February 22, 1991

Mr. Willard Hanks
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Permit Application

Dear Mr. Hanks:

Per our meeting on January 30, 1991, we have reviewed our records concerning the operation of our stone dryer. Based on the past five years of records, we have operated the dryer a total of 850 h and used 95,625 gal of waste oil.

Enclosed are the revised attachments D, F, and G to our permit application. It should be noted that Rinker will accept a restriction in the operating permit that will limit the total waste oil or distillate oil consumption to 769,459 gal/year. This limit at 0.5 percent sulfur fuel produces a net SO_2 increase of 39.5 tons/year. Rinker will maintain records and fuel oil burning integrators necessary to establish compliance with the total fuel use limitations. The balance of the fuel input will be natural gas, which has a negligible sulfur content.

I hope this will resolve the issue of emission changes to the agency's satisfaction. If you have any questions or you need any additional information, please give me a call at (305) 221-7645.

Sincerely,

Rinker Portland Cement Corporation

Michael D Vardeman

Mike Vardeman

C: Hanks
S. Brooks, SE Dist
P. Wong, DERM

ATTACHMENT D

EMISSION ESTIMATES

Pollutant emission estimates are based on expected maximum operating conditions and worst-case feed material. The highest soil contamination is assumed to be 850 ppm of residual oil. This condition is not constantly expected but represents a worst-case situation. Because of the sulfur content of residual oil this increases the potential SO_2 loss from the dryer (14.37 lb/h fuel combustion and 2.86 lb/h process loss from soil).

NO_x emissions are calculated based on NO_x generation from low excess air dryer burner and low excess air afterburner. An additional adjustment is made based on experience with the total system gas volume.

A. <u>NO_x</u>

- Assumptions

  - 150 ppm NO_x on dryer burner based on 30 percent excess air in dry flue gases
  - 150 ppm NO_x on afterburner combustion based on burner dry flue gases
  - 15 ppm additional NO_x in total dry gas volume
  - Worst-case without organics; full burner operation

- Dryer

$$\frac{(27.5x10^6\ Btu/h)(8740\ scf/10^6\ Btu)(1.3)}{60\ \min/h} = 5207 dscfm$$

$$\frac{(150\ x\ 10^{-}6\ scf\ NO_x\ /scf)(5207 scfm)(60 \min/h)}{12.8\ scf\ NO_x/lbNO_x} = 3.67\ lb/h$$

- Afterburner

- Afterburner

$$\frac{(15 \times 10^6\ Btu/h)(8740\ scf/10^6\ Btu)(1.3)}{60\ min/h} = 2841\ dscfm$$

$$\frac{(150 \times 10^{-6}\ scf\ NO_x/scf)(2841\ dscfm)(60\ min/h)}{12.8\ scf\ NO_x/lb\ NO_x} = 1.99\ lb/h$$

Total gas

$$\frac{(15 \times 10^{-6}\ scf\ NO_x/scf)(60\ min/h)(9773\ scfm)}{12.8\ scf\ NO_x/lb\ NO_x} = 0.687\ lb/h$$

Total NO_x = 6.34 lb/h

B. <u>CO</u>

- Assumptions

  - 50 ppm CO remaining in afterburner flue gases (dry basis)
  - 30 percent excess air

$$\frac{(50 \times 10^{-6}\ scf\ CO/scf)(9773\ scfm)(60\ min/h)}{13.76\ scf\ CO/lb\ CO} = 2.1\ lb/h$$

C. SO_2

- Assumptions

  - Distillate oil used in dryer with sulfur content of 0.50 percent
  - Fuel oil heat content 142,000 Btu/gal
  - Dryer heat input 27.5 x 10^6 Btu/h
  - Natural gas used on afterburner
  - Maximum 850 ppm residual oil in soil at 2.1 percent S

$$\frac{27.5 \times 10^6\ Btu/h}{142{,}000\ Btu/gal} = 193.7\ gal/h$$

$$\left(193.7\ \frac{gal}{h}\right)\left(7.4\ \frac{lb}{gal}\right) = 1433\ lb/h$$

100 (1433 lb/h) = 14.32

- Afterburner

$$(15 \times 10^6\ \frac{Btu}{h}) \rightarrow neg.\ sulfur$$

- Fuel in Soil

(2)(40 ton/h)(2000 lb/ton)(850 x 10^{-6})(2.1/100 %S) = 2.68 lb/h

Total SO_2 = 17.18 lb/h

D. VOC

- Potential (40 tons/h)(2000 lb/ton)(6000 x 10^{-6}) = 480 lb/h
- Controlled (1 - 0.988)(480 lb/h) = 5.48 lb/h

E. PM

- Assumptions

  - 0.02 gr/acf at baghouse exit

$$\frac{(5716\ dscfm)(0.02\ gr/dscf)(60\ min/h)}{7000\ gr/lb} = 0.97\ lb/h$$

Afterburner firing rate

$$\frac{15 \times 10^6\ Btu/h}{1100\ Btu/cf\ (10^6)} = 0.0136\ mm\ cf/h$$

$$(0.0136\ mm\ \frac{cf}{h})(1.0\ \frac{lb}{mm\ cf}) = 0.0136\ lb/h\ (neg)$$

Total PM < 1.0 lb/h

EXPECTED ANNUAL POTENTIAL EMISSIONS

	lb/h	lb/yr	tons/yr
PM	1200	10,512,000	5256
SO_2	17.18	80,420	40.21
CO	2.1	18,396	9.19
VOC	480	4,204,800	2102.4
NO_x	6.34	55,538	27.77

ANNUAL ACTUAL CONTROLLED EMISSIONS

	lb/h	lb/yr	tons/yr
PM	1.0	8,760	4.38
SO_2	17.18	80,420	40.21
CO	2.1	18,396	9.19
VOC	5.48	48,000	24.0
NO_x	6.34	55,538	27.77

ATTACHMENT F

HISTORIC EMISSION ESTIMATES

A. NO_x

° Assumptions

- Emission rate 0.133 lb/10^6 Btu
- Existing burner without NO_x control or excess air control

Heat input = (25 ton/h)(4.5 gal/ton)(142,000 Btu/gal) = 15.97 x 10^6 Btu/h

$$NO_x = (0.133 \text{ lb}/10^6 \text{ Btu})(15.97 \times 10^6 \text{ Btu/h}) = 2.12 \text{ lb/h}$$

$$NO_x = (2.12 \text{ lb/h})(170 \text{ h/yr})\ (1 \text{ ton}/2000 \text{ lb}) = 0.18 \text{ tons/yr}$$

B. CO

° Assumptions

- Dryer excess air at stack 134%
- Stack flow rate approximately 5750 dscfm
- Stack CO concentration approximately 400 ppm (v/v) dry

$$CO = \frac{(400 \times 10^{-6} \text{ scf CO/scf})(5750 \text{ scfm})(60 \text{ min/h})}{(13.76 \text{ scf CO/lb CO})} = 10.03 \text{ lb/h}$$

$$CO = (10.03 \text{ lb/h})(170 \text{ h/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.85 \text{ tons/yr}$$

C. SO_2

° Assumptions

- Distillate oil used in dryer with sulfur content of 0.50 percent
- Fuel oil heat content 142,000 Btu/gal
- Dryer production rate 25 tons/h
- Fuel efficiency 4.5 gal/ton stone
- 170 h/yr operation (5 year average)

$$\text{Production} = (170\ \text{h/yr})(25\ \text{tons/h}) = 4{,}250\ \text{tons/yr}$$

$$\text{Fuel usage} = (4{,}250\ \text{tons/yr})\ (4.5\ \text{gal/ton}) = 19{,}125\ \text{gal/yr}$$

$$SO_2 = (1\ \text{ton}/2000\ \text{lb})(19{,}125\ \text{gal/yr})(2)(0.5\ \%S/100)(7.4\ \text{lb/gal}) = 0.71\ \text{tons/yr}$$

D. VOC

Contaminated soils have not historically been processed in the drier.

E. PM

° Assumptions

- Emissions have been consistent with permit allowables (i.e., 26.41 lb/h)

- Production rate 25 tons/h

$$PM = (26.41\ \text{lb/h})(170\ \text{h/yr})(1\ \text{ton}/2000\ \text{lb}) = 2.24\ \text{tons/yr}$$

HISTORIC ANNUAL POTENTIAL EMISSIONS

	lb/h	lb/yr	tons/yr
PM	750	127,500	63.75
SO_2	8.32	1,414	0.71
CO	10.03	1,705	0.85
VOC	0	0	0
NO_x	2.12	360	0.18

HISTORIC CONTROLLED EMISSIONS

	lb/h	lb/yr	tons/yr
PM	26.41	4,500	2.24
SO_2	8.32	1,420	0.71
CO	10.03	1,700	0.85
VOC	0	0	0
NO_x	2.12	360	0.18

ATTACHMENT G

NET CHANGE IN EMISSIONS

	Actual historic		Actual proposed		Change	
	lb/h	tons/yr[a]	lb/h	tons/yr	lb/h	tons/yr
PM	26.41	2.24	1.0[b]	4.38	-25.41	2.14
SO_2	8.32	0.71	17.18	40.21[c]	8.86	39.50
CO	10.03	0.85	2.1	9.19	-7.93	8.34
VOC	0	0	5.48	24.00	5.48	24.00
NO_x	2.12	0.18	6.34	27.77	4.22	27.59

[a] Based on 5 year average of 170 h/year operation (100h, 100h, 100h, 250h, and 300h)

[b] Maximum of 4 lb/h (Average 1.0 lb/h)

[c] Maximum fuel oil use of 769,459 gal/year at 0.5% S, 7.4 lb/gal, maximun SO_2 from S in the soil of 11.74 ton/year