UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

MEMORANDUM

DATE: August 15, 1986

SUBJECT: North County Resource Recovery Associates
PSD Appeal No. 85-2

FROM: David P. Howekamp, Director
Air Management Division, Region 9

TO: Lee M. Thomas, Administrator
U.S. Environmental Protection Agency

This is in response to the June 3, 1986 remand of Region 9's April 2, 1985 determination to issue a Prevention of Significant Deterioration (PSD) permit to the North County Resource Recovery Associates for the construction of a 1000 ton per day resource recovery facility. The remand charged Region 9 with reconsidering the effects of unregulated pollutants when making PSD determinations.

Region 9 has reviewed the relevant BACT decisions and has prepared a response to the Administrator's remand, as recommended in the July 21, 1986 guidance memo from Gerald A. Emison, Director, Office of Air Quality Planning and Standards. Our response with supporting materials is attached.

If you have any questions regarding the enclosed materials please contact me at 454-8201 (FTS) or have you staff contact Wayne A. Blackard, Chief of our New Source Section at 454-8249 (FTS).

Enclosures

RESPONSE TO PSD REMAND
NORTH COUNTY RECYCLING AND ENERGY RECOVERY CENTER
(PSD Appeal No. 85-2)

On April 2, 1985 the Director of the Air Management Division, EPA Region 9, made a determination to issue a Prevention of Significant Deterioration (PSD) permit to the North County Resource Recovery Associates (NCRRA) for the construction and operation of a 33 megawatt, 1000 ton per day resource recovery facility. During the following appeal period EPA received three petitions filed pursuant to 40 CPR 124.19 requesting the Administrator to review Region 9's decision to issue the PSD permit. The Office of the Administrator reviewed the petitioners' comments and Region 9's responses to the comments and determined that Region 9 had satisfactorily addressed all of the petitioners' allegations with the exception of Region 9's assertion that EPA lacked the authority to "consider" pollutants not regulated by the Clean Air Act when making a PSD determination. The Administrator felt that Region 9's assertion was overly broad and that when making a PSD determination, in particular a best available control technology (BACT) decision, a permitting agency must consider not only the environmental impact of the controlled regulated pollutant but must also consider the environmental impacts of any unregulated pollutants that might be affected by the choice of control technology. For this reason the Administrator remanded the PSD determination to Region 9 for reconsideration and action consistent with the

above interpretation of EPA authority.

In response to the above, Region 9 has reviewed the BACT decisions made for the NCRRA PSD permit. Under the PSD regulations NCRRA must apply BACT to control emissions of SO2, NOx, lead, mercury, and fluorides from their proposed resource recovery facility. BACT is defined in the Clean Air Act as "...an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act...on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs.." Under environmental impacts our review of the original BACT determination included the impacts from both regulated and affected unregulated pollutants. The control of particulates, CO, and VOC emissions are not directly subject to the federal PSD BACT review, but are subject to the nonattainment permitting regulations which are administered by the San Diego Air Pollution Control District.

NCRRA is proposing to use a dry scrubber with a baghouse to control emissions of SO2, acid gases, and particulate matter from the proposed resource recovery project. The dry scrubber consists of a spray dryer and a baghouse. The spray dryer injects an atomized lime slurry sorbent into the flue gas stream. The baghouse removes the dried sorbent and flyash (particulate matter) from the flue gas. The dry scrubber will be designed for a flue gas flow of 225,000 acfm at an inlet temperature of

340 degrees F and a maximum outlet temperature of 265 degrees F. NCRRA expects the dry scrubber system to provide 83% removal of SO2 and 95% removal of acid gases as well as 99.5% removal of particulates.

Recent tests of emissions control devices for waste fired boilers (the latest being the Quebec City Test Program) have shown that properly designed and operated control devices can significantly reduce emissions from resource recovery facilities. In particular, an acid gas scrubbing system operating at optimal stoichiometric ratios, at low temperature, in tandem with a baghouse can achieve very high removal efficiencies of particulates, SO2, HCl, organics, and heavy metals. The tests indicate that the NCRRA's proposed emission control system (line slurry spray dryer, baghouse, low temperature flue gas) is the most efficient for controlling the unregulated pollutants from a resource recovery facility. While certain technologies may have the potential for greater removal of regulated pollutants (e.g. a wet scrubber may yield greater SO2 removal), available data suggests that greater control of unregulated pollutants will not result. Region 9 believes that the NCRRA's proposed control technology will have very high collection efficiencies of dioxins, furans, and heavy metals, with collection efficiencies of 95% for HCl, and greater than 90% for mercury. We conclude that a lime slurry spray dryer with a baghouse provides the greatest degree of control currently achievable for the relevant air toxics concerns and therefore, emission limitations based on the operation of a lime slurry spray dryer with a baghouse and continuous emission monitors constitute BACT for the control of SO2, lead, mercury, and fluorides from the NCRRA facility.

In addition to the proposed acid gas BACT, Region 9 also reviewed the BACT decisions made for controlling NOx emissions from the NCRRA facility. NCRRA has proposed to control NOx emissions with low excess air and staged combustion. After reviewing all of the available control technologies, Region 9 believes that the alternate NOx control technologies currently available for resource recovery do not offer any better control of the affected pollutants (organics such as dioxins and furans) than do the controls proposed for the NCRRA facility. Our review included staged combustion, selective non-catalytic reduction, selective catalytic reduction, wet flue gas de-nitrification, and the different categories of source separation. Our review also took into account the effects of the district permit requirements designed to reduce organic toxic pollutants (minimum 1800 degrees F furnace temperature and minimum 2 second residence time in the combustion zone). We conclude that an emission limitation based on the use of low excess air and staged combustion and with continuous emission monitors is BACT (considering the effect of unregulated pollutants) at this time for the control of NOx emissions from the NCRRA facility.

As part of our BACT review of the NCRRA PSD permit, Region 9 prepared

several charts listing the available SO2 and NOx control options for the NCRRA facility, ranked in order of control

effectiveness, with the estimated impacts of the controls on the projects' other air pollutants. The charts were prepared using data from existing Region 9 PSD permits, permit applications, district permits, emission control technology reports from the California Air Resources Board and the New York City Department of Sanitation, and from reports on the Quebec City Test Program. The impacts on other pollutants were estimated using our best engineering judgement based on the available data. We have included these charts with this report for your review.

After reviewing the above facts, Region 9 has concluded that no greater controls for the regulated pollutants can be applied that would be more effective in reducing the emissions of unregulated pollutants. Therefore, the BACT proposed by NCRRA and the BACT decisions made by Region 9 in the April 2, 1985 PSD determination are reaffirmed as BACT for controlling SO2, NOx, lead, mercury, and fluoride emissions from NCRRA's proposed North County Recycling and Energy Recovery Center.

REFERENCES

1. Air Pollution Control at Resource Recovery Facilities, California Air Resources Board, May 24, 1984.

2. Clarke, Marjorie J., Emission Control Technologies for Resource Recovery, New York City Department of Sanitation, March 15, 1986.

3. Ray, D.J., Finkelsteim, A., Klicuis, R., Masentette, L., "The National Incinerator Testing and Evaluation Program: An Assessment of A) Two-Stage Incineration B) Pilot Scale Emission Control", Presented at the 79th Annual Meeting of the Air Pollution Control Association, June 22-27, 1986, Minneapolis, Minnesota.[READERS NOTE: Originally this table was landscape-oriented it had to be divided due to space limitations]

EPA Region 9 - New Source Section
BACT ANALYSIS
(Ranked in Decreasing Order of Control Effectiveness)

Project: North County RRF
Project Category: Resource Recovery
Project Type: 1113 TPD, RDF, 36 MW
Pollutant: SO2
Date: August 15, 1986
Project Engineer: Bob Baker

Control Options	% Control	Emission Rates (lbs/ton) (ppm) see *	Emissions (tons/yr)
Spray Dryer, Alkaline Slurry, Baghouse	80-95	0.26-1.04 (9-35)	53-212
Spray Dryer, Lime Slurry, Baghouse	75-90	0.52-1.30 (18-44)	106-265
Spray Dryer, Alkaline Slurry, ESP	75-90	0.52-1.30 (18-44)	106-265
Dry Injection, Sodium Sorbent, Baghouse	70-85	0.78-1.56 (26-53)	159-318

Spray Dryer, Lime Slurry, ESP	65-85	0.78-1.82 (26-62)	159-371
Dry Injection, Lime, Baghouse	65-80	1.04-1.82 (35-62)	212-371
Wet Scrubbing, Alkaline	50-90+	0.52-2.61 (18-88)	106-530
Dry Injection, Sodium Sorbent, ESP	50-75	1.30-2.61 (44-88)	265-530
Dry Injection, Lime, ESP	40-70	1.56-3.13 (53-106)	318-636
Dry Injection, Limestone ESP	25-40	3.13-3.91 (106-132)	636-795
Wet Scrubbing, Water	20-30	3.65-4.1 (124-141	742-848
Source Separation	5-10	4.69-4.95 (159-168)	954-1007

[*]: Corrected to 12% CO2, 24 hour average

Control Options	Control Effectiveness on Other Pollutants				
	Heavy Metals	Dioxin Furans	HCl	Hg	Lead
Spray Dryer, Alkaline Slurry, Baghouse	Exc	Exc	Exc	Good	Exc
Spray Dryer, Lime Slurry Baghouse	Exc	Exc	Exc	Good	Exc
Spray Dryer, Alkaline Slurry, ESP	Good	Good	Exc	Fair	Good
Dry Injection, Sodium Sorbent, Baghouse	Exc	Poor	Exc	Poor	Good
Spray Dryer, Lime Slurry, ESP	Good	Good	Exc	Fair	Good
Dry Injection, Lime, Baghouse	Good	Poor	Exc	Poor	Good
Wet Scrubbing, Alkaline	Poor	Poor	Exc	Fair	Fair
Dry Injection, Sodium Sorbent, ESP	Fair	Poor	Exc	Poor	Fair
Dry Injection, Lime, ESP	Fair	Poor	Good	Poor	Fair

[READERS NOTE: Originally this table was landscape-oriented it had to be divided due to space limitations]

EPA Region 9 - New Source Section
BACT ANALYSIS
(Ranked in Decreasing Order of Control Effectiveness)

Project: North County RRF
Project Category: Resource Recovery
Project Type: 1113 TPD, RDF, 36 MW
Pollutant: NOx
Date: August 15, 1986
Project Engineer: Bob Baker

Control Options	% Control	Emission Rates (lbs/ton) (ppm) see *	Emissions (tons/yr)
Selective Catalytic Reduction (SCR)[See Footnote 2]	90-95	0.31-0.61 (15-30)	65-129
Wet Flue Gas Denitrification (FGDn) (See Footnote 2)	80-90	0.61-1.21 (30-60)	125-258
Selective Non-Catalytic Reduction (SNCR)	30-60	2.43-4.25 (110-200)	473-860
Low Excess Air/Staged Combustion	30-35	3.94-4.25 (185-200)	795-860
Flue Gas Recirculation	10-15	5.16-5.46 (240-260)	1032-1118
Source Separation	Minimal	-	-

Footnote 1: Corrected to 12% CO2, 24 hour average.

Footnote 2: This control technology has not yet been applied to refuse combustion, and has not bee considered as a transferable technology due to as yet unresolved technological problems.

Control Options	Control Effectiveness on Other Pollutants				
	Dioxin Furans	VOC	CO	Heavy Metals	
Selective Catalytic Reduction (SCR)(See Footnote 2)	Unk	Poor	Poor	None	
Wet Flue Gas Denitrification (FGDn)(See Footnote 2	None	None	None	Poor	
Selective Non-Catalytic Reduction (SNCR)	None	None	None	None	

Low Excess Air/Staged Combustion	Unk	Unk	Unk	None	
Flue Gas Recirculation	Worsen	Worsen	Worsen	None	
Source Separation	Fair	Poor	Poor	Poor	