COVERED SOURCE MINOR MODIFICATION REVIEW (0045-01)
APPLICATION NO. 0045-21

APPLICANT: Grace Pacific Corporation
Makakilo Quarry

LOCATION: 91-920 Farrington Highway
Kapolei, HI 96707

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PROPOSED PROJECT:
The subject application was submitted March 14, 2006 to modify the 600 TPH Recycled Aggregate Plant. The application filing fee of $200.00 was also submitted with the application. Addendums dated April 19 and May 23, 2006 were also submitted to revise the proposed reconfiguration and reduce the current 12-month rolling operating hours limit, respectively. The permittee proposed to re-configure parts of the plant and add additional equipment (see EQUIPMENT section). For the worst-case scenario, the proposed reconfiguration with the added equipment slightly increases total particulate emissions. The proposed changes, however, still are classified as a minor modification (see 11-60.1-81, Definition of "minor modification" 2(D)). The new equipment includes 3 new conveyors (labeled 55N, 65, and 66), bin feeder, screen station, and a stacker.

An approval letter dated 3/22/06 allowed the permittee to relocate parts of the aggregate plant during the processing of this application. The equipment that was moved included the Thunderbird II 6162 Re-screening Station, Serial No. 2175-03 (labeled as Screen A) and 2 conveyors (labeled as C-62 and C-64). Two other conveyors (labeled as C-61 and C-62) were temporarily put out of service, but will be used when the permit is amended.

EQUIPMENT:
400 TPH Non-Portable Plant, 150 and 600 TPH Screening Plants remain unchanged. Only the 600 TPH Recycled Aggregate Plant will be modified.

Existing equipment:

i. AMI 5020 VGF Grizzly Feeder, Serial No. 2152-03, Manufactured 2002
ii. Cedarapids JPR 3054 Jaw Crusher, 600 TPH, Serial No. 51636, Manufactured 2002Cedarapids 5064 HSI Impact Crusher, 400 TPH, Serial No. 51687, Manufactured 2002
iii. Cedarapids TSH 6203-32 Screen, Serial No. 51455, Manufactured 2002
iv. Thunderbird 6162 Re-screening station, Serial No. 2153-03

v. Assorted Conveyor Belts and Stackers
vi. Cummins QST30-G5 Diesel Engine Generator, 1000 kW, 63.3 gph, fired with diesel #2
vii. Water sprays

Proposed additional equipment:

i. AMI Thunderbird II, Model No. 8282-C6-D04682 Re-screening Station, Serial No. 2437-06
ii. Thunderbird II, Model No. 3613BFH-D4153 Grizzly Bin Feeder, Serial No. 2438-06
iii. 36”x30’ Jump Conveyor
iv. 36”x110’ Superior Radial Telestacker
v. 48”x60’ Super Duty Incline Conveyor

Note: Items iii, iv, and v. will be incorporated into the existing permit as “Assorted Conveyor Belts and Stackers.”

AIR POLLUTION CONTROL EQUIPMENT:
Water sprays are used to control fugitive emssions. 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

PREVENTION OF SIGNFICANT DETERIORATION (PSD):
PSD review is not applicable since the facility is not a major stationary source.

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, NESHAPs does not apply.

NEW SOURCE PERFORMANCE STANDARDS (NSPS):
The entire 600 TPH Aggregate Recycling Plant is subject to the provisions of the following federal regulations:

a. 40 CFR Part 60 Standards of Performance for New Stationary Sources, Subpart A.
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):
With the proposed new modification, CERR requirements remain unchanged. The facility is subject to the consolidated emissions reporting rule. The level of emissions requires 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., >= 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. With the proposed new modification, the facility still is 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 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
5. Not be subject to certain regulations that specifically exempt it from CAM

Compliance Assurance Monitoring (CAM) does not apply to this facility; although the plant is a major source and watersprays are used to control particulates, the watersprays are not considered an “active” air pollution control device under CAM.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) REQUIREMENTS:
BACT analysis is required for new covered sources and significant modifications to covered sources that have the potential to emit or increase emissions above significant levels, as defined in 11-60.1-1, considering any limitations, enforceable by the Director, on the covered source to emit a pollutant. For a major source, all fugitive emissions are counted toward BACT. Since the facility is a major source (not major stationary source per 11-60.1-131 for PSD purposes), the net emissions change is calculated as follows: net emissions change = proposed limit – previous limit. (note: for major stationary source, net emissions change = proposed limit – average of two years actual emissions.)

The net emissions change is +1.83 increase < 25 TPY significant level, and thus, BACT is not applicable.

INSIGNIFICANT ACTIVITIES/EXEMPTIONS:
None listed for this modification. See review dated 7/29/05 for current list of insignificant activities.

ALTERNATE OPERATING SCENARIOS:
None proposed for this modification.

PROJECT EMISSIONS:
The emission calculations incorporate the controlled emission factors from AP-42. For screening, emission factor for fines screening was not used since the plant does not have tertiary or fines crushing. Material process balance was applied throughout the crushing/screening processes. The current and proposed hours of operation are 7,000 and 6,750 hr/yr, respectively.

Worst case scenario (e.g., throughput direction through conveyors where emissions are the highest) for **current process**: (1) Maximum throughput capacity of the primary crusher is conveyed through C-51, (2) Directional flow through Screen B with the most emissions would be 400 TPH through C-61 since max capacity of Screen A is 400 TPH, and 200 TPH routed through C-56 (Thus, C-59 leg is 0 TPH), and (3) Directional flow through screen A with the most emissions would be all screened material to go through the C-63 conveyor since there are 2 conveyors of emissions sources through this leg than 1 conveyor (e.g, C-62).

Worst case scenario for **proposed process**: (1) Maximum throughput capacity of the primary crusher is conveyed through C-51 since more activities are anticipated through this direction, (2) taking into account the maximum capacity of new Screen C with the new 200 TPH bin feeder, and 200 TPH material being crushed by Secondary Crusher, directional flow through conveyor C-59 would be 100 TPH.

Table 1 – [a]Emission Factors (Controlled)

Activity	PM_{10} EF, lb/ton	$PM_{2.5}$, lb/ton	TSP, lb/ton
Primary	0.00054	0.0001	0.0012
Secondary	0.00054	0.0001	0.0012
Screen A	0.00074	0.00005	0.0022
Screen B	0.00074	0.00005	0.0022
Screen C	0.00074	0.00005	0.0022
Truck Loading	0.0001	[b]2.94 E-05	[c]1.96 E-04
Truck Unloading	1.6 E-05	[b]4.71 E-06	[c]3.14 E-05
Conveyors	4.6 E-05	1.3 E-05	0.00014
Storage Piles	0.0039	0.0012	0.0082

[a] AP-42, Table 11.19.2-2 (8/04)
[b] AP-42, Appendix B.2.2, Category 3, $PM_{2.5} = (0.15/0.51)PM_{10}$
[c] AP-42, Appendix B.2.2, Category 3, $PM = PM_{10} / 0.51$

Table 2 – Worst Case Scenarios For Current Vs. Proposed (TSP Emissions)

	Current		Proposed	
Activity	Throughput	Emissions, TPY (7,000 hr /yr)	Throughput	Emissions, TPY (6,750 hr/yr)
Primary	600 TPH	2.52	600 TPH	2.43
Secondary	[a]400 TPH	1.68	[a]400 TPH	1.62
Screen A (400)	400 TPH	3.08	n/a	n/a
Screen B (800)	800 TPH	6.16	800 TPH	5.94
Screen C (500)	n/a	n/a	500 TPH	3.71
Truck Load	4.2 E+06 tpy	0.12	[b]5.13 E+06 tpy	0.50
Truck Unload	4.2 E+06 tpy	0.02	5.13 E+06 tpy	0.08
Storage Piles	4.2 E+06 tpy	5.17	5.13 E+06 tpy	6.31
Conveyors	See Table 3	2.35	See Table 4	2.37
Total		21.10		22.96

[a]For conservatism, max capacity of crusher is used

[b][(600 ton/hr) x (6,750 hr/yr)] + [(200 ton/hr) x (6,750 hr/yr) x (80%)] = 5.13 E+06 TPY

Table 3 – Conveyor Emissions For Current (TSP Emissions)

Conveyor	Throughput, TPH	Emissions, TPY (7,000 hr/yr)
51	600	0.294
52	600	0.294
53	600	0.294
54	600	0.294
55	800	0.392
56	200	0.098
58	200	0.098
61	400	0.196
63	400	0.196
64	400	0.196
Total		2.35

Table 4 – Conveyor Emissions For Proposed (TSP Emissions)

Conveyor	Throughput, TPH	Emissions, TPY (6,750 hr/yr)
51	600	0.284
52	600	0.284
53	600	0.284
54	600	0.284
55N	800	0.378
56	200	0.095
58	200	0.095
55	500	0.236
66N	200	0.095
60, 61	500	0.236
59	100	0.047
65	100	0.047
Total		2.37

<u>Storage Piles</u>
Current:
AP-42 Section 13.2.4.3 (1/95), Equation 1
E, lb/ton = k (0.0032) x $[(U/5)^{1.3} / (M/2)^{1.4}]$ emission factor
U = 11.4 mph wind speed (AP-42, Section 7.1-9)
M = 1.77% (AP-42, Table 11.12-2, footnote b)
Aggregate storage piles = 4.2 E+06 TPY

PM_{10}: E = (0.35) (0.0032) x $[(11.4/5)^{1.3} / (1.77/2)^{1.4}]$ = 0.0039 lb/ton
(4.2 E+06 ton/yr) x (0.0039 lb/ton) x (ton/2,000 lb) x (1-70%) = 2.46
$PM_{2.5}$: k = 0.11, E = 0.0012 lb/ton
(4.2 E+06 ton/yr) x (0.0012 lb/ton) x (ton/2,000 lb) x (1-70%) = 0.76
TSP: k = 0.74, E = 0.0082 lb/ton
(4.2 E+06 ton/yr) x (0.0082 lb/ton) x (ton/2,000 lb) x (1-70%) = 5.17

Proposed: same as Current, but replace 4.2 E+06 with 5.13 E+06

Table 5 – Emissions Change For 1,000 kW Diesel Engine Generator

Pollutant	[a]Emission Factor (g/hp-hr)	Emissions, TPY		Change in Emissions, TPY
		6,750 hr/yr	7,000 hr/yr	
SO_x	mass balance	15.15	[b]15.71	-0.56
NO_x	5.4	54.25	56.26	-2.01
CO	0.55	5.53	5.73	-0.20
TOC	0.13	1.30	1.35	-0.05
PM_{10}	0.08	0.80	0.83	-0.03
$PM_{2.5}$	0.075	0.75	0.78	-0.03
TSP	PM_{10} /0.96 = 0.083	0.84	0.87	-0.03

[a]Manufacturer's data
[b](8.86 MMBtu/hr)(gal/0.14 MMBtu)(7.1 lb/gal)(0.5%) = 2.247 lb S/hr
S + O_2 -> SO_2 implies 1:1 molar ratio for S: SO_2
(MW SO_2 /MW S)(sulfur emission rate) = (64.06/32.06)(2.247) = 4.489 lb/hr
(4.489 lb/hr)(7,000 hr/yr)(ton/2,000 lb) = 15.71 TPY.

The net emissions increase (also accounting for the diesel engine generator) is +1.83 TPY (22.96 -21.10 -0.03). The proposed change is considered a minor modification since TSP emissions, representing the greatest change in emissions (e.g., as opposed to $PM_{2.5}$ and PM_{10}) are less than 2 TPY. As such, all the requirements for a minor modification are met per 11-60.1-81, Definition of "minor modification."

Table 6 – 600 TPH Aggregate Recycling Plant Annual Emissions – Proposed
(Worst Case)

Activity	PM_{10} , TPY	$PM_{2.5}$, TPY	TSP, TPY
Primary	1.09	0.20	2.43
Secondary	0.73	0.14	1.62
Screen A	n/a	n/a	n/a
Screen B	2.00	0.14	5.94
Screen C	1.25	0.08	3.71
Truck Loading	0.26	0.08	0.50
Truck Unloading	0.04	0.01	0.08
Conveyors	0.78	0.22	6.31
[a]Storage Piles	3.00	0.92	2.37
Total	9.15	1.79	22.96

[a] Same calculation for storage pile as current process except replace 4.2 E+06 with 5.13 E+06 TPY

AIR QUALITY ASSESSMENT:

The proposed modification only affects fugitive emissions. No additional combustion sources (e.g., diesel engine generator) were included to power the new equipment. For an assessment of the ambient air quality impact of the facility, see previous review dated 7/29/05.

OTHER ISSUES:

1. Material tonnage splitting off from screens is manually controlled by a gate valve. Maximum capacities of conveyors C-50 and C-51 are 200 and 600 TPH, respectively.

SIGNIFICANT PERMIT CONDITIONS:

1. Special Condition No. C.1.c – The annual operating limit is reduced from 7,000 hr/yr to 6,750 hr/yr. The proposed reduction in the annual operating limit is to keep the increase in emissions under 2 TPY so that the proposed equipment added to and re-configuration of the plant is classified as a minor modification.

CONCLUSION AND RECOMMENDATION:

Emissions were calculated with the worst case scenario. The proposed new equipment and reconfiguration indicates an increase less than 2 TPY in TSP emissions, which meets the requirements for minor modification per 11-60.1-81, Definitions (Minor Modification, (2)). Recommend issuance of permit amendment pending EPA 45-day period. Thirty-day public review period is not required for a minor modification

Carl Ibaan
May 23, 2006