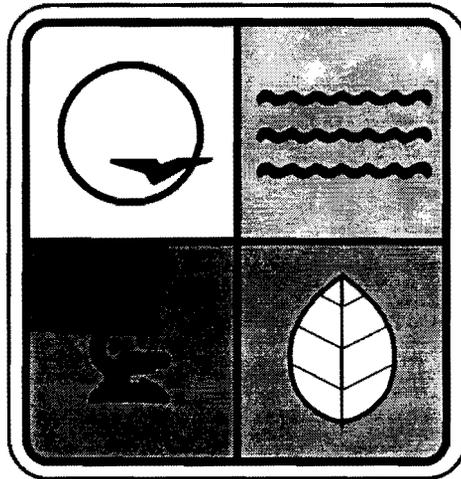


**SECTION 111 (d) STATE PLAN FOR IMPLEMENTING  
THE MUNICIPAL SOLID WASTE LANDFILL  
EMISSION GUIDELINES FOR MISSOURI  
(December 19, 1997)**

**DR**

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SECTION 111 (d) STATE PLAN FOR IMPLEMENTING  
THE MUNICIPAL SOLID WASTE LANDFILL  
EMISSION GUIDELINES FOR MISSOURI



Missouri Department of Natural Resources  
Division of Environmental Quality

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**SECTION 111(d) STATE PLAN FOR IMPLEMENTING  
THE MUNICIPAL SOLID WASTE LANDFILL  
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**December 19, 1997**

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## A. Introduction

On March 12, 1996 the Environmental Protection Agency (EPA) adopted New Source Performance Standards for Municipal Solid Waste Landfills (Title 40 CFR Part 60, Subpart WWW) and Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (Title 40 CFR Part 60, Subpart Cc). The Subpart Cc Emission Guidelines apply to existing municipal solid waste landfills. The Clean Air Act requires that the state regulatory agency implement the Emission Guidelines according to a state plan developed under Section 111(d) of the Clean Air Act. This state plan is to be submitted to EPA within nine months of EPA's adoption of the Emission Guidelines.

State plans must contain specific information and legal mechanisms necessary to implement the Emission Guidelines. The minimum requirements are listed below.

- Identification of enforceable state mechanisms selected by the state for implementing the Emission Guidelines;
- A demonstration of the state's legal authority to carry out the Section 111(d) State Plan as submitted;
- An inventory of Municipal Solid Waste (MSW) landfills in the state affected by the Emission Guidelines. This includes existing MSW landfills that have accepted waste since November 8, 1987, or have additional capacity for future waste deposition. An existing landfill may be active (currently accepting waste or having additional capacity available to accept waste) or closed (no longer accepting waste nor having available capacity for future waste deposition);
- An inventory of emission from MSW landfills in the state that are affected by the Emission Guidelines;
- Emission limitations for MSW landfills that are no less stringent than those in the Emission Guidelines;
- A state process for review and approval of site-specific gas collection and control system design plans;
- Compliance schedules, extending no later than 30 months after the effective date of the state emission standard, or 30 months after the date the annual NMOC emission rate exceeds 50 megagrams (Mg) per year, whichever is later;
- Testing, monitoring, recordkeeping, and reporting annual requirements;
- A record of public hearing(s) on the State Plan; and

- Provision for annual state progress reports to EPA on implementation of the State Plan.

States must adopt and submit a State Plan to EPA within nine months (December 12, 1996) after promulgations of the Emission Guidelines. EPA then has four months to approve or disapprove the State Plan. Plan approval or disapproval will be published in the Federal Register (FR). If a plan is disapproved, EPA will state the reasons for disapproval in the FR. If a state does not submit an approvable State Plan, EPA will adopt and implement a Federal Plan.

A draft version of Missouri's state plan entitled, Section 111(d) State Plan for Implementing the Municipal Solid Waste Landfill Emission Guidelines for Missouri, was submitted to EPA's Region VII office on December 12, 1996. The draft plan contained all the required components specified in the Emission Guidelines except that not all the rules had been adopted by the Missouri Air Conservation Commission. Missouri delayed submitting a final state plan until all rules developed as a result of the Emission Guidelines were adopted by the Missouri Air Conservation Commission and had become effective.

This document contains the final version of Missouri's State Plan to meet the requirements of the Emission Guidelines.

**B. Identification of enforceable state mechanisms selected by the state for implementing the Emission Guidelines.**

The state of Missouri will use state rules to meet the requirements of the Emission Guidelines. Rule 10 CSR 5.490 Municipal Solid Waste Landfills covers the St. Louis nonattainment area. The St. Louis nonattainment area includes the city of St. Louis and the counties of Franklin, Jefferson, St. Louis, and St. Charles. Rule 10 CSR 10-6.310 Restriction of Emissions from Municipal Solid Waste Landfills covers the remainder of the state. A copy of rule 10 CSR 10-5.490 and rule 10 CSR 10-6.310 can be found in Appendix A.

**C. Demonstration of legal authority.**

The Air Conservation Commission of the State of Missouri is the air pollution control agency for the State of Missouri. The commission was created to maintain the purity of the air resources of the state to protect the health, general welfare and physical property of the people, maximum employment and the full industrial development of the state by preventing, abating and controlling air pollution by all practical and economically feasible methods. The commission, more commonly referred to as the Missouri Air Conservation Commission (MACC), has the authority, pursuant to chapter 536, RSMo, to promulgate

rules and regulations to establish standards and guidelines to ensure that the state of Missouri is in compliance with the provisions of the federal Clean Air Act. The specific powers and duties of the MACC are outlined in section 643.050, RSMo. A copy of sections 643.010 - 643.070, RSMo, can be found in Appendix B.

D. Inventory of Municipal Solid Waste (MSW) landfills in the state affected by the Emission Guidelines.

The Air Pollution Control Program (APCP) and the Solid Waste Management Program (SWMP) of the Missouri Department of Natural Resources compiled the following list (Table 1) of MSW landfills subject to the Emission Guidelines. This list includes existing MSW landfills that have accepted waste since November 8, 1987, or have additional capacity for future waste deposition. In addition, a chart showing the location and status of many of these landfills can be found in Appendix C.

E. Inventory of emissions from MSW landfills in Missouri.

Table 1 contains estimates of the 1997 Non-Methane Organic Compound (NMOC) emissions from MSW landfills in megagrams per year. The NMOC emissions were calculated using the most recent version of the Landfill Air Emissions Estimation Model (Beta release 4) using the best available data and most recent values found in AP-42. Model parameters used in creating reports were: methane generation rate ( $k$ ) = 0.04/yr, methane generation potential ( $L_0$ ) = 100 m<sup>3</sup>/Mg, and a NMOC concentration of 595 ppmv as hexane.

Information on actual yearly solid waste acceptance rates has been difficult to obtain. Data from the Solid Waste Management Program's quarterly tonnage fee report were used when available, but the data only goes back to year 1990. Data was converted from tons to megagrams. A copy of the tonnage report is included in Appendix xxxx. There is no departmental data on acceptance rate for landfills closed prior to 1990. Therefore, for closed landfills the models use the design capacity of the landfill divided by the number of years the landfill was operating to arrive at a yearly acceptance rate. The assumption is that landfills accepted waste at a constant rate until they had reached their design capacity. For landfills that had no record of their design capacity, the volume in acre feet was used with the refuse estimator function of the program to calculate the design capacity of the landfill. The yearly acceptance rate was then calculated as described above and used in the model to estimate NMOC emissions. While this method is not as accurate as having the actual yearly acceptance rates, it does provide values to use in the model to help estimate emissions. Landfills that operated before 1990 and are still operating present problems in estimating emissions. The state has no record of how much refuse was in place before tonnage fee records were kept. The landfills also do not have this information readily available. To arrive at yearly acceptance rate before 1990, the average acceptance rate for the years 1990 to the present was used in some situations were the acceptance rate was

consistent from 1990 to 1997. In situations where the acceptance rate increased or decreased dramatically from year 1990 to year 1997, the acceptance rate for years prior to 1990 were based on year 1990 data. A copy of each existing landfills NMOC emission modeling report can be found in Appendix D.

The APCP has asked MSW landfills to supply up-to-date information to more accurately estimate NMOC emissions. Many landfills have supplied information on design capacity, but could not provide much information on yearly acceptance rates or refuse in place. Updates to the emission inventory will be performed during the annual progress reports as new information becomes available.

F. Emission limitations shall be no less stringent than those in the Emission Guidelines.

The state has tried to mirror the emission limitations established in the New Source Performance Standard (NSPS) for MSW landfills in rule 10 CSR 10-6.310. Landfills having design capacities of two and a half (2.5) million megagrams by mass or greater and NMOC emissions of fifty (50) megagrams or greater shall install a gas collection and control system. MSW landfills in the St. Louis nonattainment area are covered by rule 10 CSR 10-5.490 which has more stringent emission limitations than the Emission Guidelines. For the St. Louis nonattainment area the design capacity level is one (1) million megagrams by mass and the NMOC emission limitation level is twenty-five (25) megagrams per year.

G. A state process of review and approval of site-specific gas collection and control systems design plans.

The APCP and SWMP will jointly review design plans for gas collection and control systems. A revised Memorandum of Understanding (MOU) between the SWMP and APCP was signed by both program directors agreeing to jointly review and approve landfill gas emission collection and control systems which are required as a result of the federal NSPS and Emission Guidelines. A copy of the MOU can be found in Appendix E.

H. Compliance schedule.

The state rules establish the same compliance times as the NSPS. Floating dates are tied to the effective date of the respective rules. The rules require the design capacity report and NMOC emission report ninety (90) days after the rule effective date. Landfill owners have twelve (12) months to submit design plans for a gas collection and control system and thirty (30) months to get the system operational once their NMOC emissions equal or exceed the regulatory limit. The rule effective date for 10 CSR 10-5.490 is December 30, 1996. The rule effective date for 10 CSR 10-6.310 is September 30, 1997. A compliance schedule table for when report, plan, etc., are due is presented below.

Rule	Design capacity report due	NMOC report due	Design plans due	Control system operational
10 CSR 10-5.490	March 30, 1997	March 30, 1997	March 30, 1998	September 30, 1998
10 CSR 10-6.310	December 30, 1997	December 30, 1997	December 30, 1998	June 30, 1999

I. Testing, monitoring, recordkeeping, and reporting requirements.

Each rule contains provisions for testing, monitoring, reporting, and recordkeeping. The provisions are the same as in the NSPS.

J. A record of public hearings held.

Documentation of the public hearing for the State Plan is included in Appendix F. Rule 10 CSR 10-5.490 was presented for public hearing in July, 1996. A copy of the public hearing documentation for that rule can be found in Appendix G. Rule 10 CSR 10-6.310 was presented for public hearing in March of 1997. A copy of the public hearing documentation for that rule can be found in Appendix F.

K. Provisions for annual state progress reports to EPA on implementation of the State Plan.

The annual report will be incorporated into the reports required by 40 CFR section 51.321.

L. Use of AP-42 values for calculating emissions in rule 10 CSR 10-6.310.

In response to comments at the public hearing for rule 10 CSR 10-6.310 additional options for calculating NMOC emissions were added to the rule. The rule allows owner to calculate their landfills NMOC emission using emission factors found in AP-42 as alternatives to Tier 2 and Tier 3 methods. The MACC felt that such language was appropriate in the rule since EPA's emission factors used in the Tier 1 method were highly conservative and that other EPA approved emission factors were available (AP-42). Owners are still required to calculate NMOC emission using Tier 1, but may use AP-42 emission factors for Tier 2 or Tier 3, if needed. At this time this provision does not appear to have any effect on the applicability of rule 10 CSR 10-6.310. Only four (4) landfills in the inventory have design capacities of 2.5 million cubic meters/megagrams or greater. Three of those landfills are in Franklin or St. Louis county which is covered by rule 10 CSR 10-5.490. Rule 10 CSR 10-5.490 does not allow for the substitution of AP-42 emission factors in calculating for Tier 2 or Tier 3 emissions. The other landfill

(Southeast) is located in Jackson county. Southeast is of sufficient design capacity to exceed the estimated 50 megagrams emission limit using the lowest emission factors available in AP-42 (see model for Southeast landfill in Appendix D).

County ID	Plant Name	City Name	State	Zip	County	NMOC	Design Capacity	Status
0020	RYE CREEK SANITARY LANDFILL	KIRKSVILLE	MO	63501	ADAIR	4.6	382,280 Mg	open
0040	SAVANNAH SANITARY LANDFILL	SAVANNAH	MO	64485	ANDREW	0.8	64,226 Mg	closed
0060	ATCHISON COUNTY SLF	ROCK PORT	MO	64482	ATCHISON	2.9	282,894 Mg	closed
0080	MEXICO SANITARY LANDFILL	MEXICO	MO	65265	AUDRAIN	18.5	1,826,409 Mg	closed
0080	NATIONAL REFRACTORIES AND MINERA	MEXICO	MO	65265	AUDRAIN	1.7	141,209 Mg	closed
0160	LAMAR	LAMAR	MO	64759	BARTON	13.5	1,195,795 Mg	open
0180	WELSTON SANITARY LANDFILL	BUTLER	MO	64730	BATES	3.2	313,797 Mg	closed
0380	CENTRALIA SANITARY LANDFILL	CENTRALIA	MO	65240	BOONE	1.3	118,000 Mg	closed
0620	FULTON SANITARY LANDFILL	FULTON	MO	65251	CALLAWAY	4.5	757,677 Mg	open
0620	UNION ELECTRIC COMPANY	FULTON	MO	65251	CALLAWAY	2.6	244,762 Mg	closed
0640	EDWARD MEHL SLF	CAMDENTON	MO	65020	CAMDEN	0.1	6,955 Mg	closed
0640	MODERN SANITATION INCORPORATED	OSAGE BEACH	MO	65065	CAMDEN	7.2	706,044 Mg	closed
0640	NORTHWEST LANDFILL	GRAVOIS MILLS	MO	65037	CAMDEN	1.0	78,449 Mg	closed
0720	CAPE GIRARDEAU, CITY OF	CAPE GIRARDEAU	MO	63701	CAPE GIRARDEA	10.4	1,027,436 Mg	closed
0720	JACKSON, CITY OF	JACKSON	MO	63755	CAPE GIRARDEA	1.4	109,293 Mg	closed
0840	A & M SLF	CREIGHTON	MO	64734	CASS	1.7	162,390 Mg	closed
1140	BOONVILLE	BOONVILLE	MO	65233	COOPER	2.8	261,565 Mg	closed
1160	CRAWFORD COUNTY	STEELVILLE	MO	65565	CRAWFORD	1.1	109,045 Mg	closed
1300	CAMERON SANITARY LANDFILL	CAMERON	MO	64429	DE KALB	2.2	230,641 Mg	closed
1360	SALEM SANITARY LANDFILL	SALEM	MO	65560	DENT	5.0	486,386 Mg	closed
1680	GENERALLY HAULING - IDS	SAINT CLAIR	MO	63077	FRANKLIN	9.6	941,391 Mg	closed
1680	MIDWEST LANDFILL	ROBERTSVILLE	MO	63072	FRANKLIN	4.1	340,000 Mg	closed
1680	NORTHSIDE LANDFILL	WASHINGTON	MO	63090	FRANKLIN	29.6	2,552,224 Mg	closed
1680	WASHINTON SW MUNICIPAL LANDFILL	WASHINGTON	MO	63090	FRANKLIN	0.9	82,372 Mg	closed
1760	GASCONADE-MORRISON	GASCONADE	MO	65036	GASCONADE	0.1	14,226 Mg	closed
1760	HERMANN	HERMANN	MO	65041	GASCONADE	0.3	25,418 Mg	closed
1760	KAHLE REFUSE	OWENSVILLE	MO	65066	GASCONADE	2.8	216,007 Mg	closed
1880	HENDERSON SANITARY LANDFILL	GALT	MO	64641	GRUNDY	3.5	549,145 Mg	open
2020	HENRY COUNTY	CLINTON	MO	64735	HENRY	12.3	1,098,200 Mg	closed
2160	WEST PLAINS, CITY OF	WEST PLAINS	MO	65775	HOWELL	3.0	276,617 Mg	closed
2160	WILLOW SPRINGS SLF	WILLOW SPRINGS	MO	65793	HOWELL	2.5	238,300 Mg	closed
2200	VIBURNUM LANDFILL	VIBURNUM	MO	65566	IRON	1.5	141,209 Mg	closed
2240	SOUTHEAST	KANSAS CITY	MO	64126	JACKSON	60.6	7,844,933 Mg	open
2240	LAKE CITY-DEPT OF THE ARMY	INDEPENDENCE	MO	64050	JACKSON	1.0	94,139 Mg	closed
2240	WOODS CHAPEL	SHAWNEE	KS	66203	JACKSON	16.5	1,431,511 Mg	closed
2260	JOPLIN, CITY OF	JOPLIN	MO	64802	JASPER	7.1	734,286 Mg	closed
2540	MCDOWELL SANITARY LANDFILL	INDEPENDENCE	MO	64050	LAFAYETTE	5.5	529,533 Mg	closed
2580	T & C DISPOSAL	VERONA	MO	65769	LAWRENCE	3.1	276,430 Mg	closed
2820	BROWN SLF	MACON	MO	63552	MACON	0.6	20,397 Mg	closed
2840	FREDERICKTOWN SLF	FREDERISCKTOWN	MO	63645	MADISON	1.2	110,451 Mg	closed
2920	WAT-PARK SANITATION	DIXON	MO	65459	MARIES	5.0	470,696 Mg	closed
3140	CITY OF CALIFORNIA	CALIFORNIA	MO	65018	MONITEAU	0.5	54,915 Mg	closed
3180	MONTGOMERY CITY SLF	MONTGOMERY CITY	MO	63361	MONTGOMERY	2.4	210,932 Mg	closed
3300	NEW MADRID COUNTY	DEXTER	MO	63841	NEW MADRID	5.8	512,000 Mg	closed

County ID	Plant Name	City Name	State	Zip	County	NMOC	Design Capacity	Status
3300	ST. JUDE INDUSTRIAL PARK	NEW MADRID	MO	63869	NEW MADRID	1.3	128,820 Mg	closed
3320	NEWTON-MCDONALD COUNTY LF	NEOSHO	MO	64850	NEWTON	6.3	524,917 Mg	closed
3340	MARYVILLE SANITARY LANDFILL	MARYVILLE	MO	64468	NODAWAY	3.6	373,088 Mg	open
3600	PEMISCOT COUNTY SLF	CARUTHERSVILLE	MO	63830	PEMISCOT	2.3	197,692 Mg	closed
3620	PERRY COUNTY SANITARY LANDFILL	PERRYVILLE	MO	63775	PERRY	4.7	363,000 Mg	closed
3660	SEDALIA, CITY OF	SEDALIA	MO	65301	PETTIS	7.8	706,044 Mg	closed
3680	PHELPS COUNTY SANITARY LANDFILL	ROLLA	MO	65401	PHELPS	2.5	197,262 Mg	closed
3860	FORT LEONARD WOOD	FT LEONARD WOOD	MO	64573	PULASKI	3.9	315,366 Mg	closed
3860	ZEIGENBEIN SANITARY LANDFILL	WAYNESVILLE	MO	65583	PULASKI	2.1	211,813 Mg	closed
3900	HANNIBAL	HANNIBAL	MO	63401	RALLS	5.1	412,657 Mg	closed
3980	WARREN SANITARY LANDFILL	CENTERVILLE	MO	63633	REYNOLDS	1.0	87,863 Mg	closed
4040	DONIPHAN MUNICIPAL	DONIPHAN	MO	63935	RIPLEY	0.6	57,344 Mg	closed
4220	ST. FRANCOIS SANITARY LANDFILL	FLAT RIVER	MO	63601	ST. FRANCOIS	6.6	631,281 Mg	closed
4300	ST. LOUIS COUNTY	ST. LOUIS	MO	63043	ST. LOUIS	61.6	5,000,000 Mg	closed
4300	WEST LAKE (BRIDGETON) SLF	BRIDGETON	MO	63044	ST. LOUIS	91.0	10,355,310 Mg	open
4380	MARSHALL, CITY OF	MARSHALL	MO	65340	SALINE	5.4	445,063 Mg	closed
4620	RENFRO'S SANITARY LANDFILL	KIMBERLING CITY	MO	65686	STONE	3.3	281,770 Mg	closed
4860	NEVADA SANITARY LANDFILL	NEVADA	MO	64772	VERNON	1.3	117,674 Mg	closed
4940	WASHINTON COUNTY	POTOSI	MO	63664	WASHINGTON	4.0	305,952 Mg	closed
4960	WAYNE COUNTY SLF	GREENVILLE	MO	63944	WAYNE	1.2	117,547 Mg	closed
5000	WEBSTER COUNTY SLF	MARSHFIELD	MO	65706	WEBSTER	3.6	353,022 Mg	closed

## APPENDIX A

**Rule 10 CSR 10-5.490 Municipal Solid Waste Landfills and rule 10 CSR 10-6.310  
Restriction of Emissions from Municipal Solid Waste Landfills**



Planning and technical studies  
 Grants for training and research programs  
 Planning activities conducted pursuant to  
 Titles 23 and 49 U.S.C.  
 Federal-aid systems revisions  
 Engineering to assess social, economic, and  
 environmental effects of the proposed ac-  
 tion or alternatives to that action  
 Noise attenuation advance land acquisitions  
 (23 CFR part 712 or 23 CFR part 771)  
 Acquisition of scenic easements  
 Plantings, landscaping, etc.  
 Sign removal  
 Directional and informational signs  
 Transportation enhancement activities (except  
 rehabilitation and operation of historic  
 transportation buildings, structures, or  
 facilities)  
 Repair of damage caused by natural disasters,  
 civil unrest, or terrorist acts, except pro-  
 jects involving substantial functional, loca-  
 tional, or capacity changes

(31) **Projects Exempt From Regional Emissions Analyses.** Notwithstanding the other requirements of this rule, highway and transit projects of the types listed in Table 3 are exempt from regional emissions analysis requirements. The local effects of these projects with respect to CO concentrations must be considered to determine if a hot-spot analysis is required prior to making a project-level conformity determination. These projects may then proceed to the project development process even in the absence of a conforming transportation plan and TIP. A particular action of the type listed in Table 3 is not exempt from regional emissions analysis if the MPO in consultation with other agencies pursuant to section (5), the EPA, and the FHWA (in the case of a highway project) or the FTA (in the case of a transit project) concur that it has potential regional impacts for any reason.

**Table 3. Projects Exempt from Regional Emissions Analyses**

Intersection channelization projects  
 Intersection signalization projects at  
 individual intersections  
 Interchange reconfiguration projects  
 Changes in vertical and horizontal alignment  
 Truck size and weight inspection stations  
 Bus terminals and transfer points

(32) **Special Provisions for Nonattainment Areas Which Are Not Required to Demonstrate Reasonable Further Progress and Attainment.**

(A) **Application.** This section applies in the following areas:

1. Marginal ozone areas;

2. Submarginal ozone areas;
3. Transitional ozone areas;
4. Incomplete data ozone areas;
5. Moderate CO areas with a design value of twelve and seven-tenths (12.7) ppm or less; and
6. Not classified CO areas.

(B) **Default Conformity Procedures.** The criteria and procedures in sections (21)–(23) will remain in effect throughout the control strategy period for transportation plans, TIPs, and projects (not from a conforming plan and TIP) in lieu of the procedures in sections (17)–(19), except as otherwise provided in subsection (C).

(C) **Optional Conformity Procedures.** The state or MPO may voluntarily develop an attainment demonstration and corresponding motor vehicle emissions budget like those required in areas with higher nonattainment classifications. In this case, the state must submit an implementation plan revision which contains that budget and attainment demonstration. Once EPA has approved this implementation plan revision, the procedures in sections (17)–(19) apply in lieu of the procedures in sections (21)–(23).

*AUTHORITY: section 643.050, RSMo (Supp. 1995). \* Original rule filed Oct. 4, 1994, effective May 28, 1995. Amended: Filed May 1, 1996, effective Dec. 30, 1996.*

*\*Original authority 1965, amended 1972, transferred from 203.050 in 1986, 1992, 1993, 1995.*

**10 CSR 10-5.490 Municipal Solid Waste Landfills**

*PURPOSE: This rule requires municipal solid waste landfills to monitor their non-methane organic compound (NMOC) emissions. Landfills having NMOC emission rates above the regulatory cutoff shall design and install a gas collection and control system.*

(1) **Applicability.** This rule applies to all municipal solid waste landfills (MSWLF) located in the St. Louis ozone nonattainment area (Jefferson, Franklin, St. Charles, St. Louis Counties and St. Louis city) that have accepted waste any time since November 8, 1987, or have additional capacity available for future waste deposition.

(2) **Definitions.**

(A) **Active collection system**—A gas collection system that uses gas mover equipment.

(B) **Closed landfill**—A landfill in which refuse is no longer being placed, and in which no additional wastes will be placed

without first filing a notification of modification.

(C) **Closure**—That point in time when a landfill becomes a closed landfill.

(D) **Design capacity**—The maximum amount of waste the landfill can accept, as specified in the construction permit issued by the county or state agency responsible for regulating the landfill.

(E) **Enclosed combustor**—An enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare is considered an enclosed combustor.

(F) **Flare**—An open combustor without enclosure or shroud.

(G) **Gas mover equipment**—The equipment (i.e., fan, blower, compressor) used to transport landfill gas through the header system.

(H) **Household waste**—Any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).

(I) **Lateral expansion**—A horizontal expansion of the waste boundaries of an existing MSWLF. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill.

(J) **Municipal solid waste landfill (MSWLF)**—An entire disposal facility in a contiguous geographical space where household waste is placed in or on land. A MSWLF may also receive other types of Resource Conservation and Recovery Act (RCRA) Subtitle D wastes such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of a MSWLF may be separated by access roads. A MSWLF may be publicly or privately owned. A MSWLF may be a new MSWLF, an existing MSWLF or a lateral expansion.

(K) **NMOC**—Nonmethane organic compounds.

(L) **Passive collection system**—A gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment.

(M) **Sufficient density**—Any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this rule.

(N) **Sufficient extraction rate**—A rate sufficient to maintain a negative pressure at all

wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.

(3) General Provisions.

(A) Each owner or operator of a municipal solid waste (MSW) landfill having a design capacity less than one (1.0) million megagrams (one and one-tenth (1.1) million tons) by mass or one (1.0) million cubic meters (one and three-tenths (1.3) million cubic yards) by volume shall submit within ninety (90) days of the rule effective date an initial design capacity report, as described in section (7), to the director. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report. Submittal of the initial design capacity report shall fulfill the requirements of this rule, except as provided for in paragraphs (3)(A)1. and 2.

1. The owner or operator shall submit an amended design capacity report to the director when there is any increase in the design capacity of the landfill. An increase in design capacity may result from an increase in the area or depth of the landfill, a change in the operating procedures of the landfill, or any other means.

2. If an increase in the design capacity of the landfill results in a revised maximum design capacity equal to or greater than one (1.0) million megagrams or one (1.0) million cubic meters, the owner or operator shall comply with the provisions of subsection (3)(B).

(B) Each owner or operator of an MSW landfill having a design capacity equal to or greater than one (1.0) million megagrams or one (1.0) million cubic meters shall submit within ninety (90) days of the rule effective date an initial design capacity report and an NMOC emission rate report, as described in sections (4) and (7), to the director. The NMOC emission rate shall be recalculated annually except as provided for in subsection (7)(C).

1. If the calculated NMOC emission rate is less than twenty-five (25) megagrams (twenty-seven and one half (27.5) tons) per year, the owner or operator shall—

A. Submit an annual emission rate report to the director; and

B. Recalculate the NMOC emission rate annually until such time as the calculated NMOC emission rate is equal to or greater than twenty-five (25) megagrams, or the landfill closes.

(I) If the NMOC emission rate, upon recalculation, is equal to or greater than twenty-five (25) megagrams per year, the owner or operator shall install a collection and control system in compliance with paragraph (3)(B)2.

(II) If the landfill is permanently closed, a closure notification shall be submitted to the director.

2. If the calculated NMOC emission rate is equal to or greater than twenty-five (25) megagrams per year, the owner or operator shall—

A. Submit a collection and control system design plan prepared by a professional engineer to the director within one (1) year of the NMOC emission rate report. Permit modification approval from the Missouri Department of Natural Resources' Solid Waste Management Program shall be required prior to construction of any gas collection system.

(I) The collection and control system shall meet the design requirements of subparagraph (3)(B)2.B.

(II) The collection and control system design plan shall include any alternatives to the operation standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of sections (4) through (7) proposed by the owner or operator.

(III) The collection and control system design plan shall either conform with specifications for active collection systems or include a demonstration to the director's satisfaction of the sufficiency of the alternate system.

(IV) The director will review the collection and control system design plan and either approve it, disapprove it, or request that additional information be submitted;

B. Install a collection and control system within eighteen (18) months of the submittal of the design plan required in this section that effectively, as described in section (5), captures the gas generated within the landfill.

(I) An active collection system shall—

(a) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control;

(b) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of five (5) years or more, if active, or two (2) years or more, if closed or at final grade;

(c) Collect gas at a sufficient extraction rate; and

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

(II) A passive collection system shall—

(a) Comply with the provisions of subparts (3)(B)2.B.(I)(a), (b), and (d); and

(b) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected;

(III) Each owner or operator of an MSW landfill gas collection and control system shall—

(a) Operate the collection system with negative pressure at each wellhead except under the following conditions:

I. A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports as provided in subsection (7)(H);

II. Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan; and

III. A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the director;

(b) Operate each interior wellhead in the collection system with a landfill gas temperature less than fifty-five degrees Celsius (55°C) and with either a nitrogen level less than twenty percent (20%) or an oxygen level less than five percent (5%). The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

I. The nitrogen level shall be determined using Method 3C of Appendix A, 40 CFR part 60, unless an alternative test method is established as allowed by part (3)(B)2.A.(II).

II. Unless an alternative test method is established as allowed by part (3)(B)2.A.(II), the oxygen shall be determined by an oxygen meter using Method 3A of Appendix A, 40 CFR part 60, except that—

a. The span shall be set so that the regulatory limit is between twenty and fifty percent (20 and 50%) of the span;

b. A data recorder is not required;

c. Only two (2) calibration gases are required, a zero and span, and ambient air may be used as the span;

d. A calibration error check

is not required; and

e. The allowable sample bias, zero drift, and calibration drift are plus or minus ten percent ( $\pm 10\%$ );

(c) Operate the collection system so that the methane concentration is less than five hundred (500) parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area along a pattern that traverses the landfill at thirty (30) meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the thirty (30)-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing;

(d) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with subparagraph (3)(B)2.C. In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within one (1) hour;

(e) Operate the control or treatment system at all times when the collected gas is routed to the system; and

(f) If monitoring demonstrates that the operational requirement in subpart (3)(B)2.B.(III)(a), (b), or (c) are not met, corrective action shall be taken as specified in subsection (5)(B). If corrective actions are taken as specified in subsection (5)(B), the monitored exceedance is not a violation of the operational requirements in this section;

C. Route all the collected gas to a control system described in part (3)(B)2.C.(I), (II), or (III) of this section.

(I) An open flare;

(II) A control system designed and operated to reduce NMOC by ninety-eight (98) weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by ninety-eight (98) weight-percent, or reduce the outlet NMOC concentration to less than twenty (20) parts per million by volume, dry basis as hexane at three percent (3%) oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test; or

(III) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use; and

D. The collection and control system may be capped or removed provided the following conditions are met:

(I) The landfill shall be no longer accepting solid waste and be permanently closed. A closure report shall be submitted to the director;

(II) The collection and control system has been in operation a minimum of fifteen (15) years; and

(III) The calculated NMOC gas produced by the landfill is less than twenty-five (25) megagrams per year on three (3) successive test dates. The test dates shall be no less than ninety (90) days apart and no more than one hundred eighty (180) days apart.

(4) Test Methods.

(A) The owner or operator of a MSW landfill shall calculate the NMOC emission rate using either the equation provided in paragraph (4)(A)1. or the equation provided in paragraph (4)(A)2. The values to be used in both equations are 0.05 per year for k, 170 cubic meters per megagram for  $L_0$ , and 4,000 parts per million by volume as hexane for the  $C_{NMOC}$  unless site-specific values are calculated as described under Tier 1, Tier 2, and Tier 3 of this section.

1. The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for  $M_i$  if documentation is provided. The following equation shall be used if the actual year-to-year solid waste acceptance rate is known:

$$M_{NMOC} = \sum_{i=1}^n 2 k L_0 M_i (e^{-kt}) (C_{NMOC}) (3.6 \times 10^{-9})$$

where,

$M_{NMOC}$  = Total NMOC emission rate from the landfill, megagrams per year

k = methane generation rate constant, year<sup>-1</sup>

$L_0$  = methane generation potential, cubic meters per megagram solid waste

$M_i$  = mass of solid waste in the  $i^{th}$  section, megagrams

$t_i$  = age of the  $i^{th}$  section, years

$C_{NMOC}$  = concentration of NMOC, parts per million by volume as hexane

$3.6 \times 10^{-9}$  = conversion factor

2. The mass of nondegradable solid waste may be subtracted from the average annual acceptance rate when calculating a value for R if documentation is provided. The following equation shall be used if the actual year-to-year solid waste acceptance rate is unknown:

$$M_{NMOC} = 2L_0 R (e^{-kt} - e^{-kt'}) (C_{NMOC}) (3.6 \times 10^{-9})$$

where,

$M_{NMOC}$  = mass emission rate of NMOC, megagrams per year

$L_0$  = methane generation potential, cubic meters per megagram solid waste

R = average annual acceptance rate, megagrams per year

k = methane generation rate constant, year<sup>-1</sup>

c = time since closure, years (for active landfill c = 0 and  $e^{-kc} = 1$ )

t = age of landfill, years

$C_{NMOC}$  = concentration of NMOC, parts per million by volume as hexane

$3.6 \times 10^{-9}$  = conversion factor

(B) Tier 1. The owner or operator shall compare the calculated NMOC mass emission rate to the standard of twenty-five (25) megagrams per year.

1. If the NMOC emission rate calculated in paragraph (4)(A)1. or 2. is less than twenty-five (25) megagrams per year, then the landfill owner shall submit an emission rate report and shall recalculate the NMOC mass emission rate annually as required under paragraph (3)(B)1.

2. If the calculated NMOC emission rate is equal to or greater than twenty-five (25) megagrams per year, then the landfill owner shall either comply with paragraph (3)(B)2., or determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in subsection (4)(C).

(C) Tier 2. The owner or operator shall determine the NMOC concentration using the



following sampling procedure. The landfill owner or operator shall install at least two (2) sample probes per hectare of landfill surface that has retained solid waste for at least two (2) years. If the landfill is larger than twenty-five (25) hectares in area, only fifty (50) samples are required. The sample probes shall be located to avoid known areas of non-degradable solid waste. The owner or operator shall collect and analyze one (1) sample of landfill gas from each probe to determine the NMOC concentration using Method 25C or Method 18 of Appendix A, 40 CFR part 60. If composite sampling is used, equal volumes shall be taken from each sample probe. If more than the required number of samples are taken, all samples shall be used in the analysis. The landfill owner or operator shall divide the NMOC concentration from Method 25C by six (6) to convert from  $C_{\text{NMOC}}$  as carbon to  $C_{\text{NMOC}}$  as hexane. The owner or operator shall recalculate the NMOC mass emission rate using the equations provided in paragraph (4)(A)1. or 2. and using the average NMOC concentration from the collected samples instead of the default value in the equation.

1. If the resulting NMOC mass emission rate is less than twenty-five (25) megagrams per year, the owner or operator shall submit an emission rate report as required under paragraph (3)(B)1. and retest the site-specific NMOC concentration every five (5) years using the methods specified in this section.

2. If the resulting mass emission rate calculated using the site-specific NMOC concentration is equal to or greater than twenty-five (25) megagrams per year, then the landfill owner or operator shall either comply with paragraph (3)(B)2., or determine the site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the procedure specified in subsection (4)(D).

(D) Tier 3. The site-specific methane generation rate constant shall be determined using the procedures provided in Method 2E of Appendix A, 40 CFR part 60. The landfill owner or operator shall estimate the NMOC mass emission rate using the equations in paragraph (4)(A)1. or 2. using a site-specific methane generation rate constant  $k$ , and using the site-specific NMOC concentration as determined in subsection (4)(C) instead of the default values provided in subsection (4)(A). The landfill owner or operator shall compare the resulting NMOC mass emission rate to the standard of twenty-five (25) megagrams per year.

1. If the NMOC mass emission rate is less than twenty-five (25) megagrams per

year, then the owner or operator shall submit a periodic emission rate report as provided in paragraph (3)(B)1. and shall recalculate the NMOC mass emission rate annually. The calculation of the methane generation rate constant is performed only once, and the value obtained shall be used in all subsequent annual NMOC emission rate calculations.

2. If the NMOC mass emission rate as calculated using the site-specific methane generation rate and concentration of NMOC is equal to or greater than twenty-five (25) megagrams per year, the owner or operator shall comply with paragraph (3)(B)2.

(E) The owner or operator may use other methods to determine the NMOC concentration or a site-specific  $k$  as an alternative to the methods in subsection (4)(C) and (D) if the method has been approved in writing by the director.

(F) After the installation of a collection and control system in compliance with section (5), the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in subparagraph (3)(B)2.D., using the following equation:

$$M_{\text{NMOC}} = 1.89 \times 10^{-3} Q_{\text{LFG}} C_{\text{NMOC}}$$

where,

$$M_{\text{NMOC}} = \text{mass emission rate of NMOC, megagrams per year}$$

$$Q_{\text{LFG}} = \text{flow rate of landfill gas, cubic meters per minute}$$

$$C_{\text{NMOC}} = \text{NMOC concentration, parts per million by volume as hexane}$$

1. The flow rate of landfill gas,  $Q_{\text{LFG}}$ , shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of section 4 of Method 2E of Appendix A, 40 CFR part 60.

2. The average NMOC concentration,  $C_{\text{NMOC}}$ , shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25C or Method 18 of Appendix A, 40 CFR part 60. If using Method 18, the minimum list of compounds to be tested shall be those published in the most recent *Compilation of Air Pollutant Emission Factors (AP-42)*. The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration

from Method 25C by six (6) to convert from  $C_{\text{NMOC}}$  as carbon to  $C_{\text{NMOC}}$  as hexane.

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

(G) The owner or operator of each MSW landfill shall estimate the NMOC emission rate for comparison to the Prevention of Significant Deterioration (PSD) major source and significance levels in section 51.166 or 52.21 of 40 CFR parts 51 and 52 using AP-42 or other approved measurement procedures. If a collection system, which complies with the provisions in paragraph (3)(B)2. is already installed, the owner or operator shall estimate the NMOC emission rate using the procedures provided in subsection (4)(F).

(H) For the performance test required in part (3)(B)2.C.(II), Method 25 or Method 18 shall be used to determine compliance with ninety-eight (98) weight-percent efficiency or the twenty parts per million by volume (20 ppmv) outlet concentration level, unless another method to demonstrate compliance has been approved by the director as provided by part (3)(B)2.A.(II). If using Method 18, the minimum list of compounds to be tested shall be those published in the most recent *Compilation of Air Pollutant Emission Factors (AP-42)*. The following equation shall be used to calculate efficiency:

$$\text{Control Efficiency} = (\text{NMOC}_{\text{in}} - \text{NMOC}_{\text{out}}) / (\text{NMOC}_{\text{in}})$$

where,

$$\text{NMOC}_{\text{in}} = \text{mass of NMOC entering control device}$$

$$\text{NMOC}_{\text{out}} = \text{mass of NMOC exiting control device}$$

(5) Compliance.

(A) Except as provided for in part (3)(B)2.A.(II), the following methods shall be used to determine whether the gas collection system is in compliance.

1. One of the following equations shall be used in calculating the maximum expected gas generation flow rate from the landfill as described in subpart (3)(B)2.B.(I)(a). The  $k$  and  $L_0$  kinetic factors shall be those published in the most recent *Compilation of Air Pollution Emission Factors (AP-42)* or other site-specific values demonstrated to be appropriate and approved in writing by the director. A value of no more than fifteen (15) years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure. After installation of a collection and control

system, actual flow data shall be used to project the maximum flow rate.

A. For sites with unknown year-to-year solid waste acceptance rate:

$$Q_m = 2L_o R (e^{-kt} - e^{-kt'})$$

where,

$Q_m$  = maximum expected gas generation flow rate, cubic meters per year

$L_o$  = methane generation potential, cubic meters per megagram solid waste

$R$  = average annual acceptance rate, megagrams per year

$k$  = methane generation rate constant, year<sup>-1</sup>

$c$  = time since closure, years (for an active landfill  $c = 0$  and  $e^{-kt} = 1$ )

$t$  = age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure,  $t$  is the age of the landfill at installation, years

B. For sites with known year-to-year solid waste acceptance rate:

$$Q_m = \sum_{i=1}^n k L_o M_i (e^{-kt_i})$$

where,

$Q_m$  = maximum expected gas generation flow rate, cubic meters per year

$k$  = methane generation rate constant, year<sup>-1</sup>

$L_o$  = methane generation potential, cubic meters per megagram solid waste

$M_i$  = mass of solid waste in the  $i^{\text{th}}$  section, megagrams

$t_i$  = age of the  $i^{\text{th}}$  section, years.

2. For the purposes of determining sufficient density of gas collectors for compliance with subpart (3)(B)2.B.(1)(b), the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the director,

capable of controlling and extracting gas from all portions of the landfill.

3. For the purposes of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with subpart (3)(B)2.B.(1)(c), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within five (5) calendar days. If negative pressure cannot be achieved without excess air infiltration within fifteen (15) calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within one hundred twenty (120) days of the initial measurement of positive pressure. Compliance with this subsection will not be required during the first one hundred eighty (180) days after gas collection system start-up.

4. An owner or operator seeking to demonstrate compliance with subpart (3)(B)2.B.(1)(d) shall provide information satisfactory to the director demonstrating that off-site migration is being controlled.

(B) After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and in a serpentine pattern every thirty (30) meters for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specification provided in Method 21 of Appendix A, 40 CFR part 60, except that "methane" shall replace all references to VOC.

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

2. Surface emission monitoring shall be performed in accordance with section 4.3.1 of Method 21 of Appendix A, 40 CFR part 60, except that the probe inlet shall be placed within five to ten centimeters (5–10 cm) of the ground.

3. Any reading of five hundred parts per million (500 ppm) or more above background at any location shall be recorded as an exceedance.

A. The location of each exceedance shall be marked, and the location recorded.

B. Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made within ten (10) calendar days of detecting the exceedance.

C. Any location at which an exceedance has occurred shall be rechecked within ten (10) calendar days of detecting the exceedance. The location shall be rechecked every ten (10) calendar days until either a reading below five hundred parts per million (500 ppm) is taken or there are three (3) exceedances.

D. Any location that initially exceeded five hundred parts per million (500 ppm) methane, but does not exceed five hundred parts per million (500 ppm) methane at the ten (10)-day recheck, shall be remonitored one (1) month from the initial exceedance. If the monthly remonitoring does not exceed five hundred parts per million (500 ppm) methane, then quarterly monitoring can be resumed.

E. When any location exceeds five hundred parts per million (500 ppm) methane three (3) times within a quarterly period, a new well or other collection device shall be installed within one hundred twenty (120) calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding time line for installation may be submitted to the director for written approval.

(6) Monitoring.

(A) Each owner or operator seeking to comply with part (3)(B)2.B.(1) for an active gas collection system shall install a sampling port and a thermometer or other temperature measuring device at each wellhead—

1. Measure the gauge pressure in the gas collection header on a monthly basis;

2. Monitor the nitrogen or oxygen concentration in the landfill gas on a monthly basis; and

3. Monitor the temperature of the landfill gas on a monthly basis.

(B) Each owner or operator seeking to comply with subparagraph (3)(B)2.C. using an enclosed combustion device shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

1. A temperature monitoring device equipped with a continuous recorder and having an accuracy of  $\pm 1$  percent of the temperature being measured expressed in degrees Celsius or  $\pm 0.5^\circ$  C, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity greater than forty-four (44) megawatts; and

2. A gas flow rate measuring device that provides a measurement of gas flow to or bypass of the control device. The owner or operator shall either—



A. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every fifteen (15) minutes; or

B. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration.

(C) Each owner or operator seeking to comply with subparagraph (3)(B)2.C. using an open flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

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

2. A device that records flow to or bypass of the flare. The owner or operator shall either—

A. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every fifteen (15) minutes; or

B. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration.

(D) Each owner or operator seeking to comply with subparagraph (3)(B)2.C. using a device other than an open flare or an enclosed combustion device shall provide information satisfactory to the director describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The director shall review the information and either approve it, or request that additional information be submitted.

(E) Each owner or operator seeking to comply with subsection (5)(B) shall monitor surface concentrations of methane according to the instrument specifications. Any closed landfill that has no exceedances of the five hundred parts per million (500 ppm) standard in three (3) consecutive quarterly monitoring periods may change to annual monitoring. Any exceedance of the five hundred parts per million (500 ppm) standard recorded during the annual monitoring shall return the monitoring frequency to quarterly testing.

#### (7) Reporting and Recordkeeping.

(A) The initial design capacity report shall be submitted ninety (90) days from the rule effective date and contain the following information:

1. A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the provision of the

state, local, tribal, or RCRA construction or operating permit; and

2. The maximum design capacity of the landfill. Where the maximum design capacity is specified in the state or local construction or RCRA permit, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity shall be calculated using good engineering practices. The calculations shall be provided, along with such parameters as depth of solid waste, solid waste acceptance rate, and compaction practices as part of the report. The director may request other information as may be necessary to verify the maximum design capacity of the landfill.

(B) An amended design capacity report shall be submitted to the director providing notification of any increase in the design capacity of the landfill. The amended design capacity report shall be submitted within ninety (90) days of the issuance of an amended construction or operating permit.

(C) The initial NMOC emission rate report shall be submitted within ninety (90) days of the rule effective date and annually thereafter. The initial NMOC emission rate report may be combined with the initial design capacity report required in subsection (7)(A). The NMOC emission rate report shall include all the data, calculations, sample reports and measurements used to estimate the annual emission rate. An annual emission rate report will not be required for landfills after installation of a collection and control system.

(D) Each owner or operator subject to subparagraph (3)(B)2.A. shall submit a collection and control system design plan to the director within one (1) year of the NMOC emission rate report, required under subsection (7)(C), in which the emission rate exceeds twenty-five (25) megagrams per year, except as follows:

1. If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided under subsection (4)(C) and the resulting rate is less than twenty-five (25) megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated emission rate is equal to or greater than twenty-five (25) megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated emission rate based on NMOC sampling and analysis, shall be submitted within one hundred eighty (180) days of the first calculated

exceedance of twenty-five (25) megagrams per year; and

2. If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant (k), as provided in Tier 3 in subsection (4)(D) and the resulting NMOC emission rate is less than twenty-five (25) megagrams per year, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant (k) shall be used in the emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report, with the site-specific methane generation rate constant (k) shall be submitted to the director within one (1) year of the first calculated emission rate exceeding twenty-five (25) megagrams per year.

(E) Each owner or operator of a controlled landfill shall submit a closure report to the director within thirty (30) days of the date the landfill ceases accepting solid waste. The director may request additional information as may be necessary to verify that permanent closure has taken place.

(F) Each owner or operator of a controlled landfill shall submit an equipment removal report to the director thirty (30) days prior to removal or cessation of operation of the control equipment. The report shall contain all of the following items:

1. A copy of the closure report;
2. A copy of the initial performance test report demonstrating that the fifteen (15)-year minimum control period has expired; and
3. Dated copies of three (3) successive NMOC emission rate reports demonstrating that the landfill is no longer producing twenty-five (25) megagrams or greater of NMOC per year.

(G) Each owner or operator of an MSW landfill subject to paragraph (3)(B)2. shall keep up-to-date, readily accessible on-site records of the following:

1. Maximum design capacity;
2. Control equipment compliance monitoring;
3. A plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector; and
4. Collection and control system exceedances of the operation standards and the location of each exceedance.

(H) Each owner or operator of a landfill seeking to comply with paragraph (3)(B)2. using an active collection system designed in accordance with subparagraph (3)(B)2.B. shall submit to the director annual reports of the recorded information in paragraphs



(7)(H)1.-6. The initial annual report shall be submitted within one hundred and eighty (180) days of installation and start-up of the collection and control system, and shall include an initial performance test report.

1. Value and length of time for exceedance of applicable parameters monitored under subsections (6)(A), (B), (C), and (D).

2. Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow.

3. Description and duration of all periods when the control device was not operating for a period exceeding one (1) hour and length of time the control device was not operating.

4. All periods when the collection system was not operating in excess of five (5) days.

5. The location of each exceedance of the five hundred parts per million (500 ppm) methane concentration as provided in subpart (3)(B)2.B.(III)(c) and the concentration recorded at each location for which an exceedance was recorded in the previous month.

6. The date of installation and the location of each well or collection system expansion added.

(I) Each owner or operator seeking to comply with subparagraph (3)(B)2.A. shall include the following information with the initial performance test report:

1. A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;

2. The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;

3. The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

4. The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area;

5. The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and

6. The provisions for the control of off-site migration.

*AUTHORITY: section 643.050, RSMo (Supp. 1995). \* Original rule filed May 15, 1996, effective Dec. 30, 1996.*

*\*Original authority 1965, amended 1972, transferred from 203.050 in 1986, 1992, 1993, 1995.*



**10 CSR 10-6.310 Restriction of Emissions from Municipal Solid Waste Landfills**

*PURPOSE: This rule requires owners of municipal solid waste landfills to report their landfill's design capacity and non-methane organic compound (NMOC) emissions. Landfills having design capacities of 2.5 million cubic meters or greater and NMOC emission rates of 50 megagrams or greater shall design, install and operate a gas collection and control system.*

*PUBLISHER'S NOTE: The publication of the full text of the material that the adopting agency has incorporated by reference in this rule would be unduly cumbersome or expensive. Therefore, the full text of that material will be made available to any interested person at both the Office of the Secretary of State and the office of the adopting agency, pursuant to section 536.031.4, RSMo. Such material will be provided at the cost established by state law.*

**(1) Applicability.**

(A) This rule applies to each municipal solid waste landfill for which construction, reconstruction or modification was commenced before May 30, 1991, and has accepted waste at any time since November 8, 1987, or has additional design capacity available for future waste deposition. Landfills for which construction, reconstruction or modification was commenced on May 30, 1991 or after, are covered under the Environmental Protection Agency's New Source Performance Standard for Municipal Solid Waste Landfills.

(B) Physical or operational changes made to an existing municipal solid waste landfill solely to comply with this rule are not considered construction, reconstruction, or modification for the purposes of this rule.

(C) Municipal solid waste landfills covered by 10 CSR 10-5.490 are exempt from this rule.

**(2) Definitions.** Definitions of certain terms specified in this rule may be found in 10 CSR 10-6.020. Additional definitions are as follows:

(A) Active collection system—A gas collection system that uses gas mover equipment;

(B) Active landfill—A landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future;

(C) Closed landfill—A landfill in which solid waste is no longer being placed, and in which no additional solid wastes will be placed without first filing a notification of modification as prescribed under 40 Code of Federal Regulations (CFR) part 60.7(a)(4) (incorporated by reference). Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed. A landfill is considered closed after meeting the criteria of 40 CFR part 258.60 (incorporated by reference);

(D) Closure—That point in time when a landfill becomes a closed landfill;

(E) Commercial solid waste—All types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes;

(F) Controlled landfill—Any landfill at which collection and control systems are required under this rule as a result of the non-methane organic compounds emission rate. The landfill is considered controlled at the time either 1) a notification of intent to install a collection and control system or 2) a collection and control system design plan is submitted in compliance with subparagraph (3)(B)2.A;

(G) Design capacity—The maximum amount of solid waste a landfill can accept, as specified in the construction or operating permit issued by the state or local agency responsible for regulating the landfill;

(H) Disposal facility—All contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste;

(I) Emission rate cutoff—The threshold annual emission rate to which a landfill compares its estimated emission rate to determine if control under the regulation is required;

(J) Enclosed combustor—An enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare is considered an enclosed combustor;

(K) Flare—An open combustor without enclosure or shroud;

(L) Gas mover equipment—The equipment (that is, fan, blower, compressor) used to transport landfill gas through the header system;

(M) Household waste—Any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas);

(N) Industrial solid waste—Solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act, 40 CFR parts 264 and 265 (incorporated by reference). Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste;

(O) Interior well—Any well or similar collection component located inside the perimeter of the landfill. A perimeter well located outside the landfilled waste is not an interior well;

(P) Landfill—An area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined under 40 CFR part 257.2 (incorporated by reference);

(Q) Lateral expansion—A horizontal expansion of the waste boundaries of an existing MSW landfill. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill;

(R) Municipal solid waste landfill or MSW landfill—An entire disposal facility in a contiguous geographical space where household waste is placed in or on land. An MSW landfill may also receive other types of Resource Conservation and Recovery Act (RCRA) Subtitle D wastes, 40 CFR Part 257.2 (incorporated by reference) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned. An MSW landfill may be a new MSW landfill, an existing MSW landfill, or a lateral expansion;

(S) Municipal solid waste landfill emissions or MSW landfill emissions—Gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste;

(T) NMOC—Non-methane organic compounds, as measured according to the provisions of section (5);

(U) Nondegradable waste—Any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete, municipal waste combustor ash, and metals;

(V) Passive collection system—A gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment;

(W) Sludge—Any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant;

(X) Solid waste—Any garbage, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under 33 U.S.C. 1342 (incorporated by reference), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq., incorporated by reference);

(Y) Sufficient density—Any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this rule; and

(Z) Sufficient extraction rate—A rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.

### (3) Standards for Air Emissions from Municipal Solid Waste Landfills.

(A) Each owner or operator of an MSW landfill having a design capacity less than two and one-half (2.5) million megagrams by mass or two and one-half (2.5) million cubic meters by volume shall submit an initial design capacity report to the director as provided in subsection (8)(A). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report. For purposes of part 70 permitting under 10 CSR 10-6.065, a landfill with a

design capacity less than two and one-half (2.5) million megagrams or two and one-half (2.5) million cubic meters does not require an operating permit under part 70. Submittal of the initial design capacity report shall fulfill the requirements of this rule except as provided for in paragraphs (3)(A)1. and 2.

1. The owner or operator shall submit to the director an amended design capacity report, as provided for in paragraph (8)(A)3., when there is any increase in the design capacity of a landfill subject to the provisions of this rule, whether the increase results from an increase in the area or depth of the landfill, a change in the operating procedures of the landfill, or any other means.

2. If any increase in the maximum design capacity of a landfill exempted from the provisions of subsection (3)(B) through section (10) of this rule on the basis of the design capacity exemption in subsection (3)(A) results in a revised maximum design capacity equal to or greater than two and one-half (2.5) million megagrams or two and one-half (2.5) million cubic meters, the owner or operator shall comply with the provisions of subsection (3)(B).

(B) Each owner or operator of an MSW landfill having a design capacity equal to or greater than two and one-half (2.5) million megagrams or two and one-half (2.5) million cubic meters, shall either comply with paragraph (3)(B)2. or calculate an NMOC emission rate for the landfill using the procedures specified in section (5). The NMOC emission rate shall be recalculated annually, except as provided in subparagraph (8)(B)1.B. of this rule. The owner or operator of an MSW landfill subject to this rule with a design capacity greater than or equal to two and one-half (2.5) million megagrams or two and one-half (2.5) million cubic meters is subject to part 70 permitting requirements. When a landfill is closed, and either never needed control or meets the conditions for control system removal specified in subparagraph (3)(B)2.E. of this rule, a part 70 operating permit is no longer required.

1. If the calculated NMOC emission rate is less than fifty (50) megagrams per year, the owner or operator shall—

A. Submit an annual emission report to the director, except as provided for in subparagraph (8)(B)1.B.; and

B. Recalculate the NMOC emission rate annually using the procedures specified in paragraph (5)(A)1. until such time as the calculated NMOC emission rate is equal to or greater than fifty (50) megagrams per year, or the landfill is closed.

(I) If the NMOC emission rate, upon recalculation required in subparagraph (3)(B)1.B. is equal to or greater than fifty (50) megagrams per year, the owner or operator shall install a collection and control system in compliance with paragraph (3)(B)2.

(II) If the landfill is permanently closed, a closure notification shall be submitted to the director as provided for in subsection (8)(D).

2. If the calculated NMOC emission rate is equal to or greater than fifty (50) megagrams per year, the owner or operator shall—

A. Submit a collection and control system design plan prepared by a professional engineer to the director within one (1) year. Permit modification approval from the Missouri Department of Natural Resources' Solid Waste Management Program shall be required prior to construction of any gas collection system.

(I) The collection and control system as described in the plan shall meet the design requirements of subparagraph (3)(B)2.B.

(II) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of sections (4) through (9) proposed by the owner or operator.

(III) The collection and control system design plan shall either conform with specifications for active collection systems in section (10) or include a demonstration to the director's satisfaction, such that human health and safety is protected, of the sufficiency of the alternative provisions to section (10).

(IV) The director shall review the information submitted under parts (3)(B)2.A.(I), (II) and (III) and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems;

B. Install a collection and control system within eighteen (18) months of the submittal of the design plan under subparagraph (3)(B)2.A. that effectively captures the gas generated within the landfill.

(I) An active collection system shall—

(a) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment;

(b) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of—

I. Five (5) or more if active;  
or

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

(c) Collect gas at a sufficient extraction rate; and

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

(II) A passive collection system shall—

(a) Comply with the provisions specified in subparts (3)(B)2.B.(I)(a), (b) and (d); and

(b) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners shall be installed as required under 40 CFR part 258.40 (incorporated by reference);

C. Route all the collected gas to a control system that complies with the requirements in either part (3)(B)2.C.(I), (II) or (III).

(I) An open flare designed and operated in accordance with 40 CFR part 60.18 (incorporated by reference).

(II) A control system designed and operated to reduce NMOC by ninety-eight (98) weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by ninety-eight (98) weight-percent or reduce the outlet NMOC concentration to less than twenty parts per million by volume (20 ppmv), dry basis as hexane at three percent (3%) oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test, required under 40 CFR part 60.8 (incorporated by reference) using the test methods specified in subsection (5)(D).

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

(b) The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in section (7).

(III) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of part (3)(B)2.C.(I) or (II).

D. Operate the collection and control device installed to comply with this rule in accordance with the provisions of sections (4), (6) and (7); and

E. The collection and control system may be capped or removed provided that all the conditions of parts (3)(B)2.E.(I), (II) and (III) are met—

(I) The landfill shall be no longer accepting solid waste and be permanently closed under the requirements of 40 CFR part 258.60 (incorporated by reference). A closure report shall be submitted to the director as provided in subsection (8)(D);

(II) The collection and control system shall have been in operation a minimum of fifteen (15) years; and

(III) Following the procedures specified in subsection (5)(B) of this rule, the calculated NMOC gas produced by the landfill shall be less than fifty (50) megagrams per year on three (3) successive test dates. The test dates shall be no less than ninety (90) days apart, and no more than one hundred eighty (180) days apart.

(4) Operational Standards for Collection and Control Systems. Each owner or operator of an MSW landfill gas collection and control system used to comply with the provisions of subparagraph (3)(B)2.B. of this rule shall—

(A) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for—

1. Five (5) years or more if active; or  
2. Two (2) years or more if closed or at final grade;

(B) Operate the collection system with negative pressure at each well head except under the following conditions:

1. A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports as provided in paragraph (8)(F)1.;

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

3. A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the director;

(C) Operate each interior wellhead in the collection system with a landfill gas temperature less than fifty-five degrees Celsius (55°C) and with either a nitrogen level less than twenty percent (20%) or an oxygen level less than five percent (5%). The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a

particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

1. The nitrogen level shall be determined using Method 3C of Appendix A, 40 CFR part 60 (incorporated by reference), unless an alternative test method is established as allowed by subparagraph (3)(B)2.A. of this rule.

2. Unless an alternative test method is established as allowed by subparagraph (3)(B)2.A. of this rule, the oxygen shall be determined by an oxygen meter using Method 3A of Appendix A, 40 CFR Part 60 (incorporated by reference), except that—

A. The span shall be set so that the regulatory limit is between twenty and fifty percent (20%—50%) of the span;

B. A data recorder is not required;

C. Only two (2) calibration gases are required, a zero and span, and ambient air may be used as the span;

D. A calibration error check is not required; and

E. The allowable sample bias, zero drift, and calibration drift are plus or minus ten percent ( $\pm 10\%$ );

(D) Operate the collection system so that the methane concentration is less than five hundred (500) parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area along a pattern that traverses the landfill at thirty (30)-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the thirty (30)-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing;

(E) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with subparagraph (3)(B)2.C. In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within one (1) hour;

(F) Operate the control or treatment system at all times when the collected gas is routed to the system; and

(G) If monitoring demonstrates that the operational requirements in subsection (4)(B), (C), or (D) are not met, corrective action shall be taken as specified in paragraph (3)(A)3. through 5. or subsection (6)(C) of this rule. If corrective actions are taken as specified in section (6), the monitored exceedance is not a violation of the operational requirements in this section.

(5) Test Methods and Procedures.

(A) NMOC Emission Rate Calculation.

1. The landfill owner or operator shall calculate the NMOC emission rate using either the equation provided in subparagraph (5)(A)1.A. or the equation provided in subparagraph (5)(A)1.B. The values to be used in both equations are 0.05 per year for k, one hundred seventy (170) cubic meters per megagram for  $L_o$ , and four thousand (4,000) parts per million by volume as hexane for the  $C_{NMOC}$ .

A. The following equation shall be used if the actual year-to-year solid waste acceptance rate is known. The mass of non-degradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for  $M_i$  if the documentation provisions of paragraph (9)(D)2. are followed.

$$M_{NMOC} = \sum_{i=1}^n 2 k L_o M_i (e^{-kt_i}) (C_{NMOC}) (3.6 \times 10^{-9})$$

where,  
 $M_{NMOC}$  = Total NMOC emission rate from the landfill, megagrams per year  
 k = methane generation rate constant, year<sup>-1</sup>  
 $L_o$  = methane generation potential, cubic meters per megagram solid waste  
 $M_i$  = mass of solid waste in the  $i^{th}$  section, megagrams  
 $t_i$  = age of the  $i^{th}$  section, years  
 $C_{NMOC}$  = concentration of NMOC, parts per million by volume as hexane  
 $3.6 \times 10^{-9}$  = conversion factor

B. The following equation shall be used if the actual year-to-year solid waste acceptance rate is unknown. The mass of non-degradable solid waste may be subtracted from the average annual acceptance rate when calculating a value for R, if the documentation provisions of paragraph (9)(D)2. are followed.

$M_{NMOC} = 2 L_o R (e^{-kt} - e^{-kt'}) / (C_{NMOC})(3.6 \times 10^{-9})$   
 where,  
 $M_{NMOC}$  = mass emission rate of NMOC, megagrams per year  
 $L_o$  = methane generation potential, cubic meters per megagram solid waste  
 R = average annual acceptance rate, megagrams per year  
 k = methane generation rate constant, year<sup>-1</sup>  
 t = age of landfill, years  
 $C_{NMOC}$  = concentration of NMOC, parts per million by volume as hexane  
 c = time since closure, years. For active landfill c = 0 and  $e^{-kt} = 1$   
 $3.6 \times 10^{-9}$  = conversion factor

2. Tier 1. The owner or operator shall compare the calculated NMOC mass emission rate to the standard of fifty (50) megagrams per year.

A. If the NMOC emission rate calculated in paragraph (5)(A)1. is less than fifty (50) megagrams per year, then the landfill owner shall submit an emission rate report as provided in paragraph (8)(B)1., and shall recalculate the NMOC mass emission rate annually as required under paragraph (3)(B)1.

B. If the calculated NMOC emission rate is equal to or greater than fifty (50) megagrams per year, then the landfill owner shall either comply with paragraph (3)(B)2., or determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in paragraph (5)(A)3.

3. Tier 2. The landfill owner or operator shall determine the NMOC concentration using the following sampling procedure. The landfill owner or operator shall install at least two (2) sample probes per hectare of landfill surface that has retained waste for at least two (2) years. If the landfill is larger than twenty-five (25) hectares in area, only fifty (50) samples are required. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator shall collect and analyze one (1) sample of landfill gas from each probe to determine the NMOC concentration using Method 25C or Method 18 of Appendix A, 40 CFR part 60 (incorporated by reference). If using Method 18, the minimum list of compounds to be tested shall be those published in the most recent *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources* (AP-42),

available from the Government Printing Office. If composite sampling is used, equal volumes shall be taken from each sample probe. If more than the required number of samples are taken, all samples shall be used in the analysis. The landfill owner or operator shall divide the NMOC concentration from Method 25C by six (6) to convert from  $C_{NMOC}$  as carbon to  $C_{NMOC}$  as hexane.

A. The landfill owner or operator shall recalculate the NMOC mass emission rate using the equations provided in subparagraph (5)(A)1.A. or B. and using the average NMOC concentration from the collected samples instead of the default value in the equation provided in paragraph (5)(A)1.

B. If the resulting mass emission rate calculated using the site-specific NMOC concentration is equal to or greater than fifty (50) megagrams per year, then the landfill owner or operator shall either comply with paragraph (3)(B)2., or determine the site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the procedure specified in paragraph (5)(A)4.

C. If the resulting NMOC mass emission rate is less than fifty (50) megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report as provided in paragraph (8)(B)1. and retest the site-specific NMOC concentration every five (5) years using the methods specified in this section.

4. Tier 3. The site-specific methane generation rate constant shall be determined using the procedures provided in Method 2E of Appendix A, 40 CFR part 60 (incorporated by reference). The landfill owner or operator shall estimate the NMOC mass emission rate using equations in subparagraph (5)(A)1.A. or B. and using a site-specific methane generation rate constant k, and the site-specific NMOC concentration as determined in paragraph (5)(A)3. instead of the default values provided in paragraph (5)(A)1. The landfill owner or operator shall compare the resulting NMOC mass emission rate to the standard of fifty (50) megagrams per year.

A. If the NMOC mass emission rate as calculated using the site-specific methane generation rate and concentration of NMOC is equal to or greater than fifty (50) megagrams per year, the owner or operator shall comply with paragraph (3)(B)2.

B. If the NMOC mass emission rate is less than fifty (50) megagrams per year, then the owner or operator shall submit a periodic emission rate report as provided in paragraph (8)(B)1. and shall recalculate the NMOC mass emission rate annually, as provided in paragraph (8)(B)1. using the equations in

paragraph (5)(A)1. and using the site-specific methane generation rate constant and NMOC concentration obtained in paragraph (5)(A)3. The calculation of the methane generation rate constant is performed only once, and the value obtained is used in all subsequent annual NMOC emission rate calculations.

5. The owner or operator may use other methods to determine the NMOC concentration or a site-specific  $k$  as an alternative to the methods required in paragraphs (5)(A)3. and 4. if the method has been approved by the director

6. The owner or operator may recalculate the NMOC mass emission rate using AP-42 values instead of the default values provided in paragraph (5)(A)1. as an alternative to the methods required in paragraph (5)(A)3. or 4.

(B) After the installation of a collection and control system in compliance with section (6), the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in subparagraph (3)(B)2.E., using the following equation:

$$M_{NMOC} = 1.89 \times 10^{-3} Q_{LFG} C_{NMOC}$$

where,

$M_{NMOC}$  = mass emission rate of NMOC, megagrams per year

$Q_{LFG}$  = flow rate of landfill gas, cubic meters per minute

$C_{NMOC}$  = NMOC concentration, parts per million by volume as hexane

1. The flow rate of landfill gas,  $Q_{LFG}$ , shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of section 4 of Method 2E.

2. The average NMOC concentration,  $C_{NMOC}$ , shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25C or Method 18. If using Method 18, the minimum list of compounds to be tested shall be those published in the most recent *Compilation of Air Pollutant Emission Factors* (AP-42). The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration from Method 25C by six (6) to convert from  $C_{NMOC}$  as carbon to  $C_{NMOC}$  as hexane.

3. The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the director as provided in part (3)(B)2.A.(II).

(C) The owner or operator of each MSW landfill subject to the provisions of this rule shall estimate the NMOC emission rate for comparison to the prevention of deterioration (PSD) major source and significance levels in 40 CFR part 51.166 or 52.21 (incorporated by reference) using AP-42 or other approved measurement procedures. If a collection system, which complies with the provisions in paragraph (3)(B)2. is already installed, the owner or operator shall estimate the NMOC emission rate using the procedures provided in subsection (5)(B).

(D) For the performance test required in part (3)(B)2.C.(II), Method 25 or Method 18 shall be used to determine compliance with ninety-eight (98) weight-percent efficiency or the twenty (20) ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the director as provided by part (3)(B)2.A.(II). If using Method 18, the minimum list of compounds to be tested shall be those published in the most recent *Compilation of Air Pollutant Emission Factors* (AP-42). The following equation shall be used to calculate efficiency:

$$\text{Control Efficiency} = \frac{(\text{NMOC}_{in} - \text{NMOC}_{out})}{(\text{NMOC}_{in})}$$

where,

$\text{NMOC}_{in}$  = mass of NMOC entering control device

$\text{NMOC}_{out}$  = mass of NMOC exiting control device

(6) Compliance Provisions.

(A) Except as provided in part (3)(B)2.A.(II), the specified methods in paragraphs (6)(A)1. through (6)(A)6. shall be used to determine whether the gas collection system is in compliance with subparagraph (3)(B)2.B.

1. For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with subpart (3)(B)2.B.(I)(a), one (1) of the following equations shall be used. The  $k$  and  $L_0$  kinetic factors should be those published in the most recent *Compilation of Air Pollutant Emission Factors* (AP-42) or other site specific values demonstrated to be appropriate and approved by the director. If  $k$  has been determined as specified in paragraph (5)(A)4., the value of  $k$  determined from the test shall be used. A value of no more than fifteen (15) years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the

landfill plus the estimated number of years until closure.

A. For sites with unknown year-to-year solid waste acceptance rate—

$$Q_m = 2L_0 R (e^{-kt} - e^{-kc})$$

where,

$Q_m$  = maximum expected gas generation flow rate, cubic meters per year

$L_0$  = methane generation potential, cubic meters per megagram solid waste

$R$  = average annual acceptance rate, megagrams per year

$k$  = methane generation rate constant, year<sup>-1</sup>

$t$  = age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure,  $t$  is the age of the landfill at installation, years

$c$  = time since closure, years (for an active landfill  $c = 0$  and  $e^{-kc} = 1$ )

B. For sites with known year-to-year solid waste acceptance rate—

$$Q_m = \sum_{i=1}^n 2 k L_0 M_i (e^{-kt_i})$$

where,

$Q_m$  = maximum expected gas generation flow rate, cubic meters per year

$k$  = methane generation rate constant, year<sup>-1</sup>

$L_0$  = methane generation potential, cubic meters per megagram solid waste

$M_i$  = mass of solid waste in the  $i^{\text{th}}$  section, megagrams

$t_i$  = age of the  $i^{\text{th}}$  section, years

C. If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in subparagraphs (6)(A)1.A. and B. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using the equations in subparagraphs (6)(A)1.A. or B. or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

2. For the purposes of determining sufficient density of gas collectors for compliance with subpart (3)(B)2.B.(I)(b), the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the director, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

3. For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with subpart (3)(B)2.B.(I)(c), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within five (5) calendar days, except for the three (3) conditions allowed under subsection (4)(B). If negative pressure cannot be achieved without excess air infiltration within fifteen (15) calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within one hundred twenty (120) days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.

4. Owners or operators are not required to install additional wells as required in paragraphs (6)(A)3. during the first one hundred eighty (180) days after gas collection system start-up.

5. For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in subsection (4)(C). If a well exceeds one (1) of these operating parameters, action shall be initiated to correct the exceedance within five (5) calendar days. If correction of the exceedance cannot be achieved within fifteen (15) calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within one hundred twenty (120) days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.

6. An owner or operator seeking to demonstrate compliance with subpart (3)(B)2.B.(I)(d) through the use of a collection system not conforming to the specifications provided in section (10) shall provide information satisfactory to the director as specified in part (3)(B)2.A.(III) demonstrating that off-site migration is being controlled.

(B) For purposes of compliance with subsection (4)(A), each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in subparagraph (3)(B)2.A. Each well shall be installed within sixty (60) days of the date in which the initial solid waste has been in place for a period of—

1. Five (5) years or more if active; or
2. Two (2) years or more if closed or at final grade.

(C) The following procedures shall be used for compliance with the surface methane operational standard as provided in subsection (4)(D):

1. After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a serpentine pattern spaced thirty meters (30m) apart (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in subsection (6)(D);

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

3. Surface emission monitoring shall be performed in accordance with section 4.3.1 of Method 21 of Appendix A, 40 CFR part 60 (Incorporated by reference), except that the probe inlet shall be placed within five to ten centimeters (5–10 cm) of the ground. Monitoring shall be performed during typical meteorological conditions;

4. Any reading of five hundred parts per million (500 ppm) or more above background at any location shall be recorded as a monitored exceedance and the actions specified in subparagraphs (6)(C)4.A. through E. shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of subsection (4)(D).

A. The location of each monitored exceedance shall be marked and the location recorded.

B. Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be remonitored within ten (10) calendar days of detecting the exceedance.

C. If the remonitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within ten (10) days of the second exceedance. If the remonitoring shows a third exceedance for the same

location, the action specified in subparagraph (6)(C)4.E. shall be taken, and no further monitoring of that location is required until the action specified in subparagraph (6)(C)4.E. has been taken.

D. Any location that initially showed an exceedance but has a methane concentration less than five hundred (500) ppm methane above background at the ten (10)-day remonitoring specified in subparagraph (6)(C)4.B. or C. shall be remonitored one (1) month from the initial exceedance. If the one (1)-month remonitoring shows a concentration less than five hundred (500) ppm above background, no further monitoring of that location is required until the next quarterly monitoring period. If the one (1)-month remonitoring shows an exceedance, the actions specified in subparagraph (6)(C)4.C. or E. shall be taken.

E. For any location where monitored methane concentration equals or exceeds five hundred (500) ppm above background three times within a quarterly period, a new well or other collection device shall be installed within one hundred twenty (120) calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the director for approval; and

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

(D) Each owner or operator seeking to comply with the provisions in subsection (6)(C) shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

1. The portable analyzer shall meet the instrument specifications provided in section 3 of Method 21, except that "methane" shall replace all references to VOC;

2. The calibration gas shall be methane, diluted to a nominal concentration of five hundred (500) ppm in air;

3. To meet the performance evaluation requirements in section 3.1.3 of Method 21, the instrument evaluation procedures of section 4.4 of Method 21 shall be used; and

4. The calibration procedures provided in section 4.2 of Method 21 shall be followed immediately before commencing a surface monitoring survey.

(E) The provisions of this rule apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed five (5) days for collection systems and shall not exceed one (1) hour for treatment or control devices.



(7) Monitoring of Operations. Except as provided in part (3)(B)2.A.(II)—

(A) Each owner or operator seeking to comply with part (3)(B)2.B.(I) for an active gas collection system shall install a sampling port and a thermometer or other temperature measuring device at each wellhead and—

1. Measure the gauge pressure in the gas collection header on a monthly basis as provided in paragraph (6)(A)3.; and

2. Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as provided in paragraph (6)(A)5.; and

3. Monitor temperature of the landfill gas on a monthly basis as provided in paragraph (6)(A)5;

(B) Each owner or operator seeking to comply with subparagraph (3)(B)2.C. using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

1. A temperature monitoring device equipped with a continuous recorder and having an accuracy of plus or minus one percent ( $\pm 1\%$ ) of the temperature being measured expressed in degrees Celsius or minus or plus point five degrees Celsius ( $\pm 0.5^\circ\text{C}$ ), whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity greater than forty-four (44) megawatts; and

2. A gas flow rate measuring device that provides a measurement of gas flow to or bypass of the control device. The owner or operator shall either—

A. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every fifteen (15) minutes; or

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

(C) Each owner or operator seeking to comply with subparagraph (3)(B)2.C. using an open flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

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

2. A device that records flow to or bypass of the flare. The owner or operator shall either—

A. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every fifteen (15) minutes; or

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

(D) Each owner or operator seeking to demonstrate compliance with subparagraph (3)(B)2.C. using a device other than an open flare or an enclosed combustor shall provide information satisfactory to the director as provided in part (3)(B)2.A.(II) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The director shall review the information and either approve it, or request that additional information be submitted. The director may specify additional appropriate monitoring procedures to insure that human health and safety is protected;

(E) Each owner or operator seeking to install a collection system that does not meet the specifications in section (10) or seeking to monitor alternative parameters to those required by sections (4) through (7) shall provide information satisfactory to the director as provided in parts (3)(B)2.A.(II) and (III) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The director may specify additional appropriate monitoring procedures to insure that human health and safety is protected; or

(F) Each owner or operator seeking to demonstrate compliance with subsection (6)(C), shall monitor surface concentrations of methane according to the instrument specifications and procedures provided in subsection (6)(D). Any closed landfill that has no monitored exceedances of the operational standard in three (3) consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of five hundred (500) ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

(8) Reporting Requirements. Except as provided in part (3)(B)2.A.(II)—

(A) Each owner or operator subject to the requirements of this rule shall submit an initial design capacity report to the director.

1. The initial design capacity report shall be submitted within ninety (90) days of the rule effective date.

2. The initial design capacity report shall contain the following information:

A. A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the provisions of the state or local construction or operating permit; and

B. The maximum design capacity of the landfill. Where the maximum design capacity is specified in the state or local construction permit, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity shall be calculated using good engineering practices. The calculations shall be provided, along with such parameters as depth of solid waste, solid waste acceptance rate, and compaction practices as part of the report. The state, local agency, or director may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

3. An amended design capacity report shall be submitted to the director providing notification of any increase in the design capacity of the landfill, whether the increase results from an increase in the permitted area or depth of the landfill, a change in the operating procedures, or any other means which results in an increase in the maximum design capacity of the landfill above two and one-half (2.5) million megagrams or two and one-half (2.5) million cubic meters. The amended design capacity report shall be submitted within ninety (90) days of the issuance of an amended construction or operating permit, or the placement of waste in additional land, or the change in operating procedures which will result in an increase in maximum design capacity, whichever occurs first;

(B) Each owner or operator subject to the requirements of this rule shall submit an NMOC emission rate report to the director initially and annually thereafter, except as provided for in subparagraph (8)(B)3. The director may request such additional information as may be necessary to verify the reported NMOC emission rate.

1. The NMOC emission rate report shall contain an annual or five (5)-year estimate of the NMOC emission rate calculated using the formula and procedures provided in subsection (5)(A) or (B), as applicable.

A. The initial NMOC emission rate report shall be submitted within ninety (90) days of the rule reflective date and may be combined with the initial design capacity report required in subsection (8)(A). Subsequent NMOC emission rate reports shall be submitted annually thereafter, except

as provided for in subparagraph (8)(B)1.B. and paragraph (8)(B)3.

B. If the estimated NMOC emission rate as reported in the annual report to the director is less than fifty (50) megagrams per year in each of the next five (5) consecutive years, the owner or operator may elect to submit an estimate of the NMOC emission rate for the next five (5)-year period in lieu of the annual report. This estimate shall include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the five (5) years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based shall be provided to the director. This estimate shall be revised at least once every five (5) years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the five (5)-year estimate, a revised five (5)-year estimate shall be submitted to the director. The revised estimate shall cover the five (5)-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

2. The NMOC emission rate report shall include all the data, calculations, sample reports and measurements used to estimate the annual or five (5)-year emissions.

3. Each owner or operator subject to the requirements of this rule is exempted from the requirements of paragraphs (8)(B)1. and 2. after the installation of a collection and control system in compliance with paragraph (3)(B)2., during such time as the collection and control system is in operation and in compliance with sections (4) and (6);

(C) Each owner or operator subject to the provisions of subparagraph (3)(B)2.A. shall submit a collection and control system design plan to the director within one (1) year of the first report, required under subsection (8)(B), in which the emission rate exceeds fifty (50) megagrams per year, except as follows:

1. If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in paragraph (5)(A)3. and the resulting rate is less than fifty (50) megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated emission rate is equal to or greater than fifty (50) megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated emission rate based on NMOC sampling and analysis, shall be submitted within one hundred eighty (180) days of the first calculated exceedance of fifty (50) megagrams per year; and

2. If the owner or operator elects to recalculate the NMOC emission rate after

determining a site-specific methane generation rate constant ( $k$ ), as provided in Tier 3 in paragraph (5)(A)4., and the resulting NMOC emission rate is less than fifty (50) Mg/yr, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant ( $k$ ) shall be used in the emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of paragraph (5)(A)4. and the resulting site-specific methane generation rate constant ( $k$ ) shall be submitted to the director within one (1) year of the first calculated emission rate exceeding fifty (50) megagrams per year;

(D) Each owner or operator of a controlled landfill shall submit a closure report to the director within thirty (30) days of waste acceptance cessation. The director may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR part 258.60 (incorporated by reference). If a closure report has been submitted to the director, no additional wastes may be placed into the landfill without filing a notification of modification as described under 40 CFR part 60.7(a)(4) (incorporated by reference);

(E) Each owner or operator of a controlled landfill shall submit an equipment removal report to the director thirty (30) days prior to removal or cessation of operation of the control equipment.

1. The equipment removal report shall contain all of the following items:

A. A copy of the closure report submitted in accordance with subsection (8)(D);

B. A copy of the initial performance test report demonstrating that the fifteen (15)-year minimum control period has expired; and

C. Dated copies of three (3) successive NMOC emission rate reports demonstrating that the landfill is no longer producing fifty (50) megagrams or greater of NMOC per year.

2. The director may request such additional information as may be necessary to verify that all of the conditions for removal in subparagraph (3)(B)2.E. have been met;

(F) Each owner or operator of a landfill seeking to comply with paragraph (3)(B)2. using an active collection system designed in accordance with subparagraph (3)(B)2.B. shall submit to the director annual reports of the recorded information in paragraphs (8)(F)1. through 6. The initial annual report shall be submitted within one hundred eighty (180) days of installation and start-up of the collection and control system, and shall include the initial performance test report required under 40 CFR part 60.8 (incorporated by reference).

For enclosed combustion devices and flares, reportable exceedances are defined under subsection (9)(C).

1. Value and length of time for exceedance of applicable parameters monitored under subsections (7)(A), (B), (C), and (D).

2. Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under section (7).

3. Description and duration of all periods when the control device was not operating for a period exceeding one (1) hour and length of time the control device was not operating.

4. All periods when the collection system was not operating in excess of five (5) days.

5. The location of each exceedance of the five hundred (500) ppm methane concentration as provided in subsection (4)(D) and the concentration recorded at each location for which an exceedance was recorded in the previous month.

6. The date of installation and the location of each well or collection system expansion added pursuant to paragraph (6)(A)3., subsection (6)(B), and paragraph (6)(C)4.; and

(G) Each owner or operator seeking to comply with subparagraph (3)(B)2.A. shall include the following information with the initial performance test report required under 40 CFR part 60.8 (incorporated by reference):

1. A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;

2. The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;

3. The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

4. The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area;

5. The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover



equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and

6. The provisions for the control of off-site migration.

(9) Recordkeeping Requirements. Except as provided in part (3)(B)2.A.(II)—

(A) Each owner or operator of an MSW landfill subject to the provisions of subsection (3)(B) shall keep for at least five (5) years up-to-date, readily accessible, on-site records of the maximum design capacity, the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Records may be maintained off-site if they are retrievable within four (4) hours. A longer period is acceptable if records are needed for an unresolved enforcement action. Either paper copy or electronic formats are acceptable;

(B) Each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in paragraphs (9)(B)1. through 4. as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of five (5) years. Records of the control device vendor specifications shall be maintained until removal.

1. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with subparagraph (3)(B)2.B.—

A. The maximum expected gas generation flow rate as calculated in paragraph (6)(A)1. The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the director; and

B. The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in paragraph (10)(A)1.

2. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with subparagraph (3)(B)2.C. through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity greater than forty-four (44) megawatts—

A. The average combustion temperature measured at least every fifteen (15) minutes and averaged over the same time period of the performance test; and

B. The percent reduction of NMOC determined as specified in part (3)(B)2.C.(II) achieved by the control device.

3. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with subpart (3)(B)2.C.(II)(a) through use of a boiler or process heater of any size—a description of the location at which the collected gas vent

stream is introduced into the boiler or process heater over the same time period of the performance testing.

4. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with part (3)(B)2.C.(I) through use of an open flare, the flare type (that is, steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in 40 CFR part 60.18 (incorporated by reference); continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent;

(C) Each owner or operator of a controlled landfill subject to the provisions of this rule shall keep for five (5) years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in section (7) as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

1. The following constitute exceedances that shall be recorded and reported under subsection (8)(F):

A. For enclosed combustors except for boilers and process heaters with design heat input capacity of forty-four (44) megawatts (150 million British thermal units per hour) or greater, all three (3)-hour periods of operation during which the average combustion temperature was more than twenty-eight degrees Celsius (28°C) below the average combustion temperature during the most recent performance test at which compliance with subparagraph (3)(B)2.C. was determined; and

B. For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under subparagraph (9)(B)3.A.

2. Each owner or operator subject to the provisions of this rule shall keep up-to-date, readily accessible continuous records of the indication of flow to the control device or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under section (7).

3. Each owner or operator subject to the provisions of this rule who uses a boiler or process heater with a design heat input capacity of forty-four (44) megawatts or greater to comply with subparagraph (3)(B)2.C. shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records

could include records of steam use, fuel use, or monitoring data collected pursuant to other state or local regulatory requirements.)

4. Each owner or operator seeking to comply with the provisions of this rule by use of an open flare shall keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under subsection (7)(C), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent;

(D) Each owner or operator subject to the provisions of this rule shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.

1. Each owner or operator subject to the provisions of this rule shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under subsection (6)(B).

2. Each owner or operator subject to the provisions of this rule shall keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in subparagraph (10)(A)3.A. as well as any non-productive areas excluded from collection as provided in subparagraph (10)(A)3.B; and

(E) Each owner or operator subject to the provisions of this rule shall keep for at least five (5) years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in section (4), the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

(10) Specifications for Active Collection Systems.

(A) Each owner or operator seeking to comply with subparagraph (3)(B)2.A. shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the director as provided in part (3)(B)2.A.(III) and (IV):

1. The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end

use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat;

2. The sufficient density of gas collection devices determined in paragraph (10)(A)1. shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior; and

3. The placement of gas collection devices determined in paragraph (10)(A)1. shall control all gas producing areas, except as provided by subparagraphs (10)(A)3.A. and B.

A. Any segregated area of asbestos or nondegradable material may be excluded from collection if documentation is provided as specified under subsection (9)(D). The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the director upon request.

B. Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than one percent (1%) of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the director upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the following equation:

$$Q_i = 2 k L_o M_i (e^{-kt_i}) (C_{NMOC}) (3.6 \times 10^{-9})$$

- where,
- $Q_i$  = NMOC emission rate from the  $i^{th}$  section, megagrams per year
  - $k$  = methane generation rate constant, year<sup>-1</sup>
  - $L_o$  = methane generation potential, cubic meters per megagram solid waste
  - $M_i$  = mass of the degradable solid waste in the  $i^{th}$  section, megagram
  - $t_i$  = age of the solid waste in the  $i^{th}$  section, years
  - $C_{NMOC}$  = concentration of non-methane organic compounds, parts per million by volume
  - $3.6 \times 10^{-9}$  = conversion factor

The values for  $k$ ,  $L_o$ , and  $C_{NMOC}$  determined in field testing shall be used, if field testing has been performed in determining the NMOC emission rate or the radii of influence. If field testing has not been performed, the default values for  $k$ ,  $L_o$ , and  $C_{NMOC}$  provided in paragraph (5)(A)1. shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in subparagraph (10)(A)3.A.

(B) Each owner or operator seeking to comply with part (3)(B)2.A.(1) shall construct the gas collection devices using the following equipment or procedures:

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

2. Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

3. Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one (1) sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(C) Each owner or operator seeking to comply with part (3)(B)2.A.(1) shall convey the landfill gas to a control system in compli-

ance with subparagraph (3)(B)2.C. through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

1. For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (10)(C)2. shall be used; and

2. For new collection systems, the maximum flow rate shall be in accordance with paragraph (6)(A)1.

*AUTHORITY: section 643.050, RSMo (Cum. Supp. 1996). \* Original rule filed Jan. 14, 1997, effective Sept. 30, 1997.*

*\*Original authority 1965, amended 1972, 1992, 1993, 1995.*

**10 CSR 10-6.320 Sales Tax Exemption**

*PURPOSE: This rule sets forth the criteria used by the commission to determine eligibility for sales tax exemption for items purchased or leased for the purpose of preventing, abating or monitoring air pollution in accordance with section 144.030, RSMo.*

(1) Applicability.

(A) Machinery, equipment, appliances and devices purchased or leased and used solely for the purpose of preventing, abating or monitoring air pollution, and materials and supplies solely required for the installation, construction or reconstruction of such machinery, equipment, appliances and devices shall be eligible for sales tax exemption if so certified by the director.

(B) The applicant shall only request sales tax exemption for those machinery, equipment, appliances and devices for which sales tax would be charged.

(2) Definitions.

(A) Air pollution—The presence in the ambient air of one (1) or more air contaminants in quantities, or characteristics and of a duration which directly and proximately cause or contribute to injury to human, plant or animal life or health, or to property or which unreasonably interferes with the enjoyment of life or use of property.

(B) Definitions for other terms used in this rule may be found in 10 CSR 10-6.020(2).

(3) General Provisions.

(A) The following criteria shall be used to evaluate applications for sales tax exemption:

## APPENDIX B

Missouri Air Conservation Law, sections 643.010 - 643.070



## **MISSOURI AIR CONSERVATION LAW**

### **643.010 SHORT TITLE**

This chapter shall be known and may be cited as the "Missouri Air Conservation Law".

### **643.020 DEFINITIONS**

When used in this chapter and in standards, rules and regulations promulgated under authority of this chapter, the following words and phrases mean:

- (1) "AHERA", Asbestos Hazard Emergency Response Act of 1986 (P.L. 99-519);
- (2) "Abatement project designer", an individual who designs or plans AHERA asbestos abatement;
- (3) "Air cleaning device", any method, process, or equipment which removes, reduces, or renders less obnoxious air contaminants discharged into ambient air;
- (4) "Air contaminant", any particulate matter or any gas or vapor or any combination thereof;
- (5) "Air contaminant source", any and all sources of air contaminants whether privately or publicly owned or operated;
- (6) "Air pollution", the presence in the ambient air of one or more air contaminants in quantities, of characteristics and of a duration which directly and proximately cause or contribute to injury to human, plant, or animal life or health or to property or which unreasonably interferes with the enjoyment of life or use of property;
- (7) "Ambient air", all space outside of buildings, stacks, or exterior ducts;
- (8) "Area of the state", any geographical area designated by the commission;
- (9) "Asbestos", the asbestiform varieties of chrysotile, crocidolite, amosite, anthophyllite, tremolite and actinolite;
- (10) "Asbestos abatement", the encapsulation, enclosure or removal of asbestos containing materials in or from a building or air contaminant source, or preparation of friable asbestos containing material prior to demolition;
- (11) "Asbestos abatement contractor", any person who by agreement, contractual or otherwise, conducts asbestos abatement projects at a location other than his own place of business;
- (12) "Asbestos abatement projects", an activity undertaken to encapsulate, enclose or remove ten square feet or sixteen linear feet or more of friable asbestos containing materials from buildings and other air contaminant sources, or to demolish buildings and other air contaminant sources containing ten square feet or sixteen linear feet or more;
- (13) "Asbestos abatement supervisor", an individual who directs, controls, or supervises others in asbestos abatement projects;
- (14) "Asbestos abatement worker", an individual who engages in asbestos abatement projects;
- (15) "Asbestos air sampling professional", an individual who by qualifications and experience is proficient in asbestos abatement air monitoring. The individual shall conduct, oversee or be responsible for air monitoring of asbestos abatement projects before, during and after the project has been completed;

- (16) "Asbestos air sampling technician", an individual who has been trained by an air sampling professional to do air monitoring. Such individual conducts air monitoring of an asbestos abatement project before, during and after the project has been completed;
- (17) "Asbestos containing material", any material or product which contains more than one percent asbestos, by weight;
- (18) "Class A source", either a class A1, A2 or A3 source as defined in this section;
- (19) "Class A1 source", any air contaminant source with the potential to emit equal to or greater than one hundred tons per year of an air contaminant;
- (20) "Class A2 source", any air contaminant source, which is not a class A1 source, and with the potential, air cleaning devices not considered, to emit equal to or greater than one hundred tons per year of an air contaminant;
- (21) "Class A3 source", any air contaminant source which emits or has the potential to emit, ten tons per year or more of any hazardous air pollutant or twenty-five tons of any combination of hazardous air pollutants, or as defined pursuant to section 112 of the federal Clean Air Act, as amended, 42 U.S.C. 7412;
- (22) "Class B source", any air contaminant source with the potential, air cleaning devices not considered, to emit equal to or greater than the de minimis amounts of an air contaminant established by the commission, but not a class A source;
- (23) "Commission", the air conservation commission of the state of Missouri created in section 643.040;
- (24) "Competent person", as defined in the United States Occupational Safety and Health Administration's (OSHA) standard 29 CFR 1926.58 (b). Such person shall also be a certified asbestos abatement supervisor;
- (25) "Conference, conciliation and persuasion", a process of verbal or written communications consisting of meetings, reports, correspondence or telephone conferences between authorized representatives of the department and the alleged violator. The process shall, at a minimum, consist of one offer to meet with the alleged violator tendered by the department. During any such meeting, the department and the alleged violator shall negotiate in good faith to eliminate the alleged violation and shall attempt to agree upon a plan to achieve compliance;
- (26) "De minimis source", any air contaminant source with a potential to emit an air contaminant, air cleaning devices not considered, less than that established by the commission as de minimis for the air contaminant;
- (27) "Department", the department of natural resources of the state of Missouri;
- (28) "Director", the director of the department of natural resources;
- (29) "Emergency asbestos project", an asbestos project that must be undertaken immediately to prevent imminent, severe, human exposure or to restore essential facility operation;
- (30) "Emission", the discharge or release into the atmosphere of one or more air contaminants;
- (31) "Emission control regulations", limitations on the emission of air contaminants into the ambient air;
- (32) "Friable asbestos containing material", any asbestos containing material which is applied to ceilings, walls, structural members, piping, ductwork or any other part of a building or other air contaminant sources and which, when dry, may be

- crumbled, pulverized or reduced to powder by hand pressure;
- (33) "Inspector", an individual, under AHERA, who collects and assimilates information used to determine whether asbestos containing material is present in a building or other air contaminant sources;
  - (34) "Management planner", an individual, under AHERA, who devises and writes plans for asbestos abatement;
  - (35) "Minor violation", a violation which possesses a small potential to harm the environment or human health or cause pollution, was not knowingly committed, and is not defined by the United States Environmental Protection Agency as other than minor;
  - (36) "Nonattainment area", any area designated by the governor as a "nonattainment area" as defined in the federal Clean Air Act, as amended, 42 U.S.C. 7501;
  - (37) "Person", any individual, partnership, copartnership, firm, company, or public or private corporation, association, joint stock company, trust, estate, political subdivision, or any agency, board, department, or bureau of the state or federal government, or any other legal entity whatever which is recognized by law as the subject of rights and duties;
  - (38) "Small business", for the purpose of sections 643.010 to 643.190, a small business shall include any business regulated under this chapter, which is not a class A source and which employs less than one hundred people and emits less than fifty tons of any regulated pollutant per year and less than seventy-five tons of all regulated pollutants or as otherwise defined by the commission by rule.

#### **643.030 INTENT OF LAW - COMMISSION TO CONTROL AIR POLLUTION**

The discharge into the ambient air of air contaminants so as to cause or contribute to air pollution is contrary to the public policy of Missouri and in violation of this chapter. It is the intent and purpose of this chapter to maintain purity of the air resources of the state to protect the health, general welfare and physical property of the people, maximum employment and the full industrial development of the state. The commission shall seek the accomplishment of this objective through the prevention, abatement and control of air pollution by all practical and economically feasible methods.

#### **643.040 CREATION OF COMMISSION**

1. There is created hereby an air pollution control agency to be known as the "Air Conservation Commission of the State of Missouri", whose domicile for the purposes of sections 643.010 to 643.190 is the department of natural resources of the state of Missouri. The commission shall consist of seven members appointed by the governor, with the advice and consent of the senate. No more than four of the members shall belong to the same political party and no two members shall be a resident of and domiciled in the same senatorial district. At the first meeting of the commission and at yearly intervals thereafter, the members shall select from among themselves a chairman and a vice chairman.
2. All members shall be representative of the general interest of the public and shall have an interest in and knowledge of air conservation and the effects and control of air

contaminants. Three of such members, but not more than three, shall represent agricultural, industrial and labor interests, respectively. The governor shall not appoint any other person who has a substantial interest as defined in section 105.450, RSMo, in any business entity regulated under this chapter or any business entity which would be regulated under this chapter if located in Missouri. The commission shall establish rules of procedure which specify when members shall exempt themselves from participating in discussions and from voting on issues before the commission due to potential conflict of interest.

3. The members' terms of office shall be four years and until their successors are selected and qualified, except that the terms of those first appointed shall be staggered to expire at intervals of one, two and three years after the date of appointment as designated by the governor at the time of appointment. There is no limitation of the number of terms any appointed member may serve. If a vacancy occurs the governor may appoint a member for the remaining portion of the unexpired term created by the vacancy. The governor may remove any appointed member for cause. The members of the commission shall be reimbursed for travel and other expenses actually and necessarily incurred in the performance of their duties.
4. The commission shall hold at least nine regular meetings each year and such additional regular meetings as the chairman deems desirable at a place and time to be fixed by the chairman. Special meetings may be called by three members of the commission upon delivery of written notice to each member of the commission. Reasonable written notice of all meetings shall be given to all members of the commission. Four members of the commission shall constitute a quorum. All powers and duties conferred upon members of the commission shall be exercised personally by the members and not by alternates or representatives. All actions of the commission shall be taken at meetings open to the public, except as provided in chapter 610, RSMo. Any member absent from four regular commission meetings per calendar year for any cause whatsoever shall be deemed to have resigned and the vacancy shall be filled immediately in accordance with subsection 1 and subsection 3 of this section.

#### **643.050 POWERS AND DUTIES OF COMMISSION - RULES, PROCEDURE**

1. In addition to any other powers vested in it by law the commission shall have the following powers:
  - (1) Adopt, promulgate, amend and repeal rules and regulations consistent with the general intent and purposes of sections 643.010 to 643.190, chapter 536, RSMo, and Titles V and VI of the federal Clean Air Act, as amended, 42 U.S.C. 7661, et seq., including but not limited to:
    - (a) Regulation of use of equipment known to be a source of air contamination;
    - (b) Establishment of maximum quantities of air contaminants that may be emitted from any air contaminant source; and
    - (c) Regulations necessary to enforce the provisions of Title VI of the Clean Air Act, as amended, 42 U.S.C. 7671, et seq., regarding any Class I or Class II substances as defined therein;
  - (2) After holding public hearings in accordance with section 643.070, establish areas of the state and prescribe air quality standards for such areas giving due

- recognition to variations, if any, in the characteristics of different areas of the state which may be deemed by the commission to be relevant;
- (3) (a) To require persons engaged in operations which result in air pollution to monitor or test emissions and to file reports containing information relating to rate, period of emission and composition of effluent;  
(b) Require submission to the director for approval of plans and specifications for any article, machine, equipment, device, or other contrivance specified by regulation the use of which may cause or control the issuance of air contaminants; but any person responsible for complying with the standards established under sections 643.010 to 643.190 shall determine, unless found by the director to be inadequate, the means, methods, processes, equipment and operation to meet the established standards;
  - (4) Hold hearings upon appeals from orders of the director or from any other actions or determinations of the director hereunder for which provision is made for appeal, and in connection therewith, issue subpoenas requiring the attendance of witnesses and the production of evidence reasonably relating to the hearing;
  - (5) Enter such order or determination as may be necessary to effectuate the purposes of sections 643.010 to 643.190. In making its orders and determinations hereunder, the commission shall exercise a sound discretion in weighing the equities involved and the advantages and disadvantages to the person involved and to those affected by air contaminants emitted by such person as set out in section 643.030. If any small business, as defined by section 643.020, requests information on what would constitute compliance with the requirements of sections 643.010 to 643.190 or any order or determination of the department or commission, the department shall respond with written criteria to inform the small business of the actions necessary for compliance. No enforcement action shall be undertaken by the department or commission until the small business has had a period of time, negotiated with the department, to achieve compliance;
  - (6) Cause to be instituted in a court of competent jurisdiction legal proceedings to compel compliance with any final order or determination entered by the commission or the director;
  - (7) Settle or compromise in its discretion, as it may deem advantageous to the state, any suit for recovery of any penalty or for compelling compliance with the provisions of any rule;
  - (8) Develop such facts and make such investigations as are consistent with the purposes of sections 643.010 to 643.190, and, in connection therewith, to enter or authorize any representative of the department to enter at all reasonable times and upon reasonable notice in or upon any private or public property for the purpose of inspecting or investigating any condition which the commission or director shall have probable cause to believe to be an air contaminant source. The results of any such investigation shall be reduced to writing, and a copy thereof shall be furnished to the owner or operator of the property. No person shall refuse entry or access, requested for purposes of inspection under this provision, to an authorized representative of the department who presents appropriate credentials, nor obstruct or hamper the representative in carrying out the inspection. A suitably restricted search warrant, upon a showing of probable cause in writing and upon

- oath, shall be issued by any judge having jurisdiction to any such representative for the purpose of enabling him to make such inspection;
- (9) Secure necessary scientific, technical, administrative and operational services, including laboratory facilities, by contract or otherwise, with any educational institution, experiment station, or any board, department, or other agency of any political subdivision or state or the federal government;
  - (10) Classify and identify air contaminants; and
  - (11) Hold public hearings as required by sections 643.010 to 643.190.
2. No rule or portion of a rule promulgated under the authority of this chapter shall become effective unless it has been promulgated pursuant to the provisions of section 536.024, RSMo.
  3. The commission shall have the following duties with respect to the prevention, abatement and control of air pollution:
    - (1) Prepare and develop a general comprehensive plan for the prevention, abatement and control of air pollution;
    - (2) Encourage voluntary cooperation by persons or affected groups to achieve the purposes of sections 643.010 to 643.190;
    - (3) Encourage political subdivisions to handle air pollution problems within their respective jurisdictions to the extent possible and practicable and provide assistance to political subdivisions;
    - (4) Encourage and conduct studies, investigations and research;
    - (5) Collect and disseminate information and conduct education and training programs;
    - (6) Advise, consult and cooperate with other agencies of the state, political subdivisions, industries, other states and the federal government, and with interested persons or groups;
    - (7) Represent the state of Missouri in all matters pertaining to interstate air pollution including the negotiations of interstate compacts or agreements.
  4. Nothing contained in sections 643.010 to 643.190 shall be deemed to grant to the commission or department any jurisdiction or authority with respect to air pollution existing solely within commercial and industrial plants, works, or shops or to affect any aspect of employer-employee relationships as to health and safety hazards.
  5. Any information relating to secret processes or methods of manufacture or production discovered through any communication required under this section shall be kept confidential.

**643.055 COMMISSION MAY ADOPT RULES FOR COMPLIANCE WITH FEDERAL LAW - SUSPENSION, REINSTATEMENT - EXEMPTION, LIMITATIONS**

1. Other provisions of law notwithstanding, the Missouri air conservation commission shall have the authority to promulgate rules and regulations, pursuant to chapter 536, RSMo, to establish standards and guidelines to ensure that the state of Missouri is in compliance with the provisions of the federal Clean Air Act, as amended (42 U.S.C. Section 7401, et seq.). The standards and guidelines so established shall not be any stricter than those required under the provisions of the federal Clean Air Act, as amended; nor shall those standards and guidelines be enforced in any area of the state prior to the time required by the federal Clean Air Act, as amended. The restrictions of this section shall not apply to

the parts of a state implementation plan developed by the commission to bring a nonattainment area into compliance and to maintain compliance when needed to have a United States Environmental Protection Agency approved state implementation plan. The determination of which parts of a state implementation plan are not subject to the restrictions of this section shall be based upon specific findings of fact by the air conservation commission as to the rules, regulations and criteria that are needed to have a United States Environmental Protection Agency approved plan.

2. The Missouri air conservation commission shall also have the authority to grant exceptions and variances from the rules set under subsection 1 of this section when the person applying for the exception or variance can show that compliance with such rules:
  - (1) Would cause economic hardship; or
  - (2) Is physically impossible; or
  - (3) Is more detrimental to the environment than the variance would be; or
  - (4) Is impractical or of insignificant value under the existing conditions.

#### **643.060 POWERS AND DUTIES OF DIRECTOR**

In addition to any other powers vested by law, the director shall have the following powers and duties:

- (1) Retain, employ, provide for, and compensate, within appropriations available therefor, such consultants, assistants, deputies, clerks, and other employees on a full- or part-time basis as may be necessary to carry out the provisions of sections 643.010 to 643.190 and prescribe the times at which they shall be appointed and their powers and duties;
- (2) Accept, receive and administer grants or other funds or gifts from public and private agencies including the federal government for the purpose of carrying out any of the functions of sections 643.010 to 643.190. The director shall apply for all available grants and funds authorized and distributed pursuant to Title XI of the federal Clean Air Act, as amended, 29 U.S.C. 1662e, for training, assistance and payments to eligible individuals. The director shall report annually to the governor and the general assembly, the amount of revenue received under Title XI of the Clean Air Act and the distribution of such funds to eligible persons. Funds received by the director pursuant to this section shall be deposited with the state treasurer and held and disbursed by him in accordance with the appropriations of the general assembly. The director is authorized to enter into contracts as he may deem necessary for carrying out the provisions of sections 643.010 to 643.190;
- (3) Budget and receive duly appropriated moneys for expenditures to carry out the provisions and purposes of sections 643.010 to 643.190;
- (4) Administer and enforce sections 643.010 to 643.190, investigate complaints, issue orders and take all actions necessary to implement sections 643.010 to 643.190;
- (5) Receive and act upon reports, plans, specifications and applications submitted under rules promulgated by the commission. Any person aggrieved by any action of the director under this provision shall be entitled to a hearing before the commission as provided in section 643.080. The commission may sustain, reverse, or modify any action of the director taken under this provision, or make such other order as the commission shall deem appropriate under the circumstances.

### **643.070 COMMISSION TO ADOPT RULES, NOTICE - PUBLIC HEARING**

1. The commission shall adopt rules pursuant to chapter 536, RSMo. The commission shall notify any air pollution control agency with a certificate of authority which may be affected by the rule and any person who has previously requested notice when the proposed rulemaking is submitted to the secretary of state for publication in the Missouri Register. In addition, any interested persons, whether or not heard, may submit, within seven days subsequent to the hearings, a written statement of their views. The commission may solicit the views, in writing, of persons who may be affected by, or interested in, proposed rules and regulations, or standards. Any person heard or represented at the hearing or making written request for notice shall be given written notice of the action of the commission with respect to the subject thereof.
2. Rules shall be approved after public hearing and shall be approved in writing by at least four members of the commission.
3. Any rule or any amendment or repeal thereof which is adopted by the commission may differ in its terms and provisions for particular types and conditions of air pollution or air contamination, for particular air contaminant sources, and for particular areas of the state.

### **643.073 PERMITS**

1. The commission shall establish, by rule, a procedure for the orderly submission of applications for an operating permit by those regulated air contaminant sources in operation on August 28, 1992, and procedures for the issuance of operating permits. Any person who operates an air contaminant source on or after August 28, 1992, shall submit to the department, with the application, payment of a one hundred-dollar fee with the request for the approval of an operating permit.
2. Any person who wishes to construct or modify and operate any regulated air contaminant source shall submit an application to the department. The commission shall establish, by rule, procedures for the orderly submission of applications for those persons that wish to construct or modify and operate any regulated air contaminant source and procedures for the issuance of a permit to construct or modify and operate. The department shall review applications within the time period established in sections 643.075 and 643.078 or under section 502 of the federal Clean Air Act, as amended, 42 U.S.C. 7661, as appropriate, unless an extension is requested by the applicant and approved by the director. Each applicant must obtain both a construction permit and an operating permit but the department shall establish a unified review, hearing and approval process. The holder of a valid operating permit shall have operational flexibility to make changes to any air contaminant source under the provisions of subsection 14 of section 643.078 without submitting an application for an operating permit under this section.

### **643.075 CONSTRUCTION PERMITS**

1. It shall be unlawful for any person to commence construction of any air contaminant source in this state, without a permit therefor, if such source is of a class fixed by regulation of the commission which requires a permit therefor.
2. Every source required to obtain a construction permit shall make application therefor to

## APPENDIX C

### Closure status of sanitary landfills (SLFs) in Missouri



# Closure Status of SLFs in Missouri

(Landfills That Ceased Accepting Waste After Oct. 9, 1991 And Before April 9, 1994)

## Landfills That Have Received Final Closure Approval (Officially Closed)

1. Atchison County (Atchison)
2. Ava (Douglas)
3. Brown (Macon)
4. City of Cape Girardeau (Cape Girardeau)
5. City of Fredericktown (Madison)
6. City of West Plains (Howell)
7. Crawford County (Crawford)
8. Edward Mehl (Camden)
9. Fort Leonard Wood (Pulaski)
10. Jackson, City of (Cape Girardeau)
11. Johnson County (Johnson)
12. Gasconade-Morrison (Gasconade)
13. Herman (Gasconade)
14. Lemons (Stoddard)
15. Marshall, City of (Saline)
16. Montgomery City (Montgomery)
17. National Refractories (Audrain)
18. Nevada (Vernon)
19. New Halls Ferry (St. Louis)
20. New Madrid County (New Madrid)
21. Newton-McDonald (Newton)
22. Perry County (Perry)
23. Salem, City of (Dent)
24. Savannah, City of (Andrew)
25. St. Francois County (St. Francois)
26. St. Jude Industrial Park (New Madrid)
27. T & C Disposal (Lawrence)
28. Viturnum, City of (Iron)
29. Washington County (Washington)
30. Washington SW Municipal (Franklin)
31. Wayne County (Wayne)
32. Willow Springs (Howell)

## Inspected But Not Receiving Approval Reinspection Being Scheduled

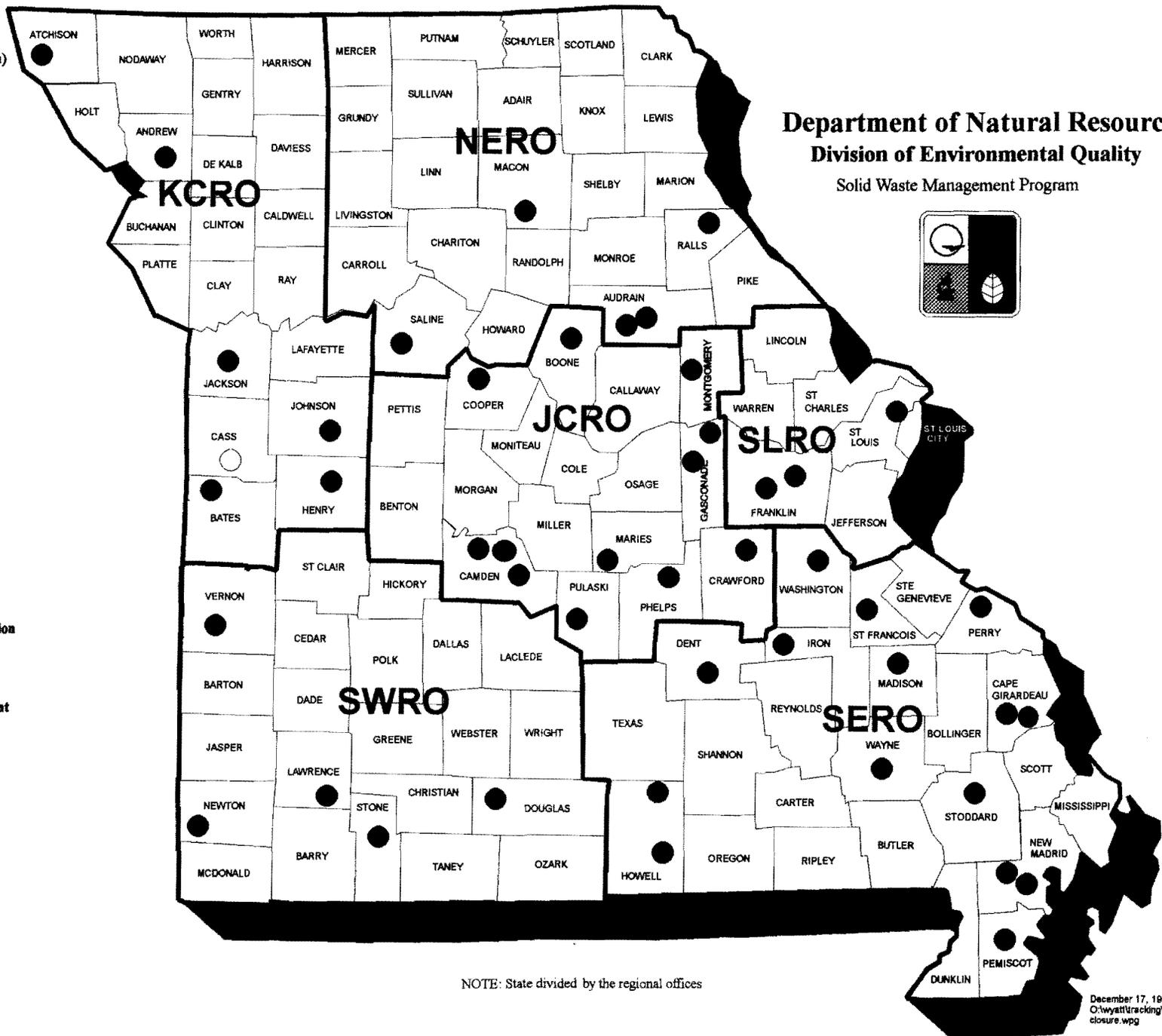
1. Boonville (Cooper)

## Landfills Still Completing Closure Documentation

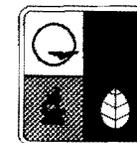
1. A & M Quarry (Cass)

## Landfill Closure Being Handled By Enforcement

1. Centralia (Boone)
2. Generally Hauling (Franklin)
3. Hannibal (Ralls)
4. Henry County (Henry)
5. Mexico (Audrain)
6. Modern Sanitation (Camden)
7. Northwest LF Inc. (Camden)
8. Pemiscot County (Pemiscot)
9. Phelps County (Phelps)
10. Renfro (Stone)
11. Wat-Park (Maries)
12. Welston (Bates)



Department of Natural Resources  
Division of Environmental Quality  
Solid Waste Management Program



NOTE: State divided by the regional offices



## APPENDIX D

NMOC emission modeling reports



=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1976      Current Year : 1994      Year Closed: 1995  
 Capacity : 282895 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 864.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1977	1.933E+04	3.297E-01	9.199E+01
1978	3.865E+04	6.466E-01	1.804E+02
1979	5.798E+04	9.509E-01	2.653E+02
1980	7.730E+04	1.243E+00	3.469E+02
1981	9.663E+04	1.524E+00	4.253E+02
1982	1.160E+05	1.794E+00	5.006E+02
1983	1.353E+05	2.054E+00	5.730E+02
1984	1.546E+05	2.303E+00	6.425E+02
1985	1.739E+05	2.542E+00	7.093E+02
1986	1.933E+05	2.772E+00	7.735E+02
1987	2.126E+05	2.993E+00	8.351E+02
1988	2.319E+05	3.206E+00	8.944E+02
1989	2.512E+05	3.410E+00	9.513E+02
1990	2.706E+05	3.606E+00	1.006E+03
1991	2.750E+05	3.541E+00	9.877E+02
1992	2.786E+05	3.463E+00	9.662E+02
1993	2.820E+05	3.385E+00	9.445E+02
1994	2.829E+05	3.267E+00	9.116E+02
1995	2.829E+05	3.139E+00	8.758E+02
1996	2.829E+05	3.016E+00	8.415E+02
1997	2.829E+05	2.898E+00	8.085E+02
1998	2.829E+05	2.784E+00	7.768E+02
1999	2.829E+05	2.675E+00	7.463E+02
2000	2.829E+05	2.570E+00	7.171E+02
2001	2.829E+05	2.470E+00	6.890E+02
2002	2.829E+05	2.373E+00	6.619E+02
2003	2.829E+05	2.280E+00	6.360E+02
2004	2.829E+05	2.190E+00	6.111E+02

```

=====
Model Parameters
=====

```

```

Lo : 100.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0400 1/yr ***** User Mode Selection *****
NMOC : 595.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume

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Landfill Parameters
=====

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```

Year Opened : 1977   Current Year : 1992   Year Closed: 1993
Capacity : 162390 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 6124.30 Mg/year

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Model Results
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Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	1.135E+04	1.937E-01	5.403E+01
1979	2.270E+04	3.797E-01	1.059E+02
1980	3.405E+04	5.585E-01	1.558E+02
1981	4.540E+04	7.303E-01	2.037E+02
1982	5.676E+04	8.953E-01	2.498E+02
1983	6.811E+04	1.054E+00	2.940E+02
1984	7.946E+04	1.206E+00	3.365E+02
1985	9.081E+04	1.353E+00	3.774E+02
1986	1.022E+05	1.493E+00	4.166E+02
1987	1.135E+05	1.628E+00	4.543E+02
1988	1.249E+05	1.758E+00	4.905E+02
1989	1.362E+05	1.883E+00	5.253E+02
1990	1.476E+05	2.003E+00	5.587E+02
1991	1.563E+05	2.073E+00	5.782E+02
1992	1.624E+05	2.096E+00	5.847E+02
1993	1.624E+05	2.014E+00	5.618E+02
1994	1.624E+05	1.935E+00	5.398E+02
1995	1.624E+05	1.859E+00	5.186E+02
1996	1.624E+05	1.786E+00	4.983E+02
1997	1.624E+05	1.716E+00	4.787E+02
1998	1.624E+05	1.649E+00	4.600E+02
1999	1.624E+05	1.584E+00	4.419E+02
2000	1.624E+05	1.522E+00	4.246E+02
2001	1.624E+05	1.462E+00	4.080E+02
2002	1.624E+05	1.405E+00	3.920E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1994      Year Closed: 1994  
 Capacity : 261565 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	1.288E+04	2.197E-01	6.130E+01
1976	2.576E+04	4.309E-01	1.202E+02
1977	3.864E+04	6.337E-01	1.768E+02
1978	5.152E+04	8.286E-01	2.312E+02
1979	6.440E+04	1.016E+00	2.834E+02
1980	7.727E+04	1.196E+00	3.336E+02
1981	9.015E+04	1.369E+00	3.818E+02
1982	1.030E+05	1.535E+00	4.282E+02
1983	1.159E+05	1.694E+00	4.727E+02
1984	1.288E+05	1.848E+00	5.154E+02
1985	1.417E+05	1.995E+00	5.565E+02
1986	1.545E+05	2.136E+00	5.960E+02
1987	1.674E+05	2.272E+00	6.339E+02
1988	1.803E+05	2.403E+00	6.704E+02
1989	1.932E+05	2.529E+00	7.054E+02
1990	2.061E+05	2.649E+00	7.391E+02
1991	2.277E+05	2.914E+00	8.131E+02
1992	2.446E+05	3.088E+00	8.615E+02
1993	2.616E+05	3.257E+00	9.085E+02
1994	2.616E+05	3.129E+00	8.730E+02
1995	2.616E+05	3.006E+00	8.387E+02
1996	2.616E+05	2.889E+00	8.059E+02
1997	2.616E+05	2.775E+00	7.743E+02
1998	2.616E+05	2.666E+00	7.439E+02
1999	2.616E+05	2.562E+00	7.147E+02
2000	2.616E+05	2.461E+00	6.867E+02
2001	2.616E+05	2.365E+00	6.598E+02
2002	2.616E+05	2.272E+00	6.339E+02
2003	2.616E+05	2.183E+00	6.091E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1988      Year Closed: 1988  
 Capacity : 230461 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	0.000E+00	0.000E+00	0.000E+00
1976	1.774E+04	3.027E-01	8.444E+01
1977	3.548E+04	5.935E-01	1.656E+02
1978	5.322E+04	8.729E-01	2.435E+02
1979	7.096E+04	1.141E+00	3.184E+02
1980	8.870E+04	1.399E+00	3.904E+02
1981	1.064E+05	1.647E+00	4.595E+02
1982	1.242E+05	1.885E+00	5.259E+02
1983	1.419E+05	2.114E+00	5.898E+02
1984	1.597E+05	2.334E+00	6.511E+02
1985	1.774E+05	2.545E+00	7.100E+02
1986	1.951E+05	2.748E+00	7.666E+02
1987	2.129E+05	2.943E+00	8.210E+02
1988	2.305E+05	3.127E+00	8.725E+02
1989	2.305E+05	3.005E+00	8.383E+02
1990	2.305E+05	2.887E+00	8.054E+02
1991	2.305E+05	2.774E+00	7.738E+02
1992	2.305E+05	2.665E+00	7.435E+02
1993	2.305E+05	2.560E+00	7.143E+02
1994	2.305E+05	2.460E+00	6.863E+02
1995	2.305E+05	2.364E+00	6.594E+02
1996	2.305E+05	2.271E+00	6.335E+02
1997	2.305E+05	2.182E+00	6.087E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1982      Current Year : 1995      Year Closed: 1996  
 Capacity : 47069 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 3620.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1983	3.620E+03	6.176E-02	1.723E+01
1984	7.240E+03	1.211E-01	3.379E+01
1985	1.086E+04	1.781E-01	4.969E+01
1986	1.448E+04	2.329E-01	6.498E+01
1987	1.810E+04	2.855E-01	7.966E+01
1988	2.172E+04	3.361E-01	9.377E+01
1989	2.534E+04	3.847E-01	1.073E+02
1990	2.896E+04	4.314E-01	1.203E+02
1991	3.258E+04	4.762E-01	1.329E+02
1992	3.620E+04	5.193E-01	1.449E+02
1993	3.982E+04	5.607E-01	1.564E+02
1994	4.344E+04	6.005E-01	1.675E+02
1995	4.706E+04	6.387E-01	1.782E+02
1996	4.707E+04	6.138E-01	1.712E+02
1997	4.707E+04	5.898E-01	1.645E+02
1998	4.707E+04	5.666E-01	1.581E+02
1999	4.707E+04	5.444E-01	1.519E+02
2000	4.707E+04	5.231E-01	1.459E+02
2001	4.707E+04	5.026E-01	1.402E+02
2002	4.707E+04	4.828E-01	1.347E+02
2003	4.707E+04	4.639E-01	1.294E+02
2004	4.707E+04	4.457E-01	1.243E+02
2005	4.707E+04	4.282E-01	1.195E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1979      Current Year : 1986      Year Closed: 1986  
 Capacity : 54915 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1980	7.845E+03	1.339E-01	3.734E+01
1981	1.569E+04	2.625E-01	7.322E+01
1982	2.354E+04	3.860E-01	1.077E+02
1983	3.138E+04	5.047E-01	1.408E+02
1984	3.922E+04	6.188E-01	1.726E+02
1985	4.707E+04	7.284E-01	2.032E+02
1986	5.492E+04	8.337E-01	2.326E+02
1987	5.492E+04	8.010E-01	2.235E+02
1988	5.492E+04	7.696E-01	2.147E+02
1989	5.492E+04	7.394E-01	2.063E+02
1990	5.492E+04	7.104E-01	1.982E+02
1991	5.492E+04	6.826E-01	1.904E+02
1992	5.492E+04	6.558E-01	1.830E+02
1993	5.492E+04	6.301E-01	1.758E+02
1994	5.492E+04	6.054E-01	1.689E+02
1995	5.492E+04	5.816E-01	1.623E+02
1996	5.492E+04	5.588E-01	1.559E+02
1997	5.492E+04	5.369E-01	1.498E+02
1998	5.492E+04	5.159E-01	1.439E+02
1999	5.492E+04	4.956E-01	1.383E+02
2000	5.492E+04	4.762E-01	1.329E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1976      Current Year : 1994      Year Closed: 1994  
 Capacity : 1027436 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1977	7.230E+04	1.234E+00	3.441E+02
1978	1.446E+05	2.419E+00	6.748E+02
1979	2.169E+05	3.557E+00	9.925E+02
1980	2.892E+05	4.652E+00	1.298E+03
1981	3.615E+05	5.703E+00	1.591E+03
1982	4.338E+05	6.713E+00	1.873E+03
1983	5.061E+05	7.683E+00	2.143E+03
1984	5.784E+05	8.615E+00	2.404E+03
1985	6.507E+05	9.511E+00	2.653E+03
1986	7.230E+05	1.037E+01	2.893E+03
1987	7.953E+05	1.120E+01	3.124E+03
1988	8.676E+05	1.199E+01	3.346E+03
1989	9.399E+05	1.276E+01	3.559E+03
1990	1.012E+06	1.349E+01	3.763E+03
1991	1.014E+06	1.299E+01	3.625E+03
1992	1.015E+06	1.250E+01	3.488E+03
1993	1.027E+06	1.222E+01	3.410E+03
1994	1.027E+06	1.174E+01	3.276E+03
1995	1.027E+06	1.128E+01	3.147E+03
1996	1.027E+06	1.084E+01	3.024E+03
1997	1.027E+06	1.041E+01	2.905E+03
1998	1.027E+06	1.001E+01	2.791E+03
1999	1.027E+06	9.614E+00	2.682E+03
2000	1.027E+06	9.237E+00	2.577E+03
2001	1.027E+06	8.875E+00	2.476E+03
2002	1.027E+06	8.527E+00	2.379E+03
2003	1.027E+06	8.192E+00	2.285E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1995      Year Closed: 1995  
 Capacity : 118000 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	5.611E+03	9.574E-02	2.671E+01
1976	1.122E+04	1.877E-01	5.237E+01
1977	1.683E+04	2.761E-01	7.702E+01
1978	2.244E+04	3.610E-01	1.007E+02
1979	2.806E+04	4.426E-01	1.235E+02
1980	3.367E+04	5.210E-01	1.453E+02
1981	3.928E+04	5.963E-01	1.663E+02
1982	4.489E+04	6.686E-01	1.865E+02
1983	5.050E+04	7.381E-01	2.059E+02
1984	5.611E+04	8.049E-01	2.246E+02
1985	6.172E+04	8.691E-01	2.425E+02
1986	6.733E+04	9.308E-01	2.597E+02
1987	7.294E+04	9.900E-01	2.762E+02
1988	7.855E+04	1.047E+00	2.921E+02
1989	8.416E+04	1.102E+00	3.073E+02
1990	8.978E+04	1.154E+00	3.220E+02
1991	9.824E+04	1.253E+00	3.496E+02
1992	1.052E+05	1.323E+00	3.691E+02
1993	1.123E+05	1.393E+00	3.885E+02
1994	1.180E+05	1.435E+00	4.003E+02
1995	1.180E+05	1.379E+00	3.846E+02
1996	1.180E+05	1.325E+00	3.695E+02
1997	1.180E+05	1.273E+00	3.550E+02
1998	1.180E+05	1.223E+00	3.411E+02
1999	1.180E+05	1.175E+00	3.277E+02
2000	1.180E+05	1.129E+00	3.149E+02
2001	1.180E+05	1.084E+00	3.025E+02
2002	1.180E+05	1.042E+00	2.907E+02
2003	1.180E+05	1.001E+00	2.793E+02
2004	1.180E+05	9.618E-01	2.683E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1976      Current Year : 1993      Year Closed: 1993  
 Capacity : 109045 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1977	6.891E+03	1.176E-01	3.280E+01
1978	1.378E+04	2.305E-01	6.432E+01
1979	2.067E+04	3.391E-01	9.460E+01
1980	2.756E+04	4.434E-01	1.237E+02
1981	3.446E+04	5.435E-01	1.516E+02
1982	4.135E+04	6.398E-01	1.785E+02
1983	4.824E+04	7.323E-01	2.043E+02
1984	5.513E+04	8.212E-01	2.291E+02
1985	6.202E+04	9.065E-01	2.529E+02
1986	6.891E+04	9.886E-01	2.758E+02
1987	7.580E+04	1.067E+00	2.978E+02
1988	8.269E+04	1.143E+00	3.189E+02
1989	8.958E+04	1.216E+00	3.392E+02
1990	9.647E+04	1.286E+00	3.587E+02
1991	1.024E+05	1.337E+00	3.729E+02
1992	1.090E+05	1.397E+00	3.898E+02
1993	1.090E+05	1.343E+00	3.746E+02
1994	1.090E+05	1.290E+00	3.599E+02
1995	1.090E+05	1.239E+00	3.458E+02
1996	1.090E+05	1.191E+00	3.322E+02
1997	1.090E+05	1.144E+00	3.192E+02
1998	1.090E+05	1.099E+00	3.067E+02
1999	1.090E+05	1.056E+00	2.946E+02
2000	1.090E+05	1.015E+00	2.831E+02
2001	1.090E+05	9.749E-01	2.720E+02
2002	1.090E+05	9.367E-01	2.613E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1982      Current Year : 1989      Year Closed: 1989  
 Capacity : 57344 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1983	8.192E+03	1.398E-01	3.899E+01
1984	1.638E+04	2.741E-01	7.646E+01
1985	2.458E+04	4.031E-01	1.125E+02
1986	3.277E+04	5.271E-01	1.470E+02
1987	4.096E+04	6.462E-01	1.803E+02
1988	4.915E+04	7.606E-01	2.122E+02
1989	5.734E+04	8.705E-01	2.429E+02
1990	5.734E+04	8.364E-01	2.333E+02
1991	5.734E+04	8.036E-01	2.242E+02
1992	5.734E+04	7.721E-01	2.154E+02
1993	5.734E+04	7.418E-01	2.070E+02
1994	5.734E+04	7.127E-01	1.988E+02
1995	5.734E+04	6.848E-01	1.910E+02
1996	5.734E+04	6.579E-01	1.836E+02
1997	5.734E+04	6.321E-01	1.764E+02
1998	5.734E+04	6.074E-01	1.694E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1979      Current Year : 1991      Year Closed: 1992  
 Capacity : 6955 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 579.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1980	5.790E+02	9.879E-03	2.756E+00
1981	1.158E+03	1.937E-02	5.404E+00
1982	1.737E+03	2.849E-02	7.948E+00
1983	2.316E+03	3.725E-02	1.039E+01
1984	2.895E+03	4.567E-02	1.274E+01
1985	3.474E+03	5.376E-02	1.500E+01
1986	4.053E+03	6.153E-02	1.717E+01
1987	4.632E+03	6.900E-02	1.925E+01
1988	5.211E+03	7.617E-02	2.125E+01
1989	5.790E+03	8.306E-02	2.317E+01
1990	6.369E+03	8.968E-02	2.502E+01
1991	6.948E+03	9.605E-02	2.680E+01
1992	6.955E+03	9.240E-02	2.578E+01
1993	6.955E+03	8.878E-02	2.477E+01
1994	6.955E+03	8.530E-02	2.380E+01
1995	6.955E+03	8.195E-02	2.286E+01
1996	6.955E+03	7.874E-02	2.197E+01
1997	6.955E+03	7.565E-02	2.110E+01
1998	6.955E+03	7.268E-02	2.028E+01
1999	6.955E+03	6.983E-02	1.948E+01
2000	6.955E+03	6.710E-02	1.872E+01
2001	6.955E+03	6.446E-02	1.798E+01

```

=====
Model Parameters
=====

```

```

Lo : 100.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0400 1/yr ***** User Mode Selection *****
NMOC : 595.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume

```

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=====
Landfill Parameters
=====

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```

Year Opened : 1984   Current Year : 1995   Year Closed: 1995
Capacity : 315366 Mg
Average Acceptance Rate Required from
Current Year to Closure Year : 0.00 Mg/year

```

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=====
Model Results
=====

```

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1985	3.596E+04	6.135E-01	1.712E+02
1986	7.191E+04	1.203E+00	3.356E+02
1987	1.079E+05	1.769E+00	4.936E+02
1988	1.438E+05	2.313E+00	6.454E+02
1989	1.798E+05	2.836E+00	7.912E+02
1990	2.157E+05	3.338E+00	9.314E+02
1991	2.517E+05	3.821E+00	1.066E+03
1992	2.877E+05	4.285E+00	1.195E+03
1993	2.917E+05	4.185E+00	1.168E+03
1994	3.154E+05	4.425E+00	1.235E+03
1995	3.154E+05	4.252E+00	1.186E+03
1996	3.154E+05	4.085E+00	1.140E+03
1997	3.154E+05	3.925E+00	1.095E+03
1998	3.154E+05	3.771E+00	1.052E+03
1999	3.154E+05	3.623E+00	1.011E+03
2000	3.154E+05	3.481E+00	9.712E+02
2001	3.154E+05	3.345E+00	9.331E+02
2002	3.154E+05	3.214E+00	8.965E+02
2003	3.154E+05	3.088E+00	8.614E+02
2004	3.154E+05	2.966E+00	8.276E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1998      Year Closed: 2008  
 Capacity : 757677 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 4186.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	2.115E+04	3.608E-01	1.007E+02
1977	4.230E+04	7.075E-01	1.974E+02
1978	6.344E+04	1.041E+00	2.903E+02
1979	8.459E+04	1.361E+00	3.796E+02
1980	1.057E+05	1.668E+00	4.654E+02
1981	1.269E+05	1.964E+00	5.478E+02
1982	1.480E+05	2.247E+00	6.270E+02
1983	1.692E+05	2.520E+00	7.031E+02
1984	1.903E+05	2.782E+00	7.761E+02
1985	2.115E+05	3.034E+00	8.464E+02
1986	2.326E+05	3.276E+00	9.139E+02
1987	2.538E+05	3.508E+00	9.787E+02
1988	2.749E+05	3.731E+00	1.041E+03
1989	2.961E+05	3.946E+00	1.101E+03
1990	3.172E+05	4.152E+00	1.158E+03
1991	3.383E+05	4.349E+00	1.213E+03
1992	3.619E+05	4.581E+00	1.278E+03
1993	3.712E+05	4.559E+00	1.272E+03
1994	3.813E+05	4.553E+00	1.270E+03
1995	3.917E+05	4.552E+00	1.270E+03
1996	3.997E+05	4.510E+00	1.258E+03
1997	4.086E+05	4.486E+00	1.251E+03
1998	4.128E+05	4.381E+00	1.222E+03
1999	4.170E+05	4.281E+00	1.194E+03
2000	4.212E+05	4.184E+00	1.167E+03
2001	4.254E+05	4.092E+00	1.142E+03
2002	4.295E+05	4.003E+00	1.117E+03
2003	4.337E+05	3.917E+00	1.093E+03
2004	4.379E+05	3.835E+00	1.070E+03
2005	4.421E+05	3.756E+00	1.048E+03
2006	4.463E+05	3.680E+00	1.027E+03
2007	4.505E+05	3.607E+00	1.006E+03
2008	7.577E+05	8.708E+00	2.429E+03
2009	7.577E+05	8.366E+00	2.334E+03
2010	7.577E+05	8.038E+00	2.242E+03
2011	7.577E+05	7.723E+00	2.155E+03
2012	7.577E+05	7.420E+00	2.070E+03
2013	7.577E+05	7.129E+00	1.989E+03
2014	7.577E+05	6.850E+00	1.911E+03
2015	7.577E+05	6.581E+00	1.836E+03
2016	7.577E+05	6.323E+00	1.764E+03
2017	7.577E+05	6.075E+00	1.695E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1976      Current Year : 1995      Year Closed: 1995  
 Capacity : 110451 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1977	6.675E+03	1.139E-01	3.177E+01
1978	1.335E+04	2.233E-01	6.230E+01
1979	2.002E+04	3.284E-01	9.163E+01
1980	2.670E+04	4.295E-01	1.198E+02
1981	3.338E+04	5.265E-01	1.469E+02
1982	4.005E+04	6.198E-01	1.729E+02
1983	4.672E+04	7.093E-01	1.979E+02
1984	5.340E+04	7.954E-01	2.219E+02
1985	6.008E+04	8.781E-01	2.450E+02
1986	6.675E+04	9.576E-01	2.671E+02
1987	7.342E+04	1.034E+00	2.884E+02
1988	8.010E+04	1.107E+00	3.089E+02
1989	8.678E+04	1.178E+00	3.286E+02
1990	9.345E+04	1.245E+00	3.475E+02
1991	9.776E+04	1.270E+00	3.543E+02
1992	1.019E+05	1.290E+00	3.600E+02
1993	1.064E+05	1.317E+00	3.675E+02
1994	1.104E+05	1.335E+00	3.723E+02
1995	1.105E+05	1.282E+00	3.577E+02
1996	1.105E+05	1.232E+00	3.437E+02
1997	1.105E+05	1.184E+00	3.302E+02
1998	1.105E+05	1.137E+00	3.173E+02
1999	1.105E+05	1.093E+00	3.048E+02
2000	1.105E+05	1.050E+00	2.929E+02
2001	1.105E+05	1.009E+00	2.814E+02
2002	1.105E+05	9.691E-01	2.704E+02
2003	1.105E+05	9.311E-01	2.598E+02
2004	1.105E+05	8.946E-01	2.496E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1976      Current Year : 1994      Year Closed: 1994  
 Capacity : 14226 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1977	9.800E+02	1.672E-02	4.665E+00
1978	1.960E+03	3.279E-02	9.147E+00
1979	2.940E+03	4.822E-02	1.345E+01
1980	3.920E+03	6.305E-02	1.759E+01
1981	4.900E+03	7.730E-02	2.157E+01
1982	5.880E+03	9.099E-02	2.538E+01
1983	6.860E+03	1.041E-01	2.905E+01
1984	7.840E+03	1.168E-01	3.258E+01
1985	8.820E+03	1.289E-01	3.597E+01
1986	9.800E+03	1.406E-01	3.922E+01
1987	1.078E+04	1.518E-01	4.235E+01
1988	1.176E+04	1.626E-01	4.535E+01
1989	1.274E+04	1.729E-01	4.824E+01
1990	1.372E+04	1.829E-01	5.101E+01
1991	1.386E+04	1.780E-01	4.967E+01
1992	1.403E+04	1.740E-01	4.853E+01
1993	1.422E+04	1.704E-01	4.753E+01
1994	1.423E+04	1.638E-01	4.571E+01
1995	1.423E+04	1.574E-01	4.391E+01
1996	1.423E+04	1.512E-01	4.219E+01
1997	1.423E+04	1.453E-01	4.054E+01
1998	1.423E+04	1.396E-01	3.895E+01
1999	1.423E+04	1.341E-01	3.742E+01
2000	1.423E+04	1.289E-01	3.595E+01
2001	1.423E+04	1.238E-01	3.454E+01
2002	1.423E+04	1.190E-01	3.319E+01
2003	1.423E+04	1.143E-01	3.189E+01

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1994      Year Closed: 1995  
 Capacity : 941391 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 7568.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	5.865E+04	1.001E+00	2.792E+02
1977	1.173E+05	1.962E+00	5.474E+02
1978	1.759E+05	2.886E+00	8.051E+02
1979	2.346E+05	3.773E+00	1.053E+03
1980	2.932E+05	4.626E+00	1.291E+03
1981	3.519E+05	5.445E+00	1.519E+03
1982	4.105E+05	6.232E+00	1.739E+03
1983	4.692E+05	6.989E+00	1.950E+03
1984	5.278E+05	7.715E+00	2.152E+03
1985	5.865E+05	8.413E+00	2.347E+03
1986	6.451E+05	9.084E+00	2.534E+03
1987	7.038E+05	9.729E+00	2.714E+03
1988	7.624E+05	1.035E+01	2.887E+03
1989	8.211E+05	1.094E+01	3.053E+03
1990	8.797E+05	1.151E+01	3.212E+03
1991	8.882E+05	1.121E+01	3.127E+03
1992	8.988E+05	1.095E+01	3.054E+03
1993	9.338E+05	1.112E+01	3.101E+03
1994	9.414E+05	1.081E+01	3.016E+03
1995	9.414E+05	1.039E+01	2.898E+03
1996	9.414E+05	9.979E+00	2.784E+03
1997	9.414E+05	9.588E+00	2.675E+03
1998	9.414E+05	9.212E+00	2.570E+03
1999	9.414E+05	8.851E+00	2.469E+03
2000	9.414E+05	8.504E+00	2.372E+03
2001	9.414E+05	8.170E+00	2.279E+03
2002	9.414E+05	7.850E+00	2.190E+03
2003	9.414E+05	7.542E+00	2.104E+03
2004	9.414E+05	7.246E+00	2.022E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975    Current Year : 1994    Year Closed: 1994  
 Capacity : 412657 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.112E+04	1.897E-01	5.292E+01
1977	2.223E+04	3.719E-01	1.038E+02
1978	3.335E+04	5.470E-01	1.526E+02
1979	4.447E+04	7.152E-01	1.995E+02
1980	5.558E+04	8.769E-01	2.446E+02
1981	6.670E+04	1.032E+00	2.880E+02
1982	7.782E+04	1.181E+00	3.296E+02
1983	8.894E+04	1.325E+00	3.696E+02
1984	1.001E+05	1.462E+00	4.080E+02
1985	1.112E+05	1.595E+00	4.449E+02
1986	1.223E+05	1.722E+00	4.804E+02
1987	1.334E+05	1.844E+00	5.145E+02
1988	1.445E+05	1.961E+00	5.472E+02
1989	1.556E+05	2.074E+00	5.787E+02
1990	1.668E+05	2.183E+00	6.089E+02
1991	1.925E+05	2.536E+00	7.074E+02
1992	3.935E+05	5.866E+00	1.636E+03
1993	4.127E+05	5.963E+00	1.664E+03
1994	4.127E+05	5.729E+00	1.598E+03
1995	4.127E+05	5.505E+00	1.536E+03
1996	4.127E+05	5.289E+00	1.476E+03
1997	4.127E+05	5.082E+00	1.418E+03
1998	4.127E+05	4.882E+00	1.362E+03
1999	4.127E+05	4.691E+00	1.309E+03
2000	4.127E+05	4.507E+00	1.257E+03
2001	4.127E+05	4.330E+00	1.208E+03
2002	4.127E+05	4.160E+00	1.161E+03
2003	4.127E+05	3.997E+00	1.115E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1979    Current Year : 1998    Year Closed: 2008  
 Capacity : 549145 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 5426.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1980	1.599E+04	2.729E-01	7.612E+01
1981	3.198E+04	5.350E-01	1.493E+02
1982	4.798E+04	7.869E-01	2.195E+02
1983	6.397E+04	1.029E+00	2.870E+02
1984	7.996E+04	1.261E+00	3.519E+02
1985	9.595E+04	1.485E+00	4.142E+02
1986	1.119E+05	1.699E+00	4.741E+02
1987	1.279E+05	1.906E+00	5.316E+02
1988	1.439E+05	2.104E+00	5.869E+02
1989	1.599E+05	2.294E+00	6.400E+02
1990	1.759E+05	2.477E+00	6.911E+02
1991	2.214E+05	3.157E+00	8.807E+02
1992	2.443E+05	3.424E+00	9.551E+02
1993	2.607E+05	3.568E+00	9.954E+02
1994	2.690E+05	3.571E+00	9.961E+02
1995	2.754E+05	3.539E+00	9.872E+02
1996	2.830E+05	3.530E+00	9.848E+02
1997	2.905E+05	3.519E+00	9.818E+02
1998	2.959E+05	3.474E+00	9.691E+02
1999	3.013E+05	3.430E+00	9.569E+02
2000	3.067E+05	3.388E+00	9.452E+02
2001	3.122E+05	3.348E+00	9.340E+02
2002	3.176E+05	3.309E+00	9.232E+02
2003	3.230E+05	3.272E+00	9.128E+02
2004	3.284E+05	3.236E+00	9.029E+02
2005	3.339E+05	3.202E+00	8.933E+02
2006	3.393E+05	3.169E+00	8.841E+02
2007	3.447E+05	3.137E+00	8.753E+02
2008	5.491E+05	6.502E+00	1.814E+03
2009	5.491E+05	6.247E+00	1.743E+03
2010	5.491E+05	6.002E+00	1.675E+03
2011	5.491E+05	5.767E+00	1.609E+03
2012	5.491E+05	5.541E+00	1.546E+03
2013	5.491E+05	5.324E+00	1.485E+03
2014	5.491E+05	5.115E+00	1.427E+03
2015	5.491E+05	4.914E+00	1.371E+03
2016	5.491E+05	4.722E+00	1.317E+03
2017	5.491E+05	4.537E+00	1.266E+03

=====  
Model Parameters  
=====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
Methane : 50.0000 % volume  
Carbon Dioxide : 50.0000 % volume

=====  
Landfill Parameters  
=====

Year Opened : 1981      Current Year : 1995      Year Closed: 1995  
Capacity : 1098200 Mg  
Average Acceptance Rate Required from  
            Current Year to Closure Year : 0.00 Mg/year

=====  
Model Results  
=====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1982	1.173E+05	2.002E+00	5.584E+02
1983	2.346E+05	3.925E+00	1.095E+03
1984	3.519E+05	5.772E+00	1.610E+03
1985	4.692E+05	7.547E+00	2.106E+03
1986	5.866E+05	9.253E+00	2.581E+03
1987	7.039E+05	1.089E+01	3.039E+03
1988	8.212E+05	1.247E+01	3.478E+03
1989	9.385E+05	1.398E+01	3.900E+03
1990	1.056E+06	1.543E+01	4.305E+03
1991	1.071E+06	1.509E+01	4.210E+03
1992	1.085E+06	1.474E+01	4.111E+03
1993	1.094E+06	1.431E+01	3.993E+03
1994	1.098E+06	1.382E+01	3.856E+03
1995	1.098E+06	1.328E+01	3.704E+03
1996	1.098E+06	1.276E+01	3.559E+03
1997	1.098E+06	1.226E+01	3.420E+03
1998	1.098E+06	1.178E+01	3.286E+03
1999	1.098E+06	1.132E+01	3.157E+03
2000	1.098E+06	1.087E+01	3.033E+03
2001	1.098E+06	1.045E+01	2.914E+03
2002	1.098E+06	1.004E+01	2.800E+03
2003	1.098E+06	9.642E+00	2.690E+03
2004	1.098E+06	9.264E+00	2.584E+03

```

=====
                          Model Parameters
=====

```

```

Lo : 100.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0400 1/yr ***** User Mode Selection *****
NMOC : 595.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume

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=====
                          Landfill Parameters
=====

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```

Year Opened : 1982      Current Year : 1994      Year Closed: 1994
Capacity : 25418 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 0.00 Mg/year

```

```

=====
                          Model Results
=====

```

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1983	3.105E+03	5.298E-02	1.478E+01
1984	6.210E+03	1.039E-01	2.898E+01
1985	9.315E+03	1.528E-01	4.262E+01
1986	1.242E+04	1.998E-01	5.573E+01
1987	1.552E+04	2.449E-01	6.833E+01
1988	1.863E+04	2.883E-01	8.043E+01
1989	2.174E+04	3.300E-01	9.205E+01
1990	2.484E+04	3.700E-01	1.032E+02
1991	2.542E+04	3.654E-01	1.019E+02
1992	2.542E+04	3.510E-01	9.793E+01
1993	2.542E+04	3.373E-01	9.409E+01
1994	2.542E+04	3.240E-01	9.040E+01
1995	2.542E+04	3.113E-01	8.686E+01
1996	2.542E+04	2.991E-01	8.345E+01
1997	2.542E+04	2.874E-01	8.018E+01
1998	2.542E+04	2.761E-01	7.704E+01
1999	2.542E+04	2.653E-01	7.401E+01
2000	2.542E+04	2.549E-01	7.111E+01
2001	2.542E+04	2.449E-01	6.832E+01
2002	2.542E+04	2.353E-01	6.565E+01
2003	2.542E+04	2.261E-01	6.307E+01

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1978      Current Year : 1995      Year Closed: 1995  
 Capacity : 109293 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1979	4.149E+03	7.079E-02	1.975E+01
1980	8.298E+03	1.388E-01	3.872E+01
1981	1.245E+04	2.042E-01	5.695E+01
1982	1.660E+04	2.669E-01	7.447E+01
1983	2.074E+04	3.273E-01	9.130E+01
1984	2.489E+04	3.852E-01	1.075E+02
1985	2.904E+04	4.409E-01	1.230E+02
1986	3.319E+04	4.944E-01	1.379E+02
1987	3.734E+04	5.458E-01	1.523E+02
1988	4.149E+04	5.952E-01	1.661E+02
1989	4.564E+04	6.427E-01	1.793E+02
1990	4.979E+04	6.882E-01	1.920E+02
1991	6.929E+04	9.940E-01	2.773E+02
1992	8.689E+04	1.255E+00	3.502E+02
1993	9.889E+04	1.411E+00	3.936E+02
1994	1.093E+05	1.533E+00	4.277E+02
1995	1.093E+05	1.473E+00	4.109E+02
1996	1.093E+05	1.415E+00	3.948E+02
1997	1.093E+05	1.360E+00	3.793E+02
1998	1.093E+05	1.306E+00	3.645E+02
1999	1.093E+05	1.255E+00	3.502E+02
2000	1.093E+05	1.206E+00	3.364E+02
2001	1.093E+05	1.159E+00	3.232E+02
2002	1.093E+05	1.113E+00	3.106E+02
2003	1.093E+05	1.070E+00	2.984E+02
2004	1.093E+05	1.028E+00	2.867E+02

```

=====
Model Parameters
=====

```

```

Lo : 100.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0400 1/yr ***** User Mode Selection *****
NMOC : 595.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume

```

```

=====
Landfill Parameters
=====

```

```

Year Opened : 1974   Current Year : 1990   Year Closed: 1991
Capacity : 734286 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 45890.00 Mg/year

```

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=====
Model Results
=====

```

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	4.589E+04	7.830E-01	2.184E+02
1976	9.178E+04	1.535E+00	4.283E+02
1977	1.377E+05	2.258E+00	6.299E+02
1978	1.836E+05	2.952E+00	8.237E+02
1979	2.294E+05	3.620E+00	1.010E+03
1980	2.753E+05	4.261E+00	1.189E+03
1981	3.212E+05	4.877E+00	1.360E+03
1982	3.671E+05	5.468E+00	1.526E+03
1983	4.130E+05	6.037E+00	1.684E+03
1984	4.589E+05	6.583E+00	1.837E+03
1985	5.048E+05	7.108E+00	1.983E+03
1986	5.507E+05	7.612E+00	2.124E+03
1987	5.966E+05	8.097E+00	2.259E+03
1988	6.425E+05	8.562E+00	2.389E+03
1989	6.884E+05	9.010E+00	2.514E+03
1990	7.342E+05	9.439E+00	2.633E+03
1991	7.343E+05	9.070E+00	2.530E+03
1992	7.343E+05	8.714E+00	2.431E+03
1993	7.343E+05	8.373E+00	2.336E+03
1994	7.343E+05	8.044E+00	2.244E+03
1995	7.343E+05	7.729E+00	2.156E+03
1996	7.343E+05	7.426E+00	2.072E+03
1997	7.343E+05	7.135E+00	1.990E+03
1998	7.343E+05	6.855E+00	1.912E+03
1999	7.343E+05	6.586E+00	1.837E+03
2000	7.343E+05	6.328E+00	1.765E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1997      Year Closed: 1997  
 Capacity : 216007 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	6.562E+03	1.120E-01	3.124E+01
1979	1.312E+04	2.195E-01	6.125E+01
1980	1.969E+04	3.229E-01	9.008E+01
1981	2.625E+04	4.222E-01	1.178E+02
1982	3.281E+04	5.176E-01	1.444E+02
1983	3.937E+04	6.093E-01	1.700E+02
1984	4.593E+04	6.973E-01	1.945E+02
1985	5.250E+04	7.819E-01	2.181E+02
1986	5.906E+04	8.633E-01	2.408E+02
1987	6.562E+04	9.414E-01	2.626E+02
1988	7.218E+04	1.016E+00	2.836E+02
1989	7.874E+04	1.089E+00	3.037E+02
1990	8.531E+04	1.158E+00	3.230E+02
1991	9.389E+04	1.259E+00	3.512E+02
1992	1.090E+05	1.467E+00	4.093E+02
1993	1.277E+05	1.729E+00	4.823E+02
1994	1.640E+05	2.280E+00	6.361E+02
1995	2.029E+05	2.854E+00	7.963E+02
1996	2.160E+05	2.966E+00	8.275E+02
1997	2.160E+05	2.850E+00	7.951E+02
1998	2.160E+05	2.738E+00	7.640E+02
1999	2.160E+05	2.631E+00	7.340E+02
2000	2.160E+05	2.528E+00	7.052E+02
2001	2.160E+05	2.429E+00	6.776E+02
2002	2.160E+05	2.333E+00	6.510E+02
2003	2.160E+05	2.242E+00	6.255E+02
2004	2.160E+05	2.154E+00	6.009E+02
2005	2.160E+05	2.070E+00	5.774E+02
2006	2.160E+05	1.988E+00	5.547E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1980      Current Year : 1997      Year Closed: 1997  
 Capacity : 94139 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1981	9.183E+03	1.567E-01	4.371E+01
1982	1.837E+04	3.072E-01	8.571E+01
1983	2.755E+04	4.519E-01	1.261E+02
1984	3.673E+04	5.908E-01	1.648E+02
1985	4.592E+04	7.243E-01	2.021E+02
1986	5.510E+04	8.526E-01	2.379E+02
1987	6.428E+04	9.759E-01	2.722E+02
1988	7.346E+04	1.094E+00	3.053E+02
1989	8.265E+04	1.208E+00	3.370E+02
1990	9.183E+04	1.317E+00	3.675E+02
1991	9.237E+04	1.275E+00	3.557E+02
1992	9.300E+04	1.236E+00	3.447E+02
1993	9.356E+04	1.197E+00	3.339E+02
1994	9.404E+04	1.158E+00	3.231E+02
1995	9.412E+04	1.114E+00	3.108E+02
1996	9.413E+04	1.071E+00	2.987E+02
1997	9.414E+04	1.029E+00	2.870E+02
1998	9.414E+04	9.883E-01	2.757E+02
1999	9.414E+04	9.496E-01	2.649E+02
2000	9.414E+04	9.124E-01	2.545E+02
2001	9.414E+04	8.766E-01	2.445E+02
2002	9.414E+04	8.422E-01	2.350E+02
2003	9.414E+04	8.092E-01	2.257E+02
2004	9.414E+04	7.775E-01	2.169E+02
2005	9.414E+04	7.470E-01	2.084E+02
2006	9.414E+04	7.177E-01	2.002E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 l/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1998      Year Closed: 2000  
 Capacity : 1195795 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 78067.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	2.956E+04	5.044E-01	1.407E+02
1979	5.913E+04	9.891E-01	2.759E+02
1980	8.869E+04	1.455E+00	4.058E+02
1981	1.183E+05	1.902E+00	5.306E+02
1982	1.478E+05	2.332E+00	6.506E+02
1983	1.774E+05	2.745E+00	7.658E+02
1984	2.069E+05	3.142E+00	8.765E+02
1985	2.365E+05	3.523E+00	9.828E+02
1986	2.661E+05	3.889E+00	1.085E+03
1987	2.956E+05	4.241E+00	1.183E+03
1988	3.252E+05	4.579E+00	1.278E+03
1989	3.548E+05	4.904E+00	1.368E+03
1990	3.843E+05	5.216E+00	1.455E+03
1991	4.139E+05	5.516E+00	1.539E+03
1992	4.465E+05	5.856E+00	1.634E+03
1993	4.810E+05	6.215E+00	1.734E+03
1994	5.181E+05	6.604E+00	1.842E+03
1995	6.683E+05	8.908E+00	2.485E+03
1996	8.327E+05	1.136E+01	3.171E+03
1997	9.863E+05	1.354E+01	3.777E+03
1998	1.064E+06	1.434E+01	4.001E+03
1999	1.142E+06	1.511E+01	4.215E+03
2000	1.196E+06	1.543E+01	4.304E+03
2001	1.196E+06	1.482E+01	4.135E+03
2002	1.196E+06	1.424E+01	3.973E+03
2003	1.196E+06	1.368E+01	3.817E+03
2004	1.196E+06	1.315E+01	3.668E+03
2005	1.196E+06	1.263E+01	3.524E+03
2006	1.196E+06	1.214E+01	3.386E+03
2007	1.196E+06	1.166E+01	3.253E+03
2008	1.196E+06	1.120E+01	3.125E+03
2009	1.196E+06	1.076E+01	3.003E+03

```

=====
Model Parameters
=====

```

```

Lo : 100.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0400 l/yr ***** User Mode Selection *****
NMOC : 595.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume

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```

=====
Landfill Parameters
=====

```

```

Year Opened : 1982   Current Year : 1994   Year Closed: 1994
Capacity : 445063 Mg
Average Acceptance Rate Required from
    Current Year to Closure Year : 0.00 Mg/year

```

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=====
Model Results
=====

```

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1983	4.010E+04	6.841E-01	1.909E+02
1984	8.019E+04	1.341E+00	3.742E+02
1985	1.203E+05	1.973E+00	5.504E+02
1986	1.604E+05	2.580E+00	7.197E+02
1987	2.005E+05	3.163E+00	8.823E+02
1988	2.406E+05	3.723E+00	1.039E+03
1989	2.807E+05	4.261E+00	1.189E+03
1990	3.208E+05	4.778E+00	1.333E+03
1991	3.526E+05	5.133E+00	1.432E+03
1992	3.894E+05	5.560E+00	1.551E+03
1993	4.220E+05	5.898E+00	1.645E+03
1994	4.451E+05	6.061E+00	1.691E+03
1995	4.451E+05	5.823E+00	1.625E+03
1996	4.451E+05	5.595E+00	1.561E+03
1997	4.451E+05	5.375E+00	1.500E+03
1998	4.451E+05	5.165E+00	1.441E+03
1999	4.451E+05	4.962E+00	1.384E+03
2000	4.451E+05	4.768E+00	1.330E+03
2001	4.451E+05	4.581E+00	1.278E+03
2002	4.451E+05	4.401E+00	1.228E+03
2003	4.451E+05	4.228E+00	1.180E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1997      Year Closed: 2007  
 Capacity : 373088 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 5320.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.460E+04	2.491E-01	6.950E+01
1977	2.920E+04	4.884E-01	1.363E+02
1978	4.380E+04	7.184E-01	2.004E+02
1979	5.840E+04	9.393E-01	2.621E+02
1980	7.300E+04	1.152E+00	3.213E+02
1981	8.760E+04	1.356E+00	3.782E+02
1982	1.022E+05	1.552E+00	4.328E+02
1983	1.168E+05	1.740E+00	4.854E+02
1984	1.314E+05	1.921E+00	5.358E+02
1985	1.460E+05	2.094E+00	5.843E+02
1986	1.606E+05	2.261E+00	6.309E+02
1987	1.752E+05	2.422E+00	6.757E+02
1988	1.898E+05	2.576E+00	7.187E+02
1989	2.044E+05	2.724E+00	7.600E+02
1990	2.190E+05	2.866E+00	7.997E+02
1991	2.376E+05	3.071E+00	8.567E+02
1992	2.582E+05	3.303E+00	9.214E+02
1993	2.728E+05	3.422E+00	9.546E+02
1994	2.920E+05	3.615E+00	1.009E+03
1995	3.027E+05	3.656E+00	1.020E+03
1996	3.132E+05	3.692E+00	1.030E+03
1997	3.185E+05	3.638E+00	1.015E+03
1998	3.238E+05	3.586E+00	1.001E+03
1999	3.292E+05	3.537E+00	9.866E+02
2000	3.345E+05	3.489E+00	9.733E+02
2001	3.398E+05	3.443E+00	9.604E+02
2002	3.451E+05	3.398E+00	9.481E+02
2003	3.504E+05	3.356E+00	9.362E+02
2004	3.558E+05	3.315E+00	9.248E+02
2005	3.611E+05	3.276E+00	9.139E+02
2006	3.664E+05	3.238E+00	9.034E+02
2007	3.731E+05	3.225E+00	8.998E+02
2008	3.731E+05	3.099E+00	8.645E+02
2009	3.731E+05	2.977E+00	8.306E+02
2010	3.731E+05	2.860E+00	7.980E+02
2011	3.731E+05	2.748E+00	7.667E+02
2012	3.731E+05	2.641E+00	7.367E+02
2013	3.731E+05	2.537E+00	7.078E+02
2014	3.731E+05	2.438E+00	6.800E+02
2015	3.731E+05	2.342E+00	6.534E+02
2016	3.731E+05	2.250E+00	6.277E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1980      Current Year : 1988      Year Closed: 1988  
 Capacity : 529533 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1981	6.620E+04	1.130E+00	3.151E+02
1982	1.324E+05	2.215E+00	6.179E+02
1983	1.986E+05	3.257E+00	9.088E+02
1984	2.648E+05	4.259E+00	1.188E+03
1985	3.310E+05	5.222E+00	1.457E+03
1986	3.972E+05	6.146E+00	1.715E+03
1987	4.634E+05	7.035E+00	1.963E+03
1988	5.295E+05	7.887E+00	2.200E+03
1989	5.295E+05	7.578E+00	2.114E+03
1990	5.295E+05	7.281E+00	2.031E+03
1991	5.295E+05	6.996E+00	1.952E+03
1992	5.295E+05	6.721E+00	1.875E+03
1993	5.295E+05	6.458E+00	1.802E+03
1994	5.295E+05	6.205E+00	1.731E+03
1995	5.295E+05	5.961E+00	1.663E+03
1996	5.295E+05	5.727E+00	1.598E+03
1997	5.295E+05	5.503E+00	1.535E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1995      Year Closed: 1995  
 Capacity : 1826409 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.157E+05	1.974E+00	5.508E+02
1977	2.314E+05	3.871E+00	1.080E+03
1978	3.471E+05	5.693E+00	1.588E+03
1979	4.628E+05	7.444E+00	2.077E+03
1980	5.785E+05	9.127E+00	2.546E+03
1981	6.942E+05	1.074E+01	2.997E+03
1982	8.099E+05	1.230E+01	3.430E+03
1983	9.257E+05	1.379E+01	3.847E+03
1984	1.041E+06	1.522E+01	4.247E+03
1985	1.157E+06	1.660E+01	4.631E+03
1986	1.273E+06	1.792E+01	5.000E+03
1987	1.388E+06	1.919E+01	5.355E+03
1988	1.504E+06	2.042E+01	5.696E+03
1989	1.620E+06	2.159E+01	6.023E+03
1990	1.736E+06	2.272E+01	6.338E+03
1991	1.757E+06	2.219E+01	6.191E+03
1992	1.777E+06	2.167E+01	6.044E+03
1993	1.801E+06	2.122E+01	5.921E+03
1994	1.826E+06	2.082E+01	5.809E+03
1995	1.826E+06	2.001E+01	5.582E+03
1996	1.826E+06	1.922E+01	5.363E+03
1997	1.826E+06	1.847E+01	5.152E+03
1998	1.826E+06	1.774E+01	4.950E+03
1999	1.826E+06	1.705E+01	4.756E+03
2000	1.826E+06	1.638E+01	4.570E+03
2001	1.826E+06	1.574E+01	4.391E+03
2002	1.826E+06	1.512E+01	4.218E+03
2003	1.826E+06	1.453E+01	4.053E+03
2004	1.826E+06	1.396E+01	3.894E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1995      Year Closed: 1996  
 Capacity : 340000 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 5146.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.053E+04	1.796E-01	5.012E+01
1977	2.106E+04	3.522E-01	9.827E+01
1978	3.159E+04	5.181E-01	1.445E+02
1979	4.212E+04	6.774E-01	1.890E+02
1980	5.264E+04	8.305E-01	2.317E+02
1981	6.317E+04	9.776E-01	2.727E+02
1982	7.370E+04	1.119E+00	3.122E+02
1983	8.423E+04	1.255E+00	3.500E+02
1984	9.476E+04	1.385E+00	3.864E+02
1985	1.053E+05	1.510E+00	4.214E+02
1986	1.158E+05	1.631E+00	4.550E+02
1987	1.263E+05	1.747E+00	4.873E+02
1988	1.369E+05	1.858E+00	5.183E+02
1989	1.474E+05	1.965E+00	5.481E+02
1990	1.579E+05	2.067E+00	5.767E+02
1991	2.217E+05	3.073E+00	8.574E+02
1992	2.949E+05	4.202E+00	1.172E+03
1993	3.209E+05	4.482E+00	1.250E+03
1994	3.349E+05	4.544E+00	1.268E+03
1995	3.400E+05	4.453E+00	1.242E+03
1996	3.400E+05	4.279E+00	1.194E+03
1997	3.400E+05	4.111E+00	1.147E+03
1998	3.400E+05	3.950E+00	1.102E+03
1999	3.400E+05	3.795E+00	1.059E+03
2000	3.400E+05	3.646E+00	1.017E+03
2001	3.400E+05	3.503E+00	9.773E+02
2002	3.400E+05	3.366E+00	9.390E+02
2003	3.400E+05	3.234E+00	9.022E+02
2004	3.400E+05	3.107E+00	8.668E+02
2005	3.400E+05	2.985E+00	8.328E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1995      Year Closed: 1996  
 Capacity : 706044 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 3173.00 Mg/year

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 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	4.396E+04	7.501E-01	2.093E+02
1977	8.793E+04	1.471E+00	4.103E+02
1978	1.319E+05	2.163E+00	6.035E+02
1979	1.759E+05	2.829E+00	7.891E+02
1980	2.198E+05	3.468E+00	9.674E+02
1981	2.638E+05	4.082E+00	1.139E+03
1982	3.077E+05	4.672E+00	1.303E+03
1983	3.517E+05	5.239E+00	1.462E+03
1984	3.957E+05	5.784E+00	1.614E+03
1985	4.396E+05	6.307E+00	1.760E+03
1986	4.836E+05	6.810E+00	1.900E+03
1987	5.276E+05	7.293E+00	2.035E+03
1988	5.715E+05	7.757E+00	2.164E+03
1989	6.155E+05	8.203E+00	2.288E+03
1990	6.595E+05	8.631E+00	2.408E+03
1991	6.724E+05	8.514E+00	2.375E+03
1992	6.820E+05	8.344E+00	2.328E+03
1993	6.921E+05	8.188E+00	2.284E+03
1994	7.029E+05	8.052E+00	2.246E+03
1995	7.060E+05	7.790E+00	2.173E+03
1996	7.060E+05	7.485E+00	2.088E+03
1997	7.060E+05	7.191E+00	2.006E+03
1998	7.060E+05	6.909E+00	1.928E+03
1999	7.060E+05	6.638E+00	1.852E+03
2000	7.060E+05	6.378E+00	1.779E+03
2001	7.060E+05	6.128E+00	1.710E+03
2002	7.060E+05	5.888E+00	1.643E+03
2003	7.060E+05	5.657E+00	1.578E+03
2004	7.060E+05	5.435E+00	1.516E+03
2005	7.060E+05	5.222E+00	1.457E+03

=====  
Model Parameters  
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Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
Methane : 50.0000 % volume  
Carbon Dioxide : 50.0000 % volume

=====  
Landfill Parameters  
=====

Year Opened : 1978 Current Year : 1993 Year Closed: 1993  
Capacity : 210932 Mg  
Average Acceptance Rate Required from  
Current Year to Closure Year : 0.00 Mg/year

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Model Results  
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Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1979	1.257E+04	2.145E-01	5.983E+01
1980	2.514E+04	4.205E-01	1.173E+02
1981	3.771E+04	6.185E-01	1.725E+02
1982	5.028E+04	8.087E-01	2.256E+02
1983	6.284E+04	9.914E-01	2.766E+02
1984	7.541E+04	1.167E+00	3.256E+02
1985	8.798E+04	1.336E+00	3.726E+02
1986	1.006E+05	1.498E+00	4.178E+02
1987	1.131E+05	1.653E+00	4.613E+02
1988	1.257E+05	1.803E+00	5.030E+02
1989	1.383E+05	1.947E+00	5.431E+02
1990	1.508E+05	2.085E+00	5.817E+02
1991	1.791E+05	2.486E+00	6.936E+02
1992	2.109E+05	2.931E+00	8.177E+02
1993	2.109E+05	2.816E+00	7.857E+02
1994	2.109E+05	2.706E+00	7.549E+02
1995	2.109E+05	2.600E+00	7.253E+02
1996	2.109E+05	2.498E+00	6.969E+02
1997	2.109E+05	2.400E+00	6.695E+02
1998	2.109E+05	2.306E+00	6.433E+02
1999	2.109E+05	2.215E+00	6.181E+02
2000	2.109E+05	2.129E+00	5.938E+02
2001	2.109E+05	2.045E+00	5.705E+02
2002	2.109E+05	1.965E+00	5.482E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1985      Current Year : 1994      Year Closed: 1995  
 Capacity : 141209 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 986.00 Mg/year

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 Model Results  
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Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1986	2.672E+04	4.559E-01	1.272E+02
1987	5.344E+04	8.940E-01	2.494E+02
1988	8.017E+04	1.315E+00	3.668E+02
1989	1.069E+05	1.719E+00	4.796E+02
1990	1.336E+05	2.108E+00	5.880E+02
1991	1.364E+05	2.073E+00	5.783E+02
1992	1.385E+05	2.028E+00	5.658E+02
1993	1.402E+05	1.977E+00	5.516E+02
1994	1.412E+05	1.916E+00	5.346E+02
1995	1.412E+05	1.841E+00	5.137E+02
1996	1.412E+05	1.769E+00	4.935E+02
1997	1.412E+05	1.700E+00	4.742E+02
1998	1.412E+05	1.633E+00	4.556E+02
1999	1.412E+05	1.569E+00	4.377E+02
2000	1.412E+05	1.508E+00	4.206E+02
2001	1.412E+05	1.448E+00	4.041E+02
2002	1.412E+05	1.392E+00	3.882E+02
2003	1.412E+05	1.337E+00	3.730E+02
2004	1.412E+05	1.285E+00	3.584E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1994      Year Closed: 1994  
 Capacity : 117674 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

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 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	4.342E+03	7.408E-02	2.067E+01
1976	8.684E+03	1.453E-01	4.053E+01
1977	1.303E+04	2.136E-01	5.960E+01
1978	1.737E+04	2.794E-01	7.794E+01
1979	2.171E+04	3.425E-01	9.555E+01
1980	2.605E+04	4.031E-01	1.125E+02
1981	3.039E+04	4.614E-01	1.287E+02
1982	3.474E+04	5.174E-01	1.443E+02
1983	3.908E+04	5.712E-01	1.594E+02
1984	4.342E+04	6.229E-01	1.738E+02
1985	4.776E+04	6.725E-01	1.876E+02
1986	5.210E+04	7.203E-01	2.009E+02
1987	5.645E+04	7.661E-01	2.137E+02
1988	6.079E+04	8.101E-01	2.260E+02
1989	6.513E+04	8.525E-01	2.378E+02
1990	6.947E+04	8.931E-01	2.492E+02
1991	8.527E+04	1.128E+00	3.146E+02
1992	1.018E+05	1.365E+00	3.808E+02
1993	1.177E+05	1.583E+00	4.416E+02
1994	1.177E+05	1.521E+00	4.243E+02
1995	1.177E+05	1.461E+00	4.076E+02
1996	1.177E+05	1.404E+00	3.916E+02
1997	1.177E+05	1.349E+00	3.763E+02
1998	1.177E+05	1.296E+00	3.615E+02
1999	1.177E+05	1.245E+00	3.474E+02
2000	1.177E+05	1.196E+00	3.337E+02
2001	1.177E+05	1.149E+00	3.206E+02
2002	1.177E+05	1.104E+00	3.081E+02
2003	1.177E+05	1.061E+00	2.960E+02

Source: D:\MSWL\NEWMADRI.PRM

=====  
Model Parameters  
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Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
Methane : 50.0000 % volume  
Carbon Dioxide : 50.0000 % volume

=====  
Landfill Parameters  
=====

Year Opened : 1976      Current Year : 1995      Year Closed: 1996  
Capacity : 512000 Mg  
Average Acceptance Rate Required from  
    Current Year to Closure Year : 18044.00 Mg/year

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Model Results  
=====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1977	2.725E+04	4.649E-01	1.297E+02
1978	5.449E+04	9.116E-01	2.543E+02
1979	8.174E+04	1.341E+00	3.740E+02
1980	1.090E+05	1.753E+00	4.891E+02
1981	1.362E+05	2.149E+00	5.996E+02
1982	1.635E+05	2.530E+00	7.058E+02
1983	1.907E+05	2.895E+00	8.078E+02
1984	2.180E+05	3.247E+00	9.058E+02
1985	2.452E+05	3.584E+00	1.000E+03
1986	2.725E+05	3.909E+00	1.090E+03
1987	2.997E+05	4.220E+00	1.177E+03
1988	3.270E+05	4.520E+00	1.261E+03
1989	3.542E+05	4.807E+00	1.341E+03
1990	3.815E+05	5.084E+00	1.418E+03
1991	4.019E+05	5.233E+00	1.460E+03
1992	4.256E+05	5.433E+00	1.516E+03
1993	4.491E+05	5.621E+00	1.568E+03
1994	4.939E+05	6.165E+00	1.720E+03
1995	5.120E+05	6.231E+00	1.738E+03
1996	5.120E+05	5.987E+00	1.670E+03
1997	5.120E+05	5.752E+00	1.605E+03
1998	5.120E+05	5.527E+00	1.542E+03
1999	5.120E+05	5.310E+00	1.481E+03
2000	5.120E+05	5.102E+00	1.423E+03
2001	5.120E+05	4.902E+00	1.368E+03
2002	5.120E+05	4.710E+00	1.314E+03
2003	5.120E+05	4.525E+00	1.262E+03
2004	5.120E+05	4.348E+00	1.213E+03
2005	5.120E+05	4.177E+00	1.165E+03
2006	5.120E+05	4.013E+00	1.120E+03
2007	5.120E+05	3.856E+00	1.076E+03
2008	5.120E+05	3.705E+00	1.034E+03
2009	5.120E+05	3.559E+00	9.930E+02
2010	5.120E+05	3.420E+00	9.541E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1994      Year Closed: 1994  
 Capacity : 524917 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.701E+04	2.902E-01	8.095E+01
1977	3.401E+04	5.690E-01	1.587E+02
1978	5.102E+04	8.368E-01	2.335E+02
1979	6.803E+04	1.094E+00	3.053E+02
1980	8.504E+04	1.341E+00	3.742E+02
1981	1.020E+05	1.579E+00	4.405E+02
1982	1.190E+05	1.807E+00	5.042E+02
1983	1.361E+05	2.027E+00	5.654E+02
1984	1.531E+05	2.237E+00	6.242E+02
1985	1.701E+05	2.440E+00	6.807E+02
1986	1.871E+05	2.634E+00	7.349E+02
1987	2.041E+05	2.821E+00	7.871E+02
1988	2.211E+05	3.001E+00	8.371E+02
1989	2.381E+05	3.173E+00	8.853E+02
1990	2.551E+05	3.339E+00	9.315E+02
1991	3.417E+05	4.686E+00	1.307E+03
1992	4.293E+05	5.997E+00	1.673E+03
1993	5.249E+05	7.393E+00	2.062E+03
1994	5.249E+05	7.103E+00	1.982E+03
1995	5.249E+05	6.824E+00	1.904E+03
1996	5.249E+05	6.557E+00	1.829E+03
1997	5.249E+05	6.300E+00	1.757E+03
1998	5.249E+05	6.053E+00	1.689E+03
1999	5.249E+05	5.815E+00	1.622E+03
2000	5.249E+05	5.587E+00	1.559E+03
2001	5.249E+05	5.368E+00	1.498E+03
2002	5.249E+05	5.158E+00	1.439E+03
2003	5.249E+05	4.956E+00	1.382E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1979      Current Year : 1996      Year Closed: 1996  
 Capacity : 2552224 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

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 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1980	1.733E+05	2.957E+00	8.249E+02
1981	3.466E+05	5.798E+00	1.617E+03
1982	5.199E+05	8.527E+00	2.379E+03
1983	6.932E+05	1.115E+01	3.110E+03
1984	8.665E+05	1.367E+01	3.813E+03
1985	1.040E+06	1.609E+01	4.489E+03
1986	1.213E+06	1.842E+01	5.138E+03
1987	1.386E+06	2.065E+01	5.761E+03
1988	1.560E+06	2.280E+01	6.360E+03
1989	1.733E+06	2.486E+01	6.935E+03
1990	1.906E+06	2.684E+01	7.488E+03
1991	2.047E+06	2.820E+01	7.866E+03
1992	2.177E+06	2.931E+01	8.176E+03
1993	2.335E+06	3.085E+01	8.608E+03
1994	2.435E+06	3.135E+01	8.746E+03
1995	2.552E+06	3.212E+01	8.960E+03
1996	2.552E+06	3.086E+01	8.609E+03
1997	2.552E+06	2.965E+01	8.271E+03
1998	2.552E+06	2.849E+01	7.947E+03
1999	2.552E+06	2.737E+01	7.635E+03
2000	2.552E+06	2.630E+01	7.336E+03
2001	2.552E+06	2.526E+01	7.048E+03
2002	2.552E+06	2.427E+01	6.772E+03
2003	2.552E+06	2.332E+01	6.506E+03
2004	2.552E+06	2.241E+01	6.251E+03
2005	2.552E+06	2.153E+01	6.006E+03

=====  
 Model Parameters  
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Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 l/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1978      Current Year : 1995      Year Closed: 1995  
 Capacity : 78449 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1979	2.834E+03	4.835E-02	1.349E+01
1980	5.668E+03	9.481E-02	2.645E+01
1981	8.502E+03	1.394E-01	3.890E+01
1982	1.134E+04	1.823E-01	5.087E+01
1983	1.417E+04	2.235E-01	6.236E+01
1984	1.700E+04	2.631E-01	7.341E+01
1985	1.984E+04	3.012E-01	8.402E+01
1986	2.267E+04	3.377E-01	9.421E+01
1987	2.551E+04	3.728E-01	1.040E+02
1988	2.834E+04	4.066E-01	1.134E+02
1989	3.117E+04	4.390E-01	1.225E+02
1990	3.401E+04	4.701E-01	1.312E+02
1991	4.401E+04	6.223E-01	1.736E+02
1992	5.344E+04	7.588E-01	2.117E+02
1993	6.564E+04	9.372E-01	2.615E+02
1994	7.844E+04	1.119E+00	3.121E+02
1995	7.845E+04	1.075E+00	2.999E+02
1996	7.845E+04	1.033E+00	2.882E+02
1997	7.845E+04	9.925E-01	2.769E+02
1998	7.845E+04	9.536E-01	2.660E+02
1999	7.845E+04	9.162E-01	2.556E+02
2000	7.845E+04	8.803E-01	2.456E+02
2001	7.845E+04	8.458E-01	2.359E+02
2002	7.845E+04	8.126E-01	2.267E+02
2003	7.845E+04	7.807E-01	2.178E+02
2004	7.845E+04	7.501E-01	2.093E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1995      Year Closed: 1995  
 Capacity : 197692 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	1.081E+04	1.845E-01	5.147E+01
1979	2.163E+04	3.618E-01	1.009E+02
1980	3.244E+04	5.321E-01	1.484E+02
1981	4.326E+04	6.958E-01	1.941E+02
1982	5.407E+04	8.530E-01	2.380E+02
1983	6.488E+04	1.004E+00	2.801E+02
1984	7.570E+04	1.149E+00	3.206E+02
1985	8.651E+04	1.289E+00	3.595E+02
1986	9.733E+04	1.423E+00	3.969E+02
1987	1.081E+05	1.551E+00	4.328E+02
1988	1.190E+05	1.675E+00	4.673E+02
1989	1.298E+05	1.794E+00	5.005E+02
1990	1.406E+05	1.908E+00	5.323E+02
1991	1.537E+05	2.057E+00	5.738E+02
1992	1.702E+05	2.258E+00	6.298E+02
1993	1.836E+05	2.398E+00	6.689E+02
1994	1.977E+05	2.544E+00	7.098E+02
1995	1.977E+05	2.445E+00	6.820E+02
1996	1.977E+05	2.349E+00	6.553E+02
1997	1.977E+05	2.257E+00	6.296E+02
1998	1.977E+05	2.168E+00	6.049E+02
1999	1.977E+05	2.083E+00	5.812E+02
2000	1.977E+05	2.002E+00	5.584E+02
2001	1.977E+05	1.923E+00	5.365E+02
2002	1.977E+05	1.848E+00	5.155E+02
2003	1.977E+05	1.775E+00	4.952E+02
2004	1.977E+05	1.706E+00	4.758E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1995      Year Closed: 1995  
 Capacity : 363000 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	3.643E+03	6.216E-02	1.734E+01
1976	7.286E+03	1.219E-01	3.400E+01
1977	1.093E+04	1.793E-01	5.001E+01
1978	1.457E+04	2.344E-01	6.539E+01
1979	1.822E+04	2.874E-01	8.017E+01
1980	2.186E+04	3.382E-01	9.436E+01
1981	2.550E+04	3.871E-01	1.080E+02
1982	2.914E+04	4.341E-01	1.211E+02
1983	3.279E+04	4.792E-01	1.337E+02
1984	3.643E+04	5.226E-01	1.458E+02
1985	4.007E+04	5.643E-01	1.574E+02
1986	4.372E+04	6.043E-01	1.686E+02
1987	4.736E+04	6.428E-01	1.793E+02
1988	5.100E+04	6.797E-01	1.896E+02
1989	5.464E+04	7.152E-01	1.995E+02
1990	5.829E+04	7.493E-01	2.091E+02
1991	2.983E+05	4.815E+00	1.343E+03
1992	3.289E+05	5.148E+00	1.436E+03
1993	3.426E+05	5.180E+00	1.445E+03
1994	3.630E+05	5.325E+00	1.486E+03
1995	3.630E+05	5.116E+00	1.427E+03
1996	3.630E+05	4.916E+00	1.371E+03
1997	3.630E+05	4.723E+00	1.318E+03
1998	3.630E+05	4.538E+00	1.266E+03
1999	3.630E+05	4.360E+00	1.216E+03
2000	3.630E+05	4.189E+00	1.169E+03
2001	3.630E+05	4.025E+00	1.123E+03
2002	3.630E+05	3.867E+00	1.079E+03
2003	3.630E+05	3.715E+00	1.036E+03
2004	3.630E+05	3.570E+00	9.959E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1981      Current Year : 1995      Year Closed: 1996  
 Capacity : 197262 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 7353.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1982	1.149E+04	1.961E-01	5.470E+01
1983	2.298E+04	3.845E-01	1.073E+02
1984	3.448E+04	5.655E-01	1.578E+02
1985	4.597E+04	7.394E-01	2.063E+02
1986	5.746E+04	9.065E-01	2.529E+02
1987	6.895E+04	1.067E+00	2.977E+02
1988	8.044E+04	1.221E+00	3.407E+02
1989	9.194E+04	1.369E+00	3.820E+02
1990	1.034E+05	1.512E+00	4.218E+02
1991	1.177E+05	1.696E+00	4.732E+02
1992	1.515E+05	2.206E+00	6.154E+02
1993	1.691E+05	2.420E+00	6.751E+02
1994	1.899E+05	2.680E+00	7.477E+02
1995	1.973E+05	2.700E+00	7.534E+02
1996	1.973E+05	2.595E+00	7.239E+02
1997	1.973E+05	2.493E+00	6.955E+02
1998	1.973E+05	2.395E+00	6.682E+02
1999	1.973E+05	2.301E+00	6.420E+02
2000	1.973E+05	2.211E+00	6.168E+02
2001	1.973E+05	2.124E+00	5.927E+02
2002	1.973E+05	2.041E+00	5.694E+02
2003	1.973E+05	1.961E+00	5.471E+02
2004	1.973E+05	1.884E+00	5.256E+02
2005	1.973E+05	1.810E+00	5.050E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1994      Year Closed: 1994  
 Capacity : 281770 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	9.035E+03	1.542E-01	4.301E+01
1976	1.807E+04	3.023E-01	8.433E+01
1977	2.710E+04	4.446E-01	1.240E+02
1978	3.614E+04	5.813E-01	1.622E+02
1979	4.518E+04	7.127E-01	1.988E+02
1980	5.421E+04	8.389E-01	2.340E+02
1981	6.324E+04	9.601E-01	2.679E+02
1982	7.228E+04	1.077E+00	3.004E+02
1983	8.132E+04	1.189E+00	3.316E+02
1984	9.035E+04	1.296E+00	3.616E+02
1985	9.938E+04	1.399E+00	3.904E+02
1986	1.084E+05	1.499E+00	4.181E+02
1987	1.175E+05	1.594E+00	4.447E+02
1988	1.265E+05	1.686E+00	4.703E+02
1989	1.355E+05	1.774E+00	4.949E+02
1990	1.446E+05	1.858E+00	5.185E+02
1991	1.779E+05	2.354E+00	6.566E+02
1992	2.233E+05	3.036E+00	8.470E+02
1993	2.818E+05	3.915E+00	1.092E+03
1994	2.818E+05	3.762E+00	1.049E+03
1995	2.818E+05	3.614E+00	1.008E+03
1996	2.818E+05	3.473E+00	9.688E+02
1997	2.818E+05	3.336E+00	9.308E+02
1998	2.818E+05	3.206E+00	8.943E+02
1999	2.818E+05	3.080E+00	8.592E+02
2000	2.818E+05	2.959E+00	8.255E+02
2001	2.818E+05	2.843E+00	7.932E+02
2002	2.818E+05	2.732E+00	7.621E+02
2003	2.818E+05	2.625E+00	7.322E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 l/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1983      Current Year : 1998      Year Closed: 1999  
 Capacity : 382280 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 2799.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1984	4.344E+04	7.413E-01	2.068E+02
1985	8.689E+04	1.453E+00	4.055E+02
1986	1.303E+05	2.138E+00	5.964E+02
1987	1.738E+05	2.795E+00	7.798E+02
1988	2.172E+05	3.427E+00	9.560E+02
1989	2.607E+05	4.034E+00	1.125E+03
1990	3.041E+05	4.617E+00	1.288E+03
1991	3.157E+05	4.634E+00	1.293E+03
1992	3.301E+05	4.698E+00	1.311E+03
1993	3.412E+05	4.703E+00	1.312E+03
1994	3.479E+05	4.632E+00	1.292E+03
1995	3.598E+05	4.655E+00	1.299E+03
1996	3.694E+05	4.635E+00	1.293E+03
1997	3.795E+05	4.626E+00	1.290E+03
1998	3.823E+05	4.492E+00	1.253E+03
1999	3.823E+05	4.316E+00	1.204E+03
2000	3.823E+05	4.147E+00	1.157E+03
2001	3.823E+05	3.984E+00	1.111E+03
2002	3.823E+05	3.828E+00	1.068E+03
2003	3.823E+05	3.678E+00	1.026E+03
2004	3.823E+05	3.533E+00	9.858E+02
2005	3.823E+05	3.395E+00	9.471E+02
2006	3.823E+05	3.262E+00	9.100E+02
2007	3.823E+05	3.134E+00	8.743E+02
2008	3.823E+05	3.011E+00	8.400E+02

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Model Parameters
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Lo : 100.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0400 1/yr ***** User Mode Selection *****
NMOC : 595.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume
=====

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Landfill Parameters
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Year Opened : 1977   Current Year : 1994   Year Closed: 1994
Capacity : 486386 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 0.00 Mg/year
=====

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Model Results
=====

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Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	3.622E+04	6.180E-01	1.724E+02
1979	7.244E+04	1.212E+00	3.381E+02
1980	1.087E+05	1.782E+00	4.972E+02
1981	1.449E+05	2.330E+00	6.502E+02
1982	1.811E+05	2.857E+00	7.971E+02
1983	2.173E+05	3.363E+00	9.382E+02
1984	2.536E+05	3.849E+00	1.074E+03
1985	2.898E+05	4.316E+00	1.204E+03
1986	3.260E+05	4.765E+00	1.329E+03
1987	3.622E+05	5.196E+00	1.450E+03
1988	3.984E+05	5.611E+00	1.565E+03
1989	4.347E+05	6.009E+00	1.676E+03
1990	4.709E+05	6.391E+00	1.783E+03
1991	4.765E+05	6.236E+00	1.740E+03
1992	4.817E+05	6.080E+00	1.696E+03
1993	4.864E+05	5.922E+00	1.652E+03
1994	4.864E+05	5.690E+00	1.587E+03
1995	4.864E+05	5.467E+00	1.525E+03
1996	4.864E+05	5.252E+00	1.465E+03
1997	4.864E+05	5.046E+00	1.408E+03
1998	4.864E+05	4.848E+00	1.353E+03
1999	4.864E+05	4.658E+00	1.300E+03
2000	4.864E+05	4.476E+00	1.249E+03
2001	4.864E+05	4.300E+00	1.200E+03
2002	4.864E+05	4.132E+00	1.153E+03
2003	4.864E+05	3.970E+00	1.107E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1986      Current Year : 1997      Year Closed: 1998  
 Capacity : 64226 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 600.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1987	1.368E+04	2.335E-01	6.514E+01
1988	2.737E+04	4.578E-01	1.277E+02
1989	4.106E+04	6.734E-01	1.879E+02
1990	5.474E+04	8.805E-01	2.456E+02
1991	5.826E+04	9.060E-01	2.528E+02
1992	6.161E+04	9.276E-01	2.588E+02
1993	6.362E+04	9.256E-01	2.582E+02
1994	6.422E+04	8.996E-01	2.510E+02
1995	6.422E+04	8.643E-01	2.411E+02
1996	6.422E+04	8.304E-01	2.317E+02
1997	6.422E+04	7.978E-01	2.226E+02
1998	6.423E+04	7.666E-01	2.139E+02
1999	6.423E+04	7.365E-01	2.055E+02
2000	6.423E+04	7.077E-01	1.974E+02
2001	6.423E+04	6.799E-01	1.897E+02
2002	6.423E+04	6.533E-01	1.822E+02
2003	6.423E+04	6.276E-01	1.751E+02
2004	6.423E+04	6.030E-01	1.682E+02
2005	6.423E+04	5.794E-01	1.616E+02
2006	6.423E+04	5.567E-01	1.553E+02
2007	6.423E+04	5.348E-01	1.492E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1976    Current Year : 1994    Year Closed: 1995  
 Capacity : 706044 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 39224.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate (Mg/yr)	NMOC Emission Rate (Cubic m/yr)
1977	3.922E+04	6.692E-01	1.867E+02
1978	7.845E+04	1.312E+00	3.661E+02
1979	1.177E+05	1.930E+00	5.384E+02
1980	1.569E+05	2.524E+00	7.040E+02
1981	1.961E+05	3.094E+00	8.631E+02
1982	2.353E+05	3.642E+00	1.016E+03
1983	2.746E+05	4.168E+00	1.163E+03
1984	3.138E+05	4.674E+00	1.304E+03
1985	3.530E+05	5.160E+00	1.440E+03
1986	3.922E+05	5.627E+00	1.570E+03
1987	4.315E+05	6.076E+00	1.695E+03
1988	4.707E+05	6.507E+00	1.815E+03
1989	5.099E+05	6.921E+00	1.931E+03
1990	5.491E+05	7.319E+00	2.042E+03
1991	5.884E+05	7.701E+00	2.148E+03
1992	6.276E+05	8.068E+00	2.251E+03
1993	6.668E+05	8.421E+00	2.349E+03
1994	7.060E+05	8.760E+00	2.444E+03
1995	7.060E+05	8.417E+00	2.348E+03
1996	7.060E+05	8.087E+00	2.256E+03
1997	7.060E+05	7.770E+00	2.168E+03
1998	7.060E+05	7.465E+00	2.083E+03
1999	7.060E+05	7.172E+00	2.001E+03
2000	7.060E+05	6.891E+00	1.922E+03
2001	7.060E+05	6.621E+00	1.847E+03
2002	7.060E+05	6.361E+00	1.775E+03
2003	7.060E+05	6.112E+00	1.705E+03
2004	7.060E+05	5.872E+00	1.638E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1983      Current Year : 1998      Year Closed: 2008  
 Capacity : 7844933 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 143899.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1984	3.284E+05	5.604E+00	1.563E+03
1985	6.569E+05	1.099E+01	3.065E+03
1986	9.853E+05	1.616E+01	4.509E+03
1987	1.314E+06	2.113E+01	5.895E+03
1988	1.642E+06	2.591E+01	7.227E+03
1989	1.971E+06	3.049E+01	8.507E+03
1990	2.299E+06	3.490E+01	9.737E+03
1991	2.627E+06	3.913E+01	1.092E+04
1992	2.926E+06	4.270E+01	1.191E+04
1993	3.232E+06	4.624E+01	1.290E+04
1994	3.536E+06	4.962E+01	1.384E+04
1995	3.895E+06	5.380E+01	1.501E+04
1996	4.230E+06	5.740E+01	1.601E+04
1997	4.547E+06	6.056E+01	1.690E+04
1998	4.691E+06	6.064E+01	1.692E+04
1999	4.835E+06	6.072E+01	1.694E+04
2000	4.979E+06	6.079E+01	1.696E+04
2001	5.123E+06	6.087E+01	1.698E+04
2002	5.267E+06	6.093E+01	1.700E+04
2003	5.410E+06	6.100E+01	1.702E+04
2004	5.554E+06	6.106E+01	1.704E+04
2005	5.698E+06	6.112E+01	1.705E+04
2006	5.842E+06	6.118E+01	1.707E+04
2007	5.986E+06	6.124E+01	1.708E+04
2008	7.845E+06	9.055E+01	2.526E+04
2009	7.845E+06	8.700E+01	2.427E+04
2010	7.845E+06	8.359E+01	2.332E+04
2011	7.845E+06	8.031E+01	2.241E+04
2012	7.845E+06	7.717E+01	2.153E+04
2013	7.845E+06	7.414E+01	2.068E+04
2014	7.845E+06	7.123E+01	1.987E+04
2015	7.845E+06	6.844E+01	1.909E+04
2016	7.845E+06	6.576E+01	1.834E+04
2017	7.845E+06	6.318E+01	1.763E+04

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1994      Year Closed: 1994  
 Capacity : 631281 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	3.272E+04	5.582E-01	1.557E+02
1976	6.543E+04	1.095E+00	3.054E+02
1977	9.815E+04	1.610E+00	4.491E+02
1978	1.309E+05	2.105E+00	5.872E+02
1979	1.636E+05	2.581E+00	7.199E+02
1980	1.963E+05	3.038E+00	8.475E+02
1981	2.290E+05	3.477E+00	9.700E+02
1982	2.617E+05	3.899E+00	1.088E+03
1983	2.945E+05	4.304E+00	1.201E+03
1984	3.272E+05	4.693E+00	1.309E+03
1985	3.599E+05	5.068E+00	1.414E+03
1986	3.926E+05	5.427E+00	1.514E+03
1987	4.253E+05	5.773E+00	1.610E+03
1988	4.580E+05	6.104E+00	1.703E+03
1989	4.908E+05	6.423E+00	1.792E+03
1990	5.235E+05	6.730E+00	1.877E+03
1991	5.624E+05	7.130E+00	1.989E+03
1992	6.008E+05	7.505E+00	2.094E+03
1993	6.313E+05	7.731E+00	2.157E+03
1994	6.313E+05	7.428E+00	2.072E+03
1995	6.313E+05	7.137E+00	1.991E+03
1996	6.313E+05	6.857E+00	1.913E+03
1997	6.313E+05	6.588E+00	1.838E+03
1998	6.313E+05	6.330E+00	1.766E+03
1999	6.313E+05	6.082E+00	1.697E+03
2000	6.313E+05	5.843E+00	1.630E+03
2001	6.313E+05	5.614E+00	1.566E+03
2002	6.313E+05	5.394E+00	1.505E+03
2003	6.313E+05	5.183E+00	1.446E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1995      Year Closed: 1995  
 Capacity : 128820 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	9.870E+03	1.684E-01	4.698E+01
1979	1.974E+04	3.302E-01	9.212E+01
1980	2.961E+04	4.857E-01	1.355E+02
1981	3.948E+04	6.350E-01	1.772E+02
1982	4.935E+04	7.785E-01	2.172E+02
1983	5.922E+04	9.164E-01	2.557E+02
1984	6.909E+04	1.049E+00	2.926E+02
1985	7.896E+04	1.176E+00	3.281E+02
1986	8.883E+04	1.298E+00	3.622E+02
1987	9.870E+04	1.416E+00	3.950E+02
1988	1.086E+05	1.529E+00	4.265E+02
1989	1.184E+05	1.637E+00	4.568E+02
1990	1.283E+05	1.741E+00	4.858E+02
1991	1.284E+05	1.674E+00	4.670E+02
1992	1.284E+05	1.609E+00	4.490E+02
1993	1.285E+05	1.547E+00	4.316E+02
1994	1.288E+05	1.492E+00	4.164E+02
1995	1.288E+05	1.434E+00	4.000E+02
1996	1.288E+05	1.378E+00	3.844E+02
1997	1.288E+05	1.324E+00	3.693E+02
1998	1.288E+05	1.272E+00	3.548E+02
1999	1.288E+05	1.222E+00	3.409E+02
2000	1.288E+05	1.174E+00	3.275E+02
2001	1.288E+05	1.128E+00	3.147E+02
2002	1.288E+05	1.084E+00	3.023E+02
2003	1.288E+05	1.041E+00	2.905E+02
2004	1.288E+05	1.000E+00	2.791E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1976      Current Year : 1996      Year Closed: 1996  
 Capacity : 5000000 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1977	1.724E+05	2.941E+00	8.204E+02
1978	3.447E+05	5.766E+00	1.609E+03
1979	5.171E+05	8.481E+00	2.366E+03
1980	6.894E+05	1.109E+01	3.094E+03
1981	8.618E+05	1.360E+01	3.793E+03
1982	1.034E+06	1.600E+01	4.464E+03
1983	1.206E+06	1.832E+01	5.110E+03
1984	1.379E+06	2.054E+01	5.730E+03
1985	1.551E+06	2.267E+01	6.326E+03
1986	1.724E+06	2.473E+01	6.898E+03
1987	1.896E+06	2.670E+01	7.448E+03
1988	2.068E+06	2.859E+01	7.976E+03
1989	2.241E+06	3.041E+01	8.484E+03
1990	2.413E+06	3.216E+01	8.972E+03
1991	3.040E+06	4.160E+01	1.160E+04
1992	3.628E+06	5.000E+01	1.395E+04
1993	4.106E+06	5.619E+01	1.568E+04
1994	4.616E+06	6.269E+01	1.749E+04
1995	5.000E+06	6.678E+01	1.863E+04
1996	5.000E+06	6.417E+01	1.790E+04
1997	5.000E+06	6.165E+01	1.720E+04
1998	5.000E+06	5.923E+01	1.652E+04
1999	5.000E+06	5.691E+01	1.588E+04
2000	5.000E+06	5.468E+01	1.525E+04
2001	5.000E+06	5.253E+01	1.466E+04
2002	5.000E+06	5.047E+01	1.408E+04
2003	5.000E+06	4.850E+01	1.353E+04
2004	5.000E+06	4.659E+01	1.300E+04
2005	5.000E+06	4.477E+01	1.249E+04

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1993      Year Closed: 1993  
 Capacity : 276430 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.289E+04	2.199E-01	6.135E+01
1977	2.578E+04	4.312E-01	1.203E+02
1978	3.866E+04	6.342E-01	1.769E+02
1979	5.155E+04	8.292E-01	2.313E+02
1980	6.444E+04	1.017E+00	2.836E+02
1981	7.733E+04	1.197E+00	3.338E+02
1982	9.022E+04	1.370E+00	3.821E+02
1983	1.031E+05	1.536E+00	4.285E+02
1984	1.160E+05	1.695E+00	4.730E+02
1985	1.289E+05	1.849E+00	5.158E+02
1986	1.418E+05	1.996E+00	5.569E+02
1987	1.547E+05	2.138E+00	5.964E+02
1988	1.675E+05	2.274E+00	6.344E+02
1989	1.804E+05	2.405E+00	6.709E+02
1990	1.933E+05	2.530E+00	7.059E+02
1991	2.345E+05	3.134E+00	8.743E+02
1992	2.764E+05	3.726E+00	1.040E+03
1993	2.764E+05	3.580E+00	9.988E+02
1994	2.764E+05	3.440E+00	9.596E+02
1995	2.764E+05	3.305E+00	9.220E+02
1996	2.764E+05	3.175E+00	8.858E+02
1997	2.764E+05	3.051E+00	8.511E+02
1998	2.764E+05	2.931E+00	8.177E+02
1999	2.764E+05	2.816E+00	7.857E+02
2000	2.764E+05	2.706E+00	7.549E+02
2001	2.764E+05	2.600E+00	7.253E+02
2002	2.764E+05	2.498E+00	6.968E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1980    Current Year : 1989    Year Closed: 1989  
 Capacity : 244762 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1981	2.720E+04	4.641E-01	1.295E+02
1982	5.440E+04	9.100E-01	2.539E+02
1983	8.160E+04	1.338E+00	3.734E+02
1984	1.088E+05	1.750E+00	4.882E+02
1985	1.360E+05	2.145E+00	5.985E+02
1986	1.632E+05	2.525E+00	7.045E+02
1987	1.904E+05	2.890E+00	8.064E+02
1988	2.176E+05	3.241E+00	9.042E+02
1989	2.448E+05	3.578E+00	9.981E+02
1990	2.448E+05	3.437E+00	9.589E+02
1991	2.448E+05	3.303E+00	9.213E+02
1992	2.448E+05	3.173E+00	8.852E+02
1993	2.448E+05	3.049E+00	8.505E+02
1994	2.448E+05	2.929E+00	8.172E+02
1995	2.448E+05	2.814E+00	7.851E+02
1996	2.448E+05	2.704E+00	7.543E+02
1997	2.448E+05	2.598E+00	7.248E+02
1998	2.448E+05	2.496E+00	6.963E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1978      Current Year : 1994      Year Closed: 1994  
 Capacity : 141209 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1979	1.137E+04	1.939E-01	5.411E+01
1980	2.273E+04	3.803E-01	1.061E+02
1981	3.410E+04	5.593E-01	1.560E+02
1982	4.547E+04	7.313E-01	2.040E+02
1983	5.684E+04	8.966E-01	2.501E+02
1984	6.820E+04	1.055E+00	2.944E+02
1985	7.957E+04	1.208E+00	3.370E+02
1986	9.094E+04	1.355E+00	3.779E+02
1987	1.023E+05	1.495E+00	4.172E+02
1988	1.137E+05	1.631E+00	4.549E+02
1989	1.250E+05	1.761E+00	4.912E+02
1990	1.364E+05	1.886E+00	5.260E+02
1991	1.373E+05	1.827E+00	5.097E+02
1992	1.394E+05	1.791E+00	4.997E+02
1993	1.412E+05	1.752E+00	4.887E+02
1994	1.412E+05	1.683E+00	4.695E+02
1995	1.412E+05	1.617E+00	4.511E+02
1996	1.412E+05	1.554E+00	4.334E+02
1997	1.412E+05	1.493E+00	4.165E+02
1998	1.412E+05	1.434E+00	4.001E+02
1999	1.412E+05	1.378E+00	3.844E+02
2000	1.412E+05	1.324E+00	3.694E+02
2001	1.412E+05	1.272E+00	3.549E+02
2002	1.412E+05	1.222E+00	3.410E+02
2003	1.412E+05	1.174E+00	3.276E+02



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                          Model Parameters
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```

Lo : 100.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0400 1/yr ***** User Mode Selection *****
NMOC : 595.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume

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=====
                          Landfill Parameters
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Year Opened : 1980   Current Year : 1994   Year Closed: 1994
Capacity : 305952 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 0.00 Mg/year

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                          Model Results
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Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1981	7.715E+03	1.316E-01	3.672E+01
1982	1.543E+04	2.581E-01	7.201E+01
1983	2.314E+04	3.796E-01	1.059E+02
1984	3.086E+04	4.964E-01	1.385E+02
1985	3.858E+04	6.085E-01	1.698E+02
1986	4.629E+04	7.163E-01	1.998E+02
1987	5.400E+04	8.199E-01	2.287E+02
1988	6.172E+04	9.193E-01	2.565E+02
1989	6.944E+04	1.015E+00	2.831E+02
1990	7.715E+04	1.107E+00	3.088E+02
1991	1.672E+05	2.601E+00	7.255E+02
1992	2.364E+05	3.678E+00	1.026E+03
1993	3.060E+05	4.721E+00	1.317E+03
1994	3.060E+05	4.536E+00	1.265E+03
1995	3.060E+05	4.358E+00	1.216E+03
1996	3.060E+05	4.187E+00	1.168E+03
1997	3.060E+05	4.023E+00	1.122E+03
1998	3.060E+05	3.865E+00	1.078E+03
1999	3.060E+05	3.714E+00	1.036E+03
2000	3.060E+05	3.568E+00	9.954E+02
2001	3.060E+05	3.428E+00	9.564E+02
2002	3.060E+05	3.294E+00	9.189E+02
2003	3.060E+05	3.165E+00	8.829E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1983      Current Year : 1995      Year Closed: 1995  
 Capacity : 82372 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1984	1.160E+04	1.979E-01	5.520E+01
1985	2.319E+04	3.879E-01	1.082E+02
1986	3.479E+04	5.706E-01	1.592E+02
1987	4.638E+04	7.461E-01	2.081E+02
1988	5.798E+04	9.147E-01	2.552E+02
1989	6.958E+04	1.077E+00	3.004E+02
1990	8.117E+04	1.232E+00	3.438E+02
1991	8.145E+04	1.189E+00	3.316E+02
1992	8.186E+04	1.149E+00	3.206E+02
1993	8.214E+04	1.109E+00	3.093E+02
1994	8.237E+04	1.069E+00	2.983E+02
1995	8.237E+04	1.027E+00	2.866E+02
1996	8.237E+04	9.871E-01	2.754E+02
1997	8.237E+04	9.484E-01	2.646E+02
1998	8.237E+04	9.112E-01	2.542E+02
1999	8.237E+04	8.755E-01	2.442E+02
2000	8.237E+04	8.411E-01	2.347E+02
2001	8.237E+04	8.082E-01	2.255E+02
2002	8.237E+04	7.765E-01	2.166E+02
2003	8.237E+04	7.460E-01	2.081E+02
2004	8.237E+04	7.168E-01	2.000E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1994      Year Closed: 1994  
 Capacity : 470696 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	3.343E+04	5.704E-01	1.591E+02
1979	6.686E+04	1.118E+00	3.120E+02
1980	1.003E+05	1.645E+00	4.589E+02
1981	1.337E+05	2.151E+00	6.001E+02
1982	1.672E+05	2.637E+00	7.357E+02
1983	2.006E+05	3.104E+00	8.659E+02
1984	2.340E+05	3.553E+00	9.911E+02
1985	2.674E+05	3.984E+00	1.111E+03
1986	3.009E+05	4.398E+00	1.227E+03
1987	3.343E+05	4.796E+00	1.338E+03
1988	3.677E+05	5.178E+00	1.445E+03
1989	4.012E+05	5.546E+00	1.547E+03
1990	4.346E+05	5.899E+00	1.646E+03
1991	4.504E+05	5.937E+00	1.656E+03
1992	4.616E+05	5.895E+00	1.645E+03
1993	4.707E+05	5.819E+00	1.623E+03
1994	4.707E+05	5.591E+00	1.560E+03
1995	4.707E+05	5.372E+00	1.499E+03
1996	4.707E+05	5.161E+00	1.440E+03
1997	4.707E+05	4.959E+00	1.383E+03
1998	4.707E+05	4.764E+00	1.329E+03
1999	4.707E+05	4.578E+00	1.277E+03
2000	4.707E+05	4.398E+00	1.227E+03
2001	4.707E+05	4.226E+00	1.179E+03
2002	4.707E+05	4.060E+00	1.133E+03
2003	4.707E+05	3.901E+00	1.088E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1992      Year Closed: 1992  
 Capacity : 117547 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	8.670E+03	1.479E-01	4.127E+01
1979	1.734E+04	2.901E-01	8.092E+01
1980	2.601E+04	4.266E-01	1.190E+02
1981	3.468E+04	5.578E-01	1.556E+02
1982	4.335E+04	6.839E-01	1.908E+02
1983	5.202E+04	8.050E-01	2.246E+02
1984	6.069E+04	9.213E-01	2.570E+02
1985	6.936E+04	1.033E+00	2.882E+02
1986	7.803E+04	1.141E+00	3.182E+02
1987	8.670E+04	1.244E+00	3.470E+02
1988	9.537E+04	1.343E+00	3.747E+02
1989	1.040E+05	1.438E+00	4.012E+02
1990	1.127E+05	1.530E+00	4.268E+02
1991	1.175E+05	1.552E+00	4.330E+02
1992	1.175E+05	1.491E+00	4.161E+02
1993	1.175E+05	1.433E+00	3.998E+02
1994	1.175E+05	1.377E+00	3.841E+02
1995	1.175E+05	1.323E+00	3.690E+02
1996	1.175E+05	1.271E+00	3.546E+02
1997	1.175E+05	1.221E+00	3.407E+02
1998	1.175E+05	1.173E+00	3.273E+02
1999	1.175E+05	1.127E+00	3.145E+02
2000	1.175E+05	1.083E+00	3.021E+02
2001	1.175E+05	1.041E+00	2.903E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1978      Current Year : 1990      Year Closed: 1990  
 Capacity : 353022 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1979	3.209E+04	5.475E-01	1.527E+02
1980	6.418E+04	1.074E+00	2.995E+02
1981	9.627E+04	1.579E+00	4.405E+02
1982	1.284E+05	2.065E+00	5.760E+02
1983	1.604E+05	2.531E+00	7.062E+02
1984	1.925E+05	2.979E+00	8.312E+02
1985	2.246E+05	3.410E+00	9.514E+02
1986	2.567E+05	3.824E+00	1.067E+03
1987	2.888E+05	4.222E+00	1.178E+03
1988	3.209E+05	4.604E+00	1.284E+03
1989	3.530E+05	4.971E+00	1.387E+03
1990	3.530E+05	4.776E+00	1.332E+03
1991	3.530E+05	4.589E+00	1.280E+03
1992	3.530E+05	4.409E+00	1.230E+03
1993	3.530E+05	4.236E+00	1.182E+03
1994	3.530E+05	4.070E+00	1.135E+03
1995	3.530E+05	3.910E+00	1.091E+03
1996	3.530E+05	3.757E+00	1.048E+03
1997	3.530E+05	3.610E+00	1.007E+03
1998	3.530E+05	3.468E+00	9.676E+02
1999	3.530E+05	3.332E+00	9.296E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1995      Year Closed: 1995  
 Capacity : 313797 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.866E+04	3.184E-01	8.883E+01
1977	3.732E+04	6.243E-01	1.742E+02
1978	5.598E+04	9.182E-01	2.562E+02
1979	7.464E+04	1.201E+00	3.349E+02
1980	9.330E+04	1.472E+00	4.106E+02
1981	1.120E+05	1.733E+00	4.834E+02
1982	1.306E+05	1.983E+00	5.532E+02
1983	1.493E+05	2.224E+00	6.204E+02
1984	1.679E+05	2.455E+00	6.849E+02
1985	1.866E+05	2.677E+00	7.468E+02
1986	2.053E+05	2.890E+00	8.064E+02
1987	2.239E+05	3.096E+00	8.636E+02
1988	2.426E+05	3.293E+00	9.186E+02
1989	2.613E+05	3.482E+00	9.714E+02
1990	2.799E+05	3.664E+00	1.022E+03
1991	2.929E+05	3.742E+00	1.044E+03
1992	3.042E+05	3.788E+00	1.057E+03
1993	3.096E+05	3.731E+00	1.041E+03
1994	3.138E+05	3.656E+00	1.020E+03
1995	3.138E+05	3.513E+00	9.801E+02
1996	3.138E+05	3.375E+00	9.417E+02
1997	3.138E+05	3.243E+00	9.048E+02
1998	3.138E+05	3.116E+00	8.693E+02
1999	3.138E+05	2.994E+00	8.352E+02
2000	3.138E+05	2.876E+00	8.025E+02
2001	3.138E+05	2.764E+00	7.710E+02
2002	3.138E+05	2.655E+00	7.408E+02
2003	3.138E+05	2.551E+00	7.117E+02
2004	3.138E+05	2.451E+00	6.838E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1998      Year Closed: 2005  
 Capacity : 10355310 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 447325.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	2.746E+05	4.686E+00	1.307E+03
1979	5.493E+05	9.188E+00	2.563E+03
1980	8.239E+05	1.351E+01	3.770E+03
1981	1.099E+06	1.767E+01	4.930E+03
1982	1.373E+06	2.166E+01	6.044E+03
1983	1.648E+06	2.550E+01	7.114E+03
1984	1.923E+06	2.919E+01	8.142E+03
1985	2.197E+06	3.273E+01	9.131E+03
1986	2.472E+06	3.613E+01	1.008E+04
1987	2.746E+06	3.940E+01	1.099E+04
1988	3.021E+06	4.254E+01	1.187E+04
1989	3.296E+06	4.556E+01	1.271E+04
1990	3.570E+06	4.846E+01	1.352E+04
1991	3.845E+06	5.125E+01	1.430E+04
1992	4.290E+06	5.683E+01	1.586E+04
1993	4.749E+06	6.244E+01	1.742E+04
1994	5.207E+06	6.780E+01	1.892E+04
1995	5.671E+06	7.306E+01	2.038E+04
1996	6.334E+06	8.151E+01	2.274E+04
1997	7.076E+06	9.097E+01	2.538E+04
1998	7.523E+06	9.503E+01	2.651E+04
1999	7.971E+06	9.894E+01	2.760E+04
2000	8.418E+06	1.027E+02	2.865E+04
2001	8.865E+06	1.063E+02	2.965E+04
2002	9.313E+06	1.098E+02	3.062E+04
2003	9.760E+06	1.131E+02	3.155E+04
2004	1.021E+07	1.163E+02	3.244E+04
2005	1.036E+07	1.143E+02	3.187E+04
2006	1.036E+07	1.098E+02	3.062E+04
2007	1.036E+07	1.055E+02	2.942E+04
2008	1.036E+07	1.013E+02	2.827E+04
2009	1.036E+07	9.736E+01	2.716E+04
2010	1.036E+07	9.354E+01	2.610E+04
2011	1.036E+07	8.987E+01	2.507E+04
2012	1.036E+07	8.635E+01	2.409E+04
2013	1.036E+07	8.296E+01	2.315E+04
2014	1.036E+07	7.971E+01	2.224E+04

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1977      Current Year : 1995      Year Closed: 1996  
 Capacity : 276617 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 344.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1978	1.755E+04	2.994E-01	8.353E+01
1979	3.510E+04	5.871E-01	1.638E+02
1980	5.265E+04	8.635E-01	2.409E+02
1981	7.020E+04	1.129E+00	3.150E+02
1982	8.774E+04	1.384E+00	3.862E+02
1983	1.053E+05	1.629E+00	4.546E+02
1984	1.228E+05	1.865E+00	5.203E+02
1985	1.404E+05	2.091E+00	5.834E+02
1986	1.579E+05	2.309E+00	6.441E+02
1987	1.755E+05	2.518E+00	7.023E+02
1988	1.930E+05	2.718E+00	7.583E+02
1989	2.106E+05	2.911E+00	8.121E+02
1990	2.281E+05	3.096E+00	8.638E+02
1991	2.390E+05	3.161E+00	8.817E+02
1992	2.505E+05	3.232E+00	9.016E+02
1993	2.637E+05	3.331E+00	9.294E+02
1994	2.763E+05	3.415E+00	9.527E+02
1995	2.766E+05	3.287E+00	9.170E+02
1996	2.766E+05	3.158E+00	8.810E+02
1997	2.766E+05	3.034E+00	8.465E+02
1998	2.766E+05	2.915E+00	8.133E+02
1999	2.766E+05	2.801E+00	7.814E+02
2000	2.766E+05	2.691E+00	7.508E+02
2001	2.766E+05	2.586E+00	7.213E+02
2002	2.766E+05	2.484E+00	6.931E+02
2003	2.766E+05	2.387E+00	6.659E+02
2004	2.766E+05	2.293E+00	6.398E+02
2005	2.766E+05	2.203E+00	6.147E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
 =====

Year Opened : 1974      Current Year : 1995      Year Closed: 1995  
 Capacity : 238300 Mg  
 Average Acceptance Rate Required from  
           Current Year to Closure Year : 0.00 Mg/year

=====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1975	1.242E+04	2.120E-01	5.913E+01
1976	2.485E+04	4.156E-01	1.159E+02
1977	3.727E+04	6.113E-01	1.705E+02
1978	4.969E+04	7.993E-01	2.230E+02
1979	6.212E+04	9.799E-01	2.734E+02
1980	7.454E+04	1.153E+00	3.218E+02
1981	8.696E+04	1.320E+00	3.683E+02
1982	9.938E+04	1.480E+00	4.130E+02
1983	1.118E+05	1.634E+00	4.559E+02
1984	1.242E+05	1.782E+00	4.972E+02
1985	1.367E+05	1.924E+00	5.368E+02
1986	1.491E+05	2.061E+00	5.749E+02
1987	1.615E+05	2.192E+00	6.115E+02
1988	1.739E+05	2.318E+00	6.467E+02
1989	1.863E+05	2.439E+00	6.804E+02
1990	1.988E+05	2.555E+00	7.129E+02
1991	2.098E+05	2.643E+00	7.373E+02
1992	2.192E+05	2.700E+00	7.532E+02
1993	2.279E+05	2.742E+00	7.651E+02
1994	2.383E+05	2.812E+00	7.846E+02
1995	2.383E+05	2.702E+00	7.539E+02
1996	2.383E+05	2.596E+00	7.243E+02
1997	2.383E+05	2.495E+00	6.959E+02
1998	2.383E+05	2.397E+00	6.687E+02
1999	2.383E+05	2.303E+00	6.424E+02
2000	2.383E+05	2.212E+00	6.172E+02
2001	2.383E+05	2.126E+00	5.930E+02
2002	2.383E+05	2.042E+00	5.698E+02
2003	2.383E+05	1.962E+00	5.474E+02
2004	2.383E+05	1.885E+00	5.260E+02

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

 =====  
 Landfill Parameters  
 =====

Year Opened : 1975      Current Year : 1992      Year Closed: 1992  
 Capacity : 1431511 Mg  
 Average Acceptance Rate Required from  
     Current Year to Closure Year : 0.00 Mg/year

 =====  
 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	5.423E+04	9.253E-01	2.582E+02
1977	1.085E+05	1.814E+00	5.062E+02
1978	1.627E+05	2.669E+00	7.445E+02
1979	2.169E+05	3.489E+00	9.735E+02
1980	2.712E+05	4.278E+00	1.193E+03
1981	3.254E+05	5.035E+00	1.405E+03
1982	3.796E+05	5.763E+00	1.608E+03
1983	4.339E+05	6.463E+00	1.803E+03
1984	4.881E+05	7.135E+00	1.990E+03
1985	5.423E+05	7.780E+00	2.171E+03
1986	5.966E+05	8.401E+00	2.344E+03
1987	6.508E+05	8.996E+00	2.510E+03
1988	7.050E+05	9.569E+00	2.670E+03
1989	7.593E+05	1.012E+01	2.823E+03
1990	8.135E+05	1.065E+01	2.971E+03
1991	1.154E+06	1.603E+01	4.472E+03
1992	1.432E+06	2.015E+01	5.620E+03
1993	1.432E+06	1.936E+01	5.400E+03
1994	1.432E+06	1.860E+01	5.188E+03
1995	1.432E+06	1.787E+01	4.985E+03
1996	1.432E+06	1.717E+01	4.789E+03
1997	1.432E+06	1.649E+01	4.602E+03
1998	1.432E+06	1.585E+01	4.421E+03
1999	1.432E+06	1.523E+01	4.248E+03
2000	1.432E+06	1.463E+01	4.081E+03
2001	1.432E+06	1.406E+01	3.921E+03

=====  
 Model Parameters  
 =====

Lo : 100.00 m<sup>3</sup> / Mg \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 k : 0.0400 1/yr \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 NMOC : 595.00 ppmv \*\*\*\*\* User Mode Selection \*\*\*\*\*  
 Methane : 50.0000 % volume  
 Carbon Dioxide : 50.0000 % volume

=====  
 Landfill Parameters  
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Year Opened : 1975      Current Year : 1990      Year Closed: 1991  
 Capacity : 211813 Mg  
 Average Acceptance Rate Required from  
             Current Year to Closure Year : 14120.00 Mg/year

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 Model Results  
 =====

Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1976	1.412E+04	2.409E-01	6.721E+01
1977	2.824E+04	4.724E-01	1.318E+02
1978	4.236E+04	6.948E-01	1.938E+02
1979	5.648E+04	9.085E-01	2.534E+02
1980	7.060E+04	1.114E+00	3.107E+02
1981	8.472E+04	1.311E+00	3.657E+02
1982	9.884E+04	1.501E+00	4.186E+02
1983	1.130E+05	1.683E+00	4.694E+02
1984	1.271E+05	1.858E+00	5.182E+02
1985	1.412E+05	2.026E+00	5.651E+02
1986	1.553E+05	2.187E+00	6.102E+02
1987	1.694E+05	2.342E+00	6.534E+02
1988	1.836E+05	2.491E+00	6.950E+02
1989	1.977E+05	2.635E+00	7.350E+02
1990	2.118E+05	2.772E+00	7.734E+02
1991	2.118E+05	2.664E+00	7.431E+02
1992	2.118E+05	2.559E+00	7.140E+02
1993	2.118E+05	2.459E+00	6.860E+02
1994	2.118E+05	2.362E+00	6.591E+02
1995	2.118E+05	2.270E+00	6.332E+02
1996	2.118E+05	2.181E+00	6.084E+02
1997	2.118E+05	2.095E+00	5.846E+02
1998	2.118E+05	2.013E+00	5.616E+02
1999	2.118E+05	1.934E+00	5.396E+02
2000	2.118E+05	1.858E+00	5.185E+02



## APPENDIX E

### Memorandum of Understanding between Solid Waste Management Program and Air Pollution Control Program



MEMORANDUM OF UNDERSTANDING  
BETWEEN

Air Pollution Control Program (APCP)  
and  
Solid Waste Management Program (SWMP)  
October 21, 1996

Intent of Memorandum of Understanding

This Memorandum of Understanding establishes a mutual understanding for coordinating interrelated permit and enforcement activities. This memorandum will designate which program has the lead in the areas regulated under the Missouri Solid Waste Management Law and the Missouri Air Conservation Law. This designation will enhance each program's ability to ensure that the regulated community is advised as early in the planning phase as possible of all potential environmental permits or approvals required; that facilities requiring multiple program approvals or permits are not given conflicting demands or instructions; and that the affected programs can develop the most reasonable approach to facility regulation which minimizes negative environmental impact.

Staff Contacts

APCP: Randy Raymond, Deputy Program Director  
SWMP: Jim Hull, Chief, Engineering and Planning Section  
APCP: Steve Feeler, Chief, Enforcement Section  
SWMP: Jim Bell, Chief, Enforcement Section

Facility Categories of Mutual Interest

- A. Solid waste disposal areas and solid waste processing facilities, including infectious waste processing facilities.
- B. New sources of air emissions.

Activities Requiring Coordination

- A. Solid waste disposal areas and solid waste processing facilities. (As defined by 10 CSR 80-2.010 of the Missouri Solid Waste Management Rules.)
  - 1. The SWMP shall continue to be the lead program for the review, approval, inspection and enforcement of all aspects of the design and operation of a solid waste disposal area/processing facility, except as noted under Number 2 and Number 3.

2. The APCP shall be the lead program for the review, approval, inspection and enforcement of the following:
    - a. The emission points of a landfill gas system for those solid waste disposal areas which dispose of more than 100,000 tons per year or have non-methane organic compound emissions that exceed 45 megagrams (25 megagrams for the St. Louis nonattainment area).
    - b. Any incinerator unit which proposes to combust or incinerate solid waste or infectious waste generated off-site submitted as part of a solid waste processing facility permit;
    - c. Any facility which proposes to combust or incinerate solid or infectious waste generated on-site.
  3. The SWMP and the APCP will jointly review and approve landfill gas emission collection and control systems which are required as a result of federal New Source Performance Standards (NSPS) and Emission Guidelines (EG) for municipal solid waste landfills.
- B. New sources of air emissions. (As defined by Missouri Air Conservation Law and Rules.)
1. The APCP shall continue to be the lead program for the review, approval, inspection and enforcement of new sources of air emissions.
  2. The SWMP shall be the lead program for the review, approval, inspection and enforcement of the design and operation of any new source of air emissions dealing with:
    - a. Off-site solid and infectious waste processing facilities except as noted in A.2.b.
    - b. Ash management and disposal.

#### Program Coordination Responsibilities

The APCP and the SWMP agree to the following responsibilities in the coordination process:

- A. Utilization of the Division of Environmental Quality PATS (Permits Action Tracking System) to communicate receipt and status of applications.

- B. During review of a permit application or permit modification, the lead program shall require evidence that the applicant/permittee is in compliance with, or is in the process of complying with the other program's regulatory requirements.
- C. Forwarding DEQ concurrence of action forms (copies attached), with pertinent information, prior to recommending issuance of permits, permit modifications, or approval requests as outlined in A.1., A.2., A.3., B.1., and B.2., and prior to finalizing rule or policy additions/revisions that affect areas of mutual interest.
- D. Reviewing and returning concurrence of action forms within fourteen (14) days of receipt.
- E. All information sent to potential applicants will recommend that the applicant contact the other program regarding other potential permit or approval requirements.
- F. Comment letters to applicants that mention the other program's requirements will be copied and sent to that program.
- G. Language will be included in all permits, permit modifications, and approvals stating that the permit/approval does not waive the responsibility for compliance with other federal, state, and local regulatory requirements.
- H. Enforcement actions taken by one program against facilities of mutual interest will be copied and sent to the other program.

The SWMP agrees to communicate the following comment to all applicants/permittees that fall into the categories of interest to the APCP:

You must contact the Department of Natural Resources' Air Pollution Control Program, at (573) 751-4817, to apply for and obtain any necessary permits for this facility as required by Missouri Air Conservation Law and Regulations.

The APCP agrees to communicate the following comment to all applicants/permittees that fall into the categories of interest to the SWMP:

All wastes processed, treated, stored, or disposed of by this facility shall be handled according to all applicable Missouri Solid Waste Management Law and Regulations. The Department of Natural Resources' Solid Waste Management Program may be contacted at (573) 751-5401 to help you determine applicable requirements.

MOU - ACP & SWMP  
Page 4

The undersigned directors agree to encourage both formal and informal communications between staffs. This Memorandum of Understanding will be reviewed annually, and any required revisions will be initiated by the program requiring the revision.

Original signed by  
Roger Randolph

Roger Randolph  
Staff Director, ACP

Original signed by  
Cindy Kemper

Cindy Kemper  
Staff Director, SWMP

## APPENDIX F

Documentation of public notice, public hearing, and adoption for Section 111(d) State Plan for Implementing the Municipal Solid Waste Landfill Emission Guidelines for Missouri and 10 CSR 10-6.310



MISSOURI AIR CONSERVATION COMMISSION  
WILL HOLD PUBLIC HEARING

JEFFERSON CITY, MO -- The Missouri Air Conservation Commission will hold a public hearing on Restrictions of Emissions from Municipal Solid Waste Landfills rule and other issues on Thursday, March 27, 1997. The public hearing will begin at 9 a.m. at the Radisson Hotel, 11228 Lone Eagle Drive, Bridgeton, Missouri.

The Commission will hear testimony related to the following rule actions.

\* 10 CSR 10-6.310 Restriction of Emissions from Municipal Solid Waste Landfills

This rule requires owners of municipal solid waste landfills to report their landfill's design capacity and their landfill's non-methane organic compound (NMOC) emissions if the design capacity is equal to or greater than 2.5 million megagrams or 2.5 million cubic meters. Landfills having design capacities equal to or greater than 2.5 million megagrams or 2.5 million cubic meters and NMOC emission rates of 50 megagrams or greater shall be required to design, install and operate a gas collection and control system.

\* State Plan for Implementing the Municipal Solid Waste Landfill Emission Guidelines

The state is required to develop a Section 111(d) State Plan to implement and enforce the Environmental Protection Agency's (EPA) Emission Guidelines for Municipal Solid Waste (MSW) Landfills and submit this plan to EPA for approval. These Emission Guidelines were promulgated on March 12, 1996 in the Federal Register (61 FR 9905), and codified in 40 CFR Part 60, Subpart Cc. The Emission Guidelines apply to existing Missouri solid waste landfills that commenced construction, modification, or reconstruction before May 30, 1991 and that have accepted waste at any time since November 8, 1987 or have additional capacity for future waste deposition.

\* 10 CSR 10-5.375 Motor Vehicle Emission Inspection Waiver

This proposed new rule defines and sets "waiver spending limits" as a phase-in measure prior to the beginning of the enhanced testing program in the St. Louis area. This is a requirement based on statute changes. This change requires owners of vehicles to continue to attempt to repair vehicles to comply with the emission standards, until a spending limit is reached. Owners of vehicles of model years older than 1981 must spend \$75 prior to a waiver being issued. Owners of newer vehicles must spend \$200 before being eligible to receive a waiver

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The Commission holds public hearings under the

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AIR POLLUTION CONTROL PGM

AFFIDAVIT OF PUBLICATION

THE KANSAS CITY STAR COMPANY, publishers of THE KANSAS CITY STAR, a newspaper published in the City of Kansas City, County of Jackson, State of Missouri, confirms that the notice and/or advertisement of

Dept. of Natural Resources  
PO Box 176  
Jefferson City, MO 65102  
WA5342628

a true copy of which is hereto attached, was duly published in the above said newspaper

FOR THE PERIOD OF: 1 Day(s)

COMMENCING: February 26

ENDING: February 26

STAR EDITION: February 26

STAR PAPER # 162

VOLUME # 117

Subscribed and sworn to before me, this 28th day of February, 1997. I certify that I was duly qualified as a Notary Public for the State of Missouri, commissioned in Jackson County, Missouri. My commission expires August 18, 1998.

*Laura S. Keeling*  
LAURA S. KEELING, NOTARY

Assessment of

Department of Natural Resources  
Box 176  
Jefferson City, MO 65102  
WA5342628

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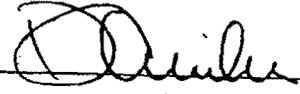
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# AFFIDAVIT OF PUBLICATION

STATE OF MISSOURI)  
COUNTY OF BUTLER) ss.

I, Don Schrieber, being duly sworn according to law, state that I am PUBLISHER of the DAILY AMERICAN REPUBLIC, a daily newspaper of general circulation in the Counties of Butler, Ripley, Carter, Wayne, Stoddard, New Madrid and Pemiscot; which newspaper has been admitted to the Post Office as second class matter in City of Poplar Bluff, Missouri, the city of publication; which newspaper has been published regularly and consecutively for a period of three years and has a list of bona fide subscribers voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time and that such newspaper has complied with the provisions of Section 493.050, Revised Statutes of Missouri 1969. The affixed notice appeared in said newspaper in the following consecutive issues.

1st Insertion	Vol. 129	No. 40	26 <sup>TH</sup> day of FEB 1997
2nd Insertion	Vol.....	No.....	..... day of ..... 19.....
3rd Insertion	Vol.....	No.....	..... day of ..... 19.....
4th Insertion	Vol.....	No.....	..... day of ..... 19.....
5th Insertion	Vol.....	No.....	..... day of ..... 19.....
6th Insertion	Vol.....	No.....	..... day of ..... 19.....
7th Insertion	Vol.....	No.....	..... day of ..... 19.....
8th Insertion	Vol.....	No.....	..... day of ..... 19.....
9th Insertion	Vol.....	No.....	..... day of ..... 19.....
10th Insertion	Vol.....	No.....	..... day of ..... 19.....

  
PUBLISHER

Subscribed and sworn to before me this 27<sup>TH</sup> day of FEBRUARY 19 97.

  
NOTARY PUBLIC

My commission expires MARCH 26, 2000

Publication Fee \$ 147.93

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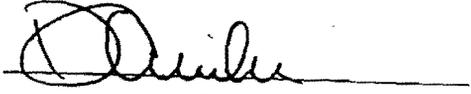
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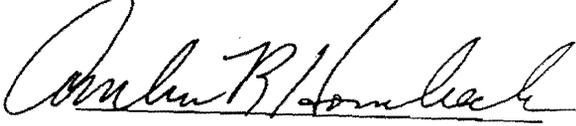
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**of our LOAN OFFICE**  
**800-569-03**  
**EDWARDS HOME**

3rd Insertion	Vol.....	No.....	day of.....	19.....
4th Insertion	Vol.....	No.....	day of.....	19.....
5th Insertion	Vol.....	No.....	day of.....	19.....
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10th Insertion	Vol.....	No.....	day of.....	19.....

  
 PUBLISHER

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 NOTARY PUBLIC

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Publication Fee \$ 149.93

THIS IS NOT AN INVOICE  
RECEIVED

'97 MAR 6 AM 10 47

AIR POLLUTION  
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AFFIDAVIT OF PUBLICATION

STATE OF MISSOURI

County of Boone

Melisa Hong being duly sworn according to law, state that I am one of the publishers of the Columbia Daily Tribune, a daily newspaper of general circulation in the County of Boone where located; which has been admitted to the Post Office as second class matter in the City of Columbia, Missouri, the city of publication; which newspaper has been published regularly and consecutively for a period of three years and has a list of bona fide subscribers voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that such newspaper has complied with the provision of Section 493.050, Revised Statutes of Missouri, 1949. The affixed notice appeared in said newspaper on the following day consecutive issues:

1st Insertion	February 25, 1997
2nd Insertion	19
3rd Insertion	19
4th Insertion	19
5th Insertion	19
6th Insertion	19
7th Insertion	19
8th Insertion	19
9th Insertion	19
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11th Insertion	19
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14th Insertion	19
15th Insertion	19
16th Insertion	19
17th Insertion	19
18th Insertion	19
19th Insertion	19
20th Insertion	19
21st Insertion	19

PRINTER FEE 105.12  
TRIBUNE PUBLISHING COMPANY

By Melisa Hong  
LM

Subscribed and sworn before me this  
day of March, 1997

Jill M. Gates  
Notary Public

My Commission Expires May 24, 1999

JILL M. GATES  
Notary Public - Notary Seal  
STATE OF MISSOURI  
Boone County  
My Commission Expires: May 24, 1999

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# ST. LOUIS POST-DISPATCH

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AIR POLLUTION  
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ATTN: J JANOWIAK  
PO BOX 176  
JEFFERSON CITY MO 65102

THE ATTACHED ADVERTISEMENT WAS PUBLISHED IN THE ST. LOUIS  
POST-DISPATCH IN CLASSIFICATION 4305, 1 TIME, STARTING ON  
FEBRUARY 26, 1997 AND ENDING ON FEBRUARY 26, 1997.

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CLASSIFIED ADVERTISING MANAGER

SWORN TO AND SUBSCRIBED BEFORE ME,  
THIS 27 DAY OF FEBRUARY, 1997.

  
NOTARY PUBLIC, CITY OF ST. LOUIS

AFFIDAVIT CHARGE \$ 2.00 EACH

# SPRINGFIELD NEWS-LEADER

651 Boonville • MPO Box 798  
Springfield, Missouri 65801  
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## MISSOURI AIR CONSERVATION COMMISSION WILL HOLD PUBLIC HEARING

JEFFERSON CITY, MO - The Missouri Air Conservation Commission will hold a public hearing on Restrictions of Emissions from Municipal Solid Waste Landfills rule and other issues on Thursday, March 27, 1997. The public hearing will begin at 9 a.m. at the Radisson Hotel, 11228 Lone Eagle Drive, Bridgeton, Missouri.

The Commission will hear testimony related to the following rule actions.

### ral Resources

10 CSR 10-6.310 Restriction of Emissions from Municipal Solid Waste Landfills

This rule requires owners of municipal solid waste landfills to report their landfills' design capacity and their landfills' non-methane organic compound (NMOC) emissions if the design capacity is equal to or greater than 2.5 million megagrams or 2.5 million cubic meters. Landfills having design capacities equal to or greater than 2.5 million megagrams or 2.5 million cubic meters and NMOC emission rates of 50 megagrams or greater shall be required to design, install and operate a gas collection and control system.

State Plan for Implementing the Municipal Solid Waste Landfill Emission Guidelines

The state is required to develop a Section 111(d) State Plan to implement and enforce the Environmental Protection Agency's (EPA) Emission Guidelines for Municipal Solid Waste (MSW) Landfills and submit this plan to EPA for approval. These Emission Guidelines were promulgated on March 12, 1996 in the Federal Register (61 FR 8905), and codified in 40 CFR Part 60, Supert Co. The Emission Guidelines apply to existing Missouri solid waste landfills that commenced construction, modification, or reconstruction before May 30, 1991 and that have accepted waste at any time since November 8, 1987 or have additional capacity for future waste deposition.

10 SCR 10-5.375 Motor Vehicle Emission Inspection Waiver

This proposed new rule defines and sets "waiver spending limits" as a phase-in measure prior to the beginning of the enhanced testing program in the St. Louis area. This is a requirement based on statute changes. This change requires owners of vehicles to continue to attempt to repair vehicles to comply with the emission standards, until a spending limit is reached. Owners of vehicles of model years older than 1981 must spend \$75 prior to a waiver being issued. Owners of newer vehicles must spend \$200 before being eligible to receive a waiver.

The above documents will be available for review at the following locations: Missouri Department of Natural Resources, Air Pollution Control Program, 205 Jefferson St., Jefferson City, (573)751-4817; Jefferson City Regional Office, 1511 Christy Drive, Jefferson City, (573)751-2729; Kansas City Regional office, 3800 S. Elizabeth Avenue, Suite G, Independence (816)795-8655; Northeast Regional Office, 1409 Prospect Drive, Macon, (816)385-2129; Southeast Regional Office, 948 Lester Street, Poplar Bluff, (573)840-9750; St. Louis Regional Office, 10805 Sunset Office Drive, St. Louis, (314)822-0101; Southwest Regional Office, 2040 W. Woodland Springfield, (417)891-4300.

Persons with disabilities requiring special services or accommodations to attend the meeting can make arrangements by calling the division directly at (573)751-7840, the Department's toll free number at 1-800-334-6946, or by writing two weeks in advance of the meeting to: Missouri Department of Natural Resources, Air Conservation Commission Secretary, P.O. Box 178, Jefferson City, MO 65102. Hearing impaired persons may contact the program through Relay Missouri, 1-800-735-2966.

The commission holds public hearings under the provisions of Chapter 643, RSMo. Citizens wishing to speak at the public hearing should notify the Secretary to the Missouri Air Conservation Commission, Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 178, Jefferson City, Missouri 65102-0176, or telephone (573)751-7840. The Department requests persons intending to give verbal presentations also provide a written copy of their testimony to the Commission Secretary at the time of the Public Hearing. The Department also will accept written comments for the record until 5 p.m. on April 3, 1997; please send two copies of written comments to Chief, Planning Section, Air Pollution Control Program, P.O. Box 178, Jefferson City, MO 65102-0176.

Rule proposals considered at this hearing may be adopted by the Missouri Air Conservation Commission as provided for under authority of 643.050, Mo. For more information or a complete meeting agenda, including being presented for adoption, contact the Department of Natural Resources' Air Pollution Control Program at (573)751-4817.

### PROOF OF PUBLICATION

STATE OF MISSOURI

County of Greene

I, Renee Simmermon of Springfield, Missouri, of lawful age, do upon my oath state that I am the Legal Clerk of The News Leader, and that I am duly authorized to and do make this affidavit for and on behalf of The News Leader a newspaper published daily in the City of Springfield, Greene County, Missouri; that the public advertisement, notice or order of publication, a true copy of which is hereto attached, was published in said newspaper 1 times upon the following dates:  
First publication on Wed. the 26th day of Feb. 19 97  
Second publication on ..... the ..... day of ..... 19 ..  
Third publication on ..... the ..... day of ..... 19 ..  
Fourth publication on ..... the ..... day of ..... 19 ..  
Fifth publication on ..... the ..... day of ..... 19 ..  
Last publication on ..... the ..... day of ..... 19 ..

I do further state under oath that said newspaper has been admitted to the Post Office as second class matter; that it is a newspaper of general circulation in the City of Springfield, Missouri; that it has been published regularly and consecutively for a period of more than three years; that it has a list of bona fide subscribers voluntarily engaged as such, who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that said newspaper has complied with the provisions of Section 14968 Revised Statutes of Missouri, 1939, relating to "Public Advertisements."

*Renee Simmermon*

3rd day of March, 19 97

*Denise Koehner*

My commission expires NOTARY PUBLIC STATE OF MISSOURI  
GREENE COUNTY  
MY COMMISSION EXP. NOV 22, 1997

PUBLIC NOTICE

Published in The St. Joseph News-Press, Wednesday, 2/26/97  
MISSOURI AIR CONSERVATION COMMISSION  
WILL HOLD PUBLIC HEARING  
JEFFERSON CITY, MO. The Missouri Air Conservation Commission will hold a public hearing on Restrictions of Emissions from Municipal Solid Waste Landfills rule and other rules on Thursday, March 27, 1997. The public hearing will begin at 8:30 a.m. at the Radisson Hotel, 11228 Lone Eagle Drive, Bridgeton, Missouri. The Commission will hear testimony related to the following rule actions:

40 CSR 10-6.310 Restrictions of Emissions from Municipal Solid Waste Landfills

This rule requires owners of municipal solid waste landfills to report their landfill's design capacity and their landfill's non-methane organic compound (NMOC) emissions if the design capacity is equal to or greater than 2.5 million megagrams of 2.5 million cubic meters. Landfills having design capacities equal to or greater than 2.5 million megagrams or 2.5 million cubic meters and NMOC emissions (base of 50 megagrams or greater) shall be required to design, install and operate a gas collection and control system.

State Plan for Implementing the Municipal Solid Waste Landfill Emission Guidelines

The state is required to develop a Section 111(d) State Plan to implement and enforce the Environmental Protection Agency's (EPA) Emission Guidelines for Municipal Solid Waste (MSW) Landfills and submit this plan to EPA for approval. These Emission Guidelines were promulgated on March 12, 1996 in the Federal Register (61 FR 9905), and codified in 40 CFR Part 60, Subpart Cc. The Emission Guidelines apply to existing Missouri solid waste landfills that commenced construction, modification, or reconstruction before May 31, 1991 and that have accepted waste at any time since September 1, 1997 or have additional capacity for waste.

40 CSR 10-6.370 Motor Vehicle Emission Inspection Waiver

This proposed new rule defines and sets waiver spending limits as a phase in meeting program at the beginning of the enhanced testing program in the St. Louis Area. This is a requirement based on statute changes. This change requires owners of vehicles to continue to attempt to repair vehicles to comply with the emission standards until a spending limit is reached. Owners of vehicles of model years older than 1981 must spend \$75 prior to a waiver being issued. Owners of newer vehicles must spend \$200 before being eligible to receive a waiver.

The above documents will be available for review at the following locations: Missouri Department of Natural Resources, Air Pollution Control Program, 205 Jefferson St., Jefferson City, (573) 751-2729; Jefferson City Regional Office, 1511 Christy Drive, Jefferson City, (573) 751-1719; Kansas City Regional Office, 3800 S. Elizabeth Avenue, Suite G, Independence, (816) 725-8855; Northeast Regional Office, 1409 Prospect Drive, Macon, (618) 385-2129; Southeast Regional Office, 948 Lester Street, Poplar Bluff, (573) 640-6750; St. Louis Regional Office, 10905 Sunset Oaks Drive, St. Louis, (314) 822-0101; Southwest Regional Office, 2040 W. Woodland, Springfield, (417) 891-4300.

Persons with disabilities requiring special services or accommodations to attend the meeting can make arrangements by calling the division directly at (573) 751-7840, the Department's toll free number at 1-800-334-6948, or by calling two weeks in advance of the meeting to: Missouri Department of Natural Resources, Air Conservation Commission Secretary, P.O. Box 176, Jefferson City, MO 65102. Hearing impaired persons may access this program through Relay Missouri, 1-800-735-2966.

The commission holds public hearings under the provisions of Chapter 643, RSMo. Citizens wishing to speak at the public hearing should notify the Secretary to the Missouri Air Conservation Commission, Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176, or telephone (573) 751-7840. The Department requests persons intending to give verbal presentations also provide a written copy of their testimony to the Commission Secretary at the time of the Public Hearing. The Department also will accept written comments for the record until 5 p.m. on April 3, 1997; please send two copies of written comments to Chief, Planning Section, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176.

Rule proposals considered at this hearing may be adopted by the Missouri Air Conservation Commission as provided for under authority of 643.050, RSMo. For more information or a complete meeting agenda, including rules being presented for adoption, contact the Department of Natural Resources' Air Pollution Control Program at (573) 751-4817.

AFFIDAVIT OF PUBLICATION

County of Buchanan  
State of Missouri

I, Wilma Goodwin, being  
duly sworn according to law, state that I am the  
Classified Administrative Manager of the St. Joseph

News-Press, a daily newspaper of  
general circulation in the county of Buchanan, where located; which has  
been admitted to the Post Office as second class matter in the city of St.  
Joseph, the city of publication; which newspaper has been published  
regularly and consecutively for a period of three years and has a list of  
bona fide subscribers voluntarily engaged as such who have paid or agreed  
to pay a stated price for a subscription for a definite period of time, and  
that such newspaper has complied with the provisions of Section 493.050  
Revised Statutes of Missouri, 1949. The affixed notice appeared in said  
newspaper on the following dates:

From February 26, 1997 to \_\_\_\_\_

(Signed) Wilma Goodwin

Subscribed and sworn to before me this

26th day of February 1997

Esther Jones  
Notary Public

ESTHER JONES  
Notary Public-Notary Seal  
STATE OF MISSOURI  
Buchanan County  
My Commission Expires Jan. 23, 2000

PUBLIC HEARING  
OF  
MO. DEPARTMENT OF NATURAL RESOURCES  
AIR CONSERVATION COMMISSION  
  
TRANSCRIPT OF PROCEEDINGS

March 27, 1997

 *Concannon  
& Jaeger*  
General  
Court  
Reporters

705 Olive Street • Suite 604  
St. Louis, Missouri 63101  
(314) 421-1000

1 MR. FARMER: At this time we'll call the public  
2 hearing to order. Let the record show that the following  
3 commissioners are present. Andy Farmer, Mike Foresman,  
4 Harriett Beard, Frank Beller, William Thomas, and Barry  
5 Kayes. The Air Conservation Commission of the State of  
6 Missouri has called this public hearing pursuant to section  
7 643.070 Revised Statutes of Missouri. EPA promulgated rule  
8 40 ~~CFS~~<sup>R</sup> 51.4 for the purpose of hearing testimony relating  
9 to 10 CSR 10-6.310, new rule restrictions of emissions from  
10 municipal solid waste landfills. State plan for  
11 implementing for Municipal Solid waste <sup>landfill</sup> fill emission  
12 guidelines, and 10 CSR 10-5.375 also a new rule, motor  
13 vehicle emission inspection waiver. The hearing will close  
14 at 5 p.m. April 3rd, 1997. The Commission will hear from  
15 the staff first, then those who have notified the staff  
16 director of their desire to be heard. Anyone who has not  
17 been scheduled to appear, but who wishes to be heard should  
18 communicate with the staff director, Roger Randolph.  
19 Section 643.100 of Missouri Statutes provides that all oral  
20 testimony will given under oath. Accordingly, the court  
21 reporter will swear in the witnesses as they appear. Those  
22 of you who want copies of the transcript may purchase them  
23 from the court reporter. Will each witness as you come  
24 forward please state your name, business address,  
25 occupation or affiliation. If you have a prepared

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1 statement, it will be helpful if you will provide a copy of  
2 the staff director, court reporter, and members of the  
3 commission. Mr. Randolph.

4 MR. RANDOLPH: Mr. Chairman, members of the  
5 Commission, my name is Roger Randolph. I'm the staff  
6 director of Air Pollution Control program within the  
7 Department of Natural Resources for Air Conservation  
8 Commission statutory notice of this hearing was provided on  
9 or before February 26th, 1997. I would like to submit as  
10 an exhibit the following affidavits for legal notice  
11 hearing St. Louis Post Dispatch, Columbia Daily Tribune,  
12 Daily American Republic in Poplar Bluff, St. Joe News  
13 Press, Springfield Newsleader, and Kansas City Star.  
14 Notice of public hearing was mailed to approximately 160  
15 citizens, organizations, corporations, associations, and  
16 elected officials. I submit that list for the record. In  
17 addition, I have for the record the certified mail receipts  
18 for the External Air Pollution Control agencies, as well as  
19 receipts from U.S. Environmental Protection Agency and  
20 States of Illinois and Kansas. Mr. Chairman, this  
21 concludes my testimony.

22 MR. FARMER: Thank you, Mr. Randolph. Paul  
23 Myers.

24 MR. MYERS: Good morning, Commissioners and  
25 members of audience. My name is Paul Myers. I work as an

1 Environmental Specialist for Department of Natural  
2 Resources, and Air Pollution 205 Jefferson Street,  
3 Jefferson City, Missouri. I will be presenting the  
4 testimony concerning rule 10 CSR 10-6.310 restriction of  
5 emission from municipal solid waste landfills, which begins  
6 on page 52 of your briefing document. Up until a few years  
7 ago, landfills were really not a concern of air pollution  
8 control program. However, all that kind of changed about a  
9 year and a half ago in March of '96, when federal EPA  
10 promulgated standards called "new source performance  
11 standards and emission guidelines for municipal solid waste  
12 landfills". This, in turn, resulted in the state having to  
13 do regulations looking at controlling emissions from  
14 landfills. If you will look at emission from landfills,  
15 there is really a couple different major things that  
16 landfills emit. One being methane and another being CO2,  
17 or carbon dioxide, and <sup>a third</sup> ~~three~~ components which we call  
18 nonmethane organic compounds, which during the hearing I'll  
19 refer to as NMOC. It's <sup>in</sup> this NMOC compound ~~is~~ that we have  
20 volatile organic compounds. If you recall, VOC is <sup>a</sup> ~~our~~  
21 ~~precursor~~ <sup>precursor</sup> to ozone formation, which is <sup>a concern of the</sup> ~~is~~ air pollution  
22 control program. That is why we're looking at developing  
23 regulations and enacting them across the state. Now, the  
24 rule begins again on page 53 of the briefing document.  
25 It's a fairly lengthy rule. What I'd like to do, I have a

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1 couple overheads I'd like to work through with you to help  
2 you understand who this regulation applies to and how it  
3 applies to them, and what the landfills will be required to  
4 do. What I'd like to do is move over to the overhead and  
5 speak from there. Hopefully, everybody will be able to  
6 hear me. If not, please let me know and I'll move back  
7 here and have somebody else assist me. I apologize, this  
8 is going to be kind of hard to read for some of you in the  
9 back of room. Hopefully, as I'm working through it, I'll  
10 explain what each of the components are, and you can follow  
11 along in that way. This flow chart kind of summarizes how  
12 this rule applies to landfills. The first thing we're  
13 going to have landfills do is submit initial design  
14 capacity report, basically, outlining size of their  
15 facility, who owns, who operates the facility, where they  
16 are located, information like that, when they first started  
17 operation, information like that. Now, in our rule we have  
18 kind of identified about 63 landfills that are going to be  
19 required to submit that initial report into our program.  
20 The first thing those landfills will be looking at is their  
21 overall design capacity, how big a facility are they. And  
22 this kind is the first hurdle in terms of the regulation of  
23 whether they are going to have to do something in addition  
24 or whether they are not going to have to do something. If  
25 design capacity is greater than two and a half million

1 megagrams, how much waste they can accept or if they have a  
2 size of two and a half million cubic meters or greater,  
3 they are going to have to follow down this pathway and I'll  
4 explain that in more detail. Landfills that are below  
5 those criteria, basically they are done, they won't have to  
6 do anything more in terms of complying with this regulation  
7 other than if they somehow change the size of their  
8 landfill. If they increase the size of the landfill, then  
9 they have to submit to us an amended design capacity report  
10 telling us how much more size they have right now and then  
11 look back again at these criteria, this 2.5 million cubic  
12 meters, or two and a half megagrams. Like I said  
13 initially, we think there is about 63 landfills that will  
14 be required to submit that initial design capacity report.  
15 Our records kind of indicate that of those 63, only about  
16 seven exceed that two and a half million cubic meters in  
17 design capacity. So those landfills will be required to do  
18 the next step, which is calculate nonmethane organic  
19 compound emission rate, and within the rule if you look at  
20 there are several equations in there that the landfills  
21 will be using to do that calculation. Once they have  
22 calculated it, they will be submitting that report to us,  
23 and they will compare first <sup>to</sup> ~~as~~ a standard of 50 megagrams  
24 per year of emissions. One of the first equations that the  
25 landfill will use in calculating their emissions is what we

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1 call Tier 1. The land fill accepts the default values that  
2 EPA has used in applying to landfills. They will compare  
3 it to 50 megagrams per year emission rate. If they are  
4 greater than 50 megagrams per year, they could go to this  
5 step here, which is submit notification they are going to  
6 install<sup>a</sup> gas collection control system. And I'll talk a  
7 little bit later what will be involved in this step in a  
8 little more detail. If they are above two and a half cubic  
9 meters and emissions is greater than 50 megagrams, they  
10 will be required to install gas collection control system  
11 to operate that system. Now, for a lot of landfills when  
12 they first calculate this Tier 1 emissions, if they are  
13 above two and a half million cubic meters in design  
14 capacity there is a very good chance they are going to be  
15 above that 50 megagrams level. Now, within the regulations  
16 we have allowed them to do what we considered a Tier 2  
17 calculation of their emission rate. And this is where  
18 instead of accepting one of EPA default values in the  
19 equation, they actually use their landfill and do some  
20 sampling on this particular landfill and get a site  
21 specific value to use in the equation. So they would do  
22 their sampling, and then they recalculate what their  
23 emission rate was using Tier 2 data. Again, they would go  
24 back and compare that to this rate of 50 megagrams per  
25 year. Again, if after doing Tier 2 calculation, they are

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1 above 50 megagrams per year, then they are required to  
2 install gas collection control system. Like I said, most  
3 of the landfills that are above two and a half million  
4 probably are going to be above this 50 megagrams per year.  
5 What we're seeing some landfills have gone ahead and done  
6 Tier 2 calculations, and what we're seeing is a fairly  
7 sizeable decrease in what their predicted emission rate is.  
8 So I anticipate a lot of the landfills that do one  
9 calculation will go ahead and do Tier 2 calculations in the  
10 hopes of opting out and being less than 50 megagrams per  
11 year. If a landfill, after doing Tier 2 calculations still  
12 above 50 megagrams per year. They can do a Tier 3  
13 calculation. In this situation, again, a landfill will do  
14 some specific sampling at their landfill and calculate  
15 their own site specific value, and use that in the equation  
16 rather than accept one of the EPA's default values. They  
17 can go to Tier 2 and recalculate and, again, compare it to  
18 emission rate of 50 megagrams per year. At that point, if  
19 they are still above 50 megagrams per year they have to  
20 install a gas collection control system. There is really  
21 no other option after that point. So that kind of  
22 summarizes how landfills will fall or go through this  
23 particular regulation to see whether it applies to them or  
24 not. The next thing I want to show as you if they do have  
25 to install a gas collection control system, kind of what's

1 involved in that process. These are kind of general  
2 guidelines. They are little more specific in the rule.  
3 One of the things is the design plan will have to be  
4 prepared by professional engineers. The collection system  
5 must be capable of handling maximum expected gas  
6 flow rate through the landfill. It must -- the system must  
7 be able to <sup>extract</sup> ~~plant~~ gas <sup>from</sup> ~~or~~ each ~~other~~ cell or group of cells,  
8 ~~i~~ if that site is 5 ~~1~~ years old and still active ~~or~~ <sup>or</sup> two years  
9 if that particular cell area is closed. So if an area of  
10 landfill has been closed for two years, then they are going  
11 to have to install some sort of collection system in that  
12 particular area. It also must be able to collect gas at  
13 sufficient extraction rate if it's an active system meaning  
14 it has a blower or fan helping to pull that gas through the  
15 system and finally, it must be able to minimize off site  
16 migration. So that is what the gas collection control  
17 system must be able to do.

18 MS. BEARD: This may be a stupid question, but  
19 we're talking about nonmethane. Is methane not a problem?

20 MR. MYERS: Methane is not one of the criteria  
21 pollutants. So in a sense, we're not concerned about that.  
22 Solid waste actually has regulations that deal with methane  
23 emission from landfills. Until a couple years ago, the air  
24 program really wasn't too concerned with landfills because  
25 basically that fell within the solid waste program, but the

1 nonmethane organic contain VOC, and there is enough data to  
2 suggest some the emissions especially from some of the very  
3 largest landfills can be quite significant. So obviously,  
4 we want to look at controlling that.

5 Now, to kind of sum up how long a process this is  
6 going to take should this rule become effective. This  
7 initial design capacity report would be due into the  
8 program 30 to 90 days after the rule effective date,  
9 probably looking at 90 days. If a landfill is above that  
10 two and a half million cubic meters in design capacity, and  
11 has to do NMOC emission rate report, we also require  
12 that to be done within 30 to 90 days as well. Again,  
13 probably go for 90 days. If their emissions are above 50  
14 megagrams per year, they would have to submit to us a  
15 collection control system design plan, and this would be  
16 due one year after they first report emissions above 50  
17 megagrams per year. So once they have done a calculation  
18 and shown their emission are above 50 megagrams per year,  
19 they have one year to submit a design plan to the program.  
20 Once they have designed, or once they have sent the design  
21 plan in and it's been approved, obviously they have to  
22 install it and get it up and running. Basically, they <sup>have</sup>~~are~~  
23 30 months after the effective date of the state standard  
24 which in a sense corresponds to about 18 months after they  
25 got approval of the design plan. They actually have to have

1 their system up and running about 18 months after that.  
2 Then they must submit a report showing their initial  
3 performance test on this system if they are using a flare  
4 or some other combustion device to get rid of their  
5 emission they also have to send a report to us and that is  
6 due within a 180 days of system start-up. So that kind of  
7 summarizes this proposed regulation dealing with landfills.  
8 It's a lot of information. Like I said, it's a rather  
9 lengthy rule. Hopefully, going through the flow chart and  
10 some other things has helped us understand it. If you have  
11 any other questions at this time I'd like to try to answer  
12 them.

13 MR. FORESMAN: Does the solid waste rules  
14 regulate methane emissions?

15 MR. MYERS: What they are concerned about from  
16 methane is explosive potential migrating off the landfill  
17 into other lowlying areas, buildings, houses, things that  
18 are outside of their landfill property and public or  
19 private property. And that is really what they are  
20 concerned about is methane. Within the regulation, one of  
21 the ways we look at seeing how efficient or how well the  
22 system is running to require landfill operators to do  
23 surface monitoring on the landfill to check for methane.  
24 That is one easy way to judge how effective the system is.  
25 If it's controlling methane emissions, then you have to

1 believe that the gas collection system is working in  
2 controlling nonmethane organic compounds as well.

3 MR. FARMER: Any other questions? Okay, Paul.  
4 Does that complete your presentation?

5 MR. MYERS: Yes.

6 MR. FARMER: Is there a Robert Robertson here?

7 MR. ROBINSON: I'm Robert Robinson. I'm  
8 consulting engineer for Burn, McDonald Waste Consultants.  
9 Our office address is 9400 Ward Parkway, Kansas City,  
10 Missouri. We are consultants for a fair number of  
11 landfills throughout the state of Missouri and Midwest. To  
12 give you a little background on myself. I was previously -  
13 - in 1970 up until about 1981, I was director of Solid  
14 Waste Management Program for Department of Natural  
15 Resources. Actually, we had solid and hazardous waste both  
16 together in the same program at that time. So some of this  
17 testimony I'm giving will be going back and recalling what  
18 the situation was at that time and why I think we may be  
19 overreacting on a certain degree regarding the severity of  
20 the emissions from landfills. I believe that the EPA has  
21 led the owners of landfills, the operators, consultants,  
22 and public to believe that the landfill emissions are a  
23 significant <sup>VOC</sup>~~DOC~~ problem impacting the ozone problem, and I  
24 agree that may be the case in some situations. But getting  
25 back to my regulatory experience. I remember some states

1 allowing liquids to be discharged into the landfills in  
2 significant quantities and I would point out that  
3 California was one of those that did that. And so a lot of  
4 ~~DOC~~<sup>VOC</sup> went into those landfills and even a few of our  
5 neighboring states, I think, did the same. But in the  
6 state of Missouri, the regulations that went into effect in  
7 1973 for landfills prohibited discharge of bulk liquids  
8 into landfills. And, of course, basically that is the way  
9 it is everywhere now throughout the country. You're not  
10 allowed to discharge liquids into landfills. So there was  
11 about 20-year period in the state of Missouri when we did  
12 not do that, which many other states did. And EPA, of  
13 course, is probably using the best data they have  
14 unfortunately, a lot of that data comes from California,  
15 and you see high numbers, and Paul mentioned that  
16 these numbers may be high. In fact, we are finding they  
17 are very, very high. In the order of one to two magnitudes  
18 high from when we do actually testing, but the regulating  
19 community, and particularly you, have to know who the  
20 landfill operators are; they want to comply. They want to  
21 be a good citizen, and we know some of them have not chosen  
22 under the NSPS regulations to do Tier 2 testing. And we  
23 anticipate probably the same situation under this rule, and  
24 so they get pulled into the system when they shouldn't be.  
25 They are emitting way, way less than 50 megagrams, but they

1 don't know that until they get in and they won't know that  
2 until they gets up and running and got their collection  
3 system in place, and then they can easily test both  
4 quantities of gases they are dealing with, and  
5 concentrations of NMOC. And they are going to be shocked  
6 to find they are under 10 tons in many cases when they  
7 thought they should be up in the areas of 800 to over a  
8 1000 tons a year because of disparity in the information  
9 that has been put out by the US EPA using data from other  
10 places other than Missouri and the Midwest. I think we're  
11 finding, as I attended some meetings recently, we're seeing  
12 that the data nationwide is substantially less. Where the  
13 EPA provided a default value of 4000 parts per million.  
14 Generally, one firm that did testing of over 60 sites  
15 throughout the nation, they were less than 400 parts per  
16 million. And in Missouri and the Midwest, particularly,  
17 Kansas where we do some work, we're finding, were another  
18 order of magnitude below that. And so that is why I come  
19 forward today to ask that -- we're not asking in no way  
20 that the rule be less restrictive than EPA, and what they  
21 require you to do. We're only asking that administratively  
22 you make it possible for landfills to come back at a later  
23 date and show you, and demonstrate to the state that they  
24 are not generating these nonmethane organics at the level  
25 that everybody thought they were, and they don't have to

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1 continue to be in the system. The way the rule is written  
2 is that if I don't do something and I don't convince my  
3 client or some people just don't have a consultant to do  
4 this testing in the first six months then it's admissible  
5 then they can't get out of the system. They are in  
6 forever. So they have to do all this monitoring, they have  
7 to do all this monthly, quarterly, yearly reporting, which  
8 is fairly onnerous. It should be able to at any time, at  
9 any time, because these large landfills that are really  
10 affected are going to put in gas recovery systems. They  
11 will do that without this rule. We're already doing that.  
12 Almost all of them of any significant size. So it's not  
13 that they are that we're not going to see systems put in.  
14 They may not be put in in the time frame, that is  
15 established here which the time frame does cost lots  
16 of money because you don't reach final elevation at five  
17 years, and so you have to put in other systems. And many  
18 of them put in our systems, intermediate stages anyway,  
19 because they have got to control odors, but the reporting  
20 that is required because they don't get themselves out of  
21 the system is what we're asking for relief from. If in the  
22 first they have got to demonstrate, we're suggesting that  
23 they really should not have ever been in the system, but  
24 observes you are considered under the regulations, a  
25 controlled landfill, as I see it, you're always in the

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1 system. And this is not just in the system during  
2 operating life; this is in the system during the 15, 20  
3 years after. So, we're asking that, and we will be  
4 providing some written recommendations on how that can be  
5 accomplished. It would be very simple, a couple sentences  
6 would allow that. And you'll have to deal with EPA whether  
7 you're exempt, but you're not. I repeat, we're not  
8 requesting any less restrictive measures regarding the  
9 protection of the environment and our air quality. The  
10 other concern I have is, of course, the state, and I  
11 understand why they did it. They were required to do it.  
12 I think to send out these <sup>EIS</sup>~~EIS~~ to all 63 or so landfills in  
13 the state. And, of course, there is only 27 landfills in  
14 the state right now, municipal landfills, that are  
15 operating. There are some being proposed, but most of  
16 these are closed. So these people, many of these are  
17 small, and they are really not equipped to be answering  
18 these questionnaires. We, of course, made money off of  
19 answering some of them for them, but the problem there is  
20 they are having to use these default values. These  
21 emission factors AP42, which are way high. So the data is  
22 going to come back here as of the 1st of April, and it's  
23 going to indicate, I think, in some cases that the  
24 landfills in the state of Missouri are generating 40 or  
25 more tons of <sup>vol</sup>~~DOC~~, when actually if you did testing on these

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1 landfills that might be showing 40 to 100 or something like  
2 that, you will find they are probably producing less than  
3 one ton. So I want to caution the agency, under this law,  
4 could be the mechanism for going forth with the EIQ and  
5 actually collecting fees, which will make great business  
6 for consultants like ourselves, but we don't need that kind  
7 of business. That is sort of extortion to require these  
8 people to do something because of some regulation that is  
9 poorly written, and if the regulatory agency does not have  
10 data that they should have. Now, they have got the data,  
11 they should have had it before the EPA. I don't think they  
12 used the data and looked nationwide, and probably as  
13 typically they use California data, and the states should  
14 ask that the EPA to revise AP42 if you are going to start  
15 collecting fees, and probably even take a look at  
16 that even if EPA would consent to revising AP42 off all the  
17 data they are getting in nationwide, but look at Missouri  
18 data. Of course, it's only going to be a few of those, a  
19 half dozen or so, that will come in and look at what the  
20 data there is and you'll see that the emissions are very  
21 low as far as NMOC in the state of Missouri. And because  
22 we've do several of them, we know that to be a fact and  
23 then establish your own AP42 for Missouri and don't use  
24 nationwide data. So in summary, I'd just reiterate that  
25 we're only asking some flexibility here, don't lock people

1 in because they didn't do something in that six months. In  
2 other words, they didn't get there Tier 2 testing done in  
3 six months they ought to be able to get out of the system  
4 showing they are below the levels you are concerned about  
5 at any time in the process and the other is look at EIQ  
6 data very closely sure people that have to submit part 70,  
7 and they will probably -- about 60, or 70 or 80 may be in  
8 the state. If you want to require them, they will be big  
9 enough to get their own data and to deal with that. So if  
10 they have to submit part 70. I have no problems with you  
11 collecting fees from them, but it's a miscarriage if you  
12 attempt to collect fees from these medium size and small  
13 facilities. I appreciate the opportunity to be here and  
14 testify. I know that you have already adopted one rule in  
15 the St. Louis area. I apologize for the fact that we  
16 weren't up to speed and didn't understand what what's going  
17 on so much at that time and didn't testify at that time. I  
18 think it would be a good idea that you go back and relook  
19 at that rule maybe in the near future and in relationship  
20 to the data that you're receiving and even revise that to  
21 provide greater flexibility. So I'll be glad to answers  
22 questions.

23 MS. KAYES: I want to make sure I understand  
24 this. Based on your understanding or your presentation,  
25 how many landfills do you think will go on to Tier 2?

1                   MR. ROBINSON: Well, that is just an individual.  
2   A big landfill, when they look at this data, they think  
3   they surely, and they have an engineering mind or something  
4   like that we think about numbers being reasonably accurate,  
5   and we don't think about that they might be off by over  
6   100, two orders of magnitude or even 10 orders, 11 orders  
7   of magnitude, so we kind of go on blind faith, but we get  
8   trapped because we didn't do something at a certain time.  
9   I don't know whether I answered your question or not.

10                  MS. KAYES: Actually not, that is okay.

11                  MR. ROBINSON: Ask it again.

12                  MS. KAYES: Perhaps it was an inappropriate  
13   question. What I wanted to know is based on your  
14   understanding of this problem, is it a large percentage of  
15   landfills that you expect to go to Tier 2?

16                  MR. ROBINSON: Well, no. Probably it shouldn't  
17   be less than 10 in the state, but if they would do Tier 2,  
18   I would say not more than three. Probably one or two would  
19   actually come into this program unless they failed to do  
20   Tier 2. If they failed to do Tier 2, they will be in the  
21   program either immediately or somewhere down the road  
22   because there is no flexibility to test out later.

23                  MR. FARMER: Any other questions. Thank you.  
24   Mr. Robinson, before I move on I might ask if there is  
25   anyone else in the audience that may have not signed up

1 that would like to speak on this issue. If not, we'll move  
2 on to Paul ~~Myers~~<sup>Myers</sup>, do you want to present the next one?

3 MR. MYERS: Again, my name is Paul Myers,  
4 Environment Specialist with the Air Pollution Control  
5 program. The state plan in the briefing document begins on  
6 page 85. I believe the Commission also received a separate  
7 mailing outlining our draft plan that deals with the  
8 landfills. What I'd like to do again I have got some  
9 overloads that I would like to run through for the  
10 Commission, kind of outlining why we are being required to  
11 do a state plan and a few details about what's in that  
12 state plan. So, again, let me move over to the overhead.  
13 The flow charts aren't quite as complicated as the last  
14 one. If you look up at the top, there are some dates that  
15 you see along the left hand side. They may be a little  
16 hard to read. This is 3-12-96, March 12th, 1996, if you  
17 remember my first presentation I talked about when federal  
18 EPA came out with their new performance standards and  
19 guidelines for landfills, that is this date right here.  
20 That set the stage some of the things the state would be  
21 required to do. When EPA promulgated emission guidelines  
22 subpart CC, it required the state to develop a state plan  
23 to address emissions from landfills. The first thing we  
24 had to do was determine whether we had any landfills in the  
25 state that were going to be subject to those emission

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1 guidelines and it turns out we do. It goes back to the 63  
2 landfills that I mentioned earlier. So we do have facilities  
3 within the state that would be subject to that emission  
4 guidelines. The next thing emission guidelines requires  
5 that the state <sup>do</sup> as they are developing a plan <sup>is</sup> that they hold  
6 a public hearing discussing that plan <sup>and</sup> presenting to the  
7 public, which is what we're doing at this point in time.  
8 Now, the state has developed a draft plan again that was  
9 sent to the commissioners, and I'll talk a little bit in  
10 the next overhead about what's involved in that state plan.  
11 Basically, EPA requires that the state submit their plan  
12 into EPA within a year when it was promulgated, and we sent  
13 our draft plan into EPA. We're a little behind schedule in  
14 maybe some of the other compliance dates on here through  
15 the EPA is willing to works with us on those things. We've  
16 developed a draft state plan, and are holding a public  
17 hearing today so we can submit a final draft or final plan  
18 to the EPA very soon. And it's up to the EPA to review  
19 that plan and either approve or disapprove it. Now, in  
20 terms of what's involved in developing that plan and what's  
21 included in that plan. First of all, EPA gets their  
22 authority to require the state to do this under section  
23 111(D) of the Clean Air Act, basically, which states if the  
24 EPA promulgates emission guidelines for a particular source  
25 that the state has to develop a plan to comply with those

1 guidelines. So within the state plan we have to develop an  
2 enforceable state mechanism to control these facilities.  
3 In this case, we're going to be using regulations, one I  
4 just spoke about and one that is already in place within  
5 the St. Louis area. The state plan has to demonstrate that  
6 the state has authority to do this. Our air law gives the  
7 commissioners the power to promulgate and develop rules.  
8 We must develop an inventory of landfills in the state.  
9 Again, within the draft plan that is a table that shows the  
10 landfills that we feel fall under this emission guidelines.  
11 Within our regulations, we must establish emission limits  
12 no less stringent than outlined in those emission  
13 guidelines. This gets back to guidelines of two and a half  
14 million cubic meters in design capacity and 50 megagrams  
15 per year of emissions. So our regulations can be no less  
16 strict than those guidelines. We must also have some sort  
17 of mechanism to review and approve those control systems.  
18 Within our program, we have staff to do that, and also  
19 worked out an agreement with solid waste programs since  
20 they have a great deal of expertise dealing with landfills.  
21 We've worked out an agreement to jointly ~~the~~ review ~~and~~ these  
22 design plans that come in. We must set up compliance  
23 schedules when landfills have to do certain things,  
24 reports, control systems, set up some provision for  
25 testing, monitoring, record keeping, and reporting

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1 requirements. Those are contained within the body of the  
2 regulations. We must document that we have a record of  
3 public hearing, which is what we're doing today. And State  
4 or program must annually report to EPA on how the plan is  
5 going, any changes in data or information that we've  
6 received things along that line. Just briefly, I want to  
7 touch upon two regulations that we're using to comply with  
8 this emission guideline. As I mentioned before, we do have  
9 a regulation in place for St. Louis area already. It  
10 became effective December 30, '96, 10 CSR 10-5.490. It  
11 applies to St. Louis ozone nonattainment area; city of St.  
12 Louis, St. Louis County, Franklin, Jefferson, and St.  
13 Charles County. Now, St. Louis area, because this is an  
14 ozone nonattainment area, we have decided to be more strict  
15 than those emission guidelines. Instead of a value of two  
16 and an half million cubic meters, we went down to one  
17 million cubic meters to bring in more landfills, possibly  
18 subject to this regulation, and we also decreased <sup>NMOC</sup>~~NMRO~~  
19 emission rate down to 25 megagrams as opposed to 50  
20 megagrams. So we made the rule more strict and it becomes  
21 effective December 30th, 1996. And the other is this rule  
22 I just presented a few minutes ago, 10 CSR 10.6.310 deals  
23 with the rest of the state, except what is covered under  
24 5.490. Again, our guidelines requires to be as strict. So  
25 we have 2.5<sup>million</sup> cubic meters of design capacity and 50

Pursuant to 643.055 RSMo, the Missouri Air Conservation Commission has determined that this rulemaking is needed to have a U.S. Environmental Protection Agency approved State Implementation Plan.

The State Plan for Implementing the Municipal Solid Waste Landfill Emission Guidelines is hereby **ADOPTED** by the Missouri Air Conservation Commission this 29th day of May, 1997.

Original signed by:	
Andy Farmer	, Chairman
Michael Foresman	
William R. "Bill" Thomas	, Vice-Chairman
Barry M. Kayes	
Harriet A. Beard	, Member
Frank Beller	
	, Member
	, Member
	, Member

Pursuant to 643.055 RSMo, the Missouri Air Conservation Commission has determined that this rulemaking is needed to have a U.S. Environmental Protection Agency approved State Implementation Plan.

10 CSR 10-6.310 (new rule) Restriction of Emissions from Municipal Solid Waste Landfills is hereby **ADOPTED** by the Missouri Air Conservation Commission this 29th day of May, 1997.

Original signed by:	
Andy Farmer	, Chairman
Michael Foresman	
William R. "Bill" Thomas	, Vice-Chairman
Barry M. Kayes	
Harriet A. Beard	, Member
Frank Beller	
	, Member
	, Member
	, Member



## APPENDIX G

Documentation of public notice, public hearing, and adoption for 10 CSR 10-5.490



**MISSOURI AIR CONSERVATION COMMISSION  
WILL HOLD PUBLIC HEARING**

JEFFERSON CITY, MO -- The Missouri Air Conservation Commission will hold a public hearing on Municipal Solid Waste Landfills and other issues on Thursday, July 25, 1996. The public hearing will begin at 9 a.m. at the Ramada Inn, 2820 N. Glenstone, Springfield.

The Commission will hear testimony related to the following rule actions.

- \* 10 CSR 10-2.390 (amendment) Conformity to State Implementation Plans of Transportation Plans, Programs and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act

This amendment will adopt specific revisions to the Federal Transportation Conformity Rule as amended November 14, 1995.

- \* 10 CSR 10-5.480 (amendment) Conformity to State Implementation Plans of Transportation Plans, Programs and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act

This amendment will adopt specific revisions to the Federal Transportation Conformity Rule as amended November 14, 1995.

- \* 10 CSR 10-5.490 (new rule) Municipal Solid Waste Landfills

The rule will apply to landfills in the St. Louis nonattainment area. Landfills generating non-methane organic compound emissions above a certain level and/or having a large design capacity will be required to install a gas collection system. The emission rate level and design capacity size have not yet been determined.

- \* 10 CSR 10-5.440 (amendment) Control of Emissions From Bakery Ovens

This amendment will require that sources use US EPA approved methods to determine capture efficiency of volatile organic compound emission controls.

- \* 10 CSR 10-6.075 (new rule) Maximum Achievable Control Technology Regulations

This proposed rule adopts by reference all federal maximum achievable control technology (MACT) regulations finalized by December 31, 1995. This rule will be updated yearly to incorporate additions and modifications to the federal MACT regulations.

The above documents will be available for review by June 25, 1996, at the following locations: Missouri Department of Natural Resources, Air Pollution Control Program, 205 Jefferson St., Jefferson City, (573) 751-4817; Jefferson City Regional Office, 1511 Christy Drive, Jefferson City, (573) 751-2729; Kansas City Regional Office, 3800 S. Elizabeth Avenue, Suite G, Independence, (816) 795-8655; Northeast Regional Office, 1409 Prospect Drive, Macon, (816) 385-2129; Southeast Regional Office, 948 Lester Street, Poplar Bluff, (573) 840-9750; St. Louis Regional Office, 10805 Sunset Office Drive, St. Louis, (314) 822-0101; Southwest Regional Office, 2040 W. Woodland, Springfield, (417) 891-4300.

Persons with disabilities requiring special services or accommodations to attend the meeting can make arrangements by calling the division directly at (573) 751-7840, the department's toll free number at 1-800-334-6946, or by writing two weeks in advance of the meeting to: Missouri

Department of Natural Resources' Air Conservation Commission Secretary, P.O. Box 176, Jefferson City, MO 65102. Hearing impaired persons may contact the program through Relay Missouri, 1-800-735-2966.

The commission holds public hearings under the provisions of Chapter 643, RSMo. Citizens wishing to speak at the public hearing should notify the Secretary to the Missouri Air Conservation Commission, Missouri Department of Natural Resources, Air Pollution Control Program, P. O. Box 176, Jefferson City, Missouri 65102-0176, or telephone (573) 751-7840. The Department requests persons intending to give verbal presentations also provide a written copy of their testimony to the Commission Secretary at the time of the Public Hearing. The Department also will accept written comments for the record until 5 p.m. on August 1, 1996; please send two copies of written comments to Chief, Planning Section, Air Pollution Control Program, P. O. Box 176, Jefferson City, MO 65102-0176.

Rule proposals considered at this hearing may be adopted by the Missouri Air Conservation Commission as provided for under authority of 643.050, RSMo. For more information or a complete meeting agenda, including rules being presented for adoption, contact the Department of Natural Resources' Air Pollution Control Program at (573) 751-4817.

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• 10 CSR 10-5.640 (amendment) Control of Emissions From Bakery Ovens

This amendment will require that sources use US EPA approved methods to determine capture efficiency of volatile organic compound emission controls.

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*John Taylor*  
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July 1 1996

MISSOURI AIR  
CONSERVATION  
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This amendment will adopt specific revisions to the Federal Transportation Conformity Rule as amended November 15, 1995.

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**PROOF OF PUBLICATION**

STATE OF MISSOURI

County of Greene

I, Billie Stewart of Springfield, Missouri, of lawful age, do upon my oath state that I am the Legal Clerk of The News Leader, and that I am duly authorized to and do make this affidavit for and on behalf of The News Leader a newspaper published daily in the City of Springfield, Greene County, Missouri; that the public advertisement, notice or order of publication, a true copy of which is hereto attached, was published in said newspaper 1 times upon the following dates:

- First publication on the 22nd day of June, 1996.
- Second publication on the day of 19
- Third publication on the day of 19
- Fourth publication on the day of 19
- Fifth publication on the day of 19
- Last publication on the day of 19

I do further state under oath that said newspaper has been admitted to the Post Office as second class matter; that it is a newspaper of general circulation in the City of Springfield, Missouri; that it has been published regularly and consecutively for a period of more than three years; that it has a list of bona fide subscribers voluntarily engaged as such, who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that said newspaper has complied with the provisions of Section 14968 Revised Statutes of Missouri, 1939, relating to "Public Advertisements."

Billie Stewart

worn to before me this 2nd day of July, 1996.

DENISE KOECHNER  
NOTARY PUBLIC STATE OF MISSOURI  
GREENE COUNTY  
MY COMMISSION EXP. NOV. 20, 1997

Denise Koehner



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Jefferson City, MO 65102

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COMMENCING: June 19

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STAR EDITION: June 19

PAPER: 276

VOLUME # 116

Subscribed and sworn to before me this 21st day of June, 1996, as a Notary Public for the State of Missouri, commissioned in Jackson County, Missouri. My commission expires August 18, 1998.

*Laura S. Keeling*  
LAURA S. KEELING, NOTARY

PUBLIC HEARING  
JEFFERSON CITY, MO-  
The Missouri Air Conservation Commission will hold a public hearing on Municipal Solid Waste Landfills and other issues on Thursday, July 25, 1996. The public hearing will begin at 9 a.m. at the Ramada Inn, 2330 N. Glenstone, Springfield. The Commission will hear testimony related to the following rule actions:  
\* 10 CSR 10-2.390 (amendment) Conformity to State Implementation Plans of Transportation Programs and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act.  
This amendment will adopt specific revisions to the Federal Transportation Conformity Rule as amended November 14, 1995.  
\* 10 CSR 10-5.480 (amendment) Conformity to State Implementation Plans of Transportation Programs and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act.  
This amendment will adopt specific revisions to the Federal Transportation Conformity Rule as amended November 14, 1995.  
\* 10 CSR 10-5.490 (new rule) Municipal Solid Waste Landfills.  
The rule will apply to landfills in the St. Louis nonattainment area. Landfills generating non-methane organic compound emissions above a certain level and/or having a large design capacity will be required to install a gas collection system. The emission rate level and design capacity size have not yet been determined.  
\* 10 CSR 10-5.440 (amendment) Control of Emissions From Bakery Ovens.  
This amendment will require that sources use US EPA approved methods to determine capture efficiency of volatile organic compound emission controls.  
\* 10 CSR 10-6.075 (new rule) Maximum Achievable Control Technology Regulations.  
This proposed rule adopts by reference all federal maximum achievable control technology (MACT) regulations finalized by December 31, 1995. This rule will be updated yearly to incorporate additions and modifications to the federal MACT regulations. The above documents will be available for review by June 25, 1996, at the following locations: Missouri Department of Natural Resources, Air Pollution Control Program, 2501 Jefferson City, MO 65117; Jefferson City Regional Office, 1511 Christy Drive, Jefferson City, MO 65117; Kansas City Regional Office, 210 S. Elizabeth Avenue, Suite 9, Independence, MO 64220; Northeast Regional Office, 1409 Prospect Drive, Macon, MO 64512; Southeast Regional Office, 648 Lester Drive, Poplar Bluff, MO 64779; St. Louis Regional Office, 1605 Sunset Drive, St. Louis, MO 63104; Southwest Regional Office, 1111 W. Walnut, Springfield, MO 65802.  
Persons with disabilities requiring special services or accommodations to attend the meeting can make arrangements by calling directly at (573) 751-7644. The department's toll free number at 1-800-334-6944, or by writing two weeks in advance of the meeting to Missouri Department of Natural Resources, Air Conservation Commission, Secretary, P.O. Box 176, Jefferson City, MO 65102.  
Hearing impaired persons may contact the program through 1-800-735-2949.  
The commission holds public hearings under the provisions of Chapter 643, RSMo. Citizens wishing to speak at the public hearing should notify the Secretary to the Missouri Air Conservation Commission, Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102.

# AFFIDAVIT OF PUBLICATION

County of Buchanan  
State of Missouri

I, Marty Novak, being

duly sworn according to law, state that I am the  
Marketing Services Manager of the St. Joseph

News-Press, a daily newspaper of  
general circulation in the county of Buchanan, where located; which has  
been admitted to the Post Office as second class matter in the city of St.  
Joseph, the city of publication; which newspaper has been published  
regularly and consecutively for a period of three years and has a list of  
bona fide subscribers voluntarily engaged as such who have paid or agreed  
to pay a stated price for a subscription for a definite period of time, and  
that such newspaper has complied with the provisions of Section 493.050  
Revised Statutes of Missouri, 1949. The affixed notice appeared in said  
newspaper on the following dates:

From June 23, 1996 to \_\_\_\_\_

## COMMISSION WILL HOLD PUBLIC HEARING

JEFFERSON CITY, MO. - The Missouri Air Conservation Commission will hold a public hearing on Municipal Solid Waste landfills and other issues on Thursday, July 25, 1996. The public hearing will begin at 9 a.m. at the Ramada Inn, 2820 N. Glenstone, Springfield.

The Commission will hear testimony related to the following rule actions.

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The rule will apply to landfills in the St. Louis nonattainment area. Landfills generating non-methane organic compound emissions above a certain level and/or having a large design capacity will be required to install a gas collection system. The emission rate level and design capacity size have not yet been determined.

• 10 CSR 10-5.440 (amendment) Control of Emissions From Bakery Ovens.

This amendment will require that sources use US EPA approved methods to determine capture efficiency of volatile organic compound emission controls.

• 10 CSR 10-6.075 (new rule) Maximum Achievable Control Technology Regulations.

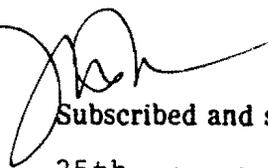
This proposed rule adopts by reference all federal maximum achievable control technology (MACT) regulations finalized by December 31, 1995. This rule will be updated yearly to incorporate additions and modifications to the federal MACT regulations.

The above documents will be available for review by June 25, 1996, at the following locations: Missouri Department of Natural Resources, Air Pollution Control Program, 205 Jefferson St., Jefferson City, (573) 751-4817; Jefferson City Regional Office, 1511 Christy Drive, Jefferson City, (573) 751-2729; Kansas City Regional Office, 3900 S. Elizabeth Avenue, Suite G, Independence, (816) 795-8655; Northeast Regional Office, 1409 Prospect Drive, Moberg, (816) 385-2129; Southeast Regional Office, 948 Lester Street, Poplar Bluff, (573) 840-9750; St. Louis Regional Office, 10805 Sunset Office Drive, St. Louis, (314) 822-0101; Southwest Regional Office, 2040 W. Woodland, Springfield, (417) 891-4300.

Persons with disabilities requiring special services or accommodations to attend the meeting can make arrangements by calling the division directly at (573) 751-7840, the department's toll free number at 1-800-334-6946, or by writing two weeks in advance of the meeting to Missouri Department of Natural Resources Air Conservation Commission Secretary, P.O. Box 176, Jefferson City, MO 65102. Hearing impaired persons may contact the program through Relay Missouri, 1-800-735-2966.

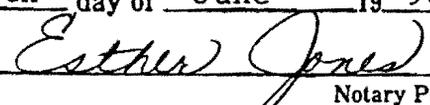
The commission holds public hearings under the provisions of Chapter 643, RSMo. Citizens wishing to speak at the public hearing should notify the Secretary to the Missouri Air Conservation Commission, Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176, or telephone (573) 751-7840. The Department

(Signed)



Subscribed and sworn to before me this

25th day of June 19 96



Notary Public

ESTHER JONES  
Notary Public-Notary Seal  
STATE OF MISSOURI  
Buchanan County  
My Commission Expires Jan. 23, 2000

**COMMISSION WILL HOLD PUBLIC HEARING**  
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- 10 CSR 10-5.440 (amendment) Control of Emissions From Bakery Ovens

This amendment will require that sources use US EPA approved methods to determine capture efficiency of volatile organic compound emission controls.

- 10 CSR 10-6.075 (new rule) Maximum Achievable Control Technology Regulations

This proposed rule adopts by reference all federal maximum achievable control technology (MACT) regulations finalized by December 31, 1995. This rule will be updated yearly to incorporate additions and modifications to the federal MACT regulations.

The above documents will be available for review by June 25, 1996, at the following locations: Missouri Department of Natural Resources, Air Pollution Control Program, 205 Jefferson St., Jefferson City, (573) 751-4817; Jefferson City Regional Office, 1511 Christy Drive, Jefferson City, (573) 751-2729; Kansas City Regional Office, 3800 S. Elizabeth Avenue, Suite G, Independence, (816) 795-8655; Northeast Regional Office, 1409 Prospect Drive, Macon, (816) 385-2129; Southeast Regional Office, 948 Lester Street, Poplar Bluff, (573) 840-9750; St. Louis Regional Office, 10805 Sunset Office

# AFFIDAVIT OF PUBLICATION

STATE OF MISSOURI

96 JUL 8 AM 11 04

County of Boone

1. Courtney McLean POLLUTION CONTROL

being duly sworn according to law, state that I am one of the publishers of the Columbia Daily Tribune a daily newspaper of general circulation in the County of Boone where located; which has been admitted to the Post Office as second class matter in the City of Columbia, Missouri, the city of publication; which newspaper has been published regularly and consecutively for a period of three years and has a list of bona fide subscribers voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that such newspaper has complied with the provision of Section 493.050, Revised Statutes of Missouri, 1949. The affixed notice appeared in said newspaper on the following consecutive issues:

1st Insertion, <u>June 25</u> .....	19 <u>96</u>
2nd Insertion, .....	19
3rd Insertion, .....	19
4th Insertion, .....	19
5th Insertion, .....	19
6th Insertion, .....	19
7th Insertion, .....	19
8th Insertion, .....	19
9th Insertion, .....	19
10th Insertion, .....	19
11th Insertion, .....	19
12th Insertion, .....	19
13th Insertion, .....	19
14th Insertion, .....	19
15th Insertion, .....	19
16th Insertion, .....	19
17th Insertion, .....	19
18th Insertion, .....	19
19th Insertion, .....	19
20th Insertion, .....	19
21st Insertion, .....	19
22nd Insertion, .....	19

PRINTER' FEE 105.8

TRIBUNE PUBLISHING COMPANY

By Courtney McLean

Subscribed and sworn to before me this 12th day of July, 19 96

Jill M. Gates  
 Notary Public

My Commission Expires May 24, 1999

**JILL M. GATES**  
 Notary Public - Notary Seal  
 STATE OF MISSOURI  
 Boone County  
 My Commission Expires: May 24, 1999

10 CSR 10-6.070 (amendment)  
 Control of Emissions From Bakery Ovens  
 This amendment will require that sources use US EPA approved methods to determine capture efficiency of volatile organic compound emission controls.

10 CSR 10-6.075 (new rule)  
 Maximum Achievable Control Technology Regulations  
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The commission holds public hearings under the provisions of Chapter 643 RSMo. Citizens wishing to speak at the public hearing should notify the Secretary to the Missouri Air Conservation Commission, Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, Missouri, 65102-0176, or telephone (573) 751-7840. The Department requests persons intending to give verbal presentations also provide a written copy of their testimony to the Commission Secretary at the time of the Public Hearing. The Department also will accept written comments for the record until 5 p.m. on August 1, 1996; please send two copies of written comments to Chief, Planning Section, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176.

Rule proposals considered at this hearing may be adopted by the Missouri Air Conservation Commission as provided for under authority of 643.050 RSMo. For more information or a complete meeting agenda, including rules being presented for adoption, contact the Department of Natural Resources, Air Pollution Control Program at (573) 751-4817.

Insertion Date: June 25, 1996.

18th Insertion, .....19.....  
 19th Insertion, .....19.....  
 20th Insertion, .....19.....  
 21st Insertion, .....19.....  
 22nd Insertion, .....19.....

PRINTER FEE *100*  
 TRIBUNE PUBLISHING COMPANY  
 By Courtney McLean  
 Subscribed and sworn to before me this 12<sup>th</sup> day of July, 1996  
Jill M. Gates  
 Notary Public

My Commission Expires May 24, 1999

**JILL M. GATES**  
 Notary Public - Notary Seal  
 STATE OF MISSOURI  
 Boone County  
 My Commission Expires: May 24, 1999

MISSOURI AIR  
CONSERVATION COMMISSION  
WILL HOLD PUBLIC HEARING

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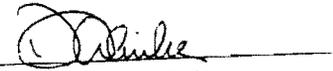
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AFFIDAVIT OF PUBLICATION

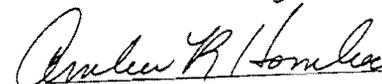
STATE OF MISSOURI)  
COUNTY OF BUTLER) ss.

I, Don Schrieber, being duly sworn according to law, state that I am PUBLISHER of the DAILY AMERICAN REPUBLIC, a daily newspaper of general circulation in the Counties of Butler, Ripley, Carter, Wayne, Stoddard, New Madrid and Pemiscot; which newspaper has been admitted to the Post Office as second class matter in City of Poplar Bluff, Missouri, the city of publication which newspaper has been published regularly and consecutively for a period of three years and has a list of bona fide subscribers voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time and that such newspaper has complied with the provisions of Section 493.050, Revised Statutes of Missouri 1969. The affixed notice appeared in said newspaper in the following consecutive issues:

1st Insertion	Vol. 128	No. 138	20th day of JUNE, 1996
2nd Insertion	Vol.....	No.....	day of..... 19.....
3rd Insertion	Vol.....	No.....	day of..... 19.....
4th Insertion	Vol.....	No.....	day of..... 19.....
5th Insertion	Vol.....	No.....	day of..... 19.....
6th Insertion	Vol.....	No.....	day of..... 19.....
7th Insertion	Vol.....	No.....	day of..... 19.....
8th Insertion	Vol.....	No.....	day of..... 19.....
9th Insertion	Vol.....	No.....	day of..... 19.....
10th Insertion	Vol.....	No.....	day of..... 19.....

  
PUBLISHER

Subscribed and sworn to before me this 20th day of June 1996

  
NOTARY PUBLIC

My commission expires MARCH 26, 2000

Publication Fee \$ 120.00



1 BEFORE THE MISSOURI AIR CONSERVATION COMMISSION  
2 PUBLIC HEARING  
3

4  
5 RAMADA INN  
6 2042 N. Glenstone  
7 Springfield, MO 65804  
8

RECEIVED  
96 JUL 31 AM 8 07  
AIR POLLUTION  
CONTROL PGM

9  
10  
11 COMMISSION MEMBERS PRESENT:  
12

13 MR. ANDY FARMER

14 MS. HARRIET BEARD

15 MR. MICHAEL FORESMAN

16 MR. FRANK BELLER

17 MR. WILLIAM THOMAS  
18

19  
20  
21  
22 MONNIE S. MCCANNON, CCR  
23 COURT REPORTING ADVANTAGE  
24 2042 South Brentwood, Suite 123  
25 Springfield, MO 65804

COPY

COURT REPORTING ADVANTAGE  
2042 South Brentwood, Suite 123  
Springfield, Missouri 65804

1 MR. FARMER: The hearing will come to  
2 order. Let the record show the following  
3 Commissioners are present: Harriet Beard, Mike  
4 Foresman, Frank Beller, William Thomas and Andy  
5 Farmer.

6 The Air Conversation Commission of the State of  
7 Missouri has called this public hearing pursuant to  
8 Section 643.070, Revised Statutes of Missouri, EPA  
9 promulgated rule 40 CFR 51.4, for the purpose of  
10 hearing testimony relating to:

11 Amendment 10 CSR 10-2.390, Conformity to the  
12 State Implementation Plans of Transportation Plans,  
13 Programs and Projects Developed, Funded or Approved  
14 under Title 23 USC or the Federal Transit Act. This  
15 amendment will adopt the specific revisions to the  
16 Federal Transportation Conformity Rule as amended  
17 November 14th, 1995. A Transportation Conformity  
18 SIP revision consistent with this Federal amendment  
19 must be submitted to EPA within 12 months.

20 Next is 10 CSR 10-5.480, amendment, Conformity to  
21 State Implementation Plans of Transportation Plans,  
22 Programs and Projects Developed, Funded or Approved  
23 Under Title 23 U.S.C. or the Federal Transit Act.  
24 This amendment will adopt specific revisions to the  
25 Federal Transportation Conformity Rule as amended

COURT REPORTING ADVANTAGE  
2042 South Brentwood, Suite 123  
Springfield, Missouri 65804

1 November 14th, 1995. A Transportation Conformity  
2 SIP revision consistent with this Federal amendment  
3 will be submitted to EPA within 12 months.

4 The next rule, new rule, is 10 CSR 10-5.490,  
5 Municipal Solid Waste Landfills. The rule will  
6 apply to landfills in the St. Louis non-attainment  
7 area. Landfills generating non-methane organic  
8 compound emissions above a certain level and/or  
9 having a large design capacity will be required to  
10 install a gas collection system. The emission rate  
11 level and design capacity size have not yet been  
12 determined.

13 Next rule, 10 CSR 10-5.440, Control of Emissions  
14 from Bakery Ovens. This amendment will require that  
15 sources use US EPA approved methods to determine  
16 capture efficiency of volatile organic compound  
17 emission controls.

18 And the last is 10 CSR 10-6.075, new rule,  
19 Maximum Achievable Control Technology Regulations.  
20 This proposed rule adopts by reference all federal  
21 maximum achievable control technology regulations  
22 finalized by December 31st, 1995. This rule will be  
23 updated yearly to incorporate additions and  
24 modifications to the federal MACT regulations.

25 The hearing record will close at 5 p.m., August

10 CSR 10-5.490 (new rule) Municipal Solid Waste Landfills is hereby **ADOPTED** by the Missouri Air Conservation Commission this 29th day of August, 1996.

Original signed by:

David Crane

\_\_\_\_\_, Chairman

Andy Farmer

Bill Thomas

\_\_\_\_\_, Vice-Chairman

Mike Foresman

Harriet A. Beard

\_\_\_\_\_, Member

\_\_\_\_\_, Member

\_\_\_\_\_, Member

\_\_\_\_\_, Member