NEBRASKA

DEPT. OF ENVIRONMENT AND ENERGY

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# Haul Road Q&A for Air Quality Permitting

## I. What is a haul road?

A haul road is a road within a facility's fence line that is used by trucks and other vehicles to move raw materials, final products, and other production-related materials into, within, or out of the facility.

## II. What kind of emissions can be expected from haul roads?

Potential emissions from haul roads, for air quality permitting purposes, include particulate matter (PM) with an aerodynamic diameter less than 10 microns ($PM_{10}$), and PM with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$).

These emissions are generated by vehicle movement and contact between the tire of a vehicle and the surface of the road. Emissions from employee vehicles, mail trucks, and other non-production related traffic are not taken into account when estimating emissions from haul roads. Additionally, particulate matter emitted by the engine exhaust, tire wear, and brake wear is not accounted for when calculating haul road emissions.

## III. How do I estimate emissions from a haul road?

The NDEE uses the calculation methodology established in the United States Environmental Protection Agency (EPA) *Compilation of Air Pollutant Emission Factors*, 5th Edition, Volume 1 (AP-42) * Chapter 13 – Miscellaneous Sources, Sections 13.2.1 (Paved Roads, revised January 2011) and 13.2.2 (Unpaved Roads, revised November 2006) to estimate emissions from haul roads. The NDEE has adapted formulas developed by the EPA into a spreadsheet to automatically calculate potential emissions when the appropriate data have been entered. The spreadsheet (titled "AIR068-Haul Roads.xls") is available on the NDEE website (Potential Emission Calculation Spreadsheets).

In order to calculate potential emissions using the NDEE's spreadsheet, the following information must be known. This information must be obtained for each individual material that is received, transported within, or loaded out from the facility.

- **Is the road paved or unpaved?** This is important because a paved road (concrete or asphalt) will have different physical characteristics than an unpaved

(dirt or gravel) road. Each road type will have a different formula for calculating emissions (the spreadsheet will automatically choose which formula to use).

- **What is the silt loading value (for paved roads) or the silt content (for unpaved roads)?** For the purposes of determining haul road emissions, silt is defined as particles equal to or less than 75 micrometers (µm) in physical diameter. Silt loading is defined in AP-42 as "the mass of silt-size material per unit area of travel surface" and is used as a measurement of how much dust is on the road. Silt content represents the proportion of the loose, dry surface dust on a road that passes through a 200-mesh screen and is measured using the American Society for Testing and Materials C-136 test method.

  Typical silt loading and silt content values for a variety of industries can be found within AP-42* Chapter 13, Sections 13.2.1 and 13.2.2. When site specific or industry representative data is not available, the NDEE generally uses default values of 6 $g/m^2$ for silt loading on paved roads and 10% for silt content on unpaved roads. A facility may propose using site specific values if silt loading testing has been conducted and submitted to the NDEE.

- **What is the approximate distance a truck will travel between entering the facility property and the loading/unloading point(s), and from the loading/unloading point(s) to leaving the facility?** It is important to know the travel distances, referred to as the roundtrip length within the spreadsheet, for empty and full trucks separately because they are a component in determining the average weight of the truck when on the haul road.

- **What is the weight of a truck traveling on the haul road (both empty and full)?** The empty and full truck weights, along with the empty and full trip distances, are used to determine the average weight of a truck on the haul road.

- **How fast will the truck be traveling on the haul roads?** The NDEE's default value is an average truck speed of 30 mph at facilities. Sources may request permit conditions to post lower speed limits on their site, thereby lowering the average truck speed to the posted speed limit. The minimum speed is assumed to be no lower than 10 miles per hour.

- **What is the maximum annual throughput of product being transported by truck and the average carrying capacity of each truck?** The maximum throughput and average truck capacity, along with the roundtrip length of the haul road, can be used to estimate the annual vehicle miles traveled (VMT).

- **How many days of the year does precipitation exceed 0.01"?** The potential emissions calculation includes an adjustment factor to account for reduced haul road emissions on days with precipitation. The default value is assumed to be 90 days per year (obtained from AP-42 Figure 13.2.1-2).

## IV. What kind of emission reductions/control strategies can be used on haul roads?

In general, there are three methods that the NDEE will accept as control strategies for haul roads: paving, sweeping, and water/oil spray. In order for any of these control strategies to be credited to a source, there must be a federally enforceable permit condition requiring that a control measure be used.

Road paving (covering a road in asphalt or concrete) can provide a significant reduction in emissions and is the most common method of controlling emissions from a haul road. This reduces emissions from the road by putting a physical barrier between the earth and the vehicles. Some dust is still emitted because dust will occasionally be deposited on top of the road and will be re-emitted to the atmosphere when vehicles travel over the road. For large facilities (facilities that have more than 20,000 VMT per year) this is considered a default requirement that must be followed. Smaller facilities are evaluated on a case-by-case basis and may be required to pave depending on the situation.

Another method of reducing emissions is to sweep the haul road. Road sweeping is generally used as a supplemental control strategy on paved roads where large amounts of dust are deposited on the road. This methodology can be used on unpaved roads but due to the nature of unpaved roads, it is not as practical or as effective.

The final common method for reducing haul road emissions is the use of a water or chemical spray on the road. Haul roads tend to emit more dust when they are very dry; therefore, the application of water or mineral oil at regular intervals, or when the roads become unusually dry, is a method that can significantly reduce particulate emissions. This control method can be used on any type of road and will produce a significant reduction in emissions.

If a source has another control strategy that they believe will be successful in addition to (or in place of) the above strategies, the NDEE is willing to review such strategies and make a case-by-case determination regarding the validity of each control strategy. In order for the NDEE to approve the use of a new control strategy, the source must provide site specific performance testing under a variety of operating conditions to demonstrate that the road will be durable and reduce emissions in all of the varying weather conditions that commonly occur in Nebraska. Any testing conducted must be conducted in accordance with Title 129, Chapter 15 in order to be considered a valid performance test.

## V. What kind of permit conditions can I expect for my haul road(s)?

Operation and maintenance of all haul roads must comply with the requirements of Title 129, including the duty to prevent the escape of dust (Title 129, Chapter 15, Section 003) which, in part, reads:

> "*No person may cause or permit a building or its appurtenances or a private road, or a driveway, or an open area to be constructed, used, repaired or demolished without applying all such reasonable measures to prevent particulate matter from*

*becoming airborne so that it remains visible beyond the premises where it originates."*

In addition to the general requirements of Title 129, NDEE air quality permits are customized to the specific facility that the permit is issued to in order to allow for a reasonable amount of operational flexibility without violating air quality rules or regulations.

Utilization of Best Management Practices (BMPs) on haul roads and the development and implementation of a Fugitive Dust Control Plan (FDCP) are two common permit requirements.

BMPs are commonly accepted methods of reducing particulate emissions from haul roads. These include, but are not limited to, cleaning material deposited upon paved roads, reductions in speed or traffic along haul roads, and surface treatment applied to non-paved roads. A facility required to demonstrate use of BMPs is required to document episodes of fugitive dust as well as the corresponding BMPs used to mitigate current and future dust emissions.

A FDCP is a formal document that must be kept on site and be reasonably available for NDEE review. The plan must be developed prior to operation of the haul roads and specify site-specific actions to be performed to limit emissions and avoid the occurrence of fugitive dust episodes. A facility required to maintain a FDCP must document actions taken in response to fugitive dust episodes.

The following factors are taken into consideration when developing appropriate facility-specific haul road conditions:

- The estimated annual VMT on the facility's haul roads;
- Whether or not the roads are paved;
- The silt loading value used to estimate potential emissions;
- Facility-wide potential to emit (PTE) for $PM_{10}$ and $PM_{2.5}$;
- Whether fugitive emissions must be accounted for in determining the applicability of Prevention of Significant Deterioration (PSD) regulations;
- Maintenance of the National Ambient Air Quality Standards (NAAQS);
- Any other facility or operational parameters relevant to use and maintenance of the haul road(s).

Although every facility is unique, the following scenarios serve as general guidelines to the type of haul road conditions that may be required of a similar sized facility:

a. **Large sized facilities**
   For the purposes of this guidance document, a large sized facility is a facility where a production related vehicle (or multiple vehicles) travels more than 20,000 vehicle miles traveled (VMT) per year on any road that meets the definition of a haul road for that facility.

These facilities can expect the following permit requirements: all roads must be paved, the requirement to develop a fugitive dust control plan (FDCP), visible emissions monitoring, and recordkeeping requirements. Depending upon whether fugitive emissions are included when determining the Prevention of Significant Deterioration (PSD) status of the facility and the proposed silt loading content, requirements for silt load testing and testing may be included. Additionally, the PSD status of the facility may require air dispersion modeling of haul road emissions.

**b. Medium sized facilities**

For the purposes of this guidance document, a medium sized facility is a facility where a production related vehicle (or multiple vehicles) travels more than 2,000 but less than 20,000 VMT per year on any road that meets the definition of a haul road for that facility.

These facilities can expect the following permit requirements: the development of a FDCP or demonstrated use of Best Management Practices (BMP) on haul roads, visible emissions monitoring, and recordkeeping requirements.

On a case-by-case basis, there may be additional haul road requirements based on the type of facility and VMT per year. These supplemental requirements can include road paving, silt loading limitations, and emissions testing. Furthermore, depending on the PSD status of the facility, air dispersion modeling may be required.

**c. Small sized facilities**

For the purposes of this guidance document, a small sized facility is a facility where a production related vehicle (or multiple vehicles) travels less than 2,000 VMT per year on any road that meets the definition of a haul road for that facility.

These facilities can expect the following permit requirements: use of BMP on haul roads, visible emissions monitoring, and recordkeeping requirements. In some cases where VMT per year is very low, it is possible that the NDEE may determine that no conditions for haul roads are needed in the permit besides the general requirements of Title 129.

If you have questions regarding your construction project, contact the Air Quality Program at NDEE.AirQuality@nebraska.gov or (402) 471-2186.

For more information concerning construction permits and air quality regulations, see the guidance document entitled Construction Permits in the Air Quality Publication Section at http://DEE.ne.gov.

*** This document contains links to non-NDEE websites; these links will open in a new tab or window.**

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