NM - 62

GENERAL CORRESPONDENCE

YEAR(S):

1994

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

March 11, 1994

CERTIFIED MAIL
RETURN RECEIPT NO. P-111-334-166

Mr. Rusty Buckingham
OMEGA-J
P.O. Box 4802
Midland, Texas 79704

1000373

RE: MOBILE THERMAL DESORPTION UNIT
OCD RULE 711 PERMIT APPLICATION

Dear Mr. Buckingham:

The New Mexico Oil Conservation Division (OCD) has received your October 20, 1993, application for a permit to operate a mobile thermal desorption unit submitted by GMA, Inc. on behalf of OMEGA-J, Inc. The application proposes to operate a mobile thermal remediation facility for the reclamation of hydrocarbon contaminated wastes generated in conjunction with the production of oil and gas in eastern New Mexico. The OCD has evaluated the need for a Rule 711 permit for this facility.

At this time the OCD does not require a Rule 711 permit for a mobile thermal treatment facility. The individual company or lease operator who wishes to dispose of waste at their lease site using your portable disposal unit must obtain prior authorization from the OCD Santa Fe Office. If wastes are moved off site from a number of leases to a centralized location to be disposed of using your thermal disposal unit then an OCD Rule 711 permit is required prior to operation of this facility.

If you have any additional questions, please do not hesitate to contact me at (505) 827-5884.

Sincerely,

Kathy M. Brown
Geologist

xc: Wayne Price, OCD Hobbs Office
A.K. Khera, GMA, Inc.

PERMIT APPLICATION TO OPERATE A MOBILE THERMAL DESORPTION UNIT FOR HYDROCARBON CONTAMINATED SOILS WITHIN NEW MEXICO

RECEIVED
OCT 21 1993
OIL CONSERVATION DIV.
SANTA FE

PREPARED FOR:
OMEGA-J, INC., MIDLAND, TEXAS

SUBMITTED TO:

NEW MEXICO OIL CONSERVATION DIVISION

PREPARED BY:

GMA, INC.

OCTOBER 20, 1993

GMA, INC.
Consultants • Engineers • Laboratory Testing
Civil • Environmental • Transportation

Memo

From
WILLIAM OLSON
Hydrogeologist

To

Verbally told A.K. Khera that OCD cannot generically approve mobile sites or processes. OCD can only approve use of the process for a specific company site. The RP is responsible for their wastes not GMA. OCD considers GMA a service to the RP and therefore approval must be to the RP.

GMA, INC.
Consultants • Engineers
Civil • Environmental • Transportation

October 20, 1993

Mr. Bill Olson
New Mexico Oil Conservation Division
State Land Office Building
P. O. Box 2088
Santa Fe, New Mexico 87504-2088

Subject: Permit to Operate a Mobile Thermal Desorption Unit for Hydrocarbon Contaminated Soils Within New Mexico

Dear Mr. Olson:

On July 29, 1993 we contacted you to discuss the permitting requirements for a mobile Thermal desorption unit for remediation of Hydrocarbon contaminated soils. Based on our understanding of that communication we have compiled the necessary information in the enclosed package for your review and issuance of a permit. GMA, Inc., is requesting the permit on behalf of our client OMEGA-J, Inc. of Midland, Texas.

Our communications with you revealed that there is no specific format for application for the said permit. Therefore, we have organized the enclosed document in a format that is succinct and easy to follow. At a glance from the table of contents you should be able to determine that all possible issues have been addressed. However, if we have inadvertently missed to address specific permit requirement, we are ready to respond promptly upon your request.

Your prompt review of the enclosed application will be much appreciated. Please do not hesitate to contact me at (505) 646-6507.

Sincerely yours,

GMA, INC.

Marwin Nagee
for
A. K. Khera, P.E.
President

xc: Mr. Rusty Buckingham - Partner, OMEGA-J

/AKK/cma/omegarpt.o20:Dsk#262

TABLE OF CONTENTS

APPLICATION FOR PERMIT FOR A THERMAL DESORPTION UNIT FOR THE REMEDIATION OF HYDROCARBON CONTAMINATED SOILS

1.0 INTRODUCTION

1.1 Background:

A group of Texas investors, all having experience in the oil related business developed a Texas Partnership to invest in the development, testing, permitting and operation of a Thermal Desorption Unit for remediation of hydrocarbon contaminated soils. A prototype of the equipment is currently operational in Midland, Texas. The Desorption unit is designed to either be located on one site for extended periods or moved to locations needing decontamination of hydrocarbon contaminated soils. The partnership is seeking a permit from the New Mexico Oil Conservation Division for the use of this mobile decontamination equipment primarily intended for use in the oil fields of eastern New Mexico.

1.2 Ownership:

The Desorption Unit is owned by a Limited Partnership, and operated by OMEGA-J, Inc., a Texas Corporation. The partners are:

PATOIL Corporation - Midland,Texas
Gordon T. West, Jr., Inc. - Wichita Falls, Texas
Henderson & Erickson Ltd., - Midland, Texas and Wichita Falls, Texas

The Partnership address and phone numbers are:

P. O. Box 4802
Midland, Texas 79704
Tel: (915) 694-7793
Fax: (915) 694-7872

1.3 Purpose:

The purpose of the Desorption unit is to provide a mobile decontamination methodology for remediating highly contaminated soils in the oil fields and other petroleum extraction and refining industries.

2.0 DESCRIPTION OF EQUIPMENT

2.1 Process Description:

The process employed by the equipment is called Thermal Desorption. It consists of heating hydrocarbon contaminated soils in a rotary kiln to a temperature high enough to volatilize the hydrocarbons. The volatilized gases are transferred to a burner section where the gases are heated to a temperature high enough to almost completely destroy the volatile hydrocarbons so that there are practically no hydrocarbon emissions from the process. The decontaminated soil can be safely backfilled into the excavation from which it was originally derived or disposed of in a manner required by the customer and in accordance with applicable regulations. The process offers a quick method of remediating contaminated soils that have very high hydrocarbon concentration (TPH = 10,000 - 25,000 ppm).

2.2 Components and Functions:

The unit consists of three basic components these are: 1) The infeed system, 2) Thermal Unit, and 3) Water Storage Skid. The infeed system prepares the soil for processing. This infeed system consists of a hopper, a shaker/screen, a crusher, and a conveyor belt which weighs the material to be processed. The second piece of equipment is the thermal unit, itself, which consists of a rotary kiln, the furnace area for flashing the volatilized gasses, and a water cooling system which also removes the particulates out of the emissions. The third piece of equipment is a water storage skid which furnishes water to the cooling system and is recycled back into the water system skid. When the water becomes a slurry from the particulate emissions it is disposed on-site in a evaporation pond. Photographs of the unit are attached in Appendix I.

2.3 Mobility and Siting:

One of the major advantages of this desorption system is that it can be mobilized to the site where contaminated soils are being excavated. This facilitates on-site decontamination and backfilling as almost simultaneous operations. Invariably the desorption unit is expected to be located in the eastern New Mexico Oil fields and areas that are predominantly involved in the extraction, storage and refining of petroleum products. The following general criteria will be used in siting the desorption unit:

1. If site permits, the unit will be located on customer's oil field or refining site, an area where petroleum hydrocarbons are handled and stored. Thus, the unit will be located on a site with compatible land use.

2. The site will appropriately be graded to contain stormwater runoff.

3. In as far as it is possible the unit will be located in low risk areas where groundwater table is greater than 100 ft. deep.

4. The unit will not be located within 1,000 ft. of residential and commercial areas unless the commercial operation is involved in the extraction, storage and refining of petroleum products (i.e. compatible uses).

The desorption unit upon complete set-up on-site, occupies an area approximately 150 ft. x 200 ft.

2.4 Capacity and Size:

As stated above the unit occupies approximately 150 ft. x 200 ft. area when fully assembled. Adequate working and vehicle maneuvering space is required to facilitate operations. Capacity of the unit depends upon the level of contaminated soil to be remediated. Nominally the unit can process up to 11 tons of soil per hour if the TPH is below 10,000 ppm.

3.0 SOIL DECONTAMINATION EFFECTIVENESS

The effectiveness of the desorption unit depends upon several factors such as:

a. Hydrocarbon concentration (TPH) of the feed soil

b. Soil moisture content

c. Type of hydrocarbon

Contaminated soils have been demonstrably remediated to levels below 100 ppm TPH and to levels as low as zero depending upon feed TPH concentration. The equipment has been demonstrated to accept crude oil contaminated soils with TPH levels of up to 35,000 ppm with treated soil TPH levels of 50-75 ppm, well within regulatory ranges.

4.0 SIDE STREAMS

4.1 Exhaust:

The plant includes a hopper, followed by a screen/shaker and crusher. Output from the crusher is conveyed to a rotary kiln vapor extraction unit which is followed by a thermal oxidizer unit. A power assisted cyclone separator preceded by a quench chamber/scrubber is used to control particulate emissions. The hydrocarbon vapors volatilized from the contaminated soil are retained in the thermal oxidizer for 0.5 seconds at a minimum temperature of 14,000° F. This results in a thermal destruction efficiency of 99.99% and could vary slightly with the hydrocarbon levels in the contaminated soil. The plant also employs two diesel generators rated at 80 KW and 50 KW capacity respectively.

An exhaustive chemical analysis has been conducted for contaminants typically found in soils contaminated with crude oil distillate. Based on these analysis potential maximum emission rates of toxic chemicals (based on State of New Mexico Environment Department, Air Quality Bureau Guidelines) were calculated for comparison with threshold levels specified in NMED's Air Quality Control Regulation 702, Appendix A (Tables for carcinogenic and non-carcinogenic chemicals). All calculated values were substantially below threshold limits.

An air quality dispersion modelling analysis was conducted to quantify the sizes of controlled area needed around the desorption unit, outside of which the State or Federal ambient air quality standards for TSP, PM-10, NO_2, CO and SO_2 are not exceeded. The EPA approved UNAMAP model, ISCST2 was used in these modelling analyses. Based on this modelling an Air Quality Permit application was submitted to the NMED, Air Quality Bureau on August 10, 1993. As of September 27, 1993 we have been advised by the bureau verbally that the application has been reviewed and found to be substantially complete. We anticipate that an air quality permit will be issued in the near future. A copy of the application is included in Appendix II.

4.2 Scrubber Slurry:

As indicated above that a quench scrubber is used to control particulate emissions from the desorption unit. The scrubber water is recirculated until it becomes a slurry and it is no longer effective in controlling exhaust emissions of particulate matter. Approximately 100 gpd of slurry is anticipated if the desorption unit is operated at its peak capacity of about 11 tons/hour. This slurry is relatively free from hydrocarbons since (as stated above) 99.9 % of hydrocarbons are destroyed in the thermal oxidizer unit which operates at a minimum of 1,500° F.

A representative sample of the slurry is not available since full scale operation of the desorption unit has not occurred yet. However, samples from the stored slurry from a previous prototype operation was tested for TPH and BTEX. Results of these tests are included in Appendix III. No TPH and BTEX was detected in the slurry sample. It should be noted that the stored slurry sample does not meet the sample storage and preservation requirements of the EPA methods 418.1 and 5030/8020 protocol and the data is simply being included for reference.

OMEGA-J, Inc. proposes to dispose the slurry into on-site evaporation ponds and when the evaporation is complete the ponds will be capped with clean fill obtained from the decontaminated soil. The evaporation ponds will be unlined if the groundwater table is in excess of 100 ft and if the site is located in a low risk area. Where the groundwater table is 100 ft. or less from the surface and in medium to high risk areas the evaporation ponds will be lined with bentonite, clay, synthetic liner (such as 40 mil thick hypalon or HDPE) or a composite liner system. In either case slurry samples will be periodically analyzed to verify that hydrocarbon concentrations are below regulatory limits.

5.0 CONCLUSIONS

In summary the thermal desorption unit provides a safe and quick method of remediating contaminated soils heavily laden with hydrocarbons. This unit offers a method for remediation of soils where other methods such as bio-remediation cannot be applied due to high hydrocarbon concentrations. Portability is another major advantage of this method since it eliminates the need for transporting contaminated soils. There are no hazardous or harmful sidestreams and exhaust produced, thus it is safe for the workers and habitants around in the area.

APPENDICES

Appendix I - Photographs

Thermal Desorption Unit

Infeed System and Water Storage Skid

Appendix II -
Air Quality Permit Application

NMED - AIR QUALITY BUREAU
P.O. BOX 26110
SANTA FE, NEW MEXICO 87502
TELEPHONE: (505) 827-0070

GENERAL AIR QUALITY PERMIT APPLICATION AND NOTICE OF INTENT FOR THE STATE OF NEW MEXICO

Revised: November 4, 1992

Please answer all questions applicable to your specific business, operation and products.
Use the abbreviation "N.A." for "not applicable" wherever appropriate.

SECTION 1 - GENERAL DATA

1. Company Name: OMEGA-T, INC. 2. Application Date: 8/10/93

3. Company Mailing Address: P.O. BOX 4802, MIDLAND TEXAS 79704 Phone: 915-694-7795

Person to Contact (1): RUSTY BUCKINGHAM Title: OPERATIONS MANAGER Phone: 915-694-7791

4. a. Name and Address of new plant or modification: UNSPECIFIED LOCATIONS IN NEW MEXICO EXCEPTING BERNALILLO COUNTY (MOBILE UNIT) Is U.S.G.S. quadrangular map or equivalent attached? (2) NO

b. Location of Plant: County: N.A. Range: _____ Township: _____ Section: _____

UTM Zone: _____ UTMH: _____ km UTMV: _____ km Plant Elevation _____ ft above mean sea level.

c. Approximate location (direction and distance from nearest town): N. A.

5. a. Describe briefly type of plant and nature of construction (or modification) and products: (3) A MOBILE, LOW TEMPERATURE THERMAL DESORPTION (REMEDIATION) UNIT FOR PROCESSING SOIL CONTAMINATED BY HYDROCARBONS SUCH AS CRUDE OIL, DIESEL FUEL, OR CONDENSATE.

b. Is this a modification to an existing plant? Yes ___ No ✓ If yes, give the date of original construction: _____

c. Date of anticipated start of construction: N.A. Date of anticipated Start of Operation: UNKNOWN

6. Maximum Design Plant capacity (specify units) (4): 11 TONS PER HOUR

7. Class of land at plant site (private, State, Federal, Indian, etc.): UNKNOWN AT THIS TIME

8. Is this site permanent? N.A. If not, how long is it expected to be occupied? _____ Date of anticipated startup: _____

9. Normal operating schedule: 10 hours per day, 7 days per week, 4 1/3 weeks per month, 12 months per year.

10. Specify maximum operational periods: UNKNOWN

11. Specify percent annual production by quarters: Dec. - Feb. _____, Mar. - May _____, June - Aug. _____, Sep. - Nov. UNKNOWN

12. Capital Costs (Reconstruction) : (To include all depreciable components only) (5)
Capital cost to build entirely new facility, including modification: $ _____.
Capital cost of modification : _____.

13. Are cooling towers used at this facility? NO Is water conditioner containing Chromium used in the water of the cooling tower? _____

SECTION 2 - FUEL USAGE {1}

(Use additional sheets if necessary)

Unit No. {2}	Type of Equipment {3}	Equipment Manufacturer	Rated Capacity {4}	FUEL DATA {5}, {6}				
				Fuel Type {7}	Amount Per Year {8}	Heating Value (State Units) {9}	Percent Sulfur {10}	Percent Ash {10}
1	ROTARY KILN, MODEL 400 OVENPAK, SIZE 425P	MAXON CORP.	2.75 Mil. BTU/HR	PROPANE (NATL. GAS) *	109,000 GAL.	84,250 BTU/GAL	.014%	0.29%
2	THERMAL OXIDIZER, MODEL 400 OVENPAK, SIZE 425P	MAXON CORP.	2.75 MIL BTU/HR	PROPANE (NAT'L. GAS) *	109,000 GAL	84,250 BTU/GAL	.014%	0.29%
4	80 KW; 128 HP DIESEL ENGINE GENERATOR	GENERAC CORP.	128 HP	NO.2 DIESEL FUEL	25,900 GAL.	141,000 BTU/GAL.	0.39% (CHEVRON)	TRACE
5	50KW, 96 HP DIESEL ENGINE GENERATOR	GENERAC CORP.	96 HP	NO.2 DIESEL FUEL	16,450 GAL.	141,000 BTU/GAL.	0.39% (CHEVRON)	TRACE

* ALTERNATIVE FUEL

SECTION 3 - MATERIALS PROCESSED AND PRODUCED

A. RAW MATERIALS PROCESSED

(Use additional sheets if necessary)

Unit No. {1}	Type	Composition {2}	Condition {3}	Quantity {4} Specify Units
1 & 3	CONTAMINATED SOIL	25,000 ppm MAX HYDROCARBONS (AT PLANT INFEED POINT)	VARIABLE MOISTURE CONTENT	11 TONS PER HOUR
	B. MATERIALS PRODUCED (DO NOT INCLUDE EMISSIONS AND PRODUCTS LISTED IN SECTIONS 6, 7, 8 & 11)			
1 & 3	CLEANED SOIL	SOIL: HYDROCARBON FREE OR BELOW REGULATORY AGENCY REQUIREMENTS	FINE, VARIABLE MOISTURE CONTENT	< 11 TONS PER HOUR

SECTION 4A - LIQUID STORAGE TANKS - MATERIAL DATA

(Use additional sheets if necessary)

Tank No. {1}	Material Name	Composition {2}	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb-mol)	Avg. Stor. Temp., Ta (°F)	True Vapor Pressure @ Ta (psia)	Max. Stor. Temp., Tm (°F)	True Vapor Pressure @ Tm (psia)

SECTION 4B - LIQUID STORAGE TANKS - TANK DATA

(Use additional sheets if necessary)

Tank No. {1}	Date Installed /modif {2}	Material(s) Stored	Roof Type {3}	Seal Type {4}	Capacity (bbl)	Diameter (ft)	Vapor Space H (ft) {5}	Roof/ Shell Color {6}	Paint Cond. {7}	Annual Throughput (gal/yr) {8}	Turnovers per Year {9}

SECTION 5A - SOLIDS MATERIAL STORAGE - MATERIAL DATA

(Use additional sheets if necessary)

Unit No. {1}	Material Name	Process Served {2}	Storage Type {3}	Composition {4}	Date Installed or Modified

SECTION 5B - MATERIAL STORAGE - STORAGE TYPE

(Use additional sheets if necessary)

Unit No. {1}	Transfer or Transport method {2}	Max. Hourly Throughput (units)	Annual Throughput	Dust Control (Storage or Transfer) {3}

SECTION 6 - HAZARDOUS, TOXIC AIR POLLUTANTS {1}, OTHER CHEMICALS, AND ODORS

(Use additional sheets if necessary)

Describe any hazardous air pollutants and toxic chemicals used or emitted in plant processes. See AQCR 702 Part Three list and 1990 CAAA Title III. You may need to expand the information and discussion with respect to compliance with AQCR 702 Part Three list and 1990 CAAA Title III compliance beyond this application form in the permit application package. {2}

Unit {3}	Description of Chemicals {4}	Quantity Emitted to Atmosphere {5}	How, Where Emitted {6}
2	TOXIC HYDROCARBONS - SEE MODELING REPORT, TABLE 1	VARIOUS - SEE MODELING REPORT, TABLE 1	THERMAL OXIDIZER STACK
2	METALLIC COMPOUNDS - SEE MODELING REPORT, TABLE 2	VARIOUS - SEE MODELING REPORT, TABLE 2	THERMAL OXIDIZER STACK

S[redacted]ON [redacted]IT E[redacted]SSIONS (PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED)

(Use additional sheets if necessary)

Unit No. {1}	Process or Operation {2}	Quantity of Gases Discharged to Control Equipment {3}	ESTIMATES OF PRE-CONTROL AIR POLLUTANTS						Estimation Method {7}
			Pollutant No. 1		Pollutant No. 2		Pollutant No. 3 {6}		
			Type {4}	Quantity {5}	Type {4}	Quantity {5}	Type {4}	Quantity {5}	
1	ROTARY KILN	6341 ACFM	PARTICULATE MATTER	15.00 lb/hr	HYDRO-CARBONS	300 lb/hr	PM-10	6.75 lb/hr	FIELD TEST DATA
				27.3 tn/yr		546 tn/yr		12.29 tn/yr	CALCULATIONS
3	CRUSHER, SCREEN, & CONVEYORS	N.A.	TSP	5.80 lb/hr	PM-10	1.94 lb/hr		lb/hr	AP-42, Tables
				10.55 tn/yr		3.52 tn/yr		tn/yr	8.19.1-1, 8.19.2-1
4	80KW DIESEL ENGINE GEN.	716 ACFM	NOx	1.79 lb/hr	CO	.355 lb/hr	NMHC	.051 lb/hr	MFGR. TEST DATA,
				3.26 tn/yr		.65 tn/yr		.092 tn/yr	CALCULATIONS
			SO2	.391 lb/hr		lb/hr		lb/hr	FUEL SPECS,
				.71 tn/yr		tn/yr		tn/yr	CALCULATIONS
5	50KW DIESEL ENGINE GEN.	700 ACFM	NOx	1.55 lb/hr	CO	.072 lb/hr	NMHC	.019 lb/hr	MFGR. TEST DATA,
				2.83 tn/yr		.13 tn/yr		.035 tn/yr	CALCULATIONS
			SO2	.248 lb/hr		lb/hr		lb/hr	FUEL SPECS,
				.45 tn/yr		tn/yr		tn/yr	CALCULATIONS
				lb/hr		lb/hr		lb/hr	
				tn/yr		tn/yr		tn/yr	
				lb/hr		lb/hr		lb/hr	
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				tn/yr		tn/yr		tn/yr	
				lb/hr		lb/hr		lb/hr	
				tn/yr		tn/yr		tn/yr	

SECTION 8 - AIR POLLUTION CONTROL EQUIPMENT, EMISSIONS TO ATMOSPHERE

(Use additional sheets if necessary)

Unit No. {1}	CONTROL EQUIPMENT		AIR POLLUTANTS EMITTED TO STACKS {3}						Control Efficiency	
			Pollutant No. 1		Pollutant No. 2		Pollutant No. 3 {6}		% by Weight	How Determined {7}
	Type {2}	Manufacturer and Model No.	Type {4}	Quantity {5}	Type {4}	Quantity {5}	Type {4}	Quantity {5}		
2	THERMAL OXIDIZER	MAXON CORP. MODEL 400 OVENPAK / PROGRESSIVE DEVELOPMENT, INC.	NO_x	1.41 lb/hr 2.57 tn/yr	SO_2	0.132 lb/hr 0.24 tn/yr	NMHC	1.20 lb/hr 2.18 tn/yr	99.6% (NMHC)	TEXAS INCEN CO. & GMA CALCS.
	AND WET SCRUBBER	PROGRESSIVE DEV. INC. ST 300, S/N 50726	CO	0.323 lb/hr 0.64 tn/yr	TSP	0.227 lb/hr 0.41 tn/yr	PM-10	0.102 lb/hr 0.19 tn/yr	98.5% (TSP)	FIELD TESTS ON SIMILAR UNIT, CALCULATIONS
3	ENCLOSURES	SFM CO, INC.	TSP	0.152 lb/hr 0.28 tn/yr	PM-10	0.068 lb/hr 0.12 tn/yr		lb/hr tn/yr	97.4%	FIELD OPAC MEASUREMENTS & CALCULATIONS
4	80 KW DIESEL ENGINE GEN.	GENERAC CORP.	NOx	1.79 lb/hr 3.26 tn/yr	CO	.355 lb/hr .65 tn/yr	NMHC	.051 lb/hr .092 tn/yr	—	MFGR. TEST DATA, CALCULATIONS
			SO_2	.391 lb/hr .71 tn/yr		lb/hr tn/yr		lb/hr tn/yr	—	FUEL SPECS, CALCULATIONS
5	50 KW DIESEL ENGINE GEN.	GENERAC CORP.	NOx	1.55 lb/hr 2.83 tn/yr	CO	.072 lb/hr .13 tn/yr	NMHC	.019 lb/hr .035 tn/yr	—	MFGR TEST DATA, CALCULATIONS
			SO_2	.248 lb/hr .45 tn/yr		lb/hr tn/yr		lb/hr tn/yr	—	FUEL SPECS., CALCULATIONS
				lb/hr tn/yr		lb/hr tn/yr		lb/hr tn/yr		
				lb/hr tn/yr		lb/hr tn/yr		lb/hr tn/yr		
				lb/hr tn/yr		lb/hr tn/yr		lb/hr tn/yr		
				lb/hr tn/yr		lb/hr tn/yr		lb/hr tn/yr		
				lb/hr tn/yr		lb/hr tn/yr		lb/hr tn/hr		
				lb/hr tn/yr		lb/hr tn/yr		lb/hr tn/yr		

SECTION 9 - STACK DATA

(Use additional sheets if necessary)

Unit No. {1}	Stack Height ft {2}	Stack Inside Exit Diameter ft {3}	EXIT GAS CONDITIONS {4}			SAMPLING PORTS		
			Temperature °F	Velocity ft/sec	Moisture % by Volume	Number	Size	Location {5}
2	13.42	0.941	224.6	96.1	24.9	3	2 INCH	ON SIDE OF HORIZONTAL PART OF STACK
4	8.00	0.250	965	243	Not Known	—		
5	6.00	0.208	985	341	Not Known	—		

SECTION 10 - EMISSION MEASUREMENT EQUIPMENT

(Use additional sheets if necessary)

Unit No.	Pollutant	Type of Instrument {1}	Manufacturer - Model No.	Range {2}	Sensitivity	Accuracy
NONE						

SECTION 11 - WASTE PRODUCT DISPOSAL (SOLID AND LIQUID WASTES, AND AUXILIARY INCINERATION, AND OTHER EMISSIONS NOT COVERED IN SECTIONS 4 OR 5)

A. Auxiliary Incineration Operation: AQCR 2000 or AQCR 2020 may apply. **INCINERATION OF HAZARDOUS MATERIALS IS NOT ALLOWED UNDER AQCR 702.**
Normal on-site combustion operating schedule: 10 hours per day 7 days per week 52 weeks per year
Seasonal or peak combustion operating periods (specify): UNKNOWN

B. Waste Products or Emissions: NONE (Use additional sheets if necessary)

Unit No. {1}	Waste Material		Method of Disposal {4}	Incinerator Capacity Specify Units	Auxillary Fuel Used {5}	Type and Efficiency of Air Cleaning Equipment {6}	ESTIMATES OF AIR POLLUTANTS, IF ANY	
	Type {2}	Amount {3}					Type {7}	Quantity Per Year {8}
		/hr						/hr
		/yr						/yr
		/hr						/hr
		/yr						/yr
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SECTION 12 - CERTIFICATION

I, CHARLES S. BUCKINGHAM, hereby certify that the information an this application are completely true and as accurate as possible, to the best of my p and professional expertise and experience.

Signed this 10th day of AUGUST, 1993, upon my oath of affirmatio of the State of NEW MEXICO

Charles S. Buckingham — 8-10-93
SIGNATURE (Authorized Company Representative) DATE

CHARLES S. BUCKINGHAM Title: OPERATIONS MANAGER
PRINTED NAME

Subscribed and sworn to before me on this 10th day of August

My authorization as a Notary of the State of New Mexico expires on the 4th April, 1994.

Lisa C. Broderick — Augugust
NOTARY'S SIGNATURE DATE

August, 10, 199

LISA C. BRODERICK
NOTARY'S PRINTED NAME

CALCULATIONS OF UNCONTROLLED EMISSIONS

FROM ROTARY KILN

1. Particulate Matter

Basis for calculation: Measured particulate rate from No. 2 Test of 8/16/91 in which insufficient, eroded spray nozzles were used in the wet scrubber. This was by far the worst result of 2 sets of test runs, and appears to represent "uncontrolled" emissions. (Reference: Source Emission Test Report For A Thermal Soil Unit, prepared for Soil Processing, Inc., Anchorage, Alaska, by Environmental Science & Engineering, Inc., October 22, 1991).

Measured particulate emission rate: 11.688 lb/hr.
Soil feed rate: 8.57 tons/hr.
Scaling emission rate up to 11 tons/hr. soil feed rate:

$$\frac{11}{8.57} \times 11.688 = 15.00 \text{ lb/hr.}$$

$$\text{or } 15.00 \frac{\text{lb}}{} \times 3640 \frac{\text{op hrs.}}{\text{yr.}} \times \frac{1}{2000 \text{ lb/ton}} = 27.3 \text{ tons/yr.}$$

2. Hydrocarbons

Maximum hydrocarbon input rate occurs at 6 tons/hr feed rate and 25,000 ppm per R. Buckingham, SFM Corp. Assuming 100% desorption of hydrocarbons from contaminated soil,

$$\text{NMHC rate} = \frac{6 \text{ tons}}{\text{hr}} \times 2000 \frac{\text{lb}}{\text{ton}} \times \frac{25{,}000}{1{,}000{,}000} = 300 \text{ lb/hr.}$$

$$\text{or } 300 \frac{\text{lb}}{\text{hr}} \times 3640 \frac{\text{op hrs.}}{\text{yr.}} \times \frac{1}{2000 \text{ lb/ton}} = 546 \text{ tons/yr.}$$

CALCULATIONS OF UNCONTROLLED EMISSIONS

FROM CRUSHER, SCREEN, AND CONVEYORS

Source	Emission Factors*, lb/ton TSP	PM-10
Screen	0.16	0.12
Transfer point 1	.029	.013
Transfer point 2	.029	.013
Transfer point 3	.029	.013
Crusher	0.28**	.017**

TSP emission rate (total) = .527 $\frac{\text{lb}}{\text{ton}}$ x 11 $\frac{\text{tons}}{\text{hr.}}$ = 5.80 lb/hr.

or 5.80 $\frac{\text{lb}}{\text{hr.}}$ x 3640 $\frac{\text{op hrs.}}{\text{yr.}}$ x $\frac{1}{2000 \text{ lb/ton}}$ = 10.55 tons/yr.

PM-10 emission rate (total) = .176 $\frac{\text{lb}}{\text{ton}}$ x 11 $\frac{\text{tons}}{\text{hr.}}$ = 1.94 lb/hr.

or 1.94 $\frac{\text{lb}}{\text{hr.}}$ x 3640 $\frac{\text{op hrs.}}{\text{yr.}}$ x $\frac{1}{2000 \text{ lb/ton}}$ = 3.52 tons/yr.

* From EPA's AP-42, Table 8.19.1-1
** From EPA's AP-42, Table 8.19.2-1

ENGINE EXHAUST EMISSION CALCULATIONS: LB/HR., TONS/YR.

See Page 17 of Modeling report for calculations of emissions in gm/sec.

Total annual operating hours = 10 hrs/day x 7 days/week x 52 weeks/year = 3640 hrs./year

Emission rates in gm/sec x 3600 sec/hr. x 1/454 gm/lb = rates in lb/hr.

or, Emission rates in gm/sec x 7.93 = rates in lb/hr.

Emissions in tons/yr. = rates in lb/hr. x 3640 hrs./yr. x 1/2000 lb/ton

= rates in lb/hr. x 1.82

Emission for 80 kw, 128 HP Diesel Engine:

NO_x: .226 gm/sec x 7.93 = 1.79 lb/hr.
1.79 lb/hr. x 1.82 = 3.26 tons/yr.

CO: .0448 gm/sec x 7.93 = 0.355 lb/hr.
0.355 lb/hr. x 1.82 = 0.65 tons/yr.

NMHC: .0064 gm/sec x 7.93 = .051 lb/hr.
.051 lb/hr. x 1.82 = .092 tons/yr.

SO_2: .391 lb/hr. x 1.82 = .071 tons/yr.

Emission for 50 kw, 96 HP Diesel Engine:

NO_x: .196 gm/sec x 7.93 = 1.55 lb/hr.
1.55 lb/hr. x 1.82 = 2.83 tons/yr.

CO: .0091 gm/sec x 7.93 = .072 lb/hr.

$$.072 \frac{lb}{hr.} \times 1.82 = .13 \frac{tons}{yr.}$$

NMHC: $$.0024 \frac{gm}{sec} \times 7.93 = .019 \frac{lb}{hr.}$$

$$.019 \frac{lb}{hr.} \times 1.82 = .035 \frac{tons}{yr.}$$

SO_2: $$.248 \frac{lb}{hr.} \times 1.82 = .45 \frac{tons}{yr.}$$

Appendix III -
TPH & BTEX Analysis

Interlab, Inc.

Certificate of Analysis

No. 230014

Project Information

Client: GMA, Inc.
Project Name: Rusty Buckingham-AQM
Project Location:

Project Manager: A.K. Khera
Project No.: 93026.00
Date Received: 8/9/93

Lab Batch No.: 230014
Units: ppm

Test Description: TPH
Test Method: EPA 418.1

Sample No.	Field Sample ID	Matrix	LOQ	Final Result	Date and Time Extracted	Date and Time Analyzed	Lab. Tech.
01	026-1 Midland Texas	Slurry	1	ND	8/11/93 9:45	8/11/93 10:39	C.G.
02	026-2 Midland Texas	Soil	5	734	8/11/93 14:15	8/11/93 15:15	C.G.

LOQ = Limit of Quantitation

* Units = Units of Measurement for Final Result and LOQ

ND = Not detected = BQL = Below Quantitation Limit

Cesar A. Muedas, Ph.D.
Technical Director

Interlab, Inc.

Certificate of Analysis
No. 230014-01

Project Information

Client: GMA, Inc.
Project Manager: A.K. Khera
Project Name: Rusty Buckingham-AQM
Project ID: 93026.00
Project Location:

Field Sample ID: 026-1 Midland Texas

Lab ID No.: 230014-01

Date Sampled: 8/3/93
Sample Depth:
Sample Matrix: Slurry
Date Received: 8/9/93
Preservative: Ice

Test Description or Parameter	Test Method	Date and Time Extracted	Date and Time Analyzed	LOQ	Final Result	Units *	Lab. Tech.
Total BTEX	5030/8020	8/11/93 8:36	8/11/93 10:17	5	ND	ppb	B.E.
Benzene				1	ND	ppb	
Toluene				1	ND	ppb	
Ethylbenzene				1	ND	ppb	
o-Xylene				1	ND	ppb	
m,p-Xylene				1	ND	ppb	

LOQ = Limit of Quantitation.

* Units = Units for Measurement of Results and LOQ

ND = Not Detected = BQL = Below Quantitation Limit

Cesar A. Muedas, Ph. D.
Technical Director

Interlab, Inc.

Certificate of Analysis
No. 230014-02

Project Information

Client: GMA, Inc.
Project Manager: A.K. Khera
Project Name: Rusty Buckingham-AQM
Project ID: 93026.00
Project Location:

Field Sample ID: 026-2 Midland Texas

Lab ID No.: 230014-02

Date Sampled: 8/3/93
Sample Depth:
Sample Matrix: Soil
Date Received: 8/9/93
Preservative: Ice

Test Description or Parameter	Test Method	Date and Time Extracted	Date and Time Analyzed	LOQ	Final Result	Units *	Lab. Tech.
Total BTEX	5030/8020	8/11/93 14:06	8/11/93 16:22	5	503	ppb	B.E.
Benzene				1	ND	ppb	
Toluene				1	ND	ppb	
Ethylbenzene				1	ND	ppb	
o-Xylene				1	ND	ppb	
m,p-Xylene				1	503	ppb	

LOQ = Limit of Quantitation.

* Units = Units for Measurement of Results and LOQ

ND = Not Detected = BQL = Below Quantitation Limit

Cesar A. Muedas, Ph. D.
Technical Director