

NSP 0696-01-NT

TEMPORARY NONCOVERED SOURCE AIR PERMIT (NSP) ENGINEERING REVIEW
 INITIAL APPLICATION NO. 0696-01

REVIEWER Philip Robbins
DATE 28 MAY 2009

FACILITY Delta Construction Corporation
 445 TPH Mobile Cone Crusher with 440 BHP Diesel Engine

LOCATION Various Temporary Sites, States of Hawaii
 599,781E / 2,365,217N (NAD-83), Waipahu, Oahu

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EQUIPMENT One (1) 455 TPH Mobile Cone Crusher
 Model No. Extec X44SBS, Serial No. TBD
 Manufacturing Date: 2000
 Production = 455 TPH

One (1) 440 HP Caterpillar Diesel Engine
 Model No. C-13, Serial No. TBD
 Fuel Consumption = 22.7 gal/hr; Fuel Oil No. 2 (0.5% Sulfur Content)
 Exhaust Diameter = 0.152m, Height = 3.51m
 Velocity = 71m/s; Actual Flow Rate 1.30 m³/s; Temp = 769K

PERMIT BACKGROUND

Delta Construction Corporation is proposing to install and operate a 455 TPH self-propelled mobile cone crusher with an integrated 4 x 10 recirculating screen at various sites throughout the state. The applicant initially submitted an application for a non-covered source permit indicating the maximum capacity of the cone crusher to be 144 TPH. Further review determined the rated capacity of the cone crusher is to be well above 150 TPH and thus subject to the National Standards of Performance for New Stationary Sources (NSPS), Subpart OOO.

PROCESS BACKGROUND

Process: SICC 1429, Crushed Rock

Rocks are dropped into a feed hopper, conveyed to the cone crusher, and then to the integrated onboard screen where the larger material is recirculated to the screen and the smaller material passes the screen and is conveyed to a stockpile. The crusher is powered and moved by a 440 BHP CAT C-13 DEG.

APPLICABLE REQUIREMENTS

Hawaii Administrative Rules (HAR)

Title 11 Chapter 59, Ambient Air Quality Standards

Title 11 Chapter 60.1, Air Pollution Control

Subchapter 1, General Requirements

Subchapter 2, General Prohibitions

11-60.1-31 Applicability

11-60.1-32 Visible Emissions

11-60.1-33 Fugitive Dust

11-60.1-38 Sulfur Oxides from Fuel Combustion

Subchapter 4, Noncovered Sources

Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning

11-60.1-111 Definitions

11-60.1-117 General fee provisions for noncovered sources

11-60.1-118 Application fees for noncovered sources

11-60.1-119 Annual fees for noncovered sources

Subchapter 10, Field Citations

This source is **subject to NSPS** (New Source Performance Standards).

40 CFR Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is **not applicable** since this engine was manufactured before July 11, 2005, also, no modifications were performed to the proposed diesel engine after July 11, 2005.

40 CFR Part 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE NESHAP) – applicable to stationary RICE located at major and area sources of HAP emissions. This subpart **is not applicable** since this is not an existing source.

40 CFR Part 60. Subpart OOO – National Emission Standards for Nonmetallic Mineral Processing Plants, **is applicable** to the mobile crusher because equipment was manufactured after 1983 and the primary crusher has a capacity greater than 150 TPH. (COVERED SOURCE)

This source is **not subject to NESHAPS** (National Emission Standards for Hazardous Air Pollutants for Source Categories) as no hazardous air pollutants are emitted at significant levels (≥ 10 TPY HAP or ≥ 25 TPY for total HAPs) and this source is not listed under 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants) or 40 CFR 63 applicable to this facility.

This source is **not subject to MACT** (Maximum Achievable Control Technology) since the source is not a major source of hazardous air pollutants (HAPS) emissions (>10 TPY single hap or >25 TPY for total haps).

This source is **not subject to PSD** (Prevention of Significant Deterioration) requirements because it is not a major stationary source as defined in 40 CFR 52.21 and HAR Title 11, Chapter 60.1, Subchapter 7; (criteria air pollutant > 100 or 250 TPY as applicable).

This source is **not subject to CAM** (compliance assurance monitoring) since the proposed equipment is not classified as a major source (criteria pollutant > 100 TPY); has no pre-control device potential emissions exceeding applicable major source thresholds; nor fitted with an “active” air pollution control device; and not or not part of a facility with total emissions exceeding major source threshold.

This source is **not subject to CERR** (Consolidated Emissions Reporting Requirements) since 40 CFR Part 51, Subpart A – Emissions Inventory Reporting Requirements, determines CERR based on facility wide emissions of each air pollutant at the CERR triggering levels. The emissions do not exceed respective CERR threshold levels. As such, emissions data will not be required to be inputted into the National Emissions Inventory (NEI) database.

The Clean Air Branch requests annual emissions reporting from those facilities that have facility wide emissions exceeding the DOH reporting level(s). Based on current emissions, the facility **is subject to annual emissions reporting** due to *PM30 (TSP)* exceeding the DOH reporting thresholds.

This source **is subject to BACT** (Best Available Control Technology) analysis because net emissions from the proposed facility exceed significant emissions levels. BACT analysis is required for new noncovered sources and significant modifications to noncovered sources that have the potential to emit or increase emissions above significant levels.

TOTAL EMISSIONS

Total facility emissions are summarized within the immediate table below.

Table 1: Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Proposed Emissions based on Limited Hours of Operation	Emissions based on 8,760 hr/yr (ANNUAL – NO LIMIT)	Significant BACT Level	CERR Level	DOH Level
CO	5.05	11.06	100	1000	250
NOx	5.78	12.65	40	100	25
PM-30(TSP)	27.97	80.93	25	-	25
PM-10	8.73	19.19	15	100	25
PM-2.5	0.06	0.20	-	100	-
SOx	3.14	6.88	40	100	25
TOC/VOC	2.18	4.78	40	100	25
HAPs	0.03	0.06	-	5	5

Proposed emissions are based on the following hours of operation:

Equipment	Limited Hours of Operation
Mobile Cone Crusher	4,000 hr/yr
Diesel Engine	4,000 hr/yr

INSIGNIFICANT ACTIVITIES (CSP) / EXEMPTIONS (NSP)

No proposed alternative operating scenario.

ALTERNATIVE OPERATING SCENERIOS

No proposed alternative operating scenario.

FACILITY EMISSIONS CALCULATIONS

Emission Calculations for 4400 HP Diesel Engine Generator

Generator Diesel Consumption	= 22.7 gallons/hour,	
Proposed Limited Operating Hours	= 4,000 hours/year	
Annual Diesel Max Consumption	= Diesel Consumption X Operating Hours = (22.7 gallons/hour)(4,000 hours/year) = 90,800 gallons/year	
Diesel #2 Heat Value	= 137,000 BTU/gal,	From AP-42, Volume 1, 5 th ed, App. A
Density of Diesel Fuel	= 7.1 lb/gal	
Diesel #2 Annual Heat Capacity	= Diesel Consumption X Diesel Heat Value = (22.7 gal/hr)(137,000 BTU/gal)(8,760 hr/yr)(10E-6 MMBTU/BTU) = 27,243 MMBTU/yr	
Diesel #2 Limited Annual Heat Capacity	= (22.7 gal/hr)(137,000 BTU/gal)(4,000 hr/yr)(10E-6 MMBTU/BTU) = 12,440 MMBTU/yr limited	Proposed Limit: 4,000 hrs/yr

For NO_x,

Emission Factor	= 4.41 lb/MMBtu
Potential Annual Emission	= Emission Factor X Annual Heat Capacity = (4.41 lbs/MMBtu)(27,243 MMBTU/yr)(1/2000 Ton/lbs) = 60.07 TPY or 1.72 g/s
Limited Operation Emission	= Emission Factor X Annual Heat Capacity = (4.41 lbs/MMBtu)(12,440 MMBTU/yr limited)(1/2000 Ton/lbs) = 27.43 TPY (limited)
Manufacturer's Data	= 12.65 TPY (annual) or 5.78 TPY (limited)

For CO,

Emission Factor	= 0.95 lb/MMBtu
Potential Annual Emission	= Emission Factor X Annual Heat Capacity = (0.95 lbs/MMBtu)(27,243 MMBTU/yr)(1/2000 Ton/lbs) = 12.94 TPY or 0.37 g/s
Limited Operation Emission	= Emission Factor X Annual Heat Capacity = (0.95 lbs/MMBtu)(12,440 MMBTU/yr limited)(1/2000 Ton/lbs) = 5.90 TPY (limited)
Manufacturer's Data	= 11.06 TPY (annual) or 5.05 TPY (limited)

For PM₁₀,

Emission Factor	= 0.31 lb/MMBtu
Potential Annual Emission	= Emission Factor X Annual Heat Capacity = (0.31 lbs/MMBtu)(27,243 MMBTU/yr)(1/2000 Ton/lbs) = 4.22 TPY or 0.12 g/s
Limited Operation Emission	= Emission Factor X Annual Heat Capacity = (0.31 lbs/MMBtu)(12,440 MMBTU/yr limited)(1/2000 Ton/lbs) = 1.93 TPY (limited)
Manufacturer's Data	= 0.63 TPY (annual) or 0.29 TPY (limited)

For **VOC/TOC**,

Emission Factor = 0.35 lb/MMBtu

Potential Annual Emission = Emission Factor X Annual Heat Capacity
 = (0.35 lbs/MMBtu)(27,243 MMBTU/yr)(1/2000 Ton/lbs)
 = **4.78 TPY or 0.14 g/s**

Limited Operation Emission = Emission Factor X Annual Heat Capacity
 = (0.35 lbs/MMBtu)(12,440 MMBTU/yr limited)(1/2000 Ton/lbs)
 = **2.18 TPY (limited)**

For **SOx (SULFUR)**,

Emission Factor = 0.101 lb/MMBtu X 0.5% Fuel Oil No. 2
 = 0.101 lb/MMBtu X 5
 = 0.505 lb/MMBtu

Potential Annual Emission = Emission Factor X Annual Heat Capacity
 = (0.505 lbs/MMBtu)(27,243 MMBTU/yr)(1/2000 Ton/lbs)
 = **6.88 TPY or 0.20 g/s**

Limited Operation Emission = Emission Factor X Annual Heat Capacity
 = (0.505 lb/MMBtu)(12,440 MMBTU/yr limited)(1/2000 Ton/lbs)
 = **3.14 TPY (limited)**

Manufacturer's Data NONE

For **HAPs**,

Emission Factor = EF(Benzene + Toluene + Xyylene + Propylene + Formaldehyde + Acetaldehyde + Acrolein)
 = 0.0042 lb/MMBtu

Potential Annual Emission = Emission Factor X Annual Heat Capacity
 = (0.0042 lbs/MMBtu)(27,243 MMBTU/yr)(1/2000 Ton/lbs)
 = **0.0572 TPY or 0.0016 g/s**

Limited Operation Emission = Emission Factor X Annual Heat Capacity
 = (0.0042 lbs/MMBtu)(12,440 MMBTU/yr limited)(1/2000 Ton/lbs)
 = **0.0261 TPY (limited)**

Note: The emission factors above were obtained from AP-42, Table 3.3-1 10/96 edition, Emission Factors For Uncontrolled Gasoline and Diesel Industrial Engines. Sulfur emission factor from AP-42, Table 3.4-1 10/96 edition, Gaseous Emission Factors for Large Stationary Diesel and all Stationary Dual-Fuel Engines.

Emission Calculations for 445 TPH Mobile Cone Crusher

Production Rate x Average Density = 445.0 ton/hr
 Control Type: Water (70% Controlled)

For **PM2.5**,

Emission Factors = 1.00 E-04 lb/ton, Crushing
 = 1.30 E-05 lb/ton, Crushing to Conveyor
 = 1.30 E-05 lb/ton, Conveyor to Stockpile

Potential Annual Emission = Density X Emission Factor X Operation Time
 = (445.0 ton/hr)(1.00 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0195 TPY, Crushing
 = (445.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0253 TPY, Crushing to Conveyor
 = (445.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0253 TPY, Conveyor to Stockpile

NET = 0.0701 TPY or 0.002 g/s

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
 = (0.0701 TPY)(4,000/8,760 hours/year)(1 - 70%)
 = **0.0096 TPY (limited, controlled)**

For **PM10**,

Emission Factors = 1.60 E-05 lb/ton, Truck Unloading
 = 2.40 E-03 lb/ton, Crushing
 = 1.10 E-03 lb/ton, Crushing to Conveyor
 = 1.10 E-03 lb/ton, Conveyor to Stockpile

Potential Annual Emission = Density X Emission Factor X Operation Time
 = (445.0 ton/hr)(1.60 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0312 TPY, Truck Unloading
 = (445.0 ton/hr)(2.40 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0468 TPY, Crushing
 = (445.0 ton/hr)(1.10 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0214 TPY, Crushing to Conveyor
 = (445.0 ton/hr)(1.10 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0214 TPY, Conveyor to Stockpile

NET = 0.1208 TPY or 0.0035 g/s

Limited Operation Emission = NET, annual X Limited Operation Time
 = (0.1208 TPY)(4,000/8,760 hours/year)(1 - 70%)
 = **0.0165 TPY (limited, controlled)**

For **TSP**,

Emission Factors = 5.40 E-03 lb/ton, Crushing
 = 3.00 E-03 lb/ton, Crushing to Conveyor
 = 3.00 E-03 lb/ton, Conveyor to Stockpile

Potential Annual Emission = Density X Emission Factor X Operation Time
 = (445.0 ton/hr)(3.00 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 5.86 TPY, Truck Unloading
 = (445.0 ton/hr)(5.40 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 10.53 TPY, Truck Loading
 = (445.0 ton/hr)(3.00 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 5.86 TPY, Grinding
 = (445.0 ton/hr)(3.00 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 5.86 TPY, Conveyor Transfer

NET = 28.11 TPY or 0.81 g/s

Limited Operation Emission = NET, annual X Limited Operation Time
 = (28.11 TPY)(4,000/8,760 hours/year)(1 - 70%)
 = **3.85 TPY (limited, controlled)**

Emission Calculations for 455 TPH Screen (FUGITIVE)

Production Rate x Average Density = 455.0 ton/hr
 Control Type: None (0% Controlled)

For **PM2.5**,

Emission Factors = 5.0 E-05 lb/ton, Screen
 = 1.3 E-05 lb/ton, Stacker 1 to Stockpile

Potential Annual Emission = Density X Emission Factor X Operation Time
 = (455.0 ton/hr)(5.00 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.100 TPY, Screen
 = (228.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.013 TPY, Stacker 1 to Stockpile

NET = 0.113 TPY or 0.0032 g/s

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
 = (0.113 TPY)(4,000/8,760 hours/year)(0%)
 = **0.052 TPY (limited)**

For **PM10**,

Emission Factors = 8.7 E-03 lb/ton, Screen
 = 1.1 E-03 lb/ton, Stacker 1 to Stockpile

Potential Annual Emission = Density X Emission Factor X Operation Time
 = (455.0 ton/hr)(8.7 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 17.34 TPY, Screen
 = (228.0 ton/hr)(1.1 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 1.10 TPY, Stacker 1 to Stockpile

NET = 18.44 TPY or 0.53 g/s

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
 = (18.44 TPY)(4,000/8,760 hours/year)(0%)
 = **8.42 TPY (limited)**

For **TSP**,

Emission Factors = 0.025 lb/ton, Screen
 = 0.003 lb/ton, Stacker 1 to Stockpile

Potential Annual Emission = Density X Emission Factor X Operation Time
 = (455.0 ton/hr)(0.025 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 49.82 TPY, Screen
 = (228.0 ton/hr)(0.003 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 3.00 TPY, Stacker 1 to Stockpile

NET = 52.82 TPY or 1.52 g/s

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
 = (52.82 TPY)(4,000/8,760 hours/year)(0%)
 = **24.12 TPY (limited)**

Note: The following emission factors are obtained from AP-42, 11.19.2-2 8/04 edition, Emission Factors for Crushed Stone Processing Op.

Emission Calculations for Stockpiles (ALL)

AP-42, 13.2.4.3 Equation 1:

Efficiency Factor	= $k(0.0032) \times [(U/5)^{1.3} / (M/2)^{1.4}]$	
U, wind speed	= 15 mph,	AP42, Table 13.2.4-1
M, moisture content	= 40%, compost	
	= 14%, soil (clay/dirt mixture)	
	= 2.525%, all	AP42, Table 13.2.4-1

Production = (455 TPH)(4,000 hr/yr) = 1,820,000 TPY

For **PM2.5**,

k, particle size multiplier	= 0.11
Efficiency Factor	= $k(0.0032) \times [(U/5)^{1.3} / (M/2)^{1.4}]$ = $(0.11)(0.0032)[(15/5)^{1.3} / (2.525/2)^{1.4}]$ = 0.0011 lb/ton
Emission	= Compost Production x Emission Factor = (1,820,000 TPY)(0.0011 lb/ton)(1/2000 ton/lb) = <u>1.00 TPY</u>

For **PM10**,

k, particle size multiplier	= 0.35
Efficiency Factor	= $k(0.0032) \times [(U/5)^{1.3} / (M/2)^{1.4}]$ = $(0.35)(0.0032)[(15/5)^{1.3} / (2.525/2)^{1.4}]$ = 0.0034 lb/ton
Emission	= Compost Production x Emission Factor = (1,820,000 TPY)(0.0034 lb/ton)(1/2000 ton/lb) = <u>3.09 TPY</u>

For **TSP**,

k, particle size multiplier	= 0.74
Efficiency Factor	= $k(0.0032) \times [(U/5)^{1.3} / (M/2)^{1.4}]$ = $(0.74)(0.0032)[(15/5)^{1.3} / (2.525/2)^{1.4}]$ = 0.0071 lb/ton
Emission	= Compost Production x Emission Factor = (1,820,000 TPY)(0.0071 lb/ton)(1/2000 ton/lb) = <u>6.46 TPY</u>

Note: The following emission factors are obtained from AP-42, 13.2.4.3 11/06 edition, Aggregate Handling and Storage Piles.

Emission Calculations for Traffic on Unpaved Roads

Mean Vehicle Weight	= 78,000 lbs, GROSS = 30,000 lbs (15 Tons), TARE	
Load Capacity	= 24.0 Tons	
Material (Production) to move	= 518,400 TPY	
NO. of Loads per year	= Material (Production) to move / Load Capacity = 518,400 TPY / 24.0 T = 21,600 Loads/yr	
NO. of Loads (inc. Unloading) per year	= 2 x 21,600 Loads /yr	
Distance (Given)	= 0.0189 mi	
Distance (Round Trip)	= 2 x 0.0189 mi	
Speed	= 10 mph = 0.1667 mi/min	
Trip Time	= Distance x Speed = (0.0189 mi)/(0.1667 min/mi)(60 sec/min) = 6.8 sec	
Load Time (Given)	= 120 sec	
NO. of Round Trip(s) per hour	= 1 Hour / 2 x (Trip Time + Load Time) = (1 hr)(60 min/hr)/(60 sec/min)/(2*(6.8 sec + 120 sec)) = 14.2 RT/hr	
NO. of Trip(s) per year	= 2 x Number of Loads = 2 x 21,600 Loads/yr = 43,200 Trips/yr	
Vehicle Miles Traveled per hour	= (Distance, Round Trip)(NO. of Round Trips per hour) = (2 x 0.0189 mi)(14.2 RT/hr) = 0.54 VMT/hr	
Vehicle Miles Traveled per year	= (Distance, Given)(NO. of Loads inc. Unloading per year) = (0.0189 mi)(2 x 21,600 Loads /yr) = 816.5 VMT/yr	
Precipitation Factor (p)	= 96 days, Honolulu Airport	
Emission Factor, Unpaved	= $k(s/12)^a(W/3)^b/(M/0.2)^c * [(365-p)/365]$, where	k, a, b: Industrial Road Constants s: surface material silt content (%) W: mean vehicle weight (T)
PM Control Efficiency	= 70%, based on direct water spraying during aggregate delivery	

For **PM2.5**,

Emission Factor, Unpaved	= $k(s/12)^a(W/3)^b/(M/0.2)^c * [(365-p)/365]$ = 0.15(15/12) ^{0.9} (27/3) ^{0.45} [(365-96)/365] = 0.36 lb/VMT
Potential Annual Emissions	= (Vehicle Miles Traveled per year) x (Emission Factor, Unpaved) = (816.5 VMT/yr)(0.36 lb/VMT)(1/2000 T/lb) = 0.15 TPY or 0.004 g/s
Limited Operation Emission	= Potential Annual Emissions X Limited Operation Time X Control Factor = (0.15 TPY)(4,000/8,760 hours/year)(1 - 70%) = 0.02 TPY (limited, controlled)

For **PM10**,

$$\begin{aligned} \text{Emission Factor, Unpaved} &= k(s/12)^a(W/3)^b/(M/0.2)^c * [(365-p)/365] \\ &= 1.5(15/12)^{0.9}(27/3)^{0.45}[(365-96)/365] \\ &= 3.63 \text{ lb/VMT} \end{aligned}$$

$$\begin{aligned} \text{Potential Annual Emissions} &= (\text{Vehicle Miles Traveled per year}) \times (\text{Emission Factor, Unpaved}) \\ &= (816.5 \text{ VMT/yr})(3.63 \text{ lb/VMT})(1/2000 \text{ T/lb}) \\ &= \mathbf{1.48 \text{ TPY or } 0.04 \text{ g/s}} \end{aligned}$$

$$\begin{aligned} \text{Limited Operation Emission} &= \text{Potential Annual Emissions} \times \text{Limited Operation Time} \times \text{Control Factor} \\ &= (1.48 \text{ TPY})(4,000/8,760 \text{ hours/year})(1 - 70\%) \\ &= \mathbf{0.20 \text{ TPY (limited, controlled)}} \end{aligned}$$

For **TSP**,

$$\begin{aligned} \text{Emission Factor, Unpaved} &= k(s/12)^a(W/3)^b/(M/0.2)^c * [(365-p)/365] \\ &= 4.9(15/12)^{0.7}(27/3)^{0.45}[(365-96)/365] \\ &= 11.35 \text{ lb/VMT} \end{aligned}$$

$$\begin{aligned} \text{Potential Annual Emissions} &= (\text{Vehicle Miles Traveled per year}) \times (\text{Emission Factor, Unpaved}) \\ &= (816.5 \text{ VMT/yr})(11.35 \text{ lb/VMT})(1/2000 \text{ T/lb}) \\ &= \mathbf{4.63 \text{ TPY or } 0.13 \text{ g/s}} \end{aligned}$$

$$\begin{aligned} \text{Limited Operation Emission} &= \text{Potential Annual Emissions} \times \text{Limited Operation Time} \times \text{Control Factor} \\ &= (4.63 \text{ TPY})(4,000/8,760 \text{ hours/year})(1 - 70\%) \\ &= \mathbf{0.63 \text{ TPY (limited, controlled)}} \end{aligned}$$

Note: The following emission factors are obtained from AP-42, 13.2.2, 11/06 update, Unpaved Roads.

AIR QUALITY ASSESSMENT

An ambient air quality analysis (AAQA) was conducted for the diesel engine to demonstrate compliance with state and national ambient air quality standards. EPA approved SCREEN3 method was used. Results attached to review.

The predicted concentrations assumes operation at proposed limited hours of operation, and using fuel oil no. 2 with 0.5% sulfur content. Based on these assumptions, the facility should comply with State and Federal AAQS for CO, SO₂, NO₂, and PM₁₀ as shown below (Pb and H₂S assumed to be negligible).

Air Pollutant	Emissions (g/s)	Averaging Time	Impact * (µg/m ³)	Background ** (µg/m ³)	Total Impact (µg/m ³)	SAAQs (µg/m ³)	NAAQS (µg/m ³)	Compared to SAAQS
CO	0.3174	1-hr	74.78	2850	2925	10000	40000	29.3%
		8-hr	52.35	1226	1278	5000	10000	25.6%
NO ₂	0.3631	Annual	5.86	9	15	70	100	21.4%
SO ₂	0.1975	3-hr	41.88	43	85	1300	1300	6.5%
		24-hr	18.61	13	32	365	365	8.8%
		Annual	4.25	1	5	80	80	6.3%
PM ₁₀	0.5508	24-hr	51.91	25	77	150	150	51.3%
		Annual	11.85	13	25	50	50	50.0%
PM _{2.5}	N/A	24-hr	N/A	10	N/A	N/A	35	N/A%
		Annual	N/A	3	N/A	N/A	15	N/A%

For CO,

1-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
 = (0.3174 g/s)(235.6 µg/m³) = **74.78 µg/m³**

8-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
 = (0.3174 g/s)(235.6 µg/m³)(0.7) = **52.35 µg/m³**

For NO₂,

Annual Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time) X ...
 ... (Tier2 multiplier)
 = (0.3631 g/s)(235.6 µg/m³)(0.2)(4000/8760)(0.75) = **5.86 µg/m³**

For SO₂,

3-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
 = (0.1975 g/s)(235.6 µg/m³)(0.9) = **41.88 µg/m³**

24-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
 = (0.1975 g/s)(235.6 µg/m³)(0.4) = **18.61 µg/m³**

Annual = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time)
 = (0.1975 g/s)(235.6 µg/m³)(0.2)(4000/8760) = **4.25 µg/m³**

For PM₁₀,

24-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
 = (0.5508 g/s)(235.6 µg/m³)(0.4) = **51.91 µg/m³**

Annual = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time)
 = (0.5508 g/s)(235.6 µg/m³)(0.2)(4000/8760) = **11.85 µg/m³**

For PM_{2.5},

24-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
 = (N/A g/s)(235.6 µg/m³)(0.4) = **N/A µg/m³**

Annual = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time)
 = (N/A g/s)(235.6 µg/m³)(0.2)(2080/8760) = **N/A µg/m³**

PROPOSED

Impact is calculated from the product of pollutant emissions and the Screen3 model result for 1 g/s:
Maximum 1-Hr Concentration = **235.6 $\mu\text{g}/\text{m}^3$** @ 70m from the point source (based on a 0 to 1,000 meter domain). Building downwash not incorporated in model (supporting information attached by applicant: email correspondence & site map).

- * Applied EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hour, 8-hour, and 24-hour concentrations are used, respectively.
A scaling factor of 0.2 is used for annual concentrations.
Conversion of NO to NO₂ factors a Tier2 multiplier value of 0.75.

- ** Background Concentration obtained from “Annual Summary 2006 Hawaii Air Quality Data”.
Representative data for the island of: **OAHU**.

For: 1-Hour Carbon Monoxide: Oahu, Honolulu – Maximum 1st High (LOCAL + MOST CONSERVATIVE)
For: 8-Hour Carbon Monoxide: Oahu, Honolulu – Maximum 1st High (LOCAL)

For: Annual Nitrogen Dioxide: Oahu, Kapolei – Annual Mean (NON-LOCAL, MOST CONSERVATIVE)

For: 3-Hour Sulfur Dioxide: Oahu, Honolulu – Maximum 1st High (LOCAL)
For: 24-Hour Sulfur Dioxide: Oahu, Honolulu – Maximum 1st High (LOCAL)
For: Annual Sulfur Dioxide: Oahu, Honolulu – Annual Mean (LOCAL)

For: 24-Hour Particulate Matter 10: Oahu, Honolulu – Maximum 1st High (LOCAL)
For: Annual Particulate Matter 10: Oahu, Honolulu – Annual Mean (LOCAL)

For: 24-Hour Particulate Matter 2.5: Oahu, Honolulu – Maximum 1st High (LOCAL)
For: Annual Particulate Matter 2.5: Oahu, Honolulu – Annual Mean (LOCAL)

440 HP Diesel Engine Stack Parameters

Exhaust Diameter = 0.152m; Height = 3.51m; Actual Flow Rate = 1.30 m³/s; Temp = 769K

FACILITY IDENTIFICATION

A major source as defined in Section 11-60.1-1 of HAR Title 11, has the potential to emit any HAP of 10 TPY or more, or 25 TPY or more of any combination of HAPs, or 100 TPY or more of any air pollutant. Calculated emission(s) do not exceed these limits and thus, this facility **is not classified** as a major source.

A synthetic minor source is a facility that is potentially major (as defined in HAR 11-60.1-1), but is made nonmajor through federally enforceable permit conditions. This facility **is not classified** as a synthetic minor source because potential emissions do exceed the major source threshold when the facility is operated at its maximum capacity continuously for 8,760 hours per year.

The facility is subject to NSPS, Subpart OOO and **is classified** as a Covered Source.

CONCLUSION

Based on the information submitted by Delta Construction Corporation, it is the determination of the Department of Health (DOH) that the proposed facility will be in compliance with the Hawaii Administrative Rules (HAR), Chapter 11-60.1 and State and Federal ambient air quality standards.

Issuance of an initial CSP No. 0696-01-CT is recommended based on the proposed operating restrictions by the applicant on the 445 TPH mobile cone crusher and 440 hp diesel engine servicing the cone crusher to reduce particulate emissions and meet state ambient air quality standards (SAAQS).