

# PERMIT BOOK

STATE OF MISSOURI



## 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: 012011-010 Project Number: 2010-09-003

Parent Company: Courtney Ridge Landfill, LLC

Parent Company Address: 2001 N. Missouri Highway 291, Sugar Creek, MO 64058

Installation Name: Courtney Ridge Landfill, LLC

Installation Number: 095-0267

Installation Address: 2001 N. Missouri Highway 291, Sugar Creek, MO 64058

Location Information: Jackson County, S18/19/13/24, T50N, R31/32W

Application for Authority to Construct was made for:

The vertical expansion of Courtney Ridge Landfill's existing landfill. This review was conducted in accordance with Section (6), 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.

JAN 13 2011

EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James L. Kavanaugh".  
\_\_\_\_\_  
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 within 30 days of actual startup. 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.

Page No.	3
Permit No.	
Project No.	2010-09-003

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

Courtney Ridge Landfill, LLC  
Jackson County, S18/19/13/24, T50N, R31/32W

1. **Superseding Condition**  
The conditions of this permit supersede all special conditions found in the previously issued construction permit 042010-011 issued by the Air Pollution Control Program.
2. **Emission Limitation**
  - A. Courtney Ridge Landfill, LLC shall emit less than 250.0 tons of carbon monoxide (CO) from the flares (EP-10 and EP-11) in any consecutive 12-month period.
  - B. Attachment A, or an equivalent form approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 2.A. Flow rate measurements used to demonstrate compliance with Special Condition 2.A. must be recorded in units of SCFM. Courtney Ridge Landfill, LLC shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
  - C. Courtney Ridge Landfill, LLC shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the end of the month during which the records from Special Condition Number 2.B. indicate that the source exceeds the limitations of Special Conditions Number 2.A.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (6) REVIEW

Project Number: 2010-09-003  
Installation ID Number: 095-0267  
Permit Number:

Courtney Ridge Landfill, LLC  
2001 N. Missouri Highway 291  
Sugar Creek, MO 64058

Complete: September 1, 2010

Parent Company:  
Courtney Ridge Landfill, LLC  
2001 N. Missouri Highway 291  
Sugar Creek, MO 64058

Jackson County, S18/19/13/24, T50N, R31/32W

REVIEW SUMMARY

- Courtney Ridge Landfill, LLC has applied for authority to vertically expand the existing landfill.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment.
- Subpart WWW of the New Source Performance Standards (NSPS), *Standards of Performance for Municipal Solid Waste Landfills*, applies to the landfill.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart AAAA, *National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills*, applies to the installation.
- Two 2000 SCFM flares will be used control landfill gas (LFG) emissions from the landfill. One 2000 SCFM flare is currently installed to control landfill gas (LFG) emissions from the landfill. A second 2000 SCFM flare will be installed by the end of year 2010 and will also be used to control LFG emissions from the landfill. Both flares have previously received construction permits from the Missouri Air Pollution Control program.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of volatile organic compounds (VOC) and carbon monoxide (CO) are above de minimis levels.
- This installation is located in Jackson County, a maintenance area for ozone and an attainment area for all other criteria pollutants.

- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was performed to determine the ambient impact of CO.
- Emissions testing is not required.
- Revision to your Part 70 Operating Permit application is required for this installation within one year of the issuance of this permit.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

Courtney Ridge Landfill, LLC operates an existing municipal solid waste (MSW) landfill (installation ID 095-0267) in Sugar Creek, Missouri. The landfill has been in operation since 1996. The landfill utilizes a gas collection and control system to minimize the possibility of LFG migration. The collected LFG is either combusted in one of two flares (EP-10 and EP-11) or is piped to Lafarge's Portland cement facility where it is used as a supplemental fuel in its kiln. The installation will be considered a minor source for CO in regards to construction permitting. The installation received a Part 70 operating permit (number OP1999-100A) in July of 1999.

The following permits have been issued to Courtney Ridge Landfill, LLC from the Air Pollution Control Program.

**Table 1: Permit History**

Permit Number	Description
042010-011	Construction of a new 2000 SCFM Flare (EP-11) replacing the 1650 SCFM flare (EP-09)
042009-004	Construction of a 2000 SCFM Flare (EP-10)
012004-003	Construction of 1650 SCFM Flare (EP-9)

### PROJECT DESCRIPTION

Courtney Ridge Landfill is planning to vertically expand their existing landfill and increase the capacity of the landfill by 7.9 million megagrams (Mg). The expansion will increase the total waste capacity to 17.7 million Mg. No new equipment is being installed and plant will still have a 250 ton Carbon Monoxide limit on the entire installation. The emissions from the landfill will continue to be controlled by two 2000 SCFM candlestick flares.

## 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, November 1998.

The LFG collection system is by default 75 percent efficient. The two flares are designed to control non-methane organic compounds (NMOC), halogenated compounds, and non-halogenated compounds found in LFG. A control efficiency of 99.2 percent was given to NMOC. A control efficiency of 98 percent was given to halogenated compounds. And a control efficiency of 99.7 percent was given to non-halogenated compounds. The combustion of LFG also creates particulate matter less than ten microns in diameter (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and carbon monoxide (CO). This review used the following control efficiencies for the operation of a typical flare system on landfill gases, listed in Table 2.

Table 2: Control Efficiencies in Percent

Collection of LFG	NMOC	Halogenated Compounds	Non-Halogenated Compounds
75.0	99.2	98.0	99.7

The primary constituents of LFG are approximately 55 percent methane (CH<sub>4</sub>) and 45 percent carbon dioxide (CO<sub>2</sub>). Typically, LFG also contains a small amount of NMOC. This NMOC fraction often contains various organic hazardous air pollutants (HAP), greenhouse gases (GHG), and compounds associated with stratospheric ozone depletion. The NMOC fraction also contains volatile organic compounds (VOC).

Maximum production of LFG was found using LandGEM version 3.02. Potential emissions from the flares (EP-10 and EP-11) and the landfill were calculated based upon this maximum. The known amount of waste accepted by the landfill from 1996 to 2009 was entered into LandGEM. The acceptance rates from 2010 to 2033 were calculated using a growth rate of three percent annually, projected from the 2007 acceptance. The maximum capacity of the landfill was predicted to be reached in 2033. The values used in the model for the methane generation potential (L<sub>0</sub>), methane generation constant (k), and NMOC concentration were the AP-42 recommended values of 100.0 cubic meters per Mg, 0.04 per year, and 2420 parts per million by volume, respectively. 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 determining applicability for a specific NSPS.

The potential emissions from the flares are directly related to LFG production of the landfill. The LandGEM calculations were based on a certain number of assumptions. The actual date that the designed flow rate of the flares is reached may be different than that calculated in the model. Landfill waste is a combination of household and industrial waste, where the amount of each waste will contribute differently to the concentration of methane in LFG. The amount of HAP/VOC emissions will also vary over the life and closure activities of the landfill.

The potential emissions for this project only include the emission related to the increase in landfill capacity. This includes the increase in captured LFG sent to the two flares along with the flare combustion byproducts and the fugitive LFG released into the atmosphere. The project potential emissions were calculated by using LandGEM and predicting the emissions from the expansion.

It was determined that the LFG emission rate increase from the landfill expansion would be 1798 average standard cubic feet per minute (SCFM), resulting in a total LFG emission rate of 4956 SCFM which would be reached in the year 2033. With a collection efficiency of 75 percent, the corresponding flow rate would be of 3717 SCFM of LFG. AP-42 approximates LFG at 55 percent methane. Therefore, the potential flow rate of methane in the collection system is 2044 SCFM. The maximum flow rate of the two flares (EP-10 and EP-11) is 4000 SCFM of LFG. The unit for emission factors for NO<sub>x</sub>, CO, and PM<sub>10</sub> is pounds of pollutant per million dry standard cubic feet (DSCF) of methane. The LFG is conditioned for moisture removal before reaching the flares, thus SCF is considered DSCF.

Based on the emission rate of methane, emissions of PM<sub>10</sub>, CO, and NO<sub>x</sub> 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, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions. CO and NO<sub>x</sub> emissions are also calculated by utilizing factors found in Table 2.4-5 of AP-42.

Each HAP specific to LFG flaring is listed in Table 2.4-1 of AP-42, but is updated in Table of Hazardous Air Pollutants, Screening Model Action Levels, August 16, 2010.

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 2033, are used to calculate the potential emissions of the installation.

Existing potential emissions are calculated from permit number 042010-011. Existing potential emissions were separated into fugitive and non-fugitive emissions for the purpose of determining major source applicability. This installation is not in one of the named source groups found in 10 CSR 10-6.020(3)(B), Table 2, therefore the installation's major source level is 250.0 tons per year of PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOC or CO and fugitive emissions are not counted. Fugitive emissions represent the regulated constituents of the LFG that are not captured by the collection system. Operation of hauling equipment at the landfill generates PM<sub>10</sub>. These emissions from the heavy equipment's engines are not associated with the project and do not count toward major source applicability, so the emissions were not calculated. The haul road emissions generated by the heavy equipment are counted toward major source applicability but are not expected change with this project therefore they were not calculated. The non-fugitive emissions are the LFG constituents that were captured but not destroyed by the flares and the combustion emissions from the two flares.

Potential emissions of the project were also separated into fugitive and non-fugitive emissions. The fugitive emissions represent the increase of potential emissions due to expansion that are not captured by the landfill gas collection system. The non-fugitive emissions include the increase in potential emissions as a result of the increase of potential LFG that will be routed to the two flares. The following table provides an emissions summary for this project.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions		Existing Actual Emissions (2009 EIQ)	Potential Emissions of the Project		New Installation Conditioned Potential of Non-Fugitive Emissions
		Fugitive	Non-Fugitive		Fugitive	Non-Fugitive	
PM <sub>10</sub>	15.0	N/D	5.67	10.92	N/A	3.31	N/D
SO <sub>2</sub>	40.0	N/A	5.05	2.11	N/A	2.96	N/D
NO <sub>x</sub>	40.0	N/A	13.33	6.02	N/A	7.80	N/D
VOC	40.0	136.7	2.60	4.72	65.76	1.51	N/D
CO	100.0	2.59	< 250.0	112.80	N/A	146.18	< 250.0
Toluene	10.0	10.35	0.07	N/D	4.79	0.04	N/D
Total HAP	25.0	15.18	0.19	1.64	7.04	0.11	N/D

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

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of CO and VOC are above de minimis levels.

### APPLICABLE REQUIREMENTS

Courtney Ridge 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 April 1 for a hard copy submittal or May 1 for online submittal 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 10-2.070

## 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.
- *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 performed to determine the ambient impact of carbon monoxide because its potential to emit is above the de minimis level. The VOC potential to emit was also over the de minimis level but currently there is no model for VOC emissions. The ambient impact is for a 2,000 SCFM flare having a stack height, total heat released, and emission rate of CO of 7.01 meters, 0.283E+07 calories per second, and 4.21 grams per second, respectively. As stated previously in the permit, the CO emission rate is based upon the methane generation rate expected from the landfill at maximum flow through the flare. As can be seen in Table 3, the results of the model predict an ambient impact below the NAAQS.

Table 4: NAAQS Compliance

Pollutant	Modeled Impact ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	Time Period
CO	19.09	10,000	8 hour
	27.27	40,000	1 hour

## STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Gerad Fox  
Environmental Engineer

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Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 25, 2010, received September 1, 2010, designating Courtney Ridge 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 September 27, 2010.



Mr. Brad Zimmerman  
Area Environmental Manager  
Courtney Ridge Landfill, LLC  
2001 N. Missouri Highway 291  
Sugar Creek, MO 64058

RE: New Source Review Permit - Project Number: 2010-09-003

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 amended 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 Gerad Fox at the Department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102, or by telephone at (573) 751-4817. Thank you for your time and attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale  
New Source Review Unit Chief

KBH:gfk

Enclosures

c: Kansas City Regional Office  
PAMS File: 2010-09-003

Permit Number: