser that cools and dries the gas sample. Conditioned sample gas continued through Teflon® tubing to the gas manifold where it was distributed to the analyzers. Excess stack gas was vented to the outside air. Zero and calibration gases were introduced directly into each analyzer via the manifold, or directed to the probe tip for bias checks. The gas manifold was constructed of Teflon® tubing and stainless steel solenoids and fittings. A constant sample and calibration gas pressure was provided to each analyzer to avoid pressure variable response errors.

The entire sampling system was leak checked before the test program by obstructing the sample probe opening(s) and pulling ~25" Hg vacuum. Once the manifold rotometers indicate zero flow, the system was proven to be leak-free.

Each analyzer's linearity was checked with zero, mid-, and high-level calibration gases. The AEC sampling and analytical system was calibrated at the beginning and end of each test run. System bias was determined by pulling calibration gas through the entire sampling system. Individual test run calibrations used the calibration gas that most closely matched the flare's effluent. The multi-component gaseous sampling train is illustrated in Figure 4.2-2.

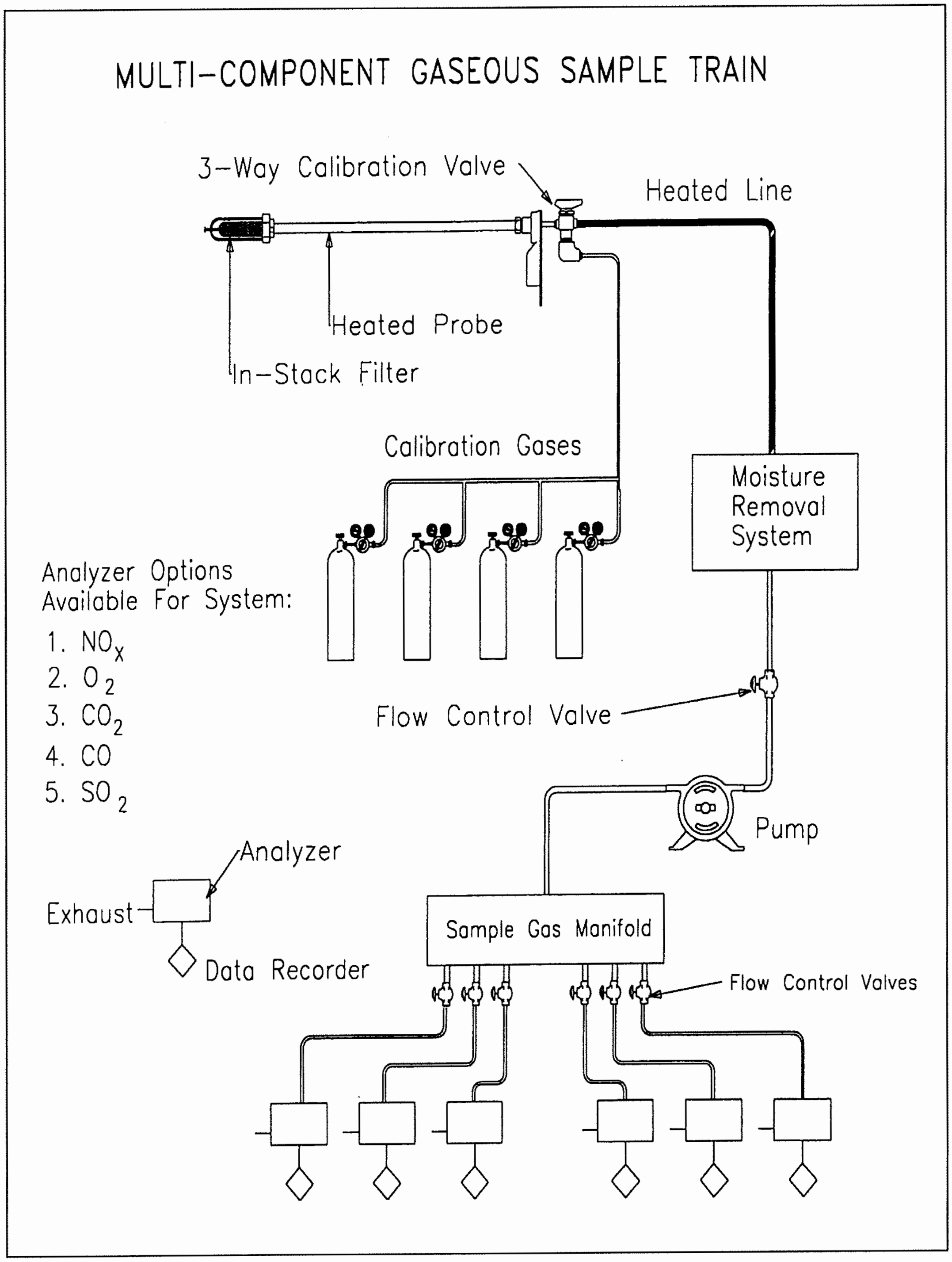

Figure 4.2-2 Schematic of gaseous sampling system.

4.3 Method Descriptions

This section is intended to provide an overview of the sampling strategy and does not attempt to summarize the sampling procedures, which are described in detail in the appendices to 40 CFR Part 60.

4.3.1 EPA Method 1: Sampling and Velocity Traverses for Stationary Sources

A preliminary source test site assessment was performed prior to the test in order to determine applicable sample point traverse locations. The stack diameter, and the distance from sample ports to the points of flow disturbance (i.e. bends, flanges, dampers, etc.), both upstream and downstream, were measured. This information was utilized to determine the minimum number of sampling points per traverse and the distance from the inner stack wall to each sample point location. Additionally, this method took into account cyclonic flow patterns and in-situ stratified pollutant concentrations.

4.3.2 EPA Method 2D: Measurement of Gas Volume Flow Rates

The LFG at the inlet of the flare was continuously directed through a rotameter to measure flow rate. The rotameter is internally compensated for temperature and pressure, thus giving flow rate readings at standard conditions.

4.3.3 EPA Method 3A: Determination of CO_2, O_2, and Dry Molecular Weight by Instrumental Analyzer

A gas sample was continuously extracted from the stack through a stainless steel sample probe into a condenser to cool and dry the sample, through the Teflon sample line, and continuous O_2 and CO_2 analyzers. Continuous O_2 and CO_2 measurements in percent were recorded on a data acquisition system. The O_2 and CO_2 analyzers were calibrated prior to sampling using zero, mid-range, and high range EPA Protocol gases. Following each test run, a sampling system bias check was performed by introducing zero and upscale (either mid-range or high range) EPA Protocol gas into the sampling system at the back end of the sample probe.

4.3.4 EPA Method 18: Determination of Gaseous Organic Compound Emissions

Stack gas was extracted from the stack outlet and the flare inlet through a stainless steel sample probe and/or a Teflon sample line into an evacuated Summa® canister. Samples were analyzed for methane concentrations using gas chromatography within 72 hours of sampling.

4.3.5 EPA Method 19: Determination of Emission Rates

The stack gas volumetric flow rate was determined based on the waste gas consumption, the F-factor, gross calorific values (40 CFR Part 60, Appendix A, Method 19, and LFG analysis), and the stack gas O_2 content utilizing the following equation:

$$DSCFM = \frac{Fuel(scfm) * \frac{Btu}{ft^3}}{1{,}000{,}000} * F\_factor * \frac{20.9}{20.9 - Stack\_O_2\%}$$

4.3.6 EPA Method 25A: Determination of Total Hydrocarbons

A gas sample was continuously extracted from the stack through a stainless steel sample probe and/or through heated Teflon® sample line, and into a flame ionization detection total hydrocarbon (THC) analyzer. Continuous THC measurements were recorded on a data acquisition system. The THC analyzer was calibrated and the instrument linearity was determined prior to sampling using zero, low-range, mid-range, and high-range EPA Protocol gases. Following each run, a sampling system bias check was performed by introducing zero and upscale (mid-range) EPA Protocol gas into the sampling system at the back end of the sample probe.

4.3.7 EPA Method 25C: Measurement of Gaseous Organic Compound Emissions by GC/Determination of Non Methane Organic Compounds

A gas sample was continuously extracted individually from the flare through an evacuated Summa® canister (as illustrated in EPA Method 25C, Figure 2). On completion of each run, the sample was labeled and transported to a certified laboratory. Analysis was performed within 72 hours of sampling. The analysis (EPA Method 25C) performed by Total Carbon Analysis/Flame Ionization Detector (TCA/FID) gives results of CH_4, CO_2, and total non-methane organics as CH_4. All NMOC were oxidized to CO_2 then reduced back to methane and then measured by flame ionization. All carbon contained in the original non-methane portion was therefore converted to methane and the results reported as total gaseous non-methane organics (TGNMO). Laboratory NMOC results are reported in ppm.

5.0 QUALITY ASSURANCE / QUALITY CONTROL

Quality assurance procedures were performed in accordance with those listed in the appropriate test method, the New Mexico Environment Department, Air Quality Bureau Air Pollution Control Rules and Regulations, and the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 3. The quality assurance procedures include:

AEC ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance program. The quality assurance procedures for the field work include, but are not limited to:

- Preparation and analysis of a full set of field blanks.
- Sample tracking through use of Chain of Custody forms.
- Complete multipoint calibration of gaseous analyzers using EPA Protocol gases.
- Zero and upscale bias checks of the gaseous analyzers before and after each test run.
- Assurance that the sample line heater operates properly.

APPENDIX A

Test Data Summaries

CONTINUOUS EMISSIONS MONITORING
TEST RESULTS

Client:	Caja Del Rio Land Fill
Test Date:	1-Sep-10
Start Time:	3:26 PM
End Time:	4:25 PM
Emissions Unit:	LFG Flare
Project:	B.A10233.00

RUN 1

Calibration Data

	O_2 - %		VOC - ppm	
	Zero	Upscale	Zero	Upscale
Certified Calibration Gas Value (C_V)	0.00	12.10	0.00	23.80
Direct Measured Response (C_{Dir})	0.06	12.11	-0.01	23.76
Calibration Span (CS)	23.00	23.00	100.00	100.00
Initial Bias Reading (C_S)	0.44	12.30	-0.29	22.97
Initial System Bias (SB_i) (%)	1.67	0.86	-0.29	-3.49
Final Bias Reading (C_S)	0.62	12.37	-0.13	23.14
Final System Bias (SB_{final}) (%)	2.42	1.16	-0.13	-2.76
Allowable Bias (%)	5.00	5.00	5.00	5.00
Drift (%)	0.75	0.30	0.15	0.17
Allowable Drift (%)	3.00	3.00	3.00	3.00
Analyte Mol Weight	32		44 (Propane)	

Stack Gas Parameters

Average Gas Fuel Flow (scfm)	76.3
Btu/ft^3	404
MMBtu/Min	0.03
$DSCF/10^6$ Btu (F-Factor)	9952
Flow rate (dscfm)	1,119

Emission Data

	O_2 - %	VOC - ppm
Average (uncorrected) (C_{Avg})	15.3	2.39
Average (drift corrected) (C_{Gas})	15.2	2.39
Methane from Lab Report		5.12
Methane as C_3H_8		1.71
NMOC as Propane		0.685
NMOC as Hexane		0.342
NMOC as C_6 @ 3% O_2		1.07
Total VOC as C_6 lbs/hr		0.0180
NMOC as C_6 lbs/hr		0.00514

CONTINUOUS EMISSIONS MONITORING
TEST RESULTS

Client:	Caja Del Rio Land Fill
Test Date:	1-Sep-10
Start Time:	4:43 PM
End Time:	5:42 PM
Emissions Unit:	LFG Flare
Project:	B.A10233.00

RUN 2

Calibration Data

	O_2 - %		VOC - ppm	
	Zero	Upscale	Zero	Upscale
Certified Calibration Gas Value (C_V)	0.00	12.10	0.00	23.80
Direct Measured Response (C_{Dir})	0.06	12.11	-0.01	23.76
Calibration Span (CS)	23.00	23.00	100.00	100.00
Initial Bias Reading (C_S)	0.62	12.37	-0.13	23.14
Initial System Bias (SB_i) (%)	2.42	1.16	-0.13	-2.76
Final Bias Reading (C_S)	0.68	12.43	-0.22	22.85
Final System Bias (SB_{final}) (%)	2.72	1.43	-0.22	-3.99
Allowable Bias (%)	5.00	5.00	5.00	5.00
Drift (%)	0.30	0.28	0.08	0.29
Allowable Drift (%)	3.00	3.00	3.00	3.00
Analyte Mol Weight	32		44 (Propane)	

Stack Gas Parameters

Average Gas Fuel Flow (scfm)	78.3
Btu/ft^3	397
MMBtu/Min	0.03
DSCF/10^6 Btu (F-Factor)	10071
Flow rate (dscfm)	1,087

Emission Data

	O_2 - %	VOC - ppm
Average (uncorrected) (C_{Avg})	15.1	2.17
Average (drift corrected) (C_{Gas})	14.9	2.17
Methane from Lab Report		5.81
Methane as C_3H_8		1.94
NMOC as Propane		0.232
NMOC as Hexane		0.116
NMOC as C_6 @ 3% O_2		0.345
Total VOC as C_6 lbs/hr		0.0158
NMOC as C_6 lbs/hr		0.00169

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CONTINUOUS EMISSIONS MONITORING
TEST RESULTS

Client:	Caja Del Rio Land Fill
Test Date:	1-Sep-10
Start Time:	5:58 PM
End Time:	6:57 PM
Emissions Unit:	LFG Flare
Project:	B.A10233.00

RUN 3

Calibration Data

	O_2 - %		VOC - ppm	
	Zero	Upscale	Zero	Upscale
Certified Calibration Gas Value (C_V)	0.00	12.10	0.00	23.80
Direct Measured Response (C_{Dir})	0.06	12.11	-0.01	23.76
Calibration Span (CS)	23.00	23.00	100.00	100.00
Initial Bias Reading (C_S)	0.68	12.43	-0.22	22.85
Initial System Bias (SB_i) (%)	2.72	1.43	-0.22	-3.99
Final Bias Reading (C_S)	0.73	12.57	-0.46	23.07
Final System Bias (SB_{final}) (%)	2.93	2.04	-0.46	-3.09
Allowable Bias (%)	5.00	5.00	5.00	5.00
Drift (%)	0.21	0.61	0.24	0.22
Allowable Drift (%)	3.00	3.00	3.00	3.00
Analyte Mol Weight	32		44 (Propane)	

Stack Gas Parameters

Average Gas Fuel Flow (scfm)	78.8
Btu/ft^3	326
MMBtu/Min	0.03
DSCF/10^6 Btu (F-Factor)	10599
Flow rate (dscfm)	913

Emission Data

	O_2 - %	VOC - ppm
Average (uncorrected) (C_{Avg})	15.0	1.63
Average (drift corrected) (C_{Gas})	14.7	1.63
Methane from Lab Report		4.82
Methane as C_3H_8		1.61
NMOC as Propane		0.0222
NMOC as Hexane		0.0111
NMOC as C_6 @ 3% O_2		0.0318
Total VOC as C_6 lbs/hr		0.00998
NMOC as C_6 lbs/hr		0.000136

CONTINUOUS EMISSIONS MONITORING
TEST RESULTS

Client:	Caja Del Rio Land Fill
Emissions Unit:	LFG Flare
Project:	B.A10233.00

RUN 1

Stack Gas Parameters

Average Inlet Gas Fuel Flow (scfm)	76.3

Emission Data

	VOC - ppm
TGNMO Concentration from Lab Report (ppmvC_6)	1113
TGNMO as C_6 lbs/hr	1.14

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC_6.

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CONTINUOUS EMISSIONS MONITORING
TEST RESULTS

Client: Caja Del Rio Land Fill
Emissions Unit: LFG Flare
Project: B.A10233.00

RUN 2

Stack Gas Parameters

Average Inlet Gas Fuel Flow (scfm)	78.3

Emission Data

	VOC - ppm
TGNMO Concentration from Lab Report (ppmvC_6)	1101
TGNMO as C_6 lbs/hr	1.16

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC_6.

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CONTINUOUS EMISSIONS MONITORING
TEST RESULTS

Client:	Caja Del Rio Land Fill
Emissions Unit:	LFG Flare
Project:	B.A10233.00

RUN 3

Stack Gas Parameters

Average Inlet Gas Fuel Flow (scfm)	78.8

Emission Data

	VOC - ppm
TGNMO Concentration from Lab Report ($ppmvC_6$)	1139
TGNMO as C_6 lbs/hr	1.20

TGNMO is total gaseous non-methane organics (excluding ethane), reported as $ppmvC_6$.

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APPENDIX B

CEM Data

Continuous Emissions Monitoring Data - ESC 8816 Data Logger

DATE	TIME	O_2	VOC	Notes
mm/dd/yy	*hh:mm*	*%*	*ppm*	
09/01/10	13:58	17.74	-4.18	
09/01/10	13:59	17.75	-4.37	
09/01/10	14:00	20.84	0.90	
09/01/10	14:01	20.81	0.76	
09/01/10	14:02	20.42	-0.09	
09/01/10	14:03	15.37	0.13	System Linearity Response
09/01/10	14:04	0.06	-0.91	
09/01/10	14:05	0.06	-0.38	
09/01/10	14:06	0.06	0.01	
09/01/10	14:07	0.06	-0.01	
09/01/10	14:08	0.06	0.16	
09/01/10	14:09	0.23	0.11	
09/01/10	14:10	11.56	0.76	
09/01/10	14:11	12.08	0.64	
09/01/10	14:12	12.10	0.62	
09/01/10	14:13	12.11	0.63	
09/01/10	14:14	12.02	0.41	
09/01/10	14:15	11.97	0.67	
09/01/10	14:16	14.38	1.07	
09/01/10	14:17	22.43	1.02	
09/01/10	14:18	22.96	0.81	
09/01/10	14:19	22.99	0.80	
09/01/10	14:20	22.77	0.44	
09/01/10	14:21	9.79	16.21	
09/01/10	14:22	0.16	24.90	
09/01/10	14:23	0.15	23.81	
09/01/10	14:24	0.14	23.79	
09/01/10	14:25	0.13	23.76	
09/01/10	14:26	0.12	23.77	
09/01/10	14:27	0.15	25.93	
09/01/10	14:28	0.12	41.03	
09/01/10	14:29	0.10	41.01	
09/01/10	14:30	0.06	41.12	
09/01/10	14:31	0.07	41.09	
09/01/10	14:32	0.09	33.86	
09/01/10	14:33	0.15	75.03	
09/01/10	14:34	0.10	80.88	
09/01/10	14:35	0.10	80.77	
09/01/10	14:36	0.09	80.86	
09/01/10	14:37	0.08	76.48	
09/01/10	14:38	0.76	52.13	
09/01/10	14:39	15.50	56.50	
09/01/10	14:40	16.77	66.44	
09/01/10	14:41	16.61	68.70	
09/01/10	14:42	16.88	34.34	
09/01/10	14:43	15.31	4.36	
09/01/10	14:44	15.92	34.43	
09/01/10	14:45	16.06	36.44	
09/01/10	14:46	16.00	25.22	
09/01/10	14:47	15.93	30.86	
09/01/10	14:48	16.00	14.22	
09/01/10	14:49	15.58	11.12	
09/01/10	14:50	16.17	27.87	
09/01/10	14:51	15.66	16.33	
09/01/10	14:52	15.48	10.06	

Continuous Emissions Monitoring Data - ESC 8816 Data Logger

DATE	TIME	O_2	VOC	Notes
mm/dd/yy	*hh:mm*	*%*	*ppm*	
09/01/10	14:53	15.53	13.51	
09/01/10	14:54	16.37	13.36	
09/01/10	14:55	16.07	13.74	
09/01/10	14:56	15.24	5.05	
09/01/10	14:57	15.34	6.82	
09/01/10	14:58	15.68	11.30	
09/01/10	14:59	15.12	10.49	
09/01/10	15:00	14.62	4.70	
09/01/10	15:01	16.20	12.49	
09/01/10	15:02	15.69	8.21	
09/01/10	15:03	15.75	11.87	
09/01/10	15:04	15.80	10.57	
09/01/10	15:05	16.84	17.67	
09/01/10	15:06	15.58	2.94	
09/01/10	15:07	14.92	1.12	
09/01/10	15:08	14.90	1.02	
09/01/10	15:09	15.55	2.78	
09/01/10	15:10	15.74	2.43	
09/01/10	15:11	16.27	2.74	
09/01/10	15:12	15.11	0.83	
09/01/10	15:13	7.78	4.11	
09/01/10	15:14	0.43	-0.09	
09/01/10	15:15	0.43	-0.20	
09/01/10	15:16	0.44	-0.29	
09/01/10	15:17	5.72	0.00	
09/01/10	15:18	12.29	0.26	
09/01/10	15:19	12.30	0.25	
09/01/10	15:20	12.30	0.19	
09/01/10	15:21	6.83	12.07	
09/01/10	15:22	0.52	22.91	
09/01/10	15:23	0.51	22.97	
09/01/10	15:24	7.89	13.58	
09/01/10	15:25	16.20	1.18	
09/01/10	15:26	15.61	2.15	Start Run 1
09/01/10	15:27	15.46	3.41	
09/01/10	15:28	15.54	2.87	
09/01/10	15:29	16.22	2.73	
09/01/10	15:30	15.37	2.25	
09/01/10	15:31	14.81	0.94	
09/01/10	15:32	15.22	2.29	
09/01/10	15:33	15.29	1.03	
09/01/10	15:34	16.01	2.17	
09/01/10	15:35	16.36	7.70	
09/01/10	15:36	16.45	3.17	
09/01/10	15:37	15.89	1.90	
09/01/10	15:38	15.31	0.99	
09/01/10	15:39	15.03	0.69	
09/01/10	15:40	15.08	1.27	
09/01/10	15:41	14.69	0.84	
09/01/10	15:42	14.85	1.33	
09/01/10	15:43	15.29	1.70	
09/01/10	15:44	15.18	0.92	
09/01/10	15:45	15.94	6.26	
09/01/10	15:46	15.17	1.44	
09/01/10	15:47	15.66	1.40	

Continuous Emissions Monitoring Data - ESC 8816 Data Logger

DATE	TIME	O_2	VOC	Notes
mm/dd/yy	*hh:mm*	*%*	*ppm*	
09/01/10	15:48	15.50	1.74	
09/01/10	15:49	15.15	2.54	
09/01/10	15:50	15.28	1.23	
09/01/10	15:51	14.88	1.77	
09/01/10	15:52	15.24	2.71	
09/01/10	15:53	15.02	2.86	
09/01/10	15:54	15.76	4.15	
09/01/10	15:55	15.89	3.60	
09/01/10	15:56	16.31	4.33	
09/01/10	15:57	16.21	3.95	
09/01/10	15:58	15.26	2.08	
09/01/10	15:59	14.98	2.54	
09/01/10	16:00	15.47	1.99	
09/01/10	16:01	14.75	1.64	
09/01/10	16:02	14.87	1.50	
09/01/10	16:03	15.68	3.94	
09/01/10	16:04	15.55	1.69	
09/01/10	16:05	15.04	1.66	
09/01/10	16:06	15.46	3.56	
09/01/10	16:07	14.74	0.71	
09/01/10	16:08	14.64	2.56	
09/01/10	16:09	14.91	2.61	
09/01/10	16:10	15.60	3.08	
09/01/10	16:11	15.27	1.66	
09/01/10	16:12	15.44	3.47	
09/01/10	16:13	15.44	1.76	
09/01/10	16:14	15.29	2.11	
09/01/10	16:15	15.50	2.60	
09/01/10	16:16	14.85	2.33	
09/01/10	16:17	15.69	2.43	
09/01/10	16:18	14.70	0.84	
09/01/10	16:19	14.78	1.71	
09/01/10	16:20	14.59	1.89	
09/01/10	16:21	14.93	2.52	
09/01/10	16:22	14.61	1.42	
09/01/10	16:23	15.36	5.27	
09/01/10	16:24	15.69	3.55	
09/01/10	16:25	15.46	2.06	End Run 1
Averages		**15.34**	**2.39**	
09/01/10	16:26	15.31	3.43	
09/01/10	16:27	15.51	3.15	
09/01/10	16:28	4.12	4.44	
09/01/10	16:29	0.61	0.86	
09/01/10	16:30	0.61	0.24	
09/01/10	16:31	0.61	0.00	
09/01/10	16:32	0.62	-0.13	
09/01/10	16:33	0.62	-0.25	
09/01/10	16:34	6.94	0.02	
09/01/10	16:35	12.37	0.26	
09/01/10	16:36	12.37	0.25	
09/01/10	16:37	7.44	11.14	
09/01/10	16:38	0.65	23.17	
09/01/10	16:39	0.64	23.14	
09/01/10	16:40	0.73	23.32	

Continuous Emissions Monitoring Data - ESC 8816 Data Logger

DATE	TIME	O_2	VOC	Notes
mm/dd/yy	*hh:mm*	*%*	*ppm*	
09/01/10	16:41	13.88	2.09	
09/01/10	16:42	14.69	0.63	
09/01/10	16:43	15.12	1.95	Start Run 2
09/01/10	16:44	15.42	4.34	
09/01/10	16:45	15.17	3.08	
09/01/10	16:46	15.12	2.46	
09/01/10	16:47	15.40	1.73	
09/01/10	16:48	15.45	2.90	
09/01/10	16:49	15.78	1.97	
09/01/10	16:50	15.48	3.66	
09/01/10	16:51	15.85	3.68	
09/01/10	16:52	15.77	2.05	
09/01/10	16:53	15.49	3.55	
09/01/10	16:54	14.79	1.63	
09/01/10	16:55	15.10	3.61	
09/01/10	16:56	14.93	1.42	
09/01/10	16:57	15.50	3.56	
09/01/10	16:58	15.43	2.75	
09/01/10	16:59	15.85	1.19	
09/01/10	17:00	15.51	2.24	
09/01/10	17:01	14.74	1.75	
09/01/10	17:02	14.99	2.69	
09/01/10	17:03	14.90	2.69	
09/01/10	17:04	14.86	1.83	
09/01/10	17:05	15.76	5.80	
09/01/10	17:06	15.33	0.52	
09/01/10	17:07	14.74	0.71	
09/01/10	17:08	14.57	0.62	
09/01/10	17:09	14.53	1.49	
09/01/10	17:10	15.12	3.57	
09/01/10	17:11	14.77	0.51	
09/01/10	17:12	14.93	1.06	
09/01/10	17:13	14.96	1.15	
09/01/10	17:14	14.67	1.90	
09/01/10	17:15	15.34	3.49	
09/01/10	17:16	15.34	5.91	
09/01/10	17:17	14.77	0.57	
09/01/10	17:18	14.73	1.15	
09/01/10	17:19	14.72	0.67	
09/01/10	17:20	15.06	1.25	
09/01/10	17:21	15.15	1.22	
09/01/10	17:22	15.08	1.64	
09/01/10	17:23	15.43	2.51	
09/01/10	17:24	14.92	2.17	
09/01/10	17:25	14.71	2.12	
09/01/10	17:26	14.92	2.70	
09/01/10	17:27	14.60	0.91	
09/01/10	17:28	14.76	1.88	
09/01/10	17:29	14.43	0.91	
09/01/10	17:30	15.15	2.34	
09/01/10	17:31	15.04	1.90	
09/01/10	17:32	14.95	2.86	
09/01/10	17:33	14.95	2.36	
09/01/10	17:34	14.91	1.31	
09/01/10	17:35	15.12	2.11	

Continuous Emissions Monitoring Data - ESC 8816 Data Logger

DATE	TIME	O_2	VOC	Notes
mm/dd/yy	*hh:mm*	*%*	*ppm*	
09/01/10	17:36	15.79	2.73	
09/01/10	17:37	15.20	1.61	
09/01/10	17:38	15.26	1.12	
09/01/10	17:39	14.84	1.71	
09/01/10	17:40	15.16	1.62	
09/01/10	17:41	14.75	0.83	
09/01/10	17:42	15.22	4.44	End Run 2
Averages		15.11	2.17	
09/01/10	17:43	7.46	2.83	
09/01/10	17:44	0.71	2.98	
09/01/10	17:45	0.71	0.77	
09/01/10	17:46	0.69	0.23	
09/01/10	17:47	0.69	-0.04	
09/01/10	17:48	0.68	-0.22	
09/01/10	17:49	5.92	0.03	
09/01/10	17:50	12.43	0.25	
09/01/10	17:51	12.43	0.22	
09/01/10	17:52	7.66	10.13	
09/01/10	17:53	0.72	22.85	
09/01/10	17:54	0.71	22.85	
09/01/10	17:55	2.07	19.76	
09/01/10	17:56	15.09	2.48	
09/01/10	17:57	15.51	2.92	
09/01/10	17:58	15.09	3.86	Start Run 3
09/01/10	17:59	15.61	3.98	
09/01/10	18:00	14.50	0.91	
09/01/10	18:01	14.78	1.65	
09/01/10	18:02	14.45	0.44	
09/01/10	18:03	15.01	2.29	
09/01/10	18:04	15.21	1.56	
09/01/10	18:05	15.11	0.54	
09/01/10	18:06	15.35	1.40	
09/01/10	18:07	14.73	1.13	
09/01/10	18:08	14.89	2.79	
09/01/10	18:09	14.54	0.53	
09/01/10	18:10	15.24	1.66	
09/01/10	18:11	14.67	0.87	
09/01/10	18:12	14.81	1.00	
09/01/10	18:13	14.84	0.83	
09/01/10	18:14	14.94	1.13	
09/01/10	18:15	15.33	2.47	
09/01/10	18:16	15.25	1.96	
09/01/10	18:17	15.14	1.11	
09/01/10	18:18	15.37	3.53	
09/01/10	18:19	15.07	1.69	
09/01/10	18:20	15.14	2.90	
09/01/10	18:21	14.74	1.41	
09/01/10	18:22	14.40	0.61	
09/01/10	18:23	14.86	2.55	
09/01/10	18:24	15.08	2.20	
09/01/10	18:25	15.04	0.60	
09/01/10	18:26	14.60	0.87	
09/01/10	18:27	14.93	1.47	
09/01/10	18:28	15.05	0.94	

Continuous Emissions Monitoring Data - ESC 8816 Data Logger

DATE	TIME	O_2	VOC	Notes
mm/dd/yy	*hh:mm*	*%*	*ppm*	
09/01/10	18:29	14.62	0.48	
09/01/10	18:30	14.85	0.95	
09/01/10	18:31	15.18	3.40	
09/01/10	18:32	15.34	2.69	
09/01/10	18:33	15.24	1.81	
09/01/10	18:34	15.53	4.77	
09/01/10	18:35	15.11	1.64	
09/01/10	18:36	15.27	1.58	
09/01/10	18:37	14.95	0.66	
09/01/10	18:38	15.36	2.99	
09/01/10	18:39	14.55	0.31	
09/01/10	18:40	14.97	1.71	
09/01/10	18:41	15.00	1.08	
09/01/10	18:42	15.53	4.68	
09/01/10	18:43	15.01	1.28	
09/01/10	18:44	15.37	2.20	
09/01/10	18:45	14.75	0.94	
09/01/10	18:46	15.33	2.03	
09/01/10	18:47	15.01	1.24	
09/01/10	18:48	14.85	0.89	
09/01/10	18:49	14.85	0.70	
09/01/10	18:50	14.86	1.05	
09/01/10	18:51	14.78	0.41	
09/01/10	18:52	15.09	1.08	
09/01/10	18:53	14.98	1.00	
09/01/10	18:54	14.96	0.40	
09/01/10	18:55	15.19	2.17	
09/01/10	18:56	15.19	1.93	
09/01/10	18:57	15.17	0.78	End Run 3
Averages		15.01	**1.63**	
09/01/10	18:58	15.17	1.30	
09/01/10	18:59	15.03	0.14	
09/01/10	19:00	15.18	2.61	
09/01/10	19:01	15.39	1.19	
09/01/10	19:02	9.51	1.94	
09/01/10	19:03	0.81	1.64	
09/01/10	19:04	0.78	0.25	
09/01/10	19:05	0.74	-0.19	
09/01/10	19:06	0.51	-0.44	
09/01/10	19:07	0.73	-0.46	
09/01/10	19:08	0.95	-0.46	
09/01/10	19:09	12.02	-0.16	
09/01/10	19:10	12.57	-0.14	
09/01/10	19:11	12.57	-0.17	
09/01/10	19:12	12.57	-0.25	
09/01/10	19:13	12.57	-0.28	
09/01/10	19:14	8.14	10.12	
09/01/10	19:15	0.75	22.71	
09/01/10	19:16	0.75	22.50	
09/01/10	19:17	0.75	23.14	
09/01/10	19:18	0.76	23.07	
09/01/10	19:19	0.76	20.69	
09/01/10	19:20	14.51	0.64	
09/01/10	19:21	21.24	0.16	

APPENDIX C

Laboratory Results

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

September 10, 2010 LTR/221n/10

Richard Walston
Applied Environmental
1553 W Elna Rae St.
Ste. 6
Tempe, AZ 85281

re: Casa Del Rio

Dear Richard:

Please find enclosed the laboratory analysis report and the original chain of custody form for three Tedlar bag samples received September 3, 2010.

The samples were analyzed for methane by FID/GC, as requested.

Sincerely,

AtmAA, Inc.

Michael L. Porter
Laboratory Director

Encl.
MLP/krm

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Methane Analysis in Tedlar Bag Samples

Report Date: September 10, 2010
Client: Applied Environmental Consultants
Site: Casa Del Rio
Location: Sante Fe, NM

Date Received: September 3, 2010
Date Analyzed: September 3, 2010

ANALYSIS DESCRIPTION

Hydrocarbon Speciation analysis was performed by flame ionization detection/gas chromatography (FID/GC), modified EPA-18.

AtmAA Lab No.:	12460-3	(repeat)	12460-4	12460-5		
Sample ID:	Run 1	Run 1	Run 2	Run 3		
	(Concentration in ppmv, component)					
Methane	5.12	5.17	5.81	4.82		

Michael L. Porter
Laboratory Director

CHAIN OF CUSTODY RECORD

APPLIED ENVIRONMENTAL CONSULTANTS, INC.

2465 W. 12th Street, Suite 6, Tempe, AZ 18281 ♦ Phone 480-829-0457 ♦ Fax 480-829-8985 ♦ www.aecinc.org

DATE

LAB NUMBER

Page ______ of ______

CLIENT: Casa Del Rio

PROJECT MANAGER: Richard Walston

ADDRESS

TELEPHONE NUMBER (AREA CODE): 480-829-0457

CITY: Santa Fe | STATE: NM | ZIP CODE

SITE CONTACT

PROJECT NAME

TELEPHONE NUMBER (AREA CODE)

CONTRACT/PURCHASE ORDER/QUOTE NO.

ANALYSES: Analysis for CH4 by EPA Method 18

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE LIQ	AIR	SOLID	No. of Containers	Analysis for CH4 by EPA Method 18						Sample Condition/ REMARKS
Run 1	9/1		10-0666		X		1	X						12460-3
Run 2	9/1		10-0667		X		1	X						4
Run 3	9/1		10-0668		X		1	X						5

DO THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN: None

SAMPLERS (SIGNATURE)	DATE	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME
[signature]	9/2/10		[signature]	9/2/10	
RECEIVED BY (SIGNATURE): J. Lusker, AAL	9-3-10		RELINQUISHED BY (SIGNATURE)		
RECEIVED BY (SIGNATURE)			RELINQUISHED BY (SIGNATURE)		
RECEIVED BY (SIGNATURE)			RELINQUISHED BY (SIGNATURE)		

RECEIVED FOR LABORATORY BY	RECEIVED	DATE	TIME	ACCEPTED	DATE	TIME

METHOD OF SHIPMENT

SPECIAL INSTRUCTIONS: Analysis For CH4 Only By EPA Method 18 report as ppm.

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

September 18, 2010 LTR/231n/10

Richard Walston
Applied Environmental
1553 W Elna Rae St.
Ste. 6
Tempe, AZ 85281

re: Casa Del Rio

Dear Richard:

Please find enclosed the laboratory analysis report, quality assurance summary, and the original chain of custody form for three SUMMA canister samples received September 7, 2010.

The samples were analyzed for permanent gases and TGNMO. BTU reports were prepared from these analysis results.

Sincerely,

AtmAA, Inc.

Michael L. Porter
Laboratory Director

Encl.
MLP/krm

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Permanent Gases and TGNMO Analysis in SUMMA Canister Samples

Report Date: September 18, 2010
Client: Applied Environmental
Site: SCS - Casa Del Rio
Location: Sante Fe, NM
Project No.: none given

Date Received: August 26, 2009
Date Analyzed: August 27, 2009

ANALYSIS DESCRIPTION

Permanent gases are measured by thermal conductivity detection/gas chromatography (TCD/GC), EPA 3C. TGNMO was measured by Method 25 analysis, FID/TCA, total combustion analysis.

AtmAA Lab No.:		12500-1	12500-2	12500-3		
Sample ID:		Run 1	Run 2	Run 3		
		(Concentration in %v)				
Methane		39.5	38.9	31.8		
Carbon Dioxide		43.8	44.3	46.4		
Nitrogen		14.0	14.1	16.6		
Oxygen		1.85	1.47	2.21		
		(Concentration in ppmvC)				
Ethane		10.75	5.57	7.05		
		(Concentration in ppmvC6)				
TGNMO		1113	1101	1139		

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC6.
Ethane is reported as ppmvC.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: SCS - Casa Del Rio
Date Received: September 7, 2010
Date Analyzed: September 10, - 16, 2010

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in %v)			
Methane	Run 1	40.0	38.9	39.5	1.4
	Run 2	38.8	38.9	38.9	0.13
	Run 3	31.8	31.7	31.8	0.16
Carbon Dioxide	Run 1	43.8	43.8	43.8	0.0
	Run 2	44.2	44.4	44.3	0.23
	Run 3	46.0	46.7	46.4	0.76
Nitrogen	Run 1	14.0	14.0	14.0	0.0
	Run 2	13.9	14.3	14.1	1.4
	Run 3	16.4	16.7	16.6	0.91
Oxygen	Run 1	1.92	1.78	1.85	3.8
	Run 2	1.49	1.44	1.47	1.7
	Run 3	2.17	2.24	2.21	1.6
		(Concentration in ppmv)			
Ethane	Run 1	10.9	10.6	10.8	1.4
	Run 2	6.14	5.00	5.57	10
	Run 3	7.04	7.06	7.05	0.14
		(Concentration in ppmvC6)			
TGNMO	Run 1	1130	1097	1113	1.5
	Run 2	1093	1108	1101	0.68
	Run 3	1162	1117	1139	2.0

Three SUMMA canister samples, laboratory numbers 12500-(1 - 3), were analyzed for permanent gases and TGNMO Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 18 repeat measurements from three canister samples is 1.4%.

Calculated values for Specific Volume, BTU and F (factor)

Report Date: September 18, 2010
Client: Applied Environmental
Project Location: SCS - Casa Del Rio
Date Received: September 7, 2010
Date Analyzed: September 10, - 16, 2010
AtmAA Lab No.: 12500-1 Run 1

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001 and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588 B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	39.47	20.90	Carbon	33.35
Carbon dioxide	43.82	63.82	Hydrogen	5.27
Nitrogen	14.01	12.99	Oxygen	48.29
Oxygen	1.77	1.88	Nitrogen	12.99
Argon	0.079	0.104	Argon	0.10
$(CH_2)_n$	0.668	0.310	Sulfur	0.00

Specific Volume	12.389
BTU/ft^3	404
BTU/ lb.	5005
F (factor)	9952

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	10.428	

* reference, Scott Specialty Gases Catalogue 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date:	September 18, 2010
Client:	Applied Environmental
Project Location:	SCS - Casa Del Rio
Date Received:	September 7, 2010
Date Analyzed:	September 10, - 16 2010
AtmAA Lab No.:	12500-2 Run 2

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue. 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	38.82	20.55	Carbon	33.27
Carbon dioxide	44.31	64.52	Hydrogen	5.18
Nitrogen	14.09	13.06	Oxygen	48.41
Oxygen	1.40	1.49	Nitrogen	13.06
Argon	0.062	0.082	Argon	0.08
$(CH_2)_n$	0.661	0.306	Sulfur	0.00

Specific Volume	12.328
BTU/ft^3	397
BTU/ lb	4898
F (factor)	10071

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	10.428	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: September 18, 2010
Client: Applied Environmental
Project Location: SCS - Casa Del Rio
Date Received: September 7, 2010
Date Analyzed: September 10, - 16, 2010
AtmAA Lab No.: 12500-3 Run 3

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	31.75	16.43	Carbon	30.58
Carbon dioxide	46.35	65.96	Hydrogen	4.15
Nitrogen	16.56	14.99	Oxygen	50.16
Oxygen	2.11	2.19	Nitrogen	14.99
Argon	0.094	0.121	Argon	0.12
$(CH_2)_n$	0.684	0.310	Sulfur	0.00

Specific Volume	11.839
BTU/ft^3	326
BTU/ lb.	3861
F (factor)	10599

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	10.428	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

CHAIN OF CUSTODY RECORD

APPLIED ENVIRONMENTAL CONSULTANTS,

1553 W. Elna Rae Street, Suite 6, Tempe, AZ 85281 ♦ Phone 480-829-0457 ♦ Fax 480-829-8985 ♦ www.aecinc.org

DATE 9/2/10

LAB NUMBER

Page ______ of ______

CLIENT: SCS - CAJA Del Rio

PROJECT MANAGER: Richard Walston

ADDRESS:

TELEPHONE NUMBER (AREA CODE): 480-829-0457

CITY: Santa Fe | STATE: NM | ZIP CODE:

SITE CONTACT:

PROJECT NAME:

TELEPHONE NUMBER (AREA CODE):

CONTRACT/PURCHASE ORDER/QUOTE NO.

ANALYSES

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE LIQ	AIR	SOLID	No. of Containers	EPA METHOD 25C	Fuel analysis					Sample Condition/ REMARKS
Run 1 146	9/1	3:25/4:25	12500-1		X		1	X	X					END VAC -6.0
Run 2 639	9/1	4:43/5:43	2		X		1	X	X					END VAC -6.0
Run 3 172	9/1	5:58/6:57	3		X		1	X	X					END VAC -6.0

DO THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN: NONE

SAMPLERS (SIGNATURE)	DATE	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME
[signature]	9/2/10	11:25	[signature]	9/2/10	11:25
RECEIVED BY (SIGNATURE): J. Luskey	DATE: 9-7-10	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY | RECEIVED | DATE | TIME | ACCEPTED | DATE | TIME

SHIP TO:
Mike Porter
AtmAA
23917 Craftsman Rd
Calabasas, CA 91302
818-223-3277

METHOD OF SHIPMENT

analysis FOR TOTAL VOC & NMOC Report as ppm C_6H_{14} (Hexane)

SPECIAL INSTRUCTIONS

Fuel analysis for Btu & F-Factor

APPENDIX D

Facility Process Data

Time	15:24	1537	1552	1623
Gas Flow Rate (scfm)	76	77	76	76
Flare Temperature (°F)	1170	1168	1169	1171
Blower Inlet Temperature (°F)	91	93	92	92
Blower Outlet Temperature (°F)	104	105	105	105

Time	1642	1718	1736	1743
Gas Flow Rate (scfm)	79	78	78	78
Flare Temperature (°F)	1182	1172	1173	1175
Blower Inlet Temperature (°F)	92	92	93	93
Blower Outlet Temperature (°F)	105	106	106	106

Time	1758	1814	1836	1850
Gas Flow Rate (scfm)	79	79	78	79
Flare Temperature (°F)	1173	1177	1168	1170
Blower Inlet Temperature (°F)	92	92	90	90
Blower Outlet Temperature (°F)	106	105	104	103

APPENDIX E

Quality Assurance Data

CONTINUOUS EMISSIONS MONITORING

QUALITY ASSURANCE RESULTS

Client: Caja Del Rio Land Fill
Test Date: 1-Sep-10
Emissions Unit: LFG Flare
Project: B.A10233.00

Leak Check Performed? Yes

NO_X Converter Checked? N/A

System Linearity Results

O_2 (%)	Cylinder Concentration	Gas Concentration % of Span	Analyzer Calibration Response	Calibration Span	Absolute Difference	Analyzer Calibration Error	Allowable Difference	PASS/FAIL
Zero	0.00	0%	0.06	23.00	0.06	0.25%	2.00%	PASS
Medium	12.10	53%	12.11	23.00	0.01	0.02%	2.00%	PASS
High	23.00	100%	22.99	23.00	0.01	0.06%	2.00%	PASS

VOC (ppm)	Cylinder Concentration	Gas Concentration % of Span	Analyzer Calibration Response	Calibration Span	Absolute Difference	Calibration Error	Allowable Difference	PASS/FAIL
Zero	0.00	0%	-0.01	100.0	0.01	0.01%	5.00%	PASS
Low	23.80	23.8%	23.76	100.0	0.04	0.16%	5.00%	PASS
Medium	40.40	40.4%	41.12	100.0	0.72	1.79%	5.00%	PASS
High	80.50	80.5%	80.86	100.0	0.36	0.45%	5.00%	PASS
Span Value	100.00							

Definitions:

Analyzer Calibration Error, means the difference between the manufacturer certified concentration of a calibration gas and the measured concentration of the same gas when it is introduced into the analyzer in direct calibration mode.

Calibration Span, means the upper limit of valid instrument response during sampling. To the extent practicable, the measured emissions should be between 20 to 100 percent of the selected calibration span.

AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: CC180739

Customer: ALA-CSL-PHOENIX
Location: PHOENIX, AZ

P.O. Number: APPLIED ENVIRO

Shipping Order Number: 29285525
Transfer Number: 29285525
Lot Number: SFS120370
Valve: CGA 350
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 7-May-2008
Expiration Date: 7-May-2011

Components	Requested Concentration	Assay Concentration
Nitrogen	**Balance**	**Balance**
Propane	**24 ppm**	**23.8 ± 0.4 ppm**

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty			Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
49.54	± 0.39	ppm	Propane	Nitrogen	CC60959	SFS100036	2-Mar-2009	AF	GMIS

Analytical Data

Component:	Propane		FIRST TRIAD ANALYSIS	7-May-2008		
Analyzer Information			Trial 1	Trial 2	Trial 3	Units
Analyzer Type:	Series II Gas Chromatograph	Zero	0.0000	0.0000	0.0000	ppm
Manufacturer:	Hewlett Packard	Reference	48.545	48.461	48.590	ppm
Model Number:	5890A	Candidate	23.309	23.292	23.320	ppm
Serial Number:	3336A54620	Result	23.79	23.81	23.78	ppm
MPR Last Calibrated:	6-May-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD			Mean Analytical Result:	23.79	ppm

Analyst: Aidan Ifland

Approved by: Tan Ngo

AIR LIQUIDE AMERICA, L.P. 8832 Dice Road, Santa Fe Springs, CA 90670-2516
Phone: (562) 945-1383 • Fax: (562) 693-1156

AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: CC261612

Customer: ALA-CSL-PHOENIX
Location: PHOENIX, AZ

P.O. Number: APPLIED ENVIRO

Shipping Order Number: 29285525
Transfer Number: 29285525
Lot Number: SFS120372
Valve: CGA 350
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 7-May-2008

Expiration Date: 7-May-2011

Components	Requested Concentration	Assay Concentration
Nitrogen	**Balance**	**Balance**
Propane	**40 ppm**	**40.4 ± 0.6 ppm**

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
49.54 ± 0.39 ppm	Propane	Nitrogen	CC60959	SFS100036	2-Mar-2009	AF	GMIS

Analytical Data

Component:	Propane		FIRST TRIAD ANALYSIS 7-May-2008			
~~Analyzer Information~~			Trial 1	Trial 2	Trial 3	Units
Analyzer Type:	Series II Gas Chromatograph	Zero	0.0000	0.0000	0.0000	ppm
Manufacturer:	Hewlett Packard	Reference	48.545	48.461	48.590	ppm
Model Number:	5890A	Candidate	39.598	39.539	39.599	ppm
Serial Number:	3336A54620	Result	40.41	40.42	40.37	ppm
MPR Last Calibrated:	6-May-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD			Mean Analytical Result:	40.40	ppm

Analyst: Aidan Ifland

Approved by: Tan Ngo

AIR LIQUIDE AMERICA, L.P. 8832 Dice Road, Santa Fe Springs, CA 90670-2516
Phone: (562) 945-1383 • Fax: (562) 693-1156

AIR LIQUIDE

SPECIALTY GASES

Scott

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: ALM027103

Customer: A L PHOENIX
Location: PHOENIX, AZ

P.O. Number: AEC

Shipping Order Number: 34151498
Transfer Number: 34151498
Lot Number: SFS133465
Valve: CGA 350
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 10-Aug-2009

Expiration Date: 10-Aug-2012

Components	Requested Concentration	Assay Concentration
Nitrogen	**Balance**	**Balance**
Propane	**80 ppm**	**80.5 ppm ± 2% NIST TRACEABLE**

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
99.5 ± 0.9 ppm	Propane	Air	ALM011356	1668	15-Aug-2009	970114	NTRM

Analytical Data

Component:	Propane		FIRST TRIAD ANALYSIS 10-Aug-2009			
Analyzer Information			Trial 1	Trial 2	Trial 3	Units
Analyzer Type:	Series II Gas Chromatograph	Zero	0.011	0.011	0.010	ppm
Manufacturer:	Hewlett Packard	Reference	98.052	98.067	98.052	ppm
Model Number:	5890A	Candidate	79.383	79.377	79.368	ppm
Serial Number:	3336A54620	Result	80.48	80.48	80.47	ppm
MPR Last Calibrated:	3-Aug-2009	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD				Mean Analytical Result:	80.47 ppm

Analyst: ____________________ David Connolly

Approved by: ____________________ Thuan Tran

AIR LIQUIDE AMERICA, S.G. 8832 Dice Road, Santa Fe Springs, CA 90670-2516
Phone: (562) 945-1383 • Fax: (562) 693-1156

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

AIR LIQUIDE

Scott Specialty Gases

8832 DICE ROAD, SANTA FE SPRINGS, CA 90670-2516 Phone: 800-323-2212 Fax: 562-464-5262

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
8832 DICE ROAD
SANTA FE SPRINGS, CA 90670-2516

P.O. No.: CORIS DOC# 36284275
Project No.: 02-68899-001

Customer

ALA CSL PHOENIX
RECERT CYLS AEC
301 SOUTH 45TH AVE
PHOENIX AZ 85043

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: CC52603 **Certification Date:** 04Feb2010 **Exp. Date:** 03Feb2013
Cylinder Pressure*:** 2000 PSIG **Batch No:** SB00012909

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
CARBON DIOXIDE	12.2 %	+/- 2%	NIST and VSL
OXYGEN	12.1 %	+/- 2%	NIST and VSL
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol procedures , September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1675	02Oct2012	K016600	13.93 %	CARBON DIOXIDE
NTRM 2658	02Oct2010	ALM065035	9.930 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN B/3400/2806	02Feb2010	FID & TCD
VARIAN B/3400/2806	22Jan2010	FID & TCD

APPROVED BY: JMU

AIR LIQUIDE Air Liquide America Specialty Gases LLC SCOTT™

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

8832 DICE ROAD, SANTA FE SPRINGS, CA 90670-2516 Phone: 800-323-2212 Fax: 562-464-5262

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
8832 DICE ROAD
SANTA FE SPRINGS, CA 90670-2516

P.O. No.: CORIS DOC# 36388502
Project No.: 02-69213-001

Customer

AEC

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: AAL14028 **Certification Date:** 01Mar2010 **Exp. Date:** 28Feb2013
Cylinder Pressure*:** 2000 PSIG **Batch No:** SBO0014159

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
CARBON DIOXIDE	23.1 %	+/- 2%	NIST and VSL
OXYGEN	23.0 %	+/- 2%	NIST and VSL
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol procedures , September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2300	02Jan2012	K009943	23.01 %	CARBON DIOXIDE
NTRM 2360	01May2013	K027039	23.48 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN B/3400/2806	02Feb2010	FID & TCD
VARIAN B/3400/2806	23Feb2010	FID & TCD

APPROVED BY: [signature]
DC

Page 1 of 1

APPENDIX F

Sample Calculations

SAMPLE CALCULATIONS

1.0 NOMENCLATURE AND CONSTANTS

CE	Analyzer calibration error
C_{ave}	Average unadjusted gas concentration indicated by data recorder for the test run, ppmv
AR	Measured concentration of a calibration gas (low, and mid) , ppmv
CV	Actual concentration of the calibration gas, ppmv
C_S	Calibration Span, ppmv
D	Drift assessment, percent of span value
S_{bi}	Pre-run system bias
S_{bf}	Post-run system bias

2.0 EQUATIONS AND SAMPLE CALCULATIONS

2.1 Calibration Error Test (per EPA Method 25A, Section 8.4)

	Cylinder Concentration Value (CV)	Analyzer Response (AR)	Calibration Error (CE)	Allowable Difference
Zero Gas	0.0	-0.01	N/A	N/A
High-Level Gas	80.5	80.86	N/A	N/A
Span Value	100.0			

$$CE = ((CV - AR) / CV) \times 100$$

Low-Level Gas	23.8	23.76	0.17%	5.00%
Mid-Level Gas	40.4	41.12	1.78%	5.00%

2.2 Drift Determination (per EPA Method 25A, Section 8.6.2)

	Initial Bias Response		Final Bias Response			
	Cylinder Concentration Value	Analyzer Response (S_{bi})	Cylinder Concentration Value	Analyzer Response (S_{bf})	Analyzer Drift (D)	Allowable Difference
Zero Gas	0.0	-0.29	0.0	-0.13	0.16%	3.00%
Low-Level Gas	23.8	22.97	23.8	23.14	0.17%	3.00%
Span Value (C_S)	100.0					

$$D = (S_{bi} - S_{bf}) / C_S$$

2.3 Calculations and Data Analysis (per EPA Method 25A, Section 12.0)

$C_{ave} =$	2.39
Average Gas Fuel Flow (scfm) (Method 2D)	76.3
Btu/ft^3 from Laboratory Analysis	404
MMBtu/Min	0.0308

$$\boxed{MMBtu/min = (scfm \times Btu/ft^3)\ /\ 1000000}$$

$DSCF/10^6$ Btu (F-Factor) from Laboratory Analysis	9952
Flow rate (dscfm) from EPA Method 19	1,125
Stack Gas O_2 %	15.2

$$\boxed{dscfm = MMBtu/min \times F\text{-}Factor \times (20.9\ /\ (20.9\text{-}Stack\ O_2\ \%))}$$

Average (uncorrected) (C_{Avg})	2.39
Methane from Lab Report	5.12
Methane as C_3 (C / C_3)	1.71
NMOC as C_3	0.68
NMOC as C_6 (C_3 / C_6)	0.34
NMOC as C_6 lbs/hr	0.00516
Molecular Weight of C_6H_{14}	86.177

$$\boxed{lbs/hr = ppm \times mol.\ wt. \times dscfm \times 1.557^{10\text{-}7}}$$

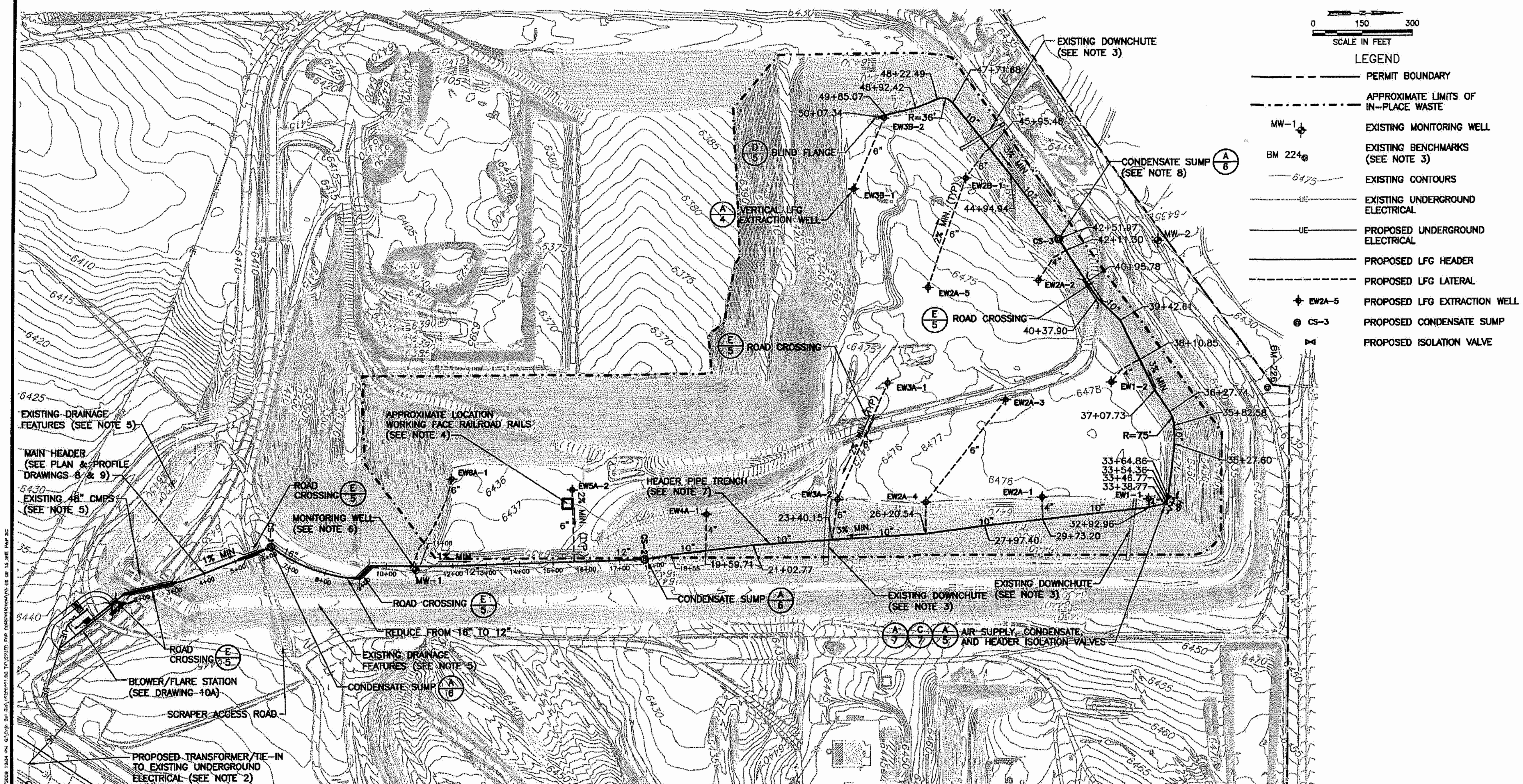
NMOC as C_6 @ 3% O_2	1.07

$$\boxed{ppm\ @\ 3\%\ O_2 = ppm \times ((20.9\text{-}3)\ /\ (20.9\text{-}\ Stack\ O_2\ \%))}$$

ATTACHMENT B

COLLECTION SYSTEM DIAGRAM (40 CFR §60.757(g)(1))

F:\Projects\Caja Del Rio, SFSWMA\16209118.00 Engineering\Task 2 - Source Testing\R101110 Source Test Transmittal.doc



NOTES:

1. THE BACKGROUND TOPOGRAPHY SHOWN ON THIS PLAN WAS PREPARED BY AERIAL PHOTOGRAPHY ON MARCH 2, 2009 BY METROPOLITAN AERIAL SURVEY HORIZONTAL CONTROL FOR THIS SURVEY IS BASED ON A SITE GRID AND BENCHMARKS AS PROVIDED BY MORRIS SURVEYING ENGINEERING.

2. CONTRACTOR SHALL MAKE ELECTRICAL CONNECTIONS TO EXISTING UG ELECTRIC LINE AT THE APPROXIMATE LOCATION SHOWN ON THIS DRAWING, AND AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS, SECTION 15090 – LFG FLARE AND EQUIPMENT SKIDS. WHERE PROPOSED ELECTRICAL LINE CROSSES THE MAIN HAUL ROAD, THE CONTRACTOR SHALL REPAIR AND REPLACE EXISTING ROADWAY TO IT'S ORIGINAL CONDITION TO THE SATISFACTION OF THE OWNER.

3. AS DESCRIBED ON DRAWING 2, CONTRACTOR SHALL INSTALL HEADER 2 FEET BELOW THE FLOWLINE OF THE EXISTING DOWNCHUTES AND IMMEDIATELY REPAIR THE DOWNCHUTES TO THE ORIGINAL CONDITION.

4. A SET OF RAILROAD RAILS WAS PLACED IN AN AREA ABOUT 30'x30' IN THIS APPROXIMATE LOCATION. THE ELEVATION OF THESE RAILROAD RAILS IS ABOUT 6435'–6440' MSL. IF PROBLEMS ARE ENCOUNTERED DURING DRILLING CONTACT ENGINEER FOR GUIDANCE.

5. THE DRAINAGE CHANNELS ON THE EAST AND SOUTH SIDE OF THE LANDFILL WERE UNDER CONSTRUCTION DURING THE PREPARATION OF THESE CONSTRUCTION PLANS. THEREFORE, PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY THE DEPTH OF THE EXISTING CULVERT AND LOCATION OF THE CHANNELS AS THEY RELATE TO THE LOCATION AND DEPTH OF THE PROPOSED LANDFILL GAS PIPE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN FIELD CONDITIONS AND DEPTHS AND LOCATIONS OF HEADER PIPE.

6. THE LOCATIONS OF THE GROUNDWATER MONITORING WELLS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY LOCATIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCY BETWEEN THE LOCATION OF MW-1 AND INSTALLATION OF THE MAIN HDPE HEADER, AS SHOWN ON DRAWING 3. DAMAGE TO MONITORING WELLS SHALL BE REPLACED OR REPAIRED AT THE EXPENSE OF THE CONTRACTOR.

7. ALL OUTER LOOP HEADER AND HEADER PIPE TO FLARE WILL ALSO HAVE AIR AND CONDENSATE FORCEMAIN INSTALLED.

8. THE BOTTOM OF CONDENSATE SUMP CS-3 HAS BEEN DESIGNED TO BE 10 FEET ABOVE THE TOP OF LINER AT THIS LOCATION. THE TOP OF LINER IS 6423 FT MSL AT THE LOCATION SHOWN ON THE PLANS, WHICH IS BASED ON AS-BUILT LINER ELEVATIONS PROVIDED TO SCS BY MORRIS SURVEYING AND ENGINEERING. PRIOR TO TRENCHING FOR HEADER INSTALLATION AND EXCAVATING AND INSTALLING CS-3, THE CONTRACTOR SHALL STAKE THE HEADER AND SUMP AND PROVIDE SUGGESTED BOTTOM OF HEADER TRENCH (I.E., SUMP TIE-IN ELEVATIONS) AND BOTTOM OF SUMP ELEVATION TO ENGINEER FOR REVIEW AND APPROVAL.

DAVID J. MEZZACAPPA
NEW MEXICO
15236
REGISTERED PROFESSIONAL ENGINEER
8/25/09

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
1	07/09	REVISE FLARE CALLOUT	DM
2	08/09	REMOVE OPEN FLARE OPTION	DM

DRAWING TITLE: LFG COLLECTION SYSTEM SITE LAYOUT PLAN

PROJECT TITLE: CONSTRUCTION PLANS PHASE 1 - LANDFILL GAS (LFG) COLLECTION SYSTEM

CLIENT: SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
PH: (505) 421-1850

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS

DATE: 08/2009

SCALE: AS SHOWN

DRAWING NO. 3

APPENDIX A.3
NMED SUBPART WWW FLEXIBILITIES

New Mexico
ENVIRONMENT DEPARTMENT

Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, NM 87507-3113
Phone (505) 476-4300
Fax (505) 476-4375
www.nmenv.state.nm.us

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

May 29, 2009

David Mezzacappa
SCS Engineers
1901 Central Drive, Suite 550
Bedford, TX 76021

RE: Santa Fe Solid Waste Management Agency, Caja del Rio Landfill

Dear David:

The NMED Air Quality Bureau has reviewed

Request for Alternative Procedures, 40 CFR 60, Subpart WWW
Standards of Performance for Municipal Solid Waste Landfills
Prepared for:
Santa Fe Solid Waste Management Agency
Caja del Rio Landfill

originally submitted in March, 2009 and revised May 29, 2009, a copy of which is attached to this letter.

The alternative procedures are approved as revised.

Sincerely,

Scott Vail
Staff Manager, Compliance Inspections

Attachment: May 29, 2009 revised alternative procedures

SECTION 3.0

REQUEST FOR ALTERNATIVE PROCEDURES
40 CFR 60, SUBPART WWW
STANDARDS OF PERFORMANCE FOR MUNICIPAL SOLID WASTE LANDFILLS

SUBMITTED IN ACCORDANCE WITH
40 CFR §60.752(b)(2)(i)(B)

Prepared for:
Santa Fe Solid Waste Management Agency
Caja del Rio Landfill
149 Wildlife Way
Santa Fe, New Mexico 87506
(505) 424-1850

Prepared by:
SCS Engineers
1901 Central Drive, Suite 550
Bedford, Texas 76021
(817) 571-2288

SCS File No. 1620800100.T1

SECTION 3.0
REQUEST FOR ALTERNATIVE PROCEDURES

INTRODUCTION

Per 40 CFR §60.752(b)(2)(i)(B), the design plan shall include proposed alternatives to the prescriptive monitoring, record keeping and reporting requirements in the NSPS. This section addresses exemptions/alternatives proposed in this submittal.

Operational Standards

1) Section 60.753(a) Operational Standards for Collection and Control Systems: *"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:*

- *5 years or more if active; or*
- *2 years or more if closed or at final grade."*

In some cases SFSWMA may need or wish to install wells at an accelerated pace compared to NSPS installation requirements. Since these wells will have been installed in advance of NSPS requirements, SFSWMA proposes that surface scans will not be performed over such areas and that the monitoring results from such wells will not be subject to NSPS requirements or reported with other NSPS data for wells that were installed in areas where waste has been in place for less than 5 years (active areas) or 2 years (closed areas or areas at final grade) until these time periods have expired.

It should be noted, however, that although the monitoring data for such wells will not be subject to NSPS requirements or reported with other NSPS data, each such well will still be monitored for pressure, temperature, and oxygen content on a minimum monthly basis. These monitoring readings will be recorded and available for NMED inspection on-site for a minimum of 5 years to match the records retention requirements for typical NSPS wellfield monitoring data.

2) Section 60.753(b)(3) Operational Standards for Collection and Control Systems (Formalization of the process to decommission or abandon a well): *"A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows."*

NSPS rules contain no special procedures for decommissioning a well. This request for alternative procedures would formalize the process to be used for decommissioning a well subject to NSPS requirements.

It should be noted that decommissioning is not meant to be used in the same way as the term "abandonment" here. A decommissioned well is simply shut down for a period of time (by fully closing the well valve or by disconnecting the well from the collection lateral) but is maintained for potential future use. This might be necessary if, for example, a well's temperature becomes elevated and it is turned off as a remedial method for a period of time, or if a well is shut down based on poor gas quality until the gas is able to recharge sufficiently.

With this revision, when a well needs to be decommissioned for any reason, this reason will be noted in the monthly monitoring report and the well shut down. The well will, however, still be monitored on a monthly basis per NSPS requirements. Although the pressure may be positive for a decommissioned well, the temperature and oxygen levels must still continue to meet and be monitored according to NSPS rules and requirements. In many cases, the well may be temporarily opened during a monitoring event or left open only very slightly to relieve pressure buildup. Additionally, quarterly surface scans will still be conducted as if the well was still active to make sure fugitive landfill gas emissions are still controlled.

If a well remains decommissioned for six consecutive months, then a notification to NMED will be included in the first semi-annual NSPS report after this six-month consecutive period of decommissioning. This notification will describe whether the well is proposed for abandonment or will provide a plan as to how this well will eventually be brought back online. This notification will allow NMED the option to respond to SFSWMA with a request for further follow-up or information requests, etc.

Unless SFSWMA requests otherwise, normal procedure will be to re-drill any abandoned well within 6 months. As with a decommissioned well, the area around an abandoned well will still be subject to surface scan requirements.

3) Section 60.753(c)(2) Operational Standards for Collection and Control Systems: *"...oxygen shall be determined by an oxygen meter using Method 3A or 3C..."*

This item is simply included to clarify that Method 3C will be used, which enables the use of a gas chromatograph (GC) or a GEM-500 or GEM-2000, to measure oxygen concentrations. The proposed method is the typical procedure for landfills throughout the country.

4) Section 60753(d) Operational Standards for Collection and Control Systems: *"...A surface monitoring design plan shall be developed...Areas with steep slopes or other dangerous areas may be excluded from surface testing.*

It is proposed to exclude dangerous areas such as active roads, the active working face area, truck traffic areas, and slopes steeper than 4H:1V and/or dangerous slopes due to surface features/conditions from surface testing as set forth here and in the surface monitoring section of this plan. Any such areas will be noted on a map including the reason that the area was considered dangerous during the monitoring event. Such information will be submitted with the quarterly surface monitoring report which will be included in the semi-annual NSPS reports that will be transmitted to NMED.

Compliance Provisions

5) Section 60.755(a)(3) Compliance Provisions: *"...shall measure gauge pressure in the gas collection header at each individual well, monthly."*

This would seem to indicate that the pressure is to be measured on the header side of the wellhead valve instead of the well side of the wellhead valve (landfill side). Other sections of the NSPS rule simply state "at the wellhead." In order to prevent confusion between regulators and operators, the facility proposes to measure each well's gauge pressure on the landfill side. This represents a more conservative approach.

6) Section 60.755(a)(3) and (5) Compliance Provisions (Formalization of the process to request an alternate timeline for a well monitoring exceedance): *"...action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under §60.753(b). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement..." and "...action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement..."*

NSPS rules require that, if a well shows an exceedance in pressure, temperature, or oxygen requirements, that action must be taken within 5 days and that re-monitoring must show that within 15 days that the well is within compliance. If compliance is not achieved within 15 days, a new well (or construction repair) must be in place within 120 days; however, some exceedances cannot be remedied within the allowable 15-day timeframe or new construction completed within the 120-day timeframe. An example of this would be if a lateral needs repair and pipe must be ordered, or if a well becomes watered-in and must be pumped down over a number of days. Weather or drilling equipment availability may also be a limiting factor; especially during the winter months. Table 4 below provides general procedures that will be followed when an initial exceedance of the NSPS-required parameters for oxygen, pressure, or temperature is measured. These procedures are listed for each parameter in the order that they might typically be implemented.

Table 4
General Actions to be Taken for Landfill Gas Well Exceedances

NSPS Parameter	General Response to Exceedance
Oxygen	• Reduce vacuum to well to prevent over-pulling which may introduce air. • Inspect well, piping, and surrounding landfill surface for damage (e.g.. broken hose or surface cracks) that could introduce air into the well and repair. • Evaluate internal well condition using measuring tape or water level meter to determine if casing is pinched or kinked or if wellscreen is watered-in due to elevated liquid level. If pinched or kinked and repair is impracticable, then abandonment of well may be necessary. Elevated liquid levels can be addressed by pumping fluids out of the well. • If high oxygen persists after implementing above actions, then decommission well to see if production recovers or high oxygen trend can be reversed.
Pressure	• Increase vacuum to well in an attempt to achieve negative pressure and allow for more landfill gas collection. • Measure lateral vacuum to ensure that adequate vacuum is available to well and confirm that lateral pipe is not watered-in or damaged. If blockage of lateral pipe is determined, then schedule and implement repair or replacement of lateral. • If no blockage is found check to make sure piping and blowers are not undersized. This can be done by tracking the vacuum throughout the wellfield and looking for trends as portions of the wellfield become more

Table 4
General Actions to be Taken for Landfill Gas Well Exceedances

NSPS Parameter	General Response to Exceedance
	remote.
Temperature	• Reduce vacuum to well to prevent over-pulling which may introduce air and increase temperature. • Inspect well and surrounding landfill surface for damage (e.g., broken hose or surface cracks) that could introduce air into the well and repair. • If high temperature persists decommission well to see if temperature drops. • Evaluate potential for a fire. If data in addition to temperature indicates the likelihood of fire, notify NMED promptly and decommission well while additional steps are assessed. • Some wells operate at higher temperatures with no evidence of a fire. If this appears to be the case after a thorough investigation, consider preparing a high operating value (HOV) request for that well to submit to NMED. This request should include historical monitoring data along with the results from all investigations of possible fire-related causes.

When an extension to the aforementioned 120-day timeframe is necessary, a notification to the file for an alternate timeline will be prepared. Each notification will contain a detailed explanation of the proposed alternate timeline with a plan of action and dates for anticipated final action. Each notification will be prepared for the landfill files by the end of the month following the month when the original exceedance was detected. Each notification will be provided to NMED in the first semi-annual NSPS report after the time for which the notification was prepared. If this procedure is followed, no deviation or exceedance will have occurred if the 15-day or 120-day timeframe (whichever is requested) is not met. This procedure will eliminate the need for interim paperwork and frequent NMED approval for individual wells. Instead, NMED may review the notification and details provided (as well as any follow-up data provided) with the semi-annual reports and respond to SFSWMA with further follow-up requirements, information requests, etc.

It should be noted that throughout any requested alternate timeline period, monthly well monitoring and recording of these values will continue. However, once an alternate timeline is filed because of a specific parameter, the 5-day action period and 15-day re-monitoring for that parameter would not be required for subsequent months until the end of the alternate timeframe request.

7) Section 60.755(a)(4) Compliance Provisions: *"Owners or operators are not required to expand the system as required in paragraph (a)(3) of this section during the first 180 days after gas collection system startup."*

The GCCS shown in this design plan will be built in phases. The installation of additional wells can cause challenges with the balancing of the entire system and therefore, additional time may be needed to achieve proper operating conditions. It is proposed to expand this condition to include the installation of new wells or the replacement of existing wells. During this 180-day time period, these new wells would be exempt from system expansion required as a result of exceedances of the pressure, temperature, or oxygen concentrations recorded during monthly monitoring.

8) Section 60.755(a)(5) Compliance Provisions: *"For the purposes of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in §60.753(c). If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days."*

Since this provision in the regulations allows the site to monitor for oxygen or nitrogen, and since most monitoring equipment to be used measures oxygen directly (as opposed to nitrogen which is usually assumed from a balance gas total) the landfill will measure oxygen, not nitrogen, for compliance with this provision unless otherwise indicated.

9) Section 60.755(c)(4)(v) Compliance Provisions (Formalization of the process to request an alternate remedy for a surface scan exceedance): *"For any location where monitored methane concentrations equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall 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."*

NSPS rules require that, if a surface scan exceedance occurs three times within a quarter, that a new well or collection device (or other constructed gas system improvement) must be in place within 120 days; however, in some cases the construction cannot be completed in this timeframe or other methods may be used in an attempt to mitigate the exceedance (i.e. upgrading the blower).

When an extension to the 120-day NSPS timeframe is necessary or another alternative remedy proposed, a notification to the file for alternate remedy and installation timeline will be prepared. Each notification will be prepared for the landfill files by the end of the month following the third exceedance within the quarter. Each notification will be provided to NMED in the first semi-annual NSPS report after the time for which the notification was prepared. Each notification will contain a detailed explanation of the proposed alternate remedy and/or timeline, with a plan of action and dates for anticipated final action. If this procedure is followed, no deviation or exceedance will have occurred if the 120-day timeframe is not met.

It should be noted that throughout any requested remedy period, quarterly surface scans will continue and the location for which the exceedance occurred will be included in the scan. However, once an alternate remedy is filed, that particular location will not require 10 or 30-day re-monitoring for any exceedances during quarterly surface scans during the alternate remedy period.

Reporting Requirements

10) Section 60.757(f)(3) Reporting Requirements: *"Description and duration of all periods when the control device was not operating for a period exceeding one hour and length of time the control device was not operating."*

This item is actually a clarification based upon experience from submitting numerous NSPS annual and semi-annual reports. The provision listed here is separate from 60.757 (f)(4) which requires reporting of all periods when the collection system was not operating in excess of 5 days. It should be noted that these two rules differ in that one references the control device and the other references the collection system. These NSPS provisions were purposely written this way because 60.757(f)(3) is meant to refer *only* to cases where the control device is down but the overall collection system is still operating.

Therefore, this request is included here to clarify that, for NSPS reporting purposes, it will be assumed that this reporting requirement is for the case where the collection system is operating but the control device is not operating such that uncombusted landfill gas is being vented for a period in excess of 1 hour.

Miscellaneous

11) Individual Well Monitoring in Dangerous Areas

NSPS regulations do not address individual well monitoring which takes place in potentially dangerous areas. Daily conditions exist, especially for active landfills, which pose safety concerns for field technicians such as waste filling/compacting operations, cap construction operations, raised wells, and seasonal weather-related dangers, etc. Because the health and safety of personnel must be considered tantamount, the facility must be given wide latitude in making dangerous area determinations.

Therefore, the facility proposes to temporarily exclude any dangerous areas from individual well monitoring. Such unsafe areas will be documented by site personnel in the wellfield monitoring records as reasons for not monitoring individual wells. It is proposed that the facility be allowed up to 30 days from cessation of filling activity or other dangerous activity in a designated area to bring new or disconnected/decommissioned infrastructure back online. If additional time is needed the well will be decommissioned or abandoned per the procedures set forth in this plan until normal operation can proceed.

12) Alternative Control Device (Intermittent Operation)

Although it is anticipated that the installed control device will be sized with a minimum range such that intermittent operation will not be required during the first phase of GCCS construction, there have been situations where, when fewer wells are constructed or flows were lower than anticipated, that the system could not be operated continuously. If gas collection rates are lower than expected, the facility may elect to operate the control device on an intermittent basis with timed cycles for GCCS operation. The GCCS would be operated when landfill gas quantities are available and sustainable and would go off-line when landfill gas supplies have been depleted to the point that the flare cannot operate within NSPS regulations or when excessive air intrusion occurs. Free venting would not be possible during off-line time periods. The use of this unique type of control device setup will require certain exemptions to NSPS regulations. The exemptions requested for this type of control device are listed in the following paragraphs.

Wellhead Standards and Surface Scan Requirements
Alternatives to the standards for wellheads set forth in 40 CFR 60.753(b) and (c). These rules require that wellheads must maintain temperatures less than 55° C (131° F), oxygen concentrations less than 5 percent by volume, and operate at negative pressures at all times. When a control device that operates in cycles, it may not be possible to achieve compliance with these rules at all times.

Therefore, if SFSWMA elects to use a control device that operates under timed cycles, the facility requests to be exempt from these requirements when the control device is off-line.

Please note that the request for exemption from these rules would not affect the facility's compliance with 40 CFR 60.753(d), which states that the GCCS must be operated such that the methane concentration is less than 500 parts per million (ppm) above background at the surface of the landfill. In fact, to make sure that the intermittent operation schedule was properly set so as to not allow excessive surface emissions, during the first quarter of intermittent operation surface scans would be performed on a monthly basis as opposed to quarterly. The results of these scans would be considered in setting the intermittent operation schedule. All monitoring results, including any follow-up for areas showing 500 ppm concentrations, would be included in the semi-annual NSPS report along with a description of how the results impacted or confirmed the selected schedule for intermittent operation.

Monitoring of Operations

Pursuant to 40 CFR 60.756, any owner or operator using an enclosed combustor shall maintain and operate a temperature monitoring device equipped with a continuous recorder as well as a gas flow rate measuring device that records the flow to the control device at least every 15 minutes. If the facility elects to install a control device which operates in timed, intermittent cycles, the GCCS will not be operating full-time. Therefore, the facility requests to be exempt from these requirements during off-line hours.

Recordkeeping Requirements

Semi-annual reports are to be submitted to the Administrator pursuant to 40 CFR 60.757, which includes a description and duration of all periods when the control device was not operating for a period exceeding 1 hour during which time the control device was not operating. These records, including scheduled downtimes due to intermittent flare operation will be documented in the facility's Startup, Shutdown, and Malfunction (SSM) Plan and reported in semi-annual SSM reports.

APPENDIX B
SURFACE EMISSIONS MONITORING PLAN

APPENDIX B
SURFACE EMISSIONS MONITORING PLAN

B INTRODUCTION

Per ***§60.763(d)***, as indicated in Section B.2 below, this appendix constitutes the formal "surface emissions monitoring (SEM) plan" for the Caja del Rio Landfill.

B.1 COMPLIANCE WITH SEM OPERATIONAL STANDARDS §60.763(d)

§60.763(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 specification provided in §60.765(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 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.*

As indicated above, this appendix constitutes the SEM Plan (Plan). Drawing B.1 at the end of this Plan shows the proposed route for surface emissions monitoring (including a background topographical map) at landfill completion. Prior to each monitoring event, SFSWMA or its consultant will conduct route planning where the best route for that round of monitoring will be decided. This will be decided based on Site operating conditions and topographical features at the time of each monitoring event.

As required by §60.763(d), the owner or operator will conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specification provided in §60.765(d). This quarterly surface testing will be performed to determine that the landfill gas (LFG) collection and control system (GCCS) is being operated so that the methane concentration is less than 500 parts per million (ppm) above background at the surface of the landfill.

The surface testing will be conducted around the perimeter of the required GCCS collection area (e.g., areas with 5 year old refuse and/or areas with 2 year old refuse that are at final grade) and along a pattern that traverses the landfill at 30-meter intervals and where visual observations indicate elevated concentrations of LFG, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations.

Openings (penetrations) that are within an area of the landfill where waste has been placed and a GCCS is required will be monitored.

> *A **"penetration"** under this GCCS Design Plan will be defined as any landfill gas collection well or landfill gas collection device included in the GCCS Design Plan that completely passes through the landfill cover into waste and is located within an area of the landfill where waste has been placed and a gas collection system is required. Cover penetrations do not include items such as survey stakes, fencing or litter fencing, flags, signs, trees, and utility poles.*

For the purposes of monitoring "any openings," "openings" is defined under this Plan to mean any cover penetration as defined above and any area where waste has been placed, and a GCCS is required by NSPS XXX, that visually exhibits distressed vegetation and cracks and seeps in the cover.

Excluded areas from surface monitoring will include dangerous areas with roads, truck traffic areas, paved areas excluding cracks, steep slopes, areas covered with snow or ice, and active filling areas of the landfill due to the health and safety risk of working around heavy equipment traffic. Prior to each monitoring event, route planning will be completed where excluded areas will be delineated and any modifications to the route will be recorded. Any deviations to the proposed route will be recorded and included in the annual NSPS reports.

B.2 COMPLIANCE WITH SEM COMPLIANCE PROVISIONS §60.765(c) and (d)

§60.765(c) *The following procedures must be used for compliance with the surface methane operational standard as provided in § 60.763(d).*

> *(1) After installation and startup of the gas collection system, the 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 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 § 60.763(d).*

(i) The location of each monitored exceedance must be marked and the location and concentration recorded.
(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 remonitored 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 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 ppm 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 remonitoring 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.

§60.765(c)(1) requires quarterly monitoring of the surface of the NSPS-required GCCS area for methane. Quarterly monitoring will take place along the entire perimeter of the required collection area and along a serpentine pattern spaced 30 meters apart for each collection area on a quarterly basis. This monitoring will be performed using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section and detailed below.

Per §60.765(c)(2), the background concentration will be determined immediately prior to conducting the survey. The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at least 30 meters from the outermost perimeter wells. The background concentration, measurement location, basic meteorological conditions, and any other factors that could affect the background concentration may also be noted.

Per §60.765(c)(3) and Section 8.3.1 of Method 21, the surface monitoring shall be performed by moving the probe along the landfill surface (using the mapped route) while observing the instrument readout. The probe must be placed within 5 to 10 centimeters of the ground. If the maximum observed meter reading is greater than 500 ppm, record and report the result. As previously mentioned, monitoring will not be performed during extreme meteorological conditions. Monitoring will be rescheduled as soon as practicable if it cannot be conducted because conditions are outside of what could reasonably be considered as typical.

If a reading in excess of 500 ppm is recorded, the following actions shall be taken (as long as these actions are taken, the exceedance is not a violation of the operational requirements of 60§ 60.763(d)):

1) The location of the monitored exceedance shall be marked, the concentration measured, and the location recorded. The location must be noted with 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 5 decimal places.

2) Cover maintenance or adjustments to the vacuum of the adjacent wells will be performed to increase gas collection in the vicinity of each exceedance. The location will then be re-monitored within 10 calendar days of detecting the exceedance.

3) If the re-monitoring of the location shows a second exceedance, additional corrective action will be taken and the location will 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 item (5) to follow will be taken, and no further monitoring of that location is required until the action specified in item (5) is taken.

4) Any location that initially showed an exceedance, but has a methane content less than 500 ppm methane above background at the 10-day re-monitoring will also be monitored 1 month from the initial exceedance. If the 1 month re-monitoring shows a concentration less than 500 ppm above background, no further monitoring of the location is required until the next quarterly monitoring period. If the 1 month re-monitoring shows an exceedance, the actions specified in item (5) to follow will be taken.

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

§60.765(c)(5) requires a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis. This may be performed during surface scan events quarterly to cover those months. During surface scan events, the monitoring technician will also look for signs of compromised cover integrity such as stressed vegetation, cracks, and erosion. If performed during the quarterly scans, the inspection should be documented in the surface scan monitoring form and appropriate Site personnel be notified so that appropriate actions can be taken.

§60.765(d) *Each owner or operator seeking to comply with the provisions in paragraph (c) of this section or § 60.764(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 of appendix A of this part must be used.*
> *(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.*

The monitoring will be conducted with an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications located in 40 CFR §60.765(d):

> The portable analyzer must meet the instrument specifications provided in Section 6 of Method 21 of Appendix A of this part, except that "methane" shall replace all references to "VOC."

To meet the performance evaluation requirements in Section 6 of Method 21, the instrument evaluation procedures of Section 8.1 of Method 21 will be used. Also, the calibration procedures provided in sections 8 and 10 of Method 21 of appendix A of this part will be followed immediately before commencing a surface monitoring survey. The performance evaluation results include response factor, calibration precision, and response time. The calibration gas shall be methane, diluted to a concentration of 500 parts per million in air. These results will be documented for each monitoring event.

B.3 COMPLIANCE WITH SEM MONITORING PROVISIONS §60.766(f)

§60.766(f) *Each owner or operator seeking to demonstrate compliance with the 500 parts per million surface methane operational standard in § 60.763(d) must monitor surface concentrations of methane according to the procedures in § 60.765(c) and the instrument specifications in § 60.765(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 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.*

Sections B.2 and B.3 of this Plan discuss the operational standards, monitoring requirements, and instrument specifications cited in §60.766(f).

40 CFR §60.766(f) also allows for any closed landfill that has no monitored exceedances of the 500 ppm limit above background in three consecutive quarterly monitored periods after landfill closure to

reduce the monitoring frequency to annually. Any methane reading of 500 ppm or more above the background detected during an annual monitoring event shall automatically return the frequency back to a quarterly frequency. This provision may be exercised if the surface scans meet these criteria after landfill closure.

B.4 COMPLIANCE WITH SEM REPORTING REQUIREMENTS §60.767(g)(5)

§60.765(g)(5) *The location of each exceedance of the 500 parts per million methane concentration as provided in § 60.763(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. 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.*

As provided in Section B.3 of this Plan, the location of each monitored exceedance of the 500 parts per million methane concentration will be marked and the location recorded. The location will be noted with 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 5 decimal places.

APPENDIX B.1
SURFACE MONITORING ROUTE DRAWING

LEGEND:

- LANDFILL PROPERTY BOUNDARY
- PERMITTED WASTE DISPOSAL LIMIT
- EXISTING CONTOURS (SEE NOTE 1)
- PERMITTED FINAL GRADES (SEE NOTE 1)
- MONITORING ROUTE

NOTES:

1. SURROUNDING AERIAL TOPOGRAPHIC MAP INFORMATION PROVIDED BY PRECISION SURVEYS, INC., ALBUQUERQUE, NM. DATE OF FLIGHT DECEMBER 21, 2016. PERMITTED FINAL COVER GRADES PROVIDED BY CDM SMITH. ALL GRADES ARE FEET ABOVE MEAN SEA LEVEL.
2. THE SURFACE SCAN SHOWN HERE IS AN EXAMPLE. AS LONG AS THE ROUTE MEETS THE REQUIREMENTS SET FORTH IN THE GCCS DESIGN PLAN AND NSPS RULES, IT MAY VARY FROM THE EXACT ROUTE SHOWN HERE.

For Compliance Purposes

DAVID J. MEZZACAPPA NEW MEXICO 15236 PROFESSIONAL ENGINEER

11/21/17

Exp. 12/31/18

REV	DATE	DESCRIPTION	BY

DRAWING TITLE
SURFACE MONITORING ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING PLAN

CLIENT
SANTA FE SOLID WASTE MANAGEMENT AGENCY
149 WILDLIFE WAY
SANTA FE, NM 87506-8342
PH: (505) 421-1850

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
500 MARQUETTE AVE. NW, SUITE 1200
PH (505) 424-1850

PROJ. NO. 16214041.00	DWN. BY: AGA	Q/A RVW BY: RRK
DSN. BY: DJM	CHK. BY: DJM	APP. BY: DJM

CADD FILE: B.1 - SEM ROUTE

DATE: 11/2017

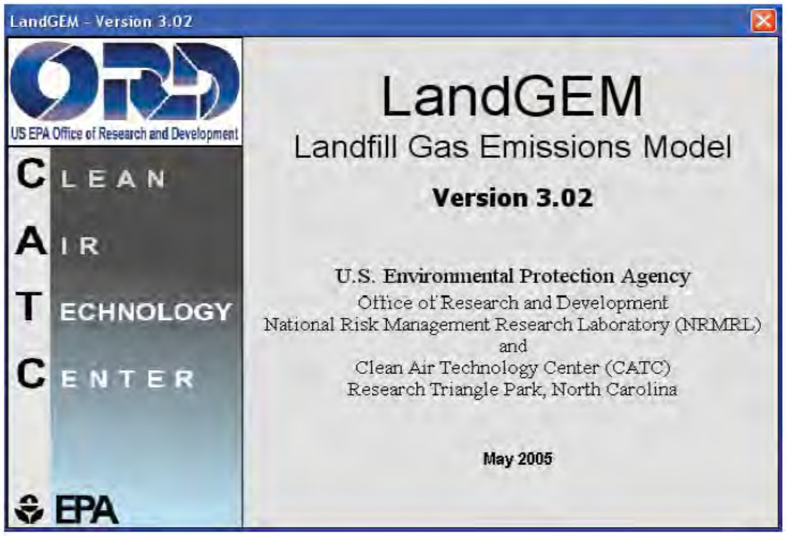
SCALE: AS SHOWN

DRAWING NO. B.1

APPENDIX C
LANDGEM MODELING AND HEADER SIZING CALCULATIONS

For Compliance Purposes
DAVID J. MEZZACAPPA
NEW MEXICO
15236
Exp. 12/31/18
PROFESSIONAL ENGINEER
11/21/17
Inclusive of Appendices C.1 through C.3

APPENDIX C.1
LANDGEM MODEL



Summary Report

Landfill Name or Identifier: Caja Del Rio Landfill

Date: Thursday, November 09, 2017

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation (*m^3/year*)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate (*$year^{-1}$*)
L_o = potential methane generation capacity (*m^3/Mg*)

M_i = mass of waste accepted in the i^{th} year (*Mg*)
t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1997**	
Landfill Closure Year (with 80-year limit)	**2037**	
Actual Closure Year (without limit)	***2037***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity		*short tons*

MODEL PARAMETERS

Methane Generation Rate, k	**0.020**	*year $^{-1}$*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**1,610**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1997	75,364	82,900	0	0
1998	125,990	138,589	75,364	82,900
1999	138,812	152,693	201,354	221,489
2000	148,840	163,724	340,165	374,182
2001	158,580	174,438	489,005	537,906
2002	160,922	177,014	647,585	712,344
2003	168,567	185,424	808,507	889,358
2004	181,831	200,014	977,075	1,074,782
2005	175,811	193,392	1,158,905	1,274,796
2006	174,652	192,117	1,334,716	1,468,188
2007	187,407	206,148	1,509,368	1,660,305
2008	184,639	203,103	1,696,775	1,866,453
2009	165,934	182,527	1,881,415	2,069,556
2010	137,628	151,391	2,047,348	2,252,083
2011	137,370	151,107	2,184,976	2,403,474
2012	135,426	148,969	2,322,346	2,554,581
2013	136,841	150,525	2,457,773	2,703,550
2014	143,011	157,312	2,594,614	2,854,075
2015	138,889	152,778	2,737,625	3,011,387
2016	143,925	158,318	2,876,514	3,164,165
2017	146,804	161,484	3,020,439	3,322,483
2018	149,740	164,714	3,167,243	3,483,967
2019	152,735	168,008	3,316,983	3,648,681
2020	155,790	171,368	3,469,718	3,816,690
2021	158,905	174,796	3,625,507	3,988,058
2022	162,083	178,292	3,784,413	4,162,854
2023	165,325	181,858	3,946,496	4,341,146
2024	168,632	185,495	4,111,821	4,523,003
2025	172,004	189,205	4,280,453	4,708,498
2026	175,444	192,989	4,452,457	4,897,703
2027	178,953	196,849	4,627,902	5,090,692
2028	182,532	200,786	4,806,855	5,287,540
2029	186,183	204,801	4,989,387	5,488,326
2030	189,907	208,897	5,175,570	5,693,127
2031	193,705	213,075	5,365,477	5,902,024
2032	197,579	217,337	5,559,181	6,115,099
2033	201,530	221,683	5,756,760	6,332,436
2034	205,561	226,117	5,958,290	6,554,119
2035	209,672	230,639	6,163,851	6,780,237
2036	213,866	235,252	6,373,524	7,010,876

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2037	218,143	239,957	6,587,389	7,246,128
2038	0	0	6,805,532	7,486,085
2039	0	0	6,805,532	7,486,085
2040	0	0	6,805,532	7,486,085
2041	0	0	6,805,532	7,486,085
2042	0	0	6,805,532	7,486,085
2043	0	0	6,805,532	7,486,085
2044	0	0	6,805,532	7,486,085
2045	0	0	6,805,532	7,486,085
2046	0	0	6,805,532	7,486,085
2047	0	0	6,805,532	7,486,085
2048	0	0	6,805,532	7,486,085
2049	0	0	6,805,532	7,486,085
2050	0	0	6,805,532	7,486,085
2051	0	0	6,805,532	7,486,085
2052	0	0	6,805,532	7,486,085
2053	0	0	6,805,532	7,486,085
2054	0	0	6,805,532	7,486,085
2055	0	0	6,805,532	7,486,085
2056	0	0	6,805,532	7,486,085
2057	0	0	6,805,532	7,486,085
2058	0	0	6,805,532	7,486,085
2059	0	0	6,805,532	7,486,085
2060	0	0	6,805,532	7,486,085
2061	0	0	6,805,532	7,486,085
2062	0	0	6,805,532	7,486,085
2063	0	0	6,805,532	7,486,085
2064	0	0	6,805,532	7,486,085
2065	0	0	6,805,532	7,486,085
2066	0	0	6,805,532	7,486,085
2067	0	0	6,805,532	7,486,085
2068	0	0	6,805,532	7,486,085
2069	0	0	6,805,532	7,486,085
2070	0	0	6,805,532	7,486,085
2071	0	0	6,805,532	7,486,085
2072	0	0	6,805,532	7,486,085
2073	0	0	6,805,532	7,486,085
2074	0	0	6,805,532	7,486,085
2075	0	0	6,805,532	7,486,085
2076	0	0	6,805,532	7,486,085

Results

Year	Total landfill gas			Methane		
	(Mg/year)	(m^3/year)	(av ft^3/min)	(Mg/year)	(m^3/year)	(av ft^3/min)
1997	0	0	0	0	0	0
1998	3.731E+02	2.988E+05	2.007E+01	9.966E+01	1.494E+05	1.004E+01
1999	9.894E+02	7.923E+05	5.323E+01	2.643E+02	3.961E+05	2.662E+01
2000	1.657E+03	1.327E+06	8.915E+01	4.426E+02	6.634E+05	4.458E+01
2001	2.361E+03	1.891E+06	1.270E+02	6.307E+02	9.453E+05	6.352E+01
2002	3.099E+03	2.482E+06	1.668E+02	8.279E+02	1.241E+06	8.338E+01
2003	3.835E+03	3.071E+06	2.063E+02	1.024E+03	1.535E+06	1.032E+02
2004	4.593E+03	3.678E+06	2.471E+02	1.227E+03	1.839E+06	1.236E+02
2005	5.402E+03	4.326E+06	2.907E+02	1.443E+03	2.163E+06	1.453E+02
2006	6.166E+03	4.937E+06	3.317E+02	1.647E+03	2.469E+06	1.659E+02
2007	6.908E+03	5.532E+06	3.717E+02	1.845E+03	2.766E+06	1.858E+02
2008	7.699E+03	6.165E+06	4.142E+02	2.057E+03	3.083E+06	2.071E+02
2009	8.461E+03	6.775E+06	4.552E+02	2.260E+03	3.388E+06	2.276E+02
2010	9.115E+03	7.299E+06	4.904E+02	2.435E+03	3.649E+06	2.452E+02
2011	9.616E+03	7.700E+06	5.174E+02	2.568E+03	3.850E+06	2.587E+02
2012	1.011E+04	8.092E+06	5.437E+02	2.699E+03	4.046E+06	2.719E+02
2013	1.058E+04	8.469E+06	5.690E+02	2.825E+03	4.234E+06	2.845E+02
2014	1.104E+04	8.843E+06	5.942E+02	2.950E+03	4.422E+06	2.971E+02
2015	1.153E+04	9.235E+06	6.205E+02	3.081E+03	4.618E+06	3.103E+02
2016	1.199E+04	9.603E+06	6.452E+02	3.203E+03	4.801E+06	3.226E+02
2017	1.247E+04	9.983E+06	6.708E+02	3.330E+03	4.992E+06	3.354E+02
2018	1.295E+04	1.037E+07	6.966E+02	3.458E+03	5.184E+06	3.483E+02
2019	1.343E+04	1.076E+07	7.227E+02	3.588E+03	5.378E+06	3.613E+02
2020	1.392E+04	1.115E+07	7.491E+02	3.719E+03	5.574E+06	3.745E+02
2021	1.442E+04	1.155E+07	7.757E+02	3.851E+03	5.773E+06	3.879E+02
2022	1.492E+04	1.195E+07	8.027E+02	3.985E+03	5.973E+06	4.013E+02
2023	1.543E+04	1.235E+07	8.300E+02	4.120E+03	6.176E+06	4.150E+02
2024	1.594E+04	1.276E+07	8.576E+02	4.258E+03	6.382E+06	4.288E+02
2025	1.646E+04	1.318E+07	8.855E+02	4.396E+03	6.590E+06	4.428E+02
2026	1.698E+04	1.360E+07	9.138E+02	4.537E+03	6.800E+06	4.569E+02
2027	1.752E+04	1.403E+07	9.424E+02	4.679E+03	7.013E+06	4.712E+02
2028	1.806E+04	1.446E+07	9.714E+02	4.823E+03	7.229E+06	4.857E+02
2029	1.860E+04	1.490E+07	1.001E+03	4.969E+03	7.448E+06	5.004E+02
2030	1.915E+04	1.534E+07	1.031E+03	5.116E+03	7.669E+06	5.153E+02
2031	1.972E+04	1.579E+07	1.061E+03	5.266E+03	7.894E+06	5.304E+02
2032	2.028E+04	1.624E+07	1.091E+03	5.418E+03	8.121E+06	5.457E+02
2033	2.086E+04	1.670E+07	1.122E+03	5.572E+03	8.352E+06	5.612E+02
2034	2.145E+04	1.717E+07	1.154E+03	5.728E+03	8.586E+06	5.769E+02
2035	2.204E+04	1.765E+07	1.186E+03	5.887E+03	8.824E+06	5.929E+02
2036	2.264E+04	1.813E+07	1.218E+03	6.047E+03	9.065E+06	6.090E+02
2037	2.325E+04	1.862E+07	1.251E+03	6.210E+03	9.309E+06	6.255E+02
2038	2.387E+04	1.911E+07	1.284E+03	6.376E+03	9.557E+06	6.421E+02
2039	2.340E+04	1.874E+07	1.259E+03	6.250E+03	9.368E+06	6.294E+02
2040	2.293E+04	1.836E+07	1.234E+03	6.126E+03	9.182E+06	6.170E+02
2041	2.248E+04	1.800E+07	1.209E+03	6.005E+03	9.000E+06	6.047E+02
2042	2.203E+04	1.764E+07	1.186E+03	5.886E+03	8.822E+06	5.928E+02
2043	2.160E+04	1.730E+07	1.162E+03	5.769E+03	8.648E+06	5.810E+02
2044	2.117E+04	1.695E+07	1.139E+03	5.655E+03	8.476E+06	5.695E+02
2045	2.075E+04	1.662E+07	1.116E+03	5.543E+03	8.308E+06	5.582E+02
2046	2.034E+04	1.629E+07	1.094E+03	5.433E+03	8.144E+06	5.472E+02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m^3/year)	(av ft^3/min)	(Mg/year)	(m^3/year)	(av ft^3/min)
2047	1.994E+04	1.597E+07	1.073E+03	5.326E+03	7.983E+06	5.364E+02
2048	1.954E+04	1.565E+07	1.051E+03	5.220E+03	7.825E+06	5.257E+02
2049	1.916E+04	1.534E+07	1.031E+03	5.117E+03	7.670E+06	5.153E+02
2050	1.878E+04	1.504E+07	1.010E+03	5.015E+03	7.518E+06	5.051E+02
2051	1.841E+04	1.474E+07	9.902E+02	4.916E+03	7.369E+06	4.951E+02
2052	1.804E+04	1.445E+07	9.706E+02	4.819E+03	7.223E+06	4.853E+02
2053	1.768E+04	1.416E+07	9.514E+02	4.723E+03	7.080E+06	4.757E+02
2054	1.733E+04	1.388E+07	9.326E+02	4.630E+03	6.940E+06	4.663E+02
2055	1.699E+04	1.360E+07	9.141E+02	4.538E+03	6.802E+06	4.571E+02
2056	1.665E+04	1.334E+07	8.960E+02	4.448E+03	6.668E+06	4.480E+02
2057	1.632E+04	1.307E+07	8.783E+02	4.360E+03	6.536E+06	4.391E+02
2058	1.600E+04	1.281E+07	8.609E+02	4.274E+03	6.406E+06	4.304E+02
2059	1.568E+04	1.256E+07	8.438E+02	4.189E+03	6.279E+06	4.219E+02
2060	1.537E+04	1.231E+07	8.271E+02	4.106E+03	6.155E+06	4.136E+02
2061	1.507E+04	1.207E+07	8.107E+02	4.025E+03	6.033E+06	4.054E+02
2062	1.477E+04	1.183E+07	7.947E+02	3.945E+03	5.914E+06	3.973E+02
2063	1.448E+04	1.159E+07	7.789E+02	3.867E+03	5.797E+06	3.895E+02
2064	1.419E+04	1.136E+07	7.635E+02	3.791E+03	5.682E+06	3.818E+02
2065	1.391E+04	1.114E+07	7.484E+02	3.716E+03	5.569E+06	3.742E+02
2066	1.363E+04	1.092E+07	7.336E+02	3.642E+03	5.459E+06	3.668E+02
2067	1.336E+04	1.070E+07	7.191E+02	3.570E+03	5.351E+06	3.595E+02
2068	1.310E+04	1.049E+07	7.048E+02	3.499E+03	5.245E+06	3.524E+02
2069	1.284E+04	1.028E+07	6.909E+02	3.430E+03	5.141E+06	3.454E+02
2070	1.259E+04	1.008E+07	6.772E+02	3.362E+03	5.039E+06	3.386E+02
2071	1.234E+04	9.879E+06	6.638E+02	3.295E+03	4.940E+06	3.319E+02
2072	1.209E+04	9.683E+06	6.506E+02	3.230E+03	4.842E+06	3.253E+02
2073	1.185E+04	9.492E+06	6.377E+02	3.166E+03	4.746E+06	3.189E+02
2074	1.162E+04	9.304E+06	6.251E+02	3.104E+03	4.652E+06	3.126E+02
2075	1.139E+04	9.120E+06	6.127E+02	3.042E+03	4.560E+06	3.064E+02
2076	1.116E+04	8.939E+06	6.006E+02	2.982E+03	4.469E+06	3.003E+02
2077	1.094E+04	8.762E+06	5.887E+02	2.923E+03	4.381E+06	2.944E+02
2078	1.073E+04	8.588E+06	5.771E+02	2.865E+03	4.294E+06	2.885E+02
2079	1.051E+04	8.418E+06	5.656E+02	2.808E+03	4.209E+06	2.828E+02
2080	1.030E+04	8.252E+06	5.544E+02	2.753E+03	4.126E+06	2.772E+02
2081	1.010E+04	8.088E+06	5.435E+02	2.698E+03	4.044E+06	2.717E+02
2082	9.901E+03	7.928E+06	5.327E+02	2.645E+03	3.964E+06	2.663E+02
2083	9.705E+03	7.771E+06	5.221E+02	2.592E+03	3.886E+06	2.611E+02
2084	9.513E+03	7.617E+06	5.118E+02	2.541E+03	3.809E+06	2.559E+02
2085	9.324E+03	7.466E+06	5.017E+02	2.491E+03	3.733E+06	2.508E+02
2086	9.140E+03	7.319E+06	4.917E+02	2.441E+03	3.659E+06	2.459E+02
2087	8.959E+03	7.174E+06	4.820E+02	2.393E+03	3.587E+06	2.410E+02
2088	8.781E+03	7.032E+06	4.725E+02	2.346E+03	3.516E+06	2.362E+02
2089	8.607E+03	6.892E+06	4.631E+02	2.299E+03	3.446E+06	2.316E+02
2090	8.437E+03	6.756E+06	4.539E+02	2.254E+03	3.378E+06	2.270E+02
2091	8.270E+03	6.622E+06	4.449E+02	2.209E+03	3.311E+06	2.225E+02
2092	8.106E+03	6.491E+06	4.361E+02	2.165E+03	3.246E+06	2.181E+02
2093	7.946E+03	6.363E+06	4.275E+02	2.122E+03	3.181E+06	2.137E+02
2094	7.788E+03	6.237E+06	4.190E+02	2.080E+03	3.118E+06	2.095E+02
2095	7.634E+03	6.113E+06	4.107E+02	2.039E+03	3.057E+06	2.054E+02
2096	7.483E+03	5.992E+06	4.026E+02	1.999E+03	2.996E+06	2.013E+02
2097	7.335E+03	5.873E+06	3.946E+02	1.959E+03	2.937E+06	1.973E+02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m^3/year)	(av ft^3/min)	(Mg/year)	(m^3/year)	(av ft^3/min)
2098	7.190E+03	5.757E+06	3.868E+02	1.920E+03	2.879E+06	1.934E+02
2099	7.047E+03	5.643E+06	3.792E+02	1.882E+03	2.822E+06	1.896E+02
2100	6.908E+03	5.531E+06	3.716E+02	1.845E+03	2.766E+06	1.858E+02
2101	6.771E+03	5.422E+06	3.643E+02	1.809E+03	2.711E+06	1.821E+02
2102	6.637E+03	5.314E+06	3.571E+02	1.773E+03	2.657E+06	1.785E+02
2103	6.505E+03	5.209E+06	3.500E+02	1.738E+03	2.605E+06	1.750E+02
2104	6.377E+03	5.106E+06	3.431E+02	1.703E+03	2.553E+06	1.715E+02
2105	6.250E+03	5.005E+06	3.363E+02	1.670E+03	2.502E+06	1.681E+02
2106	6.127E+03	4.906E+06	3.296E+02	1.636E+03	2.453E+06	1.648E+02
2107	6.005E+03	4.809E+06	3.231E+02	1.604E+03	2.404E+06	1.615E+02
2108	5.886E+03	4.713E+06	3.167E+02	1.572E+03	2.357E+06	1.583E+02
2109	5.770E+03	4.620E+06	3.104E+02	1.541E+03	2.310E+06	1.552E+02
2110	5.655E+03	4.529E+06	3.043E+02	1.511E+03	2.264E+06	1.521E+02
2111	5.543E+03	4.439E+06	2.983E+02	1.481E+03	2.219E+06	1.491E+02
2112	5.434E+03	4.351E+06	2.923E+02	1.451E+03	2.176E+06	1.462E+02
2113	5.326E+03	4.265E+06	2.866E+02	1.423E+03	2.132E+06	1.433E+02
2114	5.221E+03	4.180E+06	2.809E+02	1.394E+03	2.090E+06	1.404E+02
2115	5.117E+03	4.098E+06	2.753E+02	1.367E+03	2.049E+06	1.377E+02
2116	5.016E+03	4.017E+06	2.699E+02	1.340E+03	2.008E+06	1.349E+02
2117	4.917E+03	3.937E+06	2.645E+02	1.313E+03	1.969E+06	1.323E+02
2118	4.819E+03	3.859E+06	2.593E+02	1.287E+03	1.930E+06	1.296E+02
2119	4.724E+03	3.783E+06	2.542E+02	1.262E+03	1.891E+06	1.271E+02
2120	4.630E+03	3.708E+06	2.491E+02	1.237E+03	1.854E+06	1.246E+02
2121	4.539E+03	3.634E+06	2.442E+02	1.212E+03	1.817E+06	1.221E+02
2122	4.449E+03	3.562E+06	2.394E+02	1.188E+03	1.781E+06	1.197E+02
2123	4.361E+03	3.492E+06	2.346E+02	1.165E+03	1.746E+06	1.173E+02
2124	4.274E+03	3.423E+06	2.300E+02	1.142E+03	1.711E+06	1.150E+02
2125	4.190E+03	3.355E+06	2.254E+02	1.119E+03	1.677E+06	1.127E+02
2126	4.107E+03	3.288E+06	2.210E+02	1.097E+03	1.644E+06	1.105E+02
2127	4.025E+03	3.223E+06	2.166E+02	1.075E+03	1.612E+06	1.083E+02
2128	3.946E+03	3.160E+06	2.123E+02	1.054E+03	1.580E+06	1.061E+02
2129	3.868E+03	3.097E+06	2.081E+02	1.033E+03	1.548E+06	1.040E+02
2130	3.791E+03	3.036E+06	2.040E+02	1.013E+03	1.518E+06	1.020E+02
2131	3.716E+03	2.976E+06	1.999E+02	9.926E+02	1.488E+06	9.996E+01
2132	3.642E+03	2.917E+06	1.960E+02	9.729E+02	1.458E+06	9.798E+01
2133	3.570E+03	2.859E+06	1.921E+02	9.536E+02	1.429E+06	9.604E+01
2134	3.500E+03	2.802E+06	1.883E+02	9.348E+02	1.401E+06	9.414E+01
2135	3.430E+03	2.747E+06	1.846E+02	9.162E+02	1.373E+06	9.228E+01
2136	3.362E+03	2.692E+06	1.809E+02	8.981E+02	1.346E+06	9.045E+01
2137	3.296E+03	2.639E+06	1.773E+02	8.803E+02	1.320E+06	8.866E+01

APPENDIX C.2
HEADER PIPE SIZING CALCULATION TABLES

Appendix C.2
HEADER PIPE SIZING CALCULATIONS

Segment	Flow Rate (scfm)	Pipe Length (ft)	Minimum Pipe I.D. (inches)	K	Loss per Unit Length ("wc/ft)	Pressure Loss ("wc)	Velocity (ft/sec)	Flow Rate (ft3/hr)
A	77	750	9.486	215	0.000	0.027	2.61	4,615
B	42	905	9.486	215	0.000	0.010	1.43	2,534
C	149	1,365	9.486	215	0.000	0.184	5.07	8,955
D	213	195	9.486	215	0.000	0.054	7.23	12,774
E	213	170	11.25	330	0.000	0.020	5.14	12,774
F	316	1,170	11.25	330	0.000	0.300	7.63	18,944
G	104	430	7.611	123	0.000	0.088	5.52	6,270
H	178	725	7.611	123	0.001	0.428	9.39	10,679
J	245	1,000	7.611	123	0.001	1.119	12.93	14,697
K	294	670	7.611	123	0.002	1.082	15.53	17,658
L	17	360	7.611	123	0.000	0.002	0.91	1,036
M	39	1,060	7.611	123	0.000	0.031	2.08	2,361
N	610	870	14.118	578	0.000	0.271	9.36	36,602
O	294	160	7.611	123	0.002	0.258	15.53	17,658

Note:

1. The projected flow rate for each pipe segment is based on the number of wells and other pipe sections feeding into the pipe segment. Each well's flow contribution is based on the proportion between total flow and the well depth.

2. All well laterals with one well shall be 4" diameter, unless noted otherwise on Drawing A.2 - LFG Collection System Site Layout Plan.

Appendix C.2
FLOW CONTRIBUTIONS TO HEADER SEGMENTS

Segment	Description	Concurrent to Counter to Condensate Flow?	Length (feet)	Wells, Pipes Contributing to Segment Flow	Segment Flow (cfm) [1]
A	West of northwest corner on north	Countercurrent	750	EW-1, EW-2, EW-8, EW-9	77
B	Going northeast from CS-3	Countercurrent	905	EW-3, EW-4	42
C	Going south from northeast corner	Concurrent	1,365	Segment B, EW-5, EW-6, EW-7, EW-13, EW-14, EW-15	149
D	North of CS-2 to crossover	Concurrent	195	Segments C and M, EW-18	213
E	Just south of CS-2	Countercurrent	170	Segment D	213
F	Just north of main header to flare	Concurrent	1,170	Segment E, EW-19, EW-20, 5A-1, 5A-3, 6A-3, 6A-4, 6A-5	316
G	Northwest corner south to crossover and CS-4	Concurrent	430	SegmentS A and L, EW-10	104
H	Just south of CS-4 to high point	Countercurrent	725	Segments G, 5B-1, 5B-2, 5B-3, 5B-4, 6B-2, 6B-3	178
J	Segment west of CS-5	Concurrent	1,000	Segment H, 6B-4, 6B-5, 6B-6, 6B7, 6B-8	245
K	Segment east of CS-5	Countercurrent	670	Segment J, 6A-2, 6A-6, 6A-7, 6B-1, 6B-9	294
L	West side of crossover from peak	Concurrent	360	EW-11	17
M	East side of crossover from peak	Concurrent	1,060	EW-12, EW-16, EW-17	39
N	From main loop to control device	Countercurrent	870	Segments F and O	610
O	Northeast of CS-1 to high point	Concurrent	160	Segments K	294

Notes:
1. Each well's flow contribution is based on the proportion between the total flow and the well depth.

APPENDIX C.3
HEADER PIPE SIZING PROCEDURES

HEADER PIPE SIZING

Header and lateral pipes must be sized appropriately to convey the maximum, expected gas flow. Typical design criteria, the typical method for sizing the header pipe and typical header construction are discussed in the following sections of this appendix.

DESIGN METHODOLOGY

Header Pipe Sizing

The following design criteria have been established for calculating the minimum acceptable size for landfill gas piping:

1. If gas flow is countercurrent to condensate flow, the velocity should generally not exceed 20 feet/second. For concurrent flow the velocity should generally not exceed 40 feet/second. Please note that these are guidelines, and in some cases where changing pipe sizes would significantly change a value to drop significantly below the target velocity, the 20 or 40 feet/second velocity may be exceeded.

2. The allowable pressure drop within pipe where gas flow is concurrent or countercurrent with condensate flow should not be greater than one inch of water column per 100 feet of header, or 0.01 inches of water column per unit foot of header pipe (although slightly more pressure drop may exist in well lateral piping).

Flow conditions within any segment of header line should not consistently exceed either the pressure loss or velocity limitations. Undersizing of the header pipe can cause excessive pressure losses throughout the system, which reduces gas collection efficiency. The minimum header size is set at 8 inches to avoid having headers susceptible to clogging or diminishment of flow because of settlement.

Design Equations

Calculations for pressure losses in the header pipe are based on the Spitzglass equation for flow of compressible fluids:

$$Q = 3550K\left(\frac{h}{SL}\right)^{1/2}$$

Where:

Where:	Q	=	Flow rate (ft^3/hour)
	h	=	Pressure loss (in inches w.c.)
	S	=	Specific gravity of the flowing fluid (landfill gas) (unitless)
	L	=	Length of pipe (feet)
	K	=	Spitzglass pipe constant

$$K = \left(\frac{d^5}{1 + (3.6/d) + (0.03)d} \right)^{1/2}$$

Where: d = Inside diameter of pipe in inches

When the equation is rearranged and solved in terms of pressure drop, it becomes:

$$h = \left(\frac{Q(SL)^{1/2}}{3550K} \right)^2$$

Therefore, using the above equation, for a 4-inch SDR-17 pipe (assume an inner diameter of 3.97 inches) carrying 80 ft^3/min (4,800 ft^3/hr) across a 400 foot length, the computed head loss would be as follows:

The Spitzglass pipe constant, K, from the above equation using 3.97 inches = 22,

Next, assuming a specific gravity of 0.98 for the landfill gas, the head loss across the pipe is as follows:

$$h = \left(\frac{4{,}800(0.98 * 400)^{1/2}}{3550 * 22} \right)^2 = 1.48 \text{ inches w.c.}$$

Calculations for flow velocity are based on the following equation:

$$V = Q/A$$

Where:	V	=	Velocity of the flowing fluid (ft/sec)
	Q	=	Flow rate (ft^3/second)
	A	=	Cross sectional area of the pipe (ft^2)

These equations have been incorporated into a spreadsheet for application to the gas collection and control system layout (included in Appendix C.2). Pipe length, diameter, and flow rate (in cubic feet per minute) are input into the spreadsheet for each individual segment of header line. The spreadsheet will then calculate the flow velocity and pressure drop for the diameter of pipe selected.

DESIGN METHODOLOGY

Introduction

The optimum diameter of the header pipe is determined after the engineer has routed the header system in an efficient manner to collect gas flow from each extraction well. The diameter of each segment of the header pipe will vary in size, depending on the volume of landfill gas that it will be expected to convey.

The header line that connects the gas wells furthest from the source of vacuum will carry the least amount of gas flow. As the header piping gets closer to the source of vacuum, more and more gas wells will "contribute" flow to the line which will necessitate an increase in pipe size. Header systems usually incorporate some degree of "loops" in the piping network where possible in order to allow for partial or total loss of header function in one direction without losing gas management system functionality.

Procedures

The sizing of the header pipe begins by taking the proposed gas system design layout and dividing the main header line into individual segments. Each segment is assigned a label (i.e., A, B, etc.) in order to identify the segment properties.

The segments are then divided so that each one receives a flow contribution from a single lateral line. Laterals are short lengths of collection header which connect up to three wells to the main loop of header pipe.

Next, a "zero point" for the main header loop is chosen. The zero point is the location in the header system in which the pressure drop is equal in both directions. Alternatively, it is the point at which a molecule of gas in the header line would be as likely to travel in one direction towards the source of vacuum as another, since the header incorporates loops. Although the vacuum at this point would be zero, a value of 6 in. w.c. is assumed since this is the approximate minimum amount of vacuum that should be provided at each well in the collection system.

The designer estimates the location of the zero point and chooses one of two directions to travel along the header line towards the source of vacuum. The length of each segment of the header line along the direction of travel is measured in feet, and is input into the design spreadsheet.

The incremental increase in flow from the wells connected to each individual header segment is calculated. The flow contributed from each well is obtained by approximating the total depth of each well to the total well footage across the Site. That proportion is applied to the total flow value to project the individual well contribution. Each flow is increased by 10 percent to add a factor of safety to the design and to account for small frictional losses from pipe fittings and bends which are not individually calculated. There will be a cumulative increase in the flow volume as the gas moves from segment to segment towards the vacuum source as more wells contribute flow. The calculated minimum flow volume for each segment of header pipe is entered into the spreadsheet in the row corresponding to that section of pipe. Then this flow is also increased for the final pipe sizing since, if a blockage occurs within the loop system more gas may be directed to a segment than anticipated.

A pipe diameter (in inches inner diameter) is then assumed for the pipe segment and is entered into the spreadsheet. The flow velocity and pressure drop per unit foot are calculated by the spreadsheet for the diameter of pipe selected. If the velocity is too high or head loss too great, then a larger diameter of pipe is chosen and entered into the spreadsheet. This continues until a pipe size is found that meets the pressure and velocity criteria. Existing header segments may not show minimum pipe sizes because they were installed with oversized pipe diameters during construction, for conservative purposes. For these calculations, an inner diameter for an SDR 17 HDPE pipe was chosen.

As flow accumulates the vacuum is also cumulatively added so that once the flow has been traced back to the blower the vacuum loss throughout the system will be computed. This number will be used again in the section of this plan on the sizing of the gas moving equipment.

After all segments in the original section of header chosen are sized, the designer returns to the zero point and performs the same steps for the segments on the other side of the main loop.

The results from the spreadsheet calculations are provided in Appendix C.2. Inputs into the spreadsheet are summarized in the second table in Appendix C.2.

Section 22: Certification

Company Name: Santa Fe Solid Waste Management Agency

I, Randall Kippenbrock, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 20 day of August 2021, upon my oath or affirmation, before a notary of the State of New Mexico.

Randall Kippenbrock
*Signature

8/20/21
Date

Randall Kippenbrock
Printed Name

OFFICIAL SEAL
Rosalie Cardenas
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: October 1, 2021

Executive Director, SFSWMA
Title

Scribed and sworn before me on this 20th day of August 2021

My authorization as a notary of the State of New Mexico expires on the 1st day of October 2024. ~~2021.~~

Notary's Signature

8/20/2021
Date

Rosalie Cardenas
Notary's Printed Name

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility:	Caja Del Rio Landfill
2	Name of company:	Santa Fe Solid Waste Management Agency
3	Current Permit number:	P185L-R3
4	Name of applicant's modeler:	Bruce Nicholson, Air Quality Services, inc.
5	Phone number of modeler:	505 982-2737 or (505) 670-5519 cell
6	E-mail of modeler:	brucnichol@aol.com

16-B: Brief

1	Was a modeling protocol submitted and approved?	Yes☐	No☒
2	Why is the modeling being done?	Other (describe below)	
3	Describe the permit changes relevant to the modeling.		
3	Title V permit renewal modeling was conducted for the combined operation of all activities at the landfill. The landfill's combustion equipment, the Godwin pump, the Trommel screen engine and the purchase of a new chipper engine was evaluated due to horsepower and emission changes. There are increases in emissions and enclosed flare stack parameters and changes to operating hours that were addressed. Changes to excavation and stockpiling locations were updated. The modeling addressed the pollutants CO, SO2, NO2, PM-10 and PM-2.5. During this renewal period it is possible that cell 6-B could be filled and the SFSWMA has received permission to increase the height of previously completed cells. If cell 6-B fills, then customer waste disposal will begin at cell 1 and progress through the other cells. Modeling was conducted for the cell 1 operation because this results in higher emissions and would be valid for future renewals.		

4	What geodetic datum was used in the modeling?	NAD83	
5	How long will the facility be at this location?	Approximately 2053 (varies depending on future landfill capacity and incoming waste)	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒
7	Identify the Air Quality Control Region (AQCR) in which the facility is located	157	

8	List the PSD baseline dates for this region (minor or major, as appropriate). None	
	NO2	
	SO2	
	PM10	
	PM2.5	
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).	
	Bandelier Wilderness, 16.4km, Pecos Wilderness Area, 24.3 km	
10	Is the facility located in a non-attainment area? If so describe below	Yes☐ No☒
11	Describe any special modeling requirements, such as streamline permit requirements.	
	The PM modeling considered detail operations of all activities at the landfill and those activities were updated to encompass cell development during the next several years and changes to combustion equipment at the landfill. The landfill combustion sources were updated and modeled for combustion pollutants. The cumulative NO2 modeling used the MAXDCONT option to evaluate culpability.	

16-C: Modeling History of Facility

1. Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
CO	NSR 7928 (DelHur)	7/9/2018	DelHur permit addendum, NAAQS
NO_2	NSR 7928 (DelHur)	7/9/2018	DelHur permit addendum, NAAQS
SO_2	NSR 7928 (DelHur)	7/9/2018	DelHur permit addendum, NAAQS
H_2S	-	n/a	none
PM2.5	NSR 7928 (DelHur)	7/9/2018	DelHur permit, NAAQS
PM10	NSR 7928 (DelHur)	7/9/2018	DelHur permit, NAAQS
Lead	-		None
Ozone (PSD only)	-		None
NM Toxic Air Pollutants (20.2.72.402 NMAC)	-		None

16-D: Modeling performed for this application

1 For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
CO	☒	☐	☐	☐	☐
NO_2	☐	☐	☒	☐	☐
SO_2	☒	☐	☐	☐	☐
H_2S	☐	☐	☐	☐	☐
PM2.5	☐	☐	☒	☐	☐
PM10	☐	☐	☒	☐	☐
Lead	☐	☐	☐	☐	☐
Ozone	☐	☐	☐	☐	☐
State air toxic(s) (20.2.72.402 NMAC)	☐	☐	☐	☐	☐

16-E: New Mexico toxic air pollutants modeling

1 List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.
NONE

2 List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.

Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor

16-F: Modeling options

1 Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐

1 All modeling analysis used AERMOD (Beest version 12.05, EPA Aermod version 19191). The regulatory default option was selected except for missing meteorological days and flat terrain. Landfill stationary engine PM were set to PM2.5. The one year hourly sequential data set used in the modeling runs is the 2008 Santa Fe airport meteorological data set designated SFA2008.sfc. The dataset was screened and prepared by Air Quality Services, Inc. using the NM Air Quality Bureau's Santa Fe airport monitoring station, which contains a standard instrumented 10-meter tower. These unprocessed data are available on the Bureau's monitoring web site. Upper air data used the Albuquerque airport weather service data for the same year. These data are representative of on-site data and are included with the modeling runs. This is the same meteorological data used in the DelHur NSR permit in 2018.

For NO_2, the same version of Beest software and Aermod shown in the previous sections is used here. The PVMRM options was used for NO_2 calculations. The EPA ISR database was reviewed for diesel fired engines and it showed that in-stack NO_2 ratios were all less than 0.10 with many at 0.05 or lower. In-stack NO_2 ratio was set to 0.10. There is little data for flares. An incineration of waste gases showed in-stack ratio of around 0.01, so 0.10 should be conservative of the enclosed flare given that the available heat for the landfill gases is low. The 1-hour ambient air standards for NO_2 and SO_2 refer to the 98% (8^{th} high) and 99% (4^{th} high daily maximum 1-hour) concentrations that are then averaged over three years. This present analysis used one year

	of high quality meteorological and ozone data that is valid as on-site from the NM Air Quality Bureau's Santa Fe airport monitor site. The data as previously noted is for the year 2008 and has high data capture. Since three years of met data was not used in the multiyear averaging, the 2nd high 1-hour concentrations for SO_2 and the 6th high -high concentration for NO_2 respectively were used to compare against the NAAQS. Background hourly concurrent 2008 Santa Fe airport ozone from the Air Quality Bureau's monitoring site was used to evaluate NO_2. Given the high NO_2 emissions from the sources south of the landfill, it was felt that more reasonable results would be obtained with PVMRM using an hourly file than using some arbitrary single high (conservative) annual ozone value. The concurrent ozone dataset from the Bureau's data is quite complete, but there are some missing data. A 100% complete ozone file was generated by filling in missing data. The following rules were used to complete the data file. If one hour of data is missing, the average of the pre and post concentration was inserted. If two to three consecutive hours were missing, then linear interpolation was used to fill in data. These were the methods used for all but one event of missing data. One group of missing data was from 5 am to 1 pm. In that case the corresponding hours from the previous day were inserted. These data were previously used and provided to the Air Quality Bureau with the DelHur NSR permit modeling in 2018. Figure 5 in the 2018 model report shows the Santa Fe airport monitor site in relation to the SWMA Caja del Rio landfill. Note that the landfill is at least three miles from the built up areas of Santa Fe and there are no large sources of NOx other than what is included in the surrounding sources used in the model. The model was run in flat terrain mode given that within the landfill fenced area the internal relief is due to the completed cells but all the immediate area around the landfill is relatively flat and maximum concentrations from the landfill emissions occur at the fence line. In the area of the DelHur crushing, the crusher spread is enclosed on three sides by a large hill that is the feed material for the crusher. There is enough material to last about 5 years or more. Large product storage piles enclose the area to the south and west. Four basic cases were modeled for particulate matter to address alternate stockpile areas and the possibility of cell 1 buildup should the waste acceptance rate increase enough to fill the remaining cell 6-B. The Cell 1 buildup is selected as the model case for this Title 5 renewal permit.

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	July 2, 2017
2	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.	
	AQB Source ID	Description of Corrections
		The DelHur and the SFSWMA Caja Del Rio landfill were deleted from the surrounding source retrieval since detailed emissions were generated for all the various sources within the fenced landfill area. The remaining surrounding source's operating hours were inspected and grouped under the AERMOD operating hours factor set – Hour of Day. The same surrounding sources inventory that was used for the DelHur NSR permit within the Caja del Rio landfill in 2018 was used again in this modeling.

16-H: Building and structure downwash

1	How many buildings are present at the facility?	Three (3), main office building, maintenance building and scale house. None of these buildings are near any of the stack emission sources.
2	How many above ground storage tanks are present at the facility?	Three (3), 1- 6000 gal diesel storage tank and 1-500 gal gasoline storage tank and 1-3000 gal flare condensate tank.

3	Was building downwash modeled for all buildings and tanks? If not explain why below.	Yes☐	No☒
	No stacks are associated with buildings. All PM is fugitive except for small amounts from combustion equipment.		
4	Building comments		

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.		
	The entire landfill property is fenced and gated. Entry of all vehicles occurs through the gated road and logged into the scale house. The fence is closed and locked during non-customer times.		
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?	Yes☒	No☐

4 Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.

Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
Cartesian spacing	Irregular defining the AOI	50m fence, 100 m, then 250m, plus discrete added			Several AOI Cartesian grids were used depending upon which pollutant was modeled. Combustion used 1222 receptors. PM runs used 574 to 774 discrete receptors.

5	Describe receptor spacing along the fence line.
	A 50m spacing along the fence.
6	Describe the PSD Class I area receptors.
	No PSD Class I area receptors.

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? If so describe below. This information is optional (and purposely undefined) but may help determine issues related to public notice.	Yes☐	No☒

3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	Yes☐	No☒

16-K: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).		
	Only one scenario is evaluated for the landfill's combustion sources (SO2, NO2, CO). The primary PM modelling scenario is denoted Case C1. This case defines the PM modeling which may occur during the latter term of the current Title 5 permit renewal. This case includes cell excavation on the eastern side with stockpiling of excavated dirt at the customer active cell 1 area. This case's emissions are used to define values in the UA-2 tables 2-D and 2-E. Case D is similar, but stockpiling occurs at the previously used SW stockpile area. This stockpile area is used during times when the road to stockpile dirt within the cell 1 is not passable. Case C1 has higher emissions than current landfill operations. All cases using water controls on unpaved and haul rods give similar results. Case with landfill operations in Cell1 was selected as the basis for this Title 5 renewal and would be valid for the next renewal. Only case Case C1 is submitted with this renewal.		
2	Which scenario produces the highest concentrations? Why?		
	Cases A and B give similar results and Cases C and D yield results just slightly higher than cases A and B. It is expected that Cases A and Case B will occur during most of the period of the upcoming Title 5 renewal, but as a contingency if waste rates become great enough that cell 6-B fills, then Cell 1 (Cases C and D) would be used. Thus Cases C and D were modeled and they both yield very similar results. Cases C and D have longer haul road lengths and this is likely the reason for marginally higher PM concentrations. All PM concentrations are within the NAAQS and all the combustion modeled pollutants (SO2, CO and NO2) are within the NAAQS. Only case C1 is presented in this form.		
3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☒	No☐
4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources: Please refer to the attached spreadsheet as the factor sets are too complicated for this form.		

5	Hour of Day	Factor	Hour of Day	Factor									
	1		13										
	2		14										
	3		15										
	4		16										
	5		17										
	6		18										
	7		19										
	8		20										
	9		21										
	10		22										
	11		23										
	12		24										
	If hourly, variable emission rates were used that were not described above, describe them below.												

	Please refer to the attached spreadsheets for the factors and source ID's.		
6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☐	No☒

16-L: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.	
	☐	ARM2
	☐	100% NO_X to NO_2 conversion
	☒	PVMRM
	☐	OLM
	☐	Other:

	Describe the NO_2 modeling.
	The combustion sources within the landfill, excluding the insignificant comfort heating in the main building and the scale house include the portable Godwin pump engine that is used to pump water into the water wagon vehicles for dust suppression; the enclosed flare used to combust the collected landfill gases; the portable chipper engine in the green waste composting area; and the portable Trommel screen engine in the green waste composting area. The chipper does not operate at the landfill at this time and is included in the modeling as a place holder should it return. There are several large GCP2 sources south of the landfill that confound the NO_2 modeling due to the high NO_2 emissions listed in the surrounding sources retrieval. A culpability analysis using MAXDCONT was required to show that the landfill emissions do not contribute to any NAAQS modeled violations.

3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.	Yes☐	No☒
	The NO_2 sources consist of three diesel drive engines, two of which are small, the third NO_2 source is the enclosed landfill flare used to combust landfill gas. The PVMRM options was used for NO_2 calculations. The EPA ISR database was reviewed for diesel fired engines and it showed that in-stack NO_2 ratios were all less than 0.10 with many at 0.05 or lower. In-stack NO_2 ratio was set to 0.10. There is little data for flares. An incineration of waste gases showed in-stack ratio of around 0.01, so 0.10 should be conservative of the enclosed flare given that the available heat for the landfill gases is likely to be low. The three diesel engines all operate during daylight hours. The enclosed landfill flare potentially operates 24 hours a day. Most of the NOx emissions are from the engines. The daytime equilibrium constant is 0.8 while nighttime equilibrium is higher around 0.90. The NO_2 modeling used 0.80 as all but the flare are essentially daylight operations.		

4	Describe the design value used for each averaging period modeled.
	1-hour: Other (Describe): One year of met data that is considered on-site was used. The 6th high was used as the surrogate for the three-year average of the 8th high one hour average. Annual: One Year Annual Average

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	☐	PM2.5

	☐	PM10
	☒	None

2	Describe the particle size distributions used. Include the source of information.		
	N/A		
3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.	Yes☐	No☒
4	Was secondary PM modeled for PM2.5?	Yes☐	No☒

5	If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.			
	NO_X (ton/yr)	SO_2 (ton/yr)	$[PM2.5]_{annual}$	$[PM2.5]_{24\text{-hour}}$

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	None
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.
	None

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below. Table 2-E unit numbers and emission rates were grouped in this table. The ID's in the calculation spreadsheets are parenthetically listed in 2-D and 2-E.	Yes☐	No☒

1	Unit Number in UA-2	Unit Number in Modeling Files
	C2 (C2b) (Scraper unloading stockpile)	Area source #1
	C2 (C2a) (Scraper loading cell excavation)	Area source #2
	ACC (compaction)	Part of usertop area source #3
	ACG (grading)	Part of usertop area source #3
	R2b (Customer travel an active cell top)	Part of usertop area source #3
	C2 (C2b at SW emergency stockpile – not used)	Area source #4 (zeroed with factor set)
	W1 (W1a wind erosion active cell area)	Area source 20
	W1 (W1b wind erosion stockpile area)	Area source 21

	W1 (W1c cell excavation area)	Area source 22
	HS (scraper haul road)	201-215
	HS (scraper haul road)	216-252
	HS (scraper haul road to emergency SW stockpile-not used)	320-353 (zeroed with factor set)
	HS (scraper haul road to active cell face cover-not used)	354-395 (zeroed with factor set)
	R1 (R1a customer paved road to active cell)	28-104
	R2 (R2a customer unpaved road to active cell face)	105-108
	R3 (Green Waste cold mill road section)	110-143
	R4 (Green waste unpaved road section)	144-153
	Green waste G0 (chipper)	G0
	Green waste TROM (grouped Trommel screening operation)	F1,X1,SCN,X2,S1,S2,L1
	G1	G1
	Not listed insignificant source	TROMENG
	Not listed insignificant source	GODWENG
	Flare (NMOC enclosed flare stack)	FLARE

2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☒	No☐
	Haul roads, customer roads, green waste roads, and such are modeled as a series of volume sources. The summation of the volume points match the emission rates in the Tables 2-E		
3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes☒	No☐

4	Which units consume increment for which pollutants? N/A				
	Unit ID	NO_2	SO_2	PM10	PM2.5

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).			
6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐	

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following

	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines?	Yes☐	No☒
2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.		
	Initial sigma-z is determined by the plume height center /2.15 and the initial sigma-y is based on the plume width/4.3. For both paved and unpaved roads the volume spacing uses the every other point method, ie each point is approximately 2xW the road width. With the long roads at the landfill, exact spacing is not that important due to the large size of the landfill and long distances from roads to the landfill fences. Each volume point emissions rate is equal to the total road emission rate divided by the number of volume points comprising the road.		
3	Describe how the volume sources are related to unit numbers. Or say they are the same.		
	For some volume sources the volume source and the unit number are the same. In the case of road represented by volume sources the numbering of volume sources in the model is set as a number range, for example, if one uses sources 28-70 for a road, there would be 43 volume sources and the sum of the 43 volume sources would be the value of the road emission rate for that length of road.		
4	Describe any open pits.		
	N/A		
5	Describe emission units included in each open pit.		
	N/A		

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☒	No☒
	CO: N/A		
	NO_2: Outside Carlsbad (350151005)		
	PM2.5: Santa Fe (350490020)		
	PM10: Santa Fe (350490020)		
	SO_2: N/A		
	Other:		
	Comments:	PM10 and PM2.5 background were obtained using the modeling guideline (2018). The data listed for NO_2 background in the modeling guideline is almost all invalid for this site. Most of the data are from within urban areas or in the case of the four corners region, in areas with	

		substantial NO_2 sources. The one monitor listed for Carlsbad (5ZR), is west of the town and in a similar environment. A review of those data indicate background NO_2 may be in the realm of 40 ug/m3 at some times. For purposes of this evaluation, and due to the large southern NO_2 sources, the MAXDCONT option was used to assess contribution and significance from the Caja landfill NO_2 emissions. A MAXDCONT threshold value of 140 ug/m3 was used with no NO_2 background. The NAAQS for NO_2 is 190.6 ug/m3 and so using this threshold would allow up to 50.6 ug/m3 for background 1-hour NO_2 concentrations. The 40 ug/m3 background was used in the 16-W Results Table for NO_2.		
2	Were background concentrations refined to monthly or hourly values? If so describe below.		Yes☒	No☐
2	For NO_2 modeling, a concurrent hourly ozone dataset was used. These were obtained and completed from the NMED monitoring site near to the Santa Fe airport for the year 2008. Background hourly concurrent 2008 Santa Fe airport ozone from the Air Quality Bureau's monitoring site was used to evaluate NO_2. Given the high NO_2 emissions at the south surrounding sources, it was felt that more reasonable results would be obtained with PVMRM using an hourly ozone file than using some arbitrary single high (conservative) annual ozone value. The ozone dataset from the Bureau's data is quite complete, but there are some missing data. A 100% complete ozone file was generated by filling in missing data. The following rules were used to complete the data file. If one hour of data is missing, the average of the pre and post concentration was inserted. If two to three consecutive hours were missing, then linear interpolation was used to fill in data. These were the methods used for all but one event of missing data. One group of missing data was from 5 am to 1 pm. In that case the corresponding hours from the previous day were inserted.			

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used. Santa Fe Monitoring station near the Santa Fe airport. Data set was previously submitted to the Bureau and was used in the DelHur NSR permit modelling in 2018.	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
2	Aermet was used to process the data.		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☐	No☒
1	The model was run in flat terrain mode given that within the landfill fenced area the internal relief is due to the completed cells but all the immediate area around the landfill is relatively flat and maximum concentrations from the landfill emissions occur at the fence line. Further, almost all of the emissions are fugitive.		
2	What was the source of the terrain data?		
2	N/A		

16-U: Modeling Files

1	Describe the modeling files:		
	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
	CombNO2-AOIrev2.BST	SO2,CO,NO2	AOI
	CombNO2-Allrev2.BST	NO2	Cumulative, culpability (MAXDCONT)
	Caja-DH-AOI-CaseC1-rev2.BST	PM10, PM2.5	AOI
	Caja-DH-All-CaseC1-rev2.BST	PM10, PM2.5	Cumulative and culpability

16-V: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☐
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☐
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☐	No☐

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☒	No☐
	* NO_2: The MAXDCONT model option was used to define source culpability concentrations at the same hour and receptor location. It shows for all sources at the receptor with the 6th highest NO_2 contribution from the landfill combustion sources, a total NO_2 concentration of 183.01103 ug/m3. The Caja landfill sources contribution to this receptor at the same time and location is only 0.05969 ug/m3 which is less than the significance level. All other Caja property concentration contributions are less than this number or the NO_2 total concentration is less than the model MAXDCONT threshold value of 140 ug/m3. The highest Caja landfill concentration from its combustion emissions is 31.11951 ug/m3 and after adding 40 ug/m3 for a NO_2 background concentration, is well below the ambient standard. There are other concentrations that are above 140 ug/m3 but the highest contribution from the landfill emissions results in only a 0.4207 ug/m3 maximum contribution to those values and is insignificant. Therefore, the landfill combustion sources do not cause a NAAQS violation nor do they contribute to any violation. ** These concentrations occur at the southernmost receptor at which the Caja landfill concentration is no longer significant. The second number shown for the Total Concentration in the table is the ranked concentration difference between the total PM with surroundings and that due to only surrounding sources. This would be the ranked landfill contribution at this receptor and should correspond to the Caja landfill's source contribution, both of which are not significant.		
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (μg/m3)	Modeled Concentration with Surrounding Sources (μg/m3)	Secondary PM (μg/m3)	Background Concentration (μg/m3)	Cumulative Concentration (μg/m3)	Value of Standard (μg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
SO2,2nd 1-hr	6.04	-	-	-	-	<7.8SL	-	401902	3949064.2	
SO2 2nd 3-hr	4.15	-	-	-	-	<25SL	-	401396.1	3948439.4	
CO 2nd 1-hr	25.7	-	-	-	-	<2000SL	-	401494.4	3948438.2	

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
CO 2nd 8-hr	6.3	-	-	-	-	<500SL	-	401592.8	3948437	6430
NO2 annual	0.89	5.36	-	40	45.3	100	45.3	401500	3947000	6430
NO2 6th high 1-hr	31.1	183.01*/0.0597*	-	40	223.3	190.6	***	401500	3947000	6430
PM10 2nd high 24-hr	25.8	28.7	-	23	51.7	150	34.5	401904.28	3949261.5	6430
PM2.5 annual	0.48	4.76	-	4.32	9.1	12	75.7	402000	3946	6430
PM2.5 6th high 24-hr	2.13	16.36**/0.061**	-	9.45	25.8	35	73.7	402000	3946	6430

*** Caja/DelHur site contribution does not significantly contribute to the cumulative concentration.

16-X: Summary/conclusions

1	A statement that modeling requirements have been satisfied and that the permit can be issued.
	All the cases modeled showed that ambient air quality standards resulting from operation at the Santa Fe Waste Management Agency's Caja del Rio Landfill and in conjunction with other surrounding sources and the DelHur operation within the landfill property did not directly cause any violation of ambient air quality standards nor did they contribute to any violation resulting from the landfill's operation in conjunction with surrounding sources.