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Expiration Date: March 14, 2022

Yakima Regional Clean Air Agency

Mailing and Location Address: 329 North 1st Street
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AIR OPERATING PERMIT STATEMENT OF BASIS

Supplementary Information for Air Operating Permit No. Y-00063-1

Permit Issued to: Yakima County Public Services- Solid Waste Division
7151 Roza Hill Drive
Yakima, WA. 98901

For the Facility located at: Cheyne Landfill
4970 Cheyne Road
Zillah, WA. 98953

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1.0 Statement of Basis and Relevant Details

Pursuant to Title V of the Federal Clean Air Act (FCAA) as amended in 1990, the Yakima Regional Clean Air Agency, hereinafter known and abbreviated as YRCAA, sought and was granted delegation to implement the Title V Air Operating Permit (AOP) program. Yakima County Public Services- Solid Waste Division owns and operates Cheyne Landfill, a municipal solid waste landfill facility located at 4970 Cheyne Road. Zillah, WA. 98953. Cheyne Landfill hereinafter referred to as the Permittee, CLF, the Facility or the permitted Facility has been in operation since 1972. The permitted Facility had an original design capacity of 1.8 million tons. On August 19, 2009 CLF was issued an Order of Approval for New Source Review (NSR) to expand horizontally to a design capacity of 8.2 million tons (7.44 million Megagram (Mg)). As a result of the expansion CLF became subject to 40 CFR Part 60 Subpart WWW (Standards of Performance for New Stationary Sources for Municipal Solid Waste Landfills) which required the Permittee to obtain a Title V AOP. The Permittee submitted a Title V AOP application to YRCAA and the permit was deemed complete on January 7, 2011 and issued an AOP on March 26, 2012 for five years which will expire on March 27, 2017. The Permittee submitted the first renewal application on March 26, 2016 and was deemed complete in August, 2016. The AOP application and the renewal application and other relevant information provided the basic information for the development and issuance of the Title V AOP. The permit application and additional information provided are part of the permanent public record in the office of the YRCAA at 329 North First Street in Yakima, Washington.

The Yakima Health District (YHD) issued an operating permit for CLF on November 21, 2006. The same permit was subsequently modified and reissued on November 4, 2008 for the expansion. The current YHD permit expires on November 16, 2016.

1.1 Definitions

The terms not otherwise defined in the AOP or the permit applications have the meaning assigned to them in the referenced regulations.

1.2 Authority

This permit, number y-00063-1 issued by YRCAA, is authorized under the procedures established in the Washington Administrative Code (WAC) Chapter 173-401 Operating Permit Regulation, (effective 12/1/10). The provisions of this Title V AOP describes for the Permittee, the emission limitations, monitoring, recording and reporting requirements, and other conditions which will insure that all air emission requirements applicable to the permitted Facility are met.

1.3 Identical Applicable Requirements

Identical or nearly identical regulation requirements of the Washington Administrative Code (WAC) and the YRCAA Regulation 1 are cited together in the tables of Section 2.0 of the Title

V AOP. However, when regulations in the WAC and the YRCAA Regulation 1 with identical or nearly identical requirements are cited, the permitted source must comply with both requirements. As applicable, emission units are grouped together to indicate applicability of identical Monitoring, Recordkeeping, and Reporting Requirements (MRRR) or identical Compliance Assurance and Demonstration Provisions.

1.4 Insignificant Emission Units (IEU)

Insignificant Emission units (IEU's) are activities or emission units in the permitted Facility as defined in WAC 173-401-530 (effective 10/17/02). As provided in same WAC, an activity or emission unit is insignificant based on one or more, but not limited to, the following (WAC 173-401-530 should be referenced in its entirety):

1.4.1 regulated emissions are below the stipulated threshold levels of WAC 173-401-530(4);
1.4.2 activities are identified as categorically exempt as per WAC 173-401- 532;
1.4.3 activities are below stipulated size or production rate; and
1.4.4 activities only generate fugitive emissions as defined in WAC 173-400-030(39).

Activities or emission units in the permitted Facility found to be insignificant based on the above and WAC 173-401-530 (effective 6/17/94) are not required to conduct testing, monitoring, reporting, recordkeeping, or any compliance certification in this permit. However, no activities or emission units qualify as IEU's when such activities or emission units are subject to any federally enforceable applicable requirements [e.g. New Source Review (NSR) previously known as Notice of Construction (NOC), Regulatory Order issued per WAC 173-400-091 (effective 9/20/93) or federally enforceable requirements as provided in the State Implementation Plan (SIP) (WAC 173-401-530(2)(a)], (effective 6/17/94).

1.5 Operation and Maintenance (O&M) Monitoring Requirements

Whenever Operation and Maintenance **(**O&M) procedure is imposed as an approval condition in a NSR Order of Approval or in any other applicable regulatory requirement, the Permittee is required to implement, develop and update the O&M procedure or plan supplied by the equipment manufacturer, or an O&M plan, or procedure developed in-house for the equipment/process for which the O&M or monitoring is required. Whenever O&M is imposed on a process or equipment as a requirement in a NSR Order of Approval or in any other applicable regulation, the Permittee is required to schedule and conduct periodic inspections required in the O&M plan and insure that O&M is routinely instituted. In addition, the Permittee also agrees to continue their effort in research and development of process, materials or plan to reduce the amounts of HAP and VOC emissions from the Facility.

1.6 Rule Applicability to Source and Permit Shield

YRCAA determines applicability of the requirements in the Federal, State and Local Clean Air Laws and Regulations to Facility-wide and emission points in the permitted Facility. In the Permit Application, CLF provided a list of Washington State and Federal Air Pollution

Regulations which are considered non-applicable by CLF. The YRCAA determined the inapplicable requirements of these regulations to the permitted Facility as outlined in Table 1 below and the applicable requirements as indicated in the permit. Permit Shield from identified requirements is granted to CLF for requirements inapplicable to the Facility as indicated herein. Nonetheless, laws, the RCW rules and regulations may be superseded or revised without notice. It is the Permittee's responsibility to stay current with rules and regulations governing their business and therefore is expected to comply with all new rules and regulations immediately upon their effective date. Rules and regulation updates will be incorporated into existing permits or upon renewal or modification of said permits.

In addition, on August 29, 2016 EPA finalized promulgated 40 CFR Part 60 Subpart Cf (Emission Guidance and Compliance Times for Municipal Solid Waste Landfill) which was placed on hold due to changes in new administration (2017). If and when applicable, the Facility may be subject to this rule, if the rule will be approved by the new administration.

Table 1. Determination of Inapplicable Regulatory Requirements to CLF

Requirement	Emission Unit	Brief Discussion of Requirement	Reason
40 CFR 60 Subpart IIII	Facility	New Source Performance Standards for stationary compression ignition internal combustion engines	No stationary combustion engines exist at the facility.
40 CFR 60 Subpart Kb	Facility	New Source Performance Standards for Volatile Organic Liquid Storage Vessels	No affected sources at the facility.
40 CFR 72 – 78	Facility	Acid Rain Program	Applies only to certain electric generation and incineration facilities The subject facility does not generate electricity or incinerate waste.
WAC 173-400-050	Facility	Emission Standards for Combustion and Incineration Units	Yakima County does not operate any combustion or incineration units at CLF.
WAC 173-400-070(1) – (8)	Facility	Emission Standards for Certain Source Categories	Yakima County does not operate a wigwam burner, hog fuel boiler, orchard heater, grain elevator, catalytic cracking unit, sulfuric acid plant, or sewage sludge incinerator at CLF.
WAC 173-400-099 and YRCAA Regulation 1, Section 4.01	Facility	Registration Program	As a Title V source, the facility is not subject to the registration program.
WAC 173-400-112	Facility	Requirements for New Sources in Non-Attainment Areas	The CLF not located in a non-attainment area.
WAC 173-400-190	Facility	Requirements for Nonattainment Areas	The CLF is not located in a nonattainment area.
40CFR63 Subpart AAAA	Facility	MSW Landfill NESHAP	Facility is not a major source of HAP emissions and landfill currently emits less than 50 Mg NMOCs per year.
40CFR63 Subpart ZZZZ	Facility	Stationary Reciprocating Internal Combustion Engine NESHAP	No stationary reciprocating internal combustion engines are currently operated at CLF.

Continuation of Table 1. Determination of Inapplicable Regulatory Requirements to CLF

Requirement	Emission Unit	Discussion of Requirement	Reason
WAC 173-405	Facility	Kraft Pulping Mills	The CLF does not contain a kraft pulping mill.
WAC 173-406	Facility	Acid Rain Regulation	The CLF does not generate electricity.
WAC 173-407	Facility	CO2 Mitigation Program for Thermal Electric Generating Facilities	The CLF does not generate electricity.
WAC 173-410	Facility	Sulfate Pulping Mills	The CLF does not contain a sulfate pulping mill.
WAC 173-415	Facility	Primary Aluminum Plants	The CLF does not contain a primary aluminum plant.
WAC 173-433	Facility	Solid Fuel Burning Devices	The CLF does not operate a solid fuel burning device.
WAC 173-434	Facility	Solid Waste Incinerator Facilities	The CLF does not operate a solid waste incinerator.
WAC 173-490	Facility	Emissions Standards and Controls for Sources Emitting Volatile Organic Compounds (VOC)	The CLF is not located in an ozone non-attainment area.
WAC 173-491	Facility	Emissions Standards and Controls for Sources Emitting Gasoline Vapors	The CLF does not operate a gasoline marketing operation.
CFR 40 CFR 98	Facility	Mandatory Greenhouse Gas Reporting	74 FR (October 30, 2009) states the GHG reporting requirements are not considered applicable requirements, as defined in 40 CFR 70.2

1.7 Assurance of Compliance

The Permittee certified in the Permit Application that the information provided therein is true, accurate and complete based on reasonable inquiry on their part. The Permittee is required in the Title V AOP to at least annually certify compliance of the permitted Facility with all of the terms and conditions specified therein and the permit.

1.8 Monitoring, Recordkeeping, and Reporting Requirements (MRRR) for IEU's

For IEUs not subject to specific requirements but may exceed applicable standards, the MRRR may not be necessary to demonstrate compliance. However, the Permittee should certify that the specific IEU was operating normally and performed in its normal designed function. Usually, normal operation of the IEUs, will not likely result in violation of applicable requirements of this permit if it was not altered or modified during the certification period.

1.9 Annual Compliance Source Testing Requirement

Annual compliance source testing of any emission point from the Facility within the duration of this permit may not be required provided that the Permittee certifies that the specific processes therein were operated normally, performed their normal designed function and that no process change was made during the certification period that would cause emissions increase or violate applicable requirements. Normal operation of equipment or specific processes therein and use of specific materials for specific application, implementation of currently applicable O&M plan, and periodic operator training have been diligently carried out and as such, said manner of operations will not likely result in violation of applicable requirements of this permit. However, YRCAA may request a source test when applicable pursuant to WAC 173-400-075 (effective 6/8/07). I addition, this Facility is subject to 40 CFR Part 60 Subpart WWW which requires the Facility to do some source test depending on the method of emission calculation for Non-Methane Organic Compounds NMOC as specified in Subpart WWW which shall be done pursuant to the Subpart (effective 3/12/96).

1.10 Section 112 of the FCAA Applicability

The permit application and Section 2.0 below describe the operations in the permitted Facility. Municipal solid waste landfills generate landfill gas that contains methane gas and Non-Methane Organic Compounds (NMOC). NMOC's are considered as VOC's, the latter being one of the criteria air pollutants as a secondary. Included in these NMOC's are hazardous air pollutants (HAPs) or toxic air pollutants (TAPs).

TAP's are compounds listed in WAC 173-460 and (HAP's) are compounds listed Section 112(b) of the FCAA. EPA Emission Factors AP-42 (11/98) Table 2.4.1 & 2.4.2 lists the HAPs or TAP's with corresponding default concentration of each in the generated landfill gas. Table B in Appendix B of the permit Application submitted by Permittee estimates the emission rates of such listed compounds based on the maximum potential emission rate of methane gas. In July 6, 2010 the Permittee submitted the results of Tier 2 NMOC emission rate report. Results and

pollutants are listed on Tables of the report. In addition, they are included in section 2.1.6 air emissions below. A second tier 2 sampling was done between May 30 to June 3, 2016 and the result was submitted to YRCAA on July 21 2016. Results of the tier 2 samples were shown to be less than 50 Mg/year with the next five years from the date of the sampling.

This Facility is subject to the New Source Performance Standards (NSPS) per 40 CFR Part 60 Subpart WWW (Standards of Performance for Municipal Solid Waste Landfills (effective 3/12/1996)). This Facility must comply with all applicable requirements of the federal, state and local laws and regulation. This Facility will receive asbestos in the future as indicated in the application. Thus, it will be subject to the applicable provisions of 40 CFR Part 61 National Emission Standards for Hazardous Air Pollutants (NESHAPS) subpart M, (National Emission Standard for Asbestos) (see Facility Wide Requirements, Tables 1 and 2 of the Title V AOP). The General Provisions Subpart of the 40 CFR are usually applicable when any of the 40 CFR Subpart is applicable to the source. Hence, Subpart A of 40 CFR Part 60 is also applicable to the Source.

1.11 Compliance with New Source Review (NSR) permits requirements by YRCAA

The landfill Facility started operation in 1972. On August 19, 2009 NSR Order of Approval (NSRP-27-CLF-08) was issued for the landfill operations as a result of the landfill expansion. Prior to the issuance of the NSR NSRP-27-CLF-08 and the Title V Air Operating Permit no other permits were issued to this Facility. In 2009 the Facility applied for a Portable and Temporary NSR Order of Approval for the chipper/grinder to be moved back and forth between the Cheyne Landfill and Terrece Heights Landfilll. YRCAA issued the first portable temporary NSR Order of Approval #NSRPT-03-YCPS-09 on December 17, 2009. YRCAA reissued another temporary/portable permit for the same operation in December 17, 2010 under permit # NSRPT-05-THLF-10. The requirements contained in the order are incorporated into this permit. Any NSR when triggered resulting from modifications or establishment of new sources is covered in the Title V Permit #y-00063, Section 1.0 Permit General Terms and Conditions, 1. 22. The Facility still operates under that temporary Permit.

1.12 Reasonably Available Control Technology (RACT)

No prior RACT determination will be required for the permitted Facility as a prerequisite in the issuance of a Title V Air Operating Permit as no RACT determination has been made for the category of sources in which this permitted Facility is included. As provided in WAC 173-401-605(3) (effective 11/4/93), emission standards and other requirements contained in rules and regulatory orders in effect at the time of the operating permit issuance or renewal shall be considered RACT for purposes of this permit issuance. Emission standards in the RACT, if any, shall be the applicable standards of this permit when a RACT determination, prior to the issuance of this permit, is made for the source category of facilities in which the sources is included. When any part of the operation of the permitted Facility is subjected to a determination for Best Available Control Technology (BACT) and emission standards or requirements become federally enforceable provisions, such emissions standards or requirements shall be considered BACT for purposes of this permit issuance or any future renewal.

1.13 Applicability of Other Miscellaneous Requirements

The most significant air emissions from this permitted Facility are Volatile Organic Compounds (VOC) given off as the result of decomposition of organic materials from the deposited MSW and are known as NMOC's. VOCs are photoreactive components in the formation of ozone. Ozone is one of the criteria pollutants that have specific National Ambient Air Quality Standard (NAAQS). The permitted Facility is located in an area which is currently in attainment with Ozone NAAQS. Any new activities in the permitted Facility which will result in significant emissions increase of VOC or any other regulated pollutant will be subject to NSR as specified in 1.22 of the Title V Air Operating Permit.

Depending on the type of pollutant and net emissions increase, applicability will be determined for the requirements of the Prevention of Significant Deterioration (PSD), Best Available Control Technology (BACT), and any other SIP related provisions which insure that any increased discharges of air pollutants will not cause violation of NAAQS. YRCAA does not have any evidence which would suggest that the Facility operation is likely to contribute to visibility impairment in any mandatory Class I area. Best Available Retrofit Technology (BART) will be required of the permitted Facility if and when a determination is made that the permitted Facility is reasonably contributing to visibility impairment in any mandatory Class I area and that more than 250 tons per year of the contributing pollutant is being emitted. (WAC 173-400-151, effective date 3/22/91)

1.14 Compliance Period Allowance for Corrective Action

The Permittee shall be required to accomplish corrective measures that eliminate non-compliance with applicable requirements within a 48 to 72 hour period or as specified in the permit. This grace period provides time for the Permittee to remedy non-compliance when equipment replacement and/or parts are required express shipment and/or repair. Non-compliance within this compliance time period may not exempt the Permittee from appropriate enforcement actions except as provided in Title V Permit, 1.15 Emergencies (WAC 173-401-645, effective 11/4/93).

1.15 Compliance with Sulfur Dioxide (SO_2) Emissions Standard

The use of pipeline grade natural gas as fuel in any combustion equipment that is operated under normal operating conditions shall inherently meet the Sulfur compounds emission limits specified in Table 1, Facility-Wide Requirements, Air Operating Permit #y-00063-1. Pipeline Grade natural gas contains an average 2000 grains sulfur per million standard cubic foot (SCF) per EPA AP-42, fifth edition. This translates into 0.46 ppmv SO_2 (in the flue gas @ no excess air) according to the following:

#-moles S = #-moles SO_2 in flue gas = [2000/(7000)(32)] = 0.00893
1 million SCF natural gas = (1 atm)(1E6 cu. Ft.)/(0.7302-R gas constant)(528^0R) = 2593.7 #-mole

#-mole flue gas produced = (2593.7)(7.56), 1 #-mole natural gas will stoichiometrically produce 7.56 #-mole combustion products

SO_2 in ppmv= {(0.00893)/(2593.7)(7.56)} * 1E6 = 0.46

Compliance with SO_2 emission standard may constitute a compliance certification from the Permittee's responsible official stating that combustion equipment performed the normal designed function and was operated in the same fashion which demonstrated compliance in the past.

1.16 Use of Factors for Estimating Emissions

Unless specified, emission factors and estimation methodology used in emission estimates to be reported pursuant to this permit could be taken from actual source test data first, AP-42, Volume I, Chapter 2, Section 2.4 (Municipal Solid Waste Landfills), USEPA Federal reference method, or YRCAA-prior approval of emission factors.

1.17 Enforcement

Information from monitoring required under the AOP may be used directly for enforcement actions. Violation of any provisions of the permit conditions may be subject to enforcement actions as provided in RCW 70.94.211 (effective 1993). Appeals to enforcement orders before a hearings board may be made as provided in 43.21B RCW. Appeals should be sent to the Pollution Control Hearings Board (PCHB), P.O. Box 4903, Olympia, WA. 98504-4903. Concurrently, a copy of the application must be sent to the YRCAA, 329 North First Street, Yakima, WA 98901. In addition, USEPA (EPA, Region 10, Office of Air, Waste and Toxics, 1200 Sixth Avenue, Suite 900, Seattle, WA. 98101) may be petitioned in accordance with WAC 173-401-920(3)(c)(xi). These procedures are consistent with the provisions of Chapter 43.12B RCW and the rules and regulations adopted thereunder. A petition requesting judicial review of final orders after the Hearings Board may be made before the Superior Court of the State of Washington as provided in Chapter 34.05 RCW.

2.0. General Process Information

A more detailed description of this facility is in section 2 the permit Application. Locations of the Facility and Cell's in the landfill are shown in Figure 1 below, section 2.2.

2.1 Brief Description of the Facility

This Facility started its municipal wastes landfill operations in 1972. It was designed for municipal wastes disposal with a capacity of 1.8 million tons. The Facility is located on 960 acre site. The Permittee increased the design capacity to 8.2 million tons (7.44 million Megagram (Mg)) for cell 1 and 2. A NSR order of approval was issued for the vertical expansion increase in the design capacity in 2009 (NSRP-27-CLF-08). Haulers are weighed before and after discarding waste materials to determine the weight and or volume of waste materials and for appropriate disposal fees. The Permittee provides opportunity for garbage haulers at a reduced fee to recycle. Appliances are accepted at the Facility in a specified area and decommissioned by a certified technician. Any chlorinated fluorocarbons (CFCs) and waste oil removed from the appliances are taken to the Household Hazardous Waste Facility at Terrace Heights Landfill. The decommissioned appliances are then shipped off-site for recycling. Waste tires are also accepted at CLF and temporarily stored until they are shipped off-site by vendors. At this time, CLF is not accepting Asbestos Containing Materials (ACM) however; the facility is planning to accept ACM in the near future. The rest of the unspecified municipal wastes are deposited to the main landfill areas where all municipal wastes are covered with a minimum of 6 inches or more of daily cover within 24 hours of disposal. CLF operates an approved Septage Evaporation Ponds. Air Emissions from the operations in this facility are mainly VOC's, some of which NMOCs, including HAP's, and Particulate Matter of aerodynamic diameter of 10 micron and 2.5 or less.

2.1.1 Yard Debris/Wood Waste Reclaim Area

The Permittee converts wood wastes and other biomass to partially composted chipped/ground materials in the wood and yard waste processing area. The Facility consists mainly of a designated area in the landfill site where a wood chipper/grinder and stockpiles of converted wood waste materials are located. For a reduced fee, the Permittee receives in this area clean yard and garden debris and other wood wastes free of any plastic materials or other contamination. Stockpiles of accumulated wood materials are fed into the chipper/grinder. Ground wood waste is stockpiled in which partial decomposition occur depending on conditions and the length of time the stockpiles stay on site prior to hauling. Stockpiles of ground materials are hauled off by commercial establishments or the general public.

2.1.2 Recycling Area

This Facility provides convenient recycling opportunities for the public to maximize

participation in waste reduction/recycling programs. White goods such as household washers, dryers, dishwashers, ranges, refrigerators, freezers, air conditioners and other similar large household appliances are accepted at the Facility in a specified area and decommissioned by a certified technician. Any chlorinated fluorocarbons (CFCs) and waste oil removed from the appliances are taken to the Household Hazardous Waste Facility at Terrace Heights Landfill. The decommissioned appliances are then shipped off-site for recycling. Waste tires are also accepted at CLF and temporarily stored until they are shipped off-site by vendors.

The Facility currently provides collection bins for moderate risk waste (household hazardous wastes, oil, pesticides, etc.).

2.1.3 Asbestos-Containing Materials Disposal

At the present time and issuance of this Permit CLF is not accepting asbestos containing materials. However, CLF is planning to receive and dispose of asbestos-containing materials in the future. At the present time no asbestos is being received at CLF. If and when the Permittee decide to receive an asbestos containing materials the Facility will be subject to the National Emissions Standards for Hazardous Pollutants (NESHAP) 40 CFR Part 61 subpart M, and NSR application must be submitted and an Order of Approval must be issued prior to accepting any martials.

2.1.4 Other Special Landfill Wastes

The following describes CLF handling of Other Special Wastes:

2.1.4.1 Bio- Solids - CLF operates a series of septage evaporation ponds under a general permit issued by the Department of Ecology on July 29, 2009. A site specific Land Application Plan for CLF is used to govern bio-solids handling and land application practices and is approved by the Department of Ecology as part of the permit.

2.1.4.2 Petroleum Contaminated Soils (PCS)- CLF is permitted to accept petroleum contaminated soils with hydrocarbon levels less than the Washington Soil Cleanup Levels and the guidance for remediation of petroleum contaminated sites (revised June 2016)

2.1.4.3 Demolition Wastes - These wastes are generated in construction activities consisting mainly of building materials, concrete, asphalt, and miscellaneous wood wastes. Demolition wastes containing asbestos materials are not accepted at CLF at the present.

2.1.4.4 Biomedical Wastes - These wastes are bio-hazardous wastes such as infected animal waste, infectious microbiological cultures, communicable disease waste from certain viruses, pathological wastes and medical sharps waste (needles, syringes, surgical blades and lancets). CLF receives these

wastes provided that medical sharps and other items that can break or cut handlers are packaged in bright orange or yellow bags marked “medical waste”.

3.0 Air Emissions

The most significant air pollutants from municipal wastes landfill operations are VOCs which is synonymous to NMOCs as gaseous landfill emissions in this kind of facilities. These gaseous pollutants are generated during the biodegradation process due to bacterial action on materials buried in the landfill. These gasses permeate through the porous topsoil cover and eventually escape to the ambient air. NMOCs contain TAPs listed in Washington state toxic air pollutants regulation WAC 173-460-160 (effective /20/09) and/or as HAPs listed in FCAA Section 112 (b). Table 2 below lists and provides an estimated emission of HAPs or TAPs found in the NMOCs based on the permit application and Tier 2 results of 2016. Another air emission concentration of these HAPs and TAPs are also found on the emission rate report submitted to YRCAA on July 6, 2010 and July 21, 2016 based on the NSPS tier 2 NMOC. Tables 3 and 4 shows the total LFG and the Methane generation using US EPA LandGEM version 3.02 for 2010 and 2016, respectively.

Table 2 Hazardous Air Pollutant (HAP) Maximum Potential Emission Estimation

Compound	CAS No.	Emission Basis[a] (ppm in LFG)	Fugitive Emission (lb/hr)	LFG Rate[b] (lb/yr)[c]
1,1,1-Trichloroethane (methyl chloroform)	71-55-6	0.48	1.58E-02	138.8
1,1,2,2-Tetrachloroethane	79-34-5	1.1	4.57E-02	400.3
1,1-Dichloroethane (ethylidene dichloride)	75-34-3	2.4	5.88E-02	515.0
1,1-Dichloroethene (vinylidene chloride)	75-35-4	0.2	4.80E-03	42.0
1,2-Dichloroethane (ethylene dichloride	107-06-2	0.41	1.00E-02	88.0
1,2-Dichloropropane (propylene dichloride)	78-87-5	0.18	5.03E-03	44.1
2-Propanol (isopropyl alcohol)	67-63-0	50	7.44E-01	6516.2
Acrylonitrile	107-13-1	4	5.25E-02	460.2
Benzene	71-43-2	1.9	3.67E-02	321.8
Carbon disulfide	75-15-0	0.58	1.09E-02	95.7
Carbon monoxide	630-08-0	140	9.71E-01	8501.9
Carbon tetrachloride	56-23-5	0.004	1.52E-04	1.3
Carbonyl sulfide	463-58-1	0.49	7.28E-03	63.8
Chlorobenzene	108-90-7	0.25	6.96E-03	61.0
Chlorodifluoromethane	75-45-6	1.3	2.78E-02	243.7
Chloroethane (ethyl chloride)	75-00-3	1.3	2.08E-02	181.9
Chloroform	67-66-3	0.03	8.86E-04	7.8
Chloromethane	74-87-3	1.2	1.50E-02	131.4
Dichlorobenzene	106-46-7	0.21	7.64E-03	66.9
Dichloromethane (methylene chloride)	75-09-2	14	2.94E-01	2578.2
Ethylbenzene	100-41-4	4.6	1.21E-01	1058.8
Ethylene dibromide	106-93-4	0.001	4.65E-05	0.4
Hexane	110-54-3	6.6	1.41E-01	1233.2
Hydrogen sulfide	7783-06-4	36	3.04E-01	2660.0
Mercury (total)	7439-97-6	0.00029	1.44E-05	0.1
Methyl ethyl ketone	78-93-3	7.1	1.27E-01	1110.0
Methyl isobutyl ketone	108-10-1	1.9	4.71E-02	412.6
Perchloroethylene (tetrachloroethylene)	127-18-4	3.7	1.52E-01	1330.3
Toluene	108-88-3	39	8.89E-01	7790.1
Trichloroethylene (trichloroethene)	79-01-6	2.8	9.11E-02	797.7
Vinyl chloride	75-01-4	7.3	1.13E-01	989.2
Xylenes	1330-20-7	12	3.15E-01	2762.0

Notes:

a Based on AP-42 Chapter 2.4 (Municipal Solid Waste Landfills) default TAP concentrations in LFG.

b Potential Fugitive LFG emission rates based on highest projected LFG production rate for CLF (2,619 cubic meters per hour in year 2040).

c Annual emission rate based on 8,760 hours per year.

Table 3. LFG and Methane generation using LandGEM® of 2010

Year	User Waste Acceptance Inputs *(Mg/year)*	User Waste-In- Place *(Mg)*	Methane Generation [a] *(m^3/year)*	Total LFG Generation [a] *(m^3/year)*
1994	272,727	0	0.0E+00	0.0E+00
1995	49,455	272,727	5.4E+05	1.1E+06
1996	53,025	322,182	6.3E+05	1.3E+06
1997	53,416	375,206	7.2E+05	1.4E+06
1998	55,325	428,623	8.1E+05	1.6E+06
1999	53,782	483,948	9.1E+05	1.8E+06
2000	53,366	537,730	9.9E+05	2.0E+06
2001	55,273	591,096	1.1E+06	2.2E+06
2002	56,982	646,369	1.2E+06	2.3E+06
2003	60,369	703,351	1.3E+06	2.5E+06
2004	62,315	763,720	1.4E+06	2.7E+06
2005	63,780	826,035	1.4E+06	2.9E+06
2006	66,001	889,815	1.5E+06	3.1E+06
2007	67,196	955,816	1.6E+06	3.3E+06
2009	65,870	1,087,277	1.8E+06	3.7E+06
2010	66,339	1,153,147	1.9E+06	3.9E+06
2011	67,600	1,219,486	2.0E+06	4.1E+06
2012	68,860	1,287,086	2.1E+06	4.2E+06
2013	70,120	1,355,946	2.2E+06	4.4E+06
2014	71,380	1,426,066	2.3E+06	4.6E+06
2015	72,640	1,497,446	2.4E+06	4.8E+06
2016	73,845	1,570,086	2.5E+06	5.0E+06
2017	75,048	1,643,931	2.6E+06	5.2E+06
2018	76,253	1,718,979	2.7E+06	5.4E+06
2019	161,299	1,795,232	2.8E+06	5.6E+06
2020	255,125	1,956,531	3.1E+06	6.1E+06
2021	259,028	2,211,656	3.5E+06	7.0E+06
2022	262,930	2,470,685	3.9E+06	7.9E+06
2023	266,833	2,733,615	4.4E+06	8.8E+06
2024	270,735	3,000,447	4.8E+06	9.7E+06
2025	274,559	3,271,182	5.3E+06	1.1E+07
2026	278,438	3,545,741	5.7E+06	1.1E+07
2027	282,372	3,824,179	6.2E+06	1.2E+07
2028	286,361	4,106,551	6.6E+06	1.3E+07
2029	290,406	4,392,912	7.0E+06	1.4E+07
2030	294,509	4,683,318	7.5E+06	1.5E+07
2031	298,670	4,977,827	7.9E+06	1.6E+07
2032	302,889	5,276,497	8.3E+06	1.7E+07
2034	311,508	5,886,555	9.2E+06	1.8E+07
2035	315,909	6,198,063	9.6E+06	1.9E+07
2036	320,372	6,513,972	1.0E+07	2.0E+07
2037	324,898	6,834,344	1.1E+07	2.1E+07
2038	329,489	7,159,242	1.1E+07	2.2E+07
2039	334,144	7,488,731	1.1E+07	2.3E+07
2040	59,294	7,822,875	1.2E+07	2.4E+07
2041	0	7,882,168	1.2E+07	2.3E+07
2042	0	7,882,168	1.1E+07	2.3E+07
2043	0	7,882,168	1.1E+07	2.2E+07

a Methane and Total LFG generation rates based on EPA's LandGEM (Version 3.02), with past actual and projected annual waste acceptance rates, K = 0.020 yr^{-1}, Lo = 100 m^3/Mg, and Methane = 50 percent of total LFG. Results from RW Beck

Table 4. LFG and Methane generation using LandGEM® of 2016

Cheyne 2016 Tier 2 - landgem-v302 7/10/2016

Results

Year	Total landfill gas			Methane		
	(Mg/year)	(m^3/year)	(av ft^3/min)	(Mg/year)	(m^3/year)	(av ft^3/min)
1972	0	0	0	0	0	0
1973	9.196E+01	7.135E+04	4.794E+00	2.666E+01	3.995E+04	2.685E+00
1974	1.821E+02	1.413E+05	9.493E+00	5.278E+01	7.912E+04	5.316E+00
1975	2.704E+02	2.098E+05	1.410E+01	7.839E+01	1.175E+05	7.895E+00
1976	3.570E+02	2.770E+05	1.861E+01	1.035E+02	1.551E+05	1.042E+01
1977	4.419E+02	3.429E+05	2.304E+01	1.281E+02	1.920E+05	1.290E+01
1978	5.251E+02	4.074E+05	2.738E+01	1.522E+02	2.282E+05	1.533E+01
1979	6.067E+02	4.707E+05	3.163E+01	1.759E+02	2.636E+05	1.771E+01
1980	6.866E+02	5.327E+05	3.580E+01	1.990E+02	2.983E+05	2.005E+01
1981	7.650E+02	5.935E+05	3.988E+01	2.217E+02	3.324E+05	2.233E+01
1982	8.418E+02	6.531E+05	4.388E+01	2.440E+02	3.658E+05	2.458E+01
1983	9.171E+02	7.116E+05	4.781E+01	2.658E+02	3.985E+05	2.677E+01
1984	9.909E+02	7.688E+05	5.166E+01	2.872E+02	4.305E+05	2.893E+01
1985	1.063E+03	8.249E+05	5.543E+01	3.082E+02	4.620E+05	3.104E+01
1986	1.134E+03	8.799E+05	5.912E+01	3.287E+02	4.928E+05	3.311E+01
1987	1.204E+03	9.339E+05	6.275E+01	3.489E+02	5.230E+05	3.514E+01
1988	1.272E+03	9.867E+05	6.630E+01	3.686E+02	5.526E+05	3.713E+01
1989	1.339E+03	1.039E+06	6.978E+01	3.880E+02	5.816E+05	3.908E+01
1990	1.404E+03	1.089E+06	7.319E+01	4.070E+02	6.100E+05	4.099E+01
1991	1.468E+03	1.139E+06	7.654E+01	4.256E+02	6.379E+05	4.286E+01
1992	1.531E+03	1.188E+06	7.981E+01	4.438E+02	6.652E+05	4.470E+01
1993	1.593E+03	1.236E+06	8.303E+01	4.617E+02	6.920E+05	4.650E+01
1994	1.653E+03	1.283E+06	8.618E+01	4.792E+02	7.182E+05	4.826E+01
1995	1.712E+03	1.329E+06	8.926E+01	4.963E+02	7.440E+05	4.999E+01
1996	2.062E+03	1.600E+06	1.075E+02	5.977E+02	8.959E+05	6.019E+01
1997	2.432E+03	1.887E+06	1.268E+02	7.051E+02	1.057E+06	7.101E+01
1998	2.798E+03	2.171E+06	1.459E+02	8.112E+02	1.216E+06	8.170E+01
1999	3.172E+03	2.461E+06	1.654E+02	9.195E+02	1.378E+06	9.260E+01
2000	3.526E+03	2.736E+06	1.838E+02	1.022E+03	1.532E+06	1.029E+02
2001	3.870E+03	3.003E+06	2.018E+02	1.122E+03	1.682E+06	1.130E+02
2002	4.222E+03	3.276E+06	2.201E+02	1.224E+03	1.835E+06	1.233E+02
2003	4.581E+03	3.554E+06	2.388E+02	1.328E+03	1.990E+06	1.337E+02
2004	4.958E+03	3.847E+06	2.585E+02	1.437E+03	2.154E+06	1.447E+02
2005	5.343E+03	4.146E+06	2.786E+02	1.549E+03	2.322E+06	1.560E+02
2006	5.732E+03	4.447E+06	2.988E+02	1.662E+03	2.491E+06	1.673E+02
2007	6.130E+03	4.756E+06	3.196E+02	1.777E+03	2.664E+06	1.790E+02
2008	6.530E+03	5.067E+06	3.404E+02	1.893E+03	2.837E+06	1.906E+02
2009	6.899E+03	5.353E+06	3.597E+02	2.000E+03	2.998E+06	2.014E+02
2010	7.264E+03	5.636E+06	3.787E+02	2.106E+03	3.156E+06	2.121E+02
2011	7.623E+03	5.914E+06	3.974E+02	2.210E+03	3.312E+06	2.225E+02
2012	7.963E+03	6.179E+06	4.151E+02	2.308E+03	3.460E+06	2.325E+02
2013	8.305E+03	6.444E+06	4.330E+02	2.407E+03	3.609E+06	2.425E+02
2014	8.655E+03	6.716E+06	4.512E+02	2.509E+03	3.761E+06	2.527E+02
2015	8.996E+03	6.980E+06	4.690E+02	2.608E+03	3.909E+06	2.626E+02
2016	9.358E+03	7.261E+06	4.878E+02	2.713E+03	4.066E+06	2.732E+02
2017	9.692E+03	7.520E+06	5.053E+02	2.809E+03	4.211E+06	2.829E+02
2018	1.003E+04	7.780E+06	5.227E+02	2.907E+03	4.357E+06	2.927E+02
2019	1.036E+04	8.041E+06	5.403E+02	3.004E+03	4.503E+06	3.026E+02
2020	1.070E+04	8.304E+06	5.579E+02	3.102E+03	4.650E+06	3.124E+02
2021	1.104E+04	8.567E+06	5.756E+02	3.201E+03	4.797E+06	3.223E+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)
2022	1.138E+04	8.829E+06	5.932E+02	3.299E+03	4.944E+06	3.322E+02
2023	1.172E+04	9.090E+06	6.107E+02	3.396E+03	5.090E+06	3.420E+02
2024	1.205E+04	9.350E+06	6.282E+02	3.493E+03	5.236E+06	3.518E+02
2025	1.238E+04	9.608E+06	6.456E+02	3.590E+03	5.381E+06	3.615E+02
2026	1.272E+04	9.866E+06	6.629E+02	3.686E+03	5.525E+06	3.712E+02
2027	1.305E+04	1.012E+07	6.801E+02	3.782E+03	5.668E+06	3.809E+02
2028	1.470E+04	1.140E+07	7.661E+02	4.260E+03	6.385E+06	4.290E+02
2029	1.633E+04	1.267E+07	8.512E+02	4.733E+03	7.094E+06	4.767E+02
2030	1.794E+04	1.392E+07	9.355E+02	5.202E+03	7.797E+06	5.239E+02
2031	1.955E+04	1.517E+07	1.019E+03	5.666E+03	8.493E+06	5.706E+02
2032	2.113E+04	1.640E+07	1.102E+03	6.126E+03	9.182E+06	6.169E+02
2033	2.270E+04	1.762E+07	1.184E+03	6.581E+03	9.864E+06	6.628E+02
2034	2.426E+04	1.882E+07	1.265E+03	7.032E+03	1.054E+07	7.082E+02
2035	2.580E+04	2.002E+07	1.345E+03	7.479E+03	1.121E+07	7.532E+02
2036	2.733E+04	2.120E+07	1.425E+03	7.921E+03	1.187E+07	7.978E+02
2037	2.884E+04	2.238E+07	1.503E+03	8.360E+03	1.253E+07	8.419E+02
2038	3.034E+04	2.354E+07	1.582E+03	8.795E+03	1.318E+07	8.857E+02
2039	3.183E+04	2.469E+07	1.659E+03	9.225E+03	1.383E+07	9.291E+02
2040	3.330E+04	2.584E+07	1.736E+03	9.653E+03	1.447E+07	9.721E+02
2041	3.476E+04	2.697E+07	1.812E+03	1.008E+04	1.510E+07	1.015E+03
2042	3.621E+04	2.809E+07	1.888E+03	1.050E+04	1.573E+07	1.057E+03
2043	3.765E+04	2.921E+07	1.963E+03	1.091E+04	1.636E+07	1.099E+03
2044	3.907E+04	3.032E+07	2.037E+03	1.133E+04	1.698E+07	1.141E+03
2045	4.049E+04	3.142E+07	2.111E+03	1.174E+04	1.759E+07	1.182E+03
2046	4.189E+04	3.251E+07	2.184E+03	1.214E+04	1.820E+07	1.223E+03
2047	4.329E+04	3.359E+07	2.257E+03	1.255E+04	1.881E+07	1.264E+03
2048	4.467E+04	3.466E+07	2.329E+03	1.295E+04	1.941E+07	1.304E+03
2049	4.605E+04	3.573E+07	2.401E+03	1.335E+04	2.001E+07	1.344E+03
2050	4.742E+04	3.679E+07	2.472E+03	1.374E+04	2.060E+07	1.384E+03
2051	4.877E+04	3.784E+07	2.543E+03	1.414E+04	2.119E+07	1.424E+03
2052	5.012E+04	3.889E+07	2.613E+03	1.453E+04	2.178E+07	1.463E+03
2053	4.913E+04	3.812E+07	2.561E+03	1.424E+04	2.135E+07	1.434E+03
2054	4.816E+04	3.736E+07	2.511E+03	1.396E+04	2.092E+07	1.406E+03
2055	4.720E+04	3.662E+07	2.461E+03	1.368E+04	2.051E+07	1.378E+03
2056	4.627E+04	3.590E+07	2.412E+03	1.341E+04	2.010E+07	1.351E+03
2057	4.535E+04	3.519E+07	2.364E+03	1.315E+04	1.971E+07	1.324E+03
2058	4.446E+04	3.449E+07	2.318E+03	1.289E+04	1.932E+07	1.298E+03
2059	4.357E+04	3.381E+07	2.272E+03	1.263E+04	1.893E+07	1.272E+03
2060	4.271E+04	3.314E+07	2.227E+03	1.238E+04	1.856E+07	1.247E+03
2061	4.187E+04	3.248E+07	2.183E+03	1.214E+04	1.819E+07	1.222E+03
2062	4.104E+04	3.184E+07	2.139E+03	1.190E+04	1.783E+07	1.198E+03
2063	4.022E+04	3.121E+07	2.097E+03	1.166E+04	1.748E+07	1.174E+03
2064	3.943E+04	3.059E+07	2.055E+03	1.143E+04	1.713E+07	1.151E+03
2065	3.865E+04	2.999E+07	2.015E+03	1.120E+04	1.679E+07	1.128E+03
2066	3.788E+04	2.939E+07	1.975E+03	1.098E+04	1.646E+07	1.106E+03
2067	3.713E+04	2.881E+07	1.936E+03	1.076E+04	1.613E+07	1.084E+03
2068	3.640E+04	2.824E+07	1.897E+03	1.055E+04	1.581E+07	1.063E+03
2069	3.568E+04	2.768E+07	1.860E+03	1.034E+04	1.550E+07	1.042E+03
2070	3.497E+04	2.713E+07	1.823E+03	1.014E+04	1.519E+07	1.021E+03
2071	3.428E+04	2.660E+07	1.787E+03	9.936E+03	1.489E+07	1.001E+03
2072	3.360E+04	2.607E+07	1.752E+03	9.739E+03	1.460E+07	9.809E+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)
2073	3.293E+04	2.555E+07	1.717E+03	9.546E+03	1.431E+07	9.614E+02
2074	3.228E+04	2.505E+07	1.683E+03	9.357E+03	1.403E+07	9.424E+02
2075	3.164E+04	2.455E+07	1.650E+03	9.172E+03	1.375E+07	9.237E+02
2076	3.102E+04	2.406E+07	1.617E+03	8.990E+03	1.348E+07	9.054E+02
2077	3.040E+04	2.359E+07	1.585E+03	8.812E+03	1.321E+07	8.875E+02
2078	2.980E+04	2.312E+07	1.553E+03	8.638E+03	1.295E+07	8.699E+02
2079	2.921E+04	2.266E+07	1.523E+03	8.467E+03	1.269E+07	8.527E+02
2080	2.863E+04	2.221E+07	1.493E+03	8.299E+03	1.244E+07	8.358E+02
2081	2.806E+04	2.177E+07	1.463E+03	8.135E+03	1.219E+07	8.193E+02
2082	2.751E+04	2.134E+07	1.434E+03	7.974E+03	1.195E+07	8.031E+02
2083	2.696E+04	2.092E+07	1.406E+03	7.816E+03	1.172E+07	7.872E+02
2084	2.643E+04	2.051E+07	1.378E+03	7.661E+03	1.148E+07	7.716E+02
2085	2.591E+04	2.010E+07	1.351E+03	7.509E+03	1.126E+07	7.563E+02
2086	2.539E+04	1.970E+07	1.324E+03	7.361E+03	1.103E+07	7.413E+02
2087	2.489E+04	1.931E+07	1.298E+03	7.215E+03	1.081E+07	7.266E+02
2088	2.440E+04	1.893E+07	1.272E+03	7.072E+03	1.060E+07	7.123E+02
2089	2.391E+04	1.855E+07	1.247E+03	6.932E+03	1.039E+07	6.981E+02
2090	2.344E+04	1.819E+07	1.222E+03	6.795E+03	1.018E+07	6.843E+02
2091	2.298E+04	1.783E+07	1.198E+03	6.660E+03	9.983E+06	6.708E+02
2092	2.252E+04	1.747E+07	1.174E+03	6.528E+03	9.786E+06	6.575E+02
2093	2.208E+04	1.713E+07	1.151E+03	6.399E+03	9.592E+06	6.445E+02
2094	2.164E+04	1.679E+07	1.128E+03	6.272E+03	9.402E+06	6.317E+02
2095	2.121E+04	1.646E+07	1.106E+03	6.148E+03	9.216E+06	6.192E+02
2096	2.079E+04	1.613E+07	1.084E+03	6.026E+03	9.033E+06	6.069E+02
2097	2.038E+04	1.581E+07	1.062E+03	5.907E+03	8.854E+06	5.949E+02
2098	1.997E+04	1.550E+07	1.041E+03	5.790E+03	8.679E+06	5.831E+02
2099	1.958E+04	1.519E+07	1.021E+03	5.676E+03	8.507E+06	5.716E+02
2100	1.919E+04	1.489E+07	1.000E+03	5.563E+03	8.339E+06	5.603E+02
2101	1.881E+04	1.460E+07	9.807E+02	5.453E+03	8.174E+06	5.492E+02
2102	1.844E+04	1.431E+07	9.613E+02	5.345E+03	8.012E+06	5.383E+02
2103	1.807E+04	1.402E+07	9.422E+02	5.239E+03	7.853E+06	5.276E+02
2104	1.772E+04	1.375E+07	9.236E+02	5.135E+03	7.698E+06	5.172E+02
2105	1.737E+04	1.347E+07	9.053E+02	5.034E+03	7.545E+06	5.070E+02
2106	1.702E+04	1.321E+07	8.874E+02	4.934E+03	7.396E+06	4.969E+02
2107	1.668E+04	1.295E+07	8.698E+02	4.836E+03	7.249E+06	4.871E+02
2108	1.635E+04	1.269E+07	8.526E+02	4.741E+03	7.106E+06	4.774E+02
2109	1.603E+04	1.244E+07	8.357E+02	4.647E+03	6.965E+06	4.680E+02
2110	1.571E+04	1.219E+07	8.191E+02	4.555E+03	6.827E+06	4.587E+02
2111	1.540E+04	1.195E+07	8.029E+02	4.465E+03	6.692E+06	4.496E+02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m^3/year)	(av ft^3/min)	(Mg/year)	(m^3/year)	(av ft^3/min)
1972	0	0	0	0	0	0
1973	5.746E+01	3.139E+04	2.109E+00	1.066E-01	2.975E+01	1.999E-03
1974	1.138E+02	6.216E+04	4.177E+00	2.112E-01	5.891E+01	3.958E-03
1975	1.690E+02	9.233E+04	6.203E+00	3.136E-01	8.750E+01	5.879E-03
1976	2.231E+02	1.219E+05	8.190E+00	4.141E-01	1.155E+02	7.762E-03
1977	2.762E+02	1.509E+05	1.014E+01	5.125E-01	1.430E+02	9.607E-03
1978	3.282E+02	1.793E+05	1.205E+01	6.090E-01	1.699E+02	1.142E-02
1979	3.791E+02	2.071E+05	1.392E+01	7.036E-01	1.963E+02	1.319E-02
1980	4.291E+02	2.344E+05	1.575E+01	7.963E-01	2.222E+02	1.493E-02
1981	4.781E+02	2.612E+05	1.755E+01	8.872E-01	2.475E+02	1.663E-02
1982	5.260E+02	2.874E+05	1.931E+01	9.763E-01	2.724E+02	1.830E-02
1983	5.731E+02	3.131E+05	2.104E+01	1.064E+00	2.967E+02	1.994E-02
1984	6.192E+02	3.383E+05	2.273E+01	1.149E+00	3.206E+02	2.154E-02
1985	6.644E+02	3.630E+05	2.439E+01	1.233E+00	3.440E+02	2.311E-02
1986	7.087E+02	3.872E+05	2.601E+01	1.315E+00	3.669E+02	2.465E-02
1987	7.522E+02	4.109E+05	2.761E+01	1.396E+00	3.894E+02	2.617E-02
1988	7.947E+02	4.342E+05	2.917E+01	1.475E+00	4.115E+02	2.765E-02
1989	8.365E+02	4.570E+05	3.070E+01	1.552E+00	4.331E+02	2.910E-02
1990	8.774E+02	4.793E+05	3.220E+01	1.628E+00	4.542E+02	3.052E-02
1991	9.174E+02	5.012E+05	3.368E+01	1.703E+00	4.750E+02	3.192E-02
1992	9.567E+02	5.227E+05	3.512E+01	1.776E+00	4.953E+02	3.328E-02
1993	9.953E+02	5.437E+05	3.653E+01	1.847E+00	5.153E+02	3.462E-02
1994	1.033E+03	5.643E+05	3.792E+01	1.917E+00	5.348E+02	3.594E-02
1995	1.070E+03	5.846E+05	3.928E+01	1.986E+00	5.540E+02	3.722E-02
1996	1.289E+03	7.039E+05	4.730E+01	2.391E+00	6.671E+02	4.482E-02
1997	1.520E+03	8.304E+05	5.579E+01	2.821E+00	7.870E+02	5.288E-02
1998	1.749E+03	9.553E+05	6.419E+01	3.245E+00	9.054E+02	6.083E-02
1999	1.982E+03	1.083E+06	7.276E+01	3.679E+00	1.026E+03	6.896E-02
2000	2.204E+03	1.204E+06	8.089E+01	4.090E+00	1.141E+03	7.666E-02
2001	2.419E+03	1.321E+06	8.878E+01	4.489E+00	1.252E+03	8.414E-02
2002	2.639E+03	1.441E+06	9.685E+01	4.897E+00	1.366E+03	9.179E-02
2003	2.863E+03	1.564E+06	1.051E+02	5.312E+00	1.482E+03	9.958E-02
2004	3.098E+03	1.693E+06	1.137E+02	5.750E+00	1.604E+03	1.078E-01
2005	3.339E+03	1.824E+06	1.226E+02	6.197E+00	1.729E+03	1.162E-01
2006	3.582E+03	1.957E+06	1.315E+02	6.648E+00	1.855E+03	1.246E-01
2007	3.831E+03	2.093E+06	1.406E+02	7.110E+00	1.983E+03	1.333E-01
2008	4.081E+03	2.229E+06	1.498E+02	7.573E+00	2.113E+03	1.420E-01
2009	4.311E+03	2.355E+06	1.583E+02	8.001E+00	2.232E+03	1.500E-01
2010	4.539E+03	2.480E+06	1.666E+02	8.424E+00	2.350E+03	1.579E-01
2011	4.763E+03	2.602E+06	1.748E+02	8.840E+00	2.466E+03	1.657E-01
2012	4.976E+03	2.719E+06	1.827E+02	9.235E+00	2.577E+03	1.731E-01
2013	5.190E+03	2.835E+06	1.905E+02	9.632E+00	2.687E+03	1.805E-01
2014	5.409E+03	2.955E+06	1.985E+02	1.004E+01	2.800E+03	1.882E-01
2015	5.621E+03	3.071E+06	2.063E+02	1.043E+01	2.910E+03	1.956E-01
2016	5.848E+03	3.195E+06	2.146E+02	1.085E+01	3.028E+03	2.034E-01
2017	6.057E+03	3.309E+06	2.223E+02	1.124E+01	3.136E+03	2.107E-01
2018	6.266E+03	3.423E+06	2.300E+02	1.163E+01	3.244E+03	2.180E-01
2019	6.477E+03	3.538E+06	2.377E+02	1.202E+01	3.353E+03	2.253E-01
2020	6.688E+03	3.654E+06	2.455E+02	1.241E+01	3.463E+03	2.327E-01
2021	6.900E+03	3.769E+06	2.533E+02	1.281E+01	3.572E+03	2.400E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m^3/year)	(av ft^3/min)	(Mg/year)	(m^3/year)	(av ft^3/min)
2022	7.111E+03	3.885E+06	2.610E+02	1.320E+01	3.682E+03	2.474E-01
2023	7.321E+03	4.000E+06	2.687E+02	1.359E+01	3.790E+03	2.547E-01
2024	7.530E+03	4.114E+06	2.764E+02	1.398E+01	3.899E+03	2.620E-01
2025	7.739E+03	4.228E+06	2.841E+02	1.436E+01	4.007E+03	2.692E-01
2026	7.946E+03	4.341E+06	2.917E+02	1.475E+01	4.114E+03	2.764E-01
2027	8.153E+03	4.454E+06	2.993E+02	1.513E+01	4.221E+03	2.836E-01
2028	9.183E+03	5.017E+06	3.371E+02	1.704E+01	4.755E+03	3.195E-01
2029	1.020E+04	5.574E+06	3.745E+02	1.894E+01	5.283E+03	3.550E-01
2030	1.121E+04	6.126E+06	4.116E+02	2.081E+01	5.806E+03	3.901E-01
2031	1.221E+04	6.673E+06	4.484E+02	2.267E+01	6.324E+03	4.249E-01
2032	1.321E+04	7.214E+06	4.847E+02	2.451E+01	6.837E+03	4.594E-01
2033	1.419E+04	7.751E+06	5.208E+02	2.633E+01	7.345E+03	4.935E-01
2034	1.516E+04	8.282E+06	5.564E+02	2.813E+01	7.849E+03	5.274E-01
2035	1.612E+04	8.808E+06	5.918E+02	2.992E+01	8.347E+03	5.609E-01
2036	1.708E+04	9.329E+06	6.268E+02	3.169E+01	8.842E+03	5.941E-01
2037	1.802E+04	9.846E+06	6.615E+02	3.345E+01	9.331E+03	6.269E-01
2038	1.896E+04	1.036E+07	6.959E+02	3.519E+01	9.816E+03	6.595E-01
2039	1.989E+04	1.086E+07	7.300E+02	3.691E+01	1.030E+04	6.919E-01
2040	2.081E+04	1.137E+07	7.638E+02	3.862E+01	1.077E+04	7.239E-01
2041	2.172E+04	1.187E+07	7.973E+02	4.031E+01	1.125E+04	7.557E-01
2042	2.263E+04	1.236E+07	8.306E+02	4.199E+01	1.172E+04	7.872E-01
2043	2.353E+04	1.285E+07	8.636E+02	4.366E+01	1.218E+04	8.184E-01
2044	2.442E+04	1.334E+07	8.963E+02	4.532E+01	1.264E+04	8.494E-01
2045	2.530E+04	1.382E+07	9.287E+02	4.696E+01	1.310E+04	8.802E-01
2046	2.618E+04	1.430E+07	9.610E+02	4.859E+01	1.355E+04	9.107E-01
2047	2.705E+04	1.478E+07	9.930E+02	5.020E+01	1.401E+04	9.411E-01
2048	2.792E+04	1.525E+07	1.025E+03	5.181E+01	1.445E+04	9.712E-01
2049	2.878E+04	1.572E+07	1.056E+03	5.341E+01	1.490E+04	1.001E+00
2050	2.963E+04	1.619E+07	1.088E+03	5.499E+01	1.534E+04	1.031E+00
2051	3.048E+04	1.665E+07	1.119E+03	5.656E+01	1.578E+04	1.060E+00
2052	3.132E+04	1.711E+07	1.150E+03	5.813E+01	1.622E+04	1.090E+00
2053	3.070E+04	1.677E+07	1.127E+03	5.698E+01	1.590E+04	1.068E+00
2054	3.009E+04	1.644E+07	1.105E+03	5.585E+01	1.558E+04	1.047E+00
2055	2.950E+04	1.611E+07	1.083E+03	5.474E+01	1.527E+04	1.026E+00
2056	2.891E+04	1.580E+07	1.061E+03	5.366E+01	1.497E+04	1.006E+00
2057	2.834E+04	1.548E+07	1.040E+03	5.260E+01	1.467E+04	9.859E-01
2058	2.778E+04	1.518E+07	1.020E+03	5.156E+01	1.438E+04	9.664E-01
2059	2.723E+04	1.488E+07	9.995E+02	5.054E+01	1.410E+04	9.473E-01
2060	2.669E+04	1.458E+07	9.797E+02	4.953E+01	1.382E+04	9.285E-01
2061	2.616E+04	1.429E+07	9.603E+02	4.855E+01	1.355E+04	9.101E-01
2062	2.564E+04	1.401E+07	9.413E+02	4.759E+01	1.328E+04	8.921E-01
2063	2.514E+04	1.373E+07	9.227E+02	4.665E+01	1.301E+04	8.744E-01
2064	2.464E+04	1.346E+07	9.044E+02	4.573E+01	1.276E+04	8.571E-01
2065	2.415E+04	1.319E+07	8.865E+02	4.482E+01	1.250E+04	8.401E-01
2066	2.367E+04	1.293E+07	8.689E+02	4.393E+01	1.226E+04	8.235E-01
2067	2.320E+04	1.268E+07	8.517E+02	4.306E+01	1.201E+04	8.072E-01
2068	2.274E+04	1.243E+07	8.349E+02	4.221E+01	1.178E+04	7.912E-01
2069	2.229E+04	1.218E+07	8.183E+02	4.137E+01	1.154E+04	7.756E-01
2070	2.185E+04	1.194E+07	8.021E+02	4.056E+01	1.131E+04	7.602E-01
2071	2.142E+04	1.170E+07	7.862E+02	3.975E+01	1.109E+04	7.451E-01
2072	2.100E+04	1.147E+07	7.707E+02	3.897E+01	1.087E+04	7.304E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m^3/year)	(av ft^3/min)	(Mg/year)	(m^3/year)	(av ft^3/min)
2073	2.058E+04	1.124E+07	7.554E+02	3.819E+01	1.066E+04	7.159E-01
2074	2.017E+04	1.102E+07	7.405E+02	3.744E+01	1.044E+04	7.018E-01
2075	1.977E+04	1.080E+07	7.258E+02	3.670E+01	1.024E+04	6.879E-01
2076	1.938E+04	1.059E+07	7.114E+02	3.597E+01	1.003E+04	6.742E-01
2077	1.900E+04	1.038E+07	6.973E+02	3.526E+01	9.836E+03	6.609E-01
2078	1.862E+04	1.017E+07	6.835E+02	3.456E+01	9.641E+03	6.478E-01
2079	1.825E+04	9.972E+06	6.700E+02	3.387E+01	9.450E+03	6.350E-01
2080	1.789E+04	9.774E+06	6.567E+02	3.320E+01	9.263E+03	6.224E-01
2081	1.754E+04	9.581E+06	6.437E+02	3.255E+01	9.080E+03	6.101E-01
2082	1.719E+04	9.391E+06	6.310E+02	3.190E+01	8.900E+03	5.980E-01
2083	1.685E+04	9.205E+06	6.185E+02	3.127E+01	8.724E+03	5.862E-01
2084	1.652E+04	9.023E+06	6.062E+02	3.065E+01	8.551E+03	5.745E-01
2085	1.619E+04	8.844E+06	5.942E+02	3.004E+01	8.382E+03	5.632E-01
2086	1.587E+04	8.669E+06	5.825E+02	2.945E+01	8.216E+03	5.520E-01
2087	1.555E+04	8.497E+06	5.709E+02	2.887E+01	8.053E+03	5.411E-01
2088	1.525E+04	8.329E+06	5.596E+02	2.829E+01	7.894E+03	5.304E-01
2089	1.494E+04	8.164E+06	5.485E+02	2.773E+01	7.737E+03	5.199E-01
2090	1.465E+04	8.002E+06	5.377E+02	2.719E+01	7.584E+03	5.096E-01
2091	1.436E+04	7.844E+06	5.270E+02	2.665E+01	7.434E+03	4.995E-01
2092	1.407E+04	7.689E+06	5.166E+02	2.612E+01	7.287E+03	4.896E-01
2093	1.380E+04	7.536E+06	5.064E+02	2.560E+01	7.142E+03	4.799E-01
2094	1.352E+04	7.387E+06	4.963E+02	2.509E+01	7.001E+03	4.704E-01
2095	1.325E+04	7.241E+06	4.865E+02	2.460E+01	6.862E+03	4.611E-01
2096	1.299E+04	7.098E+06	4.769E+02	2.411E+01	6.727E+03	4.520E-01
2097	1.273E+04	6.957E+06	4.674E+02	2.363E+01	6.593E+03	4.430E-01
2098	1.248E+04	6.819E+06	4.582E+02	2.317E+01	6.463E+03	4.342E-01
2099	1.224E+04	6.684E+06	4.491E+02	2.271E+01	6.335E+03	4.256E-01
2100	1.199E+04	6.552E+06	4.402E+02	2.226E+01	6.209E+03	4.172E-01
2101	1.176E+04	6.422E+06	4.315E+02	2.182E+01	6.086E+03	4.089E-01
2102	1.152E+04	6.295E+06	4.230E+02	2.138E+01	5.966E+03	4.008E-01
2103	1.129E+04	6.170E+06	4.146E+02	2.096E+01	5.848E+03	3.929E-01
2104	1.107E+04	6.048E+06	4.064E+02	2.055E+01	5.732E+03	3.851E-01
2105	1.085E+04	5.928E+06	3.983E+02	2.014E+01	5.618E+03	3.775E-01
2106	1.064E+04	5.811E+06	3.904E+02	1.974E+01	5.507E+03	3.700E-01
2107	1.043E+04	5.696E+06	3.827E+02	1.935E+01	5.398E+03	3.627E-01
2108	1.022E+04	5.583E+06	3.751E+02	1.897E+01	5.291E+03	3.555E-01
2109	1.002E+04	5.473E+06	3.677E+02	1.859E+01	5.186E+03	3.485E-01
2110	9.819E+03	5.364E+06	3.604E+02	1.822E+01	5.084E+03	3.416E-01
2111	9.625E+03	5.258E+06	3.533E+02	1.786E+01	4.983E+03	3.348E-01

Site specific Tier 2 sampling and analysis as per 40 CFR §60.754(a)(3) showed that the NMOC emissions are below 50 Mg. Results of the analysis were submitted to YRCAA on July 6, 2010 and July 21, 2016. The Facility will re-sample NMOC emissions per 40 CFR Part 60 Subpart WWW requirements as required by the laws and regulations.

Particulate Matter (PM) in the form of fugitive dust is emitted during back fill and bulldozing daily cover to deposited refuse. Fugitive dust is also emitted from paved and unpaved road traffic, wind erosion from loose soil cover, windblown materials from chipping/grinding of wood wastes and yard debris, and wind erosion from storage piles of compost material.

The operation of the portable engine that powers the chipper/grinder in the wood wastes and yard debris processing area also emits quantifiable amounts of SO_x, NO_x, PM, CO and unburned hydrocarbon (VOCs).

Other insignificant air emission units (IEU) at this facility are as defined in 1.4 above.

4.0 Facility Site Layout

The figure below shows the facility layout including the new cell number 2 expansion and the septage evaporation ponds.

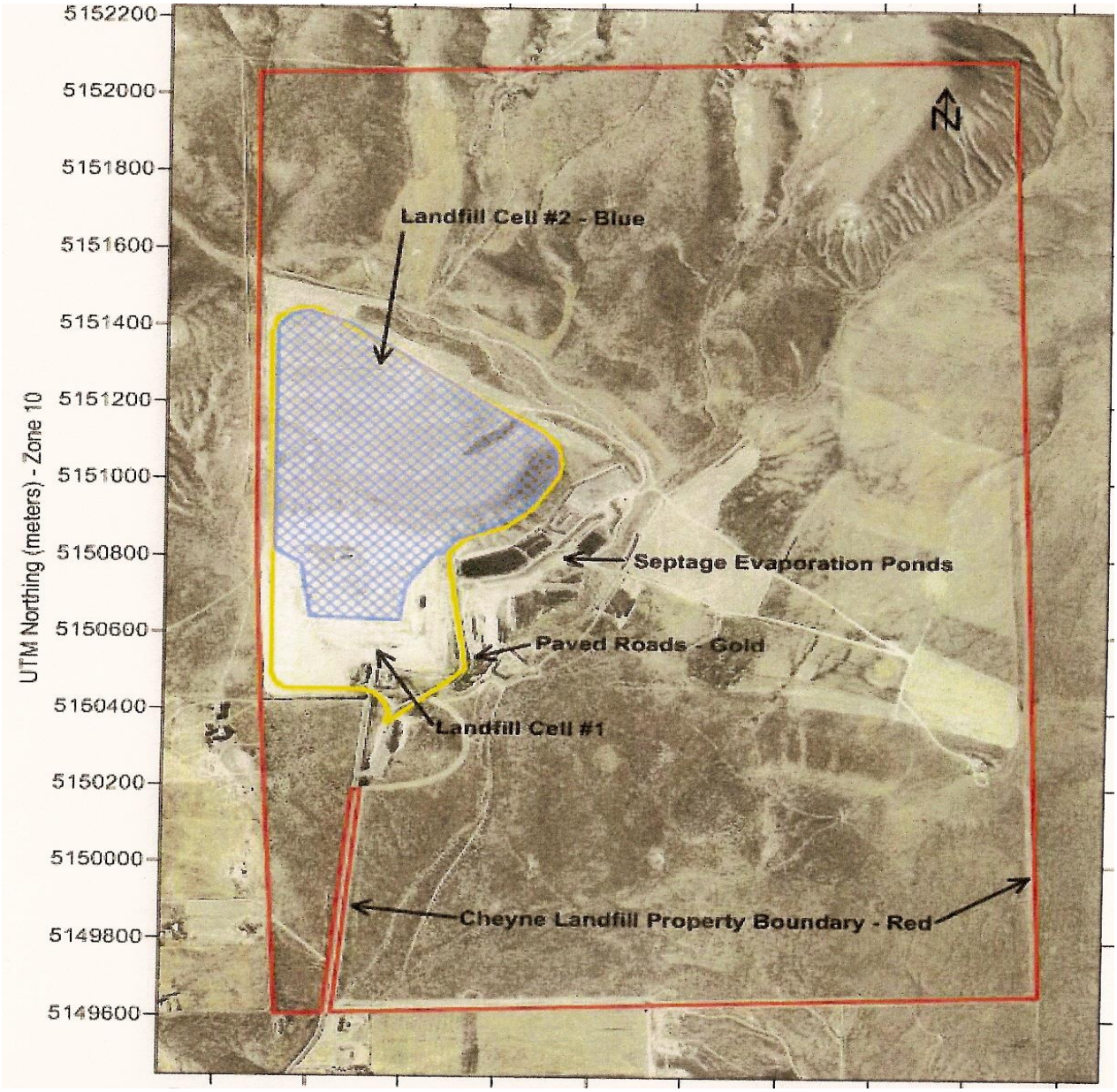

Figure 1. Landfill Site Layout