BACT DETERMINATION 593-1

Emissions Unit: Landfill gas collection and control system
Rating: 45.6 MMBtu/hr
Industry Type: Electric, Gas, And Sanitary Services

Facility Name: Norcal Waste Systems Hay Road Landfill
Mailing Address: 6426 Hay Road; Vacaville, CA 95687

Contact Name: Mr. Greg Pryor, General Manager
Telephone: (707) 678-3257

Engineer: Courtney Graham
Date: October 26, 2010

Application #: C-10-34 (superceding ATC C-10-07)

I. Proposal: The applicant is proposing to modify Permit to Operate (PTO) P-85-06(a1) by replacing the existing carbon absorption collection and control system with an enclosed landfill gas fired flare rated 45.6 MMBtu/hr.

II. Applicability: The proposed emissions for the landfill and the modified gas collection and associated flare are shown below.

Component	VOC	CO	NO_X (as NO_2)	SO_X (as SO_2)	PM_{10}
Proposed Fugitive Landfill Emissions	149.8 lb/day	- lb/day	- lb/day	- lb/day	- lb/day
Proposed Flare Emissions	44.8 lb/day	218.9 lb/day	54.7 lb/day	150.0 lb/day	18.4 lb/day
Total Process Emissions	194.7 lb/day	218.9 lb/day	54.7 lb/day	150.0 lb/day	18.4 lb/day
Rule 3.4, Section 301.1 Triggers	10.0 lb/day	250.0 lb/day	10.0 lb/day	80.0 lb/day	80.0 lb/day

The landfill is an existing emissions unit and the proposed modifications do result in a daily emissions increase that exceeds the BACT trigger level , but the changes do not result in an increase in the quarterly potential to emit (PTE) for VOC. BACT is not triggered for the landfill's VOC emissions, since the proposed emission do not result in a quarterly increase for this pollutant.

The proposed flare is a new emissions unit that replaces an existing control system and the proposed modification results in an increase in the quarterly PTE for only CO, NO_X, SO_X, and PM_{10} pollutants. As shown above, BACT is not triggered for CO, and PM_{10}, since the proposed emissions for the flare do not exceed the daily BACT trigger levels specified by Rule 3.4, Section 301.1. BACT is not triggered for the flare's VOC

emissions, since the proposed emission do not result in a quarterly in a quarterly increase for this pollutant. Lastly, BACT is triggered for the flare's NO_X and SO_X emissions, since the proposed daily emissions exceed the BACT trigger level specified by Rule 3.4, Section 301.1, and the application results in a quarterly increase in the PTE for the pollutant.

III. Top-down BACT Analysis NO_x:

A. Identify all control technologies

Option 1: Enclosed flare with a maximum NO_X emission concentration of 0.06 lb/MMBtu (Bay Area AQMD BACT Document #81.1 (10/18/1991))

Option 2: Enclosed flare with a maximum NO_X emission concentration of 0.05 lb/MMBtu (San Joaquin Valley APCD BACT Guideline 1.4.3 (01/08/2001))

Option 3: Ultra Low-NO_X enclosed flare with a maximum NO_X emission concentration of 0.03 lb/MMBtu (San Joaquin Valley APCD BACT Guideline 1.4.4 (01/08/2001))

B. Eliminate Technologically Infeasible Options

Options 1, 2, and 3 have been shown to be technologically feasible.

C. Rank Remaining Control Technologies by Control Effectiveness

Control Technology	Efficiency	Achieved in Practice (Yes / No)
Option 1	N/A	Yes
Option 2	N/A	Yes
Option 3	N/A	No

D. Cost Effective Analysis

The applicant is proposing the use of an enclosed landfill meeting the required designed criteria of Option 2, therefore no further cost analysis is required.

E. Select BACT

The applicant has proposed the control technology option with the lowest emission concentration that is both feasible and achieved in practice for this source category. Therefore, BACT has been satisfied with the proposed use of an enclosed flare meeting a NO_X emission factor of 0.05 lb/MMBtu.

IV. Top-down BACT Analysis SO_x:

A. Identify all control technologies

Option 1: Wet scrubber with 98% control efficiency (San Joaquin Valley APCD Guideline 1.4.3 (01/08/2001))

Option 2: Solid scrubber (iron sponge) (Bay Area AQMD BACT Guideline 80.1 (12/16/91))

B. Eliminate Technologically Infeasible Options

Both of the options are technologically feasible.

C. Rank Remaining Control Technology:

Control Technology	Efficiency	Achieved in Practice (Yes / No)
Option 1	98%	No
Option 2	N/A	No

D. Cost Effective Analysis

To annualize a capital cost, the following formula is used:
$A = P * ((i * (1 + i)^n)/(1 + i)^n - 1))$, where:
A = annualized capitol cost of the control equipment
P=present capitol cost of the control equipment
i = interest rate (use 10% unless alternate can be documented to representative)
n = Equipment life (use 10 years unless alternate can be documented)

I. Option 1 - Wet Scrubber

a. $A = \$37,796 * ((0.1 * (1+ 0.1)^{10})/(1+ 0.1)^{10} -1))$
$= \$6,151$

b. Annual operating costs = $580,444

c. Total annual costs = $6,151 + $580,444 = $586,595

d. SOx cost effectiveness = $3,900/ton

27.20 tons/year * 98% control = 26.66 tons

$586,595 / 26.66 tons = $22,006/ton

The cost for this control option exceeds the SOx cost effectiveness threshold, therefore this option is not cost effective.

II. Option 2 - Solid Scrubber (Iron Sponge)

a. $A = \$317,155 * ((0.1 * (1+ 0.1)^{10})/(1+ 0.1)^{10} -1))$
$=\$51,616$

b. Annual Operating Costs = $226,438

c. Total annual costs = $51,616 + $226,438 = $278,054

d. SOx cost effectiveness = $3,900/ton

27.20 tons/year * 98% control (conservative assumption) = 26.66 tons

$278,054 / 26.66 tons = $10,429/ton

E. Select BACT

None of the control options are cost effective, therefore BACT is not required for SOx.

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