United States Environmental Protection Agency
Region 10, Office of Air, Waste and Toxics
AWT-107
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

Permit Number: R10NT501700
Issued: August 10, 2010
AFS Plant I.D. Number: 16-777-00449

Non-Title V Air Quality Operating Permit

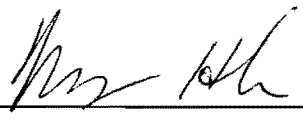
Is issued in accordance with the provisions of the Federal Air Rules for Reservations (FARR), 40 CFR § 49.139, and applicable rules and regulations to

Knife River, Inc.
CMI Portable Hot Mix Asphalt Plant

For operations in accordance with the conditions in this permit at locations listed in Section 1.3.

Operations Manager:	Zachary O'Kelley Operations Manager Knife River, Inc 5450 Gowen Road Boise, ID 83709 Phone: 208-926-0183, Fax: 208-362-0183 Email: zac.okelley@kniferiver.com
Asphalt Superintendent, Local Individual Responsible:	Ed Robinson Knife River, Inc 5450 Gowen Road Boise, ID 83709 Phone: 208-926-0183, Fax: 208-362-0183 Email: ed.robinson@kniferiver.com

A technical support document that describes the bases for conditions contained in this permit is also available.



8/11/10

Nancy Helm, Manager
Federal and Delegated Air Programs Unit
Office of Air, Waste and Toxics
U.S. EPA, Region 10

Date

1. General Conditions

1.1. For purposes of this permit, the permittee is Knife River, Incorporated and the permitted source includes the hot mix asphalt drum dryer (CMI PTD-400) and a combination of rock extraction and crushing (when required to be aggregated with this asphalt plant), handling and storage equipment used to produce hot mix asphalt.

1.2. The permittee shall comply with all conditions of this permit and any site-specific approval conditions. Any permit noncompliance constitutes a violation of the Clean Air Act.

1.3. Compliance with all conditions in this permit and any site-specific approval conditions allows the permitted source to operate at the following locations:

1.3.1. 4689 Highway 13, Kooskia, Idaho, Nez Perce Reservation (Latitude: 46° 7’ 17” N; Longitude: 115° 58’ 39” W) - within the previously disturbed portion of the existing industrial site only; and

1.3.2. Any other location on the Nez Perce Reservation that has been specifically approved for the purpose of this permit in a letter from EPA to the permittee.

1.4. Compliance with the terms of this permit does not relieve or exempt the permittee from compliance with other applicable federal, tribal, state or local laws or regulations.

2. Emission Limits and Work Practice Requirements

2.1. Permitted Source Carbon Monoxide (CO) Emission Limit. Source-wide CO emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly CO emissions shall be determined by multiplying appropriate emission factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.2. Permitted Source Nitrogen Oxides (NOx) Emission Limit. Source-wide NOx emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly NOx emissions shall be determined by multiplying appropriate emission factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.3. Permitted Source Particulate Matter (PM) Emission Limit. Source-wide PM emissions shall not exceed 200 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly PM emissions shall be determined by multiplying appropriate emission factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.4. Permitted Source Fine Particulate Matter (PM10) Emission Limit. Source-wide PM10 emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly PM10 emissions shall be determined by multiplying appropriate emission factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.5. Permitted Source Sulfur Dioxide (SO2) Emission Limit. Source-wide SO2 emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months.

2.6. Permitted Source Volatile Organic Compound (VOC) Emission Limit. Source-wide VOC emissions shall not exceed 80 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months. Monthly VOC emissions shall be determined by multiplying appropriate emission factors (lb/unit) by the actual monthly operation/production rates (units/month) and dividing by 2000 lb/ton.

2.7. Good Operation. All fuel burning equipment and the drum dryer baghouse control device shall be maintained in good operating condition. The drum dryer exhaust shall be routed to the baghouse control device at all times. The drum dryer baghouse control device shall be operated at all times that the drum dryer operates.

3. Monitoring and Recordkeeping Requirements

3.1. Visible Emission Monitoring and Recordkeeping. The permittee shall monitor and record visible emissions of particulate matter as described in Conditions 3.2 through 3.5.

3.2. Once each day, the permittee shall visually survey the drum dryer baghouse stack for the presence of visible emissions of particulate matter.

3.2.1. The observer conducting the visual survey must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting and wind, and the presence of uncombined water on the visibility of emissions (see 40 CFR part 60, Appendix A, Test Method 22).

3.2.2. For the surveys, the observer shall select a position that enables a clear view of the emission point to be surveyed, that is at least 15 feet from the emission point, and where the sunlight is not shining directly in the observer's eyes.

3.2.3. The observer shall observe emissions from the emission point for at least 15 seconds.

3.2.4. Any visible emissions of particulate matter other than uncombined water shall be recorded as a positive reading associated with the emission unit.

3.2.5. Surveys shall be conducted while the drum dryer is operating and during daylight hours.

3.3. If the survey conducted under Condition 3.2 identifies any visible emissions of particulate matter, the permittee shall:

3.3.1. Immediately upon conclusion of the visual observation in Condition 3.2, investigate the source and reason for the presence of visible emissions; and

3.3.2. As soon as practicable, take appropriate corrective action.

3.4. If the corrective actions undertaken pursuant to Condition 3.3.2 do not eliminate the visible emissions, the permittee shall within 24 hours of the initial survey conduct a visible emissions observation of the emission source in question for thirty minutes using EPA Test Method 9 (see 40 CFR part 60, Appendix A).

3.5. The permittee shall maintain records of the following:

3.5.1. Details of each visual survey and visible emissions observation, including date, time, observer and results;

3.5.2. Date, time and type of any investigation conducted pursuant to Condition 3.3.1;

3.5.3. Findings of the investigation, including the reasons for the presence of visible emissions;

3.5.4. Date, time and type of corrective actions taken pursuant to Condition 3.3.2;

3.5.5. Complete documentation of any Method 9 visible emissions observations conducted pursuant to Condition 3.4.

3.6. Baghouse Inspection and Recordkeeping. At least once each year during which the permitted source operates on an Indian reservation, the permittee shall inspect and keep records of the physical condition of the baghouse internals.

3.7. Operation and Production Records. The permittee shall track and record the operation and production such that source-wide emissions can be calculated on a daily, monthly and 12-month rolling basis. Records shall include, but not be limited to:

3.7.1. Daily hot mix asphalt, extracted rock and crushed rock (when required to be aggregated with this asphalt plant) production (tons) and type fuel used for drum dryer;

3.7.2. Daily fuel type(s) and amount (gallons) combusted by generator;

3.7.3. Daily fuel type(s) and amount (gallons or cubic feet) combusted by asphalt tank heater;

3.7.4. Ash and sulfur content (%) of any reprocessed fuel oil combusted;

3.7.5. Sulfur content (%) of any diesel combusted;

3.7.6. Pressure drop (inches) across the baghouse, recorded at least once per day while operating;

3.7.7. Documentation of any time periods when the drum dryer is producing hot mix asphalt and the baghouse is not fully operational, the baghouse is not in good operating condition, or the drum dryer exhaust is not being routed to the baghouse; and

3.7.8. Daily water and dust suppressant usage for roads, rock crushing (when required to be aggregated with this asphalt plant) and material handling including type and application technique, amount and frequency.

3.8. Equipment Installation. The permittee shall install, calibrate, maintain and operate equipment or systems for recording the operation and production records required by this permit. Equipment must be installed and calibrated before operating the asphalt plant on an Indian reservation.

3.9. Emissions Calculations. Within 20 days after each month (beginning with the first month of operating the permitted source at a location on an Indian reservation and continuing until eleven months after moving the permitted source to a location off an Indian reservation), the permittee shall calculate and record the source-wide monthly emissions (tons/month) and the rolling 12-month total emissions (tons/year) for CO, NOx, PM, PM10, SO2 and VOC using the calculation techniques required in Condition 2.

3.10. Records Retention. Copies of all required monitoring records, notifications and reports required by this permit and location approval letters from EPA shall be kept with the asphalt plant for a period of five years and shall be made available to EPA upon request.

4. Reporting Requirements

4.1. Notification before Relocation. The permittee shall notify EPA in writing at least 40 days before relocating the permitted source to or from a location on an Indian reservation. The notification shall include:

4.1.1. Complete descriptions of the existing and new locations including state, county, physical address and longitude and latitude coordinates;

4.1.2. Whether the new location(s) is on an Indian reservation;

4.1.3. If the new location(s) is not on an Indian reservation, the name of the Title V permitting authority at the new location(s); and

4.1.4. If the new location(s) is on an Indian reservation, the following information;

4.1.4.1. The source of crushed rock used by the hot mix asphalt plant including the owner name, operator name, contact information and location of the rock extraction and rock crushing operation and whether either or both is under contract to the owner or operator of the hot mix asphalt plant;

4.1.4.2. The expected existence of any other air pollution emitting operations located at the same site(s) as the permitted source;

4.1.4.3. The expected equipment list and operating configuration of the permitted source including a flow diagram;

4.1.4.4. The expected operating hours and production rates of the permitted source at the new location(s);

4.1.4.5. The expected duration (days) of operation of the permitted source at the new location(s);

4.1.4.6. An inventory of emissions actually emitted by the permitted source during the most recent previous 12 months for CO, NOx, PM, PM10, SO2 and VOC;

4.1.4.7. If the new location(s) has not previously been approved pursuant to Condition 1.3, a plot plan and a map showing locations of any water bodies or wetlands within 5 miles of the new location(s);

4.1.4.8. If the new location has not previously been approved pursuant to Condition 1.3, a list of endangered/threatened species in the new county and any adjacent counties that are within 5 miles of the new location(s) and any available site-specific assessments or approvals related to the Endangered Species Act; and

4.1.4.9. If the new location has not previously been approved pursuant to Condition 1.3, a list of any historical/cultural preservation sites in the county of the new location(s) and any available archeological surveys.

4.2. Notification after Relocation. The permittee shall notify EPA in writing within 15 days after relocating the permitted source to a location on an Indian reservation. The notification shall include:

4.2.1. Actual dates of relocation (last date of operation at previous location, date physically moved from previous location, date of physical arrival at new location, and date operation began at new location); and

4.2.2. Any corrections or adjustments to the information required to be previously submitted in Condition 4.1.

4.3. Notification of Deviations. The permittee shall notify EPA:

4.3.1. By telephone (describing the situation) within 24 hours and in writing within 10 days of determining that the drum dryer is producing hot mix asphalt and the baghouse is not fully operational, the baghouse is not in good operating condition, or the drum dryer exhaust is not being routed to the baghouse; and

4.3.2. In writing (describing the exceedance) within 10 days of determining that the rolling 12-month total emissions, calculated pursuant to Condition 3.9, exceed an emission limit in Condition 2.

4.4. Annual and Final Emission Report. Annually, within 45 days after the end of any calendar year in which the permitted source operated on an Indian reservation and (as a final report) within 13½ months after relocating from a location on an Indian reservation to a location off an Indian reservation, the permittee shall submit to EPA a report that includes:

4.4.1. The locations on an Indian reservation at which the permitted source operated during the time period being reported and the dates of operation at each location; and

4.4.2. The monthly and rolling 12-month total emissions required by Condition 3.9 for the reporting period including all assumptions and calculations used. The final report shall only include monthly and rolling 12-month total emissions, including all assumptions and calculations, not previously reported in an annual report.

4.5. Mailing Addresses and Telephone Number. All original notifications and reports shall be sent to EPA at the address below and all telephone notifications shall be made to the telephone number below. A copy of each notification required in Conditions 4.1, 4.2 and 4.3 and each emission report required in Condition 4.4 that does not contain confidential business information shall be sent to the Tribal Environmental Contact at the address below.

Original Documents go to EPA at:

Non-Title V Coordinator, AWT-107
U.S. EPA Region 10
Suite 900
1200 Sixth Avenue
Seattle, WA 98101

For telephone notifications:
Call: 1-800-424-4372
(mention the "FARR")

Copies go to Tribal Contacts at:

Julie Simpson
ERWM Air Quality Program
Coordinator
Nez Perce Tribe
P. O. Box 365
Lapwai. ID 83540
julies@nezperce.org

United States Environmental Protection Agency
Region 10, Office of Air, Waste and Toxic
AWT-107
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

Permit Number: R10NT501701
Issued: August 10, 2010
AFS Plant I.D. Number: 16-777-00449

Technical Support Document
Non-Title V Air Quality Operating Permit

Permit Writer: Doug Hardesty

Knife River, Inc.
CMI Portable Hot Mix Asphalt Plant

Purpose of Owner-Requested Non-Title V Operating Permit And Technical Support Document

Title 40 Code of Federal Regulations Section 49.139 establishes a permitting program to provide for the establishment of Federally-enforceable requirements for air pollution sources located within Indian reservations in Idaho, Oregon and Washington. The owner or operator of an air pollution source who wishes to obtain a Federally-enforceable limitation on the source's actual emissions or potential to emit must submit an application to the Regional Administrator requesting such limitation. The United States Environmental Protection Agency (EPA) then develops the permit via a public process. The permit remains in effect until it is modified, revoked or terminated by EPA in writing.

This document, the technical support document, fulfils the requirement of 40 CFR § 49.139(c)(3) by describing the proposed limitation and its effect on the actual emissions and/or potential to emit of the air pollution source. Unlike the Operating Permit, this Technical Support Document is not legally enforceable. The permittee is obligated to follow the terms of the permit. Any errors or omissions in the summaries provided here do not excuse the permittee from the requirements of the permit.

Table of Contents

1. EPA Authority to Issue Non-Title V Permits

On April 8, 2005 the United States Environmental Protection Agency (EPA) adopted regulations (70 FR 18074) codified at 40 CFR Parts 9 and 49, establishing Federal Implementation Plans under the Clean Air Act for Indian reservations in Idaho, Oregon and Washington. One Federal Implementation Plan, commonly referred to as the Federal Air Rules for Reservations (FARR), put in place basic air quality regulations to protect health and welfare on Indian reservations located in the Pacific Northwest. This permit has been developed pursuant to 40 CFR § 49.139 which creates a non-Title V permitting program for establishing Federally-enforceable requirements for air pollution sources on Indian reservations.

2. Project Description

2.1 Background

Three federal air quality programs exist that apply to primarily major sources of air pollution: Prevention of Significant Deterioration (PSD) construction permits; Title V operating permits; and Maximum Achievable Control Technology (MACT) standards. The definition of "major source" is slightly different in each program, but is generally based on the amount of pollutants emitted by a source. A source that would otherwise be major can avoid these programs by voluntarily limiting emissions of regulated pollutants to less than the thresholds for applicability in each program. EPA's non-Title V permit program, created in the FARR, can be used by sources to establish limits for avoiding PSD permitting, Title V permitting and MACT standards. On August 6, 2009, a non-Title V permit was issued to Knife River, Inc (Knife River) for their "Astec" portable hot mix asphalt plant. That permit limited the permitted source's potential emissions below the thresholds for PSD and Title V and allowed operation on the Nez Perce Reservation in Idaho, including one specific location in Kooskia, Idaho. Now Knife River is requesting a similar permit for their "CMI" portable hot mix asphalt plant.

2.2 Request Description

On February 23, 2010, EPA Region 10 received an application from Knife River requesting emission limits be established that allow Knife River's CMI portable asphalt plant to operate on the Nez Perce Indian Reservation without being subject to Title V permitting. In their application, Knife River identified only one planned location on the Nez Perce Reservation (in Kooskia, Idaho), noting that they plan to operate there for about 4 months and produce approximately 432,000 tons of hot mix asphalt. As a source that normally operates seasonally, Knife River believes their actual annual emissions will be well below the thresholds for applicability in Title V as well as PSD and MACT.

3. Facility Information

3.1 Ownership & Location

Knife River is a U.S. owned and operated, publicly traded company that is a division of the Montana Dakota Utility. The hot mix asphalt plant is considered a portable source because the equipment can be easily dismantled, transported to different locations and reassembled for operation. As such, Knife River must comply with the requirements of each jurisdiction in which it operates. This plant has a permit to construct from the State of Idaho (Permit Number P-2009.0094 issued on September 9, 2009) that authorizes operation within the jurisdiction of the Idaho Department of Environmental Quality.

This non-Title V permit authorizes Knife River to operate on the Nez Perce Reservation in Idaho, provided Knife River complies with the permit conditions and receives approval from EPA for each specific location.

At the time of initial permit issuance, only one specific location has been approved - see Permit Condition 1.3. Knife River cannot operate at any other locations until they are approved in writing by EPA. Additional specific locations will be identified and approved through the mechanism described in the permit.

3.2 Facility Description

This facility is a portable counter-flow asphalt plant facility which uses a mixture of sized aggregate and liquid asphalt cement to make hot mix asphalt (HMA) paving material. Stockpiled aggregate and recycled asphalt pavement (RAP) is transferred to feed bins. Aggregate is dispensed from the bins onto feeder conveyors, which transfer the aggregate to the drum mix dryer through a scalper screen. The scalper screen removes oversized material from the aggregate feed. Aggregate and RAP (added at the mid-point of the dryer) travel through the rotating drum dryer where it is heated and dried. The dryer is heated by burners fueled by #2 diesel, natural gas or reprocessed fuel oil (RFO) sometimes referred to as used oil or waste oil. A measured amount of heated asphalt cement is added and mixed with the hot aggregate and RAP to produce HMA. Asphalt cement is stored in an above-ground storage tank, kept in a liquid state using a tank heater that is fueled by #2 diesel, RFO or natural gas. The HMA is then conveyed to hot storage silos until it can be loaded into trucks for transport off site. All fuels are stored in above-ground tanks.

Electrical power is provided by a connection to the local grid (when available) or by a portable generator that is fueled by #2 diesel. The facility Standard Industrial Classification code is 2951, Asphalt Paving Mixtures and Blocks. The drum dryer emissions are controlled by a baghouse (fabric filter). Water may be applied to traffic areas to control fugitive dust.

Plant configurations from project to project can vary somewhat. Typically, the plant configuration will include the hot mix asphalt plant counter-flow drum dryer, a diesel generator, an asphalt tank and an asphalt tank heater, tanks to store the fuels, HMA storage silos, along with some combination of conveyors, trucks, and loaders. Table 1 lists and describes the emission units and emission controls that typically exist.

Knife River does not mine, crush or screen rock to produce the aggregate that is used as a raw material. For the initial project, crushed rock will be purchased from DeAtley Crushing located in a pit about 3 miles away from the Kooskia site. Typically, rock is extracted from the earth and crushed at a different location or before the asphalt plant is moved to the work site. EPA's source aggregation policy requires two sources to be considered one source for permit applicability purposes if their operations are: (1) located on one or more contiguous or adjacent properties, (2) are under common control (e.g. Knife River owns both or the rock crusher is a subcontractor to Knife River), and (3) belong to the same industrial grouping (two-digit Standard Industrial Classification code) or one operation supports the other operation with most of its output. Asphalt manufacturing (29) and nonmetallic mineral extraction & crushing (14) have different Standard Industrial Classification codes but while rock is extracted and crushed for an asphalt plant, it is clearly a support operation to the asphalt plant even if the rock is extracted and crushed before the asphalt plant is moved to a contiguous or adjacent site. If a combination of asphalt manufacturing and rock extraction and rock crushing meet all three of EPA's criteria for aggregation and consideration as one source, then it is necessary to count the emissions from the asphalt plant and rock extraction and rock crushing (while the upstream activities support the asphalt plant) to determine compliance with emission limits in this non-Title V permit. Source aggregation decisions can be very complicated. EPA should be consulted for regulatory advice about aggregation.

Table 1: Emission Units (EU)

EU #	Source Description	Emission Controls
1	**Hot-mix Asphalt Drum Dryer**: CMI brand, model PTD-400; manufactured 1989; portable, counter-flow design drum; 300 ton/hr rated	Standard Havens brand baghouse*,

	capacity; with RAP capability; 96.8 mmbtu/hr (Starjet SJ520) burner fueled with #2 diesel, RFO and natural gas	model PB-8.5
2	**Generators:** **(1) Operation Generator:** Caterpillar brand, compression ignition, model C32; manufactured 10/18/06; fueled with #2 diesel; 910 kW capacity (9.246 mmBtu/hr) **(2) Night Generator:** MultiQuip brand, compression ignition, model MQ70/DCA70; manufactured 1997; fueled with #2 diesel; 125 kW capacity (0.621 mmBtu/hr)	Catalyst on Cat; None on MultiQuip
3	**Storage Tanks** **(1) Two asphalt storage tanks:** 18,000 and 25,000 gal capacities; heated (see tank heater) **(2) RFO storage tank:** 13,866 gal capacity portable tank trailer; RFO is used in the drum dryer **(3) #2 diesel storage tank:** 12,000 gal capacity portable tank trailer; supplies the drum mixer, tank heater, loader and generators	None
4	**Asphalt Tank Heater**: Gencor brand, model HYCGO 100; manufactured 2003; 0.5 mmbtu/hr (indirect heat); fueled with #2 diesel, RFO and natural gas	None
5	**Aggregate Handling and Screening**: via trucks, loader and conveyors; to and from piles and to drum dryer through scalping screen; includes recycled asphalt pavement	None
6	**Silo Filling**: via conveyor from drum dryer	None
7	**Truck Loading and Fumes**: asphalt truck load-out from silos and fumes from loaded truck bed while in plant	None
8	**Traffic**: HMA trucks, aggregate and RAP trucks, asphalt trucks, loader for aggregate and RAP	Water application
9	**Wind Erosion**: open areas and aggregate storage piles	None

* All known emission controls are listed – required controls are noted with an asterisk

3.3 Local Air Quality

Knife River has requested this permit to allow operation on the Nez Perce Reservation, which is currently unclassifiable or attains the national ambient air quality standards for all criteria pollutants. An area is unclassifiable when there is insufficient monitoring data. Areas of the country where air pollution levels exceed the national ambient air quality standards are designated "nonattainment." Note that PSD applies only in attainment and unclassifiable areas. Ambient air quality designations are presented in 40 CFR Part 81.

4. Regulatory Analysis and Permit Content

4.1 Evaluation of Request

The Clean Air Act requires all major sources to obtain a PSD permit to construct and a Title V permit to operate. Major sources of hazardous air pollutants (HAP) are also subject to the MACT program. The definition of "major" and the criteria for qualifying as a major source are slightly different for each of the three programs. Asphalt plants that have the potential to emit (PTE) 250 tons per year or more are subject to PSD. Sources that have the potential to emit 10 tons per year or more of any individual HAP or 25 tons per year or more of all HAPs emitted (including fugitive emissions) are subject to the MACT program. Sources that have the potential to emit 100 tons per year or more or that are major for PSD or MACT purposes, are subject to Title V. PTE is based on the source's maximum capacity operating 8760 hours per year and only considers emission controls or limits that are enforceable (see the federal requirements discussions in Section

4.2). Sources categories subject to a New Source Performance Standard (NSPS) that was promulgated as of August 7, 1980, must count fugitive as well as non-fugitive criteria pollutants when determining major source status. NSPS Subpart I, originally promulgated in 1973, applies to asphalt plants, so fugitive emissions must be counted when determining major source status for asphalt plants.

As shown is Table 2, Knife River has the potential to emit more than 250 tpy of PM and more than 100 tpy of CO, NOx, PM10, and SO2. VOC emissions are predicted to be 71% of the Title V applicability threshold of 100 tpy. HAP (total and individual) and lead emissions are predicted to be well below the Title V and MACT applicability thresholds. See Appendix A for emission inventory details. Without enforceable emission limits in all jurisdictions in which they operate, Knife River is subject to PSD and Title V.

Table 2: Potential to Emit (PTE)

#	Emission Unit[2]	Annual Potential Emissions (tons per year)[1]								
		CO	Pb	NOx	PM	PM10	SO2	VOC	HCOH	HAP
1	Drum dryer	171	<1	72	23	5	209	42	4.1	14.0
2	Generators	37	<1	142	5	17	22	5	<0.1	0.1
3	Storage tanks	<1						2	0.8	1.4
4	Asphalt tank heater	<1	<1	<1	<1	<1	3	<1	<0.1	<0.1
5	Aggregate handling				52	20				
6	Silo filling	2			<1	<1		16	0.1	0.2
7	Truck loading/fumes	2			<1	<1		7	<0.1	0.2
8	Traffic				335	86				
9	Wind erosion				<1	<1				
	Calculated PTE	212	<1	214	417	130	234	71	5.0	15.9
	New PTE Limits[3]	80	N/A	80	200	80	80	80	N/A	N/A

[1] Carbon monoxide; lead; nitrogen oxides; particulate matter; particulate matter less than 10 microns; sulfur dioxide; volatile organic compounds; formaldehyde (highest plant wide single HAP); total hazardous air pollutants.
[2] Emissions from any rock excavation and crushing (when required to be aggregated with this asphalt plant) count towards the new PTE limits created by this permit.
[3] The PTE is capped by new limits created in this non-Title V permit.

The emission estimates considered each applicable emission limit paired with each fuel type that can be used by the equipment to determine the worst-case emissions that are allowed, assuming full-time operation at full capacity, which would produce 2.6 million of tons of HMA per year. Note that individual HAP PTE estimates were based on the worst-case fuel for each individual HAP, while the emission unit HAP PTE was based on a summation of the worst-case fuel for the emission unit. Source-wide HAP PTE was a summation of the emission units' HAP PTE. PTE was also limited by applicable NSPS and FARR emission limits when the limits resulted in lower emissions than available emission estimation techniques predicted. Emission testing performed in 2009 demonstrated that actual PM emissions were well below the NSPS limit. The permittee can use the site-specific PM data to develop an emission factor for use when reporting actual emissions.

As explained in Section 2.2 above and in Table 2, to avoid being subject to Title V, Knife River has requested emission limits (called synthetic minor limits) be created in a non-Title V permit. Our analysis indicates that limits are also necessary to avoid PSD. Knife River anticipates only seasonal operations with this project resulting in an additional production of less than 17% (432,000 tons) of the potential production (2.6 million tpy) used in the emission estimates. At the anticipated lower production rate and using fuels with much lower sulfur content than required, Knife River is confident that the actual emissions will be well below the

emission limits requested. Actual emissions will be determined using actual production rates, fuels and control efficiencies. If better emission factors (e.g. developed by testing the emissions from this source) are available that better reflect actual emissions, then those factors should be used. As described in more detail in Section 4.3, the permit will limit emissions on a rolling 12-month basis to:

- Not more than 200 tpy for PM (avoids PSD)
- Not more than 80 tpy for CO, NOx, PM10, SO2, VOC (avoids PSD and Title V)

Over 90 percent of the PM and 80 percent of PM10 emissions from this plant are expected to be fugitive emissions. Emission estimates do not take into account any unenforceable emission reductions techniques that the permittee might use (e.g. road watering) to comply with the fugitive dust or visible emission requirements that may apply. Techniques exist for quantifying emission reductions due to road watering. If the permittee relies upon controls to lower actual emissions, EPA will require adequate documentation of the emission reduction techniques and applicable operational parameters that the quantification techniques employ. The permittee should discuss the use of such techniques with EPA before using them for calculation, compliance and reporting purposes.

For portable sources such as hot mix asphalt plants that move around frequently, it is questionable whether the generator would be considered to be a stationary source or a non-road engine (see the generator discussion in the NSPS discussion in section 4.2). If a generator qualifies as a non-road engine it does not need to be included in the PTE analysis. Even though Knife River does not intend to operate the generators in the same location for more than 12 months, since we are considering worst-case scenarios, the PTE analysis assumes the emissions from the generator count towards applicability. Note that even if the generators were not counted, the source would still be major for CO, PM, PM10 and SO2 emissions and limits (and this permit) would be necessary to avoid PSD and Title V.

The emission inventory in Appendix A does not include any rock extraction or crushing emission units because Knife River does not plan to perform either activity; crushed rock will be supplied by another company. As explained in TSD Section 3.2, if a rock extraction and crushing operation ever meets EPA's source aggregation criteria and must be considered part of Knife River's plant, then Knife River will be required to account for the emissions from the rock extraction and crushing operation to document compliance with the emission limits in this permit. In that case, only the actual emissions (including fugitives) emitted by the rock extraction and crushing activities while they support the asphalt plant must be added to the asphalt plant's rolling 12-month emissions (including fugitives) to determine compliance with the 12-month rolling emission limits in this permit. Knife River's request for this permit is reasonable and approvable.

4.2 Other Federal Requirements

Endangered Species Act (ESA) – EPA is obligated under ESA, Section 7, 16 U.S.C. §1531, to consider the impact that a federal project may have on listed species or critical habitats. EPA considers ESA issues in the context of permitting decisions on a case-by-case basis.

This permit creates emission limits that allow the permittee to operate on the Nez Perce Reservation in Idaho without being subject to PSD or Title V permitting, but only at the specific location identified by the permit or subsequent letters of approval. To gain approval for a specific location, the permittee must notify EPA 40 days prior to moving the asphalt plant (including rock extraction and crushing equipment when required to be aggregated with this asphalt plant) there and supply location-specific information. EPA will post a notice on EPA Region 10's web site describing the new location and stating that EPA is assessing potential ESA impacts as a part of EPA's approval of a the new location. EPA will within 40 days assess the potential for effects on listed species and critical habitat. EPA may refer to the ESA decision in any storm water permits issued to the permittee. If EPA determines, for that requested location, that there will be "no effect" regarding

ESA impacts, EPA will send the permittee a letter approving the permittee's move to and operation at the new location and post the decision on EPA Region 10's web site. If EPA cannot conclude that there will be no effect, EPA will notify the permittee of the need for consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service and proceed with that process. Consultation can be expected to delay the permittee's planned move.

Initially, the permit is being issued with only one specific location identified and approved (see Permit Condition 1.3). The project that the permittee is supporting, Highway 12 widening from Syringa to Tumble Creek, was reviewed by U.S. Fish and Wildlife Services and the National Marine Fisheries Service for ESA concerns with both agencies concluding no effect or not likely to adversely effect or jeopardize listed species or critical habitat. The site is an existing industrial site and with no discharges to waters of the United States expected. It was assumed that the permittee would be required to operate under the existing facility's storm water permit or be issued a specific storm water permit that addresses site-specific ESA concerns. By requiring the plant to locate within the previously disturbed area of an existing industrial site, the permittee will not disturb new soil or presumably any threatened plants. There are two endangered or threatened mammals, the gray wolf and Canada lynx, that could inhabit either of these areas of Idaho, but the operation of the plant was not expected to be a concern. Additionally, it was not likely that the air emissions from the plant will have an impact on any listed terrestrial species or critical habitat. For the purpose of this permit, EPA therefore concludes that there will be no effect on listed species or critical habitat. The non-Title V permit serves as the permittee's approval of the proposed specific location.

Environmental Justice (EJ) – Pursuant to Executive Order 12898 issued on February 11, 1994 and entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," EPA is required to identify and address disproportionately high and adverse human health or environmental effects of regulatory programs, policies, and activities on minority populations and low-income populations. Consistent with a December 1, 2000, EPA memorandum entitled, "EPA Statutory and Regulatory Authorities under Which Environmental Justice Issues May Be Addressed in Permitting," EPA considers environmental justice issues in the context of permitting decisions on a case-by-case basis.

This permit creates emission limits that allow the permittee to operate on the Nez Perce Reservation in Idaho without being subject to PSD or Title V permitting, but only at the specific location identified by the permit or subsequent letters of approval. To gain approval for a specific location, the permittee must notify EPA 40 days prior to moving the asphalt plant (including rock extraction and crushing equipment when required to be aggregated with this asphalt plant) there and supply location-specific information. EPA will post a notice on EPA Region 10's web site describing the new location and stating that EPA is assessing potential EJ issues as a part of EPA's approval of a new location. EPA will within 40 days assess the potential for disproportionately high and adverse effects on an EJ community. If EPA determines, for the requested location, that there will be no disproportionate or adverse impacts regarding EJ, EPA will send the permittee a letter approving the permittee's move to and operation at the new location and post the decision on EPA Region 10's web site. If EPA concludes that there will be a disproportionate or adverse effect, EPA will notify the permittee of the need for additional consideration and begin to address those concerns. If EJ issues are identified, the permittee's planned relocation may be delayed.

The initial permit is being issued with only one specific location identified and approved (see Permit Condition 1.3). No EJ concerns were raised when a permit was previously issued to Knife River for another asphalt plant. Portable asphalt plants generally relocate frequently, often locating where there is access to available rock as close to current paving projects as possible. The permittee's specific location is an existing industrial facility - a sawmill. Links to maps that show environmental justice indicators for poverty and people of color are available on EPA's air permits website at this address: http://yosemite.epa.gov/R10/AIRPAGE.NSF/webpage/Public+Comment+Opportunities/. For this permit action, EPA is seeking input regarding possible EJ concerns and whether the permittee's operation might

cause a disproportionately high environmental or public health impact on a low income or minority population.

National Historic Preservation Act (NHPA) – Under Section 106 of NHPA (16 U.S.C. 470f), federal agencies are required to take into account the effect a permitted project may have on any sites that are listed or eligible for listing in the National Register of historic properties as well as sites that are considered tribal cultural resources.

This permit creates emission limits that allow the permittee to operate on the Nez Perce Reservation in Idaho without being subject to PSD or Title V permitting, but only at the specific locations identified by the permit or subsequent letters of approval. To gain approval for a specific location, the permittee must notify EPA 40 days prior to moving the asphalt plant (including rock extraction and crushing equipment when required to be aggregated with this asphalt plant) there and supply location-specific information. EPA will within 40 days assess the potential for effects on historic or cultural resources. EPA will contact the State and/or Tribal Historic Preservation Officer (SHPO/THPO) to confirm whether there is a concern about the permittee's proposed new location. Based on that input, if EPA determines for that specific location that there are no concerns, EPA will send the permittee a letter approving the permittee's move to and operation at the new location. If historic or cultural issues are identified, EPA will work with the permittee and the preservation officer(s) to address the concerns before approving the permittee's relocation.

Initial the permit is being issued with only one specific location identified and approved (see Permit Condition 1.3). On the Nez Perce Reservation, the THPO is the lead for the historical preservation program. EPA contacted the THPO for input on the permittee's proposed location. The specific location was approved by the THPO in a previous non-Title V permit project for Knife River. The non-Title V permit serves as the permittee's approval of the proposed specific location.

National Environmental Policy Act (NEPA) Review – Under Section 793(c) of the Energy Supply and Environmental Coordination Act of 1974, no action taken under the Clean Air Act shall be deemed a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969. This permit is an action taken under regulations implementing the Clean Air Act and is therefore exempt from NEPA.

New Source Performance Standards (NSPS) – Applicable NSPS requirements, found in 40 CFR 60, can be considered in determining a source's PTE because they are enforceable limits on emissions. Five NSPS subparts may apply to portable asphalt plants: 40 CFR 60, subparts I (asphalt plants), K (tanks), Ka (tanks), Kb (tanks) and IIII (internal combustion engines). The permittee should be aware that newly promulgated NSPS not discussed here may also be applicable.

Subpart I (Hot Mix Asphalt Plants) applies to the permittee because the asphalt plant was constructed in 1989, well after the June 11, 1973, cutoff for applicability. The standard includes a particulate matter emission limit of 0.04 grains per dry standard cubic foot of exhaust and an opacity limit of 20% or greater. The standard also requires a source test upon startup. The permittee accomplished that testing several years ago and repeated the testing in 2009. The source complied with the NSPS limit in both of those test. The NSPS requirements are not included in the permit; however, the permittee is still subject to the standard and responsible for complying with the limit. The particulate matter emission limit was also used to evaluate worst-case "allowable" potential to emit estimates in the emission inventory.

The permittee has four liquid storage tanks. Three NSPS subparts may apply to the fuel storage tanks: 40 CFR 60, Subparts K (Storage Vessels "Commenced" from 6/12/73 to 5/18/78), Ka (Storage Vessels "Commenced" from 5/19/78 to 7/22/84) and Kb (Storage Vessels "Commenced" after 7/23/84). Subparts K and Ka apply to tanks larger than 40,000 gallons and subpart Kb applies to tanks greater than or equal to 75 cubic meters (19,813 gallons). The permittee's tank capacities are as follows: Tank #1 - 25,000 gallon heated asphalt

storage tank; Tank #2 - 18,000 gallon heated asphalt storage tank; Tank #3 - 13,866 gallon RFO storage tank; Tank #4 - 12,000 gallon #2 diesel storage tank. Only tank #1 is larger than 75 cubic meters and presumably manufactured after 1984. Storage tanks that are greater than 75 cubic meters but less than 151 cubic meters storing a liquid with a maximum true vapor pressure less than 15.0 kilopascals are exempt from subpart Kb [see 60.110b(b)]. The predicted maximum vapor pressure, based on the daily liquid surface temperature, for diesel and RFO is just above zero while the maximum vapor pressure for asphalt in a heated tank can be expected to be less than 1 kPa. Based on the size of tanks #2 thru #4 and the maximum true vapor pressure of the stored asphalt, none of the tanks are subject to NSPS.

Subpart IIII (Stationary Compression Ignition Internal Combustion Engines) applies to generators manufactured, modified or reconstructed after July 11, 2005. The permittee has two generators. NSPS do not apply to generators that qualify as non-road engines. If a generator operates in the same location for more than 12 months (can be shorter for seasonal sources), it will not be considered a non-road engine and could be subject to this subpart. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at that single location approximately three months (or more) each year. If the generators do not qualify as non-road engines, then NSPS applicability must be considered. The 125 kW night generator was manufactured in 1997 and so, based on the criteria in 60.4200, is not subject to subpart IIII (see the applicability discussion for MACT subpart ZZZZ below) unless it is modified or reconstructed (as defined in NSPS) after July 11, 2005. The 910 kW operations generator was manufactured October 18, 2006, and so could become subject to the NSPS. The permittee should maintain records that document the manufacture date of each generator, whether the 125 kW generator is ever modified or "reconstructed" (see NSPS for definitions) and how long each generator operates in the same location (to confirm non-road engines status).

National Emission Standards for Hazardous Air Pollutants (NESHAP) – Applicable NESHAP requirements, found in 40 CFR 61 and 63 can be considered in determining a source's PTE because they are enforceable limits on emissions. There are no NESHAP requirements in 40 CFR part 61 that apply to asphalt plants. The emission inventory created for this permit indicate that the permittee's portable hot mix asphalt plant is a true minor source of hazardous air pollutants; as such, the permittee is not subject to any "major source" MACT standards in 40 CFR part 63. One "area source" MACT standard could apply to generators at portable asphalt plants: 40 CFR 63, subpart ZZZZ (internal combustion engines). The permittee should be aware that newly promulgated NESHAP not discussed here may also be applicable.

Subpart ZZZZ (Stationary Reciprocating Internal Combustion Engines) applies to stationary compression ignition engines including generators constructed after June 12, 2006. Generators constructed before that date and located at a non-major source are considered existing area sources and are exempted from subpart ZZZZ in 63.6590(b)(3) at this time. Like NSPS, NESHAP do not apply to generators that qualify as non-road engines (see the NSPS discussion about non-road engines above). If the generators do not qualify as non-road engines, then NESHAP applicability must be considered. The 125 kW generator was manufactured before 2006 so, per 63.6590(c), it is not subject to subpart ZZZZ or NSPS subpart IIII. The 910 kW operations generator was manufactured October 18, 2006, and so could become subject to the NESHAP. The permittee should maintain records to document the manufacture date of each generator, as well as any modification or reconstruction, of the generators and how long each generator operates in the same location (to confirm non-road engines status).

Federal Air Rules for Reservations (FARR) – Applicable FARR requirements can be considered in determining a source's PTE. There are five FARR requirements that apply to portable asphalt plants and that could contain enforceable limits for PTE purposes: 49.124 (visible emissions); 49.125 (particulate matter emissions); 49.126 (fugitive particulate matter emissions); 49.129 (sulfur dioxide emissions); and 49.130 (sulfur in fuels). The PTE emissions inventory in Appendix A considered these requirements where appropriate when estimating emissions.

4.3 Permit Conditions

The permit establishes PTE limits as well as monitoring, recordkeeping and reporting requirements necessary to assure compliance with the limits. The permit is organized into 4 sections as follow:

1. General Conditions
2. Emission Limits and Work Practice Requirements
3. Monitoring and Recordkeeping Requirements
4. Reporting Requirements

An explanation of each condition in the permit follows.

Permit Section 1, General Conditions

Permit Condition 1.1 clarifies who the permittee is and that the permitted source is the hot-mix asphalt drum dryer (CMI, model PTD-400) and any combination of rock extraction and crushing (when required to be aggregated with this asphalt plant), handling and storage equipment used to produce hot mix asphalt.

Permit Condition 1.2 requires the permittee to comply with the conditions in the permit and any conditions that are created when EPA approves new locations. Those new conditions will be communicated in the letter approval referred to in Permit Condition 1.3.

Permit Condition 1.3 states that compliance with the permit (and site-specific conditions) allows the permittee to operate at the approved location listed in this condition as well as any additional future locations approved in writing by EPA. Permit Condition 1.3.1 describes the one location already approved and includes the requirement to locate the plant in the previously disturbed portion of the industrial site. This helps assure that historical or cultural areas will not be disturbed. Permit Condition 1.3.5 allows EPA to approve new locations on the Nez Perce Reservation. To gain approval for new locations, the permittee is required in Permit Section 4 to notify EPA of its plans to relocate and to supply EPA with information about the new location. Before approving a new location, EPA will verify that there will be no effect on listed species or critical habitat (per ESA), no disproportionate impacts upon minority populations and low-income populations (per EPA's EJ policy), and no adverse effects on historic properties (per NHPA). EPA will also confirm that the permittee is still in compliance with the limits that allow them to avoid PSD and Title V. If EPA believes that adverse effects may occur, additional analysis and approval steps (e.g. biological assessments, consultations and etc) may be necessary before a final approval decision can be reached. Approval letters will be posted on EPA's web site and the permit may be periodically revised to incorporate any approved locations to this condition. Compliance with the permit means that the permittee will not be subject to PSD or Title V permits.

Permit Condition 1.4 states that the permit does not relieve the permittee from complying with any other federal, tribal, state, or local laws or requirements that apply. This permit only creates owner requested limits for the purposes explained above. The permit does not contain other Clean Air Act requirements to which the permitted facility is or may be subject, such as the FARR; New Source Performance Standards, 40 CFR Part 60; and National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61, and 63. If in the future, the permittee chooses to relax the limits in Permit Section 2 such that the facility becomes a major source, permitting requirements may apply.

Permit Section 2, Emission Limits and Work Practice Standards

Permit Conditions 2.1 to 2.6 limit the PTE of the facility to 80% of the major source thresholds for PSD (PM) and Title V (CO, NOx, PM10, SO2 and VOC). The thresholds for each program are 250 tpy (PSD) and 100 tpy (Title V). The Title V limits effectively limit emissions for PSD purposes with the exception of PM which is no longer considered a regulated pollutant for Title V applicability purposes (which is the reason the limit is

200 tpy). These synthetic minor limits allow the permittee to be treated as a minor source for permitting purposes. Each limit is written as a rolling 12-month total where each month, actual emissions must be totaled for the last 12 months to determine compliance with the ton per year limit. Emission factors are relied upon for calculating actual emissions. If a co-located rock crusher is determined to meet the criteria for aggregation (common control; contiguous and adjacent location; and a support relationship) with the asphalt plant, the emissions from the rock crusher must be added to the emission from the asphalt plant's emissions to determine compliance with these emission limits. EPA should be consulted if there is any question about EPA's aggregation policies and specific aggregation determinations.

Limiting emissions to a value equal to 80% of the major source threshold levels is necessary to account for the unknown uncertainty in the calculations employed when determining actual emissions generated by this source. Limiting these "calculated emissions" to a fraction of the threshold level helps assure that actual emissions remain below the major source threshold level. According to the Clean Air Act Stationary Source Compliance Monitoring Strategy, synthetic minor sources with PTE limits at 80 to 100% of the major source thresholds will be inspected on a once every five year frequency. Setting the limits within that range will help to ensure adequate compliance assurance.

Permit Condition 2.7 requires good operation of the fuel burning equipment (drum dryer, tank heater and generators) and the drum dryer baghouse. Good operation generally implies proper operation and good maintenance of equipment - burner tuning and baghouse bag inspection and replacement as needed. The emission factors relied upon in this permit are assumed to reflect good operation, so good maintenance and operation of the equipment is necessary to ensure the factors are representative of actual operations. This permit condition also requires the baghouse be operated at all times that the drum dryer is operated and receives any emissions generated by the drum dryer, again, to assure a level of emission control that reflects good operation and the emission factors relied upon.

Permit Section 3, Monitoring and Recordkeeping Requirements

Permit Conditions 3.1 to 3.5 Visible Emission Monitoring and Recordkeeping - These conditions require a daily survey (a plant walkthrough) for visible emissions from the drum dryer baghouse stack as well as specific follow-up steps (investigation, corrective action, RM9 observation and additional recordkeeping and reporting) if visible emissions are observed. If observed visible emissions can not be eliminated within 24 hours, a RM9 opacity observation must be performed. Records of all surveys and observations are required to be kept. This requirement will help ensure that emissions do not exceed the limits created by this permit.

Permit Condition 3.6 Baghouse Inspection and Recordkeeping - This permit condition requires an annual internal inspection of the baghouse to check for wear, corrosion and bag degradation, blinding or channeling that could impair the performance of the unit. Again, the requirement to inspect and appropriately maintain the baghouse is believed to be necessary to ensure the emission factors used in the monthly compliance evaluation represent actual operations.

Permit Condition 3.7 Operations and Production Records - The permittee must track and record the operations and production of the plant (including rock extraction and crushing equipment when required to be aggregated with this asphalt plant) such that facility-wide emissions can be reliably calculated on a monthly and 12-month basis and for troubleshooting compliance concerns. Records shall include all information necessary to perform emission calculations as required by Permit Condition 3.9. Emission estimation techniques, and the data needed, are described in detail in Appendix A to this TSD. Most of the data (production, fuel usage, baghouse pressure drop and fugitive dust controls) must be recorded each day. Other data, such as fuel sulfur and ash content, must be documented for each fuel load or through actual measurements to represent what is being burned at any time. Pursuant to Permit Condition 2.7, the drum dryer is required to be vented to the baghouse at all times and the baghouse must be kept in good operational condition. Permit Condition 3.6 requires the baghouse internals to be inspected annually. The permittee must document any period of

operation when (1) the drum dryer is not vented to the baghouse and (2) the baghouse is not in good operation to assure compliance with Permit Condition 2.7.

Permit Condition 3.8 Equipment Installation – Some monitoring requirements will require the permittee to have equipment to indicate the operational parameters that must be recorded. The permittee can also automate some recordkeeping systems to assure data is recorded. For instance, baghouse pressure drop requires pressure reading instrumentation and can be linked to recording equipment. Some combustion devices can also be equipped with fuel usage measurement and recording instrumentation. All records can be manually recorded by plant personnel using the technique (or "system") the permittee determines is appropriate to comply with the permit. If monitoring equipment will be installed and used, this condition requires it to be appropriately calibrated and maintained before the source operates on an Indian reservation.

Permit Condition 3.9 Emissions Calculations – Because compliance with the synthetic minor emission limits created in this permit must be determined on a rolling 12-month basis, this condition requires the permittee to confirm compliance with the emission limits in the permit every month that the source operates on an Indian reservation and continuing for an additional 11 months after leaving an Indian reservation, no matter which jurisdiction the source moves to. Consistent with that, it also requires the permittee to include the emissions the plant emitted during the 11 months prior to moving to an Indian reservation, again, no matter which jurisdiction the plant operated in. Obviously, it would be unrealistic to expect the permittee to anticipate when they will have a project on an Indian reservation such that they will have collected 11 months of data to calculate its emissions in advance of moving an Indian reservation; therefore, permittees with EPA-issued permits that contain synthetic minor limits should always collect the necessary data to calculate emissions from its plant, no matter where they operate. This will allow them to be able to produce accurate emissions calculations for any period of time necessary. If the recordkeeping is routine for the plant personnel, it is also less likely that the source will make recordkeeping errors during the time it needs to report to EPA.

Here is an example to demonstrate how the rolling 12-month limits work:

> The permittee moves its plant to an Indian reservation and begins operating in June 2011. While the plant is operated, the permittee records all of the production records required in Permit Condition 3.7. By July 20, 2011 (20 days after the month of June), the permittee must use the production records for June 2011 and emission calculation techniques in Appendix A to this TSD to calculate its emissions (in tons) for six pollutants. If they haven't yet, the permittee must also use previously recorded production records and the same emission calculation techniques to calculate its emissions (in tons) for the 11 months prior to June 2011 (July 2010 to May 2011), no matter where they had been operating during that time period. They must add the calculated June 2011 emissions to the calculated July 2010 - May 2011 emissions to determine whether they are in compliance with the ton per year emission limits in the permit. If the calculated emissions exceed a permit limit, the permittee must notify EPA pursuant to Permit Condition 4.3.2 in writing no later than 10 days after identifying the exceedance (in this example by July 30, 2011). If the plant continues to operate, the calculation routine is repeated within 20 days after the next month of operation. If the plant moves to a location off an Indian reservation before the end of June 2011, the permittee must continue to repeat the calculation routine by tracking production and calculating emissions for the months July 2011 thru May 2012 no matter where it is located, notifying EPA if the calculated emissions ever exceed the permit limits.
>
> By February 15, 2012, the permittee must send to EPA the emission report required in Permit Condition 4.4 including the calculated monthly emissions and 12-month rolling total emissions for the time period time period July 2010 thru December 2011. By June 30, 2012, the permittee must send EPA the emission report required in Permit Condition 4.4 including the calculated monthly emissions and 12-month rolling total emissions for the time period January 2012 to May 2012. The two reports will include a total of 23 months (July 2010 thru May 2012) of calculated emissions and

twelve 12-month rolling emission totals (first 12-month period ending June 2011 and last 12-month period ending May 2012). Note that during this time frame, the plant would have been required (by the FARR registration rule, not by this permit) to submit an annual registration report of emissions emitted during the time they operated on an Indian reservation - this is a separate requirement from the permit requirement to demonstrate compliance with the permit limits.

The emission calculations should be based on the best emission factors available and actual operational and production data. Calculations should be performed as they are described in Appendix A; however, assumptions in Appendix A should be verified as needed and when better information is available, it should be used. For instance, emission factors from site-specific emission testing would likely be more representative than basing emission on NSPS limits or AP-42. Techniques used for the calculations, including any new assumptions, must be clearly documented and acceptable to EPA. The permit does not require the permittee to calculate emissions for operations off an Indian reservation unless those operations fall within the reporting period captured by the permit (11 months before operating on an Indian reservation and 11 months after leaving an Indian reservation); but obviously, the permittee must ensure the information necessary is available when needed.

Permit Condition 3.10 Records Retention – This requirement, to keep all of the required records on site for a period of five years, makes the permit consistent with other EPA recordkeeping requirements.

Permit Section 4, Reporting Requirements

Permit Condition 4.1 Notification before Relocation – The permittee must be able to anticipate relocations of the permitted source (including rock extraction and rock crushing equipment when required to be aggregated with this asphalt plant) well enough to be able to provide EPA information about the new location and its plans for operation at least 40 days before moving; earlier notification would be even better. Information about the permittee's plans to operate will allow EPA to anticipate possible changes to the permittee's emissions when at the new location. Emissions data allows EPA to confirm past compliance with the limits that allow the permittee to avoid PSD and Title V. Location information helps EPA determine agency permitting jurisdictions. If co-located with other operations, EPA can assess whether the operations should be aggregated for program applicability purposes. Other location information allows EPA to assess possible impacts under ESA, EJ and NHPA before approving the new location. If ESA assessments or approvals (even through other permitting programs) or past archeological surveys are available, the permittee should submit them to facilitate EPA's review. The permittee cannot operate at any new locations until they are approved in writing by EPA. Once a specific location has been approved, the permittee still must notify EPA before going there, but no longer needs to submit certain location information already reviewed for that location.

Permit Condition 4.2 Notification after Relocation – When notifying EPA of the actual date of relocation, the permittee can make adjustments/corrections to what was previously reported under Permit Condition 4.1 prior to relocation to ensure EPA has accurate information. The permittee also will be expected to confirm actual dates of its physical move and operation.

Permit Condition 4.3 Notification of Deviations – To expedite the time it takes for EPA to learn that the permittee is having compliance problems, this condition lists the information and timing for notifying EPA about potential deviations from permit conditions. Operating circumstances that are of greatest concern (baghouse not operating or functioning properly) must be reported by telephone within 24 hours of discovery with written follow-up within 10 days. Calculated exceedences of the permit emission limits are expected to be reported in writing within 10 days of discovery. Notifications should include a clear, complete explanation of the exceedance or situation that warrants the notification so EPA understands the severity of the situation.

Permit Condition 4.4 Annual Report – If the permittee operated on an Indian reservation during a given calendar year, the permittee must submit an emission report to EPA that provides a summary of the operations

(dates and locations) and each calculated monthly and 12-month rolling emission total required in Permit Condition 3.9, including any 12-month totals exceeding the permit limits that were previously sent to EPA under the deviation notification requirement in Permit Condition 4.3. The emission report is due annually by February 15 following any year in which the source operated on an Indian reservation. If a source operates on an Indian reservation every year, the source is required to report every year by February 15.

In the case where a source does not operate on an Indian reservation in a given calendar year, but operated on an Indian reservation the previous year, the 12-month rolling totals from the previous year of operation that extend into the new year (recall that 12-month rolling totals extend 11 months after operation ends) will not be captured in the last annual report; a final report that will capture those missing 12-month rolling totals will then be due within 13½ months after leaving the reservation the previous year. If the last month of operation on an Indian reservation happens to be January, the last annual report and final report will be due at the same time; EPA will expect only one report in that case.

The annual report ensures that EPA will receive periodic reports from plants that operate on Indian reservations continually or at least every year. While monthly emissions data might show up in more than one report, each 12-month rolling total should only be reported once. For instance, 12-month rolling totals reported in an annual report due February 15 should not be repeated in a final report later than year; the final report would only include a partial year of 12-month totals that were not reported in the previous annual report. Note that the emission report required by this permit is different than the annual registration report required by 40 CFR 49.138 in the FARR.

Permit Condition 4.5 Mailing Addresses and Telephone Number – The telephone number for telephone notifications has been included here. Copies of all notifications and reports must be sent to the Tribal environmental contact listed.

5. Permit Procedures

5.1 Permit Revisions, Termination and Reissuance

The permittee may request EPA to revise the conditions of this permit by submitting an application that contains the information specified in 40 C.F.R. 49.139(d). EPA will revise the permit using the same procedures that apply to initial permit issuance.

If the permittee wishes to terminate the permit, a written request must be submitted to EPA explaining the reasons for the request and, if necessary for continued operation, submitting applications for any Clean Air Act permits or approvals that the permittee avoided by establishment of the limits contained in this permit.

This permit may be terminated, revised, or revoked and reissued by EPA for cause. Cause exists to terminate, revise, or revoke and reissue this permit under the following circumstances:

1. This permit contains a material mistake;
2. Inaccurate statements were made in establishing the terms or conditions of this permit;
3. The permittee fails to comply with any condition of this permit; or
4. This permit must be terminated, revised, or reopened and reissued to assure compliance with Clean Air Act requirements.

EPA will use the same proceedings to terminate, revise, or revoke and reissue a permit for cause as for initial permit issuance. Before initiating proceedings to terminate, revise, or revoke and reissue a permit, EPA will provide the permittee at least 30 days' advance written notice of EPA's intent to terminate, revise, or revoke and reissue the permit, except that EPA may provide a shorter notice period in the case of an emergency.

5.2 Public Notice and Comment

As required under 40 CFR § 49.139(c), the draft operating permit was publicly noticed and made available for public comment as follows:

1. Made available for public inspection a copy of the draft operating permit prepared by EPA, the technical support document for the draft permit, the application, and all supporting materials in twelve locations (see the public notice in the administrative record for a list) including at least one location on the Nez Perce Reservation (see 40 CFR 49.139(c)(5)(i));
2. Published the public notice for this draft permit of the availability of the draft permit and supporting materials and of the opportunity to comment in the Clearwater Progress and Lewiston Tribune, two newspapers of general circulation on the Nez Perce Reservation (see 40 CFR 49.139(c)(5)(ii));
3. Provided copies of the notice to the owner or operator of the air pollution source and the Tribal governing body and Tribal environmental organization on the Nez Perce Reservation as well as the Idaho Department of Environmental Quality and Washington Department of Ecology (see 40 CFR 49.139(c)(5)(iii)); and
4. Provided for a 30-day period for submittal of public comments, starting upon the date of publication of the notice - note that no public hearing or public comment period extension were requested or held (see 40 CFR 49.139(c)(5)(iv)).

The public comment period for this permit ran from June 17, 2010 to July 19, 2010. EPA received no comments. As required in 40 CFR § 49.139(c)(6), EPA prepared the final permit and technical support document. As required in 40 CFR 49.139(c)(7), EPA will send the final permit and technical support document to the permittee and EPA will make available for a limited time the final permit and technical support document at all of the locations where the draft permit was made available.

Correction of Typographical Errors

Notification before Relocation – Condition 4.1 of the draft operating permit contained a typographical error. Rather than requiring the permittee to notify EPA in writing at least 40 days before relocating the permitted source to or from a location on an Indian reservation as was done in five other permits being issued simultaneously with this permit, the draft permit inadvertently required only 30 days notice be given. In fact, the draft TSD correctly described the 40-day notice provision. The final permit, in Permit Condition 4.1, has been corrected to require the permittee to provide 40 days notice.

6. Abbreviations and Acronyms

AFS	Aerometric Information Retrieval System Facility Subset
CFR	Code of Federal Regulations
CO	Carbon monoxide
EJ	Environmental Justice
EPA	United States Environmental Protection Agency (also U.S. EPA)
ESA	Endangered Species Act
FARR	Federal Air Rules for Reservations
FR	Federal Register
HAP	Hazardous air pollutant (plural: HAPs)
HMA	Hot mix asphalt
MACT	Maximum Achievable Control Technology (Title 40 CFR Part 63)
NESHAP	National Emission Standards for Hazardous Air Pollutants (Title 40 CFR Parts 61 and 63)
NHPA	National Historical Preservation Act

NOx	Nitrogen oxides
NSPS	New Source Performance Standards (40 CFR Part 60)
PM	Particulate matter
PM10	Fine particulate matter (≤ 10 microns)
PSD	Prevention of Significant Deterioration (40 CFR Part 52)
PTE	Potential to emit
RAP	Recycled asphalt pavement
SO2	Sulfur dioxide
Title V	Title V of the Clean Air Act
TPY	Tons per year
VOC	Volatile organic compound

Appendix A

Emission Inventory

Knife River, Inc.
CMI Portable Asphalt Plant

Technical Support Document
Non-Title V Air Quality Operating Permit
R10NT501700

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Summary of Facility Potential Criteria Air Pollutant Emissions

Potential to Emit, (tons per year)

Point Sources

	EU 1	EU 2	EU 3	EU 4	EU 5	EU 6	EU 7	EU 8	EU 9	
	Drum Dryer	Diesel Generators	Storage Tanks	Asphalt Tank Heater	Aggregate Handling	Silo Filling	Truck Loading & Fumes	Traffic	Wind Erosion	**Point Source Subtotals**
Carbon Monoxide (CO)	170.82	37.01	0.11	0.03		1.55				209.52
Lead (Pb)	0.0197	0.00	0.00	0.01		0.00				0.03
Nitrogen Oxides (Nox)	72.27	141.59	0.00	0.31		0.00				214.17
Particulates (PM)	23.23	4.89	0.00	0.43		0.44				28.99
Fine Particulates (PM10)	5.12	17.45	0.00	0.41		0.44				23.42
Sulfur Dioxide (SO2)	208.92	22.39	0.00	2.51		0.00				233.82
Volatile Organic Compounds (VOC)	42.05	4.60	1.50	0.02		16.01				64.18

Fugitive Sources

	EU 1	EU 2	EU 3	EU 4	EU 5	EU 6	EU 7	EU 8	EU 9	
	Drum Dryer	Diesel Generator	Storage Tanks	Asphalt Tank Heater	Aggregate Handling	Silo Filling	Truck Loading & Fumes	Traffic	Wind Erosion	**Fugitive Source Subtotals**
Carbon Monoxide (CO)					0.00		2.23	0.00	0.00	2.23
Lead (Pb)					0.00		0.00	0.00	0.00	0.00
Nitrogen Oxides (Nox)					0.00		0.00	0.00	0.00	0.00
Particulates (PM)					51.51		0.24	334.97	0.93	387.65
Fine Particulates (PM10)					20.26		0.24	85.86	0.44	106.80
Sulfur Dioxide (SO2)					0.00		0.00	0.00	0.00	0.00
Volatile Organic Compounds (VOC)					0.00		6.50	0.00	0.00	6.50

All Sources

	EU 1	EU 2	EU 3	EU 4	EU 5	EU 6	EU 7	EU 8	EU 9	
	Drum Dryer	Diesel Generators	Storage Tanks	Asphalt Tank Heater	Aggregate Handling	Silo Filling	Truck Loading & Fumes	Traffic	Wind Erosion	**Plantwide Totals**
Carbon Monoxide (CO)	170.82	37.01	0.11	0.03	0.00	1.55	2.23	0.00	0.00	211.75
Lead (Pb)	0.0197	0.0004	0.0000	0.0078	0.00	0.00	0.00	0.00	0.00	0.03
Nitrogen Oxides (Nox)	72.27	141.59	0.00	0.31	0.00	0.00	0.00	0.00	0.00	214.17
Particulates (PM)	23.23	4.89	0.00	0.43	51.51	0.44	0.24	334.97	0.93	416.64
Fine Particulates (PM10)	5.12	17.45	0.00	0.41	20.26	0.44	0.24	85.86	0.44	130.22
Sulfur Dioxide (SO2)	208.92	22.39	0.00	2.51	0.00	0.00	0.00	0.00	0.00	233.82
Volatile Organic Compounds (VOC)	42.05	4.60	1.50	0.02	0.00	16.01	6.50	0.00	0.00	70.68

Plantwide PTE Limits

Carbon Monoxide (CO)	80	tpy, based on emission limit in FARR Non-Title V permit
Lead (Pb)	N/A	
Nitrogen Oxides (Nox)	80	tpy, based on emission limit in FARR Non-Title V permit
Particulates (PM)	200	tpy, based on emission limit in FARR Non-Title V permit
Fine Particulates (PM10)	80	tpy, based on emission limit in FARR Non-Title V permit
Sulfur Dioxide (SO2)	80	tpy, based on emission limit in FARR Non-Title V permit
Volatile Organic Compounds (VOC)	80	tpy, based on emission limit in FARR Non-Title V permit

Notes:

1. The "All Sources" table sums the values in the "Point Sources" and "Fugitive Sources" tables above
2. PM2.5 is assumed to be 0-100% of PM10; because this project is limiting emissions below PSD and Title V applicability thresholds, PM2.5 emission have not been estimated
3. Condensible particulate matter has not been included in PM10 emissions based on EPA's transition period for PM2.5 - see 73FR28321

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Summary of Facility Potential Hazardous Air Pollutant (HAP) Emissions

Potential to Emit, (tons per year)

Inorganics	EU 1 Drum Dryer	EU 2 Diesel Generators	EU 3 Storage Tanks	EU 4 Asphalt Tank Heater	EU 6 Silo Filling	EU 7 Truck Loading & Fumes	Single HAP Plantwide Totals (tpy)
Antimony Compounds	2.37E-04	0.00E+00		7.04E-05			3.07E-04
Arsenic Compounds (incl arsine)	7.36E-04	1.73E-04		9.39E-04			1.85E-03
Beryllium Compounds	0.00E+00	1.30E-04		2.82E-05			1.58E-04
Cadmium Compounds	5.39E-04	1.30E-04		1.88E-04			8.56E-04
Chromium Compounds (incl hexavalent)	7.23E-03	1.30E-04		2.82E-03			1.02E-02
Cobalt Compounds	3.42E-05	0.00E+00		8.13E-05			1.16E-04
Lead Compounds (not elemental lead)	1.97E-02	3.89E-04		7.82E-03			2.79E-02
Manganese Compounds	1.01E-02	2.59E-04		7.82E-04			1.12E-02
Mercury Compounds	3.42E-03	1.30E-04		6.57E-06			3.55E-03
Nickel Compounds	8.28E-02	1.30E-04		2.50E-03			8.54E-02
Phophorus Compounds	3.68E-02	0.00E+00		0.00E+00			3.68E-02
Selenium Compounds	4.60E-04	6.48E-04		3.29E-05			1.14E-03
Organics							
Acetaldehyde	1.71E+00	3.11E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E+00
Acrolein	3.42E-02	5.71E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-02
Benzene	5.12E-01	3.40E-02	3.67E-02	4.51E-06	5.12E-03	3.59E-03	5.92E-01
Bromomethane (methyl bromide)	0.00E+00	0.00E+00	5.63E-03	0.00E+00	7.85E-04	6.63E-04	7.08E-03
1,3-Butadiene	0.00E+00	1.06E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-04
Carbon Disulfide	0.00E+00	0.00E+00	1.84E-02	0.00E+00	2.56E-03	8.98E-04	2.18E-02
Chloroethane (ethyl chloride)	0.00E+00	0.00E+00	4.59E-03	0.00E+00	6.41E-04	1.45E-05	5.25E-03
Chloromethane (methyl chloride)	0.00E+00	0.00E+00	2.64E-02	0.00E+00	3.68E-03	1.04E-03	3.11E-02
Cumene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene	0.00E+00	0.00E+00	0.00E+00	2.58E-06	0.00E+00	7.60E-03	7.60E-03
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)	2.76E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.76E-10
Ethyl Benzene	3.15E-01	0.00E+00	4.36E-02	0.00E+00	6.09E-03	1.93E-02	3.84E-01
Formaldehyde	4.07E+00	6.40E-03	7.92E-01	9.54E-04	1.10E-01	6.08E-03	4.99E+00
Furans (all PCDF)	5.26E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.26E-08
Hexane (incl n-Hexane)	1.21E+00	0.00E+00	1.15E-01	3.86E-03	1.60E-02	1.04E-02	1.35E+00
Hydrogen Chloride	2.76E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.76E-01
Isooctane (2,2,4-trimethylpentane)	5.26E-02	0.00E+00	3.56E-04	0.00E+00	4.96E-05	1.24E-04	5.31E-02
Methyl Chloride (chloromethane)	0.00E+00	0.00E+00	3.10E-04	0.00E+00	4.32E-05	0.00E+00	3.53E-04
Methyl Chloroform (1,1,1-trichloroethane)	6.31E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.31E-02
Methyl tert-Butyl Ether (MTBE)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[1] (also a POM)	8.54E-01	5.50E-03	0.00E+00	1.44E-06	6.07E-03	2.37E-02	8.89E-01
Phenol	0.00E+00	0.00E+00	0.00E+00	4.38E-07	3.94E-03	2.23E-02	2.63E-02
Polycyclic Organic Matter* (incl naphthalene)	1.16E+00	9.02E-03	0.00E+00	1.28E-04	3.81E-02	4.47E-02	1.25E+00
Propionaldehyde	1.71E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-01
Quinone	2.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-01
Styrene	0.00E+00	0.00E+00	6.20E-03	0.00E+00	8.65E-04	5.06E-04	7.57E-03
Tetrachloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-04	5.32E-04
Toluene	3.81E+00	1.25E-02	7.12E-02	7.30E-06	9.93E-03	1.45E-02	3.92E+00
Xylene (incl isomers and mixtures)	2.63E+00	8.59E-03	2.95E-01	0.00E+00	4.12E-02	3.39E-02	3.01E+00

	EU 1 Drum Dryer	EU 2 Diesel Generators	EU 3 Storage Tanks	EU 4 Asphalt Tank Heater	EU 6 Silo Filling	EU 7 Truck Loading & Fumes
Emission Unit HAP Totals	14.02	0.08	1.42	0.02	0.24	0.17

Plantwide HAP Total	15.94	tons per year	
Highest Plantwide Single HAP	4.99	tons per year	(formaldehyde)

Notes:

1. Emission-Unit HAP Totals will not equal the sum of individual pollutants
2. Isomers of xylene (m-, p-, o-) are grouped as Xylenes for applicability even though the individual isomers are each listed HAPs in the Clean Air Act
3. Emission units #5, 8 and 9 are not known to emit HAPs

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#1 Drum Dryer**
Description: Hot Mix Asphalt Plant Drum Dryer - parallel drum mix design, Astec, model Super Six Pack
Control: Model PBH50 ADM Baghouse
Fuel: RF0, natural gas or #2 diesel (RF0, reprocessed fuel oil is called waste oil by AP-42)
Capacity: 300 tph hot mix asphalt (from application) Burner: 96.8 mmBtu/hr capacity
Operation: 8760 hours/year

Potential to Emit, (tons per year)

	RF0		#2 Diesel		Natural Gas		Max
	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO	0.13	170.82	0.13	170.82	0.13	170.82	170.82
Lead	1.5E-05	0.02	1.5E-05	0.02	6.2E-07	0.00	0.02
NOx	0.055	72.27	0.055	72.27	0.026	34.16	72.27
PM	0.018	23.23	0.018	23.23	0.018	23.23	23.23
PM10	0.004	5.12	0.004	5.12	0.004	5.12	5.12
SO2	0.159	208.92	0.084	110.81	0.011	13.84	208.92
VOC	0.032	42.05	0.032	42.05	0.032	42.05	42.05

Estimation Explanations
Emission factor (EF) units are lb/ton HMA product
Worst-case PTE is the higher emitting of the fuel options taking into consideration the most stringent emission limits that exist

CO factor: For RFO, diesel, natural gas: AP-42 3/04, Hot Mix Asphalt Plants, Table 11.1-7, uncontrolled (factor can vary greatly)

Lead factor: For RFO, diesel, natural gas: AP-42 3/04, Table 11.1-12, fabric filter controlled (note: assumes fabric filter is necessary to meet NSPS PM limit)

NOx factor: For RFO, diesel, natural gas: AP-42 3/04, Table 11.1-7 RF0, uncontrolled

PM factor: Option 1: EF based on NSPS limit (40 CFR 60.92, Subpart I) and actual test data as follows (RF0, diesel, natural gas):
EF = (gr/dscf) / (7000 gr/lb) * (dscf/min) * (60 min/hr) / (tph HMA)
NSPS PM Limit = 0.04 gr/dscf (tested at 0.0099 gr/dscf counting front and back half)
stack flow during test = 15647 dscf/min measured during 2009 test
production during test = 303.5 ton/hr HMA measured during 2009 test
NSPS-based emission factor = 0.018 lb/ton HMA
Note: NSPS limit is more strict than FARR PM limit of 0.1 gr/dscf, so NSPS will be used for PTE
Option 2: EF Based on AP42, 3/04, Table 11.1-3, PM=0.014 lb/ton for RF0, diesel and natural gas
Note: NSPS based factor is very close to controlled EF from AP-42, so will assume fabric filter is necessary to meet NSPS for all particulates

PM10 factor: AP-42 3/04, Table 11.1-3 -- fabric filter controlled filterable PM10 for RF0, diesel, natural gas (does not include condensible particulate)
filterable = 0.0039 organic = 0.0074 inorganic = 0.012 PM10 EF = 0.0039
Note: assumes fabric filter control is required for NSPS, so will use controlled factors for PM10

SO2 factor: Option 1: EF based on FARR combustion stack SO2 limit (40 CFR 49.129(d)(1)) = 500 ppm (dry volume basis at 7% O2) for RF0 oil, diesel, natural gas
EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (dscf/min) * (60 min/hr) * (21-O2test) / (21-O2limit) / (tph HMA)
SO2 limit = 500 ppm @ 7%O2
measured flow rate = 15647 dscf/min measured during 2009 test
O2 during test = 12.33 % measured during test
FARR limit O2 = 7 %
production during test = 303.5 ton/hr HMA
emission factor = 0.159 lb/ton HMA
Note: FARR process SO2 500 ppm limit is not corrected for O2, so in this case is less strict than the combustion limit
Note: For RFO: AP-42 3/04, Table 11.1-7 (0.058 lb/ton) results in lower emissions, but assumed fuel S content is not listed
Note: For diesel: AP-42 3/04, Table 11.1-7 (0.011 lb/ton) results in lower emissions
Note: For natural gas: AP-42 3/04, Table 11.1-7 (0.0034 lb/ton) results in lower emissions
Option 2: EF based on FARR fuel % sulfur limit (40 CFR 49.130(d)(4)) used oil and #2 fuel oil are %S by wt; natural gas is standard ppmv
For used oil: EF = (%Slimit / 100)*(max mmBTU/hr)/(19170 Btu/lb fuel)*(2 lb SO2 per lb S)/(max tph HMA)-(SO2 staying in HMA)
For diesel: EF = (%Slimit / 100)*(max mmBTU/hr)/(19170 Btu/lb fuel)*(2 lb SO2 per lb S)/(max tph HMA)*(SO2 fraction not in HMA)
For nat gas: EF = (ppmSlimit * 32 / 385.1E6)*(max mmBTU/hr)/(1020 Btu/cf fuel)*(2 lb SO2 per lb S) / (max tph HMA)*(1 - SO2 staying in HMA)
nat gas conversion: (ppm S) * (MW) / (385.1E6) = lb S / cf nat gas

	used oil	diesel	nat gas	
FARR S limit =	2	0.5	400	% by weight (nat gas is standard ppmv)
max burner firing rate =	9.70E+07	9.70E+07	9.70E+07	BTU/hr
max HMA production rate =	300	300	300	ton/hr HMA
SO2 staying in HMA =		50	50	% not to exceed 0.1 lb/ton (per AP-42 3/2004, Table 11.1-7)
	0.1			lb/ton (per AP-42 3/2004, table 11.1-7)
used oil emission factor =	0.575	0.084	0.011	lb/ton HMA

Option 3: EF Based on AP42, 3/04, Table 11.1-7, for RF0, diesel and natural gas
For RFO: SO2 = 0.058 lb/ton - so actual emission should be lower, but assumed fuel S content is not listed
For diesel: SO2 = 0.011 lb/ton - so actual emissions should be lower
For natural gas: SO2 = 0.0034 lb/ton - so actual emissions should be lower
SO2 PTE EF will be based on FARR stack SO2 limit because it is more strict than used oil sulfur limit and RF0 oil has a higher PTE than fuel oil

VOC factor: For RFO, diesel, natural gas: AP-42 3/04, Table 11.1-8, uncontrolled

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#2 Diesel Generators**

Description: Caterpillar brand, model C32, 910 kW (9.246 mmBtu/hr, 1,220 hp), manufactured in 2006 (plant operation)
MultiQuip brand, model MQ70/DCA70, 125 kW (0.621 mmBtu/hr, 167 kW), manufactured in 1997 (night light)

Control: Catalyst on Caterpillar generator

Fuel: #2 fuel oil

	Caterpillar	MultiQuip	Total	
Capacity:	9.246	0.621	9.867	mmbtu/hr
Operation:	8760	8760	8,760	hours/year

Catalytic controls claimed for 910 kW Cat generator

Controls	Reduction (%)
PM	20%
CO	41%
VOC	66%
NOx	NA

Potential to Emit, (tons per year)

	MultiQuip Generator		Cat Generator		Total
	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO	0.95	2.58	0.85	34.42	37.01
Lead	9.0E-06	0.00	9.0E-06	0.00	0.00
NOx	4.41	12.00	3.2	129.59	141.59
PM	0.310	0.84	0.100	4.05	4.89
PM10	0.310	13.40	0.100	4.05	17.45
SO2	0.518	1.41	0.518	20.98	22.39
VOC	0.35	0.95	0.09	3.64	4.60

Estimation Explanations

Note that EU#2 PTE only counts in PSD and Title V applicability if the plant stays in one location for more than one year; otherwise it is considered a non-road engine
Emission factor (EF) units are lb/mmbtu of fuel fired
AP4-42 Section 3.3 applies to generators less than 600 hp and 3.4 applies to generators greater than 600 hp
Multi Quip Generator

CO factor: AP-42 10/96, Table 3.3-1 Diesel fuel; catalyst is not required so not considered

Lead factor: AP-42 9/98, Table 1.3-10 - this assumes the lead emissions from internal and external combustion will be similar

NOx factor: AP-42 10/96, Table 3.3-1 Diesel fuel

PM factor: All PM assumed to be PM10

PM10 factor: AP-42 10/96, Table 3.3-1 Diesel fuel

SO2 factor: Option 1: EF based on FARR fuel % sulfur limit

EF = S / 100 / (heat content) x ($1x10^6$) x (2 lb SO2) / (1 lb S)

fuel oil heat content =	19,300	btu/lb, AP-42 10/96, Table 3.3-1, footnote c
S =	0.5	% sulfur from FARR 40 CFR 49.130(d)(4)
EF =	0.518	lb/mmBTU fuel oil

Option 2: EF based on FARR 500 ppm stack limit

EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (dscf/mmbtu) * (21-O2RM20) / (21-O2limit)

SO2 limit =	500	ppm @ 7%O2 from FARR 40 CFR 49.129(d)(1)
fuel oil f-factor from RM20 =	9190.0	dscf/mmbtu from 40 CFR 60, RM20
O2 assumed in RM20 =	0	%
FARR limit O2 =	7	%
EF =	1.14	lb/mmBTU fuel oil

SO2 EF will be based on the FARR fuel sulfur limit because it is more strict than FARR stack SO2 limit

VOC factor: AP-42 10/96, Table 3.3-1 Diesel fuel as TOC; catalyst is not required so not considered

Caterpillar Generator

CO factor: AP-42 10/96, Table 3.4-1 Diesel fuel; catalyst is not required so not considered

Lead factor: AP-42 9/98, Table 1.3-10 - this assumes the lead emissions from internal and external combustion will be similar

NOx factor: AP-42 10/96, Table 3.4-1 Diesel fuel, uncontrolled

PM factor: All PM assumed to be PM10

PM10 factor: AP-42 10/96, Table 3.4-1 Diesel fuel

SO2 factor: Option 1: EF based on FARR fuel % sulfur limit

EF = S / 100 / (heat content) x ($1x10^6$) x (2 lb SO2) / (1 lb S)

fuel oil heat content =	19,300	btu/lb, AP-42 10/96, Table 3.3-1, footnote c
S =	0.5	% sulfur from FARR 40 CFR 49.130(d)(4)
EF =	0.518	lb/mmBTU fuel oil

Option 2: EF based on FARR 500 ppm stack limit

EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (dscf/mmbtu) * (21-O2RM20) / (21-O2limit)

SO2 limit =	500	ppm @ 7%O2 from FARR 40 CFR 49.129(d)(1)
fuel oil f-factor from RM20 =	9190.0	dscf/mmbtu from 40 CFR 60, RM20
O2 assumed in RM20 =	0	%
FARR limit O2 =	7	%
EF =	1.14	lb/mmBTU fuel oil

SO2 EF will be based on the FARR fuel sulfur limit because it is more strict than FARR stack SO2 limit

VOC factor: AP-42 10/96, Table 3.4-1 Diesel fuel as TOC; catalyst is not required so not considered

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#3 Storage Tanks**

Description: Three tanks are used to store petroleum liquids
(Tank 1) Storage of liquid asphalt
(Tank 2) Storage of liquid asphalt
(Tank 3) Storage of RFO fuel in a portable tank trailer; RFO is used in the drum dryer and asphalt tank heater
(Tank 4) Storage of #2 diesel in portable tank trailer which supplies the loader and the generators

Parameter	Tank 1	Tank 2	Tank 3	Tank 4	Units
Liquid:	Asphalt	Asphalt	RFO	#2 Diesel	
Control:	none	none	none	none	
Capacity:	25,000	18,000	13,866	12,000	gallons
Operation:	19,618,326	14,125,194	3,628,335	21,770,013	gallons per year throughput
TOC Emissions	1,335.22	961.51	3.63	709.34	lbs/yr TOC - scaled to maximum potential throughput

Potential to Emit, (tons per year)

	Tank 1 - Asphalt		Tank 2 - Asphalt		Tank 3 - RFO		Tank 4 - #2 diesel		Total
	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO	0.097	6.5E-02	0.097	4.7E-02					0.11
Lead									
NOx									
PM									
PM10									
SO2									
VOC	1	6.7E-01	1	4.8E-01	1	1.8E-03	1	3.5E-01	1.50

Estimation Explanations

Emission factors (EF) units in table are fraction (%/100) of Total Organic Compound (TOC) emissions from computer program
Actual computer program run assumed tank throughput that were not maximums, so throughput and emissions must be scaled up to represent PTE:

Annual Asphalt Throughput:
Asphalt is assumed to be 5.5% wt of final HMA product and 8.57 lb/gal; so, gallons/ton of asphalt = (5.5/100)/(8.57 lb/gal)*(2000 lb/ton) = 12.84 gal/ton
Maximum HMA production = (300 tph)*(8760 hpy) = 2,628,000 tpy HMA; using (12.84 gpt)*(2,628,000 tpy) = 33,743,520 gal/yr liquid asphalt
Ratioing throughput based on tank size: Tank 1 = 33,743,520*(25/(25+18)) = 19,618,326 gal/yr; Tank 2 = 33,743,520*(18/(25+18)) = 14,125,194 gal/yr

TOC factor: Tanks Computer Program (see AP-42, 7.1 (11/06)), lbs/yr; see application for computer program input details
Tanks computer program assumed 186,000 gal/year (108,140+77,860) total asphalt usage, so predicted emissions must be scaled to PTE based on max production
Tanks program predicted emissions must be scaled to PTE based on max asphalt production: PTE ratio = 33,743,520 / 186,000
TOC emission scaling to PTE:

	Tank 1	Tank 2	Tank 3	Tank 4	
Throughput used in Tanks program =	108,140	77,860	20,000	120,000	gallons per year throughput
Scaled-up Throughput =	19,618,326	14,125,194	3,628,335	21,770,013	gallons per year throughput (max)
TOC Emissions from Tanks program =	7.36	5.30	0.02	3.91	lbs/yr TOC - calculated with Tanks Program 4.0.9d
Scaled-up TOC PTE =	1,335.22	961.51	3.63	709.34	lbs/yr TOC - scaled to maximum potential throughput

VOC factor: For tank 1, EF from AP-42, 3/04, table 11.1-16
For tanks 2 and 3, VOC = TOC

CO factor: AP-42, 3/04, Page 11.1-9; multiply factor by TOC emissions

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#4 Asphalt Storage Tank Heater**
Description: Asphalt heater, Heat Tec Power Flame brand, model Hsp 35
Control: none
Fuel: #2 diesel, RFO or natural gas
Capacity: 0.500 MMBtu/hr
Operation: 8760 hours/year

Potential to Emit, (tons per year)

	#2 Diesel		RFO		Natural Gas		Max
	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO	1.2	0.02	2.1	0.0	8.9	0.02	0.03
Lead	9.00E-06	1.41E-07	0.5	0.0	0.0005	1.07E-06	7.82E-03
NOx	20	0.31	16	0.3	100	0.21	0.31
PM	27.57	0.43	27.57	0.4	190.4	0.409	0.43
PM10	1.0	0.02	23.71	0.37	190.4	0.409	0.41
SO2	71	1.11	160.18	2.5	0.6	0.001	2.51
VOC	0.2	0.003	1.0	0.0	5.500	0.01	0.02

Estimation Explanations

Emission factor (EF) units are lb/1000 gallon oil and lb/mmscf natural gas
Worst-case PTE is the higher emitting of the fuel options taking into consideration the most stringent emission limits that exist

Liquid Fuel conversion factor = 140 mmBTU/1000 gal from AP42, App A
Natural gas conversion factor = 1020 Btu/scf from AP-42, Table 1.4-1, footnote a

CO factor: For disel: AP-42, 3/04, Table 11.1-13, hot oil system fired with #2 diesel
For RFO: AP-42, 10/96, Table 1.11-2, waste oil combustion in atomizing burner
For natural gas: AP-42 3/04, table 11.1-13, hot oil system fired with natural gas

Lead factor: For diesel: AP-42, 9/98, Table 1.3-10, distillate oil fired boilers <100mmbtu
For RFO: AP-42, 10/96, Table 1.11-1, waste oil combustion in atomizing burner
EF = 50L, where L = wt % lead in fuel = 0.01 Assumes 100 ppm based on limit in 40 CFR 279.11
For natural gas: AP-42 7/98, Table1.4-2

NOx factor: For diesel: AP-42, 9/98, Table 1.3-1, boilers <100mmbtu
For RFO: AP-42, 10/96, Table 1.11-2, waste oil combustion in atomizing burner
For natural gas: AP-42 7/98, Table1.4-1, small boilers uncontrolled

PM factor: Option 1 for diesel: EF based on PM emission limits in FARR (40 CFR 49.125) = 0.1 grains/dscf at 7% O2
EF = (emission limit) / (7000 gr/lb) * (dscf-out/mmBtu-in) * (mmBtu/mgal fuel oil) = lb/mgal fuel oil
FARR PM Limit = 0.1 gr/dscf (tested at 0.026 gr/dscf counting front and back half)
Stack flow conversion factor 9190 dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
O2 assumed in RM19 = 0 %
FARR limit O2 = 7 %
FARR-based EF = 27.57 lb/mgal fuel oil
Option 2 for diesel: AP-42, 9/98, Table 1.3-1, boilers <100mmbtu
EF = 9.19(S)+3.22
S= 0.5 % sulfur from FARR 40 CFR 49.130(d)(4)
EF = 7.815 lb/1000gal
For diesel: PM factor will be based on FARR limit
Option 1 for RFO: EF based on PM emission limits in FARR (40 CFR 49.125) = 0.1 grains/dscf at 7% O2
EF = (emission limit) / (7000 gr/lb) * (dscf-out/mmBtu-in) * (mmBtu/mgal fuel oil) = lb/mgal fuel oil
FARR PM Limit = 0.1 gr/dscf (tested at 0.026 gr/dscf counting front and back half)
Stack flow conversion factor 9190 dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
O2 assumed in RM19 = 0 %
FARR limit O2 = 7 %
FARR-based EF = 27.57 lb/mgal fuel oil
Option 2 for RFO: AP-42, 10/96, Table 1.11-1, waste oil combustion in atomizing burner
EF = 66L, where L = wt % ash in fuel = 0.82 From applicant
EF = 54.12 lb/1000gal
For RFO: PM factor will be based on FARR emission limit
Option 1 for natural gas: EF based on PM emission limits in FARR (40 CFR 49.125) = 0.1 grains/dscf at 7% O2
EF = (emission limit) / (7000 gr/lb) * (dscf-out/mmBtu-in) * (mmBtu/mmscf NG) = lb/mmscf Natural Gas
FARR PM Limit = 0.1 gr/dscf (tested at 0.026 gr/dscf counting front and back half)
Stack flow conversion factor 8710 dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
O2 assumed in RM19 = 0 %
FARR limit O2 = 7 %
FARR-based EF = 190.4 lb/mmscf natural gas
Option 2 for natural gas: AP-42 7/98, Table1.4-2, filterable; EF = 1.9 lb/mmscf
For natural gas: PM factor will be based on FARR limit, even though actual emissions are predicted to be much less

PM10 factor: For diesel: AP-42, 9/98, Table 1.3-2 #2 fuel oil combustion
EF= PM10 = filterable PM10 (does not include condensible particulate matter)
CPM= 1.3 lb/1000gal fuel oil
PM10= 1 lb/1000gal fuel oil
EF= 1 lb/1000gal fuel oil
For RFO: assume 86% PM is PM10 (AP-42, 10/96 Table 1.11-1)
EF = 23.71 lb/1000gal fuel oil (10.78x(2.3/7.815))
For natural gas: All of the PM is assumed to be PM10 in AP-42 7/98, Table1.4-2, so use same EF

SO2 factor: Option 1 for diesel: EF based on FARR fuel % sulfur limit and AP-42

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

EF = 142S AP-42 10/96, Table 1.3-1, boilers<100mmbtu
S = 0.5 % sulfur from FARR 40 CFR 49.130(d)(4)
EF = 71 lb/1000 gal fuel oil

Option 2 for diesel: EF based on FARR 500 ppm stack SO2 limit
EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (dscf/mmbtu) * (21-O2RM20) / (21-O2limit) * 140 mmBTU/1000gal
SO2 limit = 500 ppm @ 7%O2 from FARR 40 CFR 49.129(d)(1)
fuel oil f-factor from RM19 = 9190.0 dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
O2 assumed in RM19 = 0 %
FARR limit O2 = 7 %
EF = 160.18 lb/1000gal fuel oil

For diesel: SO2 EF will be based on AP-42 and FARR fuel sulfur limit because it is more strict than FARR stack SO2 limit

Option 1 for RFO: EF based on FARR fuel % sulfur limit and AP-42
EF = 107S AP-42 10/96, Table 1.11-2, atomizing burner
S = 2.0 % sulfur from FARR 40 CFR 49.130(d)(4)
EF = 214 lb/1000 gal fuel oil

Option 2 for RFO: EF based on FARR 500 ppm stack SO2 limit
EF = (ppm) * (1.66E-7 lb/dscf / ppm) * (dscf/mmbtu) * (21-O2RM20) / (21-O2limit) * 140 mmBTU/1000gal
SO2 limit = 500 ppm @ 7%O2 from FARR 40 CFR 49.129(d)(1)
fuel oil f-factor from RM19 = 9190.0 dscf/mmBtu from 40 CFR 60 App A, Table 19-2 at 0% O2
O2 assumed in RM19 = 0 %
FARR limit O2 = 7 %
EF = 160.18 lb/1000gal fuel oil

For RFO: SO2 EF will be based on FARR stack SO2 limit because it is more strict than FARR fuel sulfur limit

For natural gas: AP-42 7/98, Table 1.4-2

VOC factor: For disel: AP-42, 9/98, Table 1.3-3, industrial boilers, NMTOC

For RFO: AP-42, 10/96, Table 1.11-3, waste oil combustion, TOC in atomizing burner

For natural gas: AP-42 7/98, Table1.4-2

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#5 Aggregate Handling & Screening**

Description: Five transfers of aggregate and three trnafers of recycled asphlat paving (RAP) material from storage pile to drum dryer
- a. Aggregate transfer to aggregate bins
- b. Aggregate transfer from bins to conveyor belt
- c. Aggregate transfer from conveyor belt to scalping screen
- d. Aggregate transfer from scalping screen to conveyor belt
- e. Aggregate transfer from conveyor to drum mixer
- f. RAP transfer to RAP bin
- g. RAP transfer from RAP bin to conveyor
- h. RAP transfer from conveyor to drum mixer
- i. Scalping sceen

Control: none

Capacity: 300 tons/hour HMA (worst case assumes all material runs through 5 aggregate transfers and screen)

150 tph RAP

Operation: 8760 hours/year

Potential to Emit, (tons per year)

	5 Aggregate transfers		3 RAP transfers		Scalping Screen		Total
	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE, TPY
CO							0.00
Lead							0.00
NOx							0.00
PM	0.0028	18.66		0.00	0.0250	32.85	51.51
PM10	0.0013	8.83		0.00	0.0087	11.43	20.26
SO2							0.00
VOC							0.00

Estimation Explanations

Emission factor (EF) units are lb/ton of aggregate handled/screened

PM factor: For transfers, AP-42, 11/06, Section 13.2.4, Equation 1 for each drop operation (worst case assumes all material is aggregate passing through 5 transfers)

Emission factor=k(0.0032)(U/5)^1.3/(M/2)^1.4

U, mean wind speed: 8.9 mph, NOAA data for Spokane found at http://www.ncdc.noaa.gov/oa/climate/online/ccd/wndspd.txt

M, material moisture content: 3 %, Emission Inventory Improvement Program, Vol II, Chapter 3, page 3.2-3, July 1996 (range = 3-7%)

k, particle size multiplier: 0.74 for <30 microns particle size

For screen, AP-42, 8/04, Table 11.19.2-2, screening (worst case assumes all material is aggregate passing through screen)

PM10 factor: For transfers, same as for PM emission factor, except that

k, particle size multiplier: 0.35 for <10 microns particle size

For screen, AP-42, 8/04, Table 11.19.2-2, screening

Emissions are multiplied by 5 to account for all five transfers

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#6 Silo Filling**
Description: Loading of hot-mix asphalt mix (HMA mix) into Silo
Control: none
Capacity: 300 tons/hour HMA
Operation: 8760 hours/year

Potential to Emit, (tons per year)

	Silo filling	
	EF	PTE TPY
CO	1.18E-03	1.55
Lead		
NOx		
PM	3.32E-04	0.44
PM10	3.32E-04	0.44
SO2		
VOC	1.22E-02	16.01

Estimation Explanations
Emission factor (EF) units are lb/ton of HMA handled
Predictive Emission Equations used to calculate Emission Factors from AP-42 3/04, Table 11.1-14

CO factor: $CO\ EF = 0.00488(-V)e^{((0.0251)(T+460)-20.43)}$
PM factor: PM EF = 0.000332 lb/ton HMA (assumes only fraction captured by RM5 counts as PM)
PM10 factor: $PM10\ EF = 0.000332+0.00105(-V)e^{((0.0251)(T+460)-20.43)}$ (assumes all of Total PM is PM10)
PM10 EF = PM EF (only the PM fraction is included because condensables are not counted)
VOC factor: $VOC\ EF = 0.0504(-V)e^{((0.0251)(T+460)-20.43)}$ (100% of TOC measured as propane, per AP42, Table 11.1-16)
V = asphalt volatility = -0.5 AP-42 default value
T = HMA mix temperature = 325 ^{O}F, AP-42 default value

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#7 Truck Loading & Fumes**

Description: a Load-out of hot-mix asphalt mix (HMA mix) from silo to asphalt trucks
b Fumes from HMA in loaded asphalt trucks while in plant

Control: none

Capacity: 300 tons/hour HMA

Operation: 8760 hours/year

Potential to Emit, (tons per year)

	Silo loadout		Truck fumes		Total
	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO	1.35E-03	1.77	3.52E-04	0.46	2.23
Lead					
NOx					
PM	1.81E-04	0.24			0.24
PM10	1.81E-04	0.24			0.24
SO2					
VOC	3.91E-03	5.14	1.03E-03	1.36	6.50

Estimation Explanations

Emission factor (EF) units are lb/ton of HMA handled

a Silo Loadout

Predictive Emission Equations used to calculate Emission Factors from AP-42 3/04, Table 11.1-14

CO factor: $0.00558(-V)e^{((0.0251)(T+460)-20.43)}$

PM factor: (assumes only fraction captured by RM5 counts as PM)

PM10 factor: $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ (assumes all of PM is PM10)

PM10 EF = PM EF (only the PM fraction is included because condensables are not counted)

VOC factor: $0.94[0.0172(-V)e^{((0.0251)(T+460)-20.43)}]$ (94% of TOC measured as propane, per AP42, Table 11.1-16)

TOC = $0.0172(-V)e^{((0.0251)(T+460)-20.43)}$ AP42, Table 11.1-16

V = asphalt volatility = -0.5 AP-42 default value

T = HMA mix temperature = 325 ^{O}F, AP-42 default value

b Truck-load emissions (while in plant for approximately 8 minutes)

Emission factors from AP42, 11.1.2.5

TOC = 0.0011 lb/ton

CO factor: (32% of TOC measured as propane)

VOC factor: (94% of TOC measured as propane per AP42, Table 11.1-16)

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#8 Vehicle Traffic**

Description: Road dust caused by vehicle traffic
a. Truck for loading and delivery of HMA product:
b. Loader for delivering aggregate and RAP to drum dryer loading bins:
c. Truck for delivering gravel and RAP to plant
d. Asphalt truck delivering asphalt to plant

Control: none

Capacity: 300 tons per hour HMA (plant)
33,743,520 gal/yr liquid asphalt
3,628,335 gal/yr RFO
21,770,013 gal/yr diesel
59,141,868 gal/yr total liquid deliveries

Operation: 8760 hours/year

Potential to Emit, (tons per year)

	HMA Truck PTE TPY	Loaders PTE TPY	Gravel/RAP Truck PTE TPY	Liquid Truck PTE TPY	Total PTE TPY
CO					
Lead					
NOx					
PM	151.60	23.59	151.60	8.18	334.97
PM10	38.64	6.50	38.64	2.09	85.86
SO2					
VOC					

Estimation Explanations

Emission factor (EF) units are lb/vehicle mile traveled
Assumes that 100% of trip distance is on unpaved surface for all vehicles
Liquid asphalt/fuel delivery truck size = 8168 gallons
Spokane data from: http://www.nrcc.cornell.edu/ccd/prge0198.html
Predictive Emission Equations used to calculate Emission Factors from AP-42 12/03, Section 13.2.2, Equation 1a and 2
E = EF x VMT / 2000
PM EF: k*(s/12)^a*(W/3)^b*(1-P/N), from 11/06 AP-42 13.2.2, Equation 1a and 2, see below for parameters
PM10 factor: Same equation as for PM emission factor except some different parameters, see below

Road Data:

	PM	PM10	
empirical constant (k) =	4.9	1.5	PM data for particles <30 microns
material handling silt content (s), % =	7.1	7.1	silt from AP-42 Table 13.2.2-1 (sand and gravel - for loader)
road surface silt content (s), % =	4.8	4.8	silt from AP-42 Table 13.2.2-1 (sand and gravel - for roads)
empirical constant (a) =	0.7	0.9	PM data for particles <30 microns
empirical constant (b) =	0.45	0.45	PM data for particles <30 microns

Vehicle Data: (from company except asphalt delivery truck wt from EPA experience)

	HMA Truck	Loader	Gravel/RAP Truck	Liquid Truck
empty weight, tons =	20.00	15	20	18
loaded weight, tons =	38.00	20.5	38	52
mean vehicle weight (W), tons =	29.00	17.75	29.00	35.00
tons per trip, tons =	18.00	5.50	18.00	34.00
trips per day =	400.00	1309.09	400.00	19.84
round trip distance, miles =	0.42	0.019	0.42	0.42
unpaved VMT, miles/year =	61320	9050	61320	3041

Weather Data:

# of days with > 0.01 inch of precipitation (P) =	113	For Spokane, WA: http://www.nrcc.cornell.edu/ccd/prge0198.html
# of days in averaging period (N) =	365	based on need for annual PTE

Emission factors:

	HMA Truck	Loader	Gravel/RAP Truck	Liquid Truck
PM EF, lb/VMT =	4.94	5.21	4.94	5.38
PM10 EF, lb/VMT =	1.26	1.44	1.26	1.37

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Criteria Air Pollutant Emission Inventory

Emission Unit: **#9 Wind Erosion**

Description:	Wind erosion of all exposed areas including piles	
Control:	none	
Capacity:	300	tons/hour HMA
Operation:	8760	hours/year
	2628000	tons/yr (tons/hr x hours/yr)
	50538.4615	tons/pile (assumes a 1 week supply is available on site so divide total yearly amount by 52)
		ft3 per pile, assumes aggregate density is 105 lb/cu ft (Weights of
	962637.363	Materials, page 393)
Pile height:	50	feet, assumed
Pile width:	200	feet, assumed
Pile length:	96.3	feet
Pile Footprint:	19,253	ft2
	0.44	acres, assumes 43560 ft2/acre
Open Area:	2.00	acres, assumed conservative sized (disturbed) site - unvegetated area

Potential to Emit, (tons per year)

	Pile Wind Erosion		Open Area Wind Erosion		Total
	EF	PTE TPY	EF	PTE TPY	PTE TPY
CO					
Lead					
NOx					
PM	0.38	0.17	0.38	0.76	0.93
PM10	0.18	0.08	0.18	0.36	0.44
SO2					
VOC					

Estimation Explanations

Emission factor (EF) units are tons/acre per year

Stockpile size calculated based on maximum capacity, operating 8760 hr/yr

PM factor: AP-42, 10/98, Section 11.9, Table 11.9-4 for wind erosion of exposed areas

PM10 factor: Engineering estimate - 47% of PM factor from ratio of transfer particle size multipliers (0.35/0.74) in AP-42 1/95 13.2.4

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#1 Drum Dryer**
Description: Hot Mix Asphalt Plant Drum Dryer - parallel drum mix design, Astec, model Super Six Pack
Control: Model PBH50 ADM Baghouse
Fuel: RF0, #2 diesel or natural gas (RF0, reprocessed fuel oil is called waste oil by AP-42)
Capacity: 300 tph hot mix asphalt (from application)
Operation: 8,760 hours/year

Potential to Emit, (tons per year)

	RF0		#2 diesel		Natural Gas		Max
Inorganics	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
Antimony Compounds	1.80E-07	2.37E-04	1.80E-07	2.37E-04	1.80E-07	2.37E-04	2.37E-04
Arsenic Compounds (incl arsine)	5.60E-07	7.36E-04	5.60E-07	7.36E-04	5.60E-07	7.36E-04	7.36E-04
Beryllium Compounds	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium Compounds	4.10E-07	5.39E-04	4.10E-07	5.39E-04	4.10E-07	5.39E-04	5.39E-04
Chromium Compounds (incl hexavalent)	5.50E-06	7.23E-03	5.50E-06	7.23E-03	5.50E-06	7.23E-03	7.23E-03
Cobalt Compounds	2.60E-08	3.42E-05	2.60E-08	3.42E-05	2.60E-08	3.42E-05	3.42E-05
Lead Compounds (not elemental lead)	1.50E-05	1.97E-02	1.50E-05	1.97E-02	6.20E-07	8.15E-04	1.97E-02
Manganese Compounds	7.70E-06	1.01E-02	7.70E-06	1.01E-02	7.70E-06	1.01E-02	1.01E-02
Mercury Compounds	2.60E-06	3.42E-03	2.60E-06	3.42E-03	2.40E-07	3.15E-04	3.42E-03
Nickel Compounds	6.30E-05	8.28E-02	6.30E-05	8.28E-02	6.30E-05	8.28E-02	8.28E-02
Phophorus Compounds	2.80E-05	3.68E-02	2.80E-05	3.68E-02	2.80E-05	3.68E-02	3.68E-02
Selenium Compounds	3.50E-07	4.60E-04	3.50E-07	4.60E-04	3.50E-07	4.60E-04	4.60E-04
Organics							
Acetaldehyde	1.30E-03	1.71E+00	-		-		1.71E+00
Acrolein	2.60E-05	3.42E-02	-		-		3.42E-02
Benzene	3.90E-04	5.12E-01	3.90E-04	5.12E-01	3.90E-04	5.12E-01	5.12E-01
Bromomethane (methyl bromide)	-		-		-		
1,3-Butadiene	-		-		-		
Carbon Disulfide	-		-		-		
Chloroethane (ethyl chloride)	-		-		-		
Chloromethane (methyl chloride)	-		-		-		
Dichlorobenzene	-		-		-		
Cumene	-		-		-		
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)	2.10E-13	2.76E-10	2.10E-13	2.76E-10		0.00E+00	2.76E-10
Ethyl Benzene	2.40E-04	3.15E-01	2.40E-04	3.15E-01	2.40E-04	3.15E-01	3.15E-01
Formaldehyde	3.10E-03	4.07E+00	3.10E-03	4.07E+00	3.10E-03	4.07E+00	4.07E+00
Furans (all PCDF)	4.00E-11	5.26E-08	4.00E-11	5.26E-08		0.00E+00	5.26E-08
Hexane (includes n-Hexane)	9.20E-04	1.21E+00	9.20E-04	1.21E+00	9.20E-04	1.21E+00	1.21E+00
Hydrochloric Acid (hydrogen chloride)	2.10E-04	2.76E-01	-		-		2.76E-01
Isooctane (2,2,4-trimethylpentane)	4.00E-05	5.26E-02	4.00E-05	5.26E-02	4.00E-05	5.26E-02	5.26E-02
Methyl Chloride (chloromethane)	-		-		-		
Methyl Chloroform (1,1,1-trichloroethane)	4.80E-05	6.31E-02	4.80E-05	6.31E-02	4.80E-05	6.31E-02	6.31E-02
Methyl tert-Butyl Ether (MTBE)	-		-		-		
Naphthalene (also a POM)	6.50E-04	8.54E-01	8.80E-09	1.16E-05	9.00E-05	1.18E-01	8.54E-01
Phenol	-		-		-		
Polycyclic Organic Matter* (incl naphthalene)	8.85E-04	1.16E+00	8.85E-04	1.16E+00	1.87E-04	2.46E-01	1.16E+00
Propionaldehyde	1.30E-04	1.71E-01	-		-		1.71E-01
Quinone	1.60E-04	2.10E-01	-		-		2.10E-01
Styrene	-		-		-		
Tetrachloroethane	-		-		-		
Toluene	2.90E-03	3.81E+00	2.90E-03	3.81E+00	1.50E-04	1.97E-01	3.81E+00
Xylenes (inlc isomers and mixtures)	2.00E-04	2.63E-01	2.00E-03	2.63E+00	2.00E-04	2.63E-01	2.63E+00
HAP Total		1.40E+01		1.40E+01		7.07E+00	1.40E+01

	RF0		#2 diesel		Natural Gas	
***Polycyclic Organic Matter**	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY
Acenaphthene	1.40E-06	1.84E-03	1.40E-06	1.84E-03	1.40E-06	1.84E-03
Acenaphthylene	2.20E-05	2.89E-02	2.20E-05	2.89E-02	8.60E-06	1.13E-02
Anthracene	3.10E-06	4.07E-03	3.10E-06	4.07E-03	2.20E-07	2.89E-04
Benzo(a)anthracene	2.10E-07	2.76E-04	2.10E-07	2.76E-04	2.10E-07	2.76E-04
Benzo(b)fluoranthene	1.00E-07	1.31E-04	1.00E-07	1.31E-04	1.00E-07	1.31E-04
Benzo(k)fluoranthene	4.10E-08	5.39E-05	4.10E-08	5.39E-05	4.10E-08	5.39E-05
Benzo(g,h,i)perylene	4.00E-08	5.26E-05	4.00E-08	5.26E-05	4.00E-08	5.26E-05
Benzo(a)pyrene	9.80E-09	1.29E-05	9.80E-09	1.29E-05	9.80E-09	1.29E-05
Benzo(e)pyrene	1.10E-07	1.45E-04	1.10E-07	1.45E-04	1.10E-07	1.45E-04
Chrysene	1.80E-07	2.37E-04	1.80E-07	2.37E-04	1.80E-07	2.37E-04
Dioxins (Total PCDD; incl 2,3,7,8 TCDD)	7.90E-11	1.04E-07	7.90E-11	1.04E-07	-	
Fluoranthene	6.10E-07	8.02E-04	6.10E-07	8.02E-04	6.10E-07	8.02E-04
Fluorene	1.10E-05	1.45E-02	1.10E-05	1.45E-02	3.80E-06	4.99E-03
Furans (all PCDF)	4.00E-11	5.26E-08	4.00E-11	5.26E-08	-	
Indeno(1,2,3-cd)pyrene	7.00E-09	9.20E-06	7.00E-09	9.20E-06	7.00E-09	9.20E-06
2-Methylnaphthalene	1.70E-04	2.23E-01	1.70E-04	2.23E-01	7.40E-05	9.72E-02
Naphthalene (also individual HAP)	6.50E-04	8.54E-01	6.50E-04	8.54E-01	9.00E-05	1.18E-01
Perylene	8.80E-09	1.16E-05	8.80E-09	1.16E-05	8.80E-09	1.16E-05
Phenanthrene	2.30E-05	3.02E-02	2.30E-05	3.02E-02	7.60E-06	9.99E-03
Pyrene	3.00E-06	3.94E-03	3.00E-06	3.94E-03	5.40E-07	7.10E-04
POM Subtotal	8.85E-04	1.16E+00	8.85E-04	1.16E+00	1.87E-04	2.46E-01

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Estimation Explanations

Emission factor (EF) units are lb/ton HMA

Worst-case PTE is the higher emitting of the fuel options taking into consideration the most stringent emission limits that exist

To avoid double-counting, "HAP Total" does not count naphthalene, dioxin (HAP) or furans separately because they are accounted for in "POM Subtotal"

Chromium EF:	Chromium EF is assumed to included separately reported hexavalent chromium EF in AP-42
Hydrogen chloride EF:	AP-42, Table 11.1-8 for RF0
All other inorganics EF:	AP-42, 3/04, Table 11.1-12 for fuel oil and RF0 with fabric filter
Dioxin EF:	AP-42, 3/04, Table 11.1-10 for fuel oil & RF0 with fabric filter - all dioxins are POM; only 2,3,7,8 TCDD is a HAP
Furans EF:	AP-42, 3/04, Table 11.1-10 for fuel oil & RF0 with fabric filter - total of all furans (is a HAP & POM)
Naphthalene EF:	AP-42, 3/04, Table 11.1-10 for fuel oil & RF0 with fabric filter (is a HAP & POM)
POM EF:	AP-42, 3/04, Table 11.1-10 for fuel oil & RF0 with fabric filter (includes naphthalene, dioxin & furans)
All other organics EF:	AP-42, 3/04, Table 11.1-10 for fuel oil & RF0 with fabric filter

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#2 Diesel Generators**
Description: Caterpillar brand, model C32, 910 kW (9.246 mmBtu/hr), manufactured in 2006 (plant operation)
MultiQuip brand, model MQ70/DCA70, 125 kW (0.621 mmBtu/hr), manufactured in 1997 (night light)
Control: Catalyst on Caterpillar generator
Fuel: #2 fuel oil

	Caterpillar	MulitQuip	Total	
Capacity:	9.246	0.621	9.87	mmbtu/hr
Operation:	8760	8760	8,760	hours/year

Potential to Emit, (tons per year)

	MultiQuip		CAT		Total
Inorganics	EF	PTE TPY	EF	PTE TPY	PTE TPY
Antimony Compounds	-				
Arsenic Compounds (incl arsine)	4.00E-06	1.09E-05	4.00E-06	1.62E-04	1.73E-04
Beryllium Compounds	3.00E-06	8.16E-06	3.00E-06	1.21E-04	1.30E-04
Cadmium Compounds	3.00E-06	8.16E-06	3.00E-06	1.21E-04	1.30E-04
Chromium Compounds (incl hexavalent)	3.00E-06	8.16E-06	3.00E-06	1.21E-04	1.30E-04
Cobalt Compounds	-				
Lead Compounds (not elemental lead)	9.00E-06	2.45E-05	9.00E-06	3.64E-04	3.89E-04
Manganese Compounds	6.00E-06	1.63E-05	6.00E-06	2.43E-04	2.59E-04
Mercury Compounds	3.00E-06	8.16E-06	3.00E-06	1.21E-04	1.30E-04
Nickel Compounds	3.00E-06	8.16E-06	3.00E-06	1.21E-04	1.30E-04
Phophorus Compounds	-		-		0.00E+00
Selenium Compounds	1.50E-05	4.08E-05	1.50E-05	6.07E-04	6.48E-04
Organics					
Acetaldehyde	7.67E-04	2.09E-03	2.52E-05	1.02E-03	3.11E-03
Acrolein	9.25E-05	2.52E-04	7.88E-06	3.19E-04	5.71E-04
Benzene	9.33E-04	2.54E-03	7.76E-04	3.14E-02	3.40E-02
Bromomethane (methyl bromide)	-				
1,3-Butadiene	3.91E-05	1.06E-04			1.06E-04
Carbon Disulfide	-				
Chloroethane (ethyl chloride)	-				
Chloromethane (methyl chloride)	-				
Dichlorobenzene	-				
Cumene	-				
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)	-				
Ethyl Benzene	-				
Formaldehyde	1.18E-03	3.21E-03	7.89E-05	3.20E-03	6.40E-03
Furans (all PCDF)	-				
Hexane (incl n-Hexane)	-				
Hydrochloric Acid (hydrogen chloride)	-				
Isooctane (2,2,4-trimethylpentane)	-				
Methyl Chloride (chloromethane)	-				
Methyl Chloroform (1,1,1-trichloroethane)	-				
Methyl tert-Butyl Ether (MTBE)	-				
Naphthalene[1] (also a POM)	8.48E-05	2.31E-04	1.30E-04	5.26E-03	5.50E-03
Phenol	-				
Polycyclic Organic Matter* (incl naphthalene)	1.68E-04	4.57E-04	2.12E-04	8.57E-03	9.02E-03
Propionaldehyde	-				
Quinone	-				
Styrene	-				
Tetrachloroethane	-				
Toluene	4.09E-04	1.11E-03	2.81E-04	1.14E-02	1.25E-02
Xylene (incl isomers and mixtures)	2.85E-04	7.75E-04	1.93E-04	7.82E-03	8.59E-03
HAP Total		1.07E-02		6.57E-02	7.64E-02

***Polycyclic Organic Matter**	EF	PTE TPY	EF	TPY	
Acenaphthylene	5.06E-06	1.38E-05	9.23E-06	3.74E-04	3.88E-04
Acenaphthene	1.42E-06	3.86E-06	4.68E-06	1.90E-04	1.93E-04
Anthracene	1.87E-06	5.09E-06	1.23E-06	4.98E-05	5.49E-05
Benzo(a)athracene	1.68E-06	4.57E-06	6.22E-07	2.52E-05	2.98E-05
Benzo(b)fluoranthene	9.91E-08	2.70E-07	1.11E-06	4.50E-05	4.52E-05
Benzo(k)fluoranthene	1.55E-07	4.22E-07	2.18E-07	8.83E-06	9.25E-06
Benzo(g,h,I)perylene	4.89E-07	1.33E-06	5.56E-07	2.25E-05	2.38E-05
Benzo(a)pyrene	1.88E-07	5.11E-07	2.57E-07	1.04E-05	1.09E-05
Chrysene	3.53E-07	9.60E-07	1.53E-06	6.20E-05	6.29E-05
Dibenz(a,h)anthracene	5.83E-07	1.59E-06	3.46E-07	1.40E-05	1.56E-05
Fluoranthene	7.61E-06	2.07E-05	4.03E-06	1.63E-04	1.84E-04
Fluorene	2.92E-05	7.94E-05	1.28E-05	5.18E-04	5.98E-04
Indeno(1,2,3-cd)pyrene	3.75E-07	1.02E-06	4.14E-07	1.68E-05	1.78E-05
Napthalene (also individual HAP)	8.48E-05	2.31E-04	1.30E-04	5.26E-03	5.50E-03
Phenanthrene	2.94E-05	8.00E-05	4.08E-05	1.65E-03	1.73E-03
Pyrene	4.78E-06	1.30E-05	3.71E-06	1.50E-04	1.63E-04
POM Subtotal	1.68E-04	4.57E-04	2.12E-04	8.57E-03	9.02E-03

Estimation Explanations
Emission factor (EF) units are lb/mmbtu
Note that EU#2 PTE only counts in MACT applicability if the plant stays in one location for more than one year; otherwise it is considered a non-road engine
Catalyst should reduce CO, VOC and HAP emissions, however it is not required and so does not count for PTE

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"

Inorganic EF: AP-42 9/98, Table 1.3-10 - assumes that metal emissions from internal and external combustion are similar

Organics EF: AP42, 10/96; Table 3.3-2 (Multiquip); Tables 3.4.3 & 3.4.4 (Cat); assumes PAH = POM

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#3 Storage Tanks**

Description: Three tanks are used to store petroleum liquids
(Tank 1) Storage of Asphalt
(Tank 2) Storage of Asphalt
(Tank 3) Storage of RFO fuel in a portable tank trailer, RFO is used in the drum dryer
(Tank 4) Storage of #2 diesel in portable tank trailer which supplies the loader used to feed the plant and the generator

Parameter	Tank 1	Tank 2	Tank 3	Tank 4	Units
Liquid:	Asphalt	Asphalt	RFO	#2 Diesel	
Control:	none	none	none	none	
Capacity:	25,000	18,000	13,866	12,000	gallons
Operation:	19,618,326	14,125,194	3,628,335	21,770,013	gallons per year throughput
TOC Emissions	1,335.22	961.51	3.63	709.34	lbs/yr TOC - calculated with Tanks Program 4.0.9d

Potential to Emit, (tons per year)

	(Tank 1) Asphalt		(Tank 2) Asphalt		(Tank 3) RFO		(Tank 4) #2 diesel		Total
Organics	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
Acetaldehyde									
Acrolein									
Benzene	0.032	2.14E-02	0.032	1.54E-02		0.00E+00		0.00E+00	3.67E-02
Bromomethane (methyl bromide)	0.0049	3.27E-03	0.0049	2.36E-03		0.00E+00		0.00E+00	5.63E-03
1,3-Butadiene									
Carbon Disulfide	0.016	1.07E-02	0.016	7.69E-03		0.00E+00		0.00E+00	1.84E-02
Chloroethane (ethyl chloride)	0.004	2.67E-03	0.004	1.92E-03		0.00E+00		0.00E+00	4.59E-03
Chloromethane (methyl chloride)	0.023	1.54E-02	0.023	1.11E-02		0.00E+00		0.00E+00	2.64E-02
Cumene									
Dichlorobenzene									
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)									
Ethyl Benzene	0.038	2.54E-02	0.038	1.83E-02		0.00E+00		0.00E+00	4.36E-02
Formaldehyde	0.69	4.61E-01	0.69	3.32E-01		0.00E+00		0.00E+00	7.92E-01
Furans (all PCDF)									
Hexane (incl n-Hexane)	0.1	6.68E-02	0.1	4.81E-02		0.00E+00		0.00E+00	1.15E-01
Hydrochloric Acid (hydrogen chloride)									
Isooctane (2,2,4-trimethylpentane)	0.00031	2.07E-04	0.00031	1.49E-04		0.00E+00		0.00E+00	3.56E-04
Methyl Chloride (chloromethane)	0.00027	1.80E-04	0.00027	1.30E-04		0.00E+00		0.00E+00	3.10E-04
Methyl Chloroform (1,1,1-trichloroethane)									
Methyl tert-Butyl Ether (MTBE)									
Naphthalene[1] (also a POM)									
Phenol									
Polycyclic Organic Matter* (incl naphthalene)									
Propionaldehyde									
Quinone									
Styrene	0.0054	3.61E-03	0.0054	2.60E-03		0.00E+00		0.00E+00	6.20E-03
Tetrachloroethane									
Toluene	0.062	4.14E-02	0.062	2.98E-02		0.00E+00		0.00E+00	7.12E-02
Xylene (incl isomers and mixtures)	0.257	1.72E-01	0.257	1.24E-01		0.00E+00		0.00E+00	2.95E-01
HAP Total		0.82		0.59		0.00		0.00	1.42E+00

Estimation Explanations

Emission factor (EF) units are % of organic PM for POM and phenol and fraction (%/100) of TOC for all other organics
Actual computer program run did not assum max tank throughput; throughput and emissions must be scaled up to represent PTE:
Annual throughputs were predicted on the tanks criteria emissions page.
To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"

TOC Emissions: Tanks Computer Program (see AP-42, 7.1 (11/06)), lbs/yr; see tanks criteria emissions page
Xylenes EF: m-, o- and p- isomers are individually listed as HAPs but for applicability purposes, are grouped as Xylenes
All other organics EF: AP-42, 3/04, Table 11.1-16 - (TOC) organic volatile-based speciation percentages
TOC = VOC/100% (AP-42, 3/04, Table 11.1-16)
For diesel and RFO, HAP data is not presented, because HAP emissions are expected to be very low

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#4 Asphalt Tank Heater**
Description: Asphalt heater, Heat Tec Power Flame brand, model Hsp 35
Control: none
Fuel: #2 diesel, RFO or natural gas
Capacity: 0.500 MMBtu/hr (from applicant)
Operation: 8760 hours/yr

Potential to Emit, (tons per year)

	#2 Diesel		RFO		Natural Gas		Total
Inorganics	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY	PTE TPY
Antimony Compounds	-		4.50E-03	7.04E-05	-		7.04E-05
Arsenic Compounds (incl arsine)	4.00E-06	8.76E-06	6.00E-02	9.39E-04	2.00E-04	4.29E-07	9.39E-04
Beryllium Compounds	3.00E-06	6.57E-06	1.80E-03	2.82E-05	1.20E-05	2.58E-08	2.82E-05
Cadmium Compounds	3.00E-06	6.57E-06	1.20E-02	1.88E-04	1.10E-03	2.36E-06	1.88E-04
Chromium Compounds (incl hexavalent)	3.00E-06	6.57E-06	1.80E-01	2.82E-03	1.40E-03	3.01E-06	2.82E-03
Cobalt Compounds	-		5.20E-03	8.13E-05	8.40E-05	1.80E-07	8.13E-05
Lead Compounds (not elemental lead)	9.00E-06	1.97E-05	5.00E-01	7.82E-03	5.00E-04	1.07E-06	7.82E-03
Manganese Compounds	6.00E-06	1.31E-05	5.00E-02	7.82E-04	3.80E-04	8.16E-07	7.82E-04
Mercury Compounds	3.00E-06	6.57E-06	-		2.60E-04	5.58E-07	6.57E-06
Nickel Compounds	3.00E-06	6.57E-06	1.60E-01	2.50E-03	2.10E-03	4.51E-06	2.50E-03
Phophorus Compounds	-		-		-		
Selenium Compounds	1.50E-05	3.29E-05	-		2.40E-05	5.15E-08	3.29E-05
Organics							
Acetaldehyde	-		-		-		
Acrolein	-		-		-		
Benzene	-		-		2.10E-03	4.51E-06	4.51E-06
Bromomethane (methyl bromide)	-		-		-		
1,3-Butadiene	-		-		-		
Carbon Disulfide	-		-		-		
Chloroethane (ethyl chloride)	-		-		-		
Chloromethane (methyl chloride)	-		-		-		
Cumene	-		-		-		
Dichlorobenzene	-		8.00E-07	1.25E-08	1.20E-03	2.58E-06	2.58E-06
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)	-		-		-		
Ethyl Benzene	-		-		-		
Formaldehyde	6.10E-02	9.54E-04	-		7.50E-02	1.61E-04	9.54E-04
Furans (all PCDF)	-		-		-		
Hexane (incl n-Hexane)	-		-		1.80E+00	3.86E-03	3.86E-03
Hydrochloric Acid (hydrogen chloride)	-		-		-		
Isooctane (2,2,4-trimethylpentane)	-		-		-		
Methyl Chloride (chloromethane)	-		-		-		
Methyl Chloroform (1,1,1-trichloroethane)	-		-		-		
Methyl tert-Butyl Ether (MTBE)	-		-		-		
Naphthalene (also a POM)	-		9.20E-05	1.44E-06	6.10E-04	1.31E-06	1.44E-06
Phenol	-		2.80E-05	4.38E-07	-		4.38E-07
Polycyclic Organic Matter* (incl naphthalene)	3.30E-03	5.16E-05	8.20E-03	1.28E-04	6.98E-04	1.50E-06	1.28E-04
Propionaldehyde	-		-		-		
Quinone	-		-		-		
Styrene	-		-		-		
Tetrachloroethane	-		-		-		
Toluene	-		-		3.40E-03	7.30E-06	7.30E-06
Xylene (incl isomers and mixtures)	-		-		-		
HAP Total		1.11E-03		1.53E-02		4.05E-03	2.02E-02

	#2 Diesel		RFO		Natural Gas	
***Polycyclic Organic Matter**	EF	PTE TPY	EF	PTE TPY	EF	PTE TPY
Acenaphthene	-		-		1.80E-06	3.86E-09
Acenaphthylene	-		-		1.80E-06	3.86E-09
Anthracene	-		-		2.40E-06	5.15E-09
Benzo(a)anthracene	-		4.00E-03	6.26E-05	1.80E-06	3.86E-09
Benzo(b)fluoranthene	-		-		1.80E-06	3.86E-09
Benzo(k)fluoranthene	-		-		1.80E-06	3.86E-09
Benzo(g,h,i)perylene	-		-		1.20E-06	2.58E-09
Benzo(a)pyrene	-		4.00E-03	6.26E-05	-	
Benzo(e)pyrene	-		-		1.20E-06	2.58E-09
Chrysene	-		-		1.80E-06	3.86E-09
Dibenzo(a,h)anthracene	-		-		1.20E-06	2.58E-09
7,12-Dimethylbenz(a)anthracene	-		-		1.60E-05	3.44E-08
Dioxins (Total PCDD; incl 2,3,7,8 TCDD)	-		-		-	
Fluoranthene	-		-		3.00E-06	6.44E-09
Fluorene	-		-		2.80E-06	6.01E-09
Furans (all PCDF)	-		-		-	
Indeno(1,2,3-cd)pyrene	-		-		1.80E-06	3.86E-09
3-Methylcloranthrene	-		-		1.80E-06	
2-Methylnaphthalene	-		-		2.40E-05	5.15E-08
Naphthalene (also individual HAP)	-		9.20E-05	1.44E-06	6.10E-04	1.31E-06
Perylene	-		-		-	

Phenanthrene	-		1.00E-04	1.56E-06	1.70E-05	3.65E-08
Pyrene	-		8.30E-06	1.30E-07	5.00E-06	1.07E-08
POM Subtotal	0.00E+00	0.00E+00	8.20E-03	1.28E-04	6.98E-04	1.50E-06

Estimation Explanations

Emission factor (EF) units are lb/1000 gallon oil and lb/mmscf natural gas
Worst-case PTE is the higher emitting of the fuel options

Liquid fuel conversion factor = 140 mmBTU/1000 gal from AP42, App A
Natural gas conversion factor = 1020 Btu/scf from AP-42, Table 1.4-1, footnote a

Inorganics EF: For diesel: AP-42 9/98, Table 1.3-10 for diesel, distillate oil, lb/mmbtu
For RFO: AP-42, 10/96, Table 1.11-4, waste oil combustion, atomizing burners
For natural gas: AP-42 7/98, Table1.4-4

Organics and POM: For diesel: AP-42 9/98, Table 1.3-8 for diesel, distillate oil, lb/mgal
For RFO: AP-42, 10/96, Table 1.11-5, waste oil combustion, atomizing burners
For natural gas: AP-42 7/98, Table1.4-3

Dichlorobenzene: For RFO: AP-42, 10/96, Table 1.11-5, waste oil combustion, vaporizing burners

Benzo(a)anthracene: For RFO: AP-42, 10/96, Table 1.11-5, waste oil combustion, vaporizing burners

Benzo(a)pyrene: For RFO: AP-42, 10/96, Table 1.11-5, waste oil combustion, vaporizing burners

Lead: For RFO: AP-42, 10/96, Table 1.11-1, waste oil combustion in atomizing burner
EF = 50L, where L = wt % lead in fuel = 0.01 Assumes 100 ppm based on limit in 40 CFR 279.11
For natural gas: AP-42 7/98, Table1.4-2

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#6 Silo Filling**
Description: Loading of hot-mix asphalt mix (HMA mix) into silo
Control: none
Capacity: 300 tons/hr HMA (from applicant)
Operation: 8,760 hours/yr

Potential to Emit, (tons per year)

Organics	EF	PTE TPY
Acetaldehyde		
Acrolein		
Benzene	0.032	5.12E-03
Bromomethane (methyl bromide)	0.0049	7.85E-04
1,3-Butadiene		
Carbon Disulfide	0.016	2.56E-03
Chloroethane (ethyl chloride)	0.004	6.41E-04
Chloromethane (methyl chloride)	0.023	3.68E-03
Cumene		
Dichlorobenzene		
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)		
Ethyl Benzene	0.038	6.09E-03
Formaldehyde	0.69	1.10E-01
Furans (all PCDF)		
Hexane (incl n-Hexane)	0.1	1.60E-02
Hydrochloric Acid (hydrogen chloride)		
Isooctane (2,2,4-trimethylpentane)	0.00031	4.96E-05
Methyl Chloride (chloromethane)	0.00027	4.32E-05
Methyl Chloroform (1,1,1-trichloroethane)		
Methyl tert-Butyl Ether (MTBE)		
Naphthalene[1] (also a POM)	1.82	6.07E-03
Phenol	1.18	3.94E-03
Polycyclic Organic Matter* (incl naphthalene)	11.41	3.81E-02
Propionaldehyde		
Quinone		
Styrene	0.0054	8.65E-04
Tetrachloroethane		
Toluene	0.062	9.93E-03
Xylene (incl isomers and mixtures)	0.257	4.12E-02
HAP Total		2.39E-01

***Polycyclic Organic Matter**	EF	PTE TPY
Acenaphthene	0.47	1.57E-03
Acenaphthylene	0.014	4.67E-05
Anthracene	0.13	4.34E-04
Benzo(a)athracene	0.056	1.87E-04
Benzo(e)pyrene	0.0095	3.17E-05
Chrysene	0.21	7.01E-04
Fluoranthene	0.15	5.00E-04
Fluorene	1.01	3.37E-03
2-Methylnaphthalene	5.27	1.76E-02
Naphthalene (also individual HAP)	1.82	6.07E-03
Perylene	0.03	1.00E-04
Phenanthrene	1.8	6.00E-03
Pyrene	0.44	1.47E-03
POM Subtotal	11.41	3.81E-02

Estimation Explanations

Emission factor (EF) units are % of organic PM for POM and phenol and % of TOC for all other organics
To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"
Predictive emission factors from AP-42 Tbl 11.1-14 for silo filling
Xylenes EF: m-, o- and p- isomers are individually listed as HAPs but for applicability purposes, are grouped as Xylenes
POM, naphthalene and phenol EF: AP-42, 3/04, Table 11.1-15 - organic particulate-based speciation percentages (%/100 x PM)
All other organics EF: AP-42, 3/04, Table 11.1-16 - (TOC) organic volatile-based speciation percentages (%/100 x TOC)

TOC EF: $0.0504(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded into silo

Organic PM EF: $0.00105(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded into silo

V = asphalt volatility =	-0.5	AP-42 default value
T = HMA mix temperature =	325	^{O}F, AP-42 default value
TOC EF =	1.22E-02	lb/ton
TOC emissions =	1.60E+01	tons/year (TOC EF x annual capacity)
Organic PM EF =	2.54E-04	lb/ton
Organic PM emissions =	3.34E-01	tons/year (Organic PM EF x annual capacity)

Emission Inventory
Knife River, Inc. CMI Portable Asphalt Plant

Hazardous Air Pollutant Emission Inventory

Emission Unit: **#7 Truck Loading & Fumes**
Description: a Load-out of hot-mix asphalt mix (HMA mix) from silo to asphalt trucks
b Fumes from loaded asphalt trucks while in plant
Control: none
Capacity: 300 tons/hr HMA (from applicant)
Operation: 8,760 hours/yr

Potential to Emit, (tons per year)

	Truck loading		Truck-load fumes		Total
Organics	EF	PTE TPY	EF	PTE TPY	PTE TPY
Acetaldehyde					
Acrolein					
Benzene	0.052	2.84E-03	0.052	7.52E-04	0.004
Bromomethane (methyl bromide)	0.0096	5.25E-04	0.0096	1.39E-04	0.001
1,3-Butadiene					
Carbon Disulfide	0.013	7.10E-04	0.013	1.88E-04	0.001
Chloroethane (ethyl chloride)	0.00021	1.15E-05	0.00021	3.04E-06	0.000
Chloromethane (methyl chloride)	0.015	8.20E-04	0.015	2.17E-04	0.001
Dichlorobenzene					
Cumene	0.11	6.01E-03	0.11	1.59E-03	0.008
Dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin)					
Ethyl Benzene	0.28	1.53E-02	0.28	4.05E-03	0.019
Formaldehyde	0.088	4.81E-03	0.088	1.27E-03	0.006
Furans (all PCDF)					
Hexane (incl n-Hexane)	0.15	8.20E-03	0.15	2.17E-03	0.010
Hydrochloric Acid (hydrogen chloride)					
Isooctane (2,2,4-trimethylpentane)	0.0018	9.84E-05	0.0018	2.60E-05	0.000
Methyl Chloride (chloromethane)					
Methyl Chloroform (1,1,1-trichloroethane)					
Methyl tert-Butyl Ether (MTBE)					
Naphthalene[1] (also a POM)	1.25	5.60E-03	1.25	1.81E-02	0.024
Phenol	1.18	5.29E-03	1.18	1.71E-02	0.022
Polycyclic Organic Matter* (incl naphthalene)	5.93	2.66E-02	1.25	1.81E-02	0.045
Propionaldehyde					
Quinone					
Styrene	0.00732	4.00E-04	0.00732	1.06E-04	0.001
Tetrachloroethane	0.0077	4.21E-04	0.0077	1.11E-04	0.001
Toluene	0.21	1.15E-02	0.21	3.04E-03	0.015
Xylene (incl isomers and mixtures)	0.49	2.68E-02	0.49	7.08E-03	0.034
HAP Total		1.10E-01		5.59E-02	1.66E-01

***Polycyclic Organic Matter**	EF	PTE TPY	EF	PTE TPY
Acenaphthene	0.26	1.16E-03		
Acenaphthylene	0.028	1.25E-04		
Anthracene	0.07	3.14E-04		
Benzo(a)athracene	0.019	8.51E-05		
Benzo(b)fluoranthene	0.0076	3.40E-05		
Benzo(k)fluoranthene	0.0022	9.86E-06		
Benzo(g,h,I)perylene	0.0019	8.51E-06		
Benzo(a)pyrene	0.0023	1.03E-05		
Benzo(e)pyrene	0.0078	3.49E-05		
Chrysene	0.103	4.61E-04		
Dibenzo(a,h)anthracene	0.00037	1.66E-06		
Fluoranthene	0.05	2.24E-04		
Fluorene	0.77	3.45E-03		
Indeno(1,2,3-cd)pyrene	0.00047	2.11E-06		
2-Methylnaphthalene	2.38	1.07E-02		
Naphthalene (also individual HAP)	1.25	5.60E-03	1.25	1.81E-02
Perylene	0.022	9.86E-05		
Phenanthrene	0.81	3.63E-03		
Pyrene	0.15	6.72E-04		
POM Subtotal	5.93	2.66E-02	1.25	1.81E-02

Estimation Explanations

Emission factor (EF) units are % of organic PM for POM and phenol and % of TOC for all other organics

To avoid double-counting, "HAP Total" does not count naphthalene separately because naphthalene is accounted for in "POM Subtotal"

POM, naphthalene and phenol EF: AP-42, 3/04, Table 11.1-15 - organic particulate-based speciation percentages

All other organics EF: AP-42, 3/04, Table 11.1-16 - (TOC) organic volatile-based speciation percentages

Xylenes EF: m-, o- and p- isomers are individually listed as HAPs but for applicability purposes, are grouped as Xylenes

a. Truck loading predictive emission factors from AP-42 Tbl 11.1-14

TOC EF: $0.0172(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded out

Organic PM EF: $0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ lb/ton HMA loaded out

V = asphalt volatility = -0.5 AP-42 default value

T = HMA mix temperature = 325 ^{O}F, AP-42 default value

TOC EF = 4.16E-03 lb/ton

TOC emissions = 5.46E+00 tons/year (TOC EF x annual capacity)

Organic PM EF = 3.41E-04 lb/ton

Organic PM emissions = 4.48E-01 tons/year (Organic PM EF x annual capacity)

b. Truck-load emission factors from AP42, 11.1.2.5

TOC EF: 1.10E-03 lb/ton HMA hauled by trucks

TOC emissions = 1.45 tons/year (TOC EF x annual capacity)