

STATE OF MISSOURI

PERMIT BOOK



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **08 2 0 0 9 - 0 1 2** Project Number: 2009-06-042

Parent Company: Show-Me Regional Landfill, LLC

Parent Company Address: 5605 Moreau River Access Rd.,
Jefferson City, MO, 65101

Installation Name: Show-Me Regional Landfill, LLC

Installation Address: 230 Southeast 421, Warrensburg, MO, 64093

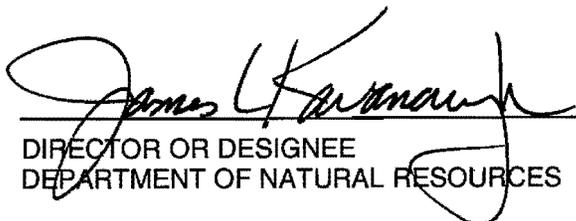
Location Information: Johnson County, S3&4, T45N, R25W

Application for Authority to Construct was made for:
The replacement of 600 scfm flare with a 3,000 scfm flare. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

AUG 26 2009

EFFECTIVE DATE


DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2009-06-042
Installation ID Number: 101-0046
Permit Number:

Show-Me Regional Landfill, LLC
230 Southeast 421
Warrensburg, MO, 64093

Complete: June 22, 2009

Parent Company:
Show-Me Regional Landfill, LLC
5605 Moreau River Access Rd.
Jefferson City, MO, 65101

Johnson County, S3&4, T45N, R25W

REVIEW SUMMARY

- Show-Me Regional Landfill, LLC has applied for authority to replace a 600 scfm flare with a 3,000 scfm flare.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment.
- Subpart WWW of the New Source Performance Standards (NSPS) applies to the landfill. Subpart A, Section 60.18, *General Control Device Requirements*, does not apply to the new flare.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart AAAA, *National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills*, does not apply to the installation, as the estimated uncontrolled emissions are less than 50 megagrams per year (Mg/yr) NMOC. If the uncontrolled NMOC emissions exceed 50 Mg/yr as calculated according to §60.754(a) the MACT would apply.
- A 3,000 scfm flare is being used to control landfill gas migration. The flare is not currently being used to demonstrate compliance with NSPS.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below their respective de minimis level thresholds.
- This installation is located in Johnson County, an attainment area for all criteria air pollutants.
- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B),

Table 2].

- Ambient air quality modeling was not performed as potential emissions of the application are below de minimis levels.
- Emissions testing is required as outlined in NSPS, Subpart WWW, *Standards of Performance for Municipal Solid Waste Landfills*.
- Revision to your current operating permit is required for this installation.
- Approval of this permit is recommended without special conditions.

INSTALLATION DESCRIPTION

Show-Me Regional Landfill, LLC (SMRL) operates an existing municipal solid waste landfill (installation ID 101-0046) in Warrensburg, Missouri. The installation includes two landfills, Johnson County Regional Landfill also known as Autoshred and Show-Me Landfill. Johnson County/Autoshred accepted refuse from 1975 to 1992. Show-Me Landfill began accepting refuse in 1993 and is doing so currently. In 1999 the installation underwent a vertical expansion bringing the design capacity to 6,894,056 cubic yards, or approximately 3.75 million megagrams. The installation is subject to NSPS Subpart WWW, and is currently permitted for a landfill gas collection system and 600 standard cubic feet per minute (scfm) flare.

In 1996, Tier 2 sampling determined the non-methane organic compound (NMOC) concentration to be 516.24 parts per million volume in landfill biogas. SMRL has annually calculated the NMOC emission rate to be less than 50 megagrams. Therefore, the construction and operation of the collection system and flare was not performed to comply with the NSPS Subpart WWW, but to address landfill gas migration.

The installation has a Part 70 operating permit.

The following construction permit has been issued to Show-Me Regional Landfill, LLC from the Air Pollution Control Program.

Table 1: Construction Permits Issued

Permit Number	Description
052003-020	Landfill gas collection system and 600 scfm flare

PROJECT DESCRIPTION

SMRL proposes installing a 3,000 scfm open flare. The flare will combust landfill gas produced by the decomposition of waste. This flare is to replace the currently installed 600 scfm flare. The new flare is being installed to address landfill gas migration, not to comply with NSPS Subpart WWW. It will reduce methane and HAP/VOC emissions from the landfill gas, but produce carbon monoxide and other combustion products.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 2.4 *Municipal Solid Waste Landfills*, November 1998.

According to AP-42, the landfill gas collection system is by default 75 percent efficient. The flare is designed to control non-methane organic compounds (NMOC), halogenated compounds, and non-halogenated compounds found in landfill gas each at 98 percent efficiency. The combustion of landfill gas also creates particulate matter less than ten microns in diameter (PM₁₀), sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon monoxide (CO).

The primary constituents of landfill gas are approximately 55 percent methane (CH₄) and 45 percent carbon dioxide (CO₂). Typically, landfill gas also contains a small amount of NMOC. This NMOC fraction often contains various organic hazardous air pollutants (HAP), greenhouse gases (GHG), volatile organic compounds (VOC), and other compounds associated with stratospheric ozone depletion.

Maximum production of landfill gas was found using LandGEM version 3.02. Potential emissions from the new flare were calculated based upon this maximum. Potential emissions using the design rate of the flare were not calculated because given the current design capacity of the landfill and projected refuse intake until that capacity is reached, the amount of landfill gas routed to the flare will be less than the design rate of the flare. The landfill gas generation rate is the bottleneck. Shall an expansion of the landfill occur, with the amount of landfill gas routed to this flare increasing, thereby changing the bottleneck, emissions from the flare should be reevaluated.

The known amount of waste accepted by the landfill from 1975 to 2008 was entered into LandGEM. The acceptance rates from 2009 to 2017 were calculated using a growth rate of 3% annually, projected from the 2008 acceptance. The maximum capacity of the landfill was predicted to be reached in 2017. The values used in the model for the methane generation potential (L₀) and methane generation constant (k) were the AP-42 recommended values of 100.0 cubic meters per megagram and 0.04 per year, respectively. The NMOC concentration was calculated from Tier 2 sampling conducted in 2006, 516 parts per million volume. The AP-42 recommended values were used instead of those presented in the NSPS Subpart WWW since the purposes of these calculations are to estimate the most realistic potential emissions of the landfill and are not for showing compliance with the NSPS. The actual NMOC concentration was used to also estimate the most realistic potential emissions.

The potential emissions from the flare are directly related to landfill gas production. Landfill gas production was based on a certain number of assumptions. Refuse acceptance rates may differ from the 3 percent growth projection. The actual volume of in-place waste may differ due to daily covering activities. Landfill waste is not

comprised of a constant proportion of household and industrial waste. Typically, larger amounts of household waste will increase the landfill gas generation rate. Tier 2 testing for the NMOC concentration will occur again in 2011, and help minimize the difference between assumptions and actuals.

It was determined that a maximum landfill gas generation rate from the landfill of 1,151 average actual cubic feet per minute (acfm) would be reached in the year 2018. With a collection efficiency of 75 percent, this would correspond to a flow rate of approximately 863 acfm of landfill gas. AP-42 approximates landfill gas at 55 percent methane. Therefore, the potential flow rate of methane in the collection system is 475 acfm. The maximum flow rate of the proposed flare is 3,000 scfm. The unit for emission factors for NO_x, CO, and PM₁₀ is pounds of pollutant per million dry standard cubic feet (dscf) of methane. Acfm needs to be converted to scfm, then to dscf. Temperature, relative humidity, and pressure of the landfill gas are necessary to convert acfm to scfm. Due to the many variables that will cause the temperature, relative humidity, and pressure of the landfill gas to deviate from constant, Show-Me Regional Landfill LLC proposes installing monitoring equipment that will record each of these factors and calculate landfill gas flow rate in scfm. Also, the landfill gas is conditioned for moisture removal before reaching the flare, thus scfm is considered dscf.

Based on the emission rate of methane, the emissions of PM₁₀, CO, and NO_x can be calculated. Particulate emissions are calculated using the emission factor for flares found in Table 2.4-5 in AP-42. According to the footnote to this table, most of the particulate matter will be less than 2.5 microns in diameter, therefore the emission factor can be assumed to estimate total PM, PM₁₀, and PM_{2.5} emissions. CO and NO_x emissions are also calculated by utilizing factors found in Table 2.4-5 of AP-42.

Landfill gas constituents and their default concentrations are listed in Table 2.4-1 of AP-42. The HAPs in that table were checked against the *Table of Hazardous Air Pollutants, Screening Model Action Levels*, Missouri Department of Natural Resources Air Pollution Control Program, December 23, 2008. Any delisted HAP from the AP-42 table was removed from this review.

Sulfur, VOC as a NMOC, and HAP concentrations are provided in parts per million volume, which is converted to volumetric flow rate. Using the ideal gas law, the volumetric flow rate is converted to a mass flow rate. The mass flow rates of sulfur, VOC as a NMOC, and HAP assuming continuous operation (8760 hours per year) at maximum flow rate in the year 2018, are used to calculate their respective potential emissions for the application.

Potential emissions of the 600 scfm flare are cited from permit number 052003-020. Potential emissions from the 3,000 scfm flare are less than the potential emissions from the 600 scfm flare. The 3,000 scfm flare emissions were evaluated at the maximum methane generation rate routed to the flare, approximately 475 scfm. The 600 scfm flare was evaluated at the maximum methane gas generation rate routed to the flare, approximately 522 scfm. The maximum methane generation rates differ due to selecting different input parameters in LandGEM. The following table provides an emissions summary for this review.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Potential Emissions of the 600 scfm Flare	Actual Installation Emissions (2008 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM ₁₀	15.0	3.11	5.50	2.12	N/A
SO _x	40.0	N/D	0.87	1.90	N/A
NO _x	40.0	7.32	2.48	4.99	N/A
VOC	40.0	N/D	1.61	0.52	N/A
CO	100.0	137.25	46.45	93.58	N/A
HAPs	10.0/25.0	N/D	0.63	0.07	N/A

N/A = Not Applicable; N/D = Not Determined

Construction permit need was based upon the potential CO emissions of the application, 21.37 pounds per hour, being greater than the insignificant emission exemption level, 6.88 pounds per hour, from 10 CSR 10-6.061, Construction Permit Exemptions (3)(A)3.A. Potential emissions from the entire installation were not determined in this or prior reviews.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions are below de minimis levels.

APPLICABLE REQUIREMENTS

Show-Me Regional Landfill, LLC shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110. The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070. *New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills*, 40 CFR Part 60, Subpart WWW.
- *New Source Performance Regulations*, 10 CSR 10-6.070. *General Provisions*, 40 CFR Part 60, Subpart A, Section 60.18, *General Control Device Requirements*.
- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills*, 40 CFR Part 63, Subpart AAAA.

AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted without special conditions.

David Little
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated June 11, 2009, received June 15, 2009, designating Show-Me Regional Landfill, LLC as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Kansas City Regional Office Site Survey, dated July 1, 2009.
- Tier 2 NMOC Sampling and Analysis Report, Show Me Regional Landfill, LLC. Warrensburg, MO. Aquaterra Project Number 1865.10, June 2006.
- Missouri Department of Natural Resources, Air Pollution Control Program. *Table of Hazardous Air Pollutants, Screening Model Action Levels, and Risk Assessment Levels*. December 23, 2008.

Mr. Brad Zimmerman
Area Environmental Manager
Show-Me Regional Landfill, LLC
230 Southeast 421
Warrensburg, MO, 64093

RE: New Source Review Permit - Project Number: 2009-06-042

Dear Mr. Zimmerman:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files.

Operation in accordance with these conditions, your new source review permit application and with your operating permit is necessary for continued compliance.

The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact David Little, at the departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:dpll

Enclosures

c: Kansas City Regional Office
PAMS File: 2009-06-042

Permit Number: