UTAH DIVISION OF AIR QUALITY – NOTICE OF INTENT

Kilgore Companies > Erda Facility

New Approval Order

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Project 184502.0004

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1. EXECUTIVE SUMMARY

Kilgore Companies (Kilgore) is a full-scale construction materials company that offers paving and construction services, as well as ready-mix concrete and aggregates. Kilgore is proposing to operate an aggregate mining plant with crushing and screening operations at a location near Erda, Utah in Tooele County (Erda Plant).

Kilgore is submitting this Notice of Intent air quality application (NOI) to the Utah Department of Air Quality (UDAQ) for the Erda Plant, in order to obtain an air quality approval order (AO). The Erda Plant will consist of crushing and screening operations with a proposed throughput of 400 tons per hour (tph), producing 297,000 tons of processed product per year (tpy) and 14,850 tpy of unprocessed material.

Emissions from the Erda Plant will consist of fugitive and non-fugitive $PM_{2.5}$ and PM_{10} (crushing and screening and related operations), as well as NO_X, SO_2, VOCs, and CO (from two [2] on-site generator engines). Water application will be used to control fugitive dust throughout the material handling processes.

The Erda Plant will be located within an area of Tooele County that is designated as a non-attainment area of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$) and 2015 8-hour ozone and an attainment area for all other criteria pollutants. Nitrogen oxide (NO_x), sulfur dioxide (SO_2), volatile organic compounds (VOCs), and ammonia are considered precursors to $PM_{2.5}$ in Utah.

The facility will be subject to New Source Performance Standards (NSPS) Subpart OOO, NSPS Subpart IIII and National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart ZZZZ.

This NOI application has been developed pursuant Utah Administrative Code (UAC) R307-401-5 and Utah's application guidance including but not limited to:

- NOI Forms and Fees;
- Process Description;
- Site Plan;
- Potential Emission Calculations;
- Best Available Control Technology (BACT) Analysis;
- Applicable Requirements; and
- Emission Impact Analysis.

2.1. DESCRIPTION OF FACILITY

The Erda Plant will be an aggregate crushing and screening facility located at 5800 North Highway 36, Erda, Utah. The facility will be within an area of Tooele County that is designated as a non-attainment area of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$) and 2015 8-hour ozone and an attainment area for all other criteria pollutants. Nitrogen oxide (NO_x), sulfur dioxide (SO_2), volatile organic compounds (VOCs), and ammonia are considered precursors to $PM_{2.5}$ in Utah.

Its Standard Industrial Classification (SIC) code is 1442 and is proposed to be permitted as a minor source. Equipment has been moved to the site under a temporary relocation letter, AO DAQC-547-18, dated May 4, 2019.

The Universal Transverse Mercator (UTM) coordinates for the Erda Plant are as follows:

- Easting: 391,220 m
- Northing: 4,499,174 m
- Zone: 12
- 1984 World Geodetic System

Activities at the facility include aggregate mining, crushing, screening, storage, and transportation. Equipment includes conveyors, crushers, bulldozers, front-end loaders, feeders, stackers, and generator engines. Raw material is mined from the site and loaded into conveyor systems, which transport the material to crushers. The crushers reduce the raw material to sizes that can then pass through a series of screens, which sort the aggregate by size. Post-crushing and screening, the aggregate is stored in stockpiles by stackers. It is then sold and loaded into haul trucks for transport off site. Mined and disturbed areas undergo reclamation activities in order to reduce fugitive PM emissions, and to properly care for the land.

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2.2. FEES

Kilgore will use the UDAQ's Payment Portal to prepay the following UDAQ NOI fees associated with this submittal:

- "Application Filing Fee" for the "New Minor Source and Major (not PSD) Source" source type = $500
- "Application Review Fee" for the "New Minor Source" source type = $2,000
- Total UDAQ fees = $2,500

Kilgore understands that the total permit review fee is based on the total actual time spent by UDAQ staff processing this NOI. Upon issuance of the AO, if the total review time is more than twenty (20) standard hours, UDAQ will invoice Kilgore at $100 per hour for the additional time above twenty (20) standard hours.

2.3. FORMS

The following UDAQ forms have been included in Appendix A of this application:

- Form 1: Notice of Intent (NOI) Application Checklist
- Form 2: Company Information/Notice of Intent
- Form 3: Process Information
- Form 5: Emissions Information
- Form 11: Internal Combustion Engines
- Form 15: Rock Crushing and Screening
- Form 20: Organic Liquid Storage Tank

3.1. DESCRIPTION OF PROJECT

Kilgore is requesting an AO for their Erda aggregate crushing and screening plant. Material is mined on-site by a bulldozer and is then transported by front-end loaders to either temporary stockpiles or to crushing and screening operations. Primary, secondary, and tertiary crushers – jaw, cone, and horizontal-shaft impact (HSI) and vertical-shaft impact (VSI) crushers, respectively – reduce the size of the mined aggregate to the desired sizes. Various-sized screens separate the aggregate, after which conveyors carry specific sizes of material to stackers. The stackers form stockpiles, from which the front-end loaders load material to haul trucks to be transported off-site. With this NOI, Kilgore seeks to obtain an AO that allows for the operations described above, and that allows for the use and operation of the equipment found in the list in Section 3.2, below.

3.2. DESCRIPTION OF PROCESS

This section contains the NOI information required by UDAQ Form 1, NOI Application bullets one (1) through five (5), which are regulated under R307-401-5(2)(a) and (e). This includes the following:

- Detailed description of the project and source processes;
- Discussion of fuels, raw materials, and products consumed/produced;
- Description of equipment used in the process, production rates, etc.; and
- Site plan of source with building dimensions, stack parameters etc.

3.2.1. Crushing and Screening

The aggregate crushing and screening operation will consist of a series of primary, secondary, and tertiary crushers, as well as screens, all used to size and sort aggregate material mined on-site. Specifically, the crushers entail one (1) primary jaw crusher, two (2) secondary cone crushers, and one (1) tertiary HSI and VSI crushers, each. The screens consist of five (5) screens of various sizes, and one (1) high-frequency (HF) screen. Raw material is loaded into a feeder on the crushing and screening plant by the front-end loaders, and is then processed by the aforementioned crushers and screens. Then, processed aggregate will be transported by conveyors and stackers to storage piles, depending on its size. Three (3) front-end loaders will load haul trucks with processed aggregate from the storage piles, which will then be hauled off-site. The proposed annual throughput for the crushing and screening operations is 297,000 tons per rolling 12-month period.

The conveyors, crushers, screens, stackers, offices, etc. – i.e., all on-site equipment – will be powered by two (2) prime power, 900 kW diesel-fired generator engines. A third diesel-fired engine (336 kW) will also be on site to provide power to a portion of the crushing and screening operation in the event that the two (2) prime power engines are not running. The 336 kW engine will not be operated at the same time as either of the 900 kW generator engines.

Fugitive PM_{10} and $PM_{2.5}$ will be generated by the crushing and screening operations. Multiple means will be utilized throughout the crushing and screening process to mitigate PM emissions. A water spray system will be used at appropriate locations, as the addition of moisture provides control for fugitive dust emissions. Furthermore, drop point distances will be minimized; this will be accomplished by using adjustable-height stackers, and by employing good front-end loader practices. Fugitive particulate emissions from truck traffic is addressed in the Roads section, below.

A list of installations and the associated emission sources are included on the following page.

- Primary Equipment:
  - One (1) Primary Jaw Crusher (400 tph);
  - Two (2) Secondary Cone Crushers (400 tph each);
  - Five (5) Screens (8 x 20) – (400 tph);
  - One (1) HSI Crusher (400 tph);
  - One (1) VSI Crusher (400 tph);
  - Two (2) Generator Engines (900 kW [1,207 HP] each); and
  - One (1) HF Screen (400 tph).

- Miscellaneous Equipment and Sources:
  - Fifteen (15) Conveyors (conveyor types vary);
  - One (1) Feeder;
  - 8.25 acres Stockpiles and Disturbed Grounds;
  - Three (3) Front-End Loaders (Off-Hwy Equipment);
  - One (1) Bulldozer (Off-Hwy Equipment);
  - One (1) Diesel Storage Tank (21,327 gallons); and
  - One (1) Backup Diesel Engine (336 kW [450 hp]).

The Erda Plant is proposing to have a site-wide throughput of 297,000 tpy of processed aggregate, and 14,850 tpy of unprocessed aggregate. The 297,000 tpy of processed aggregate will be processed utilizing the equipment listed above. Kilgore has prepared site-wide emissions based on this equipment, which are detailed Section 4.

3.2.2. Roads

Fugitive PM from haul roads will be controlled by both watering and sweeping of paved roads, and watering or chemical application on unpaved roads. Two haul routes will be used at the Erda Plant; one will be the main haul road used for hauling processed product, while the other will be a secondary haul road used for hauling unprocessed aggregate. Paved roads will make up 0.83 miles for both the main and secondary haul roads, while the unpaved roads will make up 0.30 miles and 0.73 miles for the main and secondary haul roads, respectively. All of these distances are given as two-way distances. Further discussion of control technologies used on the Erda Plant's roads is given in the BACT analysis section of this NOI.

3.3. SITE PLAN

The image below, Figure 3-1, provides a vicinity map of the Erda Plant, where the property boundaries are given in blue, while Figure 3-2 provides a closer look of the site boundaries. Figure 3-3 shows the paved (blue) and unpaved (red) portions of the main haul road used for processed product hauling. Figure 3-4 shows the paved (blue) and unpaved (red) portions of the haul road used for unprocessed product.

Figure 3-1. Vicinity Map.

Figure 3-2. Site Boundaries.

Figure 3-3. Main Haul Route for Processed Product.

Figure 3-4. Secondary Haul Route for Unprocessed Product.

This section details the methodology used to calculated controlled and uncontrolled emissions for criteria pollutants, greenhouse gases, and hazardous air pollutants (HAPs) associated with each new unit and its associated fugitives as regulated by R307-401-5(2)(b). Additionally, a comparison to major source thresholds is conducted. Detailed emission calculation tables are included at the end of this section.

4.1. CRUSHING AND SCREENING

PM, PM_{10}, and $PM_{2.5}$ emissions generated from the crushing and screening of aggregate are estimated by multiplying the material throughput by the appropriate emission factor (EF). Uncontrolled EFs for screening and crushing were obtained from AP-42, Section 11.19.2 (Crushed Stone Processing and Pulverized Mineral Processing), August 2004.The equation used is as follow:

$$\text{Annual Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) = \text{Emission Factor}\left(\frac{\text{lb}}{\text{ton}}\right) \times \text{Annual Throughput}\left(\frac{\text{tons}}{\text{yr}}\right) \times \left(\frac{\text{ton}}{2{,}000\ \text{lb}}\right)$$

Material throughput for crushing and screening operations incorporates the maximum site-wide throughput of 297,000 tpy and the appropriate equipment throughput ratio for each process. Besides the inherent moisture content of the mined material and good operating practices, water sprays will be used during crushing and screening operations. This will be discussed further in Section 5.

4.2. MATERIAL LOADING, UNLOADING AND TRANSFER

For all material transfer, including all conveyor transfer points and material loading/unloading, the uncontrolled PM_{10} and $PM_{2.5}$ EFs were obtained from the "drop equation" in AP-42, Section 13.2.4 (November 2006). The equation is:

$$E = k(0.0032) \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

where:

E = emission factors (lb/ton)
k = particle size multiplier (dimensionless)
U = mean wind speed (mph)
M = material moisture content (%)

Parameter "U" is determined from historical data retrieved from the Salt Lake International Airport in Salt Lake City, UT from 2014-2019. The material moisture content used in this equation is based on the average material moisture content acquired by testing of on-site material.

However, material loading, unloading and transfer points will have a higher material moisture content from water applied to the product feed stockpiles. Increased material moisture content, good operating practices, and applied water via water sprays will be implemented during material loading, unloading and transfer. This is discussed further in Section 5.

Material throughput for material transfer will incorporate the maximum site-wide throughput of 297,000 tpy and the appropriate equipment throughput ratio for each process.

The annual PM emissions rate in tpy is given by the equation below. The EF corresponds to the annual emissions of the criteria pollutant in question at the time of use of the equation; namely, PM_{10} or $PM_{2.5}$.

$$\text{Annual Crushing and Screening PTE (tpy)} = \text{Potential Annual Throughput (tpy)} \times EF\left(\frac{\text{lb}}{\text{ton}}\right) \times \text{Number of Units or Drop Points} \times \text{Conversion}\left(\frac{1\text{ ton}}{2{,}000\text{ lb}}\right)$$

4.3. STOCKPILES

A maximum pile area for each stockpile was determined based on a conservative engineering estimate of the facility. It is assumed that each stockpile will not exceed the size on any given day. The maximum pile area is multiplied by an EF, along with several conversion factors, to determine the potential emissions associated with each stockpile. EFs are chosen based on what size the particle is ($PM_{2.5}$ or PM_{10}), and whether the stockpile is controlled or uncontrolled, and active or inactive. Uncontrolled EF were obtained from AP-42 Fourth Edition Table 8.19.1-1 and AP-42 Appendix B.2 Table B.2-2.[1,2]

$$\text{Annual Stockpile Emissions (tpy)} = \text{Max. Pile Area (acre)} \times EF\left(\frac{\text{lb}}{\text{day} \cdot \text{acre}}\right) \times \text{Conversion}\left(\frac{365\text{ day} \times 1\text{ ton}}{1\text{ year} \times 2{,}000\text{ lb}}\right)$$

Water will be applied to product stockpiles via a water truck as a means of PM control. This will be discussed further in Section 5.

4.4. BULLDOZER USE

PM_{10}, and $PM_{2.5}$ emissions generated from bulldozing were calculated assuming one (1) bulldozer operating 4,160 hours/year. Bulldozer emissions are multiplied by EF given in AP-42, Section 11.9 (October 1998). AP-42 Table 11.9-1 provides the following equations for calculating EFs for total suspended solids (TSP) and PM_{15} from bulldozing operation:

$$\text{TSP} = \frac{5.7(s)^{1.2}}{(M)^{1.3}}$$

$$PM_{15} = \frac{1.0(s)^{1.5}}{(M)^{1.4}}$$

[1] AP-42 Fourth Edition, Table 8.19.1-1. https://www3.epa.gov/ttn/chief/ap42/oldeditions/4th_edition/ap42_4thed_orig.pdf

[2] AP-42 Appendix B.2, Table B.2-2. https://www3.epa.gov/ttn/chief/ap42/appendix/appb-2.pdf

where:

TSP and PM_{15} = emission factors (lb/hr)
s = material silt content (%),
M = material moisture content (%),

The material silt and material moisture content used in this equation were provided by Kilgore after on-site testing was done in preparation for the submittal of this NOI. AP-42 Section 11, Table 11.9-1, provides scaling factors that are applied to TSP and/or PM_{15} EFs to obtain PM_{10}, and $PM_{2.5}$ EFs. PM_{10} and $PM_{2.5}$ EFs were calculated as follows:

- PM_{10} = 0.75 PM_{15}; and
- $PM_{2.5}$ = 0.105 TSP.

Water will be applied to bulldozed areas via a water truck as a means of PM control. This will be discussed further in Section 5.

The annual PM emissions generated by bulldozer use are estimated by utilizing the EFs stated above. The EF is multiplied by the maximum annual operating hours, the application of the control efficiency, the number of bulldozers, and the conversion factor of pounds to tons.

$$\text{Annual Dozing Emissions (tpy)} = \text{EF}\left(\frac{\text{lb}}{\text{hr}}\right) \times \text{Max. Operating Hours}\left(\frac{\text{hr}}{\text{yr}}\right) \times (1 - \text{Control Efficiency}) \times \text{Number of Dozers} \times \text{Conversion}\left(\frac{1\text{ ton}}{2{,}000\text{ lb}}\right)$$

4.5. ROADS

The haul roads at the Erda Plant consist of both paved and unpaved roads. PM_{10} and $PM_{2.5}$ emissions were derived using the guidance found in UDAQ's March 10, 2008 memorandum regarding EFs for unpaved haul roads[3]. Emissions from these roads were calculated using the following equation:

$$PM = k \times \left(\frac{s}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b} \times D \times \frac{1\text{ ton}}{2{,}000\text{ lb}} \times (1 - \eta)$$

Where:

PM	=	$PM/PM_{10}/PM_{2.5}$ emissions (tpy)
k	=	$PM/PM_{10}/PM_{2.5}$ k-Factor (lb/VMT)
s	=	Average silt content (%)
W	=	Mean vehicle weight (tons)
D	=	Distance traveled (VMT/yr)
a	=	Constant for equation (varies for $PM/PM_{10}/PM_{2.5}$) (unit less)
b	=	Constant for equation (varies for $PM/PM_{10}/PM_{2.5}$) (unit less)
η	=	Control efficiency (%)

[3] Per memorandum issued by UDAQ; "Emission Factors for Paved and Unpaved Haul Roads" dated January 12, 2015.

Parameter (W) is determined by taking the mean weight of an empty tractor trailer and the maximum allowed gross vehicle weight limitation.[4,5] Parameter (D) is determined by using the product throughput divided by the difference in full and empty vehicle weight to determine the total number of hauls required. This value is multiplied by the round-trip distance traveled by the customer trucks. The average silt content used in this equation is provided in U.S. EPA AP-42, Section 13.2.2 (Unpaved Roads), published in November 2006.

As a means of control, a watering truck regularly applies water to suppress fugitive PM emissions at the Erda Plant; therefore, using guidance from the memorandum issued by UDAQ regarding emission factors for paved and unpaved haul roads, a control factor of 70% for basic watering was used for fugitive emissions. Emissions were projected based on the plant road layouts, vehicle weights, and hauling capacity.

4.6. GENERATOR ENGINES

Calculations for the criteria pollutants produced by on-site engines are conservatively based on the assumption that the two (2) prime-power, 900 kW (1,207 hp), diesel-fired generator engines would account for all power during total annual hours of operation and that they would operate at their maximum power output. The backup, 336 kW (450 hp) diesel-fired generator engine was not accounted for in these calculations because it is both smaller and is rated to meet EPA's Tier IV final (Tier IVf) Nonroad Compression-Ignition Engines: Exhaust Emission Standards. The 900 kW engines are rated to meet EPA's Tier IV interim (Tier IVi) Nonroad Compression-Ignition Engines: Exhaust Emission Standards. As the plant will either operate with both prime-power engines or the backup engine only, and as the three will not operate simultaneously, the described approach to the emission calculations is considered an appropriate, conservative estimate.

PM_{10}, $PM_{2.5}$, NO_x, VOC, and CO potential emissions are calculated by multiplying the Tier IVi EFs by the power output, hours of operation, and appropriate conversion factors. EFs for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equivalent to the EF provided for PM. Annual PM_{10}, $PM_{2.5}$, NO_x, VOC, and CO emission rates are calculated using the following equation:

$$\text{Annual } PM_{10}, PM_{2.5}, NO_x, \text{VOC, and CO Emissions (tpy)} = \text{EF}\left(\frac{\text{grams}}{\text{HP} \cdot \text{hr}}\right) \times \text{Power (HP)} \times \text{Hours of Operation}\left(\frac{\text{hr}}{\text{yr}}\right) \times \text{Conversion}\left(\frac{1 \text{ ton}}{907{,}185 \text{ grams}}\right)$$

The engines at the Erda Plant will be using ultra-low sulfur diesel (ULSD) fuel. The EF for SO_2 is based on a fuel sulfur content of 0.0015% for ULSD, as defined under 40 CFR 80, Subpart I, Section 80.510(c)(1). The SO_2 emission factor from AP-42 Section 3.4, Table 3.4-1 (10/96) is used to calculate annual SO_2 emissions, and accounts for the fuel sulfur content. Annual SO_2 emissions are calculated using the following Equation:

$$\text{Annual } SO_2 \text{ Emissions (tpy)} = \text{EF}\left(\frac{\text{lbs}}{\text{hp} \cdot \text{hr}}\right) \times \text{Power Output (hp)} \times \text{Hours of Operation}\left(\frac{\text{hr}}{\text{yr}}\right) \times \text{Conversion}\left(\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right)$$

GHG pollutants expected to be emitted from the engines include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Standard EFs for CO_2, N_2O and CH_4 are provided in 40 CFR Part 98, Subpart C, Table C-1 and Table C-2. The global warming potential (GWP) for each pollutant is obtained from 40 CFR Part 98, Subpart A, Table A-1. Calculations for GHG pollutants are based on the EF for each GHG pollutant, relevant GWP, annual

[4] National Academy of Sciences, Technologies and Approaches to Reducing the Fuel Consumption of Medium and Heavy-Duty Vehicles, prepublication copy, March 2010, pp. 2-2 and 5-42. Table 5.13.

[5] Per UAC R909-2-5. Table 2.

hours of operation, and the maximum heat input. The heat input for the engines is determined by the maximum fuel consumption as detailed on the gensets' nameplates. The sum of each pollutant's effect is summed to represent total carbon dioxide equivalent (CO_2e) emissions, as shown below:

$$\begin{aligned} &CO_2e \text{ Annual Emission Rate (tpy)} \\ &= \left(EF_{CO_2}\left(\frac{kg}{MMBtu}\right) + EF_{CH_4}\left(\frac{kg}{MMBtu}\right) \times GWP_{CH_4} + EF_{N_2O}\left(\frac{kg}{MMBtu}\right) \times GWP_{N_2O}\right) \\ &\times \text{Heat Input}\left(\frac{MMBtu}{hr}\right) \times \text{Hours of Operation}\left(\frac{hr}{yr}\right) \times \text{Conversion}\left(\frac{2.2 \text{ lb} \times 1 \text{ ton}}{1 \text{ kg} \times 2{,}000 \text{ lb}}\right) \end{aligned}$$

HAP emissions are determined using the maximum heat input and annual hours of operation. EFs for HAPs are obtained from AP-42, Section 3.4, Table 3.4-3 and Table 3.4-4. For conservatism, HAP emissions are calculated for all speciated organic compounds and polycyclic aromatic hydrocarbons (PAH), provided in AP-42, Section 3.4, Tables 3.4-3 and 3.4-4. Annual HAP emissions are calculated as follows:

$$\begin{aligned} &\text{Annual HAP Emissions (tpy)} \\ &= \sum_{i}^{\text{Species n}} \left(EF_n\left(\frac{lb}{MMBtu}\right) \times \text{Heat Input}\left(\frac{MMBtu}{hr}\right) \times \text{Operation}\left(\frac{hr}{yr}\right) \times \text{Conversion}\left(\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right)\right) \end{aligned}$$

Whereas hourly HAP emissions are calculated as follows:

$$\text{Hourly HAP Emissions}\left(\frac{lb}{hr}\right) = \text{Species EF}\left(\frac{lb}{MMBtu}\right) \times \text{Heat Input}\left(\frac{MMBtu}{hr}\right)$$

4.7. TANKS

Minimal VOC emissions are also anticipated from working losses, resulting from one (1) 21,327-gallon tank used to store diesel fuel. VOC emissions from the tank will not be controlled with add-on control equipment. Annual VOC emissions from fixed-roof storage tanks are calculated by summing the standing storage loss and working loss as shown from the Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-1):

$$L_T = L_S + L_W$$

Where:

L_T	=	total losses	$\left(\frac{lb}{yr}\right)$
L_S	=	standing storage losses	$\left(\frac{lb}{yr}\right)$
L_W	=	working losses	$\left(\frac{lb}{yr}\right)$

The standing storage loss and working loss components of the total loss equation are discussed in the subsections that follow.

a. Standing Storage Loss

Annual fixed-roof tank standing losses are estimated using Equation (1-2) from Fifth Edition (2006) of AP-42 Section 7.1.

$$L_S = 365\ (V_v)(\ W_w)(K_E)(K_S)$$

Where:

L_S	=	Standing storage loss	$\left(\frac{lb}{yr}\right)$
V_V	=	Vapor space volume	(ft^3)
W_v	=	Stock vapor density	$\left(\frac{lb}{ft^3}\right)$
K_E	=	Vapor space expansion factor	(Dimensionless)
K_S	=	Vented vapor saturation factor	(Dimensionless)
365	=	constant, the number of daily events in a year	$\left(\frac{1}{yr}\right)$

b. Tank Vapor Space Volume

The tank vapor space volume (V_V) is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-3):

$$V_V = \left(\frac{\pi}{4}D^2\right)H_{VO}$$

Where:

V_V	=	vapor space volume	(ft^3)
D	=	tank diameter,	(ft)
H_{VO}	=	vapor space outage	(ft)

The vapor space outage, H_{VO}, is estimated from Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-15):

$$H_{VO} = H_S - H_L + H_{RO}$$

Where:

H_{VO}	=	vapor space outage	(ft)
H_S	=	tank shell height	(ft)
H_L	=	liquid height	(ft)
H_{RO}	=	roof outage, cone or dome roof	(ft)

For a cone roof, the roof outage, H_{RO}, is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equations (1-16) and (1-17):

$$H_{RO} = \frac{1}{3}H_R$$

Where:

H_{RO}	=	roof outage (or shell height equivalent to the volume contained under the roof)	(ft)
H_R	=	tank roof height	(ft)

$$H_R = S_R R_S$$

Where:

S_R	=	tank cone roof slope; if unknown, a standard value of 0.0625 is used	$\left(\frac{ft}{ft}\right)$
R_S	=	tank shell radius	(ft)

For a dome roof, the roof outage is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equations (1-18) and (1-19):

$$H_{RO} = H_R\left(\frac{1}{2} + \frac{1}{6}\left(\frac{H_R}{R_S}\right)^2\right)$$

Where:

H_{RO}	=	roof outage	(ft)
R_S	=	tank shell radius	(ft)
H_R	=	tank roof height	(ft)

$$H_R = R_R - (R_R^2 - R_S^2)^{0.5}$$

Where:

H_R	=	tank roof height	(ft)
R_R	=	tank dome roof radius	(ft)
R_S	=	tank shell radius	(ft)

c. Vapor Space Expansion Factor

The vapor space expansion factor (K_E) is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equations (1-7) through (1-12) and Equations (1-24) through (1-28):

$$K_E = \frac{\Delta T_V}{T_{LA}} + \frac{\Delta P_V - \Delta P_B}{P_A - P_{VA}}$$

Where:

K_E	=	vapor space expansion factor	
ΔT_V	=	daily vapor temperature range	(°R)
ΔP_V	=	daily vapor pressure range	(psi)
ΔP_B	=	breather vent pressure setting range	(psi)
P_A	=	atmospheric pressure	(psia)
P_{VA}	=	vapor pressure at daily average liquid surface temperature	(psia)
T_{LA}	=	daily average liquid surface temperature	(°R)

The daily vapor temperature range is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-8).

$$\Delta T_V = 0.72\Delta T_A + 0.028\,\alpha\,I$$

Where:

ΔT_V	=	daily vapor temperature range	(°R)
ΔT_A	=	daily ambient temperature range	(°R)

α	=	tank paint solar absorbance	(dimensionless)
I	=	daily total solar insolation factor	$\left(\frac{BTU}{ft^2*day}\right)$

The true vapor pressure of organic liquids can be estimated by using Antoine's equation as shown in Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-25) or Fifth Edition (2006) of AP-42 Section 7.1 Tables 7.1-5.

$$\log_{10}(P_{VA}) = A - \left(\frac{B}{T_{LA} + C}\right)$$

Where:

T_{LA}	=	daily average liquid surface temperature	(°C)
P_{VA}	=	vapor pressure at daily average liquid surface temperature	(mm Hg)
A	=	constant in vapor pressure equation	(dimensionless)
B	=	constant in vapor pressure equation	(°C)
C	=	constant in vapor pressure equation	(°C)

The daily vapor pressure range is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-9).

$$\Delta P_V = P_{VX} - P_{VN}$$

Where:

ΔP_V	=	daily vapor pressure range	(psia)
P_{VX}	=	vapor pressure at the daily maximum liquid surface temperature	(psia)
P_{VN}	=	vapor pressure at the daily minimum liquid surface temperature	(psia)

The vapor pressures at the daily maximum and minimum liquid surface temperatures may be calculated by substituting the daily maximum and minimum liquid surface temperatures into the vapor pressure functions discussed above. Note that for the purposes of the emission calculations, vapor pressure at the daily maximum liquid surface temperature, daily average surface temperature, and daily minimum liquid surface temperature were assumed to be equivalent since a majority of the tanks are temperature controlled and/or indoors.

The daily maximum and minimum liquid surface temperatures are calculated using Fifth Edition (2006) of AP-42 Section 7.1 Figure 7.1-17.

$$T_{LX} = T_{LA} + 0.25\Delta T_V$$

$$T_{LN} = T_{LA} - 0.25\Delta T_V$$

Where:

T_{LX}	=	daily maximum liquid surface temperature	(°R)
T_{LA}	=	daily average liquid surface temperature	(°R)
ΔT_V	=	daily vapor temperature range	(°R)
T_{LN}	=	daily minimum liquid surface temperature	(°R)

The breather vent pressure setting range is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-11).

$$\Delta P_B = P_{BP} - P_{BV}$$

Where:

ΔP_B	=	breather vent pressure setting range	(psig)
P_{BP}	=	breather vent pressure setting	(psig)
P_{BV}	=	breather vent vacuum setting	(psig)

The daily ambient temperature range is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-12).

$$\Delta T_A = T_{AX} - T_{AN}$$

Where:

ΔT_A	=	daily ambient temperature range	(°R)
T_{AX}	=	daily maximum ambient temperature	(°R)
T_{AN}	=	daily minimum ambient temperature	(°R)

The daily average liquid surface temperature is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-26).

$$T_{LA} = 0.44T_{AA} + 0.56T_B + 0.0079\ \alpha\ I$$

Where:

T_{LA}	=	daily average liquid surface temperature	(°R)
T_{AA}	=	daily average ambient temperature	(°R)
T_B	=	liquid bulk temperature	(°R)
α	=	tank paint solar absorption	(dimensionless)
I	=	daily total solar insolation factor	$\left(\frac{BTU}{ft^2 * day}\right)$

The daily average ambient temperature is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-27).

$$T_{AA} = \frac{T_{AX} + T_{AN}}{2}$$

Where:

T_{AA}	=	daily average ambient temperature	(°R)
T_{AX}	=	daily maximum ambient temperature	(°R)
T_{AN}	=	daily minimum ambient temperature	(°R)

The liquid bulk temperature is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-28).

$$T_B = T_{AA} + 6\alpha - 1$$

Where:

T_B	=	liquid bulk temperature	(°R)
T_{AA}	=	daily average ambient temperature	(°R)
α	=	tank paint solar absorption	(dimensionless)

d. Vapor Space Expansion Factor

The vented vapor saturation factor, (K_S), is calculated using Fifth Edition (2006) of AP-42 Section 7.1 Equation (1-20):

$$K_S = \frac{1}{1 + 0.053 P_{VA} H_{VO}}$$

Where:

K_S	=	vented vapor saturation factor	(dimensionless)
P_{VA}	=	vapor pressure at daily average liquid surface temperature	(psia)
H_{VO}	=	vapor space outage	(ft)

Stock Vapor Density

The density of the vapor, (W_V), is calculated using Equation (1-21) from Fifth Edition (2006) of AP-42 Section 7.1.

$$W_V = \frac{M_V P_{VA}}{R T_{LA}}$$

Where:

W_V	=	vapor density	$\left(\frac{lb}{ft^3}\right)$
R	=	the ideal gas constant	$\left(\frac{10.731 \text{ psia ft}^3}{\text{lbmol °R}}\right)$
P_{VA}	=	vapor pressure at daily average liquid surface temperature	(psia)
M_V	=	vapor molecular weight, (Fifth Edition (2006) of AP-42 Section 7.1 Tables 7.1-2 and 7.1-3)	$\left(\frac{lb}{lbmol}\right)$
T_{LA}	=	daily average liquid surface temperature, (Fifth Edition (2006) of AP-42 Section 7.1 Eqn. 1-26)	(°R)

e. Working Loss

Annual fixed-roof tank working losses are estimated using Equation (1-29) from Fifth Edition (2006) of AP-42 Section 7.1.

$$L_w = (0.0010)(M_v)(P_{va})(Q)(K_n)(K_p)$$

Where:

L_w	=	working loss	$\left(\frac{lb}{yr}\right)$
M_V	=	molecular weight of vapor	$\left(\frac{lb}{lbmol}\right)$
Q	=	tank throughput	$\left(\frac{gal}{yr}\right)$
D	=	density	$\left(\frac{lb}{gal}\right)$
P_{VA}	=	true vapor pressure of liquid at daily average liquid surface temperature	(psia)
K_N	=	turnover factor, dimensionless	
		for turnovers > 36, $K_N = \frac{180+N}{6N}$	
		for turnovers ≤36 $K_N = 1$	
		for hourly emission calculations $K_N = 1$	
K_P	=	working loss product factor, $K_P = 1$	
		$K_p = .75$ for crude oils	
N	=	number of turnovers per year	

$$N = \frac{5.614Q}{V_{LX}}$$

Where:

V_{LX}	=	tank maximum liquid volume	(ft^3)

$$V_{LX} = \frac{\pi}{4} D^2 H_{LX}$$

Where:

D	=	diameter	(ft)
H_{LX}	=	maximum liquid height	(ft)

4.8. SOURCE SIZE DETERMINATION

Per UDAQ's Form 1 for NOI, this section should include UDAQ Form 1a or proposed emissions resulting from the project. The site-wide potential emissions for the Erda Plant are summarized in Table 4-1. This table contains the information required in UDAQ Form 1.

As presented in Table 4-1, none of the proposed emissions at the Erda Plant are greater than major source thresholds (MST) (i.e., 100 tons for any criteria pollutant with exception to direct $PM_{2.5}$ and its precursors for which the MST is 70 tpy[6], 10 tons for any HAP, 25 tons for all HAPs combined, and 100,000 tons for CO_2e). Therefore, the Erda Plant will continue to be classified as a major source.

Table 4-1. Facility-wide Emissions for Source Size Determination.

Emissions (tpy)								
Criterion	**PM_{10} (Total)**	**PM_{10} (Fugitive)**	**$PM_{2.5}$**	**NO_X**	**CO**	**SO_2**	**VOC**	**CO_2e**
Proposed Site-Wide Emissions	5.62	4.96	2.05	31.4	10.2	0.06	1.22	2,090
Major Source Thresholds[7,8]	70	NA	70	70	100	70	70	100,000
Threshold Exceeded?	No	NA	No	No	No	No	No	No
Modeling Limits[9]	15.00	5.00	No Limit	40	100	40	N/A	No Limit
Threshold Exceeded?	No	No	No	No	No	No	No	No

[6] The Erda Plant is located in the Salt Lake Nonattainment area for $PM_{2.5}$, Since the Salt Lake $PM_{2.5}$ non-attainment area was recently designated as serious non-attainment, the major source threshold is 70 tpy for direct $PM_{2.5}$ and its precursors (NO_X, SO_2, VOCs, and NH_3).

[7] The Erda Plant is located in Tooele County, which is in serious nonattainment for $PM_{2.5}$. Values are per UAC R307-403-5(2)(b)(ii).

[8] Ammonia and HAPs emissions were considered in the Erda Plant's facility-wide emissions; however, these emissions are not applicable. Major source thresholds are not surpassed by these pollutants.

[9] Per Emissions Impact Assessment Guidelines published by UDAQ.

5. BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

In the State of Utah, under R307-401-5(2)(d), Notice of Intent, every facility, operation, or process that proposes any activity that would emit an air contaminant, must consider BACT for the proposed activity. The BACT analysis below was performed pursuant to this rule. It only addresses units which will be modified, installed or otherwise altered according to this NOI.

5.1. CRUSHING AND SCREENING AGGREGATE OPERATIONS

5.1.1. PM_{10} and $PM_{2.5}$ Emissions

The Erda Plant will have a crushing and screening operation for aggregate mined on-site. The equipment associated with this operation will include the following classifications:

- Crushing
- Screening
- Conveyor drop points
- Stockpiling

Material Handling PM_{10} and $PM_{2.5}$ Step 1 – Identify All Control Technologies

Control technologies identified for PM_{10} and $PM_{2.5}$ emissions from material handling operations are as follows, based on March 21, 2017 review of relevant entries in EPA's RACT/BACT/LAER Clearinghouse (RBLC):

- Baghouse/Fabric Filter
- Cyclone
- Electrostatic Precipitator
- Enclosures
- Management/Operation Practices
- Watering and Material Moisture Content
- Wet Scrubber

Material Handling PM_{10} and $PM_{2.5}$ Step 2 – Eliminate Technically Infeasible Options

Baghouse/Fabric Filter

Fabric filters (baghouses) are used for medium and low gas-flow streams with high particulate concentrations. The typical baghouse has a control efficiency between 95% to 99.9%[10]. This is typically accomplished through the installation of ductwork, capture hoods, fans, motors, starters, stacks, and other stationary equipment. Material at the Erda Plant will travel through a series of mobile conveyors that will extend hundreds of feet. The process requires flexibility to alter on-site stockpile configurations. In other words, the crushing and screening equipment must be mobile. This configuration is incompatible with stationary baghouse equipment and thus renders the use of a baghouse technically infeasible.

[10] From EPA Air Pollution Control Technology Fact Sheet for baghouses: https://www3.epa.gov/ttnchie1/mkb/documents/ff-pulse.pdf (EPA-452/F-03-025).

Cyclone

A cyclone separator (cyclone) operates on the principle of centrifugal separation. A high-efficiency cyclone designed specifically for $PM_{2.5}$ and PM_{10} removal is likely to achieve between 20% to 70% removal for $PM_{2.5}$ and 60 to 95% removal for PM_{10} respectively.[11]. Similar to a baghouse, cyclone feasibility is based on routing emissions to a stationary control system via ductwork, capture hoods, fans, etc. This caveat results in a cyclone being technically infeasible for the Erda Plant, as the crushing and screening equipment used for production are mobile.

Electrostatic Precipitator

A dry electrostatic precipitator (ESP) is a particle-control device that uses electrical forces to move coarse particles at high concentrations out of a gas stream and onto collector plates, and then into a hopper. This removal efficiency is typically between 90-99.9%[12]. ESPs are sensitive to variations in gas streams and do not work well with streams that are highly variable, such as those present in crushing and screening.[13] Therefore, implementation of this control technology is considered technically infeasible for all crushing and screening sources.

Enclosures

Enclosures confine emissions to the enclosed area, prohibiting PM from reaching ambient air. Although effective, industrial enclosures are permanent structures. As discussed, the Erda Plant operates with mobile equipment, which requires flexibility of stockpile configurations. Therefore, enclosures are technically infeasible as control technology.

Management/Operation Practices

Management practices during material movement, such as minimizing drop heights, will minimize $PM_{2.5}$ and PM_{10} emissions will be implemented in this project. Best operating practices, such as regular inspection and maintenance, will be implemented as well.

Watering and Material Moisture Content

Watering changes the physical properties of the surface material by binding soil particles together such that fugitive emissions are minimized or not generated. Moreover, carryover of material moisture content from water sprays mitigates particulate emissions beyond the initial point of watering. Inherent moisture found in mined aggregate achieves the same effect was wetting by watering controls. Wet suppression is shown to achieve between 50-90% control of emissions[14]. This control measure is considered technically feasible for material handling.

Wet Scrubber

Wet gas scrubbers can achieve 50-95% control of PM emissions[15]. However, they face the same difficulties in mobile mining facilities as baghouses and cyclones, namely, they rely on stationary ductwork and other equipment to route emissions to the scrubber itself. Due to the nature of mining, conveyors leading to crushing, screening, and drop points will be moved frequently throughout the life of the mine. The incompatibility

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[11] From Air Pollution Control Technology Fact Sheet for cyclones: https://www3.epa.gov/ttn/catc/dir1/fcyclon.pdf (EPA-452/F-03-005)

[12] From EPA Air Pollution Control Technology Fact Sheet for Dry Electrostatic Precipitators: https://www3.epa.gov/ttn/catc/dir1/fdespwpi.pdf (EPA-452/F-03-028)

[13] Ibid.

[14] From Western Regional Air Partnership, *Fugitive Dust Handbook*; Executive Summary, p. 3, September 2006.

[15] From EPA Air Pollution Control Technology Fact Sheet for Packed-Bed/Packed-Tower Wet Scrubber (EPA-452/F-03-015)

between the mobile crushing and screening equipment and stationary wet scrubber equipment renders the use of a wet scrubber technically infeasible.

Material Handling PM_{10} and $PM_{2.5}$ Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Table 5-1. Summary of PM_{10} and $PM_{2.5}$ for Material Handling.

Control Technologies	Rank	Percent Control	Feasible	BACT
Baghouse	1	95 - 99.9%	No	No
ESP	2	90-99.9%	No	No
Wet Scrubber	3	50 – 95%	No	No
Water Spray/Inherent Properties	4	50 – 90%	Yes	Yes
Enclosure[16]	6	50-100%	No	No
Cyclone	5	20 - 70%[17]	No	No
Best Management/ Operation Practices	7	Variable	Yes	Yes

These operations are subject to NSPS, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plant(s) (NMPP). These NSPS standards were updated by U.S. Environmental Protection Agency (EPA) in 2008[18]. Section 111 of the Clean Air Act (CAA) requires that NSPS reflect the application of the best system of emission reductions, taking into consideration the cost of achieving such reductions, non-air quality health impact, environmental impact, and energy requirements. In this amendment, EPA made revisions to the emission limits for NMPP-affected facilities which commence construction, modification, or reconstruction after publishing the revised rules. EPA's review of permits and other available information when revising these standards of performance did not reveal any new or emerging pollution-prevention measures or PM control technologies as best demonstrated technologies (BDT). EPA found that the NSPS, Subpart OOO fugitive emission limits are most commonly met through use of wet suppression (as needed), water carryover, or with a partial enclosure. Wet dust suppression remains the method of choice for the vast majority of crushing and screening facilities.

Material Handling PM_{10} and $PM_{2.5}$ Step 4 – Evaluate Most Effective Controls and Document Results

The BDT control systems identified in EPA's NSPS evaluations achieve a reduction in PM_{10} and $PM_{2.5}$, along with reduction in larger PM particles required to meet NSPS, Subpart OOO emission standards. Additionally, as the Erda Plant is located in a $PM_{2.5}$ Nonattainment Area, it is subject to R307-312 Aggregate Processing Operations. Furthermore, because the selected technologies provide the highest control efficiencies feasible, a cost analysis is not necessary. Therefore, the selected controls are the most effective for the proposed crushing and screening plant.

[16] Nevada Division of Environmental Protection (NDEP), *Guidance on Emission Factors for the Mining Industry,* Pg. 26, May 2017

[17] From EPA Air Pollution Control Technology Fact Sheet for cyclones: https://www3.epa.gov/ttncatc1/dir1/fcyclon.pdf (EPA-452/F-03-005)

[18] U.S. EPA revised NSPS, Subpart OOO in 73 Federal Register (FR) 78, April 22, 2008.

Material Handling PM_{10} and $PM_{2.5}$ Step 5 – Select BACT

Kilgore proposes that BACT consists of restricting fugitive emissions to opacity standards set forth by NSPS Subpart OOO, Standards of Performance for NMPP, namely 7% opacity for belt conveyors, transfer points, screens, storage bins, enclosed trucks, and bucket elevators; and 12% opacity for crushing operations. Similar to many crushing and screening facilities, this will be done by watering and material moisture content controls. This includes, but is not limited to:

- Application of water to stockpiles;
- Application of water sprays to crushing and screening operations; and
- Moisture content carryover during transportation on conveyors.

Furthermore, management and best operational practices will be applied. These include, but are not limited to:

- Minimizing drop distance for material transfers; and
- Periodic inspections of material handling.

5.2. ROAD EMISSIONS

5.2.1. Fugitive PM_{10} and $PM_{2.5}$ Emissions

There is one primary hauling road which travels from the exterior of the property to the scale and loading area. This road consists of paved and unpaved portions. Fugitive emissions are generated from road use by customer trucks, support vehicles, and heavy equipment used in mining operations. Fugitive dust from production activities such as loading, unloading, storage of bulk materials, and material transporting may cause PM to be deposited on plant roads. Vehicular traffic in these areas may then disturb dust deposited on plant roads, resulting in more PM emissions.

Roads PM_{10} and $PM_{2.5}$ Step 1 - Identify All Control Technologies

Control technologies identified for PM_{10} and $PM_{2.5}$ emissions from roads are as follows, based on March 21, 2017 review of relevant entries in EPA's RBLC:

- Chemical Treatment
- Reduced Speed (Applicable to Unpaved Roads Only)
- Road Paving (Applicable to Unpaved Roads Only)
- Silt Content Reduction (Applicable to Unpaved Roads Only)
- Street Sweeping (Applicable to Paved Roads Only)
- Watering and Material Moisture Content

Roads PM_{10} and $PM_{2.5}$ Step 2 – Eliminate Technically Infeasible Options

Chemical Treatment

Applying chemical treatment to unpaved roads binds surface particles together and inhibits fugitive emissions by up to 85%[19]. This is feasible for haul roads, but not for paths on which bulldozers and/or front-end loaders

[19] UDAQ Guidelines: Emission Factors for Paved and Unpaved Haul Roads, January 2015

operate. Chemical treatment applied in such areas may contaminate mined aggregate and cause technical problems during the crushing and screening process. Thus, chemical treatment is not technically feasible for all vehicle paths, but will be implemented where it is practical to do so.

Reduced Speed

Reducing the speed on plant roads reduces the generation of fugitive dust. The Western Regional Air Partnership (WRAP) Fugitive Dust Handbook reports that a 57% reduction in emissions occurs when speeds are restricted to less than fifteen miles per hour (15 mph), and a 44% reduction in emissions when speeds are restricted to 25 mph[20]. This control method is considered technically feasible.

Road Paving

Paving provides effective controls on fugitive road emissions. Guidelines from UDAQ indicate that paved roadways, combined with sweeping and watering, provide a 90% control efficiency for particulate emissions[21]. Paving the haul roads is not technically feasible near mining operations at the Erda Plant. The high volume and heavy weight haul trucks and track equipment travel would cause rapid deterioration of paved roads. Furthermore, the road configurations will frequently change. Dust from deteriorated roads is difficult to control and emissions from paved roads in disrepair are higher than properly treated unpaved roads. Similarly, the benefits from applying chemical dust suppressants are negated in areas where trucks turn and tracked equipment is used because those activities cause chemical dust suppressants to deteriorate.

However, the mine access road, which will be used for product export, will not need to change throughout the life of the mine. As such, paving of the mine access road is technically feasible.

Silt Content Reduction

Silt content reduction involves covering unpaved road surfaces with material that has a lower silt content than what is naturally present, e.g., gravel or slag. Combined with watering, this method achieves up to 75% control efficiency[22]. This is considered technically feasible and will be applied where appropriate.

Street Sweeping

Street sweeping is a method of PM control that utilizes a mobile street sweeping unit to remove loose material from road surfaces. This control technology is technically feasible on paved surfaces, but is considered technically infeasible on unpaved surfaces. Street sweeping will be employed on the shared, paved portion of the main haul road.

Watering and Material Moisture Content

Watering of haul roads reduces fugitive $PM_{2.5}$ and PM_{10} emissions by binding soil particles together, preventing their being picked up by wind or vehicles. Water is applied on a scheduled basis and supplemented as needed based on driver observation of dust conditions. Basic watering results in a dust control efficiency of up to 70%[23]. This control technology is considered technically feasible and will be used at the Erda Plant.

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[20] Western Regional Air Partnership, *Fugitive Dust Handbook*. Executive Summary, p. 3, September 2006.

[21] UDAQ Guidelines: Emission Factors for Paved and Unpaved Haul Roads, January 2015

[22] Ibid.

[23] Ibid.

Roads PM_{10} and $PM_{2.5}$ Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Table 5-2. Fugitive PM_{10} and $PM_{2.5}$ Control Technologies and Efficiencies for Roads.

Control Method	Control Efficiency (%)
Pave Road with Sweeping and Watering	90
Chemical Suppressant and Watering	85
Basic Watering and Road Base	75
Basic Watering	70
Speed Reduction	57

For the technologies applied to unpaved roads, any grouping of silt-content reduction, watering, and speed reduction can be applied together, as they are not competitive. For paved roads, speed reduction, watering, and sweeping are noncompetitive technologies and may be applied together.

Note that variable control technologies that will be utilized include:

- Silt Content Reduction: Varies with current, uncontrolled road conditions, per AP-42 13.2.2.
- Street Sweeping: Highly variable, depends on current road conditions, per AP-42 Section 13.2.1.4.
- Road Paving: Depends on paved road final conditions and current unpaved road conditions.

Roads PM_{10} and $PM_{2.5}$ Step 4 – Evaluate Most Effective Controls and Document Results

Since the highest available controls include implementing road watering, speed reduction, and silt content reduction on unpaved roads, and street sweeping for paved roads, no detailed economic, energetic, or environmental impact evaluations were conducted.

Roads PM_{10} and $PM_{2.5}$ Step 5 – Select BACT

Fugitive road emissions are generated from road use by customer trucks, employee vehicles, and front-end loaders. Haul roads at the Erda Plant consist of a paved and unpaved portion for hauling of processed and unprocessed product. The routes taken to haul both are shown in the figures in Section 3. The paved (blue) and unpaved (red) portions of the main haul road used for processed product are shown in Figure 3-3. The paved (blue) and unpaved (red) portions of the haul road used for unprocessed product are shown in Figure 3-4.

BACT for paved roads is considered to consist of watering and sweeping. BACT for unpaved roads is considered to consist of watering, chemical suppressant application, and silt-content reduction. The Erda Plant plans to implement these controls.

5.3. GENERATOR ENGINES

Emission estimates for generator engine operation at the Erda Plant are based on the operation of the two (2) 900 kW (1,207 HP) diesel-fired generator engines. These engines are assumed to provide all electrical power to the Erda Plant. Both are rated to meet EPA's Tier IVi Nonroad Compression-Ignition Engines: Exhaust Emission

Standards. The backup, 336 kW (450 hp) diesel-fired engine is rated to meet EPA's Tier IVf Nonroad Compression-Ignition Engines: Exhaust Emission Standards. All engines will meet the applicable NSPS Subpart ZZZZ emission limits for reciprocating internal combustion engines (RICE). ULSD fuel will be used to fuel the engines, which is based on a fuel sulfur content of 0.0015% as defined under 40 CFR 80, Subpart I, Section 80.510(c)(1).

Generator NO_X Step 1 - Identify All Control Technologies

The following sources were reviewed to identify available control technologies:

- EPA's RBLC Database for Diesel Engines;
- EPA's Air Pollution Technology Fact Sheets; and
- South Coast Air Quality Management District Example Permits.

Available control technologies for diesel-fired non-emergency engines include the following:

- Limited Hours of Operation
- Good Combustion Practices
- Use of Tier-Certified Engines
- Engine Design
- Diesel Particulate Filter (DPF)
- Ultra-Low Sulfur Fuel
- Diesel Oxidation Catalyst (DOC)
- Exhaust Gas Recirculation (EGR)
- Selective Catalyst Reduction (SCR)

The following step evaluates the technical feasibility of each of these options.

Generator NO_X Step 2 – Eliminate Technically Infeasible Options

Limited Hours of Operation

One of the apparent opportunities to control the emissions of all pollutants released from non-emergency engines is to limit the hours of operation. The engines proposed will be limited to 4,160 hours of operation per year, each.

Good Combustion Practices

Good combustion practices refer to the operation of engines at high combustion efficiency, which reduces the products of incomplete combustion. The engines proposed are designed to achieve maximum combustion efficiency. The manufacturer has provided operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency.

Use of an Appropriate Tier Certified Engine

EPA noted that non-road engines were a significant source of emissions and began adopting emission standards for these emission units in 1994. Today, engines are required to meet certain emission limits, or tier ratings, based on the size and model year. Emission standards for these engines have progressively become more stringent over time and are an indicator of good combustion design. Kilgore owns two (2) Tier IVi engines that have been dedicated to provide on-site power to the Erda Plant's operations, and one (1) Tier IVf engine that has been dedicated to provide backup power when the Tier IVi engines are not in use.

Diesel Particulate Filters

This technology is placed in the exhaust pathway to prevent the release of particulate, and may be coated with a catalyst to further capture hydrocarbon emissions. According to EPA's Response to Public Comments on Notice of Reconsideration of NESHAP for RICE and NSPS for Stationary ICE, "Diesel particulate filters are also proven commercially available technology for retrofit applications to stationary engines…and are capable of reducing diesel PM by 90 percent or more."[24] Additionally, the California Air Resources Board (CA ARB) was able to determine that this technology was technically feasible for non-emergency and prime engines through obtaining several vendor quotes.[25] The proposed engines are equipped with a DPF, and are therefore considered technically feasible for the proposed engines.[26]

Ultra-Low Sulfur Diesel

ULSD fuel contains less than 0.0015% sulfur by weight. The reduced sulfur content reduces the potential for SO_2 emissions. Additionally, the low sulfur content results in a lower potential for aggregation of sulfur-containing compounds, and thus reduces $PM_{2.5}$ emissions. The Erda Plant will continue the use of ULSD fuel for its diesel-fired engines.

Diesel-Oxidation Catalyst

A diesel-oxidation catalyst (DOC) utilizes a catalyst such as platinum or palladium to further oxidize the engine's exhaust, which includes hydrocarbons (HC), (e.g., VOC), to carbon dioxide (CO_2) and water. Use of a DOC can result in approximately 90 percent reduction in HC/VOC emissions.[27] In addition to controlling HC/VOC, a DOC also has the potential to reduce PM emissions by 30 percent (based on the concentration of soluble organics) and CO emissions by 50 percent if low sulfur diesel fuel is used.[28] The proposed engines for the Erda Plant are equipped with DOCs.[29] Therefore, this technology is considered technically feasible.

Exhaust Gas Recirculation

NO_X reduction can be achieved through recirculating exhaust into an engine. EPA tests conducted on mobile engines have demonstrated NO_x reduction up to 50% if the engine timing is retarded, but test results are accompanied by an increase in particulates[30]. Computer-based control schemes can assist in NO_X reduction with associated timing retardation, but EGR can also result in heat rejection, reduced power density and lower fuel economy. The proposed engines for the Erda Plant are equipped with a manufacturer-installed NO_X reduction system that is effectively equivalent to an EGR.[31] It is for this reason that an EGR is considered technically feasible for the proposed engines.

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[24] Response to Public Comments on Notice of Reconsideration of National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines and New Source Performance Standards for Stationary Internal Combustion Engines, EPA Docket EPA-HQ-OAR-2008-0708, June 16, 2014
[25] Ibid.
[26] Per manufacturer's guarantee.
[27] U.S. EPA, *Alternative Control Techniques Document: Stationary Diesel Engines*, March 5, 2010, p. 41. (https://www.epa.gov/sites/production/files/2014-02/documents/3_2010_diesel_eng_alternativecontrol.pdf)
[28] Response to Public Comments on Notice of Reconsideration of National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines and New Source Performance Standards for Stationary Internal Combustion Engines, EPA Docket EPA-HQ-OAR-2008-0708, June 16, 2014
[29] Per manufacturer's guarantee.
[30] U.S. EPA Control of Heavy-Duty Diesel NOx Emissions by Exhaust gas recirculation, Office of Mobile Source Air Pollution Emissions Control Technology Division, August 1985
[31] Per manufacturer's guarantee.

Selective Catalytic Reduction

Selective catalytic reduction (SCR) systems introduce a liquid reducing agent such as ammonia or urea into the flue gas stream prior to a catalyst. The catalyst reduces the temperature needed to initiate the reaction between the reducing agent and NO_X to form nitrogen and water. Retro-fitting an SCR creates backpressure in the exhaust system which affects the performance and effective power output of an engine. For these reasons, retrofitting an SCR is considered technically infeasible.

Generator NO_X Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Effective control technologies for diesel engines include limited hours of operation, good combustion practices, use of tier-certified engines, use of EGR, use of a DOC, use of a DPF, use of high-efficiency engines, and the use of ULSD fuel.

Generator NO_X Steps 4-5 – Evaluate Most Effective Controls and Document Results, and Select BACT

The diesel-fired generator engines at the Erda Plant are well designed, efficient, reliable, and will be operated using good combustion practices. The engines will use diesel fuel meeting the requirements of 40 CFR §80.510(b) for non-road diesel fuel (i.e., a maximum sulfur content of 15 ppm and either a minimum cetane index of 40 or a maximum aromatic content of 35 percent by volume). They will operate under limited annual hours of operation, to the extent that they will only be run during operation scenarios.

The use of ULSD fuel and limited annual hours of operation, the operation of engines certified as EPA Tier IVi – which include built-in EGR, DOC, and DPF – and compliance with NESHAP Subpart ZZZZ and Subpart IIII is proposed as BACT for the diesel engines.

5.4. OTHER SMALL SOURCES

Diesel fuel is stored on site for use in the diesel-fired generator engines. The fuel storage tank can be categorized as an aboveground, fixed-roof, horizontal tank.

Emissions from fixed-roof storage tanks result from displacement of headspace vapor during filling operations (working losses) and from diurnal temperature and heating variations (breathing losses). While a variety of technologies may be considered, due to the size and minimal throughput anticipated for the proposed tank as demonstrated in the emission calculations, VOC emissions from tank is negligible (approximately 5.62E-03 tpy).[32] Therefore, BACT for the diesel storage tank is good operating practices (e.g.., minimizing spills) and maintenance with no additional controls required.

[32] The technologies identified as possible through a review of the RBLC, EPA Air pollution Fact Sheets, NSPS Kb, NESHAP G, NESHAP WW, SCAQMD LAER/BACT Determinations, SJVAPCD BACT Cleaning house, BAAQMD BACT/TBACT Workbook and Permits available online VOC reduction technologies for storage tanks are: internal floating roof, vapor recovery system, wet scrubber, carbon filtration system, and simple thermal oxidizer.

6.1. COMPARISON TO MODELING THRESHOLDS

Table 6-1 compares criteria pollutant total proposed emissions to applicable modeling thresholds contained in R307-403-4 through 7, and R307-410-4.

Table 6-1. Comparison to Criteria Modeling Thresholds

Emissions (tpy)							
Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_X**	**CO**	**SO_2**	**VOC**	**CO_2e**
Crushing & Screening Plant	0.61	0.06	-	-	-	-	-
Stockpiles and Disturbed Grounds	1.69	0.81	-	-	-	-	-
Bulldozer & Loaders	0.51	0.29	-	-	-	-	-
Roads	2.13	0.21	-	-	-	-	-
Engine	0.66	0.66	31.44	10.18	6.09E-02	1.22	2,090
Bank Run Export	0.01	0.00	-	-	-	-	-
Tanks	-	-	-	-	-	5.62E-03	-
Fugitive Emissions	4.96	1.39	-	-	-	-	-
Proposed Site Wide Emissions	5.62	2.05	31.44	10.18	6.09E-02	1.22	2,090
Major Source Thresholds[1,2]	70	70	70	100	70	70	N/A
Threshold Exceeded?	No	No	No	No	No	No	No
Modeling Limits[3]	5/15	No Limit	40	100	40	N/A	No Limit
Threshold Exceeded?	No	No	No	No	No	No	No

[1] Per UAC R307-415-3 definition of major source, only sources listed must include fugitive emissions or fugitive dust emissions to determine applicability.

[2] Ammonia emissions were considered; however, they are not applicable as none of the sources are anticipated to release ammonia in a quantifiable amount.

[3] Per Emissions Impact Assessment Guidelines published by UDAQ.

Table 6-2 compares HAP emission increases to applicable modeling thresholds as regulated by R307-410-5. For this project, Kilgore determined that the most applicable Emission Threshold Values (ETV) are those representative of vertically unrestricted releases within fifty (50) meters of the property boundary.

Table 6-2. Comparison to HAP Modeling Thresholds

Pollutant[1]	Total HAP Emissions PTE		ETV [2]	Modeling Required?
	(lb/hr)	(tpy)	(lb/hr)	
Benzene	4.77E-03	9.91E-03	0.3163	No
Toluene	1.73E-03	3.59E-03	14.922	No
Xylene (isomers and mixture)	1.19E-03	2.47E-03	85.970	No
Formaldehyde	4.85E-04	1.01E-03	0.0567	No
Acetaldehyde	1.55E-05	3.22E-04	6.9363	No
Acrolein	4.84E-05	1.01E-04	0.0353	No
Naphthalene	7.98E-04	1.66E-03	10.381	No
Polycyclic Aromatic Hydrocarbons (PAH)	1.30E-03	2.71E-03	--	No
Max HAP	4.77E-03	9.91E-03	--	--
Total HAP	1.05E-02	2.18E-02	--	--

1. Considered HAPs are those listed in AP-42 3.4 Large Stationary Diesel and All Stationary Dual-fuel Engines.
2. The Emission Threshold Value (ETV) within a 50-meter distance to the fence line; vertically unrestricted stack.

The PTE for the Erda Plant are below UDAQ modeling thresholds; therefore, modeling is not required. Additionally, a visibility analysis is not required, as the emission increase from this project does not constitute a major modification.[33]

[33] Per R307-406-2.

7. NONATTAINMENT/MAINTENANCE AREAS - OFFSETTING

The UDAQ offset requirements are applicable to sources located within a non-attainment area of a criteria pollutant. The Erda Plant is located within a $PM_{2.5}$ and ozone nonattainment area. As recorded in R307-403, $PM_{2.5}$ offsets are not applicable to minor sources. The ozone nonattainment offset requirements in R307-420-3 are applicable to all sources that have an increase in VOC emissions of 25 tpy or greater, the proposed PTE of the Erda site is less than the 25 tpy threshold. Therefore, no offset requirements are applicable to the Erda Site at this time.

This section includes a discussion of Federal and State requirements and their applicability to the project. Regulations can include NAAQS, SIP, NSPS, and National Emission Standards for Hazardous Air Pollutants (NESHAP) and Utah Air Quality Regulations. Kilgore has evaluated the applicability of the aforementioned regulatory measures associated with projects described in this NOI application. Applicable regulatory measures associated with projects described in this NOI will be discussed in the subsequent sections. Regulatory measures not associated with projects described in this NOI application or previously permitted equipment will not be discussed, as they have already been reviewed in a previous NOI application.

8.1. GENERAL INTRODUCTION – UTAH REGULATIONS

Kilgore has evaluated the applicability of each rule under the Utah Administrative Code (UAC) Title R307. Rules generally applicable to the Erda Plant but not associated with one specific proposed change will be discussed in this section, all other applicable rules associated with projects described in this NOI will be discussed in the subsequent sections.

Table 8-1. Evaluation of UDAQ Air Quality Rules

Reference	Regulation Name	Applicability	
		Yes	No
R307-101	General Requirements	X	
R307-102	[1] General Requirements: Broadly Applicable Requirements	X	
R307-103	[1] Administrative Procedures	X	
R307-104	[1] Conflict of Interest		X
R307-105	[1] General Requirements: Emergency controls	X	
R307-107	General Requirements: Breakdowns	X	
R307-110	[1] General Requirements: State Implementation Plan	X	
R307-115	[1] General Conformity	X	
R307-120	[1] General Requirements: Tax Exemption for Air Pollution Control Equipment	X	
R307-121	[2] General Requirements: Clean Air and Efficient Vehicle Tax Credit		X
R307-122	[2] General Requirements: Heavy Duty Vehicle Tax Credit		X
R307-123	[2] General Requirements: Clean Fuels and Vehicle Technology Grant and Loan Program		X
R307-124	[2] General Requirements: Conversion to Alternative Fuel Grant Program		X
R307-125	[2] Clean Air Retrofit, Replacement, and Off-Road Technology Program		X

Reference	Regulation Name	Applicability	
		Yes	No
R307-130	[1] General Penalty Policy	X	
R307-135	Enforcement Policy for Asbestos Hazard Emergency Response Act		X
R307-150	Emission Inventories	X	
R307-165	Emission Testing		X
R307-170	Continuous Emission Monitoring Program		X
R307-201	Emission Standards: General Emission Standards	X	
R307-202	Emission Standards: General Burning		X
R307-203	Emission Standards: Sulfur Content of Fuels	X	
R307-204	Emission Standards: Smoke Management		X
R307-205	Emission Standards: Fugitive Emissions and Fugitive Dust	X	
R307-206	[1] Emission Standards: Abrasive Blasting		X
R307-207	Residential Fireplaces and Solid Fuel Burning Devices		X
R307-208	Outdoor Wood Boilers		X
R307-210	[3] Standards of Performance for New Stationary Sources	X	
R307-214	[3] National Emission Standards for Hazardous Air Pollutants	X	
R307-220	Emission Standards: Plan for Designated Facilities		X
R307-221	Emission Standards: Emission Controls for Existing Municipal Solid Waste Landfills		X
R307-222	Emission Standards: Existing incinerator for Hospital, Medical, Infectious Waste		X
R307-223	Emission Standards: Existing Small Municipal Waste Combustion Units		X
R307-224	Mercury Emission Standards: Coal Fired Electric Generating Units		X
R307-230	NO_X Emission Limits for Natural Gas-Fired Water Heaters		X
R307-250	Western Backstop Sulfur Dioxide Trading Program		X
R307-301	Utah and Weber Counties: Oxygenated Gasoline Program as a Contingency Measure		X
R307-302	Solid Fuel Burning Devices		X
R307-303	Commercial Cooking		X
R307-304	Solvent Cleaning		X

Reference	Regulation Name	Applicability	
		Yes	No
R307-305	Nonattainment and Maintenance Areas for PM_{10}: Emission Standards		X
R307-306	PM_{10} Nonattainment and Maintenance Areas: Abrasive Blasting		X
R307-307	Road Salting and Sanding		X
R307-309	Nonattainment and Maintenance Areas for PM_{10} and $PM_{2.5}$: Fugitive Emissions and Fugitive Dust	X	
R307-310	Salt Lake County: Trading of Emission Budgets for Transportation Conformity		X
R307-311	Utah County: Trading of Emission Budgets for Transportation Conformity		X
R307-312	Aggregate Processing Operations for $PM_{2.5}$ Nonattainment Areas	X	
R307-320	Ozone Maintenance Areas and Ogden City: Employer Based Trip Reduction		X
R307-325	Ozone Nonattainment and Maintenance Areas: General Requirements	X	
R307-326	Ozone Nonattainment and Maintenance Areas: Control of Hydrocarbon Emissions in Petroleum Refineries		X
R307-327	Ozone Nonattainment and Maintenance Areas: Petroleum Liquid Storage		X
R307-328	Gasoline Transfer and Storage		X
R307-335	Degreasing		X
R307-341	Ozone Nonattainment and Maintenance Areas: Cutback Asphalt		X
R307-342	Adhesives and Sealants		X
R307-343	Wood Furniture Manufacturing Operations		X
R307-344	Paper, Film, and Foil Coatings		X
R307-345	Fabric and Vinyl Coatings		X
R307-346	Metal Furniture Surface Coatings		X
R307-347	Large Applicable Surface Coatings		X
R307-348	Magnet Wire Coatings		X
R307-349	Flat Wood Panel Coating		X
R307-350	Misc. Metal Parts and Product Coating		X
R307-351	Graphic Arts		X
R307-352	Metal Container, Closure, and Coil Coatings		X

Reference	Regulation Name	Applicability	
		Yes	No
R307-353	Plastic Parts Coatings		X
R307-354	Automotive Refinishing Coatings		X
R307-355	Aerospace Manufacture and Rework Facilities		X
R307-356	Appliance Pilot Light		X
R307-357	Consumer Products		X
R307-361	Architectural Coatings		X
R307-401	Permit: New and Modified Sources	X	
R307-403	[2] Permits: New and Modified Sources in Nonattainment and Maintenance Areas		X
R307-405	Permits: Major Sources in Attainment or Unclassified Areas (PSD)		X
R307-406	[2] Visibility		X
R307-410	Permits: Emission Impact Analysis	X	
R307-414	Permits: Fees for Approval Orders	X	
R307-415	Permits: Operating Permit Requirements		X
R307-417	Permits: Acid Rain Sources		X
R307-420	Permits: Ozone Offset Requirements in Salt Lake County and Davis County		X
R307-421	Permits: PM_{10} Offset Requirements in Salt Lake County and Utah County		X
R307-424	Permits: Mercury Requirements for Electric Generating Units		X
R307-501 to 505	Oil and Gas Industry		X
R307-801	Utah Asbestos Rule		X
R307-840	Lead-Based Paint Program Purpose, Applicability, and Definitions		X
R307-841	Residential Property and Child-Occupied Facility Renovation		X
R307-842	Lead-Based Paint Activities		X

1. The subject rule is or could be applicable to Kilgore's Erda Plant; however, this rule is not specific to operational compliance requirements, and is therefore not discussed in the enclosed NOI.

2. At the time of submission of this NOI, this rule does not apply.

3. Applicable NSPS and NESHAP regulations are detailed under appropriate project headings

8.1.1. UAC R307-101 General Requirements:

The Erda Plant complies in accordance with Condition I.1 of the AO currently issued with the definitions, terms, abbreviations, and references issued in its AO which conform to those used in the UAC R307-101, and 40 CFR.

8.1.2. UAC R307-107 General Requirements: Breakdowns

The Erda Plant reports breakdowns in accordance with Condition I.7 of the AO currently issued within 24 hours via telephone, electronic mail, fax, or other similar method and provides detailed written description within 14 days of the onset of the incident to UDAQ.

8.1.3. UAC R307-150 Emission Inventories:

For every third year, the Erda Plant reports its emissions inventory in accordance with Condition I.6 of its AO. The emissions inventory shall include all criteria pollutants, including filterable and condensable PM, hazardous air pollutants not exempted in R307-150-8 and chargeable pollutants in accordance with R307-150-6.

8.1.4. UAC R307-201 Emission Standards: General Emission Standards:

All rules applicable to the Erda Plant are incorporated by reference from 40 CFR Part 60. Applicability and requirements for these rules are outlined in Section I.2 of this submittal.

8.1.5. UAC R307-203 Emission Standards: Sulfur Content of Fuels:

The Erda Plant utilizes fuel oil or diesel where the sulfur content is 0.0015 percent or less by weight. In accordance with AO condition II.B.1.d the Erda Plant only burns No.1-D S15 or No.2-D S15 fuel oil or better in all equipment permitted for diesel/fuel oil combustion. Kilgore maintains records demonstrating that Ultra-Low Sulfur fuel was purchased for a period of five (5) years.[34]

8.1.6. UAC R307-205 Emission Standards: Fugitive Emissions and Fugitive Dust:

- *UAC R307-205-4 Emission Standards - Fugitive Emissions*

  The Erda Plant is located in Tooele County, which is in attainment and not a maintenance area for PM_{10}. Fugitive emissions from sources shall not exceed 20% opacity.

- *UAC R307-205-5 Emission Standards - Fugitive Dust*

  Owning, operating or maintaining a new or existing material storage, handling or hauling operation shall take measures to minimize fugitive dust from such activities. Such control may include enclosures, covers, stabilization or other equivalent methods or techniques as approved by the director.

  The Erda Plant will comply with minimization techniques as described in R307-205-5. Steps will be taken to minimize fugitive dusts.

[34] Title V permit Condition I.S.1.a

- *UAC R307-205-7 Emission Standards – Roads*

  The Erda Plant will supply traffic count information as determined necessary and clean any deposited materials that may create fugitive dust.

- *UAC R307-205-7 Emission Standards – Mining Activities*

  Minimizing fugitive dust shall be an integral part of site preparation mining activities and reclamation operations. Fugitive dust control measures include: periodic watering of unpaved roads, paving of roads, and prompt removal of coal, rock minerals, soil, and other dust-forming debris from roads. Additional controls include: frequent scraping and compaction of unpaved roads to stabilize the road surface, restricting the speed of vehicles in and around the mining operation and restricting the travel of vehicles on other than established roads. Enclosing, covering, watering, or otherwise treating loaded haul trucks to minimize loss of material to wind and spillage is a viable means to control fugitive dust from haul trucks. Substitution of conveyor systems for haul trucks and the covering of conveyor systems are subject to wind erosion. Additionally, minimizing the disturbed grounds and engaging in activities such as revegetation, mulching, or otherwise stabilizing the surface of all areas adjoining roads that are source of fugitive dust.

  The Erda Plant will comply with minimization techniques described in R307-205-7. The Erda Plant will also engage in various techniques aimed to reduce fugitive dust from mining activities. Techniques include, but are not limited to: water controls, maintaining both paved and unpaved roads, restricting the speed of vehicles in and around mining operations, and control of dust from storage piles.

8.1.7. UAC R307-309 Nonattainment and Maintenance Areas for PM_{10} and $PM_{2.5}$: Fugitive Emissions and Fugitive Dust:

Fugitive emissions from any sources shall not exceed 15% opacity.
Fugitive dust shall not exceed the following opacity limits:

(a) 10% at the property boundary; and

(b) 20% on site

Any person responsible for construction or maintenance of any existing road or having right-of-way easement or possessing the right to use the same whose activities result in fugitive dust from the road shall minimize fugitive dust to the maximum extent possible. Any such person who deposits materials that may create fugitive dust on a public or private paved road shall clean the road promptly.

The Erda Plant will minimize fugitive dust created from the construction and maintenance of the existing paved road to the extent both practical and possible.

8.1.8. UAC R307-312 Aggregate Processing Operations for $PM_{2.5}$ Nonattainment Areas:

- *R307-312-4 Visible Emissions*

  (1) Visible emissions from aggregate processing operations shall not exceed opacity limits as described in Appendix Table I-2.

Table 2. Aggregate Processing Operations Visible Emissions

Category	Opacity Limit
Crushers	12%
Screens	7%
Conveyor Transfer Points	7%

The Erda Plant will comply with visible emissions for aggregate processing operations described in R307-312.

8.1.9. UAC R307-325 Ozone Nonattainment and Maintenance Areas: General Requirements:

The Erda Plant will ensure that all VOC-containing liquid storage containers are closed when not in use, leaks are minimized, and any spills are contained and cleaned up immediately.

8.1.10. UAC R307-401-4: General Requirements:

The Erda Plant complies with the general requirements set forth for new and modified installations for existing fuel combustion burners. All new or modified fuel combustion burners shall possess low oxides of nitrogen burner technology unless such equipment is not physically practical or cost effective. All equipment is adequately and properly maintained.

8.1.11. UAC R307-401-8: Approval Order:

(1) The director will issue an AO if all conditions and regulations have been met.

(a) The degree of pollution control for emissions, to include fugitive emissions and fugitive dust, is at least best available control technology. When determining best available control technology for a new or modified source in an ozone nonattainment or maintenance area that will emit VOC or NO_X, best available control technology shall be at least as stringent as any Control Technique Guidance document that has been published by EPA that is applicable to the source.

(b) The proposed installation will meet the applicable requirements of:

(i) R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas;

(ii) R307-405, Permits: Major Sources in Attainment or Unclassified Areas (PSD);

(iii) R307-406, Visibility;

(iv) R307-410, Emissions Impact Analysis;

(v) R307-420, Permits: Ozone Offset Requirements in Davis and Salt Lake Counties;

(vi) R307-210, National Standards of Performance for New Stationary Sources;

(vii) National Primary and Secondary Ambient Air Quality Standards;

(viii) R307-214, National Emission Standards for Hazardous Air Pollutants;

(ix) R307-110, Utah State Implementation Plan; and

(x) All other provisions of R307.

(2) The AO requires that all pollution control equipment be adequately and properly maintained.

(3) Receipt of an AO does not relieve any owner or operator of the responsibility to comply with the provisions of R307 or the State Implementation Plan.

The Erda Plant will establish and maintain compliance through the following:

(1) All pollution control equipment will be properly maintained; and

(2) Provisions of R307 or SIP will be followed.

BACT provisions specified in UAC R307-401 have been applied through control equipment installed and monitoring conditions.

8.1.12. UAC R307-410 Permits: Emission Impact Analysis:

Emission impacts associated with the Erda Plant are addressed in Section 9 of this submittal.

8.1.13. UAC R307-414 Permits: Fees for Approval Orders:

Fees associated with the submission of this NOI are addressed in Section 2 of this submittal.

8.2. FEDERAL REGULATIONS

8.2.1. NSPS Subpart A (General Provisions)

All affected sources subject to an NSPS are also subject to the general provisions of NSPS Subpart A, unless specifically excluded by the source-specific NSPS. NSPS Subpart A requires the following facilities subject to a source-specific NSPS:

- Initial construction/reconstruction notification
- Initial startup notification
- Performance tests
- Performance test date initial notification
- General monitoring requirements
- General recordkeeping requirements
- Semi-annual monitoring system and/or excess emission reports

8.2.2. NSPS Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels […])

NSPS Subpart Kb, *Standards of Performance for Volatile Liquid Storage Vessels*, is applicable to storage tanks that meet one of the following criteria:

1. Have a capacity less than 75 cubic meters (m^3);
2. Have a capacity greater than or equal to 151 m^3 and storing a liquid with a maximum true vapor pressure of less than 3.5 kilopascals (kPa); or

3. Have a capacity between 75 m^3 and 151 m^3 and storing a liquid with a maximum true vapor pressure of less than 15.0 kPa.

The storage tank on site will have a capacity less than 151 m^3 and store diesel fuel, which has a vapor pressure less than 15.0 kPa (~0.15 kPa at 100^0 F). Therefore, NSPS Subpart Kb is not applicable to the storage tank.

8.2.3. NSPS Subpart OOO (Standards of Performance for Nonmetallic Mineral Processing Plants)

NSPS Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*, provide standards of performance for affected facilities located at fixed or portable nonmetallic mineral processing plants that are constructed, modified, or reconstructed after August 31, 1983. The following are considered affected facilities under NSPS Subpart OOO:

- Crusher(s)
- Screening Operation(s)
- Belt Conveyor(s)

The proposed project will involve the installation of nonmetallic mineral affected facilities under NSPS Subpart OOO (e.g., crushers, screens, conveyor belts, etc.). Per 40 CFR 60.672(a), the affected facilities must meet the emission limits and compliance requirements in Table 2 of the standard within 60 days after achieving maximum production rate but no later than 180 days after initial startup. Monitoring must be conducted in accordance with 40 CFR 60.674(c) or (d). Finally, testing, recordkeeping and reporting must be met in accordance with 40 CFR 60.675 through 60.676. Kilgore will demonstrate compliance with the requirements upon completion of construction of the affected facilities.

Table 8-2. NSPS Subpart OOO Visible Emissions

Requirement	Opacity Limit	Regulatory Citation
I. Fugitive Emission Limits Crushers	Opacity must be less than 12 percent for crushers for which a capture system is not used.	60.672(b) Table 3
III. Additional Fugitive Emission Limits (Excluding Crushing)	Opacity must be less than 7 percent for screening operations, transfer points on belt conveyors or from any other affected facility.	60.670 60.671 Table 3

Periodic wet suppression system inspections from affected facilities is required as described in 60.674(b). These inspections must be recorded with the date and any corrective actions taken in the logbook required under 40 CFR 60.676(b).

Recordkeeping and reporting must be met in accordance with 40 CFR 60.676. Morgan Asphalt will demonstrate compliance with the requirements upon completion of construction of the affected facilities.

8.2.4. NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

40 CFR 60, Subpart IIII establishes standards for owners and operators of compression ignition, internal combustion engines which commenced construction after July 11, 2005, and were manufactured after April 1, 2006. The construction date is the date the engine was ordered by the owner or operator. Kilgore is proposing to operate two (2) prime-power, diesel-fired generator engines, each with a rating of 900 kW (1,207 hp), and one

(1) backup, diesel-fired generator engine with a rating of 336 kW (450 hp). The stationary compression ignition engines will be constructed after the specified construction dates and are therefore subject to the requirements of Subpart IIII.

8.2.5. NESHAP SUBPART ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines)

NESHAP Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, applies to stationary RICE at major and area sources of HAPs. Per 40 CFR 63.6590(a)(2)(iii), a stationary RICE at an area source of HAPs is new if construction commenced after June 12, 2006. Thus, the proposed engines are considered a new stationary RICE under NESHAP Subpart ZZZZ. Per 40 CFR 63.6590(c) and 40 CFR 63.6590(c)(1), new stationary RICE located at an area source of HAPs may show compliance with NESHAP ZZZZ by being in compliance with NSPS IIII.[35] The Erda Plant is not a major source of HAP, as total HAP emissions amount to less than ten (10) tons per year for an individual HAP, and less than twenty-five (25) tons per year of total HAP. Therefore, by maintaining compliance with NSPS IIII, Kilgore can demonstrate compliance with NESHAP ZZZZ.

[35] NESHAP Subpart 40 CFR 63.6675

9. EMISSIONS IMPACT ANALYSIS

As noted in Section 4 and demonstrated in Table 4-1, site-wide emissions for the Erda Plant are less than UDAQ's modeling thresholds given in UAC R307-410-4. Therefore, an emissions impact analysis is not required.

APPENDIX A: FORMS

Form 1
Notice of Intent (NOI) Application Checklist

Date April 2020

Company Kilgore Companies

Utah Division of Air Quality
New Source Review Section

Source Identification Information [R307-401-5]

1. Company name, mailing address, physical address and telephone number ☑
2. Company contact (Name, mailing address, and telephone number) ☑
3. Name and contact of person submitting NOI application (if different than 2) ☑
4. Source Universal Transverse Mercator (UTM) coordinates ☑
5. Source Standard Industrial Classification (SIC) code ☑
6. Area designation (attainment, maintenance, or nonattainment) ☑
7. Federal/State requirement applicability (NAAQS, NSPS, MACT, SIP, etc.) ☑
8. Source size determination (Major, Minor, PSD) ☑
9. Current Approval Order(s) and/or Title V Permit numbers ☑

NOI Application Information: [R307-401]

1. Detailed description of the project and source process ☑
2. Discussion of fuels, raw materials, and products consumed/produced ☑
3. Description of equipment used in the process and operating schedule ☑
4. Description of changes to the process, production rates, etc. ☑
5. Site plan of source with building dimensions, stack parameters, etc. ☑

6. Best Available Control Technology (BACT) Analysis [R307-401-8]
   A. BACT analysis for all new and modified equipment ☑

7. Emissions Related Information: [R307-401-2(b)]
   A. Emission calculations for each new/modified unit and site-wide (Include PM_{10}, $PM_{2.5}$, NO_x, SO_2, CO, VOCs, HAPs, and GHGs) ☑
   B. References/assumptions, SDS, for each calculation and pollutant ☑
   C. All speciated HAP emissions (list in lbs/hr) ☑

8. Emissions Impact Analysis – Approved Modeling Protocol [R307-410]
   A. Composition and physical characteristics of effluent (emission rates, temperature, volume, pollutant types and concentrations) ☐

9. Nonattainment/Maintenance Areas – Major NSR/Minor (offsetting only) [R307-403]
   A. NAAQS demonstration, Lowest Achievable Emission Rate, Offset requirements ☐ N/A ■
   B. Alternative site analysis, Major source ownership compliance certification ☐ N/A ■

10. Major Sources in Attainment or Unclassified Areas (PSD) [R307-405, R307-406]
    A. Air quality analysis (air model, met data, background data, source impact analysis) ☐ N/A ■
    B. Visibility impact analysis, Class I area impact ☐ N/A ■
11. Signature on Application ☑

Note: The Division of Air Quality will not accept documents containing confidential information or data. Documents containing confidential information will be returned to the Source submitting the application.

Form 2
Company Information/Notice of Intent (NOI)

Date April 2020

Utah Division of Air Quality
New Source Review Section

Application for: ☑ **Initial Approval Order** ☐ **Approval Order Modification**

General Owner and Source Information

1. Company name and mailing address:
Kilgore Companies
7057 W 2100 S
Salt Lake City, UT 84128
Phone No.: (801) 250-0132
Fax No.: (801) 250-0671

2. Company** contact for environmental matters:
Mr. Lee Ware
Phone no.: (801) 250-0132 ext. 1412
Email: lee.ware@kilgorecompanies.com
*** Company contact only; consultant or independent contractor contact information can be provided in a cover letter*

3. Source name and physical address (if different from above):
Phone no.: ( )
Fax no.: ( )

4. Source Property Universal Transverse Mercator coordinates (UTM), including System and Datum:
UTM: 1984 World Geodetic System
X: 391,220 Easting
Y: 4,499,200 Northing

5. The Source is located in: Tooele County

6. Standard Industrial Classification Code (SIC)
1442 (Construction Sand and Gravel)

7. If request for modification, AO# to be modified: DAQE #_____ DATED: ____/____/____

8. Brief (50 words or less) description of process.
Kilgore Companies (Kilgore) is a full-scale construction materials company that offers paving and construction services, as well as ready-mix concrete and aggregates. Kilgore is proposing to construct an aggregate mining plant with crushing and screening operations at a location near Erda, Utah in Tooele County.

Electronic NOI

9. A complete and accurate electronic NOI submitted to DAQ Permitting Mangers Jon Black (*jlblack@utah.gov*) or Alan Humpherys (ahumpherys@utah.gov) can expedite review process. Please mark application type.

Hard Copy Submittal ☐ Electronic Copy Submittal ☑ Both ☐

Authorization/Singnature

I hereby certify that the information and data submitted in and with this application is completely true, accurate and complete, based on reasonable inquiry made by me and to the best of my knowledge and belief.

Signature: _____ Title: Environmental Director

Lee Ware
Name (Type or print)

Telephone Number:
(801) 831-7402
Email:
lee.ware@kilgorecompanies.com

Date: 04/23/2020

Form 3

Process Information

Utah Division of Air Quality
New Source Review Section

Company Kilgore Companies

Site Erda

Process Information - For New Permit ONLY	
1. Name of process: Crushing and Screening Aggregate Pit	2. End product of this process: Aggregate
3. Process Description*: Mining, crushing, screening, storage, and transport of aggregate.	

Operating Data	
4. Maximum operating schedule: 16 hrs/day 5 days/week 52 weeks/year	5. Percent annual production by quarter: Winter 12% Spring 13% Summer 50% Fall 25%
6. Maximum Hourly production (indicate units.): 400 tph	7. Maximum annual production (indicate units): 311,850 tpy
8. Type of operation: Continuous ☐ Batch ☐ Intermittent ☑	9. If batch, indicate minutes per cycle _____ Minutes between cycles _____

10. Materials and quantities used in process.*

Material	Maximum Annual Quantity (indicate units)
Processed Aggregate (tpy)	297,000.00
Unprocessed Aggregate (tpy)	14,850.00

11.Process-Emitting Units with pollution control equipment*

Emitting Unit(s)	Capacity(s)	Manufacture Date(s)
Jaw, Secondary, HSI, VSI Crushers (tph)	400	
Screens (tph)	400	
Generator Engines (kW)	900	11/11/14
Conveyors (tph)	400	
Backup Engine (kW)	336	02/02/15
Loaders		
Bulldozer		

**If additional space is required, please create a spreadsheet or Word processing document and attach to form.*

Form 5
Emissions Information
Criteria/GHGs/ HAP's
Utah Division of Air Quality
New Source Review Section

Company Kilgore Companies

Site Erda

Potential to Emit* Criteria Pollutants & GHGs			
Criteria Pollutants	**Permitted Emissions (tons/yr)**	**Emissions Increases (tons/yr)**	**Proposed Emissions (tons/yr)**
PM_{10} Total		5.62	5.62
PM_{10} Fugitive		4.96	4.96
$PM_{2.5}$		2.05	2.05
NO_x		31.40	31.40
SO_2		0.06	0.06
CO		10.20	10.20
VOC		1.22	1.22
VOC Fugitive		0.01	0.01
NH_3			
Greenhouse Gases	**CO_2e**	**CO_2e**	**CO_2e**
CO_2		2,083.00	2,083.00
CH_4		0.08	0.08
N_2O		0.02	0.02
HFCs			
PFCs			
SF_6			
Total CO2e		2,090.00	2,090.00

**Potential to emit to include pollution control equipment as defined by R307-401-2.*

Hazardous Air Pollutants** (**Defined in Section 112(b) of the Clean Air Act)				
Hazardous Air Pollutant* **	**Permitted Emissions (tons/yr)**	**Emission Increase (tons/yr)**	**Proposed Emission (tons/yr)**	**Emission Increase (lbs/hr)**
Benzene		0.01	0.01	0.01
Touene		0.00	0.00	0.00
Xylene		0.00	0.00	0.00
Formaldehyde		0.00	0.00	0.00
Acetaldehyde		0.00	0.00	0.00
Acrolein		0.00	0.00	0.00
Naphthalene		0.00	0.00	0.00
PAH		0.00	0.00	0.00
Total HAP		0.02	0.02	0.01

**** Use additional sheets for pollutants if needed*

Utah Division of Air Quality
New Source Review Section

Form 11
Internal Combustion Engines

Company Kilgore Companies
Site/Source Erda
Date April 2020

Equipment Information

1. Manufacturer: Caterpillar
   Model no.: 800SC4
   The date the engine was constructed or reconstructed 11/2014

2. Operating time of Emission Source:

	average	maximum
Hours/day		16
Days/week		5
Weeks/year		52

3. Manufacturer's rated output at baseload, ISO 1207 hp or 900 Kw
   Proposed site operating range _____ hp or ____ Kw

Gas Firing

4. Are you operating site equipment on pipeline quality natural gas: ☐ Yes ☐ No

5. Are you on an interruptible gas supply:
   ☐ Yes ☐ No
   If "yes", specify alternate fuel:
   _____

6. Annual consumption of fuel:
   _____ MMSCF/Year

7. Maximum firing rate:
   _____ BTU/hr

8. Average firing rate:
   _____ BTU/hr

Oil Firing

9. Type of oil:
   Grade number ☐ 1 ☐ 2 ☐ 4 ☐ 5 ☐ 6 Other specify _____

10. Annual consumption: _____ gallons

11. Heat content: _____ BTU/lb or
    _____ BTU/gal

12. Sulfur content: 0.0015 % by weight

13. Ash content: _____ % by weight

14. Average firing rate: _____ gal/hr

15. Maximum firing rate: _____ gal/hr

16. Direction of firing: ☐ horizontal ☐ tangential ☐ other: (specify)

Internal Combustion Engine
Form 11 (Continued)

Operation

17. Application:
- ■ Electric generation
  _____ Base load _____ Peaking
- ☐ Emergency Generator
- ☐ Driving pump/compressor
- ☐ Exhaust heat recovery
- ☐ Other (specify) _____

18. Cycle
- ☐ Simple cycle
- ☐ Regenerative cycle
- ☐ Cogeneration
- ☐ Combined cycle

Emissions Data

19. Manufacturer's Emissions in grams per hour (gr/hp-hr): 2.84 NO_X 0.92 CO 0.11 VOC
NA Formaldehyde

20. Attach manufacturer's information showing emissions of NO_x, CO, VOC, SO_x, CH_2O, PM_{10}, $PM_{2.5}$, CO_2, CH_4 and N_2O for each proposed fuel at engine loads and site ambient temperatures representative of the range of proposed operation. The information must be sufficient to determine maximum hourly and annual emission rates. Annual emissions may be based on a conservatively low approximation of site annual average temperature. Provide emissions in pounds per hour and except for PM_{10} and $PM_{2.5}$ parts per million by volume (ppmv) at actual conditions and corrected to dry, 15% oxygen conditions.

Method of Emission Control:

☐ Lean premix combustors ■ Oxidation catalyst ☐ Water injection ☐ Other (specify)_____

☐ Other low-NO_x combustor ☐ SCR catalyst ☐ Steam injection

Additional Information

21. On separate sheets provide the following:

A. Details regarding principle of operation of emission controls. If add-on equipment is used, provide make and model and manufacturer's information. Example details include: controller input variables and operational algorithms for water or ammonia injection systems, combustion mode versus engine load for variable mode combustors, etc.

B. Exhaust parameter information on attached form.

C. All calculations used for the annual emission estimates must be submitted with this form to be deemed complete.

D. All formaldehyde emissions must be modeled as per Utah Administrative Code R307-410-5 using SCREEN3.

E. If this form is filled out for a new source, forms 1 and 2 must be submitted also.

INTERNAL COMBUSTION ENGINE
FORM 11 (continued)
EMISSION SOURCES

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this form.

AIR CONTAMINANT DATA							EMISSION POINT DISCHARGE PARAMETERS							
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM			AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (6)			STACK SOURCES (7)				
										HEIGHT ABOVE GROUND (FT)	HEIGHT ABOVE STRUCT. (FT)	EXIT DATA		
NUMBER	NAME	COMPONENT OR AIR CONTAMINANT NAME (2)		CONC. (%V) (3)	LB/HR (4)	TONS/YR (5)	ZONE	EAST (METERS)	NORTH (METERS)			DIA. (FT)	VELO. (FPS)	TEMP. (^{O}F)

Refer to Section 4 of the NOI application.

Location of emission points will be variable, stack data will be provided upon request.

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 4348 feet.
UTAH AIR CONSERVATION BOARD STANDARD CONDITIONS ARE 68^{O} F AND 14.7 PSIA.

General Instructions for this form.

1. Identify each emission; point with a unique number for this plant site on plot plan, previous permits and emission inventory questionnaire. Limit emission point number to 8 character spaces. For each emission point use as many lines as necessary to list air contaminant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are OK.
2. Typical component names are: air, H_2O, nitrogen, oxygen, CO_2, CO, NO_x, SO_x, hexane, particulate matter (PM_{10} and $PM_{2.5}$), etc. Abbreviations are OK.
3. Concentration data is required for all gaseous components. Show concentration in volume percent of total gas stream.
4. Pounds per hour. (#/hr) is maximum emission rate expected by applicant.
5. Tons per year (T/Y) is annual maximum emission rate expected by applicant, which takes into account process operating schedule.
6. As a minimum applicant must furnish a facility plot plan drawn to scale showing a plant benchmark, latitude and longitude correct to the nearest second for the benchmark, and all emission points dimensioned with respect to the benchmark. Please show emission point UTM coordinates if known.
7. Supply additional information as follows if appropriate:
   (a) Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.
   (b) Stack's height above supporting or adjacent structures if structure is within three "stack heights above ground" of stack.

Utah Division of Air Quality
New Source Review Section

Date April 2020
Company Kilgore Companies
Site Erda

Form 15
Aggregate Processing Operations

Equipment Information

1. Check the appropriate crushing operations used in your process:

Type of Unit Jaw, Cone, HSI, VSI
Manufacturer/Model _____
Design Capacity 400 tons/hr
Date Manufactured _____
☑ Primary Crushing type ☐ Cone ☑ Jaw ☐ Ball
☑ Secondary Crushing type ☑ Cone ☐ Jaw ☐ Ball
☑ Tertiary Crushing type ☐ Cone ☐ Jaw ☐ Ball
Screen Manufacturer _____
Model and Date Manufactured _____
Screen type and size (triple, double, or single deck)
Triple Deck

2. Dust sources will be controlled as follows:

	No Control	Pre Soaked	Water Spray	Bag house	Other (explain)
☑ Feed hopper	☐	☐	☑	☐	☐
☑ All belt transfer points	☐	☐	☑	☐	☐
☑ Inlet to all crushers	☐	☐	☑	☐	☐
☑ Exit of all crushers	☐	☐	☑	☐	☐
☑ All shaker screens	☐	☐	☑	☐	☐

3. Water Sprays

Total Water Rate to nozzles (gal/min):	Nozzle pressure (psi):	Quantity of nozzles at each spray bar location:
_____	_____	_____

4. Maximum Plant Production Rate and Operating Hours:

311850 tons/yr 400 tons/hr
4160 hrs/yr 16 hrs/day

297,000 tpy will be processed product, while 14,850 tpy will be unprocessed product.

5. Water sprays used on storage piles?
☑ Yes ☐ No

Storage pile size: Various

6a. Number of conveyor belt transfer and drop points:

15

6b. List manufactured dates for all conveyor belts

NOTE:
1. **Submit this form in conjunction with Form 1 and Form 2.**
2. To relocate an Aggregate Plant submit Form 15b.
3. Call the Division of Air Quality (DAQ) at **(801) 536-4000** if you have problems or questions in filling out this form. Ask to speak with a New Source Review engineer. We will be glad to help!
4. Equipment listed on this form may be subject to New Source Performance Standards. If so, additional information may be requested for the engineering review.

Instructions

1. Indicate the type, manufacturer/model, design capacity and manufactured date of the equipment. Mark the appropriate box for the kind of crushing at the facility and indicate the type (cone, ball, jaw) of crushing being done.
2. Mark the appropriate box for the control device for the emission points.
3. List the specifications of the water sprays. Check vendor literature or call sales agent.
4 Indicate the maximum amount of product that will be processed by the facility in tons per hour, the number of hours the facility will be run per day and number of days/year.
5. Are water sprinklers used on storage piles? Indicate the size of the storage piles.
6. Provide the number of belt drop points and list manufactured dates for all your conveyor belts.

Utah Division of Air Quality
New Source Review Section

Form 20
Organic Liquid Storage Tank

Company: Kilgore Companies
Site/Source: Erda Plant
Date: April 2020

Equipment

1. Tank manufacturer: TBD
2. Identification number: TBD
3. Installation date: TBD
4. Volume: 21327 gallons
5. Inside tank diameter: 11 feet
6. Tank height: 11 feet
7. True vapor pressure of liquid: _____ psia
8. Reid vapor pressure of liquid: _____ psi
9. Outside color of tank: White
10. Maximum storage temperature: 100 ^{O}F
11. Average throughput: 382340 gallons per year
12. Turnovers/yearly 18 Monthly 1.5 Weekly 0.35
13. Average liquid height (feet): _____
14. Access hatch: □ Yes □ No Number _____
15. Type of Seals:
    a. Primary seals:
    - □ Mechanical shoe
    - □ Resilient filled
    - □ Liquid filled
    - □ Vapor mounted
    - □ Liquid mounted
    - □ Flexible wiper

    b. Secondary seal:
    Type: _____
16. Deck Fittings:
    - Gauge float well □ Yes □ No Number_____
    - Gauge hatch/ sample well □ Yes □ No Number_____
    - Roof drains □ Yes □ No Number_____
    - Rim vents □ Yes □ No Number_____
    - Vacuum break □ Yes □ No Number_____
    - Roof leg □ Yes □ No Number_____
    - Ladder well □ Yes □ No Number_____
    - Column well □ Yes □ No Number_____
    - Other:_____
17. Shell Characteristics:
    Condition: Good
    Breather Vent Settings: _____
    Tank Construction: Horizontal
    Roof Type: Fixed
    Deck Construction: _____
    Deck Fitting Category: _____
18. Type of Construction:
    - □ Vertical Fixed Roof
    - ■ Horizontal Fixed Roof
    - □ Internal Floating Roof
    - □ External Floating Roof
    - □ Other (please specify)

    _____
19. Additional Controls:
    □ Gas Blanket □ Venting □ Carbon Adsorption □ Thermal Oxidation □ Other:_____

20. Single Liquid Information

Liquid Name: Diesel Fuel Oil No. 2 Distillate	Liquid Name: _____
CAS Number: _____	CAS Number: _____
Avg. Temperature: 40F - 100F	Avg. Temperature: _____
Vapor Pressure: 0.0031 psia - 0.022 psia	Vapor Pressure: _____
Liquid Molecular Weight: 188 lb/lb-mol	Liquid Molecular Weight: _____

Form 20 - Organic Liquid Storage Tank
(Continued)

21. **Chemical Components Information**	
Chemical Name: _____	Chemical Name: _____
Percent of Total Liquid Weight: _____	Percent of Total Liquid Weight: _____
Molecular Weight: _____	Molecular Weight: _____
Avg. Liquid Temperature: _____	Avg. Liquid Temperature: _____
Vapor Pressure: _____	Vapor Pressure: _____

Emissions Calculations (PTE)

22. Calculated emissions for this device:

VOC _____Lbs/hr_5.62E-03_ Tons/yr

HAPs_____Lbs/hr (speciate)_____Tons/yr (speciate)

Submit calculations as an appendix. Provide Material Safety Data Sheets for products being stored.

Instructions

Note: 1. **Submit this form in conjunction with Form 1 and Form 2.**

2. Call the Division of Air Quality (DAQ) at **(801) 536-4000** if you have problems or questions in filling out this form. Ask to speak with a New Source Review engineer. We will be glad to help!

1. Indicate the tank manufacturer's name.
2. Supply the equipment identification number that will appear on the tank.
3. Indicate the date of installation.
4. Indicate the capacity of the tank in gallons or barrels.
5. Specify the inside tank diameter in feet.
6. Specify the tank height in feet.
7. Indicate the true vapor pressure of the liquid (psia).
8. Indicate the Reid vapor pressure of the liquid (psi).
9. Indicate the outside color of the tank.
10. Supply the highest temperature the liquid will reach during storage (degrees Fahrenheit).
11. Indicate average annual throughput (gallons).
12. Specify how many times the tank will be emptied and refilled per year, month or week.
13. Specify the average liquid height (feet).
14. Indicate whether or not the tank has access hatches and the number.
15. Indicate what type of seals the tank has.
16. Indicate what types of deck fittings are installed.
17. Specify condition of the tank, also include the following:
    - Breather vent settings in (psig) for fixed roof tanks
    - Tank construction, welded or riveted
    - Roof type; pontoon, double deck, or self-supporting roof
    - Deck construction; bolted or welded, sheet or panel construction sizes and seam length
    - Deck fitting category; typical, controlled, or detail
18. Indicate the type of tank construction.
19. Indicate other types of additional controls which will be used.
20. Provide information on liquid being stored, add additional sheets as necessary.
21. Provide information on chemicals being stored, add additional sheets as necessary.
22. Supply calculations for all criteria pollutants and HAPs. Use AP-42 or manufacturers' data to complete your calculations.

APPENDIX B: EMISSION CALCULATIONS

Table A-1 Operating Parameters

Description	Value	Unit
Potential daily operating hours	16	(hr/day)
Desired annual operating days	260	(day/yr)
Maximum Hourly Throughput	400	(tph)
Potential Annual Throughput	297,000	(tpy)

Table A-2. Equipment Lists

Type of Equipment / Activities	Number of Units or Drop Points	Throughput Percent (%)	Maximum Hourly Limit (tph)	Potential Annual Throughput (tpy/unit)
Jaw Crusher	1	100%	400	297,000
Cone Crusher	2	70%	400	207,900
HSI Crusher	1	35%	400	103,950
VSI Crusher	1	35%	400	103,950
Primary Screening	1	100%	400	297,000
Secondary Screening	1	70%	400	207,900
Secondary Screening	1	70%	400	207,900
Tertiary Screening	1	35%	400	103,950
Tertiary Screening	1	35%	400	103,950
H.F. Screen	1	35%	400	103,950
Conveyors	15	100%	400	297,000
Loading Product Export	1	100%	400	297,000
Bank Run Export	1	5%	400	14,850

Table A-3. Equipment List

Type of Equipment / Activities	Quantity	Maximum Pile Area (Acres)
3" Minus Pile	1	1.75
1.5" Road Base Pile	1	1.25
1" Gravel Pile	1	1.2
Number 4 Pile	1	1
Disturbed Area	1	3.05
Total	**5**	**8.25**

Table A-4. Supporting Equipment

Type of Equipment	Quantity	Maximum Annual (hr/yr/unit)[1]
Front-End Loaders	3	4,160
Bulldozers	1	4,160

[1] Annual operating hours per phone call with Lee Ware, Environmental Manager for Kilgore on December 2, 2019.

Table A-5. Supporting Equipment

Type of Equipment[1,2]	Quantity	Engine Rating (kW)	Maximum Hourly Limit (hr/yr/unit)
Primary Generator Engine	2	900	4,160

[1] Both generator engines are EPA Tier IV Interim.

Table A-6. Additional Parameters

Parameter	Quantity	Unit
Maximum One-way Road Length	0.56	miles
One-Way Paved Road Length	0.41	miles
One-Way Unpaved Road Length	0.15	miles
Empty Vehicle Weight (Overweight)	42.0	tons
GVW (Overweight)	64.5	tons
Empty Vehicle Weight (Standard)	11.5	tons
GVW (Standard)	40	tons

Table A-7. Tanks Emissions

Type of Equipment	Capacity	Unit
Diesel Storage	21,327	gallons

Table B-1. Facility-Wide Emissions

	Emissions (tpy)							
	PM_{10}	PM_{10} (Fugitive)	$PM_{2.5}$	NO_X	CO	SO_2	VOC	CO_2e
Proposed Site-Wide Emissions	5.62	4.96	2.05	31.4	10.2	0.06	1.22	2090
Major Source Thresholds[1,2]	70	NA	70	70	100	70	70	N/A
Threshold Exceeded?	No	NA	No	No	No	No	No	No
Modeling Limits[3]	15.00	5.00	No Limit	40	100	40	N/A	No Limit
Threshold Exceeded?	No	No	No	No	No	No	No	No

1. The Erda Site is located in Tooele County, which is in serious nonattainment for $PM_{2.5}$. Values are per UAC R307-403-5(2)(b)(ii).

2. HAPs emissions were considered in the Erda Site's facility-wide emissions; however, these emissions are not applicable.

3. Per Emissions Impact Assessment Guidelines published by UDAQ.

Table C-1. Annual Potential Emissions Summary

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	SO_2 (tpy)	VOC (tpy)	CO_2e (tpy)
Crushing and Screening	0.61	0.06	-	-	-	-	-
Stock Piles and Disturbed Grounds	1.69	0.81	-	-	-	-	-
Bulldozer & Loader	0.51	0.29	-	-	-	-	-
Roads	2.13	0.21	-	-	-	-	-
Engine Emissions	0.66	0.66	31.44	10.18	6.09E-02	1.22	2,090
Bank Run Export	0.01	0.00	-	-	-	-	-
Tanks	-	-	-	-	-	5.62E-03	-
Total Potential (tpy)	**5.62**	**2.05**	**31.44**	**10.18**	**6.09E-02**	**1.22**	**2,090**

Table C-2. Emission Factors for Crushing, Screening, and Material Handling

Source		Emission Factor (lb/ton)	
		PM_{10} [1]	$PM_{2.5}$ [1,2]
Primary Crushing	Controlled	1.40E-04	2.12E-05
Secondary Crushing	Controlled	2.70E-04	4.09E-05
Tertiary Crushing	Controlled	5.40E-04	1.00E-04
Screening	Controlled	7.40E-04	5.00E-05
Conveyor Transfer	Controlled	4.60E-05	6.97E-06

1. Emission factors per EPA Potential to Emit Calculator for Stone Quarrying, Crushing, and Screening Plants last updated November 2013
2. Where $PM_{2.5}$ emission factors (EF) are not provided, a ratio of aerodynamic particle size multipliers from AP-42 Ch. 13.2.4 was used to estimate $PM_{2.5}$ emission factors. $PM_{2.5}$ EF = (PM_{10} EF/0.35)*0.053.

Particle size multiplier (dimensionle:	PM	PM_{10}	$PM_{2.5}$
where:	0.74	0.35	0.053

Table C-3. Annual Aggregate Processed

Equipment / Activity	Source Description	Number of Units or Drop Points	Throughput Percent (%)	Potential Annual Throughput (tpy)	Controls [1]	Emission Factor (lb/ton)		Daily PTE Emissions (lb/day)		Annual PTE Emissions (tpy)[1]	
						PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Primary Crushing	Jaw Crusher	1	100%	297,000	Wet Suppression	1.40E-04	2.12E-05	1.60E-01	2.42E-02	0.021	0.003
Secondary Crushing	Cone Crusher	2	70%	207,900	Wet Suppression	2.70E-04	4.09E-05	4.32E-01	6.54E-02	0.056	0.009
Tertiary Crushing	HSI Crusher	1	35%	103,950	Wet Suppression	5.40E-04	1.00E-04	2.16E-01	4.00E-02	0.028	0.005
Tertiary Crushing	VSI Crusher	1	35%	103,950	Wet Suppression	5.40E-04	1.00E-04	2.16E-01	4.00E-02	0.028	0.005
Screening	Primary Screening	1	100%	297,000	Wet Suppression	7.40E-04	5.00E-05	8.45E-01	5.71E-02	0.110	0.007
	Secondary Screening	1	70%	207,900	Wet Suppression	7.40E-04	5.00E-05	5.92E-01	4.00E-02	0.077	0.005
	Secondary Screening	1	70%	207,900	Wet Suppression	7.40E-04	5.00E-05	5.92E-01	4.00E-02	0.077	0.005
	Tertiary Screening	1	35%	103,950	Wet Suppression	7.40E-04	5.00E-05	2.96E-01	2.00E-02	0.038	0.003
	Tertiary Screening	1	35%	103,950	Wet Suppression	7.40E-04	5.00E-05	2.96E-01	2.00E-02	0.038	0.003
	H.F. Screen	1	35%	103,950	Wet Suppression	7.40E-04	5.00E-05	2.96E-01	2.00E-02	0.038	0.003
Conveyor Transfer	Conveyors	15	100%	297,000	Moisture Carryover	4.60E-05	6.97E-06	7.88E-01	1.19E-01	0.102	0.016
					Total Annual Emissions:			**4.73**	**0.49**	**0.61**	**0.06**

[1] Water application will be used to control PM emissions on all transfer points, including crushers and screens. This, per phone communication with Lee Ware, Environmental Manager for Kilgore, on December 2, 2019.

Table C-4. Bank Run Loading Emissions (Unprocessed Aggregate)

Emission Activity	Potential Annual Throughput (tpy)	Uncontrolled Emission Factor[1] (lb/ton)		Control Efficiency[2]	Daily Emissions (lb/day)		Annual Emissions (tpy)	
		PM_{10}	$PM_{2.5}$	(%)	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bank Run Export	14,850	9.56E-04	1.45E-04	0%	0.05	0.01	0.01	1.08E-03
Total Bank Run Loading Emissions					**0.05**	**8.27E-03**	**7.10E-03**	**1.08E-03**

1. Uncontrolled emission factors using the "drop equation" contained in U.S. EPA AP-42, Section 13.2.4 (Aggregate Handling and Storage Piles), November 2006:

$$E = k(0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

where:

E = Emission factor

	PM	PM_{10}	$PM_{2.5}$	
k =	0.74	0.35	0.053	Particle size multiplier (dimensionless)
U =	7.97			Mean wind speed (mph). The mean wind speed is determined from historical data retrieved
M =	3.45			Material moisture content (%). Equation (1) from AP-42 13.2.4 has a moisture content range of 0.25-4.8%.

2. From UDAQ Guidelines on Emission Factors for Paved and Unpaved Haul Roads, January 12, 2015.

Table C-5. Stockpiles - Potential Emissions

Stockpiles	Maximum Pile Area (Acres)	Quantity	Control	Uncontrolled Active Emission Factor (lb/day/acre)[1,2,3]		Uncontrolled Inactive Emission Factor (lb/day/acre)[5,6]		Controlled Active Emission Factor (lb/day/acre)		Controlled Inactive Emission Factor (lb/day/acre)		Annual Active Emissions (tpy)		Annual Inactive Emissions (tpy)	
				PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
3" Minus Pile	1.75	1.00		6.3	1.85	1.7	0.50	2.14	1.11	0.58	0.30	0.49	0.25	1.48E-02	0.00
1.5" Road Base Pile	1.25	1.00	Water	6.3	1.85	1.7	0.50	2.14	1.11	0.58	0.30	0.35	0.18	1.06E-02	0.00
1" Gravel Pile	1.20	1.00	Applicatio	6.3	1.85	1.7	0.50	2.14	1.11	0.58	0.30	0.33	0.17	1.01E-02	0.00
Number 4 Pile	1.00	1.00	n	6.3	1.85	1.7	0.50	2.14	1.11	0.58	0.30	0.28	0.14	8.45E-03	0.00
Disturbed Area	3.05	1.00		0.19	0.03	NA	NA	0.06	0.02	NA	NA	0.20	0.05	NA	NA
Total	**8.25**	**5.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.65**	**0.80**	**0.04**	**0.01**

[1] PM_{10} emission factors taken from AP-42, Fourth Edition Table 8.19.1-1.

[2] $PM_{2.5}$ emission factor was calculated using data from AP-42 Appendix B.2 Table B.2-2.

[3] Per U.S. EPA AP-42, Section 11.9 (Western Surface Coal Mining), Table 11.9-4; August 1998.

Where:

TSP emission factor[3]:	0.38	ton/acre-yr
PM_{10} content[4]:	50%	
$PM_{2.5}$ content[4]:	7.50%	

[4] Per U.S. EPA AP-42, Section 13.2.5.3 (Industrial Wind Erosion).

[5] PM_{10} uncontrolled, inactive emission factor taken from AP-42 Fourth Edition, Table 8.19-1.

[6] $PM_{2.5}$ uncontrolled, inactive emission factor is based on the ratio of the uncontrolled, active PM_{10} and $PM_{2.5}$ emission factors.

Control Efficiency[5]	
PM_{10} Control Efficiency	66%
$PM_{2.5}$ Control Efficiency	40%

[5] PM_{10} and $PM_{2.5}$ control efficencies are weighted according to UDAQ's guidelines from data received from AP-42 Appendix B.2, Table B.2-3.

Table C-6. Dozing and Loading Emissions

Source	Annual Emissions (tpy)[2]	
	PM_{10}	$PM_{2.5}$
Bulldozing Operations	0.43	0.28
Loading Operations	0.09	1.29E-02
Total Loading and Dozing Emissions	**0.51**	**0.29**

Table C-7. Dozing Emissions

Vehicle Type	Maximum Annual Operating Hours (hr/yr)	Quantity	Emission Factor[1] (lb/hr)		Control Efficiency[2]	Daily Emissions (lb/day)		Annual Emissions (tpy)	
			PM_{10}	$PM_{2.5}$	(%)	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bulldozers	4160	1	0.69	0.45	70%	3.30	2.15	0.43	0.28
					Total Dozing Emissions:	**3.30**	**2.15**	**0.43**	**0.28**

1. Emissions for the bulldozer were characterized using AP-42, Section 11.9 (October 1998), Table 11.9-1 and Table 11.9-3

$$TSP = \frac{5.7(s)^{1.2}}{(M)^{1.3}}$$

$$PM_{15} = \frac{1.0(s)^{1.5}}{(M)^{1.4}}$$

where:

s = 3.0 material silt content (%) for Plant Road in Sand and Gravel Processing Industries, AP-42, Table 13.2.2.

M = 3.5 material moisture content (%), from AP-42 Table 11.9-3; Bulldozers, Overburden.

	PM_{10}	$PM_{2.5}$
Bulldozer	0.75	0.105

Per AP-42, Section 11.9 (October 1998), Table 11.9-1

2. From UDAQ Guidelines on Emission Factors for Paved and Unpaved Haul Roads, January 12, 2015.

Table C-8. Loader Emissions (Supporting Operations)

Emission Activity	Location	Potential Annual Throughput (tpy)	Uncontrolled Emission Factor[1] (lb/ton)		Control Efficiency[2]	Daily Emissions (lb/day)		Annual Emissions (tpy)	
			PM_{10}	$PM_{2.5}$	(%)	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Loading Into Primary Crusher	Jaw Crusher	297,000	9.56E-04	1.45E-04	70%	0.33	4.96E-02	4.26E-02	6.45E-03
Loading Processed Aggregate to Product Trucks	Loading Product Export	297,000	9.56E-04	1.45E-04	70%	0.33	4.96E-02	4.26E-02	6.45E-03
					Total Loading Emissions	**0.66**	**9.93E-02**	**0.09**	**1.29E-02**

1. Uncontrolled emission factors using the "drop equation" contained in U.S. EPA AP-42, Section 13.2.4 (Aggregate Handling and Storage Piles), November 2006:

$$E = k(0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

E = Emission factor

where:

	PM	PM_{10}	$PM_{2.5}$	
k =	0.74	0.35	0.053	Particle size multiplier (dimensionless)
U =	7.97			Mean wind speed (mph). The mean wind speed is determined from historical data retrieved for Salt Lake City airport for 2008-2012 .
M =	3.5			Material moisture content (%). Equation (1) from AP-42 13.2.4 has a moisture content range of 0.25-4.8%.

2. From UDAQ Guidelines on Emission Factors for Paved and Unpaved Haul Roads, January 12, 2015.

Table C-9. Roads Emissions - Traveling Parameters (Supporting Operations)

Road Source (tpy)	Product Throughput (tpy)	Mean Trailer Weight, Overweight (tons)[1,2]		Mean Trailer Weight, Standard (tons)		Tons/Haul (Overweight)	Tons/Haul (Standard)	Haul/ Day	Two-way Travel Distance per Haul (miles)			Total Vehicle Miles Traveled			
												Daily (VMT/day)		Annual (VMT/yr)	
		Empty Vehicle Weight (Overweight)	GVW (Overweight)	Empty Vehicle Weight (Standard)	GVW (Standard)				Unpaved	Paved	Total	Unpaved	Paved	Unpaved	Paved
Potential Annual Throughput	297,000	42	64.5	11.5	40	22.5	28.5	48	0.30	0.83	1.12	14	40	3,682	10,296
Bank Run Export	14,850	42	64.5	11.5	40	22.5	28.5	3	0.73	0.83	1.12	2	2	569	644
Loader	311,850	NA	NA	33.5	43.5	NA	10.0	120	0.01	0.00	0.01	1	0	295	0

[1] Truck weights according to communication with Lee Ware, environmental manager, on December 2, 2019, where the average truck weighs 84,000 lbs empty, and 129,000 lbs loaded.

[2] Maximum Gross Vehicle Weight (GVW) limitation per R909-2-5 Table 2.

[3] Clarification from Lee Ware on March that both overweight and standard weight trucks operate at the Erda Site,

Annual Days Vehicles Operate: 260

Percent Overweight Trucks: 70%

Percent Standard Weight Trucks: 30%

Table C-10. Roads Emissions - Emission Factors

Road Surface	Controls [1]	Control Efficiency (%)	Controlled Emission Factor [2] (lb/VMT)	
			PM_{10}	$PM_{2.5}$
Unpaved	None	0	2.40	0.24
Unpaved	Watering	70%	0.72	0.07
Unpaved	Chemical Suppressant and Watering	85%	0.36	0.04
Paved	Pave Road Surface with Sweeping and Watering	90%	0.24	0.02

[1] Emission controls for vehicular traffic on paved and unpaved roads per UDAQ guidelines: Emission Factors for Paved and Unpaved Haul Roads, January 2015.

[2] Emission factors for vehicular traffic on unpaved roads for sand and gravel processing per U.S. EPA AP-42, Section 13.2.2 (Unpaved Roads), November 2006.

Unpaved Roads

$$E = k\,(s/12)^a (W/3)^b$$

where

E = Size-specific emission factor (lb/VMT)

k, a, b = Constants for equation 1a

	PM	PM_{10}	$PM_{2.5}$
k =	4.9	1.5	0.15
a =	0.7	0.9	0.9
b =	0.45	0.45	0.45

s = surface material silt content (%)

4.8 Per AP-42 13.2.2, Table 13.2.2-1, for plant road of sand and gravel processing industry.

W = 53.3 Mean vehicle weight (tons)

Table C-11. Roads Emissions - PTE Emissions

Road Source	Controlled Emissions			
	Daily Emissions (lb/day)[1]		Annual Emissions (tpy)[1]	
	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Unpaved, Chemicals, Watered	5.88	0.59	0.82	0.08
Paved, Swept, Watered	10.10	1.01	1.31	0.13
Total	**15.98**	**1.60**	**2.13**	**0.21**

[1] Daily and annual controlled emissions are calculated by applying the controlled emission factor (per UDAQ's control efficiencies) to the vehicular miles traveled per day (paved and unpaved).

$$Daily\ Emissions\ \left(\frac{lb}{day}\right) = Miles\ Travelled\ per\ Day\ \left(\frac{VMT}{day}\right) \times Uncontrolled\ Emission\ Factor\ \left(\frac{lb}{VMT}\right) * (1-\eta)$$

$$Annual\ Emissions\ (tpy) = Miles\ Travelled\ per\ Year\ \left(\frac{VMT}{yr}\right) \times Uncontrolled\ Emission\ Factor\ \left(\frac{lb}{VMT}\right) * (1-\eta)$$

Table C-12. Diesel Generator Engine Parameters

	Quantity	Generator Engine Size		
		(kW)	(hp)	(MMBtu/Hr)
Generator Engines with max. HP > 600				
Primary Generator Engine	2	900	1,207	3.07
Total for All Units >600 HP	2	1,800	2,414	6.14

1. There will be one (1) backup generator on site that will be used in the event that the primary generator is not operable. Only one (1) generator will be operating at any given time.

Appendix Table C-13. Diesel Generator Engine Criteria Pollutants and GHG Emissions

Pollutant	Large Unit Emission Factor[1,2,3,4]	Units	Hourly Emissions[5] (lb/hr)	Annual Emissions[6] (tpy)
NO_X	2.84	g/(hp-hr)	15.11	31.44
CO	0.92	g/(hp-hr)	4.90	10.18
PM	0.06	g/(hp-hr)	0.32	0.66
PM_{10}	0.06	g/(hp-hr)	0.32	0.66
$PM_{2.5}$	0.06	g/(hp-hr)	0.32	0.66
SO_2	1.21E-05	lb/(hp-hr)	0.03	0.06
VOC	0.11	g/(hp-hr)	0.59	1.22
CO_2	73.96	kg/MMBtu	1002	2083
CH_4	3.00E-03	kg/MMBtu	0.04	0.08
N_2O	6.00E-04	kg/MMBtu	8.12E-03	0.02
CO_2e	74.21	kg/MMBtu	1005	2090

1. Criteria pollutant emission factors are per manufacturer's guarantee at 100% load.
2. GHG emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C. CO_2e is the sum of GHG constituents multiplied by their respective global warming potential (i.e. 1 for CO_2, 25 for CH_4, and 298 for N_2O), per Table A-1, 40 CFR 98, Subpart A.
3. Large Units are above 600 hp. PM emissions represent filterable and condensable fractions, additionally it has been assumed that $PM=PM_{10}=PM_{2.5}$.
4. It is assumed that the TOCs are VOCs as a conservative estimate.
5. Hourly emissions account for both generator engines operating simultaneously.
6. Annual emissions account for both generator engines operating simultaneously.

Appendix Table C-14. Diesel Generator Engine HAP Emissions

Pollutant	Large Unit Emission Factor[1]	Units	Hourly Emissions (lb/hr)	Annual Emissions (tpy)	UDAQ ETV[2] (lb/hr)	Modeling Required?
Benzene	7.76E-04	lb/MMBtu	4.77E-03	9.91E-03	0.3163	No
Toluene	2.81E-04	lb/MMBtu	1.73E-03	3.59E-03	14.922	No
Xylene	1.93E-04	lb/MMBtu	1.19E-03	2.47E-03	85.970	No
Formaldehyde	7.89E-05	lb/MMBtu	4.85E-04	1.01E-03	0.0567	No
Acetaldehyde	2.52E-05	lb/MMBtu	1.55E-04	3.22E-04	6.9363	No
Acrolein	7.88E-06	lb/MMBtu	4.84E-05	1.01E-04	0.0353	No
Naphthalene	1.30E-04	lb/MMBtu	7.98E-04	1.66E-03	10.381	No
Polycyclic Aromatic Hydrocarbons (PAH)	2.12E-04	lb/MMBtu	1.30E-03	2.71E-03	--	No
Max HAP	***7.76E-04***	***lb/MMBtu***	***4.77E-03***	***9.91E-03***	--	--
Total HAPs	***1.70E-03***	***lb/MMBtu***	***1.05E-02***	***2.18E-02***	--	--

1. Emission factors Per AP-42 Section 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines Tables 3.4-3 and 3.4-4.
Additional polycyclic aromatic hydrocarbon (PAH) may be emitted but for regulatory purposes, this list is only inclusive of HAPs regulated under the Clean Air Act.
2. The Emission Threshold Value (ETV) assumes a <50m distance to the fenceline and vertically unrestricted release.

Table C-15. Storage Tanks

Tank	Configuration[1]	Quantity	Capacity (gal)	Material	Annual Throughput (gal/yr)	Total VOC Emissions[2] (tpy)
Diesel Storage	HFR	1	21,327	Diesel	382,340	0.01

1. HFR = Horizontal Fixed Roof
2. Tank emissions calculated per AP-42 7.1 *Organic Liquid Storage Tanks*

MODELING REPORT
Kilgore Companies > Erda Facility

Modeling Report for NO_2 at Erda Facility

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TABLE OF CONTENTS

1. INTRODUCTION

1.1 GENERAL INFORMATION

Kilgore Companies (Kilgore) is a full-scale construction company that offers paving and construction services, as well as ready-mix concrete and aggregates. Kilgore is proposing to increase its crushing and screening aggregate operations at a location near Erda, Utah in Tooele County (Erda Pit). Kilgore submitted a Notice of Intent (NOI) air quality permit application to the Utah Division of Air Quality (UDAQ) on April 24, 2020 to obtain an approval order (AO) for the Erda Pit.

Tooele County is currently classified as a non-attainment area of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$) and 2015 8-hour ozone; it is in attainment for all other criteria pollutants. Oxides of nitrogen (NOx), sulfur dioxide (SO_2), volatile organic compounds (VOCs), and ammonia are considered precursors to $PM_{2.5}$ in Utah.

The increase in NO_X emissions reported in the April 24, 2020 NOI air quality permit application is 31.4 tons per year (tpy). Although this value does not exceed the emission threshold value provided by UDAQ, a modeling analysis will be conducted to demonstrate compliance, as requested by UDAQ.

This modeling protocol and report outlines the methodology that Kilgore proposes to use in conducting air dispersion modeling. It will also describe the results to demonstrate compliance with NAAQS for NO_2. Dispersion modeling has been conducted in accordance with R307-410-3 and 40 Code of Federal Regulations (CFR) Part 51, Appendix W *Guideline on Air Quality Models*.

1.2. FACILITY LOCATION

The location of the Erda Pit is at 5800 North Highway 36, Erda, Tooele County, Utah. Universal Transverse Mercator (UTM) Datum 1984 World Geodetic System (WGS84) coordinates for the Erda Pit are as follows:

- Erda Pit: 391,220 m East, 4,499,174 m North, Zone 12T

Figure 1-1 provides a site map displaying the Erda Pit's property boundary in relation to the surrounding area.

Figure 1-2 provides a site map that displays the Erda Pit's property boundary and the locations of its stockpiles and crushing and screening operations.

Figure 1-1. Site Location in Reference to the Surrounding Area

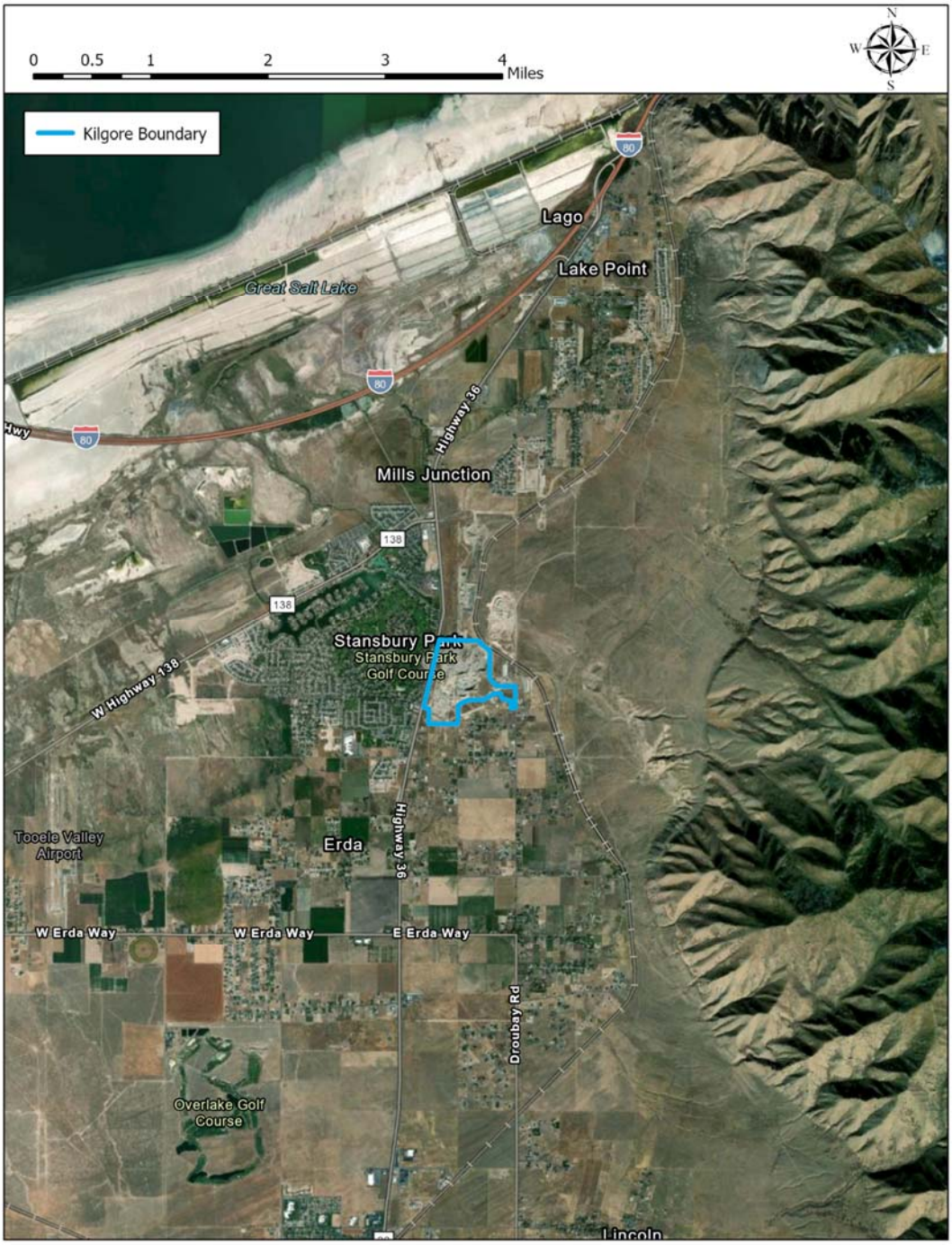

Figure 1-2. Close-up of Site Boundary and Operations

2. AIR DISPERSION MODELING PROTOCOL

This section describes the air quality dispersion modeling analysis that will be performed to estimate ambient air impacts due to Kilgore's Erda Pit. NO_2 modeling results will be compared to the NAAQS for the 1-hour and annual averaging periods. The objective of the modeling analysis is to demonstrate through air quality dispersion modeling that emissions from the Erda Pit do not cause or contribute to an exceedance of the NAAQS in ambient air. A significant impact analysis was conducted and assessed against the NAAQS with background concentrations.

2.1. MODEL SELECTION

This modeling analysis was performed using the latest version of the AERMOD modeling system (version 19191) which is an EPA-approved, steady-state Eulerian, Gaussian mathematical plume model. AERMOD is composed of three (3) modular components: AERMAP, the terrain preprocessor that characterizes the terrain and generates source and receptor elevations; AERMET, the meteorological preprocessor that processes raw surface and upper air meteorological observations for use by AERMOD; and AERMOD, the control module and modeling processor.

2.2. METEOROLOGICAL DATA

Meteorological data used in the dispersion modeling analysis was processed and provided by UDAQ. Data consisted of five years (2008 through 2012) of National Weather Service (NWS) surface data collected at the Salt Lake City Airport. Concurrent upper air observations used in AERMET were obtained from the Salt Lake City Airport in Utah.

2.3. TERRAIN ELEVATIONS

Terrain elevations for the Erda Pit's sources, receptors and buildings were determined using National Elevation Dataset (NED), the primary elevation data product of the United States Geologic Survey (USGS).[1] NED data are distributed in geographic coordinates in units of decimal degrees, and in conformance with the North American Datum of 1983 (NAD83). All elevation values are in meters and, over the conterminous United States, are referenced to the North American Vertical Datum of 1988 (NAVD 88).[2] The NED used for this analysis was at a resolution of 1/3 arc-second (about 10 meter) grid spacing. Elevations were converted from the NED grid spacing to the air dispersion model receptor spacing using the AERMOD preprocessor, AERMAP version 18081. All data obtained from the NED files were checked for completeness and spot-checked for accuracy.

2.4. RECEPTOR GRIDS

A modeling domain was developed for modeling analysis to encompass the location of the maximum modeled concentration from Kilgore's sources. Discrete receptors locations in AERMOD were based on UTM coordinates in the NAD 83 datum, Zone 12T.

The receptor grid was developed to ensure that maximum pollutant concentrations were captured by the model. The grid consisted of 8,366 receptors with the following spacing:

[1] NED data obtained at https://www.mrlc.gov/viewerjs/, downloaded February 21, 2018.
[2] Gesch, D., Evans, G., Mauck, J., Hutchinson, J., Carswell Jr., W.J., 2009, The National Map—Elevation: U.S. Geological Survey Fact Sheet 2009-3053, 4 p., http://pubs.usgs.gov/fs/2009/3053/.

- 25 meters spacing around the fence line;
- 100 meters spacing for receptors extending from fence line to 3 kilometers;
- 250-meters spacing for receptors extending from 3 to 5 kilometers;
- 500-meter spacing for receptors extending from 5 to 7 kilometers; and
- 1,000-meter spacing for receptors extending from 7 to 20 kilometers.

2.5. UTM COORDINATE SYSTEM

In all modeling analysis input and output data files, the locations of emission sources, structures, and receptors were represented in the UTM coordinate system and based NAD83. The general area of the proposed site is located in UTM Zone 12.

2.6. BUILDING DOWNWASH

There are no nearby structures that would impact the downwash of the proposed sources. Hence, a downwash evaluation was not considered.

Physical parameters for point sources that were modeled were determined per manufacturer specification sheets.

Proposed point sources at the Erda Pit consist of two (2) Prime-power, 900 kW, Diesel-fired Generator Engines. NO_2 emissions are generated from the point sources described above; they were therefore be included in the air dispersion modeling analysis. Source parameters such as UTM coordinates, stack base elevations and source release heights for modeled point sources are provided below in Table 3-1. A summary of modeled parameters included in this modeling analysis has been included in Appendix A.

Table 3-1. Point Source Modeled Parameters

Source ID	Source Description	UTM X (m)	UTM Y (m)	Elevation (m)	Release Height (m)	Stack Temp. (K)	Stack Velocity (m/s)	Stack Diameter (m)
Eng1	CAT900	391,278	4,499,146	1,327	4.6	773	126.9	0.2
Eng2	CAT900	391,312	4,499,115	1,328	4.6	773	126.9	0.2

NO_x emissions were estimated from the engines based on manufacturer's guarantee at 100% load. Emissions were calculated as follows:

$$NO_x\ Short\ Term\ Emission\ Rate\ \left(\frac{g}{s}\right) = Engine\ Size\ (hp) \times Emission\ Factor\ \left(\frac{g}{hp\ hr}\right) \times \frac{1\ hr}{60\ min} \times \frac{1\ \text{min}}{60\ \text{sec}}$$

$$NO_x\ Long\ Term\ Emission\ Rate\ \left(\frac{g}{s}\right) = Engine\ Size\ (hp) \times Emission\ Factor\ \left(\frac{g}{hp\ hr}\right) \times Annual\ Limit\ \frac{hr}{year} \times \frac{1\ year}{8{,}760\ hrs} \times \frac{1\ hr}{60\ min} \times \frac{1\ \text{min}}{60\ \text{sec}}$$

The modeled NO_x emission rates are contained in Table 3-2.

Table 3-2. Modeled Emission Rates

Source ID	Source Description	Hourly Emissions (g/s)	Annual Emissions (g/s)
Eng1	CAT900	0.95	0.45
Eng2	CAT900	0.95	0.45

This modeling analysis predicts ambient concentrations of NO_2 due to emissions generated from the Erda Pit. The NO_2 modeling analysis has also included a significant impact analysis and has incorporated emissions from surrounding sources. The modeling outputs for both modeling analysis included tabulated modeling results comparing NO_2 emissions to the NAAQS.

4.1.1. Background Concentrations

Monthly NO_2 and Ozone background concentrations were generated using monitoring data collected in Erda, Utah (EPA AIRS code: 49-045-0004). The monthly background concentrations were derived using the averaged maximum 1-hour concentration observed in each month from 2017 through 2019, consistent with the NO_2 design value. Ozone background values were calculated similarly as a conservative estimate. Background concentrations for NO_2 and Ozone are contained in Table 4-1 and Table 4-2, as seen below.

Table 4-1. NO_2 Background Concentration

Pollutant	Month	Max 1-hr by Month ($\mu g/m^3$)
NO_2	January	47.38
	February	32.84
	March	28.33
	April	21.56
	May	19.49
	June	22.12
	July	21.81
	August	32.02
	September	33.15
	October	40.04
	November	42.30
	December	71.63

Table 4-2. Ozone Background Concentration

Pollutant	Month	Max 1-hr by Month (ppm)
Ozone (O_3)	January	0.046
	February	0.052
	March	0.057
	April	0.069
	May	0.071
	June	0.083
	July	0.090
	August	0.083
	September	0.082
	October	0.057
	November	0.048
	December	0.045

4.1.2. Off-site Inventory

In conjunction with the delivery of the background concentration values, UDAQ also provided data on NO_2 point source emissions within 50 kilometers (km) from the Erda Plant. The guidance given was to include all sources with an emission rate over distance (Q/D) value greater than ten (10), except those resulting from the Kennecott Copper Mine. This led to the inclusion of a single NO_2 point source, that of US Magnesium, LLC's Rowley Plant. Please refer to Table 4-3, below, for the data from the Rowley Plant that was incorporated into the Erda Plant's NO_2 model.

Table 4-3. US Magnesium, LLC's Rowley Plant NO_2 Data.

Site Name	Latitude	Longitude	UTM East (m)	UTM North (m)	Distance (km)	2017 Emissions (tpy)	Q/d
US Magnesium LLC: Rowley Plant	40.912519	-112.731994	354,141	4,530,490	48.69	1,115.40	22.90

4.1.3. NO_2 Air Dispersion Modeling Results

4.1.3.1. NO_2 Modeling Considerations

Kilgore used a Tier 3 approach for NO_2 modeling, specifically using the plume volume molecular ratio method (PVMRM). EPA recommends various default options to be used for the In-Stack NO_2/NO_X Ratio and Equilibrium NO_2/NO_X Ratio. As a conservative approach, Kilgore used the default in-stack NO_2/NO_X ratio and equilibrium NO_2/NO_X ratios presented below.

- In-Stack NO_2/NO_X Ratio = 0.1
- Equilibrium NO_2/NO_X Ratio = 0.9

These default values were used as a conservative approach, because manufacturer NO_2/NO_X ratios are not available at this time.

The resulting concentration of NO_2 from this air dispersion modeling analysis was compared against the NAAQS for NO_2 to demonstrate that emissions from the Erda Pit do not cause or contribute to an exceedance of the NAAQS. The primary NAAQS is the maximum concentration ceilings, measured in terms of total concentration of a pollutant in the atmosphere, which define the "level of air quality which the U.S. EPA judges are necessary, with an adequate margin of safety, to protect the public health."[3] The form of the 1-hour NO_2 NAAQS requires the 8th highest high concentration over the five modeled years be compared to the standard. The annual NO_2 NAAQS requires the 1st highest high concentration over the five modeled years be compared to the standard. These resulting concentrations includes the Erda Pit's emissions sources combined with the background concentration described in Section 4.1.3.2

Receptors within the fence line boundary were removed from the model analysis.

4.1.3.2. NO_2 NAAQS Analysis Results

A NAAQS analysis considering the impact from the Erda Pit and the impact from the Rowley Plant, as well as the background concentrations was compared to the 1-hour NO_2 NAAQS of 188 micrograms per cubic meter ($\mu g/m^3$) and the annual NO_2 NAAQS of 100 $\mu g/m^3$.

Table 4-3 contains the modeled impacts from the cumulative analysis and background concentrations and compares these values to the 1-hour and annual NAAQS. The results presented in Table 4-3 demonstrate that the cumulative impact modeling result is below the 1-hour and annual NAAQS for NO_2. AERMOD output summaries are contained in Appendix B.

Table 4-3. NAAQS Compliance Demonstration

Pollutant	Averaging Period	Model-Predicted Concentration[1]	NAAQS
		($\mu g/m^3$)	($\mu g/m^3$)
NO_2	1-hour	186.36	188
NO_2	Annual	67.13	100

[3] 40 CFR 50.2(b).

APPENDIX A: ERDA PIT MODELING PARAMETERS

Table A-1. Erda Pit NO_2 Modeling Parameter Sources.

Source ID	Source Description	UTM X (m)	UTM Y (m)	Elevation (m)	Release Height (m)	Stack Temp. (K)	Stack Velocity (m/s)	Stack Diameter (m)
Eng1	CAT900	391,278	4,499,146	1,327	4.6	773	126.9	0.2
Eng2	CAT900	391,312	4,499,115	1,328	4.6	773	126.9	0.2
10716	US Magnesium LLC - Rowley Plant	354,141	4,530,490	1,289	3.1	400	4.7	0.3

APPENDIX B: AERMOD OUTPUT FILES

NO_2 1-HOUR OUTPUT FILE

```
          8TH HIGHEST VALUE IS      53.12319 AT (  391407.40,  4499398.60,
1358.74,  2851.52,    0.00)  DC
          9TH HIGHEST VALUE IS      49.82114 AT (  391582.30,  4499395.10,
1370.72,  2851.52,    0.00)  DC
         10TH HIGHEST VALUE IS      49.80997 AT (  391585.20,  4499395.00,
1370.97,  2851.52,    0.00)  DC

KILGORE   1ST HIGHEST VALUE IS      91.31589 AT (  391282.40,  4499401.20,
1326.99,  2851.52,    0.00)  DC
          2ND HIGHEST VALUE IS      89.15515 AT (  391257.40,  4499401.70,
1325.62,  2851.52,    0.00)  DC
          3RD HIGHEST VALUE IS      88.94198 AT (  391507.30,  4499396.60,
1365.94,  2851.52,    0.00)  DC
          4TH HIGHEST VALUE IS      88.14075 AT (  391532.30,  4499396.10,
1367.68,  2851.52,    0.00)  DC
          5TH HIGHEST VALUE IS      87.34532 AT (  391482.30,  4499397.10,
1364.35,  2851.52,    0.00)  DC
          6TH HIGHEST VALUE IS      86.51047 AT (  391232.40,  4499402.20,
1325.13,  2851.52,    0.00)  DC
          7TH HIGHEST VALUE IS      86.39140 AT (  391457.30,  4499397.60,
1363.11,  2851.52,    0.00)  DC
          8TH HIGHEST VALUE IS      85.75480 AT (  391307.40,  4499400.60,
1327.06,  2851.52,    0.00)  DC
          9TH HIGHEST VALUE IS      85.05087 AT (  391207.40,  4499402.70,
1325.08,  2851.52,    0.00)  DC
         10TH HIGHEST VALUE IS      84.81506 AT (  391480.40,  4499461.90,
1364.38,  2851.52,    0.00)  DC
 *** AERMOD - VERSION  19191 ***   ***  Kilgore - Erda - NO2 - 1hr
                          ***        01/28/21
 *** AERMET - VERSION  16216 ***   ***
                          ***       11:47:11

                                PAGE  1193
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  PVMRM  RURAL
ADJ_U*

                      *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST MAX DAILY  1-HR
RESULTS AVERAGED OVER   5 YEARS ***


                                    ** CONC OF NO2      IN MICROGRAMS/M**3
               **


                         NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR,
ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -
```

```
ALL_BKG   1ST HIGHEST VALUE IS     186.36222 AT (  391482.30,  4499397.10,
1364.35,  2851.52,    0.00)  DC
          2ND HIGHEST VALUE IS     185.90746 AT (  391457.30,  4499397.60,
1363.11,  2851.52,    0.00)  DC
          3RD HIGHEST VALUE IS     185.14374 AT (  391507.30,  4499396.60,
1365.94,  2851.52,    0.00)  DC
          4TH HIGHEST VALUE IS     185.05642 AT (  391532.30,  4499396.10,
1367.68,  2851.52,    0.00)  DC
          5TH HIGHEST VALUE IS     181.63460 AT (  391557.30,  4499395.60,
1369.18,  2851.52,    0.00)  DC
          6TH HIGHEST VALUE IS     181.07064 AT (  391432.40,  4499398.10,
1361.66,  2851.52,    0.00)  DC
          7TH HIGHEST VALUE IS     180.95347 AT (  391407.40,  4499398.60,
1358.74,  2851.52,    0.00)  DC
          8TH HIGHEST VALUE IS     178.51678 AT (  391257.40,  4499401.70,
1325.62,  2851.52,    0.00)  DC
          9TH HIGHEST VALUE IS     177.87339 AT (  391582.30,  4499395.10,
1370.72,  2851.52,    0.00)  DC
         10TH HIGHEST VALUE IS     177.52295 AT (  391480.40,  4499461.90,
1364.38,  2851.52,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION  19191 ***   ***  Kilgore - Erda - NO2 - 1hr
                         ***        01/28/21
 *** AERMET - VERSION  16216 ***   ***
                        ***        11:47:11

                                PAGE  1194
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  PVMRM  RURAL
ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of          15 Warning Message(s)
 A Total of         901 Informational Message(s)

 A Total of       43848 Hours Were Processed

 A Total of         353 Calm Hours Identified

 A Total of         548 Missing Hours Identified (  1.25 Percent)
```

```
   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
 SO W320      24        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W320      25        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W298     118        SOGRP: Results reported for source group ALL include
BACKGROUND
 ME W187   17082       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 ME W531   17082       MEOPEN: CAUTION! Met Station ID Missing from SURFFILE for
  SITEDATA
 OU W565   17088       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17089       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17090       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17091       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17092       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17093       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17094       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17095       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17096       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17097       OUPLOT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE

   ************************************
   *** AERMOD Finishes Successfully ***
   ************************************
```

NO_2 2008 ANNUAL OUTPUT FILE

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT PVMRM RURAL ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

NETWORK GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
ALL_BKG	1ST HIGHEST VALUE IS	66.80307 AT (391232.40, 4499402.20, 1325.13, 2851.52, 0.00)	DC	
	2ND HIGHEST VALUE IS	66.74589 AT (391207.40, 4499402.70, 1325.08, 2851.52, 0.00)	DC	
	3RD HIGHEST VALUE IS	66.70097 AT (391257.40, 4499401.70, 1325.62, 2851.52, 0.00)	DC	
	4TH HIGHEST VALUE IS	66.58617 AT (391182.40, 4499403.20, 1324.37, 2851.52, 0.00)	DC	
	5TH HIGHEST VALUE IS	66.48965 AT (391157.40, 4499403.70, 1324.51, 2851.52, 0.00)	DC	
	6TH HIGHEST VALUE IS	66.44677 AT (391282.40, 4499401.20, 1326.99, 2851.52, 0.00)	DC	
	7TH HIGHEST VALUE IS	66.41418 AT (391132.50, 4499404.20, 1324.26, 2851.52, 0.00)	DC	
	8TH HIGHEST VALUE IS	66.28713 AT (391107.60, 4499405.80, 1322.26, 2851.52, 0.00)	DC	
	9TH HIGHEST VALUE IS	66.28346 AT (391180.40, 4499461.90, 1321.04, 2851.52, 0.00)	DC	
	10TH HIGHEST VALUE IS	66.17330 AT (391082.60, 4499407.40, 1321.15, 2851.52, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  PVMRM  RURAL
ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           10 Warning Message(s)
 A Total of          377 Informational Message(s)

 A Total of         8784 Hours Were Processed

 A Total of          111 Calm Hours Identified

 A Total of          266 Missing Hours Identified (  3.03 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 SO W320      24        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W320      25        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W298     118        SOGRP: Results reported for source group ALL include
BACKGROUND
 ME W187   17083       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 ME W531   17083       MEOPEN: CAUTION! Met Station ID Missing from SURFFILE for
  SITEDATA
 OU W565   17087       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17088       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17089       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17090       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17091       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

NO_2 2009 ANNUAL OUTPUT FILE

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT PVMRM RURAL ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID	NETWORK	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
ALL_BKG	1ST HIGHEST VALUE IS	66.35195	AT (391232.40, 4499402.20, 1325.13, 2851.52, 0.00)	DC	
	2ND HIGHEST VALUE IS	66.33602	AT (391207.40, 4499402.70, 1325.08, 2851.52, 0.00)	DC	
	3RD HIGHEST VALUE IS	66.27318	AT (391257.40, 4499401.70, 1325.62, 2851.52, 0.00)	DC	
	4TH HIGHEST VALUE IS	66.23789	AT (391182.40, 4499403.20, 1324.37, 2851.52, 0.00)	DC	
	5TH HIGHEST VALUE IS	66.17247	AT (391157.40, 4499403.70, 1324.51, 2851.52, 0.00)	DC	
	6TH HIGHEST VALUE IS	66.10592	AT (391132.50, 4499404.20, 1324.26, 2851.52, 0.00)	DC	
	7TH HIGHEST VALUE IS	66.10097	AT (391282.40, 4499401.20, 1326.99, 2851.52, 0.00)	DC	
	8TH HIGHEST VALUE IS	65.98934	AT (391107.60, 4499405.80, 1322.26, 2851.52, 0.00)	DC	
	9TH HIGHEST VALUE IS	65.94739	AT (391180.40, 4499461.90, 1321.04, 2851.52, 0.00)	DC	
	10TH HIGHEST VALUE IS	65.89084	AT (391082.60, 4499407.40, 1321.15, 2851.52, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  PVMRM  RURAL
ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           10 Warning Message(s)
 A Total of          573 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of           73 Calm Hours Identified

 A Total of          123 Missing Hours Identified (  1.40 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 SO W320      24        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W320      25        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W298     118        SOGRP: Results reported for source group ALL include
BACKGROUND
 ME W187   17083       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 ME W531   17083       MEOPEN: CAUTION! Met Station ID Missing from SURFFILE for
  SITEDATA
 OU W565   17087       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17088       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17089       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17090       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17091       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

NO_2 2010 ANNUAL OUTPUT FILE

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT PVMRM RURAL ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

NETWORK GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
ALL_BKG	1ST HIGHEST VALUE IS	66.84830 AT (391232.40, 4499402.20, 1325.13, 2851.52, 0.00)	DC	
	2ND HIGHEST VALUE IS	66.81427 AT (391257.40, 4499401.70, 1325.62, 2851.52, 0.00)	DC	
	3RD HIGHEST VALUE IS	66.72614 AT (391207.40, 4499402.70, 1325.08, 2851.52, 0.00)	DC	
	4TH HIGHEST VALUE IS	66.62611 AT (391282.40, 4499401.20, 1326.99, 2851.52, 0.00)	DC	
	5TH HIGHEST VALUE IS	66.49814 AT (391182.40, 4499403.20, 1324.37, 2851.52, 0.00)	DC	
	6TH HIGHEST VALUE IS	66.32680 AT (391157.40, 4499403.70, 1324.51, 2851.52, 0.00)	DC	
	7TH HIGHEST VALUE IS	66.25431 AT (391307.40, 4499400.60, 1327.06, 2851.52, 0.00)	DC	
	8TH HIGHEST VALUE IS	66.24463 AT (391180.40, 4499461.90, 1321.04, 2851.52, 0.00)	DC	
	9TH HIGHEST VALUE IS	66.18527 AT (391132.50, 4499404.20, 1324.26, 2851.52, 0.00)	DC	
	10TH HIGHEST VALUE IS	66.16076 AT (391280.40, 4499461.90, 1323.70, 2851.52, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  PVMRM  RURAL
ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           10 Warning Message(s)
 A Total of          788 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of          115 Calm Hours Identified

 A Total of          100 Missing Hours Identified (  1.14 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 SO W320      24        PPARM: Input Parameter May Be Out-of-Range for Parameter
        VS
 SO W320      25        PPARM: Input Parameter May Be Out-of-Range for Parameter
        VS
 SO W298     118        SOGRP: Results reported for source group ALL include
BACKGROUND
 ME W187   17083       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 ME W531   17083       MEOPEN: CAUTION! Met Station ID Missing from SURFFILE for
  SITEDATA
 OU W565   17087       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17088       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17089       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17090       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17091       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

NO_2 2011 ANNUAL OUTPUT FILE

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT PVMRM RURAL ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID	NETWORK	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
ALL_BKG	1ST HIGHEST VALUE IS	66.64741	AT (391257.40, 4499401.70, 1325.62, 2851.52, 0.00)	DC	
	2ND HIGHEST VALUE IS	66.63440	AT (391232.40, 4499402.20, 1325.13, 2851.52, 0.00)	DC	
	3RD HIGHEST VALUE IS	66.56694	AT (391207.40, 4499402.70, 1325.08, 2851.52, 0.00)	DC	
	4TH HIGHEST VALUE IS	66.55773	AT (391282.40, 4499401.20, 1326.99, 2851.52, 0.00)	DC	
	5TH HIGHEST VALUE IS	66.47381	AT (391182.40, 4499403.20, 1324.37, 2851.52, 0.00)	DC	
	6TH HIGHEST VALUE IS	66.44174	AT (391157.40, 4499403.70, 1324.51, 2851.52, 0.00)	DC	
	7TH HIGHEST VALUE IS	66.38714	AT (391132.50, 4499404.20, 1324.26, 2851.52, 0.00)	DC	
	8TH HIGHEST VALUE IS	66.26008	AT (391307.40, 4499400.60, 1327.06, 2851.52, 0.00)	DC	
	9TH HIGHEST VALUE IS	66.24367	AT (391107.60, 4499405.80, 1322.26, 2851.52, 0.00)	DC	
	10TH HIGHEST VALUE IS	66.16433	AT (391180.40, 4499461.90, 1321.04, 2851.52, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  PVMRM  RURAL
ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           10 Warning Message(s)
 A Total of          841 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of           19 Calm Hours Identified

 A Total of           34 Missing Hours Identified (  0.39 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 SO W320      24        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W320      25        PPARM: Input Parameter May Be Out-of-Range for Parameter
       VS
 SO W298     118        SOGRP: Results reported for source group ALL include
BACKGROUND
 ME W187   17083       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 ME W531   17083       MEOPEN: CAUTION! Met Station ID Missing from SURFFILE for
  SITEDATA
 OU W565   17087       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17088       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17089       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17090       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17091       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

NO_2 2012 ANNUAL OUTPUT FILE

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT PVMRM RURAL ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID	NETWORK	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
ALL_BKG	1ST HIGHEST VALUE IS	67.13075	AT (391257.40, 4499401.70, 1325.62, 2851.52, 0.00)	DC	
	2ND HIGHEST VALUE IS	67.12473	AT (391232.40, 4499402.20, 1325.13, 2851.52, 0.00)	DC	
	3RD HIGHEST VALUE IS	66.98342	AT (391207.40, 4499402.70, 1325.08, 2851.52, 0.00)	DC	
	4TH HIGHEST VALUE IS	66.95438	AT (391282.40, 4499401.20, 1326.99, 2851.52, 0.00)	DC	
	5TH HIGHEST VALUE IS	66.75414	AT (391182.40, 4499403.20, 1324.37, 2851.52, 0.00)	DC	
	6TH HIGHEST VALUE IS	66.57155	AT (391157.40, 4499403.70, 1324.51, 2851.52, 0.00)	DC	
	7TH HIGHEST VALUE IS	66.50710	AT (391307.40, 4499400.60, 1327.06, 2851.52, 0.00)	DC	
	8TH HIGHEST VALUE IS	66.43661	AT (391180.40, 4499461.90, 1321.04, 2851.52, 0.00)	DC	
	9TH HIGHEST VALUE IS	66.40816	AT (391280.40, 4499461.90, 1323.70, 2851.52, 0.00)	DC	
	10TH HIGHEST VALUE IS	66.38435	AT (391132.50, 4499404.20, 1324.26, 2851.52, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  NODRYDPLT  NOWETDPLT  PVMRM  RURAL
ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           10 Warning Message(s)
 A Total of          901 Informational Message(s)

 A Total of         8784 Hours Were Processed

 A Total of           35 Calm Hours Identified

 A Total of           25 Missing Hours Identified (  0.28 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 SO W320      24        PPARM: Input Parameter May Be Out-of-Range for Parameter
        VS
 SO W320      25        PPARM: Input Parameter May Be Out-of-Range for Parameter
        VS
 SO W298     118        SOGRP: Results reported for source group ALL include
BACKGROUND
 ME W187   17083       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 ME W531   17083       MEOPEN: CAUTION! Met Station ID Missing from SURFFILE for
  SITEDATA
 OU W565   17087       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17088       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17089       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17090       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE
 OU W565   17091       PERPLT: Possible Conflict With Dynamically Allocated FUNIT
  PLOTFILE

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

Trinity Consultants

MEMORANDUM

To: **Jacob Reis, Utah Division of Air Quality**

From: **Chase Peterson, Trinity Consultants**

CC: **Lee Ware, Kilgore Companies**

Brian Mensinger, Trinity Consultants

Date: **March 17, 2021**

RE: **Permitting of Kilgore Companies' Backup, Emergency Generator**

Dear Jake,

On April 24, 2020, a Notice of Intent (NOI) air permit application was submitted for Kilgore Companies' (Kilgore's) Erda Pit. After review of the submitted NOI air permit application and emission calculations, the Utah Division of Air Quality (UDAQ) submitted a question regarding a 450 brake-horsepower (bhp) backup generator engine; the question is given in italics, below, with the response given immediately thereafter. It is requested that the changes detailed in this memorandum replace the corresponding section of the April 24, 2020 NOI air permit application. Please do not hesitate to contact me with any questions with respect to the contents of this response.

1. *There is one thing I want to confirm with you about the engines. The BACT analysis and Form 3 state that there is a 450 HP backup generator, but it is not listed anywhere else (calculations, form 11, modeling memo, etc.). Has this engine been removed from the project?*

The backup, diesel-fired, emergency generator engine in question is intended to serve as an emergency generator that will power a portion of the Erda Pit's crushing and screening operations in the event that the two (2) prime power generator engines are unavailable. While it is not intended to power the entire plant, it is meant to allow primary operations to continue while the prime power generator engines are brought back online. The emergency generator is rated by the Environmental Protection Agency (EPA) as Tier-IV final. As an emergency generator, it will be limited to 100 hours of operation per year for maintenance and testing. It will comply with New Source Performance Standards (NSPS) Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, and 40 Code of Federal Regulations (CFR) Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

The emergency generator was inadvertently omitted from emission calculations included in the April 24, 2020 NOI air permit application; supplemental and updated calculations have been included in this memorandum for inclusion in the NOI air permit application in Section 4 and Appendix B.

Kilgore proposes that the emergency generator be considered as meeting the National Ambient Air Quality Standards (NAAQS) for NO_2 without it undergoing air dispersion modeling. This is based on several key factors:

- The emergency generator will not operate at the same time for maintenance and testing as the two (2) prime power generator engines, and it is proposed that a permit condition be drafted as such;
- The pound per hour (lb/hr) emission rate of NO_X resulting from the emergency generator is <2% of the lb/hr NO_X emission rate resulting from the two (2) prime power generator engines;

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- The two (2) prime power generator engines have already demonstrated achieving the NAAQS;
- The emergency generator is rated EPA Tier-IV final, and the emission factors used to calculate its emission rates are from EPA's Nonroad Compression-Ignition Engines: Exhaust Emission Standards, March 2016, except for the SO_2 emission factor which is from EPA's AP-42 Section 3.3 Gasoline And Diesel Industrial Engines;
- The emergency generator will not share a stack with either of the two (2) prime power generator engines; and
- The emergency generator will be stationed next to the Erda Pit's crushing and screening operations, meaning that it will be located relatively close to the center of the mine during its operation.

Kilgore also requests that the following changes to the April 24, 2020 NOI air permit application be made.

1. EXECUTIVE SUMMARY

Please redact the third paragraph of Section 1 and replace it with the following:
Emissions from the Erda Plant will consist of fugitive and non-fugitive $PM_{2.5}$ and PM_{10} (crushing and screening related operations), as well as NO_X, SO_2, VOCs, and CO (from two [2] on-site prime power generator engines and one [1] emergency generator engine). Water application will be used to control fugitive dust throughout the material handling processes.

3. DESCRIPTION OF PROJECT AND PROCESS

Please redact the second paragraph of Section 3.2.1 and replace it with the following:
The conveyors, crushers, screens, stackers, and offices will be powered by two (2) prime power, 900 kW diesel-fired generator engines. A 336 kW emergency generator (i.e., equivalent to 450 hp) will also be on site to provide power to a portion of the crushing and screening operation in the event that the two (2) prime power generator engines are not running. The emergency engine will not be operated at the same time as either of the 900 kW prime power generator engines.

Proposed Draft Permit Condition:

The 336 kw emergency engine will not be operated at the same time for maintenance and testing as the two (2) 900 kW prime power generator engines.

4. EMISSIONS RELATED INFORMATION

Please redact the first two (2) paragraphs and the first equation of Section 4.6 and replace them with the following:
Calculations for the criteria pollutants produced by on-site engines are based on the assumption that the two (2) prime-power, 900 kW (1,207 hp), diesel-fired generator engines would account for all power during total annual hours of operation and that they would operate at their maximum power output. The emergency, 336 kW (450 hp) diesel-fired generator engine will be limited to 100 hours per year for maintenance and testing; it is rated to meet EPA's Tier IV final (Tier IVf) Nonroad Compression-Ignition Engines: Exhaust Emission Standards. The 900 kW engines are rated to meet EPA's Tier IV interim (Tier IVi) Nonroad Compression-Ignition Engines: Exhaust Emission Standards. The Erda Pit will not operate the emergency generator at the same time as the two (2) prime-power generator engines.

PM_{10}, $PM_{2.5}$, NO_X, VOC, and CO potential emissions are calculated for the two (2) prime-power generator engines by multiplying their Tier IVi emission factors, as provided by the manufacturer, by the engines'

power output, hours of operation, and appropriate conversion factors. PM_{10}, $PM_{2.5}$, NO_X, VOC, and CO potential emissions are conservatively calculated for the emergency generator engine by multiplying the emission factors of EPA Tier IVf diesel industrial engines from EPA's Nonroad Compression-Ignition Engines: Exhaust Emission Standards, March 2016 by the engine's power output, hours of operation, and appropriate conversion factors. The annual emissions for both the prime-power generator engines and the emergency generator engine are then summed for a total PTE for all generator engines on site. Emission factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equivalent to the emission factors provided for PM. Annual PM_{10}, $PM_{2.5}$, NO_X, VOC, and CO emission rates are calculated using the following equation:

$$\begin{aligned}&\text{Annual } PM_{10}, PM_{2.5}, NO_X, \text{VOC, and CO Emissions (tpy)}\\&= EF_{IVi}\left(\frac{\text{grams}}{HP\cdot hr}\right)\times \text{Power}_{IVi}\,(HP)\times \text{Hours of Operation}_{IVi}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{1\text{ ton}}{907{,}185\text{ grams}}\right)\\&+ EF_{IVf}\left(\frac{lb}{HP\cdot hr}\right)\times \text{Power}_{IVf}(HP)\times \text{Hours of Operation}_{IVf}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{1\text{ ton}}{2{,}000\text{ lbs}}\right)\end{aligned}$$

As annual emissions calculations in Section 4.6 now account for both the two (2) prime-power generator engines and the emergency generator engine, please update the remaining equations for annual emissions in this section for SO_2, CO_2e, and HAPs as follows. Please also note that emission factors for the prime-power generator engines (IVi) are from AP-42 3.4, whereas emission factors for the emergency backup generator engine (IVf) are from AP-42 3.3, as noted in the NOI air permit application:

$$\begin{aligned}&\text{Annual } SO_2 \text{ Emissions (tpy)}\\&= EF_{IVi}\left(\frac{lbs}{hp\cdot hr}\right)\times \text{Power Output}_{IVi}\,(HP)\times \text{Hours of Operation}_{IVi}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{1\text{ ton}}{2{,}000\text{ lb}}\right)\\&+ EF_{IVf}\left(\frac{lbs}{hp\cdot hr}\right)\times \text{Power Output}_{IVf}\,(HP)\times \text{Hours of Operation}_{IVf}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{1\text{ ton}}{2{,}000\text{ lb}}\right)\end{aligned}$$

$$\begin{aligned}&CO_2e \text{ Annual Emission Rate (tpy)}\\&= \left[\left(EF_{CO_2}\left(\frac{kg}{MMBtu}\right)+EF_{CH_4}\left(\frac{kg}{MMBtu}\right)\times GWP_{CH_4}+EF_{N_2O}\left(\frac{kg}{MMBtu}\right)\times GWP_{N_2O}\right)\right.\\&\left.\times \text{Heat Input}\left(\frac{MMBtu}{hr}\right)\times \text{Hours of Operation}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{2.2\text{ lb}\times 1\text{ ton}}{1\text{ kg}\times 2{,}000\text{ lb}}\right)\right]_{IVi}\\&+\left[\left(EF_{CO_2}\left(\frac{kg}{MMBtu}\right)+EF_{CH_4}\left(\frac{kg}{MMBtu}\right)\times GWP_{CH_4}+EF_{N_2O}\left(\frac{kg}{MMBtu}\right)\times GWP_{N_2O}\right)\right.\\&\left.\times \text{Heat Input}\left(\frac{MMBtu}{hr}\right)\times \text{Hours of Operation}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{2.2\text{ lb}\times 1\text{ ton}}{1\text{ kg}\times 2{,}000\text{ lb}}\right)\right]_{IVf}\end{aligned}$$

$$\begin{aligned}&\text{Annual HAP Emissions (tpy)}\\&= \sum_{i}^{\text{species n}}\left(EF_n\left(\frac{lb}{MMBtu}\right)\times \text{Heat Input}\left(\frac{MMBtu}{hr}\right)\times \text{Operation}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{1\text{ton}}{2{,}000\text{lb}}\right)\right)_{IVi}\\&+\sum_{i}^{\text{species n}}\left(EF_n\left(\frac{lb}{MMBtu}\right)\times \text{Heat Input}\left(\frac{MMBtu}{hr}\right)\times \text{Operation}\left(\frac{hr}{yr}\right)\times \text{Conversion}\left(\frac{1\text{ton}}{2{,}000\text{lb}}\right)\right)_{IVf}\end{aligned}$$

5. BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

Please redact the text under "Limited Hours of Operation" in Section 5.3 and replace it with the following:
One of the apparent opportunities to control the emissions of all pollutants released from non-emergency engines is to limit the hours of operations. The two (2) prime-power generator engines will be limited to 4,160 hours of operation per year, each, while the emergency backup generator will be limited to 100 hours per year for maintenance and testing.

Please redact the paragraph under "Use of an Appropriate Tier Certified Engine" in Section 5.3 and replace it with the following:
EPA noted that non-road engines were a significant source of emissions and began adopting emission standards for these emission units in 1994. Today, engines are required to meet certain emission limits, or tier ratings, based on the size and model year. Emission standards for these engines have progressively become more stringent over time and are an indicator of good combustion design. Kilgore owns two (2) Tier IVi engines that have been dedicated to providing on-site power to the Erda Plant's operations, and one (1) Tier IVf engine that has been dedicated to providing power to a portion of the crushing and screening operations during emergency events, i.e., when the two (2) prime-power Tier IVi engines cannot be used.

Please redact the paragraph under "Selective Catalytic Reduction" and replace it with the following:
Selective catalytic reduction (SCR) systems introduce a liquid reducing agent such as ammonia or urea into the flue gas stream prior to a catalyst. The catalyst reduces the temperature needed to initiate the reaction between the reducing agent and NO_X to form nitrogen and water. Retro-fitting an SCR creates backpressure in the exhaust system which affects the performance and effective power output of an engine. For these reasons, retrofitting an SCR is considered technically infeasible. An SCR that is already equipped, such as that in a Tier IVf engine, is considered technically feasible.

Please redact the two (2) paragraphs under "Generator NO_X Steps 4-5 – Evaluate Most Effective Controls and Document Results, and Select BACT" and replace it with the following two (2) paragraphs:
The diesel-fired generator engines at the Erda Plant are well designed, efficient, reliable, and will be operated using good combustion practices. The engines will use diesel fuel meeting the requirements of 40 CFR §80.510(b) for non-road diesel fuel (i.e., a maximum sulfur content of 15 ppm and either a minimum cetane index of 40 or a maximum aromatic content of 35 percent by volume). The two (2) prime-power generator engines will operate under limited annual hours of operation, to the extent that they will only be run during operation scenarios. The single emergency backup generator will also operate under limited annual hours of operation, defined as 100 hours per year for maintenance and testing, as described by manufacturer suggestion.

BACT for the two (2) prime-power generator engines is proposed as the use of ULSD fuel, limited annual hours of operation, maintaining an EPA Tier IVi rating – which includes built-in EGR, DOC, and DPF – and compliance with NESHAP Subpart ZZZZ and NSPS Subpart IIII. BACT for the emergency backup generator engine is proposed as the use of ULSD fuel, limited annual hours of operation (100 hours per year for maintenance and testing), maintaining an and EPA Tier IVf – which includes built-in EGR, DOC, DPF, and SCR – and compliance with NESHAP Subpart ZZZZ and NSPS Subpart IIII.

6. EMISSION IMPACT ANALYSIS

Please redact Table 6-1 and Table 6-2 from Section 6.1 and replace them with the following tables of the same name:

Table 6-1. Comparison to Criteria Modeling Thresholds

Emissions (tpy)							
Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_X**	**CO**	**SO_2**	**VOC**	**CO_2e**
Crushing and Screening	0.61	0.06	-	-	-	-	-
Stockpiles and Disturbed Grounds	1.69	0.81	-	-	-	-	-
Bulldozers & Loaders	0.51	0.29	-	-	-	-	-
Roads	2.13	0.21	-	-	-	-	-
Engines	0.66	0.66	31.45	10.31	0.11	1.22	2,100
Bank Run Export	7.10E-03	1.08E-03	-	-	-	-	-
Tanks	-	-	-	-	-	5.62E-03	-
Fugitive Emissions	4.96	1.39	-	-	-	-	-
Proposed Site-Wide Emissions (total)	5.62	2.05	31.45	10.33	0.11	1.23	2,100
Major Source Thresholds[1,2]	70	70	70	100	70	70	N/A
Threshold Exceeded?	No	No	No	No	No	No	No
Modeling Limits[3]	5/15	No Limit	40	100	40	N/A	No Limit
Threshold Exceeded?	No	No	No	No	No	No	No

1. Per UAC R307-415-3 definition of major source, only sources listed must include fugitive emissions or fugitive dust emissions to determine applicability.
2. Ammonia emissions were considered; however, they are not applicable as none of the sources are anticipated to release ammonia in a quantifiable amount.
3. Per Emissions Impact Assessment Guidelines published by UDAQ.

Table 6-2. Comparison to HAP Modeling Thresholds

Pollutant[1]	Total HAP Emissions PTE			UDAQ ETV[2] (lb/hr)	Modeling Required?
	Prime-Power Generators (lb/hr)	Emergency Generator (lb/hr)	Total Generators (tpy)		
Benzene	4.77E-03	1.07E-03	9.97E-03	0.3163	No
Toluene	1.73E-03	4.69E-04	3.61E-03	14.922	No
Xylene (isomers and mixture)	1.19E-03	3.27E-04	2.48E-03	85.970	No
Formaldehyde	4.85E-04	1.35E-03	1.08E-03	0.0567	No
Acetaldehyde	1.55E-04	8.79E-04	3.66E-04	6.9363	No
Acrolein	4.84E-04	1.06E-04	1.06E-04	0.0353	No
Naphthalene	7.98E-04	9.72E-05	1.67E-03	10.381	No
Polycyclic Aromatic Hydrocarbons (PAH)	1.30E-03	1.93E-04	2.72E-03	--	No
1,3-Butadiene	--	4.48E-05	2.24E-06	0.292	No
Max HAP	**4.77E-03**	**1.35E-03**	**9.97E-03**	**--**	**--**
Total HAP	**1.05E-02**	**4.54E-03**	**2.20E-02**	**--**	**--**

1. Considered HAPs are those listed in AP-42 3.3 Gasoline and Diesel Industrial Engines and AP-42 3.4 Large Stationary Diesel and All Stationary Dual-fuel Engines.
2. The Emission Threshold Value (ETV) within a 50-meter distance to the fenceline; vertically unrestricted stack.

APPENDIX A: FORMS

Please add this additional Form 11 to Appendix A for the emergency generator:

Utah Division of Air Quality
New Source Review Section

Form 11
Internal Combustion Engines

Company: Kilgore Companies
Site/Source: Erda Pit
Date: March 2021

Equipment Information

1. Manufacturer: Cummins
   Model no.: _____
   The date the engine was constructed or reconstructed _____

2. Operating time of Emission Source:

	average	maximum
	_____ Hours/day	_____ Hours/day
	_____ Days/week	_____ Days/week
	_____ Weeks/year	_____ Weeks/year

100 hours/year

3. Manufacturer's rated output at baseload, ISO 450 hp or 336 Kw
   Proposed site operating range _____ hp or ____ Kw

Gas Firing

4. Are you operating site equipment on pipeline quality natural gas: ☐ Yes ■ No

5. Are you on an interruptible gas supply:
   ☐ Yes ☐ No
   If "yes", specify alternate fuel:
   _____

6. Annual consumption of fuel:
   _____ MMSCF/Year

7. Maximum firing rate:
   _____ BTU/hr

8. Average firing rate:
   _____ BTU/hr

Oil Firing

9. Type of oil:
   Grade number ☐ 1 ■ 2 ☐ 4 ☐ 5 ☐ 6 Other specify _____

10. Annual consumption: _____ gallons

11. Heat content: _____ BTU/lb or
    _____ BTU/gal

12. Sulfur content: 0.0015 % by weight

13. Ash content: _____ % by weight

14. Average firing rate: _____ gal/hr

15. Maximum firing rate: _____ gal/hr

16. Direction of firing: ☐ horizontal ☐ tangential ☐ other: (specify)

Internal Combustion Engine
Form 11 (Continued)

Operation

17. Application:

- ☐ Electric generation
  _____ Base load _____ Peaking
- ■ Emergency Generator
- ☐ Driving pump/compressor
- ☐ Exhaust heat recovery
- ☐ Other (specify) _____

18. Cycle

- ☐ Simple cycle
- ☐ Regenerative cycle
- ☐ Cogeneration
- ☐ Combined cycle

Emissions Data

19. Manufacturer's Emissions in grams per hour (gr/hp-hr): _____ NO_X _____ CO _____ VOC
From EPA's Nonroad Compression-Ignition Engines: Exhaust Emission Standards, March 2016 _____ Formaldehyde

20. Attach manufacturer's information showing emissions of NO_x, CO, VOC, SO_x, CH_2O, PM_{10}, $PM_{2.5}$, CO_2, CH_4 and N_2O for each proposed fuel at engine loads and site ambient temperatures representative of the range of proposed operation. The information must be sufficient to determine maximum hourly and annual emission rates. Annual emissions may be based on a conservatively low approximation of site annual average temperature. Provide emissions in pounds per hour and except for PM_{10} and $PM_{2.5}$ parts per million by volume (ppmv) at actual conditions and corrected to dry, 15% oxygen conditions.

Method of Emission Control:

☐ Lean premix combustors ☐ Oxidation catalyst ☐ Water injection ☐ Other (specify)_____

☐ Other low-NO_x combustor ☐ SCR catalyst ☐ Steam injection

Additional Information

21. On separate sheets provide the following:

A. Details regarding principle of operation of emission controls. If add-on equipment is used, provide make and model and manufacturer's information. Example details include: controller input variables and operational algorithms for water or ammonia injection systems, combustion mode versus engine load for variable mode combustors, etc.

B. Exhaust parameter information on attached form.

C. All calculations used for the annual emission estimates must be submitted with this form to be deemed complete.

D. All formaldehyde emissions must be modeled as per Utah Administrative Code R307-410-5 using SCREEN3.

E. If this form is filled out for a new source, forms 1 and 2 must be submitted also.

INTERNAL COMBUSTION ENGINE
FORM 11 (continued)
EMISSION SOURCES

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this form.

AIR CONTAMINANT DATA							EMISSION POINT DISCHARGE PARAMETERS							
EMISSION POINT (1)		CHEMICAL COMPOSITION OF TOTAL STREAM			AIR CONTAMINANT EMISSION RATE		UTM COORDINATES OF EMISSION PT. (6)			STACK SOURCES (7)				
										HEIGHT ABOVE GROUND (FT)	HEIGHT ABOVE STRUCT. (FT)	EXIT DATA		
NUMBER	NAME	COMPONENT OR AIR CONTAMINANT NAME (2)		CONC. (%V) (3)	LB/HR (4)	TONS/YR (5)	ZONE	EAST (METERS)	NORTH (METERS)			DIA. (FT)	VELO. (FPS)	TEMP. (^{O}F)

Refer to Section 4 of the NOI Application

Location of emission points will be variable, stack data will be provided upon request.

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 4348 feet.
UTAH AIR CONSERVATION BOARD STANDARD CONDITIONS ARE 68^{O} F AND 14.7 PSIA.

General Instructions for this form.

1. Identify each emission; point with a unique number for this plant site on plot plan, previous permits and emission inventory questionnaire. Limit emission point number to 8 character spaces. For each emission point use as many lines as necessary to list air contaminant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are OK.
2. Typical component names are: air, H_2O, nitrogen, oxygen, CO_2, CO, NO_x, SO_x, hexane, particulate matter (PM_{10} and $PM_{2.5}$), etc. Abbreviations are OK.
3. Concentration data is required for all gaseous components. Show concentration in volume percent of total gas stream.
4. Pounds per hour. (#/hr) is maximum emission rate expected by applicant.
5. Tons per year (T/Y) is annual maximum emission rate expected by applicant, which takes into account process operating schedule.
6. As a minimum applicant must furnish a facility plot plan drawn to scale showing a plant benchmark, latitude and longitude correct to the nearest second for the benchmark, and all emission points dimensioned with respect to the benchmark. Please show emission point UTM coordinates if known.
7. Supply additional information as follows if appropriate:
   (a) Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.
   (b) Stack's height above supporting or adjacent structures if structure is within three "stack heights above ground" of stack.

Please redact Table A-5 and replace it with the following table of the same name:

Table A-5. Supporting Equipment

Type of Equipment[1,2]	Quantity	Engine Rating (kW)	Maximum Hourly Limit (hr/yr/unit)
Primary Generator Engine	2	900	4,160
Backup Generator Engine	1	336	100

[1] Both primary generator engines are EPA Tier IV Interim.

[2] The backup generator engine is rated EPA Tier IV Final.

Please redact Table B-1 and replace it with the following table of the same name:

Table B-1. Facility-Wide Emissions

	Emissions (tpy)							
	PM_{10}	PM_{10} (Fugitive)	$PM_{2.5}$	NO_X	CO	SO_2	VOC	CO_2e
Proposed Site-Wide Emissions	5.62	4.96	2.05	31.45	10.31	0.11	1.23	2,100
Major Source Thresholds[1,2]	70	NA	70	70	100	70	70	N/A
Threshold Exceeded?	No	NA	No	No	No	No	No	No
Modeling Limits[3]	15.00	5.00	No Limit	40	100	40	N/A	No Limit
Threshold Exceeded?	No	No	No	No	No	No	No	No

1. The Erda Site is located in Tooele County, which is in serious nonattainment for $PM_{2.5}$. Values are per UAC R307-403-5(2)(b)(ii).
2. HAPs emissions were considered in the Erda Site's facility-wide emissions; however, these emissions are not applicable.
3. Per Emissions Impact Assessment Guidelines published by UDAQ.

Please redact Table C-1 and replace it with the following table of the same name:

Table C-1. Annual Potential Emissions Summary

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	SO_2 (tpy)	VOC (tpy)	CO_2e (tpy)
Crushing and Screening	0.61	0.06	-	-	-	-	-
Stock Piles and Disturbed Grounds	1.69	0.81	-	-	-	-	-
Bulldozer & Loader	0.51	0.29	-	-	-	-	-
Roads	2.13	0.21	-	-	-	-	-
Engine Emissions	0.66	0.66	31.45	10.31	0.11	1.22	2,100
Bank Run Export	7.10E-03	1.08E-03	-	-	-	-	-
Tanks	-	-	-	-	-	5.62E-03	-
Total Potential (tpy)	**5.62**	**2.05**	**31.45**	**10.31**	**0.11**	**1.23**	**2,100**

Please redact Table C-12 and replace it with the following table of the same name:

Table C-12. Diesel Generator Engine Parameters

	Quantity	Generator Engine Size		
		(kW)	(hp)	(MMBtu/hr)
Emergency Generator Engines with max. HP <600				
Backup Generator	1	336	450.58	1.15
Current Total for All Units <600 HP	1	336	450.58	1.15
Generator Engines with max. HP > 600				
Primary Generator Engine	2	900	1,207	3.07
Total for All Units >600 HP	2	1,800	2,414	6.14

1. There will be one (1) emergency generator on site that will be used in the event that the two (2) prime-power generators are not operable. The emergency generator will not operate at the same time as the two (2) prime-power generators.

Please redact Appendix Table C-13 and replace it with Table C-13, below:

Table C-13. Diesel Generator Engine Criteria Pollutants and GHG Emissions

Pollutant	Small Unit Emission Factor[2,4]	Units	Large Unit Emission Factor[1,2,3,5]	Units	Primary Generators Hourly Emissions[6] (lb/hr)	Emergency Generator Hourly Emissions[7] (lb/hr)	Annual Emissions[8] (tpy)
NO_X	0.40	g/(kW-hr)	2.84	g/(hp-hr)	15.11	0.30	**31.45**
CO	3.50	g/(kW-hr)	0.92	g/(hp-hr)	4.90	2.59	**10.31**
PM	0.02	g/(kW-hr)	0.06	g/(hp-hr)	0.32	0.01	**0.66**
PM_{10}	0.02	g/(kW-hr)	0.06	g/(hp-hr)	0.32	0.01	**0.66**
$PM_{2.5}$	0.02	g/(kW-hr)	0.06	g/(hp-hr)	0.32	0.01	**0.66**
SO_2	2.05E-03	lb/(hp-hr)	1.21E-05	lb/(hp-hr)	0.03	0.92	**0.11**
VOC	0.19	g/(kW-hr)	0.11	g/(hp-hr)	0.59	0.14	**1.22**
CO_2	73.96	kg/MMBtu	73.96	kg/MMBtu	1002	187	**2093**
CH_4	3.00E-03	kg/MMBtu	3.00E-03	kg/MMBtu	0.04	7.58E-03	**0.08**
N_2O	6.00E-04	kg/MMBtu	6.00E-04	kg/MMBtu	8.12E-03	1.52E-03	**0.02**
CO_2e	74.21	kg/MMBtu	74.21	kg/MMBtu	1005	188	**2100**

1. Criteria pollutant emission factors are per manufacturer's guarantee at 100% load except for SO_2 which is taken from AP-42 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines.

2. GHG emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C. CO_2e is the sum of GHG constituents multiplied by their respective global warming potential (i.e. 1 for CO_2, 25 for CH_4, and 298 for N_2O), per Table A-1, 40 CFR 98, Subpart A.

3. Large Units are above 600 hp. PM emissions represent filterable and condensable fractions, additionally it has been assumed that $PM=PM_{10}=PM_{2.5}$.

4. Small units are those under 600 hp. Criteria pollutant emission factors are from EPA Tier IV engine rating from EPA's Nonroad Compression-Ignition Engines: Exhaust Emission Standards, March 2016, except for that of SO_2, which is from AP-42 Section 3.3, Table 3.3-1. PM emissions represent filterable and condensable fractions, additionally it has been assumed that $PM=PM_{10}=PM_{2.5}$.

5. It is assumed that the TOCs are VOCs as a conservative estimate.

6. Hourly emissions account for both primary generator engines operating simultaneously. The backup generator engine will not operate at the same time as the two primary generator engines.

7. Hourly emissions account for the backup, emergency generator operating by itself, as it will never operate at the same time as the two (2) primary generators.

8. Annual emissions account for both primary generator engines and the backup generator operating simultaneously, although the backup generator engine will not operate at the same time as the two primary generator engines.

Please redact Appendix Table C-14 and replace it with Table C-14, below:

Table C-14. Diesel Generator Engine HAP Emissions

Pollutant	Small Unit Emission Factor[1]	Large Unit Emission Factor[2]	Units	Primary Generators Hourly Emissions [4] (lb/hr)	Emergency Generator Hourly Emissions [5] (lb/hr)	Annual Emissions (tpy)	UDAQ ETV[3] (lb/hr)	Modeling Required?
Benzene	9.33E-04	7.76E-04	lb/MMBtu	4.77E-03	1.07E-03	9.97E-03	0.3163	No
Toluene	4.09E-04	2.81E-04	lb/MMBtu	1.73E-03	4.69E-04	3.61E-03	14.922	No
Xylene	2.85E-04	1.93E-04	lb/MMBtu	1.19E-03	3.27E-04	2.48E-03	85.970	No
1,3-Butadiene[6]	3.91E-05	--	lb/MMBtu	--	4.48E-05	2.24E-06	0.292	No
Formaldehyde	1.18E-03	7.89E-05	lb/MMBtu	4.85E-04	1.35E-03	1.08E-03	0.0567	No
Acetaldehyde	7.67E-04	2.52E-05	lb/MMBtu	1.55E-04	8.79E-04	3.66E-04	6.9363	No
Acrolein	9.25E-05	7.88E-06	lb/MMBtu	4.84E-05	1.06E-04	1.06E-04	0.0353	No
Naphthalene	8.48E-05	1.30E-04	lb/MMBtu	7.98E-04	9.72E-05	1.67E-03	10.381	No
Polycyclic Aromatic Hydrocarbons (PAH)	1.68E-04	2.12E-04	lb/MMBtu	1.30E-03	1.93E-04	2.72E-03	--	No
Max HAP	***1.18E-03***	***7.76E-04***	***lb/MMBtu***	***4.77E-03***	***1.35E-03***	***9.97E-03***	--	--
Total HAPs	***3.96E-03***	***1.70E-03***	***lb/MMBtu***	***1.05E-02***	***4.54E-03***	***2.20E-02***	--	--

1. Emission factors per AP-42 Section 3.3, Gasoline and Diesel Industrial Engines Table 3.3-2.

2. Emission factors Per AP-42 Section 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines Tables 3.4-3 and 3.4-4.
Additional polycyclic aromatic hydrocarbon (PAH) may be emitted but for regulatory purposes, this list is only inclusive of HAPs regulated under the Clean Air Act.

3. The Emission Threshold Value (ETV) assumes a <50m distance to the fenceline and vertically unrestricted release.

4. Hourly emissions account for both primary generator engines operating simultaneously. The backup generator engine will not operate at the same time as the two primary generator engines.

5. Hourly emissions account for the backup, emergency generator operating by itself, as it will never operate at the same time as the two (2) primary generators.

6. An emission factor for 1,3-Butadiene is not given in AP-42 3.4. It has thus not been included for the two prime power generator engines.

Jacob Ries <jries@utah.gov>

Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal

Chase Peterson <CPeterson@trinityconsultants.com> Thu, May 27, 2021 at 12:
To: Jacob Ries <jries@utah.gov>

Jake,

Please see the attached image from Kilgore's engines. As the engines are identical, this serves for both. You can see the NO_X emission rate as well as the manufacturing year (2014) confirming its Tier IVi status.

Also, please see the updated emissions calculations and results from using the Tier IVi emissions limits for both primary generators, below. Please use these to update the ER.

Table B-1. Facility-Wide Emissions

	Emissions (tpy)							
	PM_{10}	PM_{10} (Fugitive)	$PM_{2.5}$	NO_X	CO	SO_2	VOC	CO_2e
Proposed Site-Wide Emissions	5.78	4.96	2.21	28.91	29.02	0.11	3.31	2,100
Major Source Thresholds[1,2]	70	NA	70	70	100	70	70	N/A
Threshold Exceeded?	No	NA	No	No	No	No	No	No
Modeling Limits[3]	15.00	5.00	No Limit	40	100	40	N/A	No Limit
Threshold Exceeded?	No	No	No	No	No	No	No	No

1. The Erda Site is located in Tooele County, which is in serious nonattainment for $PM_{2.5}$. Values are per UAC R307-403-5(2)(b)(ii).

2. HAPs emissions were considered in the Erda Site's facility-wide emissions; however, these emissions are not applicable.

3. Per Emissions Impact Assessment Guidelines published by UDAQ.

Table C-1. Annual Potential Emissions Summary

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	SO_2 (tpy)	VOC (tpy)	CO_2e (tpy)
Crushing and Screening	0.61	0.06	-	-	-	-	-
Stock Piles and Disturbed Grounds	1.69	0.81	-	-	-	-	-
Bulldozer & Loader	0.51	0.29	-	-	-	-	-
Roads	2.13	0.21	-	-	-	-	-
Engine Emissions	0.83	0.83	28.91	29.02	0.11	3.31	2,100
Bank Run Export	7.10E-03	1.08E-03	-	-	-	-	-
Tanks	-	-	-	-	-	5.62E-03	-
Total Potential (tpy)	**5.78**	**2.21**	**28.91**	**29.02**	**0.11**	**3.31**	**2,100**

Appendix Table C-13. Diesel Generator Engine Criteria Pollutants and

GHG Emissions

Pollutant	Small Unit Emission Factor[2,4]	Units	Large Unit Emission Factor[1,2,3,5]	Units	Primary Generators Hourly Emissions[6] (lb/hr)	Emergency Generator Hourly Emissions[7] (lb/hr)	Annual Emissions[8] (tpy)
NO_X	0.40	g/(kW-hr)	3.50	g/(kW-hr)	13.89	0.30	**28.91**
CO	3.50	g/(kW-hr)	3.50	g/(kW-hr)	13.89	2.59	**29.02**
PM	0.02	g/(kW-hr)	0.10	g/(kW-hr)	0.40	0.01	**0.83**
PM_{10}	0.02	g/(kW-hr)	0.10	g/(kW-hr)	0.40	0.01	**0.83**
$PM_{2.5}$	0.02	g/(kW-hr)	0.10	g/(kW-hr)	0.40	0.01	**0.83**
SO_2	2.05E-03	lb/(hp-hr)	1.21E-05	lb/(hp-hr)	0.03	0.92	**0.11**
VOC	0.19	g/(kW-hr)	0.40	g/(kW-hr)	1.59	0.14	**3.31**
CO_2	73.96	kg/MMBtu	73.96	kg/MMBtu	1002	187	**2,093**
CH_4	3.00E-03	kg/MMBtu	3.00E-03	kg/MMBtu	0.04	7.58E-03	**0.08**
N_2O	6.00E-04	kg/MMBtu	6.00E-04	kg/MMBtu	8.12E-03	1.52E-03	**0.02**
CO_2e	74.21	kg/MMBtu	74.21	kg/MMBtu	1005	188	**2,100**

1. Criteria pollutant emission factors are per EPA Tier IVi emission standards, EPA-420-B-16-022, except for SO_2 which is taken from AP-42 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines.

2. GHG emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C. CO_2e is the sum of GHG constituents multiplied by their respective global warming potential (i.e. 1 for CO_2, 25 for CH_4, and 298 for N_2O), p Table A-1, 40 CFR 98, Subpart A.

3. Large Units are above 600 hp. PM emissions represent filterable and condensable fractions, additionally it has been assumed that $PM=PM_{10}=PM_{2.5}$.

4. Small units are those under 600 hp. Criteria pollutant emission factors are from EPA Tier IV engine rating from EPA's Nonroad Compression-Ignition Engines: Exhaust Emission Standards, March 2016, except for that of SO_2, which is from AP-42 Section 3.3, Table 3.3-1. PM emissions represent filterable and condensable fractions, additionally it has been assumed that PM=PM10=PM2.5.

5. It is assumed that the TOCs are VOCs as a conservative estimate.

6. Hourly emissions account for both primary generator engines operating simultaneously. The backup generator engine will not operate at the same time as the two primary generator engines.

7. Hourly emissions account for the backup, emergency generator operating by itself, as it will never operate at the same time as the two (2) primary generators.

8. Annual emissions account for both primary generator engines and the backup generator operating simultaneously, although the backup generator engine will not operate at the same time as the two primary generator engines.

Please let me know whether you have any further questions.

Thanks very much,

Chase Peterson

Associate Consultant

Trinity Consultants, Inc.

P 801-272-3000 (ext 324)

4525 Wasatch Blvd, Suite 200,

Salt Lake City, Utah 84124

Email: CPeterson@trinityconsultants.com

From: Jacob Ries <jries@utah.gov>
Sent: Thursday, May 27, 2021 10:21
To: Chase Peterson <CPeterson@trinityconsultants.com>
Subject: Re: Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal

Hi Chase,

The table you sent over is the correct table to use, as the one I was referencing was an older edition. However, the primary engine NOx emissions still do not meet the Tier 4i standards of 3.5 g/kw-hr (2.57 g/hp-hr) according to the data in the NOI. When you have free time, we can discuss how you'd like to proceed!

Thank you!

On Thu, May 27, 2021 at 9:31 AM Chase Peterson <CPeterson@trinityconsultants.com> wrote:

> Jake,
>
> As discussed, here is the table that we are using for the EPA Tier rating values. Once you have taken a look at it, and perhaps once your manager has reviewed it, let's chat.
>
> Thanks,
>
> **Chase Peterson**
> Associate Consultant
> Trinity Consultants, Inc.
>
> P 801-272-3000 (ext 324)
> 4525 Wasatch Blvd, Suite 200,
> Salt Lake City, Utah 84124
> Email: CPeterson@trinityconsultants.com

From: Jacob Ries <jries@utah.gov>
Sent: Thursday, May 27, 2021 08:02
To: Chase Peterson <CPeterson@trinityconsultants.com>
Subject: Re: Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal

Hi Chase,

Sorry for the delay in the ER. I have received comments from my manager and I only have a clarification question on one. The BACT analysis for the primary engines states that they will m Tier 4i emission standards, but the emission factors used in calculations do not meet Tier 4i, specifically the NOx. Could you confirm which emission factors are accurate? Feel free to give a call if you have any questions or would like to discuss further!

As for the other comments, I have made the changes and will get the ER to you as soon as this comment has been addressed.

Thank you!

On Wed, May 12, 2021 at 9:58 AM Chase Peterson <CPeterson@trinityconsultants.com> wrote:

> Good morning, Jake,
>
> Thank you very much for getting back to me and letting me know where this project is at. We look forward to receiving the ER.
>
> Thanks,
>
> **Chase Peterson**
> Associate Consultant

Trinity Consultants, Inc.

P 801-272-3000 (ext 324)

4525 Wasatch Blvd, Suite 200,

Salt Lake City, Utah 84124

Email: CPeterson@trinityconsultants.com

From: Jacob Ries <jries@utah.gov>
Sent: Tuesday, May 11, 2021 16:26
To: Chase Peterson <CPeterson@trinityconsultants.com>
Cc: Brian Mensinger <bmensinger@trinityconsultants.com>; Lee Ware <Lee.Ware@kilgorecompanies.com>
Subject: Re: Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal

Hi Chase,

I apologize for the delay as I had to take more than a week away from work. The ER is nearing the end of internal reviews, but Alan has the day off tomorrow. I am expecting to have the ER with you next week hopefully, depending on the manager review. Please let me know if you have any questions.

Thank you!

On Tue, May 11, 2021 at 4:01 PM Chase Peterson <CPeterson@trinityconsultants.com> wrote:

> Good afternoon, Jake,
>
> Just want to touch base with you on this project and see where things are at for the application process of Kilgore's Erda Pit.
>
> Thanks very much,
>
> **Chase Peterson**
>
> Associate Consultant
>
> Trinity Consultants, Inc.
>
> P 801-272-3000 (ext 324)
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> 4525 Wasatch Blvd, Suite 200,
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> Salt Lake City, Utah 84124
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> Email: CPeterson@trinityconsultants.com
>
> 
>
>
> ---
>
> **From:** Chase Peterson
> **Sent:** Wednesday, March 17, 2021 12:08
> **To:** Jacob Ries <jries@utah.gov>
> **Cc:** Brian Mensinger <bmensinger@trinityconsultants.com>; Lee Ware <Lee.Ware@kilgorecompanies.com>
> **Subject:** RE: Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal
>
> Good afternoon, Jake,
>
> Please see the attached memorandum addressing your question regarding the emergency generator at Kilgore's Erda Pit. Please let me know if you have any questions.
>
> Thanks very much,
>
> **Chase Peterson**
>
> Associate Consultant

Trinity Consultants, Inc.

P 801-272-3000 (ext 324)

4525 Wasatch Blvd, Suite 200,

Salt Lake City, Utah 84124

Email: CPeterson@trinityconsultants.com

From: Jacob Ries <jries@utah.gov>
Sent: Thursday, March 11, 2021 08:46
To: Chase Peterson <CPeterson@trinityconsultants.com>
Cc: Brian Mensinger <bmensinger@trinityconsultants.com>; Lee Ware <Lee.Ware@kilgorecompanies.com>
Subject: Re: Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal

Good morning Chase,

Alan has approved of beginning the review process without Dave's complete review, so the ER is currently with my peer for review. There is one thing I want to confirm with you about engines. The BACT analysis and Form 3 state that there is a 450 HP backup generator, but it is not listed anywhere else (calculations, form 11, modeling memo, etc.). Has this engine been removed from the project?

Please let me know if you have any questions!

Thank you!

On Wed, Mar 10, 2021 at 9:46 AM Chase Peterson <CPeterson@trinityconsultants.com> wrote:

> Good morning, Jake,
>
> Just wanting to touch base with you regarding the progress and status of Kilgore Companies' Erda Pit project. We are hoping to receive the Engineering Review as soon as possible; has your peer been able to review it? Did Alan approve of sending it over for our review prior to Dave's complete review of the NO_2 model? As you know, we would l to expedite the permitting process as much as possible, and we appreciate your assistance in this effort.
>
> Thanks very much,
>
> **Chase Peterson**
>
> Associate Consultant
>
> Trinity Consultants, Inc.
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> P 801-272-3000 (ext 324)
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> 4525 Wasatch Blvd, Suite 200,
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> Salt Lake City, Utah 84124
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> Email: CPeterson@trinityconsultants.com
>
> 
>
> ---
>
> **From:** Chase Peterson
> **Sent:** Monday, February 15, 2021 10:49
> **To:** Jacob Ries <jries@utah.gov>
> **Cc:** Brian Mensinger <bmensinger@trinityconsultants.com>; Lee Ware <Lee.Ware@kilgorecompanies.com>
> **Subject:** RE: Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal
>
> Good morning, Jake,
>
> Thank you for getting back to me last week about the status of Kilgore Companies' (Kilgore's) Erda Pit project. We would like to request that the Engineering Review (ER) be s back to us and to Kilgore prior to Dave Prey's complete review of the NO_2 model. Although it may not be conventional, this has been the precedent that Trinity has developed with UDAQ in situations where we have coordinated expedited review. We would ask that you refer to Alan Humpherys to inquire as to whether this is an acceptable format. I

understood that the ER is a preliminary draft until Dave Prey completes his modeling review, but receiving it early will allow both Kilgore and Trinity to expedite the permitting process.

Thank you very much for your consideration.

All the best,

Chase Peterson

Associate Consultant

Trinity Consultants, Inc.

P 801-272-3000 (ext 324)

4525 Wasatch Blvd, Suite 200,

Salt Lake City, Utah 84124

Email: CPeterson@trinityconsultants.com

From: Jacob Ries <jries@utah.gov>
Sent: Thursday, February 11, 2021 14:40
To: Chase Peterson <CPeterson@trinityconsultants.com>
Cc: Brian Mensinger <bmensinger@trinityconsultants.com>; Lee Ware <Lee.Ware@kilgorecompanies.com>
Subject: Re: Kilgore Companies' Erda Pit - NO2 Modeling Report Submittal

Hi Chase,

Thank you for getting this sent over! I have been working on the ER and it is almost ready to be sent for internal reviews. I will have to wait for Dave to review the model before I se to my peer, but once that is done, the process should move forward quickly depending on feedback from internal reviews. I will keep you updated when I move this forward! Please let me know if you have any questions in the meantime.

Thank you!

On Wed, Feb 3, 2021 at 2:22 PM Chase Peterson <CPeterson@trinityconsultants.com> wrote:

> Good afternoon, Jake,
>
> As requested by the Utah Division of Air Quality following the submittal of a Notice of Intent (NOI) air permit application for Kilgore Companies' (Kilgore's) Erda Pit, a model analysis for NO_2 has been completed. Please find Kilgore's Modeling Report for its Erda NO_2 Modeling Project attached to this email. The Modeling Report details both the modeling protocol that was followed for the development of the model as well as the results of the modeling analysis. As demonstrated therein, Kilgore is in compliance with the National Ambient Air Quality Standards for NO_2.
>
> Please let me know whether you have any questions regarding this Modeling Report. We also look forward to receiving your Engineering Review for the initial NOI air permi application.
>
> Dave,
>
> We have also copied you as a follow-up to your request to perform this air dispersion modeling analysis. We will send you a separate email with the modeling files for your review.
>
> Thanks very much,
>
> **Chase Peterson**
>
> Associate Consultant
>
> Trinity Consultants, Inc.
>
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>
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> Salt Lake City, Utah 84124

Email: CPeterson@trinityconsultants.com

--

Jake Ries

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3 attachments

image002.jpg
1K

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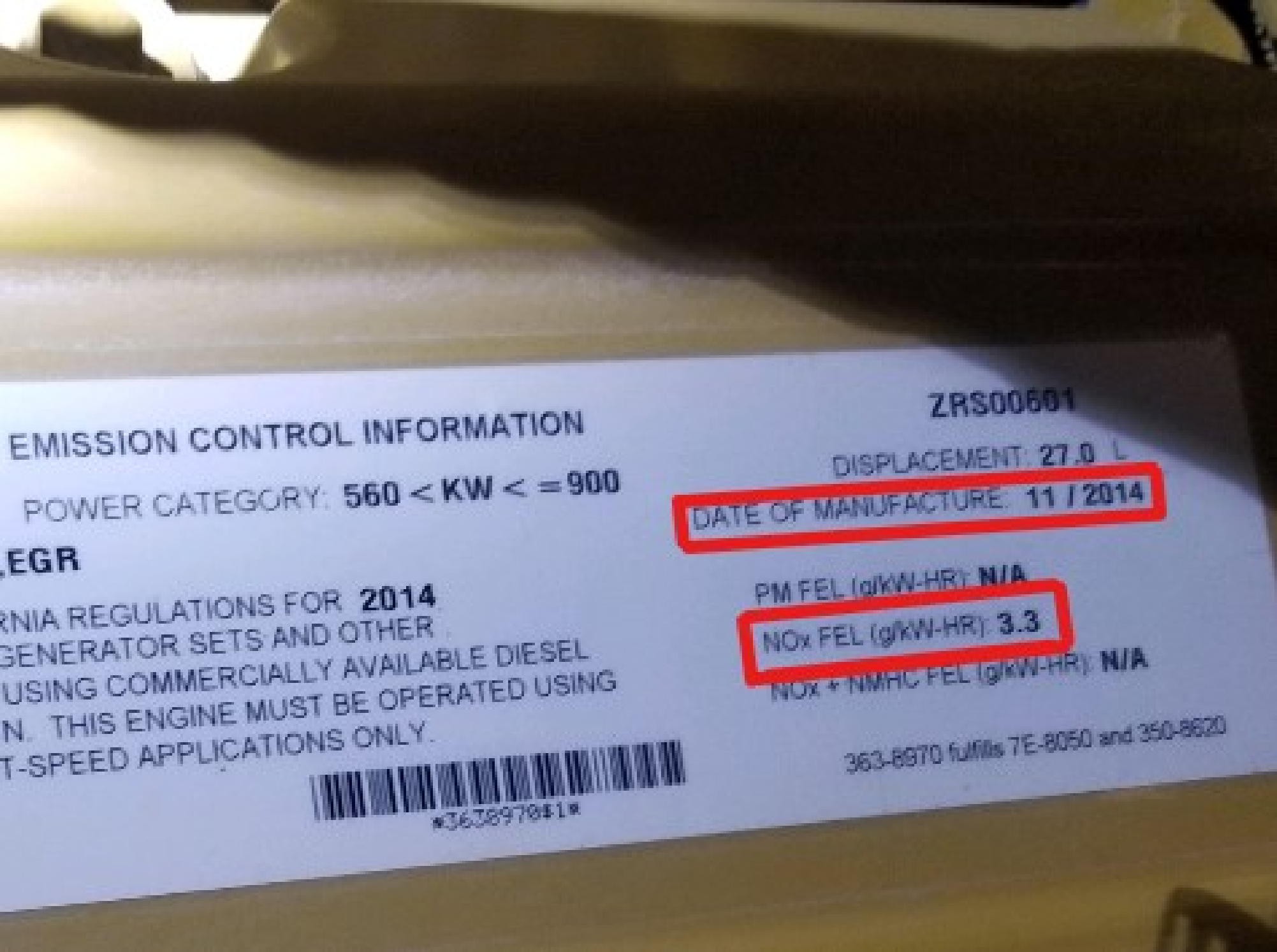
Kilgore Erda - Engine NO2 Emissions and Manufacture Year.pdf
45K


36
Droubay Rd
E 560th N
N 7th St
Ironwood Dr
© 2020 Google
Google Earth
Imagery Date: 6/23/2017 40°38'00.81" N 112°17'15.12" W elev 4363 ft eye alt 10395 ft


EMISSION CONTROL INFORMATION
ZRS00601
POWER CATEGORY: 560 < KW < = 900
DISPLACEMENT: 27.0 L
DATE OF MANUFACTURE: 11 / 2014
EGR
RNIA REGULATIONS FOR 2014
GENERATOR SETS AND OTHER
USING COMMERCIALLY AVAILABLE DIESEL
N. THIS ENGINE MUST BE OPERATED USING
T-SPEED APPLICATIONS ONLY.
PM FEL (g/kW-HR): N/A
NOx FEL (g/kW-HR): 3.3
NOx + NMHC FEL (g/kW-HR): N/A
363-8970 fulfills 7E-8050 and 350-8620
*36J8970*1*

Jacob Ries <jries@utah.gov>

Kilgore Erda Pit - Source Review Document

Lee Ware <Lee.Ware@kilgorecompanies.com> Mon, Jul 26, 2021 at 1:32 PM
To: Jacob Ries <jries@utah.gov>

Jacob,

Thanks again for your willingness and patience to work through the permitting language of this draft permit with us. Please see below the proposes revisions for the consideration of the DAQ.

1. Owner: Kilgore Companies, LLC dba Kilgore Contracting

2. Section II.B.1.a

We would like to request that new language be drafted to address the both processed and unprocessed production, as per meeting discussions.

3. Section II.B.2.b

The owner / operator shall maintain paving of at least 0.42 miles of haul road. The….

Should there be any questions or need for additional clarification, please do not hesitate to reach out to me.

Kindest Regards,

Lee Ware

Environmental Director

Kilgore Companies

801-831-7402

From: Jacob Ries <jries@utah.gov>
Sent: Friday, May 28, 2021 12:42 PM
To: Lee Ware <Lee.Ware@kilgorecompanies.com>
Cc: Chase Peterson <cpeterson@trinityconsultants.com>
Subject: Kilgore Erda Pit - Source Review Document

This message originated from outside your organization

Hi Lee,

I have attached the Source Review Document for your review. Please let me know if you have any questions or comments on the document. If you approve of the document, please sign the first page and send it back to me!

Once the document is approved, I will move forward with generating the Intent to Approve (ITA) document and have it published for a 30-day public comment period. Feel free to reach out with any questions you may have!

Thank you!

--

Jake Ries

Environmental Engineer | Minor NSR Section

P: (385) 306-6530

airquality.utah.gov

State of Utah
SPENCER J. COX
Governor
DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality
Kimberly D. Shelley
Executive Director
DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160180001

July 26, 2021

Lee Ware
Kilgore Companies, LLC dba Kilgore Contracting
7057 W 2100 S
Salt Lake City, UT 84128
lee.ware@kilgorecompanies.com

Dear Lee Ware,

Re: Engineer Review:
New Erda Aggregate Processing Plant
Project Number: N160180001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Kilgore Companies, LLC dba Kilgore Contracting should complete this review within **10 business days** of receipt.

Kilgore Companies, LLC dba Kilgore Contracting should contact **Jake Ries** at (385) 306-6530 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email jries@utah.gov the signed cover letter to Jake Ries. Upon receipt of the signed cover letter, the DAQ will prepare an ITA for a 30-day public comment period. At the completion of the comment period, the DAQ will address any comments and will prepare an AO for signature by the DAQ Director.

If Kilgore Companies, LLC dba Kilgore Contracting does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Kilgore Companies, LLC dba Kilgore Contracting has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____ 07/26/2021
(Signature & Date)

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160180001
Owner Name	Kilgore Companies, LLC dba Kilgore Contracting
Mailing Address	7057 W 2100 S Salt Lake City, UT, 84128
Source Name	Kilgore Companies, LLC- Erda Aggregate Pit
Source Location	5800 North Highway 36 Erda, UT 84074
UTM Projection	391,220 m Easting, 4,499,200 m Northing
UTM Datum	NAD83
UTM Zone	UTM Zone 12
SIC Code	1442 (Construction Sand & Gravel)
Source Contact	Lee Ware
Phone Number	(801) 250-0132 Ext 1412
Email	lee.ware@kilgorecompanies.com
Project Engineer	Jake Ries, Engineer
Phone Number	(385) 306-6530
Email	jries@utah.gov
Notice of Intent (NOI) Submitted	April 24, 2020
Date of Accepted Application	May 27, 2021

SOURCE DESCRIPTION

General Description
Kilgore Companies, LLC (Kilgore) is a full-scale construction materials company that offers paving and construction services, as well as ready-mix concrete and aggregates. Kilgore is proposing to operate an aggregate mining plant with crushing and screening operations at a location near Erda in Tooele County. Emissions are primarily associated with particulate matter and diesel combustion in a variety of generators. Kilgore employs water sprays, chemical suppressant, and Tier IVi engine standards for controlling emissions.

NSR Classification:
New Minor Source

Source Classification
Located in Northern Wasatch Front O3 NAA, Salt Lake City UT $PM_{2.5}$ NAA
Tooele County
Airs Source Size: B

Applicable Federal Standards
NSPS (Part 60), A: General Provisions
NSPS (Part 60), OOO: Standards of Performance for Nonmetallic Mineral Processing Plants
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Title V (Part 70) Area Source

Project Proposal
New Erda Aggregate Processing Plant

Project Description
Kilgore has requested to operate a new aggregate mining plant with crushing and screening operations at a location near Erda in Tooele County. Facility-wide PTE were evaluated based on equipment list and operations.

EMISSION IMPACT ANALYSIS

All criteria pollutants, including fugitive PM_{10}, and all HAP emissions are below the modeling thresholds contained in R307-410-4 and R307-410-5, respectively. Annual and one-hour modeling for NO_2 was completed by the applicant (see memo DAQE-MN160180001-21). The predicted total concentration is 72.3% of the one-hour NAAQS and 5.73% of the annual NAAQS. [Last updated May 27, 2021]

SUMMARY OF EMISSIONS

The emissions listed below are an estimate of the total potential emissions from the source. Some rounding of emissions is possible.

Criteria Pollutant	Change (TPY)	Total (TPY)
CO_2 Equivalent	2100.00	2100.00
Carbon Monoxide	29.02	29.02
Nitrogen Oxides	28.91	28.91
Particulate Matter - PM_{10}	5.78	5.78
Particulate Matter - $PM_{2.5}$	2.21	2.21
Sulfur Dioxide	0.11	0.11
Volatile Organic Compounds	3.31	3.31

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Benzene (Including Benzene From Gasoline) (CAS #71432)	20	20
Generic HAPs (CAS #GHAPS)	20	20
	Change (TPY)	**Total (TPY)**
Total HAPs	0.2	0.02

Note: Change in emissions indicates the difference between previous AO and proposed modification.

Review of BACT for New/Modified Emission Units

1. **BACT review regarding Mining and Processing of Aggregate**

Haul Roads:
PM_{10} and $PM_{2.5}$ are emitted as fugitive dust from haul roads. Controls for these emissions include paving with watering and sweeping (95%), chemical suppressants with watering (85%), and watering (70-75%). The site will be developed as time goes on, making the paving of all of the haul and loader roads technically infeasible, however some portions of the haul roads have been paved. Water application and sweeping of haul roads is considered BACT for fugitive emissions from paved roads. Chemical suppressant and water application of haul roads is considered BACT for fugitive emissions from unpaved roads. To ensure watering is adequate, visible emissions from haul roads will not exceed 20% opacity on site and 10% at the property boundary.

Storage Piles
PM_{10} and $PM_{2.5}$ are emitted as fugitive dust from storage piles through pile disturbances and erosion. Storage pile emissions can be controlled through water sprays. Water application to maintain visible emissions at or below 20% on site and 10% at the site boundary is considered BACT for storage piles.

Disturbed Areas
Disturbed areas generate PM_{10} and $PM_{2.5}$ emissions as fugitive dust. Disturbed areas are limited to 3.05 acres of all disturbed areas combined and visible emissions will not exceed 20% opacity on site and 10% at the property boundary.

Conveyor Drop Points:
Water sprays will control the emissions from conveyor drop points. Sprays will operate as needed to reduce visible emissions to 20% opacity or less on site and 10% at the property boundary.

Bulldozing:
Bulldozing generates PM_{10} and $PM_{2.5}$ emissions as material is moved. Bulldozing operations are limited to 4,160 hours per year. Visible emissions from bulldozing will not exceed 20% opacity on site and 10% at the property boundary.

Crushing, Screening, Conveying, and Material Handling Operations.
Crushing, screening, conveyor transfers, and material handling operations generate PM_{10} and $PM_{2.5}$ as material is sized and moved. Potential controls include a baghouse, watering, and best management practices. Due to the low individual PM_{10} emissions from the crushers, screens, transfers, and the material handling, a baghouse is not cost effective. Water sprays are used to reduce PM_{10} and $PM_{2.5}$ emissions by saturating aggregate to prevent dust generation. Best management for these practices includes operating and maintaining on-site equipment in accordance with manufacturer specifications. BACT for these operations is water sprays and best management practices. To ensure watering is adequate, visible emissions from the following emission points will not exceed the follow values:

Crushers - 12% opacity
Screens - 7% opacity
Conveyor Transfer Points - 7% opacity

Storage Tanks
The source will have one fuel storage tank on site. This tank will store ultra-low sulfur diesel (ULSD) fuel to be used by the diesel-fired engines on site. Emissions from the tank are VOC. The

tank will be a fixed-roof storage tank and will approximately emit 0.006 tpy of VOC. Due to the small emissions and minimal throughput anticipated, all control technologies are economically infeasible. The DAQ has determined BACT for the fuel storage tank to be good operating practices and proper maintenance. [Last updated May 27, 2021]

2. **BACT review regarding Diesel-fired Engines**

Diesel-fired Engines

The source will operate two primary diesel-fired engines and one emergency generator engine on site. Emissions from the engines include criteria pollutants and HAPs. Available add-on control technologies include selective catalytic reduction (SCR) for NO_x, diesel fuel particulate filters (DPF) for particulate control, diesel-oxidation catalyst (DOC) for NO_x and CO, and exhaust gas recirculation (EGR) for NO_x. Each engine will be equipped with built-in EGR, DPF, and DOC. The emergency generator engine will also have built-in SCR control technology. Retro-fitting SCR control technology on the primary engines would create backpressure in the exhaust system affecting the performance and effective power output needed for the engines. Retro-fitting SCR control technology is considered technically infeasible for the primary engines.

Each of the 1,207 HP diesel fired engines will be certified to meet tier IV interim emission standards. Each engine will be certified by the respective manufacturer to meet the following emission rates:

1207 HP generator engines:
NO_x g/hp-hr 2.6 g/hp-hr
CO g/hp-hr 2.6 g/hp-hr
PM g/hp-hr 0.075 g/hp-hr
HC g/hp-hr 0.30 g/hp-hr

The 450 HP emergency generator engine will be certified to meet tier IV final emission standards. The engine will be certified by the respective manufacturer to meet the following emission rates:

450 HP emergency generator engine:
NO_x g/hp-hr 0.30 g/hp-hr
CO g/hp-hr 2.6 g/hp-hr
PM g/hp-hr 0.01 g/hp-hr
HC g/hp-hr 0.14 g/hp-hr

The DAQ has determined BACT for each engine to be the following:
1. The emission factors listed above;
2. Use ultra-low sulfur diesel fuel;
3. Conduct manufacturer recommended maintenance and testing; and
4. Limit visible emissions at or below 20% opacity. [Last updated May 27, 2021]

SECTION I: GENERAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

I.1	All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]
I.2	The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
I.3	Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]
I.4	All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of two (2) years. [R307-401-8]
I.5	At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]
I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	The owner/operator shall comply with UAC R307-150 Series. Emission Inventories. [R307-150]
I.8	The owner/operator shall submit documentation of the status of construction or modification to the Director within 18 months from the date of this AO. This AO may become invalid if construction is not commenced within 18 months from the date of this AO or if construction is discontinued for 18 months or more. To ensure proper credit when notifying the Director, send the documentation to the Director, attn.: NSR Section. [R307-401-18]

SECTION II: PERMITTED EQUIPMENT

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.A THE APPROVED EQUIPMENT

II.A.1 NEW	**Erda Aggregate Pit**

II.A.2 NEW	**One (1) Jaw Crusher** Capacity: 400 tons/hour (TPH) NSPS Applicability: Subpart OOO
II.A.3 NEW	**Two (2) Cone Crushers** Capacity: 400 TPH each NSPS Applicability: Subpart OOO
II.A.4 NEW	**One (1) HSI Crusher** Capacity: 400 TPH NSPS Applicability: Subpart OOO
II.A.5 NEW	**One (1) VSI Crusher** Capacity: 400 TPH NSPS Applicability: Subpart OOO
II.A.6 NEW	**One (1) Primary Screen** Capacity: 400 TPH Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.7 NEW	**Two (2) Secondary Screens** Capacity: 400 TPH each Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.8 NEW	**Two (2) Tertiary Screens** Capacity: 400 TPH each Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.9 NEW	**One (1) HF Screen** Capacity: 400 TPH Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.10 NEW	**Two (2) Diesel Fired Generator Engines** Rating: 1,207 HP each Fuel: Ultra Low Sulfur Diesel (ULSD) NSPS Applicability: Subpart IIII MACT Applicability: Subpart ZZZZ
II.A.11 NEW	**One (1) Emergency Generator Engine** Rating: 450 HP Fuel: ULSD NSPS Applicability: Subpart IIII MACT Applicability: Subpart ZZZZ

II.A.12 NEW	**One (1) Diesel Storage Tank** Contents: ULSD Capacity: 21,327 gallons
II.A.13 NEW	**Various Conveyors** NSPS Applicability: Subpart OOO
II.A.14 NEW	**Various Mobile Equipment** Loaders, Haul Trucks, Bulldozer, and Water Trucks

SECTION II: SPECIAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.B REQUIREMENTS AND LIMITATIONS

II.B.1 NEW	**Site-Wide Requirements**
II.B.1.a NEW	The owner/operator shall not produce more than the following: A. 311,850 tons of combined (processed and unprocessed) aggregate per rolling 12-month period B. 297,000 tons of processed aggregate per rolling 12-month period. [R307-401-8]
II.B.1.a.1 NEW	The owner/operator shall: A. Determine production with sales receipts or scale house records B. Record production on a daily basis C. Use the production data to calculate a new rolling 12-month total by the 20th day of each month using data from the previous 12 months. [R307-401-8]
II.B.1.b NEW	Within 30 days of the date of this AO, the owner/operator shall submit a FDCP in electronic or written format. An electronic FDCP can be completed through the Utah DEQ Fugitive Dust Plan Permit Application Website. If a written FDCP is completed, it shall be submitted to the Director, attention: Compliance Branch, for approval. The owner/operator shall comply with the FDCP for control of all fugitive dust sources associated with the Erda Aggregate Pit. [R307-309-6]

II.B.1.c NEW	The owner/operator shall not operate bulldozers on site for more than 4,160 hours combined per rolling 12-month period. [R307-401-8]
II.B.1.c.1 NEW	The owner/operator shall: A. Determine hours of operation with an hour meter on each bulldozer B. Record hours of operation each day for each bulldozer on site C. Use the hours of operation to calculate a new rolling 12-month total by the 20th day of each month using data from the previous 12 months. [R307-401-8]
II.B.1.d NEW	The owner/operator shall install water sprays on each crusher, screen, conveyor transfer point, and conveyor drop point on site to control emissions. Water sprays shall operate as necessary to prevent visible emissions from exceeding the opacity limits listed in this AO. [R307-401-8]
II.B.1.e NEW	The owner/operator shall perform monthly periodic inspections to check that water is flowing to discharge spray nozzles associated with each crusher, screen, and conveyor. If the owner/operator finds that water is not flowing properly during an inspection of the water spray nozzles, the owner/operator shall initiate corrective action within 24 hours and complete corrective action as expediently as practical. [40 CFR 60 Subpart OOO, R307-401-8]
II.B.1.e.1 NEW	Records of the water sprays inspections shall be kept and maintained in a logbook for all periods when the plant is in operation. The records shall include the following items: A. Date the inspections were made B. Any corrective actions taken C. Control mechanism used if sprays are not operating. [40 CFR 60 Subpart OOO, R307-401-8]
II.B.1.f NEW	Visible emissions from the following emission points shall not exceed the following values: A. Crushers - 12% opacity B. Screens - 7% opacity C. All Conveyor Transfer Points - 7% opacity D. All Diesel Engines - 20% opacity E. All Conveyor Drop Points - 20% opacity F. All Other Points - 20% opacity [R307-312-4, R307-401-8]

II.B.1.f.1 NEW	Unless otherwise specified in this AO, opacity observations of emission from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9. [R307-401-8]
II.B.2 NEW	**Haul Roads and Fugitive Dust Sources Requirements**
II.B.2.a NEW	The owner/operator shall not allow visible emissions from any fugitive dust source (including but not limited to haul roads, loader operation areas, stockpiles and exposed areas) to exceed 20% opacity on site and 10% at the property boundary. [R307-309-5]
II.B.2.a.1 NEW	Opacity observations of fugitive dust from intermittent sources shall be conducted according to 40 CFR 60, Appendix A, Method 9; however, the requirement for observations to be made at 15-second intervals over a six-minute period shall not apply. The number of observations and the time period shall be determined by the length of the intermittent source. For fugitive dust generated by mobile sources, visible emissions shall be measured at the densest point of the plume but at a point not less than 1/2 vehicle length behind the vehicle and not less than 1/2 the height of the vehicle. [R307-309-5]
II.B.2.b NEW	The owner/operator shall maintain paving of at least 0.42 miles of the haul road. The haul roads and loader operation areas shall not exceed the following lengths: A. 0.57 miles, measured from the site entrance to the aggregate processing area B. 0.79 miles, measured from the site entrance to the mining area C. 0.01 miles for the loader operation routes [R307-401-8]
II.B.2.b.1 NEW	Compliance shall be determined through GPS measurements or aerial photographs. [R307-401-8]
II.B.2.c NEW	The owner/operator shall apply water to fugitive dust sources, shall apply chemical suppressants to unpaved haul roads, and shall sweep paved haul roads to prevent visible emissions from exceeding the opacity limits listed in this AO. The owner/operator may stop applying water to fugitive dust sources when the temperature is below freezing but shall apply other controls as necessary to prevent visible emissions from exceeding the opacity limits listed in this AO. [R307-401-8]
II.B.2.c.1 NEW	The owner/operator shall keep records of water application and fugitive dust control for all periods when the plant is in operation. The records shall include the following: A. Date and time chemical suppressant or water application was made B. Number of chemical suppressant and water applications made and quantity of water applied C. Records of any other controls used to reduce fugitive dust. [R307-401-8]

II.B.2.d NEW	The owner/operator shall not exceed 8.25 acres of all disturbed areas and storage piles combined. [R307-401-8]
II.B.2.d.1 NEW	To determine compliance with the total disturbed areas and storage piles, the owner/operator shall measure the total disturbed areas and storage piles at least once every 6 months and shall maintain a record of the total disturbed acres and storage piles acres. To determine the disturbed acres and storage pile acres on site, the owner/operator shall use GPS measurements, aerial photographs, or an aerial drone survey of each disturbed area and storage pile on site to calculate each disturbed acre and storage pile acre on site. Records of the total disturbed areas and storage piles shall contain the following: A. Date of measurements B. Size of each disturbed area and storage pile on site C. Total acres of all disturbed areas and storage piles combined. [R307-401-8]
II.B.3 NEW	**Crusher, Screens, and Conveyors Subject to NSPS Subpart OOO Requirements**
II.B.3.a NEW	The owner/operator shall conduct an initial performance test for all crushers, screens, and conveyor transfer points on site within 60 days after achieving the maximum production rate but not later than 180 days after initial startup. Performance tests shall meet the limitations specified in Table 3 to Subpart OOO. Records of initial performance tests shall be kept and maintained on site for the life of the equipment. [40 CFR 60 Subpart OOO]
II.B.3.a.1 NEW	Initial performance tests for fugitive emissions limits shall be conducted according to 40 CFR 60.675(c). The owner/operator may use methods and procedures specified in 40 CFR 60.675(e) as alternatives to the reference methods and procedures specified in 40 CFR 60.675(c). [40 CFR 60 Subpart OOO]
II.B.3.a.2 NEW	The owner/operator shall submit written reports to the Director of the results of all performance tests conducted to demonstrate compliance with the standards set forth in 40 CFR 60.672. [40 CFR 60 Subpart OOO]
II.B.4 NEW	**Diesel-fired Generator Engines Requirements**
II.B.4.a NEW	The owner/operator shall not exceed the following hours of operation A. 4,160 hours of operation per rolling 12-month period for each of the 1,207 HP engines B. 100 hours of operation per rolling 12-month period during non-emergency situations for the 450 HP emergency engine. There is no time limit on the use of this engine during emergencies. [40 CFR 63 Subpart ZZZZ, R307-401-8]

II.B.4.a.1 NEW	To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total by the 20th day of each month using data from the previous 12 months. Records documenting the operation of each engine shall be kept in a log and shall include the following: a. The date the engine was used b. The duration of operation in hours c. For the emergency engine only: The reason for the emergency engine use. [40 CFR 63 Subpart ZZZZ, R307-401-8]
II.B.4.a.2 NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each engine. [40 CFR 63 Subpart ZZZZ, R307-401-8]
II.B.4.b NEW	The owner/operator shall install two (2) 1,207 hp engines that are certified to meet the following emission rates: A. NO_x 2.6 g/hp-hr B. CO 2.6 g/hp-hr C. PM 0.075 g/hp-hr D. VOC 0.30 g/hp-hr [40 CFR 60 Subpart IIII, 40 CFR 63 Subpart ZZZZ, R307-401-8]
II.B.4.c NEW	The owner/operator shall install a 450 hp emergency engine that is certified to meet the following emission rates: A. NO_x 0.3 g/hp-hr B. PM 0.01 g/hp-hr C. VOC 0.14 g/hp-hr [R307-401-8]
II.B.4.c.1 NEW	The owner/operator shall keep a record of the manufacturer's certification for each of the engine's emission rates. Each record shall be kept for the life of the equipment. [R307-401-8]
II.B.5 NEW	**Fuel Requirements**
II.B.5.a NEW	The owner/operator shall only combust diesel fuel that meets the definition of ultra-low sulfur diesel (ULSD), which has a sulfur content of 15 ppm or less. [R307-401-8]
II.B.5.a.1 NEW	To demonstrate compliance with the ULSD fuel requirement, the owner/operator shall maintain records of diesel fuel purchase invoices or obtain certification of sulfur content from the diesel fuel supplier. The diesel fuel purchase invoices shall indicate the diesel fuel meets the ULSD requirements. [R307-401-8]

PERMIT HISTORY

When issued, the approval order shall supersede (if a modification) or will be based on the following documents:

Is Derived From	NOI dated April 24, 2020
Incorporates	Additional Information dated October 13, 2020
Incorporates	Additional Information dated February 3, 2021
Incorporates	Additional Information dated March 17, 2021
Incorporates	MN160180001-21 dated March 23, 2021
Incorporates	Additional Information dated May 27, 2021

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**
Emissions estimates were based of the total aggregate processing of 297,000 tons/year and unprocessed aggregate of 14,850 tons/year.

Crushing, screening, and transfer point emissions for PM_{10} and $PM_{2.5}$ were calculated using emission factors from AP-42 Table 11.19.2-2. Water application was assumed as a control factor in the calculation.

Storage pile emissions were based on emission factors for PM_{10} and $PM_{2.5}$ listed in AP-42 Table 8.19.1-1 and Appendix B.2-2.

Wind erosion PM_{10} and $PM_{2.5}$ emissions were estimated using AP-42 Table 11.9-4 and 13.2.5.3.

Haul road and loader road PM_{10} and $PM_{2.5}$ emissions were calculated AP-42 Table 13.2.2. The calculations included an estimated of 1,450 feet of unpaved road and average vehicle weights for each road. A control percentage of 70% was assumed for water application on haul and loader roads.

Bulldozing operation PM_{10} and $PM_{2.5}$ emissions were estimated through AP-42 Table 11.9-1.

ULSD combustion emissions from the generator engines were calculated using the engine ratings. Tier IVi nonroad compression-ignition engine emission factors were used for NO_x, CO, and PM emissions from the 1,207 HP engines. Tier IVf nonroad compression-ignition engine emission factors were used for NO_x, CO, and PM emissions from the 450 HP emergency generator engine. Emission factors of the other criteria pollutants and HAPs were estimated using AP-42 Section 3.3 and 3.4, Tables 3.3-1 and 3.4-1. [Last updated May 27, 2021]

2. **Comment regarding NSPS and MACT Applicability:**
NSPS 40 CFR 60

Subpart Kb applies to storage vessels with a capacity greater than or equal to 75 cubic meters that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984. This subpart does not apply to storage vessels with a capacity between 75 and 151 cubic meters and storing a liquid with a maximum true vapor pressure less than 15.0 kPa. Kilgore will have a storage tank with a capacity of 81 cubic meters and will store diesel fuel with a tru vapor pressure less than 15.0 kPa. Therefore, Subpart Kb does not apply to the source.

Subpart OOO applies to equipment associated with nonmetallic mineral processing plants. Applicable nonmetallic mineral processing plant equipment includes: crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck or railcar loading station. This applies to this area source. Replaced equipment is subject to this subpart and an initial performance test must be administered. Additionally, Kilgore must submit to record keeping and reporting requirements in 60.676(b) and 60.676(f).

NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006. The stationary engines at this source were manufactured after April 1, 2006; therefore, NSPS Subpart IIII applies to this AO for the stationary diesel-fired engine. Subpart IIII requires engines to meet the emission limits as listed in 40 CFR 60.4204 use diesel fuel in compliance with 40 CFR 80.510, comply with the monitoring requirements of 40 CFR 60.4209, and meet the compliance requirements in 60.4211.

MACT 40 CFR 63

MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. This source will have stationary RICE at an area source of HAP emissions; therefore, MACT Subpart ZZZZ will apply to the stationary engines at this source. Compliance with Subpart ZZZZ is meeting the requirements of Subpart IIII. [Last updated April 13, 2021]

3. **Comment regarding Title V Applicability:**

Title V of the 1990 Clean Air Act (Title V) applies to the following:

1. Any major source
2. Any source subject to a standard, limitation, or other requirement under Section 111 of the Act, Standards of Performance for New Stationary Sources;
3. Any source subject to a standard or other requirement under Section 112 of the Act, Hazardous Air Pollutants.
4. Any Title IV affected source.

This operation is not a major source and is not a Title IV source, but is subject to 40 CFR 60 NSPS Subpart OOO. As a minor source subject to NSPS Subpart OOO, the source is designated as a Title V area source but is exempt from the obligation to submit a Title V permit application per state rule R307-415-5a(3)(c). [Last updated April 13, 2021]

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by EPA to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ/UDAQ	Division of Air Quality
DAQE	This is a document tracking code for internal UDAQ use
EPA	Environmental Protection Agency
FDCP	Fugitive dust control plan
GHG	Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i)
GWP	Global Warming Potential - 40 CFR Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/HR	Pounds per hour
LB/YR	Pounds per year
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM_{10}	Particulate matter less than 10 microns in size
$PM_{2.5}$	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO_2	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
VOC	Volatile organic compounds

State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

RN160180001

July 26, 2021

Lee Ware
Kilgore Companies, LLC dba Kilgore Contracting
7057 W 2100 S
Salt Lake City, UT 84128
lee.ware@kilgorecompanies.com

Dear Lee Ware,

Re: Engineer Review:
New Erda Aggregate Processing Plant
Project Number: N160180001

The DAQ requests a company representative (Title V Responsible Official for enhanced Approval Order application) review and sign the attached Engineer Review (ER). This ER identifies all applicable elements of the New Source Review permitting program. Kilgore Companies, LLC dba Kilgore Contracting should complete this review within **10 business days** of receipt.

Kilgore Companies, LLC dba Kilgore Contracting should contact **Jake Ries** at (385) 306-6530 if there are questions or concerns with the review of the draft permit conditions. Upon resolution of your concerns, please email jries@utah.gov the signed cover letter to Jake Ries. Upon receipt of the signed cover letter, the DAQ will prepare an ITA for a 30-day public comment period. At the completion of the comment period, the DAQ will address any comments and will prepare an AO for signature by the DAQ Director.

If Kilgore Companies, LLC dba Kilgore Contracting does not respond to this letter within **10 business days,** the project will move forward without source concurrence. If Kilgore Companies, LLC dba Kilgore Contracting has concerns that cannot be resolved and the project becomes stagnant, the DAQ Director may issue an Order prohibiting construction.

Approval Signature _____
(Signature & Date)

UTAH DIVISION OF AIR QUALITY
ENGINEER REVIEW

SOURCE INFORMATION

Project Number	N160180001
Owner Name	Kilgore Companies, LLC dba Kilgore Contracting
Mailing Address	7057 W 2100 S Salt Lake City, UT, 84128
Source Name	Kilgore Companies, LLC- Erda Aggregate Pit
Source Location	5800 North Highway 36 Erda, UT 84074
UTM Projection	391,220 m Easting, 4,499,200 m Northing
UTM Datum	NAD83
UTM Zone	UTM Zone 12
SIC Code	1442 (Construction Sand & Gravel)
Source Contact	Lee Ware
Phone Number	(801) 250-0132 Ext 1412
Email	lee.ware@kilgorecompanies.com
Project Engineer	Jake Ries, Engineer
Phone Number	(385) 306-6530
Email	jries@utah.gov
Notice of Intent (NOI) Submitted	April 24, 2020
Date of Accepted Application	May 27, 2021

SOURCE DESCRIPTION

General Description
Kilgore Companies, LLC (Kilgore) is a full-scale construction materials company that offers paving and construction services, as well as ready-mix concrete and aggregates. Kilgore is proposing to operate an aggregate mining plant with crushing and screening operations at a location near Erda in Tooele County. Emissions are primarily associated with particulate matter and diesel combustion in a variety of generators. Kilgore employs water sprays, chemical suppressant, and Tier IVi engine standards for controlling emissions.

NSR Classification:
New Minor Source

Source Classification
Located in Northern Wasatch Front O3 NAA, Salt Lake City UT $PM_{2.5}$ NAA
Tooele County
Airs Source Size: B

Applicable Federal Standards
NSPS (Part 60), A: General Provisions
NSPS (Part 60), OOO: Standards of Performance for Nonmetallic Mineral Processing Plants
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Title V (Part 70) Area Source

Project Proposal
New Erda Aggregate Processing Plant

Project Description
Kilgore has requested to operate a new aggregate mining plant with crushing and screening operations at a location near Erda in Tooele County. Facility-wide PTE were evaluated based on equipment list and operations.

EMISSION IMPACT ANALYSIS

All criteria pollutants, including fugitive PM_{10}, and all HAP emissions are below the modeling thresholds contained in R307-410-4 and R307-410-5, respectively. Annual and one-hour modeling for NO_2 was completed by the applicant (see memo DAQE-MN160180001-21). The predicted total concentration is 72.3% of the one-hour NAAQS and 5.73% of the annual NAAQS. [Last updated May 27, 2021]

SUMMARY OF EMISSIONS

The emissions listed below are an estimate of the total potential emissions from the source. Some rounding of emissions is possible.

Criteria Pollutant	Change (TPY)	Total (TPY)
CO_2 Equivalent	2100.00	2100.00
Carbon Monoxide	29.02	29.02
Nitrogen Oxides	28.91	28.91
Particulate Matter - PM_{10}	5.78	5.78
Particulate Matter - $PM_{2.5}$	2.21	2.21
Sulfur Dioxide	0.11	0.11
Volatile Organic Compounds	3.31	3.31

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Benzene (Including Benzene From Gasoline) (CAS #71432)	20	20
Generic HAPs (CAS #GHAPS)	20	20
	Change (TPY)	**Total (TPY)**
Total HAPs	0.2	0.02

Note: Change in emissions indicates the difference between previous AO and proposed modification.

Review of BACT for New/Modified Emission Units

1. **BACT review regarding Mining and Processing of Aggregate**

Haul Roads:
PM_{10} and $PM_{2.5}$ are emitted as fugitive dust from haul roads. Controls for these emissions include paving with watering and sweeping (95%), chemical suppressants with watering (85%), and watering (70-75%). The site will be developed as time goes on, making the paving of all of the haul and loader roads technically infeasible, however some portions of the haul roads have been paved. Water application and sweeping of haul roads is considered BACT for fugitive emissions from paved roads. Chemical suppressant and water application of haul roads is considered BACT for fugitive emissions from unpaved roads. To ensure watering is adequate, visible emissions from haul roads will not exceed 20% opacity on site and 10% at the property boundary.

Storage Piles
PM_{10} and $PM_{2.5}$ are emitted as fugitive dust from storage piles through pile disturbances and erosion. Storage pile emissions can be controlled through water sprays. Water application to maintain visible emissions at or below 20% on site and 10% at the site boundary is considered BACT for storage piles.

Disturbed Areas
Disturbed areas generate PM_{10} and $PM_{2.5}$ emissions as fugitive dust. Disturbed areas are limited to 3.05 acres of all disturbed areas combined and visible emissions will not exceed 20% opacity on site and 10% at the property boundary.

Conveyor Drop Points:
Water sprays will control the emissions from conveyor drop points. Sprays will operate as needed to reduce visible emissions to 20% opacity or less on site and 10% at the property boundary.

Bulldozing:
Bulldozing generates PM_{10} and $PM_{2.5}$ emissions as material is moved. Bulldozing operations are limited to 4,160 hours per year. Visible emissions from bulldozing will not exceed 20% opacity on site and 10% at the property boundary.

Crushing, Screening, Conveying, and Material Handling Operations.
Crushing, screening, conveyor transfers, and material handling operations generate PM_{10} and $PM_{2.5}$ as material is sized and moved. Potential controls include a baghouse, watering, and best management practices. Due to the low individual PM_{10} emissions from the crushers, screens, transfers, and the material handling, a baghouse is not cost effective. Water sprays are used to reduce PM_{10} and $PM_{2.5}$ emissions by saturating aggregate to prevent dust generation. Best management for these practices includes operating and maintaining on-site equipment in accordance with manufacturer specifications. BACT for these operations is water sprays and best management practices. To ensure watering is adequate, visible emissions from the following emission points will not exceed the follow values:

Crushers - 12% opacity
Screens - 7% opacity
Conveyor Transfer Points - 7% opacity

Storage Tanks
The source will have one fuel storage tank on site. This tank will store ultra-low sulfur diesel (ULSD) fuel to be used by the diesel-fired engines on site. Emissions from the tank are VOC. The

tank will be a fixed-roof storage tank and will approximately emit 0.006 tpy of VOC. Due to the small emissions and minimal throughput anticipated, all control technologies are economically infeasible. The DAQ has determined BACT for the fuel storage tank to be good operating practices and proper maintenance. [Last updated May 27, 2021]

2. **BACT review regarding Diesel-fired Engines**

Diesel-fired Engines

The source will operate two primary diesel-fired engines and one emergency generator engine on site. Emissions from the engines include criteria pollutants and HAPs. Available add-on control technologies include selective catalytic reduction (SCR) for NO_x, diesel fuel particulate filters (DPF) for particulate control, diesel-oxidation catalyst (DOC) for NO_x and CO, and exhaust gas recirculation (EGR) for NO_x. Each engine will be equipped with built-in EGR, DPF, and DOC. The emergency generator engine will also have built-in SCR control technology. Retro-fitting SCR control technology on the primary engines would create backpressure in the exhaust system affecting the performance and effective power output needed for the engines. Retro-fitting SCR control technology is considered technically infeasible for the primary engines.

Each of the 1,207 HP diesel fired engines will be certified to meet tier IV interim emission standards. Each engine will be certified by the respective manufacturer to meet the following emission rates:

1207 HP generator engines:
NO_x g/hp-hr 2.6 g/hp-hr
CO g/hp-hr 2.6 g/hp-hr
PM g/hp-hr 0.075 g/hp-hr
HC g/hp-hr 0.30 g/hp-hr

The 450 HP emergency generator engine will be certified to meet tier IV final emission standards. The engine will be certified by the respective manufacturer to meet the following emission rates:

450 HP emergency generator engine:
NO_x g/hp-hr 0.30 g/hp-hr
CO g/hp-hr 2.6 g/hp-hr
PM g/hp-hr 0.01 g/hp-hr
HC g/hp-hr 0.14 g/hp-hr

The DAQ has determined BACT for each engine to be the following:
1. The emission factors listed above;
2. Use ultra-low sulfur diesel fuel;
3. Conduct manufacturer recommended maintenance and testing; and
4. Limit visible emissions at or below 20% opacity. [Last updated May 27, 2021]

SECTION I: GENERAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

I.1	All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]
I.2	The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
I.3	Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]
I.4	All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of two (2) years. [R307-401-8]
I.5	At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]
I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	The owner/operator shall comply with UAC R307-150 Series. Emission Inventories. [R307-150]
I.8	The owner/operator shall submit documentation of the status of construction or modification to the Director within 18 months from the date of this AO. This AO may become invalid if construction is not commenced within 18 months from the date of this AO or if construction is discontinued for 18 months or more. To ensure proper credit when notifying the Director, send the documentation to the Director, attn.: NSR Section. [R307-401-18]

SECTION II: PERMITTED EQUIPMENT

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.A THE APPROVED EQUIPMENT

II.A.1 NEW	**Erda Aggregate Pit**

II.A.2 NEW	**One (1) Jaw Crusher** Capacity: 400 tons/hour (TPH) NSPS Applicability: Subpart OOO
II.A.3 NEW	**Two (2) Cone Crushers** Capacity: 400 TPH each NSPS Applicability: Subpart OOO
II.A.4 NEW	**One (1) HSI Crusher** Capacity: 400 TPH NSPS Applicability: Subpart OOO
II.A.5 NEW	**One (1) VSI Crusher** Capacity: 400 TPH NSPS Applicability: Subpart OOO
II.A.6 NEW	**One (1) Primary Screen** Capacity: 400 TPH Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.7 NEW	**Two (2) Secondary Screens** Capacity: 400 TPH each Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.8 NEW	**Two (2) Tertiary Screens** Capacity: 400 TPH each Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.9 NEW	**One (1) HF Screen** Capacity: 400 TPH Size: 8' x 20' NSPS Applicability: Subpart OOO
II.A.10 NEW	**Two (2) Diesel Fired Generator Engines** Rating: 1,207 HP each Fuel: Ultra Low Sulfur Diesel (ULSD) NSPS Applicability: Subpart IIII MACT Applicability: Subpart ZZZZ
II.A.11 NEW	**One (1) Emergency Generator Engine** Rating: 450 HP Fuel: ULSD NSPS Applicability: Subpart IIII MACT Applicability: Subpart ZZZZ

II.A.12 NEW	**One (1) Diesel Storage Tank** Contents: ULSD Capacity: 21,327 gallons
II.A.13 NEW	**Various Conveyors** NSPS Applicability: Subpart OOO
II.A.14 NEW	**Various Mobile Equipment** Loaders, Haul Trucks, Bulldozer, and Water Trucks

SECTION II: SPECIAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO. **(New or Modified conditions are indicated as "New" in the Outline Label):**

II.B REQUIREMENTS AND LIMITATIONS

II.B.1 NEW	**Site-Wide Requirements**
II.B.1.a NEW	The owner/operator shall not produce more than the following: A. 311,850 tons of combined (processed and unprocessed) aggregate per rolling 12-month period B. 297,000 tons of processed aggregate per rolling 12-month period. [R307-401-8]
II.B.1.a.1 NEW	The owner/operator shall: A. Determine production with sales receipts or scale house records B. Record production on a daily basis C. Use the production data to calculate a new rolling 12-month total by the 20th day of each month using data from the previous 12 months. [R307-401-8]
II.B.1.b NEW	Within 30 days of the date of this AO, the owner/operator shall submit a FDCP in electronic or written format. An electronic FDCP can be completed through the Utah DEQ Fugitive Dust Plan Permit Application Website. If a written FDCP is completed, it shall be submitted to the Director, attention: Compliance Branch, for approval. The owner/operator shall comply with the FDCP for control of all fugitive dust sources associated with the Erda Aggregate Pit. [R307-309-6]

II.B.1.c NEW	The owner/operator shall not operate bulldozers on site for more than 4,160 hours combined per rolling 12-month period. [R307-401-8]
II.B.1.c.1 NEW	The owner/operator shall: A. Determine hours of operation with an hour meter on each bulldozer B. Record hours of operation each day for each bulldozer on site C. Use the hours of operation to calculate a new rolling 12-month total by the 20th day of each month using data from the previous 12 months. [R307-401-8]
II.B.1.d NEW	The owner/operator shall install water sprays on each crusher, screen, conveyor transfer point, and conveyor drop point on site to control emissions. Water sprays shall operate as necessary to prevent visible emissions from exceeding the opacity limits listed in this AO. [R307-401-8]
II.B.1.e NEW	The owner/operator shall perform monthly periodic inspections to check that water is flowing to discharge spray nozzles associated with each crusher, screen, and conveyor. If the owner/operator finds that water is not flowing properly during an inspection of the water spray nozzles, the owner/operator shall initiate corrective action within 24 hours and complete corrective action as expediently as practical. [40 CFR 60 Subpart OOO, R307-401-8]
II.B.1.e.1 NEW	Records of the water sprays inspections shall be kept and maintained in a logbook for all periods when the plant is in operation. The records shall include the following items: A. Date the inspections were made B. Any corrective actions taken C. Control mechanism used if sprays are not operating. [40 CFR 60 Subpart OOO, R307-401-8]
II.B.1.f NEW	Visible emissions from the following emission points shall not exceed the following values: A. Crushers - 12% opacity B. Screens - 7% opacity C. All Conveyor Transfer Points - 7% opacity D. All Diesel Engines - 20% opacity E. All Conveyor Drop Points - 20% opacity F. All Other Points - 20% opacity [R307-312-4, R307-401-8]

II.B.1.f.1 NEW	Unless otherwise specified in this AO, opacity observations of emission from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9. [R307-401-8]
II.B.2 NEW	**Haul Roads and Fugitive Dust Sources Requirements**
II.B.2.a NEW	The owner/operator shall not allow visible emissions from any fugitive dust source (including but not limited to haul roads, loader operation areas, stockpiles and exposed areas) to exceed 20% opacity on site and 10% at the property boundary. [R307-309-5]
II.B.2.a.1 NEW	Opacity observations of fugitive dust from intermittent sources shall be conducted according to 40 CFR 60, Appendix A, Method 9; however, the requirement for observations to be made at 15-second intervals over a six-minute period shall not apply. The number of observations and the time period shall be determined by the length of the intermittent source. For fugitive dust generated by mobile sources, visible emissions shall be measured at the densest point of the plume but at a point not less than 1/2 vehicle length behind the vehicle and not less than 1/2 the height of the vehicle. [R307-309-5]
II.B.2.b NEW	The owner/operator shall maintain paving of at least 0.42 miles of the haul road. The haul roads and loader operation areas shall not exceed the following lengths: A. 0.57 miles, measured from the site entrance to the aggregate processing area B. 0.79 miles, measured from the site entrance to the mining area C. 0.01 miles for the loader operation routes [R307-401-8]
II.B.2.b.1 NEW	Compliance shall be determined through GPS measurements or aerial photographs. [R307-401-8]
II.B.2.c NEW	The owner/operator shall apply water to fugitive dust sources, shall apply chemical suppressants to unpaved haul roads, and shall sweep paved haul roads to prevent visible emissions from exceeding the opacity limits listed in this AO. The owner/operator may stop applying water to fugitive dust sources when the temperature is below freezing but shall apply other controls as necessary to prevent visible emissions from exceeding the opacity limits listed in this AO. [R307-401-8]
II.B.2.c.1 NEW	The owner/operator shall keep records of water application and fugitive dust control for all periods when the plant is in operation. The records shall include the following: A. Date and time chemical suppressant or water application was made B. Number of chemical suppressant and water applications made and quantity of water applied C. Records of any other controls used to reduce fugitive dust. [R307-401-8]

II.B.2.d NEW	The owner/operator shall not exceed 8.25 acres of all disturbed areas and storage piles combined. [R307-401-8]
II.B.2.d.1 NEW	To determine compliance with the total disturbed areas and storage piles, the owner/operator shall measure the total disturbed areas and storage piles at least once every 6 months and shall maintain a record of the total disturbed acres and storage piles acres. To determine the disturbed acres and storage pile acres on site, the owner/operator shall use GPS measurements, aerial photographs, or an aerial drone survey of each disturbed area and storage pile on site to calculate each disturbed acre and storage pile acre on site. Records of the total disturbed areas and storage piles shall contain the following: A. Date of measurements B. Size of each disturbed area and storage pile on site C. Total acres of all disturbed areas and storage piles combined. [R307-401-8]
II.B.3 NEW	**Crusher, Screens, and Conveyors Subject to NSPS Subpart OOO Requirements**
II.B.3.a NEW	The owner/operator shall conduct an initial performance test for all crushers, screens, and conveyor transfer points on site within 60 days after achieving the maximum production rate but not later than 180 days after initial startup. Performance tests shall meet the limitations specified in Table 3 to Subpart OOO. Records of initial performance tests shall be kept and maintained on site for the life of the equipment. [40 CFR 60 Subpart OOO]
II.B.3.a.1 NEW	Initial performance tests for fugitive emissions limits shall be conducted according to 40 CFR 60.675(c). The owner/operator may use methods and procedures specified in 40 CFR 60.675(e) as alternatives to the reference methods and procedures specified in 40 CFR 60.675(c). [40 CFR 60 Subpart OOO]
II.B.3.a.2 NEW	The owner/operator shall submit written reports to the Director of the results of all performance tests conducted to demonstrate compliance with the standards set forth in 40 CFR 60.672. [40 CFR 60 Subpart OOO]
II.B.4 NEW	**Diesel-fired Generator Engines Requirements**
II.B.4.a NEW	The owner/operator shall not exceed the following hours of operation A. 4,160 hours of operation per rolling 12-month period for each of the 1,207 HP engines B. 100 hours of operation per rolling 12-month period during non-emergency situations for the 450 HP emergency engine. There is no time limit on the use of this engine during emergencies. [40 CFR 63 Subpart ZZZZ, R307-401-8]

II.B.4.a.1 NEW	To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total by the 20th day of each month using data from the previous 12 months. Records documenting the operation of each engine shall be kept in a log and shall include the following: a. The date the engine was used b. The duration of operation in hours c. For the emergency engine only: The reason for the emergency engine use. [40 CFR 63 Subpart ZZZZ, R307-401-8]
II.B.4.a.2 NEW	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each engine. [40 CFR 63 Subpart ZZZZ, R307-401-8]
II.B.4.b NEW	The owner/operator shall install two (2) 1,207 hp engines that are certified to meet the following emission rates: A. NO_x 2.6 g/hp-hr B. CO 2.6 g/hp-hr C. PM 0.075 g/hp-hr D. VOC 0.30 g/hp-hr [40 CFR 60 Subpart IIII, 40 CFR 63 Subpart ZZZZ, R307-401-8]
II.B.4.c NEW	The owner/operator shall install a 450 hp emergency engine that is certified to meet the following emission rates: A. NO_x 0.3 g/hp-hr B. PM 0.01 g/hp-hr C. VOC 0.14 g/hp-hr [R307-401-8]
II.B.4.c.1 NEW	The owner/operator shall keep a record of the manufacturer's certification for each of the engine's emission rates. Each record shall be kept for the life of the equipment. [R307-401-8]
II.B.5 NEW	**Fuel Requirements**
II.B.5.a NEW	The owner/operator shall only combust diesel fuel that meets the definition of ultra-low sulfur diesel (ULSD), which has a sulfur content of 15 ppm or less. [R307-401-8]
II.B.5.a.1 NEW	To demonstrate compliance with the ULSD fuel requirement, the owner/operator shall maintain records of diesel fuel purchase invoices or obtain certification of sulfur content from the diesel fuel supplier. The diesel fuel purchase invoices shall indicate the diesel fuel meets the ULSD requirements. [R307-401-8]

PERMIT HISTORY

When issued, the approval order shall supersede (if a modification) or will be based on the following documents:

Is Derived From	NOI dated April 24, 2020
Incorporates	Additional Information dated October 13, 2020
Incorporates	Additional Information dated February 3, 2021
Incorporates	Additional Information dated March 17, 2021
Incorporates	MN160180001-21 dated March 23, 2021
Incorporates	Additional Information dated May 27, 2021

REVIEWER COMMENTS

1. **Comment regarding Emission Estimates:**
Emissions estimates were based of the total aggregate processing of 297,000 tons/year and unprocessed aggregate of 14,850 tons/year.

Crushing, screening, and transfer point emissions for PM_{10} and $PM_{2.5}$ were calculated using emission factors from AP-42 Table 11.19.2-2. Water application was assumed as a control factor in the calculation.

Storage pile emissions were based on emission factors for PM_{10} and $PM_{2.5}$ listed in AP-42 Table 8.19.1-1 and Appendix B.2-2.

Wind erosion PM_{10} and $PM_{2.5}$ emissions were estimated using AP-42 Table 11.9-4 and 13.2.5.3.

Haul road and loader road PM_{10} and $PM_{2.5}$ emissions were calculated AP-42 Table 13.2.2. The calculations included an estimated of 1,450 feet of unpaved road and average vehicle weights for each road. A control percentage of 70% was assumed for water application on haul and loader roads.

Bulldozing operation PM_{10} and $PM_{2.5}$ emissions were estimated through AP-42 Table 11.9-1.

ULSD combustion emissions from the generator engines were calculated using the engine ratings. Tier IVi nonroad compression-ignition engine emission factors were used for NO_x, CO, and PM emissions from the 1,207 HP engines. Tier IVf nonroad compression-ignition engine emission factors were used for NO_x, CO, and PM emissions from the 450 HP emergency generator engine. Emission factors of the other criteria pollutants and HAPs were estimated using AP-42 Section 3.3 and 3.4, Tables 3.3-1 and 3.4-1. [Last updated May 27, 2021]

2. **Comment regarding NSPS and MACT Applicability:**
NSPS 40 CFR 60

Subpart Kb applies to storage vessels with a capacity greater than or equal to 75 cubic meters that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984. This subpart does not apply to storage vessels with a capacity between 75 and 151 cubic meters and storing a liquid with a maximum true vapor pressure less than 15.0 kPa. Kilgore will have a storage tank with a capacity of 81 cubic meters and will store diesel fuel with a tru vapor pressure less than 15.0 kPa. Therefore, Subpart Kb does not apply to the source.

Subpart OOO applies to equipment associated with nonmetallic mineral processing plants. Applicable nonmetallic mineral processing plant equipment includes: crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck or railcar loading station. This applies to this area source. Replaced equipment is subject to this subpart and an initial performance test must be administered. Additionally, Kilgore must submit to record keeping and reporting requirements in 60.676(b) and 60.676(f).

NSPS Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006. The stationary engines at this source were manufactured after April 1, 2006; therefore, NSPS Subpart IIII applies to this AO for the stationary diesel-fired engine. Subpart IIII requires engines to meet the emission limits as listed in 40 CFR 60.4204 use diesel fuel in compliance with 40 CFR 80.510, comply with the monitoring requirements of 40 CFR 60.4209, and meet the compliance requirements in 60.4211.

MACT 40 CFR 63

MACT Subpart ZZZZ applies to owners and operators of stationary RICE at a major or area source of HAP emissions. This source will have stationary RICE at an area source of HAP emissions; therefore, MACT Subpart ZZZZ will apply to the stationary engines at this source. Compliance with Subpart ZZZZ is meeting the requirements of Subpart IIII. [Last updated April 13, 2021]

3. **Comment regarding Title V Applicability:**

Title V of the 1990 Clean Air Act (Title V) applies to the following:

1. Any major source
2. Any source subject to a standard, limitation, or other requirement under Section 111 of the Act, Standards of Performance for New Stationary Sources;
3. Any source subject to a standard or other requirement under Section 112 of the Act, Hazardous Air Pollutants.
4. Any Title IV affected source.

This operation is not a major source and is not a Title IV source, but is subject to 40 CFR 60 NSPS Subpart OOO. As a minor source subject to NSPS Subpart OOO, the source is designated as a Title V area source but is exempt from the obligation to submit a Title V permit application per state rule R307-415-5a(3)(c). [Last updated April 13, 2021]

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by EPA to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ/UDAQ	Division of Air Quality
DAQE	This is a document tracking code for internal UDAQ use
EPA	Environmental Protection Agency
FDCP	Fugitive dust control plan
GHG	Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i)
GWP	Global Warming Potential - 40 CFR Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/HR	Pounds per hour
LB/YR	Pounds per year
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM_{10}	Particulate matter less than 10 microns in size
$PM_{2.5}$	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO_2	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
VOC	Volatile organic compounds

State of Utah

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Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQE-MN160180001-21

M E M O R A N D U M

TO: Jake Ries, NSR Engineer JR

FROM: Dave Prey, Air Quality Modeler DP

DATE: March 19, 2021

SUBJECT: Modeling Analysis Review for the Notice of Intent for Kilgore Companies – Erda Pit, Tooele County, Utah

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This is not a Major Prevention of Significant Deterioration (PSD) Source.

I. OBJECTIVE

Kilgore Companies (Applicant) is seeking a new approval order for their Erda Pit located in Tooele County, Utah.

This report, prepared by the Staff of the New Source Review Section (NSR), contains a review of the air quality impact analysis (AQIA) including the information, data, assumptions and modeling results used to determine if the facility would be in compliance with State and Federal concentration standards.

II. APPLICABLE RULE(S)

Utah Air Quality Rules:

R307-401-6	Condition for Issuing an Approval Order
R307-410-3	Use of Dispersion Models
R307-410-4	Modeling of Criteria Pollutants in Attainment Areas

III. MODELING METHODOLOGY

A. Applicability

Emissions from the facility include PM_{10}, NO_x, CO, SO_2, and HAPs. This modeling is part of a modified approval order. The emission rate for NO_x warranted a modeling review to demonstrate compliance with the one-hour NO_2 NAAQS. Modeling was performed by the Applicant.

B. Assumptions

1. Topography/Terrain

The Plant is at an elevation 4354 feet with terrain features that have an affect on concentration predictions.

a. Zone: 12

b. Approximate Location:

UTM (NAD83): 391278 meters East
4499146 meters North

2. Urban or Rural Area Designation

After a review of the appropriate 7.5 minute quadrangles, it was concluded the area is "rural" for air modeling purposes.

3. Ambient Air

It was determined the Plant boundary used in the AQIA meets the State's definition of ambient air.

4. Building Downwash

The source was modeled with the AERMOD model. All structures at the plant were used in the model to account for their influence on downwash.

5. Meteorology

Five (5) years of off-site surface and upper air data were used in the analysis consisting of the following:

Surface – Salt Lake Airport, UT NWS: 2008-2012
Upper Air – Salt Lake Airport, UT NWS: 2008-2012

6. Background

The background concentrations were based on concentrations measured in Erda, Utah.

7. Receptor and Terrain Elevations

The modeling domain used by the Applicant consisted of receptors including property boundary receptors. This area of the state contains mountainous terrain and the modeling domain has simple and complex terrain features in the near and far fields. Therefore, receptor points representing actual terrain elevations from the area were used in the analysis.

8. Model and Options

The State-accepted AERMOD model was used to predict air pollutant concentrations under a simple/complex terrain/wake effect situation. In quantifying concentrations, the regulatory default option was selected.

9. Air Pollutant Emission Rates

Source	UTM Coordinates		Modeled Emission Rates		
	Easting (m)	Northing (m)	No_x (lb/hr)	No_x (tons/yr)	hrs/year
ENG1	391278	4499146	7.5573	33.101	8760
ENG2	391312	4499115	7.5573	33.101	8760
Total			15.11	66.202	

10. Source Parameters

Source	Type	Source Parameters					
		Elev (ft)	Ht (m)	Ht (ft)	Temp (K)	Flow (m/s)	Dia (ft)
ENG1	POINT	4354.7	4.6	15.0	773	126.9	0.20
ENG2	POINT	4355.5	4.6	15.0	773	126.9	0.20

IV. RESULTS AND CONCLUSIONS

A. National Ambient Air Quality Standards

The below table provides a comparison of the predicted total air quality concentrations with the NAAQS. The predicted total concentrations are less than the NAAQS.

Air Pollutant	Period	Prediction ($\mu g/m^3$)	Class II Significant Impact Level ($\mu g/m^3$)	Background ($\mu g/m^3$)	Nearby Sources* ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent NAAQS
NO_2	1-Hour	89.0	7.5	31.1	15.9	135.9	188	72.30%
	Annual	2.0	1.0	3.8	0.0	5.7	100	5.73%

DP:sa

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