

## PROPOSED

**COVERED SOURCE RENEWAL APPLICATION REVIEW (0045-15)**  
**AND SIGNIFICANT MODIFICATION REVIEW (0045-16 and 17)**  
Covered Source Permit Renewal (CSP) 0045-01-C

**APPLICANT:** Grace Pacific Corporation  
Makakilo Quarry

**LOCATION:** 91-920 Farrington Highway  
Kapolei, HI 96707

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**SIC CODE:** 1411 (Dimension Stone)

**PROPOSED PROJECT:**

The subject application submitted April 29, 2004, a renewal for an existing covered source permit, seeks to renew the operating permit for the Grace Pacific Makakilo Quarry. The receipt for the application filing fee of \$3,000.00 was mailed on November 22, 2004. The applicant also is proposing to increase the operating hours of the 600 TPH aggregate recycling plant from 3,120 to 7,000 hours. In addition, the applicant proposes to include a 600 TPH screening plant (with 2,080 hr/yr operation limit) to their existing equipment. The increase in emissions for both proposals is considered a "significant" modification.

Two applications were submitted (May 3 and 31, 2005) as a significant modification (e.g., increase in hour operations for the recycling plant, and adding a 600 TPH screener). The assessment of emissions was reviewed as "one" significant modification. Although the applicant submitted \$1,000.00 for each application, only \$1,000 fee would be charged since both proposals could have been submitted under one application.

Permitting history is as follows:

05/02/2000: Initial covered source permit issued for 250 TPH Portable Crushing Plant, 400 TPH Non-Portable Plant, and 150 TPH Screening Plant

01/29/01: Minor modification to operate two baghouses servicing the three Canica crushers at the 400 TPH Non-Portable Plant

11/13/01: Minor modification to remove four 3-deck Nordberg screens and replace with four 3-deck Telsmith screens at the 400 TPH Non-Portable Plant

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- 05/21/02: Minor modification to remove two baghouses which were amended to permit 1/29/01; incorporated monthly and annual visible emission (V.E.) requirements for equipment not covered by NSPS Subpart OOO
- 04/28/03: Significant modification to add a 600 TPH Recycled Aggregate Plant with 1,000 kW diesel engine generator and remove 250 TPH crushing plant with 900 hp diesel engine generator; revise monthly and annual V.E. monitoring for the 400 TPH Non-Portable Plant to be only conducted on the crushers rather than the entire plant; 150 TPH Screening Plant was determined to be subject to NSPS Subpart OOO and thereby included in the permit
- 10/29/03: Minor modification to add a screen, which was inadvertently left off permittee's equipment list for 600 TPH Aggregate Recycling Plant; administrative amendment to correct typographical errors related to opacity requirement for 150 TPH Screening Plant
- 07/06/04: Minor modification to include alternate operating scenario for the 1,000 kW diesel engine generator servicing 600 TPH Aggregate Recycling Plant

### **EQUIPMENT:**

1. The renewal permit encompasses the following equipment and associated appurtenances:

a. 400 TPH Non-Portable Plant

- i. Hydraulic Track Feeder
- ii. Vibrating Grizzly 6' x 8'
- iii. 400 TPH jaw crusher, Kue Ken model no. 150S, serial no. 150S6477
- iv. 400 TPH double deck screen, Nordberg model no. unknown
- v. 400 TPH cone crusher, Symons/Nordburg model no. 7
- vi. 400 TPH 3-deck screen, Nordburg model no. unknown
- vii. 400 TPH VSI crusher (crusher #4), Canica model no. 125
- viii. 400 TPH VSI crusher (crusher #5), Canica model no. 100S
- ix. 400 TPH VSI crusher (crusher #6), Canica model no. 95
- x. 200 TPH crusher, Canica model no. 85
- xi. (4) - 100 TPH 2-deck screens Nordberg 6' x 20' - 2 deck
- xii. (4) - 250 TPH 3-deck screens Telsmith 6' x 20'
- xiii. Assorted conveyor belts
- xiv. Watersprays

b. 150 TPH Screening Plant

- i. CAY Manufacturing Model 482 Screening Plant with integrated 58 hp diesel engine; serial no. 482-88-D-124
- ii. Assorted Conveyor Belts

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- c. 600 TPH Recycled Aggregate Plant (RAP Plant)
  - i. AMI 5020VGF Grizzly Feeder, serial no. 2152-03, Manufactured 2002
  - ii. Cedarapids JPR 3054 Jaw Crusher, 600 TPH, serial no. 51636, Manufactured 2002
  - iii. Cedarapids 5064 HSI Impact Crusher, 400 TPH, serial no. 51687, Manufactured 2002
  - iv. Cedarapids TSH 6203-32 Screen, serial no. 51455, Manufactured 2002
  - v. Thunderbird 6162 re-screening station, serial number 2153-03
  - vi. Assorted conveyor belts and stackers
  - vii. Cummins QST30-G5 Diesel Engine Generator, 1,000 kW, 63.3 gph, fired with diesel #2.
  - viii. Water sprays
2. The significant modification encompasses the addition of the following equipment and associated appurtenances:
  - a. 600 TPH Screening Plant
    - i. The Read Corporation, Model RD 90 A Screening Plant (Serial No. 648388) with integrated Lister Petter, Model No. TR3, 24.8 hp diesel engine

### **AIR POLLUTION CONTROL EQUIPMENT:**

Air pollution control equipment at the facility consists of water sprays located at the 400 TPH Non-Portable Plant and the 600 TPH Aggregate Recycling Plant. The water sprays are assumed to have a control efficiency of 70%. Water trucks are also used for storage piles and work area.

### **APPLICABLE REQUIREMENTS:**

Hawaii Administrative Rules (HAR)

Chapter 11-59, Ambient Air Quality Standards

Chapter 11-60.1, 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, & 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 8, Standards of Performance for Stationary Sources

Subchapter 10, Field Citations

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### **PREVENTION OF SIGNIFICANT DETERIORATION (PSD):**

PSD review is not applicable since the facility is not a major stationary source. Facility is not a listed major stationary source where PSD threshold is 100 TPY or for all other sources, emissions do not exceed 250 TPY. For this facility, fugitive emissions *are not included* in determining major stationary source for PSD purposes (reference HAR 11-60.1-131 or PSD Workshop Manual, Section II.B.3, p. A.10).

### **NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS):**

No hazardous air pollutants are emitted at significant levels (>10 TPY single HAP or >25 TPY for total HAPs). Therefore, National Emission Standards for Hazardous Air Pollutants (NESHAPS) does not apply.

### **NEW SOURCE PERFORMANCE STANDARDS (NSPS):**

The Canica model no. 125, Canica model no. 100S, Canica model no. 95 crushers, located at the 400 TPH Non-Portable Plant, the 150 and 600 TPH Screening Plants, and the entire 600 TPH Aggregate Recycling Plant are subject to the provisions of the following federal regulations:

- a. 40 CFR Part 60 Standards of Performance for New Stationary Sources, Subpart A, General Provisions; and
- b. 40 CFR Part 60 Standards of Performance for New Stationary Sources, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants.

### **CONSOLIDATED EMISSIONS REPORTING REQUIREMENTS (CERR):**

CERR requirements are unchanged. The facility is subject to the consolidated emissions reporting rule (CERR). The level of emissions require that reporting be done every three years.

### **MAJOR SOURCE/SYNTHETIC MINOR SOURCE APPLICABILITY:**

A synthetic minor is a facility that is potentially major as defined in HAR 11-60.1-1 (e.g.,  $\geq 100$  TPY), but is made non-major through operational restrictions by enforceable permit conditions. All fugitive emissions being emitted from the emission units and associated stationary activities (e.g., storage piles) are included in the applicability of synthetic minor. The facility is currently classified as a major source. Thus, synthetic minor classification is not applicable.

### **COMPLIANCE ASSURANCE MONITORING (40 CFR Part 64):**

Applicability of the Compliance Assurance Monitoring (CAM) rule is determined on a pollutant specific basis for each affected emission unit. Each determination is based upon a series of evaluation criteria. In order for a source to be subject to CAM, each source must:

1. Be located at a major stationary source per Title V of the Clean Air Act Amendments of 1990;
2. Be subject to federally enforceable applicable requirements;
3. Have pre-control device potential emissions that exceed applicable major source thresholds;
4. Be fitted with an "active" air pollution control device; and

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5. Not be subject to certain regulations that specifically exempt it from CAM.

Compliance Assurance Monitoring (CAM) does not apply to this facility because the unit is not subject to any federally enforceable emission limitation or standard.

**BEST AVAILABLE CONTROL TECHNOLOGY (BACT) REQUIREMENTS:**

Due to the increased operating hours of the 600 TPH aggregate recycling plant with diesel engine generator and addition of a 600 TPY screening plant, particulate emissions increase exceed the respective significant level. As such, BACT applies. As before, installation of water sprays is considered BACT.

Per HAR 11-60.1-1, the facility is a major source (not to be confused with major stationary source definition per HAR 11-60.1-131 for PSD purposes). For a major source, all fugitive emissions are counted toward BACT. Since the facility is a major source, the net emissions change is calculated as follows: net emissions change = proposed limit - previous limit. (Note: if facility was determined to be a major stationary source, net emissions change = proposed limit - average of two years actual emissions.)

Emissions factors for crushed stone processes were updated from 1/95 to 8/04. To determine net emissions change from the recycling plant, the emissions based on the previous (3,120 hr/yr) and proposed (7,000 hr/yr) limits are calculated on the updated emission factors for consistency.

| Pollutant        | 600 TPH Recycling Plant w/ Diesel Eng. Gen., TPY |             | +/- change, TPY | 600 TPH Screening Plant, TPY (2,080 hr/yr) | Total Net Change, TPY | Significant Level, TPY |
|------------------|--|-------------|-----------------|--|-----------------------|------------------------|
|                  | 3,120 hr/yr                                      | 7,000 hr/yr |                 |  |                       |                        |
| NO <sub>x</sub>  | 25.08  | 56.26       | +31.18          | --   | +31.18                | 40                     |
| CO               | 2.55   | 5.73        | +3.18           | --   | +3.18                 | 100                    |
| SO <sub>2</sub>  | 6.91   | 15.71       | +8.80           | --   | +8.80                 | 40                     |
| TSP              | 0.37+100.72                                      | 0.83+225.97 | +125.71         | 58.91                                      | +184.62               | 25                     |
| PM <sub>10</sub> | 0.37 +26.87                                      | 0.83+60.27  | +33.86          | 14.72                                      | +48.58                | 15                     |

**INSIGNIFICANT ACTIVITIES/EXEMPTIONS:**

A 595 hp diesel engine generator (DEG) used to power dust control devices during blasting was exempted from permitting requirements in a July 11, 2002 letter. The exemption assumed the DEG is operated in the following manner:

1. Fired on diesel oil no. 2 with a sulfur content not to exceed 0.5% by weight.
2. Used only to power the water pump, which provides dust control during blasting.
3. Activated prior to blasting and shut down immediately after blasting.
4. Used approximately 30 hours per year.

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The diesel engine servicing the addition of a 600 TPH screen plant is rated at 0.262 MMBtu/Hr. Per HAR 11-60.1-82(f)(2), the diesel engine is exempt since heat input is less than 1.0 MMBtu/Hr.

### **ALTERNATE OPERATING SCENARIOS:**

Per July 6, 2004 minor modification, the alternate operating scenario for the 1,000 kW diesel engine generator incorporated allowance for a temporary replacement.

### **PROJECT EMISSIONS:**

The applicant proposes the following significant modifications to the facility:

1. Increase in operating hours for the 600 TPH aggregate recycling plant from 3,120 to 7,000 hours per year.

AP-42 emissions factors for crushed stone processing were updated with most recent revision on 8/04. The updated emission factors also included PM<sub>2.5</sub>. However, the available PM<sub>2.5</sub> factors in the AP-42 didn't apply to the activities shown in the table. As such, PM<sub>2.5</sub> factors were determined using AP-42, Appendix B.2.

Emissions based on 3,120 hr/yr are shown in parenthesis for the 1,000 kW diesel engine generator and 600 TPH Recycled Aggregate Plant.

1,000 kW Diesel Engine Generator - Criteria Pollutants

| Pollutant         | <sup>a</sup> Emission Factor (g/hp-hr) | Emissions (TPY)            |
|-------------------|--|----------------------------|
| SO <sub>x</sub>   | <sup>b</sup> mass balance              | 15.71 (7.00)               |
| NO <sub>x</sub>   | 5.4                                    | <sup>c</sup> 56.26 (25.08) |
| CO                | 0.55                                   | 5.73 (2.55)                |
| TOC               | 0.13                                   | 1.35 (0.60)                |
| PM <sub>10</sub>  | 0.08                                   | 0.83 (0.37)                |
| PM <sub>2.5</sub> | <sup>d</sup> 0.075                     | 0.78 (0.35)                |

<sup>a</sup> manufacturer's information

<sup>b</sup> (8.86 MMBtu/hr)(gal/ 0.14 MMBtu)(7.1 lb/gal)(0.5%) = 2.247 lb S/hr

S + O<sub>2</sub> -> SO<sub>2</sub> implies 1:1 molar ratio for S:SO<sub>2</sub>

(MW SO<sub>2</sub> / MW S)(sulfur emission rate) = (64.06/32.06)(2.247) = 4.489 lb/hr

(4.432 lb/hr)(7,000 hr/yr)(ton/2,000 lb) = 15.71 TPY

<sup>c</sup> (5.4 g/hp-hr)(1,350 hp)(7,000 hr/yr)(ton/2,000 lb)(2.205 E-03 lb / g) = 56.26 TPY

<sup>d</sup> Appendix B.2, Table B.2-2 => PM<sub>2.5</sub> = (0.90/0.96) PM<sub>10</sub>

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## Diesel Engine Generator - HAPs and PAH

| Pollutant    | <sup>a</sup> Emission Factor (lb/MMBtu) | Emissions (TPY) |
|--------------|---|-----------------|
| Benzene      | 7.76 E-04                               | 2.41 E-02       |
| Toluene      | 2.81 E-04                               | 8.71 E-03       |
| Xylene       | 1.93 E-04                               | 5.98 E-03       |
| Propylene    | 2.79 E-03                               | 8.65 E-02       |
| Formaldehyde | 7.89 E-05                               | 2.45 E-03       |
| Acetaldehyde | 2.52 E-05                               | 7.81 E-04       |
| Acrolein     | 7.88 E-06                               | 2.44 E-04       |
| Naphthalene  | 1.30 E-04                               | 4.03 E-03       |
| Total HAPs   |   | 1.33 E-01       |
| Total PAH    | <2.12 E-04                              | <6.57 E-03      |

<sup>a</sup> AP-42, Table 3.4-3 and 3.4-4 (10/96)

## 600 TPH Aggregate Recycling Plant

| Activity                     | <sup>a</sup> PM <sub>10</sub> Emission Factor, lb/ton | <sup>b</sup> Control Efficiency, % | PM <sub>10</sub> Annual Emissions, TPY | <sup>c</sup> PM <sub>2.5</sub> Annual Emissions, TPY | <sup>a</sup> TSP Emission Factor, lb/ton | TSP Annual Emissions, TPY |
|------------------------------|---|------------------------------------|--|--|--|---------------------------|
| Truck unloading              | 0.0001  | 70                                 | <sup>d</sup> 0.07 (0.03)               | 4.82 E-03 (2.15 E-03)                                | <sup>e</sup> 1.96 E-04                   | 0.12 (0.05)               |
| Primary Crushing             | 0.0024  | 70                                 | 1.52 (0.68)                            | 0.12 (0.05)  | 0.0054                                   | 3.40 (1.52)               |
| Conveyor Transfer Point (12) | (0.0011) x 12 = 0.0132                                | 70                                 | 8.32 (3.71)                            | 0.63 (0.28)  | 0.0030 x 12 = 0.0360                     | 22.68 (10.11)             |
| Fines Screening              | 0.072   | 70                                 | 45.37 (20.22)                          | 3.47 (1.55)  | 0.30                                     | 189.00 (84.24)            |
| Secondary Crushing           | 0.0024  | 70                                 | 1.52 (0.68)                            | 0.12 (0.05)  | 0.0054                                   | 3.40 (1.52)               |
| Storage Piles                | see below   | 70                                 | 3.47 (1.55)                            | 1.07 (0.48)  | see below                                | 7.37 (3.28)               |
| Total                        |   |                                    | 60.27 (26.87)                          | 5.41 (2.41)  | Total                                    | 225.97 (100.72)           |

<sup>a</sup> AP-42, Table 11.19.2-2 (8/04)

<sup>b</sup> 70% water spray control efficiency

<sup>c</sup> AP-42, Appendix B.2, Table B.2.2, Category 3, PM<sub>2.5</sub> = (0.15/0.51) PM<sub>10</sub>.

<sup>d</sup> (600 ton/hr) (7,000 hr/yr) (0.0001 lb/ton) (1 - 0.70) (ton/2,000 lb) = 0.07 ton/yr

<sup>e</sup> AP-42, Appendix B.2., Table B.2.2, Category 3, PM = PM<sub>10</sub> / 0.51

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## Storage Piles

AP-42, Section 13.2.4.3 (1/95), Equation 1

$E, \text{ lb/ton} = k (0.0032) \times [(U/5)^{1.3} / (M/2)^{1.4}]$  emission factor

U = 15 mph wind speed (AP-42, Section 13.2.4, highest value in range)

M = 1.77% (AP-42, Table 11.12-2, footnote b)

aggregate storage piles: 600 TPH x 7,000 hr/yr = 4,200,000 ton/yr

PM<sub>10</sub>:  $E = (0.35) (0.0032) \times [(15/5)^{1.3} / (1.77/2)^{1.4}] = 0.0055 \text{ lb/ton}$

$(4,200,000 \text{ ton yr}) \times (0.0055 \text{ lb/ton}) \times (\text{ton}/2,000 \text{ lb}) \times (1-70\%) = 3.47 \text{ TPY}$

PM<sub>2.5</sub>: k = 0.11, E = 0.0017 lb/ton

$(4,200,000 \text{ ton yr}) \times (0.0017 \text{ lb/ton}) \times (\text{ton}/2,000 \text{ lb}) \times (1-70\%) = 1.07 \text{ TPY}$

TSP: k = 0.74, E = 0.0117 lb/ton

$(4,200,000 \text{ ton yr}) \times (0.0117 \text{ lb/ton}) \times (\text{ton}/2,000 \text{ lb}) \times (1-70\%) = 7.37 \text{ TPY}$

## 2. Addition of a 600 TPH Screening Plant

Diesel engine is rated at 0.262 MMBtu/Hr and is considered an “insignificant activity”; no emission calculations required. The emissions for the screening plant, based on 2,080 hr/yr operation, are shown below. Conveyor transfer point emissions factor is used for front-end loading onto the screener.

### 600 TPH Screening Plant

| Activity                    | <sup>a</sup> PM <sub>10</sub> Emission Factor, lb/ton | Control Efficiency, % | PM <sub>10</sub> Annual Emissions, TPY | <sup>b</sup> PM <sub>2.5</sub> Annual Emissions, TPY | <sup>a</sup> TSP Emission Factor, lb/ton | TSP Annual Emissions, TPY |
|-----------------------------|---|-----------------------|--|--|--|---------------------------|
| Fines Screening             | 0.072   | 70                    | <sup>a</sup> 13.48                     | <sup>b</sup> 3.96                                    | 0.30                                     | 56.16                     |
| Conveyor Transfer Point (1) | 0.0011  | 70                    | 0.21                                   | 0.06   | 0.0030                                   | 0.56                      |
| Storage Piles               | 0.0055  | 70                    | 1.03                                   | 0.32   | 0.0117                                   | 2.19                      |
| Total                       |   |                       | 14.72                                  | 4.34   | Total                                    | 58.91                     |

<sup>a</sup>  $(600 \text{ ton/hr})(2,080 \text{ hr/yr})(0.072 \text{ lb/ton})(\text{ton}/2,000 \text{ lb})(1-70\%) = 13.48 \text{ TPY}$

<sup>b</sup> AP-42, Appendix B.2, Table B.2.2, Category 3,  $PM_{2.5} = (0.15/0.51) PM_{10}$

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## Unpaved Roads

AP-42, Section 13.2.2 (12/03), Equation 1a and 2, Table 13.2.2-2

$$E, \text{ lb/VMT} = k (s/12)^a (W/3)^b [(365 - P) / 365]$$

s = 3.9% silt content

W = 26.5 tons mean vehicle weight

P = no. of "wet" days with at least 0.01 inches of precipitation for a year = 82

| Constant   | PM <sub>2.5</sub> | PM <sub>10</sub> | TSP  |
|------------|-------------------|------------------|------|
| k (lb/VMT) | 0.23              | 1.5              | 4.9  |
| a          | 0.9               | 0.9              | 0.7  |
| b          | 0.45              | 0.45             | 0.45 |

Trucks VMT/yr: 0.2 mi. round trip

amount of material screened = 1,248,000 ton/yr

truck load capacity = 21 tons

no. of truck loads = no. of trips on road = 1,248,000/21 = 59,429 trips

trucks VMT/yr = 0.2 x 59,429 = 11,886 mi/yr

$$\text{PM}_{2.5}: E = 0.23 (3.9/12)^{0.9} (26.5/3)^{0.45} [(365 - 82) / 365] = 0.17 \text{ lb/VMT}$$
$$(0.17 \text{ lb/VMT}) \times (11,886 \text{ mi/yr}) \times (1 - 70\%) \times (\text{ton}/2,000 \text{ lb}) = 0.31 \text{ TPY}$$

$$\text{PM}_{10}: E = 1.5 (3.9/12)^{0.7} (26.5/3)^{0.45} [(365 - 82) / 365] = 1.11 \text{ lb/VMT}$$
$$(1.11 \text{ lb/VMT}) \times (11,886 \text{ mi/yr}) \times (1 - 70\%) \times (\text{ton}/2,000 \text{ lb}) = 1.98 \text{ TPY}$$

$$\text{TSP}: E = 4.9 (3.9/12)^{0.9} (26.5/3)^{0.45} [(365 - 82) / 365] = 3.68 \text{ lb/VMT}$$
$$(3.68 \text{ lb/VMT}) \times (11,886 \text{ mi/yr}) \times (1 - 70\%) \times (\text{ton}/2,000 \text{ lb}) = 6.57 \text{ TPY}$$

Other permitted equipment:

The emissions are updated per revised AP-42 emission factors (8/04).

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### 400 TPH Non-Portable Plant

| Activity                     | <sup>a</sup> PM <sub>10</sub> Emission Factor, lb/ton | <sup>b</sup> Control Efficiency, % | PM <sub>10</sub> Annual Emissions, TPY | <sup>c</sup> PM <sub>2.5</sub> Annual Emissions, TPY | <sup>a</sup> TSP Emission Factor, lb/ton | TSP Annual Emissions, TPY |              |
|------------------------------|---|------------------------------------|--|--|--|---------------------------|--------------|
| Primary Crushing             | 0.0024  | 70                                 | <sup>d</sup> 0.72                      | 0.21   | 0.0054                                   | 1.62                      |              |
| Secondary Crushing           | 0.0024  | 70                                 | 0.72                                   | 0.21   | 0.0054                                   | 1.62                      |              |
| Tertiary Crushing            | 0.0024  | 70                                 | 0.72                                   | 0.21   | 0.0054                                   | 1.62                      |              |
| Primary Screening            | 0.0087  | 70                                 | 2.61                                   | 0.77   | 0.025                                    | 7.50                      |              |
| Unloading to Conveyor        | 0.0001  | 70                                 | 0.03                                   | 0.01   | <sup>e</sup> 0.0002                      | 0.06                      |              |
| Conveyor Transfer Point (46) | (0.0011) x 46 = 0.0506                                | 70                                 | 15.18                                  | 4.46   | (0.0030) x 46 = 0.1380                   | 41.40                     |              |
| Storage Piles                | 0.0055  | 70                                 | 1.65                                   | 0.51   | 0.0117                                   | 3.51                      |              |
| <b>Total</b>                 |   |                                    | <b>21.63</b>                           | <b>6.38</b>  | <b>Total</b>                             |                           | <b>57.33</b> |

<sup>a</sup> AP-42, Table 11.19.2-2 (8/04)

<sup>b</sup> 70% water spray control efficiency

<sup>c</sup> AP-42, Appendix B.2, Table B.2.2, Category 3, PM<sub>2.5</sub> = (0.15/0.51) PM<sub>10</sub>

<sup>d</sup> (2,000,000 ton/yr)(0.0024 lb/ton) (1 - 0.70) (ton/2,000 lb) = 0.72 ton/yr

<sup>e</sup> AP-42, Appendix B.2., Table B.2.2, Category 3, PM = PM<sub>10</sub> / 0.51

### 150 TPH Screening Plant

| Activity                     | <sup>a</sup> PM <sub>10</sub> Emission Factor, lb/ton | <sup>b</sup> Control Efficiency, % | PM <sub>10</sub> Annual Emissions, TPY | <sup>c</sup> PM <sub>2.5</sub> Annual Emissions, TPY | <sup>a</sup> TSP Emission Factor, lb/ton | TSP Annual Emissions, TPY |              |
|------------------------------|---|------------------------------------|--|--|--|---------------------------|--------------|
| Primary Screening            | 0.072   | 70                                 | <sup>a</sup> 3.37                      | 0.99   | 0.30                                     | 14.04                     |              |
| Unloading to Conveyor        | 0.0001  | 70                                 | 4.68 E-03                              | 1.38 E-03  | 0.0002                                   | 9.83 E-03                 |              |
| Conveyor Transfer Point (16) | (0.0011) x 16 = 0.0176                                | 70                                 | 0.82                                   | 0.24   | (0.0030) x 16 = 0.0480                   | 2.25                      |              |
| Storage Piles                | 0.0055  | 70                                 | 0.26                                   | 0.08   | 0.0117                                   | 0.55                      |              |
| <b>Total</b>                 |   |                                    | <b>4.45</b>                            | <b>1.31</b>  | <b>Total</b>                             |                           | <b>16.85</b> |

<sup>a</sup> (150 ton/hr)(2,080 hr/yr)(0.072 lb/ton)(ton/2,000 lb)(1-70%) = 3.37 TPY

<sup>b</sup> 70% water spray control efficiency

<sup>c</sup> AP-42, Appendix B.2, Table B.2.2, Category 3, PM<sub>2.5</sub> = (0.15/0.51) PM<sub>10</sub>

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### Total Emissions Summary:

| Pollutant         | 600 TPH Recycling Plant with Diesel Engine, TPY | Screening Plants, TPY |         | 400 TPH Non-Portable Plant, TPY | Total, TPY |
|-------------------|---|-----------------------|---------|---------------------------------|------------|
|                   |   | 600 TPH               | 150 TPH |                                 |            |
| NO <sub>x</sub>   | 56.26   | --                    | --      | --                              | 56.26      |
| CO                | 5.73  | --                    | --      | --                              | 5.73       |
| SO <sub>2</sub>   | 15.71   | --                    | --      | --                              | 15.71      |
| TSP               | 226.80  | 58.91                 | 16.85   | 57.33                           | 359.89     |
| PM <sub>10</sub>  | 61.10   | 14.72                 | 4.45    | 21.63                           | 101.90     |
| PM <sub>2.5</sub> | 6.19  | 4.34                  | 1.31    | 6.38                            | 18.22      |

### **AIR QUALITY ASSESSMENT:**

The applicant is proposing a significant modification to the existing title V permit. Therefore, an ambient air quality analysis is required for the covered source permit renewal.

SCREEN3 air quality modeling in complex terrain was used to predict emission concentrations from the 1,000 kW diesel engine providing power to the 600 TPH recycling plant. The modeling incorporated "rural" option and default meteorology.

The plant was operated at a different part of the quarry and thus, the diesel engine was moved there as well. The air modeling took into account the new location within the property boundary. Receptors were placed at the same locations as previous air modeling with difference being distance from diesel engine stack to property line increased from 200 to 350 meters.

For complex terrain, the highest concentration at 1 g/s was 34.33 µg/m<sup>3</sup>. Complex terrain results are based on a 24-hour time period and to convert to a 1-hour time period, the 24-hour maximum is multiplied by 4. The corresponding 1-hr impact is therefore 137.32 µg/m<sup>3</sup>. One-hour conversion factors to appropriate averaging periods were 0.2, 0.4, 0.7 and 0.9 for annual, 24-hr, 8-hr, and 3-hr, respectively. The modeling results account for annual operating factor of 0.8 (7,000 hr/8,760 hr). The equation to determine SAAQS compliance:

$$(\text{emission rate, g/s}) \times (\text{max conc. from modeling @ 1 g/s}) \times \text{conversion factor} < \text{SAAQS}$$

Emission Rates (g/s) For Diesel Engine Generator Servicing 600 TPH Recycling Plant

| Unit          | NO <sub>x</sub> (as NO <sub>2</sub> ) | PM <sub>10</sub> | SO <sub>2</sub> | CO   |
|---------------|---------------------------------------|------------------|-----------------|------|
| Diesel Engine | 2.03                                  | 0.03             | 0.56            | 0.21 |

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### Stack Parameters

| Unit          | stack height (m) | stack dia. (m) | stack velocity (m/s) | stack temp. (K) |
|---------------|------------------|----------------|----------------------|-----------------|
| Diesel Engine | 3.0              | 0.152          | 201.2                | 766             |

### Modeling Results

| Pollutant        | Averaging Period | Conc. (µg/m <sup>3</sup> ) | <sup>a</sup> Background (µg/m <sup>3</sup> ) | Total (µg/m <sup>3</sup> ) | SAAQS (µg/m <sup>3</sup> ) | Percent of SAAQS (%) |
|------------------|------------------|----------------------------|--|----------------------------|----------------------------|----------------------|
| SO <sub>2</sub>  | 3-hr             | <sup>b</sup> 69.21         | 67   | 136.21                     | 1,300                      | 10.48                |
|                  | 24-hr            | 30.76                      | 17   | 47.76                      | 365                        | 13.08                |
|                  | Annual           | 12.29                      | 3  | 15.29                      | 80                         | 19.11                |
| NO <sub>2</sub>  | Annual           | <sup>c</sup> 44.55         | 9  | 53.55                      | 70                         | 76.50                |
| PM <sub>10</sub> | 24-hr            | 1.65                       | 32   | 33.65                      | 150                        | 22.43                |
|                  | Annual           | 0.67                       | 14   | 14.67                      | 50                         | 29.34                |
| CO               | 1-hr             | 28.84                      | 2,850  | 2,878.84                   | 10,000                     | 28.79                |
|                  | 8-hr             | 20.19                      | 1,539  | 1,559.19                   | 5,000                      | 31.18                |

<sup>a</sup> 2003 Annual Summary Hawaii Air Quality Data: Honolulu Monitoring Station for SO<sub>2</sub>, PM<sub>10</sub>, and CO  
Kapolei Monitoring Station for NO<sub>2</sub>

<sup>b</sup> (0.56 g/s) [(137.32 µg/m<sup>3</sup>) / (1 g/s)] x 0.9 = 69.21 ug/m<sup>3</sup>

<sup>c</sup> (2.03 g/s) [(137.32 µg/m<sup>3</sup>) / (1 g/s)] x 0.2 x (7,000 hr/8,760 hr) = 44.55 ug/m<sup>3</sup>

#### **OTHER ISSUES:**

1. The renewal permit incorporates the proposed significant modification, and also revisions to update and/or clarify existing permit conditions. See attached "Ramseyer Format For Revisions to Permit as Issued 07/06/04."
2. The opacity requirements for the 400 TPH Non-Portable Plant includes only monthly monitoring of all its crushers (see Attachment II, Special Condition No. D.6.c of renewal permit), and annual testing (Attachment II, Special Condition No. F.1.b. of renewal permit) for Canica crushers model nos. 125, 110S and 95 (see 2/20/03 review and incorporated in permit issued 4/28/03). Note that crushers that are not subject to the NSPS requirement of 15% opacity have a 20% opacity limit per *HAR 11-60.1-32, Visible Emissions* (see Attachment II, Special Condition No. C.2.c. of renewal permit; note that 20% opacity also applies to other equipment of the non-portable plant such as screens).

#### **SIGNIFICANT PERMIT CONDITIONS:**

Significant Permit Conditions Include:

- a. The Non-Portable Plant shall produce no more than 2,000,000 tons in any rolling twelve (12) month period.

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- b. The 140 TPH Screening Plant shall operate no more than 2,080 hours in any rolling twelve (12) month period.
- c. The 600 TPH Screening Plant shall operate no more than 2,080 hours in any rolling twelve (12) month period.
- d. The Aggregate Recycling Plant and associated diesel engine generator shall operate no more than 7,000 hours, as measured by the hours of operation of the 1,000 kW diesel engine generator, in any rolling twelve (12) month period.

### **CONCLUSION AND RECOMMENDATION:**

The covered source permit renewal complies with all State and Federal air pollution standards. Recommend issuance of renewal permit pending public 30-day and 45-day EPA review periods.

Reviewer: Carl Ibaan  
Date: July 29, 2005