PROPOSED

CSP 0547–01-CT

TEMPORARY COVERED SOURCE AIR PERMIT (CSP) ENGINEERING REVIEW
RENEWAL APPLICATION NO. **0547-04**

REVIEWER	PR
DATE	11 SEP 2008
FACILITY	Northwest Demolition & Dismantling 200 TPH Stone Processing Plant with 375 HP Diesel Engine and Triple-Deck Screener
LOCATION	Various Temporary Sites, State of Hawaii Hickam Air Force Base, Honolulu, Oahu
R. OFFICIAL	Mr. Brian Smith 1.503.638.6900
CONTACT	Mr. Brian Smith 1.503.638.6900
MAIL ADDRESS	P.O. Box 230819 Tigard, Oregon 97281
EQUIPMENT	One (1) 200 TPH Portable Stone Processing Plant Model No. 1000-15CV, Serial No. 30008; Manufacturing Date = 2005; One (1) 375 BHP Detroit Diesel Engine Model No. 6063MK33, Serial No. 06R0727141 Fuel Consumption = 19.6 gal/hr; Fuel Oil No. 2 (0.5% Sulfur Content) Exhaust Diameter = 0.1524m, Height = 4.11m Velocity = 64.4735 m/s; Actual Flow Rate = 1.176091 m^3/s; Temp = 675.2K One (1) 5' x 12' CEC Triple-Deck Screener Model 5' x 12'; Serial No. N/A

PERMIT BACKGROUND

The applicant has submitted a renewal for temporary CSP 0547-01-CT.
There are no changes to equipment, process or products, permit limitations, alternate operating scenarios and all other aspects of the existing permit.

PROCESS BACKGROUND

Process: SICC 1442
An excavator dumps the material into the hopper of the EAGLE impact crusher. From the crusher the material is transported by conveyor belt to the 2-Deck Screen. The two decks of the screen separate the material into two different sizes which are transported by conveyor belts to two stock piles.

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 5, Covered Sources
  - Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
    - 11-60.1-111 Definitions
    - 11-60.1-112 General fee provisions for covered sources
    - 11-60.1-113 Application fees for covered sources
    - 11-60.1-114 Annual fees for covered sources
  - Subchapter 10, Field Citations

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

40 CFR Part 60, Subpart OOO - Standards of Performance for Non-metallic Mineral Processing Plants is applicable to portable crushed stone plants with capacities greater than 150 TPH that commence construction, reconstruction, or modification after August 31, 1983. The proposed unit meets these conditions and **is subject to Subpart OOO**.
Existing screening units are normally operated independently of the crushing plants. Although stand alone screens are exempt from Subpart OOO, there may be times, depending on future jobs, when one or more of the screens will be operated in conjunction with a crusher (i.e., all of the material crushed is then screened). Should these screening plants be utilized in conjunction with a crusher, that screen and its conveyors, shall be subject to Subpart OOO. The new crushing and screening plant is designed to operate as one unit where the screen will always be used in conjunction with the crusher, and thus is subject to OOO.

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 and 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.

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 *CO* & TSP exceeding the DOH reporting thresholds.

This source is **not subject to BACT** (Best Available Control Technology) analysis because, the plant is an existing source and there are no changes proposed for its operations.

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	**4.46**	**11.17**	100	1000	250
NOx	**20.72**	**51.87**	40	100	25
PM-30(TSP)	**36.57**	**96.57**	25	-	25
PM-10	**13.94**	**34.46**	15	100	25
PM-2.5	**0.47**	**0.63**	-	100	-
SOx	**2.37**	**5.94**	40	100	25
TOC/VOC	**1.64**	**4.12**	40	100	25
HAPs	**0.02**	**0.05**	-	5	5

Individual equipment emissions are summarized within the immediate table below.

Table 2: Total Equipment Emissions (TPY): Limited, Annual

Pollutant	Mobile Impact Crusher	Diesel Engine	Screener	TOTAL
CO	--	**4.46, 11.17**	--	**4.46, 11.17**
NOx	--	**20.72, 51.87**	--	**20.72, 51.87**
PM-30(TSP)	**1.51, 12.62**	--	**32.57, 81.46**	**36.57, 96.57**
PM-10	**0.24, 1.97**	**1.46, 3.65**	**11.05, 27.65**	**13.94, 34.46**
PM-2.5	**0.005, 0.04**	--	**0.08, 0.20**	**0.47, 0.63**
SOx	--	**2.37, 5.94**	--	**2.37, 5.94**
TOC/VOC	--	**1.64, 4.12**	--	**1.64, 4.12**
HAPs	--	**0.02, 0.05**	--	**0.02, 0.05**

Proposed emissions are based on the following hours of operation:

Equipment	Limited Hours of Operation
Mobile Impact Crusher	**3,500** hr/yr
Diesel Engine	**3,500** hr/yr
Screener	**NONE**

INSIGNIFICANT ACTIVITIES (CSP) / EXEMPTIONS (NSP)

The applicant may exchange the permitted diesel engine for an engine of the same size or smaller if necessary due to engine repair or maintenance.

ALTERNATIVE OPERATING SCENERIOS

No proposed alternative operating scenario.

FACILITY EMISSIONS CALCULATIONS

Emission Calculations for 375 HP Diesel Engine

Generator Diesel Consumption = 19.6 gallons/hour,
Proposed Limited Operating Hours = 3,500 hours/year

Annual Diesel Max Consumption = Diesel Consumption X Operating Hours
= (19.6 gallons/hour)(3,500 hours/year)
= 68,600 gallons/year

Diesel #2 Heat Value = 137,000 BTU/gal, From AP-42, Volume 1, 5th ed, App. A
Density of Diesel Fuel = 7.1 lb/gal

Diesel #2 Annual Heat Capacity = Diesel Consumption X Diesel Heat Value
= (19.6 gal/hr)(137,000 BTU/gal)(8,760 hr/yr)(10E-6 MMBTU/BTU)
= 23,522 MMBTU/yr

Diesel #2 Limited Annual Heat Capacity = (19.6 gal/hr)(137,000 BTU/gal)(3,500 hr/yr)(10E-6 MMBTU/BTU) Proposed Limit: 3,500 hrs/yr
= 9,398.2 MMBTU/yr limited

For **NOx**,

Emission Factor = 4.41 lb/MMBtu

Potential Annual Emission = Emission Factor X Annual Heat Capacity
= (4.41 lbs/MMBtu)(23,522 MMBTU/yr)(1/2000 Ton/lbs)
= **51.87 TPY or 1.49 g/s**

Limited Operation Emission = Emission Factor X Limited Annual Heat Capacity
= (4.41 lbs/MMBtu)(9,398.2 MMBTU/yr limited)(1/2000 Ton/lbs)
= **20.72 TPY (limited)**

For **CO**,

Emission Factor = 0.95 lb/MMBtu

Potential Annual Emission = Emission Factor X Annual Heat Capacity
= (0.95 lbs/MMBtu)(23,522 MMBTU/yr)(1/2000 Ton/lbs)
= **11.17 TPY or 0.32 g/s**

Limited Operation Emission = Emission Factor X Limited Annual Heat Capacity
= (0.95 lbs/MMBtu)(9,398.2 MMBTU/yr limited)(1/2000 Ton/lbs)
= **4.46 TPY (limited)**

For **PM10**,

Emission Factor = 0.31 lb/MMBtu

Potential Annual Emission = Emission Factor X Annual Heat Capacity
= (0.31 lbs/MMBtu)(23,522 MMBTU/yr)(1/2000 Ton/lbs)
= **3.65 TPY or 0.10 g/s**

Limited Operation Emission = Emission Factor X Limited Annual Heat Capacity
= (0.31 lbs/MMBtu)(9,398.2 MMBTU/yr limited)(1/2000 Ton/lbs)
= **1.46 TPY (limited)**

For **VOC/TOC**,

Emission Factor = 0.35 lb/MMBtu

Potential Annual Emission = Emission Factor X Annual Heat Capacity
= (0.35 lbs/MMBtu)(23,522 MMBTU/yr)(1/2000 Ton/lbs)
= **4.12 TPY or 0.12 g/s**

Limited Operation Emission = Emission Factor X Limited Annual Heat Capacity
= (0.35 lbs/MMBtu)(9,398.2 MMBTU/yr limited)(1/2000 Ton/lbs)
= **1.64 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)(23,522 MMBTU/yr)(1/2000 Ton/lbs)
= **5.94 TPY or 0.17 g/s**

Limited Operation Emission = Emission Factor X Limited Annual Heat Capacity
= (0.505 lb/MMBtu)(9,398.2 MMBTU/yr limited)(1/2000 Ton/lbs)
= **2.37 TPY (limited)**

For **HAPs**,

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

Potential Annual Emission = Emission Factor X Annual Heat Capacity
= (0.0042 lbs/MMBtu)(23,522 MMBTU/yr)(1/2000 Ton/lbs)
= **0.0494 TPY or 0.0014 g/s**

Limited Operation Emission = Emission Factor X Limited Annual Heat Capacity
= (0.0042 lbs/MMBtu)(9,398.2 MMBTU/yr limited)(1/2000 Ton/lbs)
= **0.020 TPY (limited)**

Note: The above emission factors are 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 200 TPH Mobile Impact Crusher (FUGITIVE)

Production Rate x Average Density	= 200.0 ton/hr
Control Type:	Water (70% Controlled)

For **PM2.5**,

Emission Factors = 1.30 E-05 lb/ton, Grizzly to Impact
= 1.00 E-04 lb/ton, Impact 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
= (200.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0114 TPY, Grizzly to Impact
= (200.0 ton/hr)(1.00 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0087 TPY, Impact Crushing
= (200.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0114 TPY, Crushing to Conveyor
= (200.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0114 TPY, Conveyor to Stockpile
NET **= 0.04 TPY or 0.0012 g/s**

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
= (0.04 TPY)(3,500/8,760 hours/year)(1 - 70%)
= **0.0048 TPY (limited, controlled)**

For **PM10**,

Emission Factors = 1.60 E-05 lb/ton, Truck Unloading
= 1.10 E-03 lb/ton, Grizzly to Impact
= 2.40 E-03 lb/ton, Impact 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
= (200.0 ton/hr)(1.60 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0140 TPY, Truck Unloading
= (200.0 ton/hr)(1.10 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0097 TPY, Grizzly to Impact
= (200.0 ton/hr)(2.40 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.0210 TPY, Impact Crushing
= (200.0 ton/hr)(1.10 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.9636 TPY, Crushing to Conveyor
= (200.0 ton/hr)(1.10 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.9636 TPY, Conveyor to Stockpile
NET **= 1.97 TPY or 0.06 g/s**

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
= (1.97 TPY)(3,500/8,760 hours/year)(1 - 70%)
= **0.24 TPY (limited, controlled)**

For **TSP**,

Emission Factors = 3.00 E-03 lb/ton, Grizzly to Impact
= 5.40 E-03 lb/ton, Impact 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
= (200.0 ton/hr)(3.00 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 2.63 TPY, Truck Unloading
= (200.0 ton/hr)(5.40 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 4.73 TPY, Truck Loading
= (200.0 ton/hr)(3.00 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 2.63 TPY, Grinding
= (200.0 ton/hr)(3.00 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 2.63 TPY, Conveyor Transfer
NET **= 12.62 TPY or 0.36 g/s**

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
= (12.62 TPY)(3,500/8,760 hours/year)(1 - 70%)
= **1.51 TPY (limited, controlled)**

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

Emission Calculations for 600 TPH Screen (FUGITIVE)

Production Rate x Average Density	= 600.0 TPH
Control Type:	None (0% Controlled)

For **PM2.5**,

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

Potential Annual Emission = Density X Emission Factor X Operation Time
= (600.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.034 TPY, Feeder to Screen
= (600.0 ton/hr)(5.00 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.131 TPY, Screen
= (300.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.017 TPY, Screen to Stacker 1
= (300.0 ton/hr)(1.30 E-05 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 0.017 TPY, Stacker 1 to Stockpile
NET **= 0.20 TPY or 0.0057 g/s**

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
= (0.20 TPY)(3,500/8,760 hours/year)(0%)
= **0.08 TPY (limited)**

For **PM10**,

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

Potential Annual Emission = Density X Emission Factor X Operation Time
= (600.0 ton/hr)(1.1 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 2.89 TPY, Feeder to Screen
= (600.0 ton/hr)(8.7 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 22.86 TPY, Screen
= (300.0 ton/hr)(1.1 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 1.45 TPY, Screen to Stacker 1
= (300.0 ton/hr)(1.1 E-03 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 1.45 TPY, Stacker 1 to Stockpile
NET **= 27.65 TPY or 0.79 g/s**

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
= (27.65 TPY)(3,500/8,760 hours/year)(0%)
= **11.05 TPY (limited)**

For **TSP**,

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

Potential Annual Emission = Density X Emission Factor X Operation Time
= (600.0 ton/hr)(0.003 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 7.88 TPY, Feeder to Screen
= (600.0 ton/hr)(0.025 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 65.70 TPY, Screen
= (300.0 ton/hr)(0.003 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 3.94 TPY, Screen to Stacker 1
= (300.0 ton/hr)(0.003 lb/ton)(8,760 hr/yr)(ton/2000 lb) = 3.94 TPY, Stacker 1 to Stockpile
NET **= 81.46 TPY or 2.34 g/s**

Limited Operation Emission = NET, annual X Limited Operation Time X Control Factor
= (81.46 TPY)(3,500/8,760 hours/year)(0%)
= **32.57 TPY (limited)**

Note: The above 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)

Efficiency Factor	= k(0.0032) x [(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
Limited Annual Production	= (200 TPH)(3,500 hr/yr) = 700,000 TPY	

For **PM2.5**,

k, particle size multiplier	= 0.11
Efficiency Factor	= k(0.0032) x [(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	= Production x Emission Factor = (700,000 TPY)(0.0011 lb/ton)(1/2000 ton/lb) = **0.39 TPY**

For **PM10**,

k, particle size multiplier	= 0.35
Efficiency Factor	= k(0.0032) x [(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	= Production x Emission Factor = (700,000 TPY)(0.0034 lb/ton)(1/2000 ton/lb) = **1.19 TPY**

For **TSP**,

k, particle size multiplier	= 0.74
Efficiency Factor	= k(0.0032) x [(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	= Production x Emission Factor = (700,000 TPY)(0.0071 lb/ton)(1/2000 ton/lb) = **2.49 TPY**

Note: The above 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	= 700,000 TPY
NO. of Loads per year	= Material (Production) to move / Load Capacity = 700,000 TPY / 24.0 T = 29,167 Loads/yr
NO. of Loads (inc. Unloading) per year	= 2 x 29,167 Loads /yr
Distance (Given) Distance (Round Trip)	= 0.0189 mi = 2 x 0.0189 mi
Speed	= 10 mph = 0.1667 mi/min
Trip Time	= Distance x Speed = (0.0189 mi)(1/0.1667 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(29,167 Loads/yr) = 58,334 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 29,167 Loads /yr) = 1,102.5 VMT/yr
Precipitation Factor (p)	= 43 days, Pu'u Anahulu
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	= $k(s/12)^a(W/3)^b/(M/0.2)^c * [(365-p)/365]$ = $0.15(15/12)^{0.9}(27/3)^{0.45}[(365-43)/365]$ = 0.44 lb/VMT
Potential Annual Emissions	= (Vehicle Miles Traveled per year) x (Emission Factor, Unpaved) = (1,102.5 VMT/yr)(4.35 lb/VMT)(1/2000 T/lb) = **0.24 TPY or 0.01 g/s**
Limited Operation Emission	= Potential Annual Emissions X Limited Operation Time X Control Factor = (0.24 TPY)(3,500/8,760 hours/year)(1 - 70%) = **0.03 TPY (limited, controlled)**

For **PM10**,

Emission Factor, Unpaved = $k(s/12)^a(W/3)^b/(M/0.2)^c * [(365-p)/365]$
= $1.5(15/12)^{0.9}(27/3)^{0.45}[(365-43)/365]$
= 4.35 lb/VMT

Potential Annual Emissions = (Vehicle Miles Traveled per year) x (Emission Factor, Unpaved)
= (1,102.5 VMT/yr)(4.35 lb/VMT)(1/2000 T/lb)
= **2.40 TPY or 0.07 g/s**

Limited Operation Emission = Potential Annual Emissions X Limited Operation Time X Control Factor
= (2.40 TPY)(3,500/8,760 hours/year)(1 - 70%)
= **0.29 TPY (limited, controlled)**

For **TSP**,

Emission Factor, Unpaved = $k(s/12)^a(W/3)^b/(M/0.2)^c * [(365-p)/365]$
= $4.9(15/12)^{0.7}(27/3)^{0.45}[(365-43)/365]$
= 17.45 lb/VMT

Potential Annual Emissions = (Vehicle Miles Traveled per year) x (Emission Factor, Unpaved)
= (1,102.5 VMT/yr)(17.45 lb/VMT)(1/2000 T/lb)
= **9.62 TPY or 0.28 g/s**

Limited Operation Emission = Potential Annual Emissions X Limited Operation Time X Control Factor
= (9.62 TPY)(3,500/8,760 hours/year)(1 - 70%)
= **1.15 TPY (limited, controlled)**

Note: The above 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 * ($\mu g/m^3$)	Background ** ($\mu g/m^3$) OAHU	Total Impact ($\mu g/m^3$)	SAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Compared to SAAQS
CO	**0.32**	**1-hr**	**536.3**	**2850**	**3386**	**10000**	**40000**	**33.9%**
		8-hr	**375.4**	**1226**	**1601**	**5000**	**10000**	**32.0%**
NO2	**0.33*** **	**Annual**	**33.2**	**9**	**42**	**70**	**100**	**60.0%**
SO2	**0.17**	**3-hr**	**256.4**	**43**	**299**	**1300**	**1300**	**23.0%**
		24-hr	**114.0**	**13**	**127**	**365**	**365**	**34.8%**
		Annual	**22.8**	**1**	**24**	**80**	**80**	**30.0%**
PM10	**0.10**	**24-hr**	**67.0**	**25**	**92**	**150**	**150**	**61.3%**
		Annual	**13.4**	**13**	**26**	**50**	**50**	**52.0%**
PM2.5	**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)
= (0.32 g/s)(1,676 $\mu g/m^3$) = **536.3 $\mu g/m^3$**

8-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
= (0.32 g/s)(1,676 $\mu g/m^3$)(0.7) = **375.4 $\mu g/m^3$**

For **NO2**, *** **BASED ON PROVIDED MANUFACTURER'S EMISSION RATE: 4.652 TPY, LIMIT = 11.64 TPY = 0.33 g/s**

Annual Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time) X …
… (Tier2 multiplier)
= (0.33 g/s)(1,676 $\mu g/m^3$)(0.2)(3500/8760)(0.75) = **33.2 $\mu g/m^3$**

For **SO2**,

3-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
= (0.17 g/s)(1,676 $\mu g/m^3$)(0.9) = **256.4 $\mu g/m^3$**

24-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
= (0.17 g/s)(1,676 $\mu g/m^3$)(0.4) = **114.0 $\mu g/m^3$**

Annual = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time)
= (0.17 g/s)(1,676 $\mu g/m^3$)(0.2)(3500/8760) = **22.8 $\mu g/m^3$**

For **PM10**,

24-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
= (0.10 g/s)(1,676 $\mu g/m^3$)(0.4) = **67.0 $\mu g/m^3$**

Annual = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time)
= (0.10 g/s)(1.676 $\mu g/m^3$)(0.2)(3500/8760) = **13.4 $\mu g/m^3$**

For **PM2.5**,

24-hr Impact = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor)
= (0.00 g/s)(258.2 $\mu g/m^3$)(0.4) = **0 $\mu g/m^3$**

Annual = (Emissions) X (Maximum 1-Hr Concentration) X (Avg Time Scaling Factor) X (Limited Operation Time)
= (0.00 g/s)(258.2 $\mu g/m^3$)(0.2)(4000/8760) = **0 $\mu g/m^3$**

Impact is calculated from the product of pollutant emissions and the Screen3 model result for 1 g/s: Maximum 1-Hr Concentration = **1,676 μg/m^3** @ 13m from the point source (based on a 0 to 1,000 meter range).

Building downwash incorporated in model (imported from previous screen3 model run).

Fugitive PM Emissions not included in air quality assessment (Stockpiles, Un/Paved Roads, & Screener).

* 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)

375 BHP Detroit Diesel Engine Stack Parameters

Exhaust Diameter = 0.1524m, Height = 4.11m; Velocity = 64.4735 m/s; Actual Flow Rate = 1.176091 m^3/s; Temp = 675.2K

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, or is subject to NSPS requirements. Calculated emission(s) do not exceed these limits, however, the facility is subject to NSPS and thus classified as a major (covered) 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 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.

CONCLUSION

Based on the information submitted by Northwest Demolition & Dismantling, 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 temporary CSP No. 0547-01-CT is recommended based on the proposed operating restrictions by the applicant to reduce CO & TSP emissions and meet state ambient air quality standards (SAAQS).