

# TECHNICAL REVIEW

FOR:

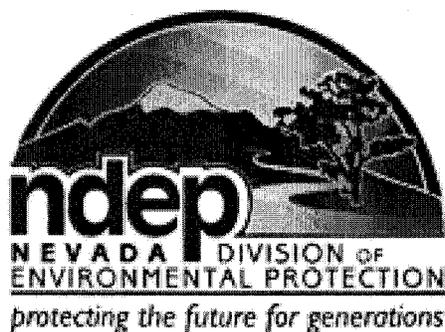
## REFUSE, INC. LOCKWOOD LANDFILL

Storey County, Nevada, HA – 83

**Class I (Title V) Operating Permit RENEWAL**

AP4953-1148.02, FIN A0018

Air Case 12AP0390



BY

STATE OF NEVADA  
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES  
DIVISION OF ENVIRONMENTAL PROTECTION  
BUREAU OF AIR POLLUTION CONTROL

PAT MOHN, P.E.  
STAFF ENGINEER III

FEBRUARY 2013  
(AMENDED APRIL 2013)



## 1.0 INTRODUCTION

Refuse Inc. (Waste Management of Nevada, RI) submitted an application for renewal of Class I (Title V) Operating Permit AP4953-1148 to the Nevada Division of Environmental Protection, Bureau of Air Pollution Control (BAPC).

The Class I Renewal application was received by the BAPC on March 30, 2012. The application was deemed *Administratively Complete* on April 16, 2012, which constitutes the Official Date of Submittal (ODS) of the application. The date of expiration of RI's current permit was December 17, 2012. Based on the expiration date of RI's permit, a complete application for renewal had to be provided by RI on or before April 21, 2012 (240 days prior to expiration). Because the ODS was established prior to April 21, RI's application shield is in place.

A preliminary determination to issue or deny the Class I permit is required within 180 days of the ODS, which would have been October 13, 2012, the end of the Technical Review period, which would have been, ideally, the beginning of the Public Notice period. However, the BAPC is allowed additional time for technical review, because RI did not submit a timely response to information requests.

In a letter dated June 29, 2012, the BAPC provided 21 comments on RI's application for renewal, with some of the items requiring RI to submit supplemental technical information. The deadline for response was July 13, 2012. The consultant for RI, SCS Engineers, requested an extension until July 29, 2012, but the BAPC did not receive the supplemental information until September 12, 2012, 61 days after the original deadline. SCS Engineers was informed in July 2012 that the BAPC is allowed extra time for technical review if information submittal deadlines are not met by applicants.

In a letter dated October 18, 2012, the BAPC provided 6 additional comments on RI's application, also with a request for submittal of supplemental technical information. The deadline for response was November 1, 2012. SCS Engineers provided a response on November 2, 2012, but did not submit the requested information for one of the six items, instead requesting a meeting on November 28, 2012 to discuss the item (i.e. PCS VOC concentration limits). RI was informed that, even though the BAPC agreed to a meeting, RI was still obligated to provide the requested information. On December 14, 2012, the BAPC received the additional item of technical information requested in its October 18 letter. This added an additional 43 days on to the BAPC technical review period.

Therefore, the deadline for the BAPC's preliminary determination to issue/deny will be pushed back 104 days, until January 26, 2013. However, because of the BAPC's ongoing and concurrent work on other permit actions, and also the requirement for increment tracking to support RI's application for renewal, the technical review deadline will not be met.

The purpose of this review is to determine the likely air quality impacts from continued operation of the Lockwood Landfill under the draft renewal permit conditions.



## **2.0 DESCRIPTION OF PROCESS**

### **2.1 INTRODUCTION**

The primary function of the Lockwood Landfill is for the disposal of municipal solid waste (MSW) and other wastes, which are brought to the landfill under contract to RI. Landfill gas (LFG) is produced by the decomposition of garbage in the landfill. The LFG contains dominantly methane and carbon dioxide (roughly 50/50), plus other gases including a variety of non-methane organic compounds (NMOCs).

Control of LFG emissions from the landfill is required through the NSPS 40 CFR Part 60, Subpart WWW. The startup of the LFG collection and control system (GCCS), including the currently-permitted open (candlestick) flare, was completed on January 6, 2009.

RI also operates a landfill gas-to-energy (LFGTE) facility under a separate Class I Operating Permit-to-Construct (OPTC, AP4953-2970), which was constructed in mid-2012 and is now operating. The LFGTE facility consists of two, 2,233 HP Caterpillar engines and appurtenances for LFG treatment. Eventually, RI will have to roll-over the OPTC for the LFG engines into its Title V Operating Permit.

The Lockwood Landfill also has, or intends to install, equipment for wood chipping and asphalt grinding. The facility also accepts petroleum-contaminated soil (PCS) for disposal or use as landfill cover.

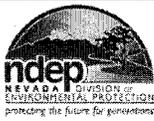
Details regarding process rates, monitoring, recordkeeping, and testing requirements for the various permitted equipment and processes are included in RI's draft renewal permit. The following are descriptions of each permitted system.

### **2.2 MUNICIPAL SOLID WASTE LANDFILL (System 01, F0.001)**

The Lockwood Regional Landfill accepts non-hazardous, municipal solid waste (MSW). For the draft renewal permit, RI requested a maximum design capacity of 42.5 million megagrams (Mg) of solid waste, unchanged from the current permit. Modeling performed by RI using the EPA LandGEM model indicated that uncontrolled non-methane organic compound (NMOC) emissions are projected at 549.4 Mg (605.6 tons) per year, which is higher than the currently-permitted limit of 223.6 Mg per year.

However, the increase in the calculated NMOC emission rate does not constitute a modification under NSPS rules, because LFG generation in a landfill will increase over time, based on the age of the waste and the cumulative amount of waste that is placed in the landfill. Increases in NMOC that are coincident with an increase in design capacity would trigger a modification, but that is not the case here. The highest NMOC emissions are projected to occur in the landfill closure year, 2041.

Because the uncontrolled NMOC potential-to-emit (PTE) exceeds 50 Mg per year (based on the currently-requested design capacity of the landfill), RI is required to maintain and operate a landfill gas collection and control system (GCCS) to fulfill NSPS (40 CFR Part 60, Subpart WWW) and State of Nevada regulations. The collection system consists of LFG extraction wells and a piping network that collects the LFG (75% collection efficiency) and routes it to an open flare to destroy NMOC.



## **2.0 DESCRIPTION OF PROCESS (continued)**

### **2.2 MUNICIPAL SOLID WASTE LANDFILL (System 01, F0.001)(continued)**

The GCCS at Lockwood was designed as an “active” collection system, where the LFG flow at the well-heads and piping network is driven by gas-mover equipment that maintains negative pressure gradients throughout the system, according to the “*Gas Collection and Control System (GCCS) Design Plan, Lockwood Regional Landfill, Sparks, Nevada*” (June 2007), prepared by Cornerstone Environmental Group, LLC., on behalf of Refuse, Inc.

Permit conditions for F0.001 are based almost entirely on NSPS requirements, which are outlined in detail in the various sections of the draft permit. In the current draft permit, only those NSPS provisions pertaining to the active GCCS and the flare control device are included. In general, the following permit language changes for F0.001 were implemented:

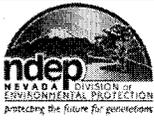
- Removal of requirements to formulate an initial GCCS design plan, since this has already been done, and the facility now contains an active GCCS system.
- Removal of requirements that pertained to a “passive” LFG collection system. The GCCS at Lockwood is operating as an “active” collection system.
- Removal of requirements that pertained to Tier I, II, and III sampling to establish NMOC emission rates. These provisions were removed because Refuse has already constructed a GCCS at Lockwood.
- Inclusion of only those requirements that pertained to the LFG open-flare control device. While Refuse is operating two LFG engines under a separate OPTC, the flare is the only LFG control device included in the draft Title V renewal permit.

### **2.3 WOOD CHIPPING CIRCUIT (Systems 02A – 02E)**

Systems 02A – 02E constitute the Wood Chipping Circuit. The currently-permitted equipment was sold by RI in 2008 or 2009. However, the BAPC determined that placeholders could be kept in the permit for generic equipment to enable RI to bring a contractor’s wood chipping equipment on site, if needed.

In RI’s current Title V permit, they are only allowed to replace the Wood Chipper itself (PF1.002), so language retaining this flexibility was retained in the draft renewal permit. Because all the equipment had been sold, it was essentially de-commissioned. Therefore, if RI constructs and operates a contractor’s wood chipping equipment, they will be required to do notifications and initial opacity tests on each of the equipment comprising the wood chipping circuit as detailed in Section II of the draft operating permit. RI’s representative at Lockwood was informed of this during a phone conversation on January 10, 2013.

If a different wood chipper is brought on site, then each time RI will have to provide notification to the BAPC and then perform an initial opacity test on the new wood chipper. If the other equipment (i.e. conveyors) needs to be changed out, RI can pursue an administrative mechanism for like-kind replacements. During a meeting between RI and the BAPC on November 28, 2012, RI was advised that administrative mechanisms for approval of like-kind replacements are available, even if language allowing such replacements is not included in an air quality permit.



## **2.0 DESCRIPTION OF PROCESS (continued)**

### **2.3 WOOD CHIPPING CIRCUIT (Systems 02A – 02E)(continued)**

Because NSPS and/or NESHAP emissions standards can be triggered for some engines, the BAPC can no longer allow engine change-outs without a formal permit modification or a formal request for determination of like-kind replacement. As such, change out of the 750 HP engine is not allowed in the renewal permit. It must be noted that the change-out provision for S2.001 was removed for this same reason during 2011 Title V significant revision.

RI accepts waste wood at the Lockwood Landfill, processing up to 60 tons per hour. The circuit will operate no more than 2,650 hours per year.

### **2.4 ASPHALT GRINDING CIRCUIT (Systems 03A – 03F)**

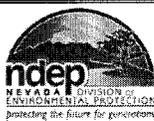
Systems 03A – 03F constitute the Asphalt Grinding Circuit. RI accepts waste asphalt pavement and recycles the material by crushing and stockpiling the ground asphalt. The system will process up to 110 tons per hour (tph) and is limited to operating 8 hours per day, and 265 days per year (2,120 hours per year). Water sprays control particulate emissions from some transfers. In its renewal application, Refuse requested 200 tph, however, they were advised that increasing throughput would require a separate application for revision, because their current permit only specifies 110 tph. The Asphalt Grinding Circuit also includes a 519 HP stationary engine (System 03F).

Because NSPS and/or NESHAP emissions standards can be triggered for some engines (> 300 HP), the BAPC can no longer allow engine change-outs without a formal permit modification. During a meeting on November 28, 2012, RI was informed that there is an administrative process for approval of like-kind replacements, even if specific language that allows such replacements is not included in an air quality permit. RI can certainly pursue such a process, if they so choose. Equipment replacement language was retained for the Asphalt Grinder itself (PF1.008), because replacement language was in the current Title V permit for this emission unit.

### **2.5 PETROLEUM-CONTAMINATED SOIL (PCS) (System 04)**

RI is authorized to accept and manage petroleum-contaminated soils (PCS). The criterion for acceptance, treatment, and discharge of PCS at Lockwood is regulated under RI's NDEP Bureau of Waste Management (BWM) and Bureau of Water Pollution Control (BWPC) permits. These permits reference Total Petroleum Hydrocarbon (TPH) and/or Gasoline-Range Organics (GRO), neither of which is specifically regulated under the NDEP air program.

Treatment of the PCS is performed in a bioremediation cell prior to emplacement in the landfill. RI can accept PCS with any concentration of TPH or GRO. However, if TPH/GRO exceeds 600 ppmw/300 ppmw, they are required to treat the PCS in the bioremediation cell prior to emplacement in the landfill. They are limited by their BWPC permit to having no more than 16,000 tons (11,000 cubic yards) of PCS in the bioremediation cell at any one time. These restrictions are set forth in RI's most current *O&M Manual for the Bioremediation and Liquid Solidification* facilities. The manual is periodically updated and approved by the BWPC.



## **2.0 DESCRIPTION OF PROCESS (continued)**

### **2.5 PETROLEUM-CONTAMINATED SOIL (PCS) (System 04)(continued)**

It was also determined that VOC emissions from the bioremediation cell are negligible, based on information submitted by RI and accepted by the BAPC in July 2008. RI's current Title V permit focuses on TPH emissions from the bioremediation cell, but the focus of the permit should have been on long-term VOC emissions from the treated and untreated PCS emplaced in the landfill itself. Therefore, current permit limits, operating parameters, monitoring, and recordkeeping were critically re-evaluated.

It was found that the permit provision that references volumetric concentration limits (ppm by volume) should have been based, instead, on mass-concentration units, specifically, parts-per-million by mass (ppmw), because all soil VOC analyses are based on mass concentration units. Given that TPH is not regulated by the BAPC, the provision in the current permit that references a TPH limit was removed from the draft renewal permit, and RI was required to provide a maximum PCS VOC concentration in ppmw.

Permit PCS disposal limits were also re-evaluated. RI's BWM Operational Plan (SW214R01) allows acceptance and disposal of up to 50,000 tons per year of low-TPH and low-GRO PCS. But, there is no explicit restriction in their current BWM and BWPC permits that limits the tonnage of additional "treated" PCS that is disposed of at the landfill.

The current Title V permit does not have a PCS disposal limit – it only references the maximum capacity of the bioremediation cell (11,000 cubic yards, or 16,000 tons). RI indicated they would like their new VOC PTE to be based on 50,000 tpy of PCS disposal and 300 ppmw VOC. This equates to 15 tons per year VOC, which is a more reasonable PTE estimate than the one currently in the permit. The annual VOC emissions can be verified by monitoring VOC concentrations and PCS tonnage, and RI is already required to do this monitoring.

RI's current permit contains PCS monitoring methodology that is based on "petroleum units", where the tonnage of accepted PCS is weighted more heavily for gasoline-contaminated soil than for diesel-contaminated soil. However, this methodology does not have any relationship to actual emissions, making emissions reporting impossible for the permit holder and the BAPC.

Therefore, as a result of a meeting held on November 28, 2012 between RI and the BAPC to discuss the PCS issue, the following items were agreed upon:

- RI and the BAPC agreed that monitoring, recordkeeping, and reporting of VOC emissions should be based on the mass concentrations of VOC and the tonnage of PCS.
- RI and the BAPC agreed that the "petroleum units" recordkeeping methodology should not be included in the draft renewal permit.
- The BAPC agreed to construct draft permit language for System 04, and that RI would review the new language and provide alternative language. During the November 28 meeting, RI tentatively proposed a VOC concentration of 300 ppmw for PCS disposed of at the landfill.

The draft Title V permit now contains language that ensures a reasonable demonstration of compliance with requested VOC limits.



## **2.0 DESCRIPTION OF PROCESS (continued)**

### **2.6 CANDLESTICK FLARE (System 05, S2.010)**

The Candlestick Flare serves as the control device for LFG collected at the Lockwood Landfill, and is a major component of the Lockwood GCCS. The Candlestick Flare is the only LFG control listed in RI's current Title V permit. A LFG control device is required under the NSPS for MSW Landfills, as set forth under 40 CFR Part 60, Subpart WWW. Two new reciprocating engines also control LFG emissions, but these are covered under a separate Class I Operating Permit-to-Construct (OPTC), and will not be included in the Title V permit renewal.

The flare has a maximum heat input capacity of 63 MMBtu, and it may operate up to 8,760 hours per calendar year. Subpart WWW requires that the flare must be operated in accordance with the applicable NSPS *General Control Device and Work Practice Requirements*, as set forth in 40 CFR 60.18.

### **2.7 System 06 - RESERVED**

This system is reserved as a placeholder for the eventual roll-over of RI's Class I OPTC for the two new reciprocating engines that combust LFG for electricity generation.

### **2.8 KATOLITE PROPANE GENERATOR (System 07A, S2.013)**

The Katolite generator (25 kW, 34 HP) is an emergency power unit that combusts propane. It has an annual limit of 52 hours per year, as requested by RI. The unit is not listed in RI's current Title V permit, but it has been operated on-site as a "limited-use" source. Because the unit would have otherwise qualified as an Insignificant Activity, but for NSPS and/or NESHAP applicability, RI was allowed to include the engine as part of their Title V renewal application.

The unit functions as a stationary source, and, therefore, it is subject to 40 CFR Part 60, Subpart JJJJ. However, there are no specific requirements in Subpart JJJJ for new emergency engines manufactured prior to 2009. RI requested flexibility to do like-kind replacements for this unit. During a meeting with RI on November 28, 2012, the BAPC initially agreed to formulate some permit language allowing engine replacements.

However, during subsequent review of the draft renewal permit, and given that EPA makes frequent changes to the NSPS and NESHAP regulations for reciprocating engines, the BAPC elected not to include like-kind replacement language in the draft permit. It must be noted that, during the November 28, 2012 meeting with RI, the BAPC informed them that an administrative process exists for approval of like-kind replacements, even if specific language allowing such replacements is not included in an air quality permit. RI can certainly pursue such a process if they so choose.

### **2.9 KOHLER GASOLINE 16 HP PUMP (System 07B, S2.014)**

The Kohler gasoline pump (16 HP) functions as a stationary source. The unit is located at a water pond near the LFGTE plant. RI requested 2,500 hours per year of operation, and therefore it is not an emergency unit. RI did not indicate whether the pump engine is lean-burn or rich burn. Gasoline-powered reciprocating engines operate under the Otto Cycle, so it is reasonable to assume that the Kohler engine is a rich-burn engine. Because the unit was manufactured in 2004, it is subject to certain work practice standards set forth under 40 CFR Part 63, Subpart ZZZZ.



## **2.0 DESCRIPTION OF PROCESS (continued)**

### **2.9 KOHLER GASOLINE 16 HP PUMP (System 07B, S2.014)(continued)**

The unit is not listed in RI's current Title V permit, but it has been operated as an intermittent source (< 8,760 hours per year). Because the unit would have otherwise qualified as an Insignificant Activity, but for NSPS and/or NESHAP applicability, RI was allowed to include the engine as part of their Title V renewal application.

RI requested flexibility to do like-kind replacements, for this unit. During a meeting with RI on November 28, 2012, the BAPC initially agreed to formulate some permit language allowing engine replacements.

However, during subsequent review of the draft renewal permit, and given that EPA makes frequent changes to the NSPS and NESHAP regulations for reciprocating engines, the BAPC elected not to include like-kind replacement language in the draft permit. It must be noted that, during the November 28, 2012 meeting with RI, the BAPC informed them that an administrative process exists for approval of like-kind replacements, even if specific language allowing such replacements is not included in an air quality permit. RI can certainly pursue such a process if they so choose.

### **2.10 GASOLINE STORAGE TANK (System 08, PF1.012)**

System 08 consists of a 2,000-gallon gasoline storage tank. This tank was previously listed in the facility-wide *Insignificant Activity* list. But, because gasoline storage tanks are now regulated under the NESHAP for Gasoline Dispensing Facilities (40 CFR Part 63, Subpart CCCCC), the tank is now included as a permitted emission unit. RI requested 7,000 gallons per year of gasoline throughput for the tank. Because of the low annual (and monthly) gasoline usage, RI only has to implement best management practices to control gasoline spills.

### **2.11 INSIGNIFICANT ACTIVITIES**

A variety of Insignificant Activities are listed in RI's draft renewal permit. They include diesel, waste oil, hydraulic oil, and motor oil storage tanks, all less than 10,000 gallons, plus a variety of parts-cleaning solvents, which are mostly consumer products not stored in tanks.

### **2.12 NON-ROAD ENGINES**

Several currently-permitted emission sources qualify as non-road engines. As part of the application, Refuse, Inc. indicated that several reciprocating engines currently permitted at Lockwood were *non-road* engines, and are therefore exempt from the NESHAP for Reciprocating ICE, 40 CFR Part 63, Subpart ZZZZ. However, Refuse, Inc. did not request that the engines in question be removed from their Title V permit.

RI's proposed non-road engines are listed as follows:

- System 05, S2.003 – S2.005, 130 HP Truck Tipper Engines
- System 06, S2.006 – S2.008, 10.5 HP Light Plant Engines
- System 07, S2.009, 96 HP Diesel Engine

In order to confirm the intended use and mode of operation of these engines, the author made a site visit to the Lockwood Landfill on December 5, 2012 to see the engines, and also to ask on-site personnel some questions about them.



## **2.0 DESCRIPTION OF PROCESS (continued)**

### **2.12 NON-ROAD ENGINES (continued)**

As a result of the site visit, the author can confirm that all the engines listed above can be considered non-road engines. A detailed applicability determination is given below for the engines in question:

#### **System 05 – (Three) 130 HP Truck Tipper Engines**

The Truck Tipper Engines power a platform that tips semi-trailers at a steep angle, so that trash will fall out of them on to the landfill. The Tipper Platforms have wheels on them, and each 130 HP engine is physically attached to its platform. The Tipper Platforms and the Tipper Engines are moved around the landfill every two weeks, on average, because different parts of the landfill are loaded with trash at different times. In general, the Tipper Engines are usually moved greater than 100 feet from their original locations each time they are moved.

On the basis of their portability, and the fact that they are used at any one location less than 12 months, the Truck Tipper Engines can be considered non-road engines.

#### **System 06 – (Three) 10.5 HP Light Plant Engines**

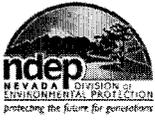
The Light Plant Engines are fairly small in size and are mounted on two-wheel trailers for portability. As the name implies, the Light Plant Engines have lighting fixtures on them to illuminate work areas when trash is unloaded at various locations at the landfill. An on-site representative informed the author that the Light Plant Engines are moved around to various parts of the landfill every few days.

On the basis of their portability and their use at a variety of locations during the course of a year, the Light Plant Engines can be considered non-road engines.

#### **System 07 – 96 HP Diesel Engine**

The 96 HP engine is currently not on site, but Refuse, Inc. would like to keep System 07 as a placeholder in their Title V permit. Refuse, Inc. considers the 96 HP engine to be a non-road engine. An on-site representative informed the author that the 96 HP engine is currently being used at Waste Management's Commercial Row Transfer Station in Reno, and that the 96 HP engine had a variety of uses at Lockwood, including jump-starting mobile equipment and operating air compressors at various locations throughout the landfill property.

On the basis of its purpose and mode of operation (moved around to service mobile equipment), the 96 HP engine can be considered a non-road engine.



## 2.0 DESCRIPTION OF PROCESS (continued)

### 2.12 NON-ROAD ENGINES (continued)

#### NESHAP 40 CFR Part 63, Subpart ZZZZ Exemption

Based on the December 5, 2012 site visit and discussions with on-site personnel, the following engines qualify for the non-road exemption under 40 CFR Part 63, Subpart ZZZZ (40 CFR 63.6585(a)), because they do not meet the definition of “stationary RICE” as set forth in the rulemaking:

System 05, S2.003 – S2.005, 130 HP Truck Tipper Engines

System 06, S2.006 – S2.008, 10.5 HP Light Plant Engines

System 07, S2.009, 96 HP Diesel Engine

#### Removal of Non-Road Engines from Title V Permit

Based on the determination that S2.003 – S2.005, S2.006 – S2.008, and S2.009 qualify as non-road engines, the author formulated a memo for review by the Class I permit supervisor, advocating the designation of these engines as non-road, and thereby recommending that they be removed from the draft renewal permit for Lockwood. The Class I permit supervisor agreed with the proposal and instructed the author to proceed with permitting based on those non-road determinations. It was determined that the 750 HP (System 02E) and the 519 HP engine (System 03F) *do not* qualify as non-road, because their purpose is to support the operation of stationary source equipment.

Therefore, the non-road engines were not included in Lockwood’s draft renewal permit. RI was informed via e-mail (January 3, 2013) that they can operate these engines without having them referenced in the permit, as long as they continue to qualify as non-road engines, and as long as their non-road status qualifies as one of the criteria for exemption from NSPS and/or NESHAP regulations. These engines were also removed from the emissions inventory; however, they were still included in the facility-wide air dispersion modeling analysis.



## **3.0 APPLICABLE REGULATIONS**

### **3.1 NEVADA REVISED STATUTES**

The Nevada Revised Statutes (NRS) are the current codified laws of the State of Nevada. The NRS is the statutory authority for the adoption and implementation of administrative regulations. The statutes relating to the control of air pollution are contained in Title 40, Public Health and Safety, Chapter 445B, Air Pollution, NRS 445B.100 through NRS 445B.640. The NRS specifies that the State Environmental Commission is the governing body given the power to adopt administrative regulations. The Lockwood Landfill will be subject to the NRS and needs to comply with all applicable regulations under the NRS. The NRS may be viewed at the following website: <http://www.leg.state.nv.us/NRS/Index.cfm>

### **3.2 NEVADA ADMINISTRATIVE CODE**

The Nevada Administrative Code (NAC) contains the regulations that have been adopted by the State Environmental Commission (SEC), pursuant to the authority granted by the Nevada Revised Statutes (NRS), relating to the control of air pollution. The NAC requires that, where State regulations are more stringent in comparison to Federal regulations, the State regulations are applicable. The NAC sets forth, by rule, maximum emission standards for visible emissions (opacity), PM<sub>10</sub> (particulate matter less than 10 microns in diameter) and sulfur emitting processes. Other requirements are established for incinerators, storage tanks, odors and maximum concentrations of criteria air pollutants in the ambient air. Other NAC regulations specify the requirements for applying for and method of processing applications for operating permits. All the equipment considered in this application must meet, at a minimum, the applicable standards and requirements set forth in the NAC, specifically, the emission standards contained in NAC 445B.22027 through 445B.22033 for particulate matter, 445B.2204 through 445B.22047 for sulfur emissions, 445B.22017 for opacity, and the Nevada Ambient Air Quality Standards as set forth in NAC 445B.310 through 445B.311. The NAC may be viewed at the following website:

<http://www.leg.state.nv.us/NAC/CHAPTERS.HTML>

### **3.3 NEVADA APPLICABLE STATE IMPLEMENTATION PLAN**

The Applicable State Implementation Plan (ASIP) is a document that is prepared by a state or local air regulatory agency and required to be submitted to the U.S. EPA for approval. Title I of the Clean Air Act is the statutory authority for the U.S. EPA regulations that require a State to submit a ASIP. The contents of the ASIP are intended to show how a state, through the implementation and enforcement of the regulations contained in the ASIP, will either show how attainment of the national ambient air quality standards (NAAQS) will be achieved or how a state will continue to maintain compliance with the NAAQS.

### **3.4 CODE OF FEDERAL REGULATIONS**

The Code of Federal Regulations (CFR) are regulations adopted by the U.S. EPA and published in the Federal Register pursuant to the authority in the Clean Air Act. The CFR addresses multiple aspects, including but not limited to, permitting requirements, performance standards, testing methods, and monitoring requirements. The CFRs may be viewed online at the following website: <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl>



### 3.0 APPLICABLE REGULATIONS (continued)

#### 3.4.1 NEW SOURCE PERFORMANCE STANDARDS

Section 111 of the Clean Air Act, "Standards of Performance of New Stationary Sources," (NSPS) requires EPA to establish federal emission standards for source categories which cause or contribute significantly to air pollution. Each NSPS defines the facilities subject to these requirements and prescribes emission limits for specified pollutants, compliance requirements, monitoring requirements, and test methods and procedures. Since December 23, 1971, the Administrator has promulgated 88 such standards and associated test methods. These standards can be found in the CFR at Title 40 (Protection of Environment), Part 60 (Standards of Performance for New Stationary Sources).

Applicable NSPS provisions include the following:

- 40 CFR Part 60, Subpart WWW for the MSW Landfill GCCS. The draft renewal permit contains only those Subpart WWW applicable requirements that align with RI's established GCCS. Additional Subpart WWW language can be added later to the permit when the LFG engines are rolled into the Title V.
- The Asphalt Grinder and associated equipment are exempt from 40 CFR Part 60, Subpart OOO, because the Lockwood Landfill does not fit the definition of *nonmetallic mineral processing plant*.
- 40 CFR Part 60, Subpart JJJJ for the 34 HP emergency propane engine (manufactured August 2006). However, emergency engines manufactured prior to January 1, 2009 do not have any specific requirements. There appears to be an applicability gap for SI engines constructed after June 12, 2006, and manufactured before January 1, 2009, assuming that the construction date occurred after the manufacture date. Because the 34 HP engine was manufactured in August 2006, there are no specific Subpart JJJJ applicable requirements, and the propane engine is not subject to 40 CFR Part 63, Subpart ZZZZ.
- Depending upon the manufacture and construction dates for any engine that is brought on site, S2.001 could be subject to 40 CFR Part 60, Subpart IIII, and/or 40 CFR Part 63, Subpart ZZZZ. For the existing 519 HP engine, S2.002, the manufacture date (1999) indicates that the engine is only subject to the 40 CFR Part 63, Subpart ZZZZ regulation.

#### 3.4.2 FEDERAL NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

NESHAP for hazardous air pollutants (HAPs) are established in the CFR pursuant to Section 112 of the Clean Air Act Amendments of 1990. These standards regulate air pollutants that are believed to be detrimental to human health. The NESHAP program applies to all sources, both existing and new. These standards are codified in Title 40 CFR Parts 61 and 63.

NESHAPs may cover both major sources and area sources in a given source category. Major sources are defined as those facilities emitting, or having the potential to emit, 10 tons per year or more of one Hazardous Air Pollutant (HAP) or 25 tons per year or more of multiple HAPs. Major sources are required to comply with MACT standards. *Area Sources* are defined as those facilities that are not major sources.



### 3.0 APPLICABLE REGULATIONS (continued)

#### 3.4.2 FEDERAL NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

The Lockwood Landfill is an *Area Source* of HAPs. The following NESHAPs apply:

- 40 CFR Part 63, Subpart AAAA for the MSW Landfill GCCS.
- 40 CFR Part 63, Subpart ZZZZ covers some compression-ignition (S2.001, S2.002) and spark-ignition engines (S2.014).
- 40 CFR Part 63, Subpart CCCCCC for the 2000-gallon gasoline storage tank.

#### 3.4.3 PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The Prevention of Significant Deterioration (PSD) permitting program is a Clean Air Act permitting program for new and modified major stationary sources of air pollution. Implementation of the federal PSD regulations is delegated to the State of Nevada by U.S. EPA and these regulations are contained at 40 CFR Part 52.21. Therefore, BAPC implements the federal PSD regulations directly. These regulations specify federally required permitting procedures for each "major stationary source".

"Major" is defined as the potential to emit of a stationary source, which equals or exceeds a specified threshold (in tons per year) of any air pollutant regulated under the Clean Air Act (40 CFR 52.21(b)(1)). The first threshold is for a stationary source that emits or has the potential to emit 100 tons per year or more of any regulated NSR pollutant and is defined as one of 28 specific categories of sources (see 40 CFR 52.21(b)(1)(i)(a)). The other applicability threshold is for any other stationary source that emits or has the potential to emit 250 tons per year of any regulated NSR pollutant (see 40 CFR 52.21(b)(1)(i)(b)).

The SIC code for the Lockwood Landfill is 4953 for Sanitary Landfills. However, none of the 28 specific categories is representative of the facility. Therefore, major stationary source status would be triggered for the Lockwood Landfill at the 250 ton per year threshold for any pollutant regulated under the Act. However, the Lockwood Landfill will remain a Title V source, even including emissions from the two new LFG engines covered under the state-only Class I OPTC.

#### 3.4.4 COMPLIANCE ASSURANCE MONITORING (CAM) – 40 CFR Part 64

Compliance Assurance Monitoring (CAM) plans are required for major sources required to obtain Title V (Part 70 or 71) permits. The CAM rule was signed on October 3, 1997 and came into effect on November 21, 1997. The U.S. EPA developed the CAM rule to focus on monitoring of certain operating parameters to ensure compliance with emission limitations in-between scheduled source tests. CAM requirements apply to stationary sources that: (1) are equipped with post-process pollutant control devices; (2) have pre-control device emissions equal to or greater than 100% of the major source threshold for a pollutant; and (3) are subject to the Title V permit program. The Lockwood Landfill is not subject to CAM because one or more of the above criteria do not apply to the emission sources at Lockwood.



## 4.0 EMISSIONS INVENTORY

### 4.1 PROPOSED EMISSIONS

A summary of facility-wide emissions are presented in Table 4.1. The Lockwood Landfill is a major (Title V) source based on the annual potential-to-emit (PTE) for SO<sub>2</sub> and CO. The Lockwood Landfill is considered an *area source* of HAPs, with total HAP emissions of < 25 tons per year, and the emissions of any individual HAP < 10 tons per year. The most prevalent HAP in the inventory is toluene at 2.87 tons per year (from the MSW landfill and the PCS disposal).

It must be noted that the BAPC has not yet adopted the PM<sub>2.5</sub> ambient air quality standards into its administrative regulations. As such, the BAPC does not require non-PSD sources to conduct emissions inventories or model for PM<sub>2.5</sub>. However, assuming all PM<sub>2.5</sub> equals PM<sub>10</sub>, the facility wide PTE for PM<sub>2.5</sub> at the Lockwood Landfill will be less than 20 tons per year, which is well below both the Title V and PSD major source thresholds.

SCS Engineers prepared an evaluation of GHG emissions, on behalf of RI, for their application for revision. Total anthropogenic combustion GHG emissions total 4,337 (4,722 calculated by BAPC) tons per year CO<sub>2</sub>e, with biogenic combustion emissions totaling 100,120 tons per year (100,492 calculated by the BAPC). The current permit action does not trigger a requirement to assess PSD applicability with respect to GHG's, because it is a Title V permit renewal, and not a modification.

EPA has finalized a rule (76 FR 43490, July 20, 2011) that gives facilities a 3-year deferral from the requirement to count biogenic CO<sub>2</sub> emissions in determining PSD and Title V applicability. Of the total LFG generated, 25% is considered fugitive. Biogenic CO<sub>2</sub> in LFG that is not captured in the GCCS (i.e. fugitive emissions) does not have to be counted in the inventory for PSD applicability, because the MSW landfills are not on the list of 28 source categories under 40 CFR 52.21(b)(1)(i)(a). So, with biogenic CO<sub>2</sub> excluded, the emissions of CO<sub>2</sub>e are only 4,337 tons per year, well below any major source thresholds.

NMOC is a regulated pollutant for MSW landfills. The NMOC limit in the draft renewal permit is 549.4 Mg per year (605.55 tons), which is the un-captured and uncontrolled NMOC, as calculated by RI using the EPA LandGEM model. The highest NMOC emissions are projected to occur in the closure year 2041. The new NMOC calculation is higher than before (223.6 Mg/yr), but the increase in NMOC is not the result of an increase in maximum landfill capacity. The landfill capacity will remain unchanged at 42.5 million Mg of solid waste, until RI formally requests a capacity increase.

NMOC emissions increase in a landfill over time, depending upon the age of the waste and the cumulative amount of waste emplaced in the landfill. Based on these considerations, the requirement to assess PSD applicability is not triggered for this permit action. The uncontrolled NMOC value is not considered a permit limit – its only function is to determine if, and when, a GCCS is required at a landfill.

With the exception of the two small (<34 HP) engines, any increases in the PTE for pollutants is the result of updating emission factors that had been used in the past. As such, these increases are not associated with a change in the method or manner of operation of any equipment or process.

Section VI of the draft renewal permit contains detailed monitoring, recordkeeping, and reporting requirements to ensure that RI complies with its requested emission limits for all regulated pollutants.



## 4.0 EMISSIONS INVENTORY (continued)

**Table 4.1**  
**Lockwood Landfill - Class I (Title V) Renewal**  
**Facility Wide Potential-to-Emit (April 2013)**

System	Annual Emissions (tons/yr)									
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	H <sub>2</sub> S	CO <sub>2e</sub>	
System 01 - MSW Landfill (Uncontrolled)	NMOC of 549.4 Mg/yr (605.55 tons per year)						N/A	N/A	N/A	N/A
System 02A - 02D Wood Chipping Circuit	7.51	4.18	0.63	N/A	N/A	N/A	N/A	N/A	N/A	
System 02E - 750 HP Diesel Engine	0.11	0.09	0.08	0.83	5.24	1.39	0.15	N/A	1,805	
System 03A - 03E Asphalt Grinding Circuit	0.71	0.27	0.04	N/A	N/A	N/A	N/A	N/A	N/A	
System 03F - 519 HP Diesel Engine	0.23	0.23	0.23	0.21	3.21	0.69	0.26	N/A	1,304	
System 04 - Petroleum-Contaminated Soil Storage	N/A	N/A	N/A	N/A	N/A	N/A	15.00	N/A	N/A	
System 05 - Candlestick Flare	9.20	9.20	9.20	86.60	19.32	102.10	2.00	0.49	N/A	
System 06 - Reserved - LFGTE Project, Class I OPTC	4.32	4.32	4.32	25.70	25.88	130.00	7.48	1.92	N/A	
System 07A - Katolite Propane Generator (25 kW)	0.001	0.001	0.001	0.00004	0.020	0.010	0.010	N/A	234	
System 07B - Kohler Gasoline Pump (16 HP)	0.010	0.010	0.010	0.010	0.220	0.140	0.430	N/A	76	
System 08 - Gasoline Storage Tank	N/A	N/A	N/A	N/A	N/A	N/A	0.050	N/A	N/A	
Non-Permit and Non-Road Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.004	N/A	1,303	
<b>Total =</b>	<b>22.09</b>	<b>18.30</b>	<b>14.51</b>	<b>113.35</b>	<b>53.89</b>	<b>234.33</b>	<b>25.38</b>	<b>2.41</b>	<b>4,722</b>	

**Note:** There are no permit limits in System 01 for fugitive CO, VOC, or H<sub>2</sub>S, nor does Refuse, Inc. report these on an annual basis. Fugitive GHG (CO<sub>2e</sub>) from the landfill itself are currently exempted from the inventory (i.e. the biogenic exemption), as are emissions from combustion equipment that burn landfill gas. The GHG (CO<sub>2e</sub>) emissions represent those from *anthropogenic* sources (other fuel-burning equipment). The uncontrolled emission rate of NMOC for System 01 is actually the maximum in the landfill closure year 2041. The PTE for the LFG engines covered under Class I OPTC AP4953-2970 are included in the facility-wide totals, because there are no restrictions limiting concurrent operation of the flare and the LFG engines.



## 5.0 AMBIENT AIR IMPACT ANALYSIS

### 5.1 INTRODUCTION/ PURPOSE

The purpose of this analysis is to determine the likely air quality impacts resulting from continued operation of the Lockwood Landfill under the conditions of the draft renewal permit.

### 5.2 CLASSIFICATION OF AIR BASIN

The Lockwood Landfill is located in Air Quality Hydrographic Basin (HA) 83, the Tracy Segment of the Truckee River Basin. HA 83 is currently unclassified for all criteria pollutants. The unclassifiable designation was developed due to lack of available monitoring data to properly classify the air basin. HA 83 is a PSD-triggered 107(d) Planning Area. Therefore, this evaluation will address the dual issues of compliance with the Nevada AAQS and the PSD increments.

### 5.3 AIR QUALITY MODELING ANALYSIS

#### 5.3.1 AIR DISPERSION MODEL

RI performed the requisite air dispersion modeling analysis and environmental evaluation in support of their renewal application using the currently approved/preferred U.S. EPA model AERMOD to determine likely air quality impacts (subcontracted to SCS Engineers and LNM Consulting). The BAPC ran check model runs to test the sensitivity of the model to changes in key input parameters, for example, emission rate scalars. The BAPC also used the model AERMOD (v. 12060). Currently, applicants are allowed to use the U.S. EPA Scheffe screening tool to determine worst-case ozone impacts.

The BAPC used Lakes Environmental's *AERMOD-View* graphical-user interface to input source information, generate receptors, and to actually run AERMOD.

#### 5.3.2 AVERAGING PERIODS

The BAPC performed check model runs for PM<sub>10</sub> (24-hour, Annual), SO<sub>2</sub> (3-hour, 24-hour, Annual), NO<sub>x</sub> (Annual), CO (1-hour, 8-hour), and H<sub>2</sub>S (1-hour). The newer PM<sub>2.5</sub>, 1-hour NO<sub>2</sub>, and 1-hour SO<sub>2</sub> standards have not yet been adopted for inclusion in the Nevada air quality regulations. As such, these newer standards are not applied at the present time. To be conservative, the BAPC did not apply Hour-of-Day (HROFDY) scalars or annualized emission-rate adjustments to the model. The BAPC considers the highest-first-high (H1H) model result (plus background) for compliance demonstration.

#### 5.3.3 SOURCE PARAMETERS

Source input parameters were provided by RI in their 2012 application for renewal. Although it is not possible to verify all source release parameters used by an applicant, a review of the models at that time indicated that the input data used by RI was reasonable and not out of the ranges typically encountered in models submitted to this agency by applicants. In order to model conservatively, the BAPC ran its check models without HROFDY scalars, and with non-road engines and decommissioned emission units included. The BAPC ran check models using the maximum, or greater, short-term (hourly) emission rate for each emission unit. The BAPC also included the 2 new LFG engines permitted under the Class I OPTC AP4953-2970.



## 5.0 AMBIENT AIR IMPACT ANALYSIS (CONTINUED)

### 5.3.4 RECEPTORS

Plant boundary receptors were spaced at 25 meter intervals. Receptors were spaced at 50 meter intervals up to about 1.5 km from the plant boundary. A total of 5,103 receptors were included in the model. A slightly different plant boundary was provided by the applicant, relative to the last model that was performed. This plant boundary has a physical fenceline associated with it, in NAD 83 UTM coordinates.

### 5.3.5 METEOROLOGICAL DATA

The BAPC performed its check model runs using the 2009 and 2010 met data from the NV Energy Tracy Power plant. The met data was processed by Redhorse as part of their work on re-vamping the BAQP Increment Tracking System. This same met data will be used by the Nevada Bureau of Air Quality Planning (BAQP) for PSD increment tracking in HA 83.

### 5.3.6 BUILDING DOWNWASH

In accordance with current U.S. EPA and BAPC guidelines, building downwash was considered for all model runs. Building downwash effects were evaluated using the BPIPPRIME algorithm to calculate projected building heights and widths for each point source in the model. This information is used by AERMOD to determine whether plume dispersion from a particular point source will be influenced by building downwash.

### 5.3.7 TERRAIN

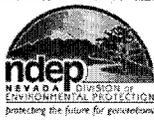
AERMOD requires that elevated terrain be considered in air dispersion modeling analyses. RI provided a GeoTiff file prepared using the National Elevation Dataset (NED). It must be noted that the NED is currently supported by AERMAP/AERMOD.

### 5.3.8 BACKGROUND CONCENTRATIONS

RI provided background concentrations for PM<sub>10</sub>, NO<sub>x</sub>, CO, and ozone. The BAPC recommended background concentrations for SO<sub>2</sub>. No background values are available for H<sub>2</sub>S. Background values used in the Nevada AAQS compliance demonstration are tabulated in Table 5.4-1. The BAPC has determined that these background values are very conservative, because they were derived from ambient monitoring conducted by the Washoe County AQMD in the adjacent Reno urbanized area. Noteworthy is that the Reno urbanized area is not in the same hydrographic basin as the Lockwood Landfill.

## 5.4 AIR QUALITY IMPACT ASSESSMENT

Results of air dispersion modeling are presented in Table 5.4-1. As can be seen, operation of the Lockwood Landfill under the draft renewal permit conditions will not result in violations of the Nevada AAQS. In addition, the Nevada Bureau of Air Quality Planning (BAQP) performed a separate increment tracking analysis for PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>x</sub>. Their results indicated that the Lockwood Landfill will not adversely impact PSD increments in HA 83.



## 5.0 AMBIENT AIR IMPACT ANALYSIS (CONTINUED)

<b>Table 5.4-1</b>							
<b>Lockwood Landfill - 2013 Class I (Title V) Renewal</b>							
<b>BAPC Air Dispersion Model - January 2013</b>							
Pollutant	AAQS Averaging Period	BAPC Model Met Year	BAPC 2013 Model	Backgr. Conc.	BAPC Total Impact	AAQS	BAPC Percent of Standard
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	%
PM <sub>10</sub>	24-hr	2009	49.2	69	118.2	150	79
	Annual	2009	4.7	28	32.7	50	65
SO <sub>2</sub>	3-hr	2009	65.7	26	91.7	1,300	7
	24-hr	2010	22.4	10	32.4	365	9
	Annual	2009	1.9	4	5.9	80	7
NOX	Annual	2010	21	37	58.0	100	58
CO	1-hr	2009	769	5,142	5,911	40,500	15
	8-hr	2010	209	3,511	3,720	10,500	35
H <sub>2</sub> S	1-hr	2009	59.8	0	59.8	112	53
O <sub>3</sub>	1-hr	N/A	32	180	212	235	90

**\*Note:** Background concentrations were provided by the applicant, and are very conservative, because most of them were derived from monitoring conducted in the Reno urban area (Washoe County), west of the Lockwood Landfill. Y2009 and 2010 Meteorology from the Tracy Power plant was used for modeling.



## 5.0 AMBIENT AIR IMPACT ANALYSIS (CONTINUED)

### 5.6 OZONE SCREENING

The BAPC performed an assessment of worst-case, potential ozone impacts from operation of the Lockwood Landfill. Ozone screening was performed using reference tables in the U.S. EPA document entitled, *VOC/NO<sub>x</sub> Point Source Screening Tables*, by Richard Scheffe (1986, 88). Based upon the annual PTE for NO<sub>x</sub> and VOCs, the BAPC has confirmed the analysis by RI that the 1-hour ozone increment will not exceed 32  $\mu\text{g}/\text{m}^3$ . With a conservative background of 180  $\mu\text{g}/\text{m}^3$  added, the total impact would be 212  $\mu\text{g}/\text{m}^3$  (the standard is 235). Based on these results, the BAPC believes that continued operation of the Lockwood Landfill will not result in future exceedances of the AAQS for ozone.



## 6.0 CONCLUSIONS

Based on the above review and supporting data and analyses, operation of Lockwood Landfill, under the draft renewal permit conditions, will not result in violations of any applicable ambient air quality standards.

Appendix 1 - BAPC Detailed Emissions Inventory for the Lockwood Landfill

Appendix 2 - BAPC-Draft Class I (Title V) Permit Renewal AP4953-1148.02

*Pat Mohn*

*4/2/13*

Pat Mohn, Staff Engineer III

Date

*Jeffrey Kinder*

*4/22/2013*

Jeffrey Kinder, P.E.  
Supervisor, Permitting Branch  
Bureau of Air Pollution Control

Date

Nevada Division of Environmental Protection Bureau of Air Pollution Control	Company Name:	Date:
	Refuse Inc. (Waste Management of Nevada)	Compiled January 2013
	Source Name:	Location:
	Lockwood Regional Landfill	Storey County, Nevada

**System #1 - Municipal Solid Waste Landfill**

**I. Emission Units/Process Description:**

F0.001                      Municipal Solid Waste Landfill (MSW)

**Refuse, Inc.'s Estimated Emissions**

EPA Landfill Gas Emissions Model (LandGEM), Version 3.02 was used by Refuse, Inc.

**Input Review**

			<u>Note</u>
Landfill Open Year		1969	
Landfill Closure Year (w/ 80 year limit)		2041	
Actual Closure Year		2041	
Design Capacity	(42.5 million Mg solid waste)	46,848,200	Short Tons
Landfill Type		No Codisposal	
Methane Generation Rate k (1/yr)		0.02	
Potential Methane Generation Capacity (Lo), m <sup>3</sup> /Mg of refuse		69	A
NMOC concentration, ppmv as hexane		2079	B
Methane, % volume		50	
Carbon Dioxide, % volume		50	
LFG Collection System Efficiency (%)		75	

**Results from LandGEM:**

Uncontrolled NMOC (tons/year)	605.55	
Fugitive NMOC (tons/year @ 25% fugitive)	151.39	
Uncontrolled VOC (tons/year)	236.16	C
Fugitive VOC (tons/year @ 25% fugitive)	59.04	

A - Refuse Inc. provided documentation in Sept. 2012, showing that the Lo value of 69 m<sup>3</sup>/Mg was still valid.

B - NMOC concentration based on July 24-28, 2006, Tier 2 Study.

C - For MSW sites with unknown VOC concentration in LFG, assume VOC is 39% of NMOC; AP-42, Sec. 2.4-2.

D - Check LandGEM runs performed by the BAPC, using input data provided by RI, were comparable to RI's NMOC estimates.

E - It is not possible to formulate a single emission factor for NMOC, because the MSW emplacement rate is not fixed from year-to-year, and RI is not required to have an annual MSW emplacement limit. In general, the tonnage of MSW emplaced will increase every year as the service area population grows. Moreover, the NMOC emissions will increase with time based on the age of the waste and the cumulative tonnage of MSW emplaced in the landfill.

# Refuse, Inc. - Lockwood Regional Landfill - 2013 Renewal

## Material Handling Emissions

System #	Source #	Source Description	SCC Code	MATERIAL		Operating Hours		Emission Factor, lb/ton			Particulate Emissions Control Tech.	Control Efficiency Percent	Volume Flow Rate dscf/m	Outlet Grain Loading, (PM) grains/dscf	Outlet Grain Loading, (PM-10) grains/dscf	Outlet Grain Loading, (PM2.5) grains/dscf	CALCULATED Emissions, lb/hr			CALCULATED Emissions, ton/yr			Emission Factor Reference				
				ton/hr	ton/yr	hr/day	hr/yr	PM	PM-10	PM2.5							PM	PM-10	PM2.5	PM	PM-10	PM2.5					
<b>02A Wood Chipping Circuit - Wood Chipper Loading</b>																											
PFI.001		Material Transfer by Loader to Tub Grinder (Wood Chipper)	3-05-020-32	60	159,000	24	2,650	0.0002	0.0001	0.00002	None	0	N/A	N/A	N/A	N/A	0.012	0.006	0.001	0.016	0.008	0.001	AP-42, Sec. 11.19.2-2 Estimated Truck Loading				
<b>02B Wood Chipping Circuit - Wood Chipper</b>																											
PFI.002		Wood Chipper	3-07-008-02	60	159,000	24	2,650	0.35	0.20	0.03	Water Sprays	75	N/A	N/A	N/A	N/A	5.250	3.000	0.450	6.956	3.975	0.596	Historical AP-42 for Log Sawing, SCC 30700802				
<b>02C Wood Chipping Circuit - Wood Chipper Discharge</b>																											
PFI.003		Wood Chipper transfer to Conveyor (Phase 1 Belt)	3-05-020-06	60	159,000	24	2,650	0.0030	0.0011	0.00017	None	0	N/A	N/A	N/A	N/A	0.180	0.066	0.010	0.239	0.087	0.014	AP-42, Sec. 11.19.2-2 Conveyor Drop				
PFI.004		Conveyor (Phase 1 Belt) to Conveyor (Phase 2 Belt)	3-05-020-06	60	159,000	24	2,650	0.0030	0.0011	0.00017	None	0	N/A	N/A	N/A	N/A	0.180	0.066	0.010	0.239	0.087	0.014	AP-42, Sec. 11.19.2-2 Conveyor Drop				
<b>02D Wood Chipping Circuit - Stockpile</b>																											
PFI.005		Conveyor (Phase 2 Belt) to Stockpile for trailer discharge	3-05-020-06	60	159,000	24	2,650	0.0030	0.0011	0.00017	Water Sprays	75	N/A	N/A	N/A	N/A	0.045	0.017	0.003	0.060	0.022	0.003	AP-42, Sec. 11.19.2-2 Conveyor Drop				
													<b>Totals</b>				5.67	3.15	0.47	7.51	4.18	0.63					

Note: The BAPC used conveyor drop emission factors from AP-42, Section 11.19 (Aggregate Handling). There appear to be no EFs for wood chip handling in the current version of AP-42, so the aggregate handling factors were used. Note that the previous renewal by the BAPC accepted the aggregate handling factors for the wood chip transfers. For the 2012 renewal, the BAPC researched available information, and it appears that there are still no process-specific EFs available for wood chip handling. It must be noted that the BAPC found that the State of TX has used the Section 11.19 EFs for "wood biomass" transfer, so there is a precedent for using the aggregate handling factors for wood chip handling. The historical AP-42 (4th Ed.) EF for Sawmill "Log Sawing" was also used for the previous renewal at Lockwood, and the EF had been revised in 2002, but this is the only factor that may be used at this time for the wood chipper itself. The EFs for the loader drop to the wood chipper are the same as used by the BAPC for the previous permit renewal, where PM was estimated as 2X the PM10 factor for Truck Loading (AP-42, Sec. 11.19.2.2). To estimate PM2.5, the ratio PM10/PM2.5 = 6.6 was used. RI used outdated emission factors for some of the material transfers, but the BAPC required RI to submit amended emission unit forms correcting the factors. In Nov. 2012 information submitted, RI clarified the requested controls for each of the above units, and the controls listed reflect their most recent request. Minor differences may exist between the PTES calculated by RI and the BAPC, but these are mainly due to rounding errors. The RI-requested permit limits will be included in the renewal permit.

**Refuse, Inc. - Lockwood Regional Landfill - 2013 Renewal**

Unit Description	SCC	Location UTM (NAD 83/Zone 11)		Yearly Operation Hours (hrs)	Heat Input (MMBtu/hr)	Fuel		Power Output (hp)	Emission Factor		Controls		Emission Rate		Emission Factor Notes
		East (km)	North (km)			(amount)	(units)		Pollutant	Factor	Unit	Type	Efficiency (%)	Hourly (lbs/hr)	

**System 02E - Wood Chipping Circuit - 750 HP Diesel Engine**

S2.001	750 HP Diesel Engine	20200401	275,407	4,374,957	1,300	2.52	18	gal/hr	750	PM	0.0697	lbs/MMBtu		0.18	0.11	AP-42, Sec. 3.4 Large Diesel Engines
					1,300	2.52	18	gal/hr	750	PM10	0.0573	lbs/MMBtu		0.14	0.09	AP-42, Sec. 3.4 Large Diesel Engines
					1,300	2.52	18	gal/hr	750	PM2.5	0.0479	lbs/MMBtu		0.12	0.08	AP-42, Sec. 3.4 Large Diesel Engines
					1,300	2.52	18	gal/hr	750	SO2	0.505	lbs/MMBtu		1.27	0.83	AP-42, Sec. 3.4 Large Diesel Engines
					1,300	2.52	18	gal/hr	750	CO	0.85	lbs/MMBtu		2.14	1.39	AP-42, Sec. 3.4 Large Diesel Engines
					1,300	2.52	18	gal/hr	750	NOX	3.2	lbs/MMBtu		8.06	5.24	AP-42, Sec. 3.4 Large Diesel Engines
					1,300	2.52	18	gal/hr	750	VOC	0.09	lbs/MMBtu		0.23	0.15	AP-42, Sec. 3.4 Large Diesel Engines

Fuel	Heat Content	Units	Ash Content (% weight)	Sulfur Content (% weight)	Trace Elms (% weight)	Percent Moisture (%)	Volatiles Matter (%)	Fixed Carbon (%)
Distillate Fuel Oil	140,000	Btu/gal	0.010	0.5000	negligible			

Note: Emission factors are from AP-42, Section 3.4 for Large Diesel Engines (Tables 3.4-1 and 3.4-2). HAPs are from Sec. 3.4-3 and 3.4-4. Subpart ZZZZ CO limits are also applicable in mid-2013. The SO2 EF was derived from Refuse's requested sulfur content of 0.5% (i.e. 1.01 x %S), which is conservative, as all diesel is less than 500 ppmw (0.05%). PM sizing from Table 3.4-2, with PM2.5 approximated as PM3+condensable particulate. RI proposed emission limits match BAPC limits above.





# Refuse, Inc. - Lockwood Regional Landfill - 2013 Renewal

## Petroleum-Contaminated Soil (PCS)

System #	Source #	Source Description	SCC Code	PCS Disposal Limit (ton/yr)	Operating Hours		EF (lb/ton) VOC	PTE (ton/yr) VOC	Emission Factor Reference
					hr/day	hr/yr			
4		Petroleum-Contaminated Soil							

**PFI.011    Petroleum-Contaminated Soil Storage and Disposal    5-03-008-20    50,000    24    8,760    0.60    15.0    EF's based on applicant-requested permit limits.**

Note: RI requested a VOC concentration limit for emplaced PCS as 300 ppmw (0.6 lb VOC/ton PCS), which corresponds to an annual VOC PTE of 15 tons per year.

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Unit Description	SCC	Location UTM (NAD 83 Zone 11)		Yearly Operation Hours (hrs)	Heat Input (MMBtu/hr)	LFG Fuel		Power Output (hp)	Emission			Controls		Emission Rate		Emission Factor Notes
		East (km)	North (km)			(amount)	(units)		Pollutant	Factor	Unit	Type	Efficiency (%)	Hourly (lbs/hr)	Yearly (ton/yr)	

System 05 - Candlestick Flare 63 MMBtu

S2.010 Candlestick Flare (Open Flare)	50300601	274.754	4,374.726	8,760	63	126,000	Scf/hr	N/A	PM	0.033	lbs/MMBtu		2.10	9.2	AP-42, Section 2.4-5, 0.001 lb/hr/DSCFM (11/98).
				8,760	63	126,000	Scf/hr	N/A	PM10	0.033	lbs/MMBtu		2.10	9.2	AP-42, Section 2.4-5, 0.001 lb/hr/DSCFM (11/98).
				8,760	63	126,000	Scf/hr	N/A	PM2.5	0.033	lbs/MMBtu		2.10	9.2	AP-42, Section 2.4-5, 0.001 lb/hr/DSCFM (11/98).
				8,760	63	126,000	Scf/hr	N/A	SO2	0.31	lbs/MMBtu		19.77	86.6	ER based on 98% removal of H2S and its conversion to SO2. The limit proposed by RI is higher than that calculated by the NBAPC based on the amount of H2S destroyed in the flare.
				8,760	63	126,000	Scf/hr	N/A	CO	0.37	lbs/MMBtu		23.31	102.10	Manufacturer guarantee in lb/MMBtu.
				8,760	63	126,000	Scf/hr	N/A	NOX	0.07	lbs/MMBtu		4.41	19.32	Manufacturer guarantee in lb/MMBtu.
				8,760	63	126,000	Scf/hr	N/A	VOC	0.0073	lbs/MMBtu		0.46	2.00	39% of NMOC = VOC, AP-42, Section 2.4-2 (11/98) for "No Co-Disposal" landfills.
				8,760	63	126,000	Scf/hr	N/A	H2S	0.0018	lbs/MMBtu		0.11	0.49	EF based on 98% destruction of 500 ppmv H2S in LFG.
				8,760	63	126,000	Scf/hr	N/A	NMOC	0.0186	lbs/MMBtu		1.17	5.13	EF based on 98% destruction of 2079 ppmv NMOC in LFG (NSPS Tier 2 sampling).

Fuel	Heat Content	Units	Ash Content (% weight)	Sulfur Content (ppmv H2S)	Trace Elems (% weight)	Percent Moisture (%)	Volatile Matter (%)	Fixed Carbon (%)
Landfill Gas, LFG	500	Btu/ft <sup>3</sup>		500				

Notes: VOC, H2S, NMOC, and HAPs are constituents of the LFG and are controlled by the flare. PM, CO, NOX, and SO2 are secondary pollutants emitted from combustion of the LFG constituents. Emissions of HAPs and GHGs from the flare are in separate worksheets.

Note: Estimates of the emissions of the individual pollutants are based on different computational methods, as seen above. However, for the current emissions inventory, all emission factors were cast in lb/MMBtu, based on applicant-requested short-term limits and the hourly heat input of the flare. RI's current permit requires tracking heat input.



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Unit Description	SCC	Location UTM (NAD 83/Zone 11)		Yearly Operation Hours (hrs)	Heat Input (MMBtu/hr)	Fuel		Power Output (hp)	Emission			Controls		Emission Rate		Emission Factor Notes	
		North (km)	East (km)			(amount)	(units)		Pollutant	Factor	Unit	Type	Efficiency (%)	Hourly (lbs/hr)	Yearly (ton/yr)		
<b>System 07B - 16 HP Gasoline Pump</b>																	
S2.014	16 HP Gas Engine	2-03-003-01	4,360,225	275,407	2,500	0.11	0.97	gal/hr	16.0	PM	0.10	lbs/MMBtu	None		0.011	0.01	AP-42, Sec. 3.3 Small Gasoline Engines
					2,500	0.11	0.97	gal/hr	16.0	PM10	0.10	lbs/MMBtu	None		0.011	0.01	AP-42, Sec. 3.3 Small Gasoline Engines
					2,500	0.11	0.97	gal/hr	16.0	PM2.5	0.10	lbs/MMBtu	None		0.011	0.01	AP-42, Sec. 3.3 Small Gasoline Engines
					2,500	0.11	0.97	gal/hr	16.0	SO2	0.084	lbs/MMBtu	None		0.009	0.012	AP-42, Sec. 3.3 Small Gasoline Engines
					2,500	0.11	0.97	gal/hr	16.0	CO	0.99	lbs/MMBtu	None		0.11	0.14	AP-42, Sec. 3.3 Small Gasoline Engines
					2,500	0.11	0.97	gal/hr	16.0	NOX	1.63	lbs/MMBtu	None		0.18	0.23	AP-42, Sec. 3.3 Small Gasoline Engines
					2,500	0.11	0.97	gal/hr	16.0	VOC	3.03	lbs/MMBtu	None		0.34	0.42	AP-42, Sec. 3.3 Small Gasoline Engines

Fuel	Heat Content	Units	Ash Content (% weight)	Sulfur Content (% weight)	Trace Elms (% weight)	Percent Moisture (%)	Volatlie Matter (%)	Fixed Carbon (%)
Gasoline	115,000 (LHV)	Btu/gal	0.010	0.5000	negligible			

Note: Emission factors are from AP-42, Section 3.3 for Small Gasoline Engines (Tables 3.3-1). The VOC emission factor is the TOC for exhaust+evaporative+crankcase+refueling as conservatively requested by the applicant. The applicant used EF's in lb/HP-hr. BAPC prefers EF's in lb/MMBtu. The applicant estimated 0.04 MMBtu/hr heat input, but based on 7000 Btu/HP-hr, the correct heat input should be 0.112 MMBtu/hr and 0.97 gal/hr. RI approved these changes during a meeting on Nov. 28, 2012 by initialing the EU form. The hourly and annual emission limits now match, with minor rounding errors. The emission limits requested by RI will be used in the permit.

## Refuse, Inc. - Lockwood Landfill - 2013 Renewal

System #	I.D. #	Source Description	Max. Tank Cap. (gal.)	Annual Throughput (gal.)	EF lb. VOC/10 <sup>3</sup> gal.	VOC Control Tech.	VOC Control Eff. %	Controlled VOC ER		Emission Factor Reference
								(lbs/yr)	(tons/yr)	
8	Gasoline Tank									
	S2.015	Joor Gasoline Tank	2,000	7,000	13.10	None	0	92	0.05	Emissions estimates from RI supplemental information to their application for renewal.

## Refuse, Inc. - 2013 Renewal - Non-Permit Equipment (Insignificant Activities)

ID. #	Source Description	Max. Tank Cap. (gal.)	Annual Throughput (gal.)	EF lb. VOC/10 <sup>3</sup> gal.	VOC Control Tech.	VOC Control Eff. %	Controlled VOC ER		Emission Factor Reference	
							(lbs/yr)	(tons/yr)		
IA1.001	1,000 Gallon Diesel Tank	1,000	156,000	0.007300	None	0	1.1	0.001	ER's provided by RI using Tanks program.	
IA1.002	10,000 Gallon Diesel Tank	10,000	300,000	0.014000	None	0	4.2	0.002	ER's provided by RI using Tanks program.	
IA1.003	1,500 Gallon Diesel Tank	1,500	253,000	0.013	None	0	3.3	0.0016	ER's provided by RI using Tanks program.	
IA1.004	2,000 Gallon Waste Oil Tank	2,000	4,000	Neg	None	0	Neg	Neg	RI calculated 0.0005 lb/yr losses using Tanks.	
IA1.005	605 Gallon Hydraulic Oil Tank	605	1,250	Neg	None	0	Neg	Neg	RI calculated 0.0043 lb/yr losses using Tanks.	
IA1.006	200 Gallon Motor Oil Tank	200	400	Neg	None	0	Neg	Neg	RI calculated 0.0012 lb/yr losses using Tanks.	
IA1.007	264 Gallon Motor Oil Tank	264	900	Neg	None	0	Neg	Neg	RI calculated 0.0013 lb/yr losses using Tanks.	
IA1.008	500 Gallon Used Oil Tank	500	3,500	Neg	None	0	Neg	Neg	RI calculated 0.02 lb/yr losses using Tanks.	
IA1.009	1,500 Gallon Motor Oil Tank	1,500	1,250	Neg	None	0	Neg	Neg	RI calculated 0.0003 lb/yr losses using Tanks.	
IA1.010	1,500 Gallon Used Oil Tank	1,500	1,250	Neg	None	0	Neg	Neg	RI calculated 0.0003 lb/yr losses using Tanks.	
IA1.011	Citrus Solve Cleaner/Degreaser			Neg	None	0	Neg	Neg	Water-based degreaser. Negligible vaporization.	
IA1.012	Brake Wash (non-chlorinated)			Neg	None	0	Neg	Neg	Some VOC content. Comes in bottles, spray cans.	
IA1.013	Petro AMSOL 120 Mineral Spirits			Neg	None	0	Neg	Neg	Some VOC content. Product not stored in tanks.	
<b>Total VOC's</b>										<b>0.0043</b>