Best Available Copy

1050208

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION) Air permitting

2.

3.

4.

	Initial	Date
1.		
2.		
3.		
4.		

REMARKS:

This is a major source facility & should be handled by Tally

INFORMATION	
Review & Return	
Review & File	
Initial & Forward	

DISPOSITION	
Review & Respond	
Prepare Response	
For My Signature	
For Your Signature	
Let's Discuss	
Set Up Meeting	
Investigate & Report	
Initial & Forward	
Distribute	
Concurrence	
For Processing	
Initial & Return	

FROM:

DATE

PHONE

air consulting and engineering, Inc.

August 27, 1990
285 90 01

Mr. Bill Thomas
Southwest District
Florida Department of
Environmental Regulation
4520 Oak Fair Boulevard
Tampa, Florida 33610

Dear Mr. Thomas:

Enclosed are four (4) copies of each of two construction permit applications for Lakeland Drum Service.

The permit applications were prepared by Mr. Bruno Ferraro of Grove Scientific with my coordination and review. We have separated the proposed "drum conditioning furnace" from the balance of the facility sources.

Please review and contact me if you wish additional information or clarification.

Respectfully,

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck

Stephen L. Neck, P.E.

SLN/cvt

cc: Mike Alexander, Lakeland Drum
Bruno Ferraro, Grove Scientific
T. Heron
B. Thomas, SW Dist

2106 N.W. 67th Place, Suite 4 • Gainesville, Florida 32606 • (904) 335-1889

LAKELAND DRUM SERVICES, INC. BEST AVAILABLE COPY

PHONE 967-3388, OR 965-1926
2006 THORNHILL ROAD
AUBURNDALE, FL 33823

5934

63-579
631

9-20 1990

PAY TO THE ORDER OF Fla. Dept. of Environmental Regulations $ 3500.00

Three Thousand five Hundred + NO/100 DOLLARS

FIRST UNION First Union National Bank of Florida
Auburndale, Florida 33823

FOR TWO PERMITS

[redacted]

RECEIVED
MAIL ROOM
2 PM 2:12

Florida Department of
Environmental Regulation
4520 Oak Fair Boulevard
Tampa, Florida 33610

Dear Mr. Thomas:

Enclosed are four (4) copies of each of two construction permit applications for Lakeland Drum Service.

The permit applications were prepared by Mr. Bruno Ferraro of Grove Scientific with my coordination and review. We have separated the proposed "drum conditioning furnace" from the balance of the facility sources.

Please review and contact me if you wish additional information or clarification.

Respectfully,

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck

Stephen L. Neck, P.E.

SLN/cvt

cc: Mike Alexander, Lakeland Drum
Bruno Ferraro, Grove Scientific

1031

2106 N.W. 67th Place, Suite 4 • Gainesville, Florida 32606 • (904) 335-1889

$1,000 pd. 10-2-90 Receipt # 151181

DER Form #
Form Title
Effective Date
DER Application No. (Filled in by DER)

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

AC53-187549

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Drum Reconditioning Furnace [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [XX] Construction [ ] Operation [ ] Modification

COMPANY NAME: Lakeland Drum Service COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Drum reconditioning furnace with thermal incinerator, natural gas fired

SOURCE LOCATION: Street 206 Neptune Rd. City Auburndale, 33823

UTM: East 17-418.78 Km North 3103.58 Km

Latitude 28 ° 3 ' 23.8"N Longitude 81 ° 49 ' 35.4"W

APPLICANT NAME AND TITLE: Randy Guy, President

APPLICANT ADDRESS: 206 Neptune Rd., Auburndale, FL 33823

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Lakeland Drum Service

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Randy Guy, President
Name and Title (Please Type)

Date: 9-20-90 Telephone No. 813-967-3388

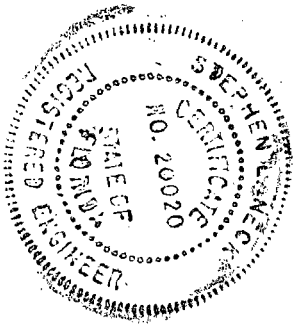
B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

Northwest District 160 Governmental Center Pensacola, Florida 32501-5794 904-436-8300
Northeast District 3426 Bills Rd. Jacksonville, Florida 32207 904-798-4200
Central District 3319 Maguire Blvd. Suite 232 Orlando, Florida 32803-3767 407-894-7555
Southwest District 4520 Oak Fair Blvd. Tampa, Florida 33610-7347 813-623-5561
South District 2269 Bay St. Fort Myers, Florida 33901-2896 813-332-2667
Southeast District 1900 S. Congress Ave., Suite A West Palm Beach, Florida 33406 407-964-6100

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed Stephen L. Neck

Stephen L. Neck, P.E.
Name (Please Type)

Air Consulting and Engineering, Inc.
Company Name (Please Type)

2106 NW 67th Pl., Ste. 4, Gainesville, FL 32606
Mailing Address (Please Type)

Florida Registration No. 20020 Date: 8/27/90 Telephone No. 904-335-1889

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

To construct a "drum reconditioning furnace" used to burn paint and residual materials from 55 gallon metal drums. The furnace is equipped with an afterburner to control smoke and odor when operated at 1450°F. This project will result in full compliance with 17-2 F.A.C. and other F.D.E.R. requirements.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction September, 1990 Completion of Construction January, 1990

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

$200,000 for the incinerator

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A - application for paint operation already submitted.

E. Requested permitted equipment operating time: hrs/day 8 ; days/wk 6 ; wks/yr 52 ;

if power plant, hrs/yr_____; if seasonal, describe:_____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? N/A

   b. If yes, has "Lowest Achievable Emission Rate" been applied? N/A

   c. If yes, list non-attainment pollutants. N/A

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. NO

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. NO

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? NO

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants? N/A

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

Regulated by 17-2.600(1)(a) and 17-2.620(1) and (2)

N/A

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) N/A

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels N/A

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

N/A

N/A

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: _____ ft. Stack Diameter: _____ ft.

Gas Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F.

Water Vapor Content: _____ % Velocity: _____ FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated						1600 lbs/hr	
Uncontrolled (lbs/hr)						1600 lbs/hr	

Description of Waste Dried paint on metal drums and container residue.

Total Weight Incinerated (lbs/hr) 1600 Design Capacity (lbs/hr) 1600

Approximate Number of Hours of Operation per day 8 day/wk 6 wks/yr. 52

Manufacturer Spencer Boiler and Engineering, Inc.

Date Constructed N/A Model No. SBC0450

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel Type	Fuel BTU/hr	Temperature (°F)
Primary Chamber	662	29.8 MM	Nat. Gas	1.0 MM	900°F maximum
Secondary Chamber	726	4.7 MM	Nat. Gas	4.7 MM	1600°F maximum

Stack Height: 30 ft. Stack Diamter: 48" x 36" Stack Temp. 600°F

Gas Flow Rate: 57278 ACFM 26833 DSCFM* Velocity: 88 FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [XX] Afterburner

[ ] Other (specify) _____

Brief description of operating characteristics of control devices: Paint and residual coatings, oils or other liquids are volatilized in the drum furnaces. Gases and particulate matter are controlled by an afterburner designed to incinerate approximately 11,000 SCFM of effluent at 1600°F with a one (1) second retention time.

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

This process results in no liquid or solid waste because all materials are pyrolysized. If ash is produced, it will be collected in a drum and disposed of as a solid waste.

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

N/A

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

N/A

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/____/____ to _____/____/____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO^2	_____ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

SOURCE DESCRIPTION

Lakeland Drum Service is located in Auburndale, Florida and is proposing to construct a metal drum reconditioning furnace. This furnace is equipped with a conveyor which automatically moves the metal drums through the furnace where paint and residual material is pyrolysized. The smoke generated by this pyrolysis process is controlled by a thermal afterburner operated at 1450°F minimum.

Drums from a variety of sources will be treated in this furnace. The previous contents (and hence the residue remaining in the drum) includes citrus and food products, paints, varnishes, other coatings, solvents, oils, hydraulic fluid, other chemical products (i.e., cleaning products and janitorial supplies). All drums must be empty as defined by 60 CFR (less than one (1) inch of residue remaining in the drum). A customer signs a documents which states that if a drum is not empty by this definition, they must retrieve the drums and return it to their facility.

Drums which contained solvents are usually empty and contain no liquid residue since the contents has already evaporated . Other drums which contained paint or coatings may have some liquid, but usually contains dried on residue. Drums which contained oil or hydraulic fluid, will contain some liquid residue since these oils do not evaporate. Drums used for aqueous cleaning products will also contain some liquid residue.

For permitting purposes, this source is classified as an incinerator. The specifications for the drum furnace and air pollution control system are provided by Spencer Boiler and Engineering, Inc., and are included in Appendix A.

SECTION V: SUPPLEMENTAL REQUIREMENTS

SUPPLEMENT 1:

The design capacity of the proposed furnace is 400, 55 gallons

drums/hour, each containing a maximum of 4 lbs. residue/drum. Product weight does not apply as this represents an incineration process. Therefore:

(400 drums/hour)(4 lbs residue/drum) = 1600 lbs residue/hour

The proposed operating hours are as follows:

8 hours/day, 6 day/week, 52 weeks/year or 2496 hours/year

SUPPLEMENT 2 & 3:

Emissions are based on test results of a similar systems build by Spenser Boiler and Engineering, Inc. The test report is included in Appendix B.

During the referenced test, 338 drums and drum lids were processed in one hour (design capacity is 400 drums/hour). Particulate loading into the incinerator is estimated based on 4 lbs. of combustible material per drum. Therefore:

Summary of Stack Test Results

(338 drums/hour)(4 lbs./drum) = 1352 lbs./hour particulates uncontrolled

Measured 2.81 lbs./hour particulate matter

Therefore:

$$\text{Control Efficiency} = 1 - \frac{(2.81 \text{ lbs./hour})}{(1352 \text{ lbs./hour})} = 99.79\%$$

This system is designed for a 95% control efficiency or 0% opacity. Therefore:

(1600 lbs./hour)(1-0.95) = 80 lbs./hour

(80 lbs./hour)(2496 hours/year)(1 ton/2000 lbs.) 99.8 TPY

This source is regulated by 17-2.600(1)(a) for particulate matter with an allowable emission of 5% or less opacity except that 20% opacity is allowed for not more than three minutes in any one hour and no objectionable odors.

VOC emissions are regulated by 17-2.620(1) and (2).

Compliance will be demonstrated by an E.P.A. Method 9, Visible Emission Evaluation while the incinerator is operating at 1450°F minimum. A chart recorder will be installed and records maintained as proof of compliance.

Yearly annual operating reports will be submitted to the F.D.E.R. as an additional demonstration of compliance.

Based on the stack test results from Truesdail Laboratories, Inc. (Appendix A), non-methane hydrocarbons were measured at:
0.42 lbs./hour + 0.1 lbs./hour = 0.52 lbs./hour (See attached Stack Test results)

Therefore: Assume a worst case of 1.0 lbs./hour as a conservative estimate of full production.

VOC Emissions
(1.0 lbs./hour)(2496 hrs./year)(1 ton/2000 lbs.) = 1.25 TPY

FUEL CONSUMPTION AND EMISSIONS

Maximum natural gas consumption is 8000 Ft^3/hour or 8.0 MM BTU/hour, average consumption if 5700 Ft^3/hour of 5.7 MM BTU/hour as referenced in Section IV of the application.

Emissions from natural gas based on AP-42, Table 1.4-1, "Uncontrolled Emission Factors for Natural Gas Combustion". Domestic and commercial boiler <10 MM BTU/hour heat input.

Particulates

(0.008 MM Ft^3/hour(5 lbs/MM Ft^3) = 0.04 lbs./hour

(0.04 lbs./hour)(2496 hrs./year)(1 ton/2000 lbs) = 0.05 TPY

SO_2

(0.008 MM Ft^3/hour)(0.6 lbs./MM Ft^3) = 0.005 lbs./hour

(0.005 lbs./hour)(2496 hrs./year)(1 ton/2000 lbs) = 0.006 TPY

NO_x

(0.008 MM Ft^3/hour)(100 lbs./MM Ft^3) = 0.8 lbs./year

(0.8 lbs./hour)(2496 hrs./year)(1 ton/2000 lbs) = 1.0 TPY

CO

(0.008 MM Ft^3/hour)(20 lbs./MM Ft^3) = 0.16 lbs./hour

(0.16 lbs./hour)(2496 hrs./year)(1 ton/2000 lbs.) = 0.2 TPY

Non-Methane VOC's

(0.008 MM Ft^3/hour)(5.3 lbs./MM Ft^3) = 0.04 lbs./hour

(0.04 lbs./hour)(2496 hrs./year)(1 ton/2000 lbs.) = 0.05 TPY

Supplement 4

Design details and specifications are included in Appendix B. Also included is a blueprint of the proposed drum furnace.

Supplement 5

Control efficiency is based on the manufacturers design specifications and verified by the stack test results included in Appendix A. The control device (thermal incinerator) has been designed in accordance with E.P.A. AP-40 to incinerate approximately 11,000 SCFM of effluent at 1600°F with a one (1) second retention time. A temperature of 1450°F will be sufficient to meet the emission limiting standards referenced above.

Supplement 6, 7, and 8 : Attached

Supplement 9: Enclosed

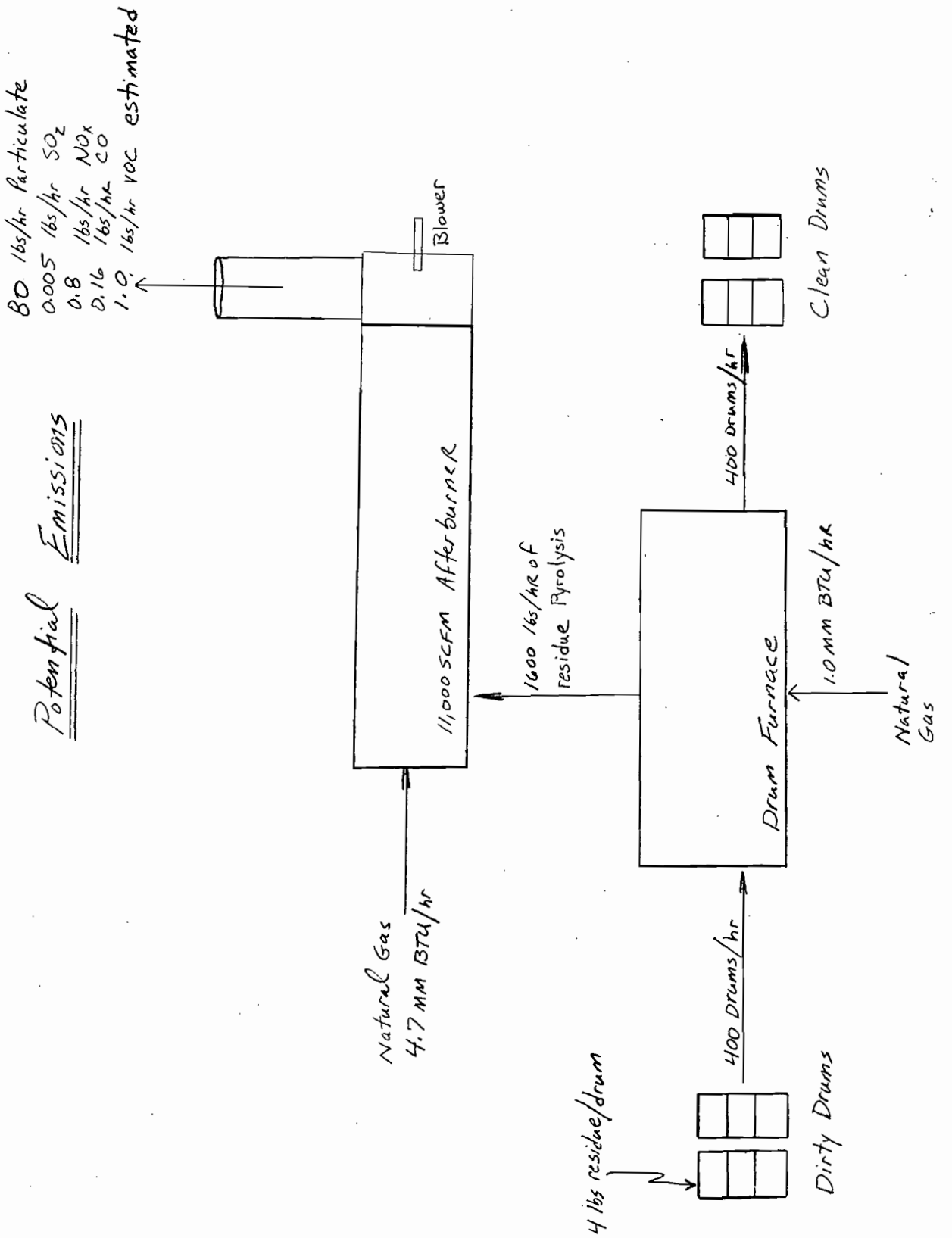
The application fee is based on 99.8 TPY of particulate and is $1,000.00 per 17-4.050(4)(a)1.d.

LDRUM2/AIRSTUDY/062890

GROVE SCIENTIFIC

COMP. BY: BRUNO FERRARO
CHK. BY: STEVE NECK, P.E.
DATE: 6-27-90
SHEET NO.: 1
JOB NO.: 03-087.01

SUBJECT: SUPPLEMENT 6: FLOW DIAGRAM LAKELAND DRUM SERVICE
PROPOSED DRUM FURNACE

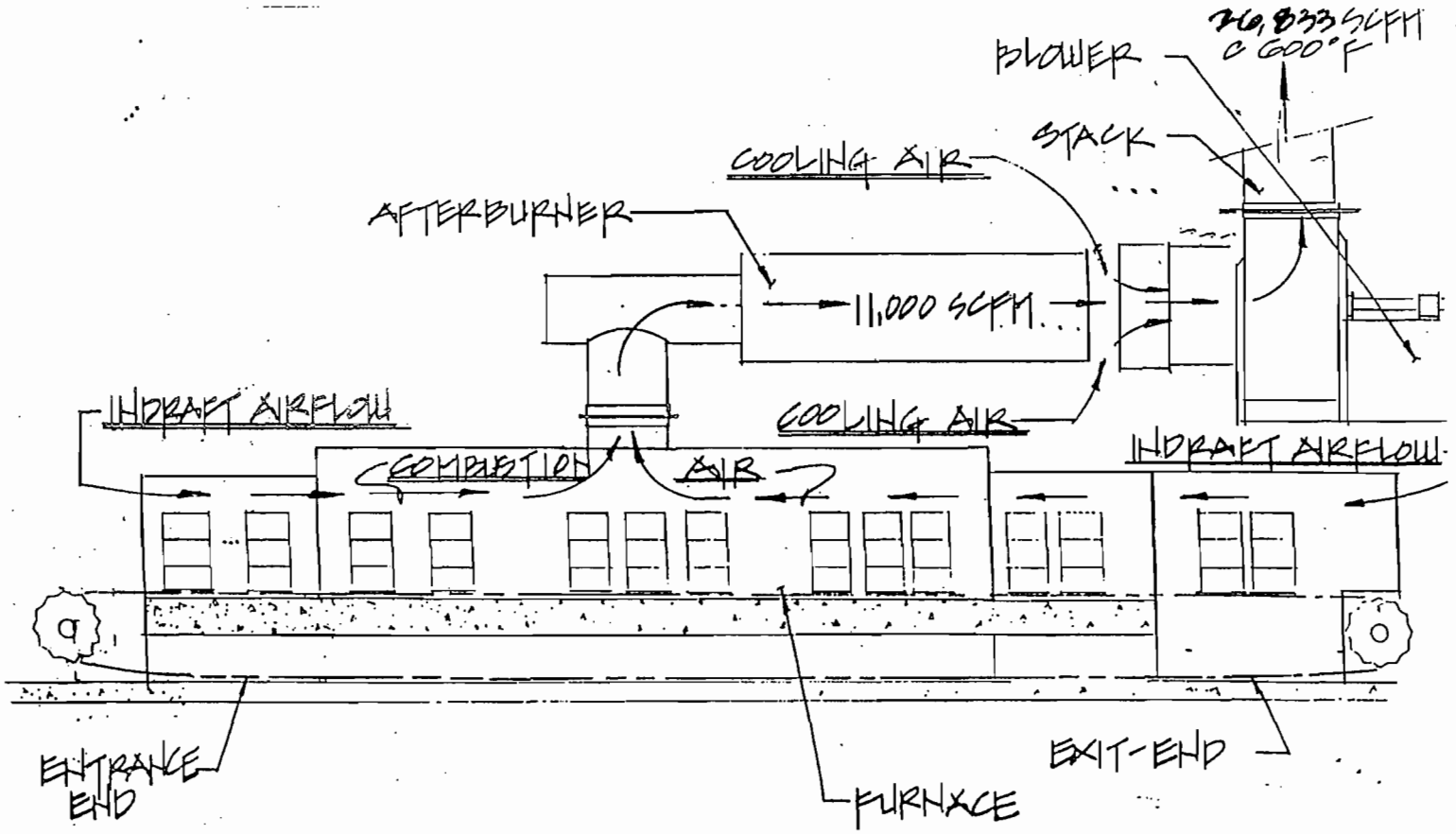


GROVE SCIENTIFIC

COMP. BY: BRUNO FERRARO
CHK. BY: STEVE NECK, P.E.
DATE: 6-27-90
SHEET NO.: 2
JOB NO.: 03-087.01

SUBJECT: SUPPLEMENT 6: AIRFLOW DIAGRAM
LAKELAND DRUM SERVICE ; PROPOSED DRUM FURNACE

source: Spencer Boiler and Engineering, Inc.



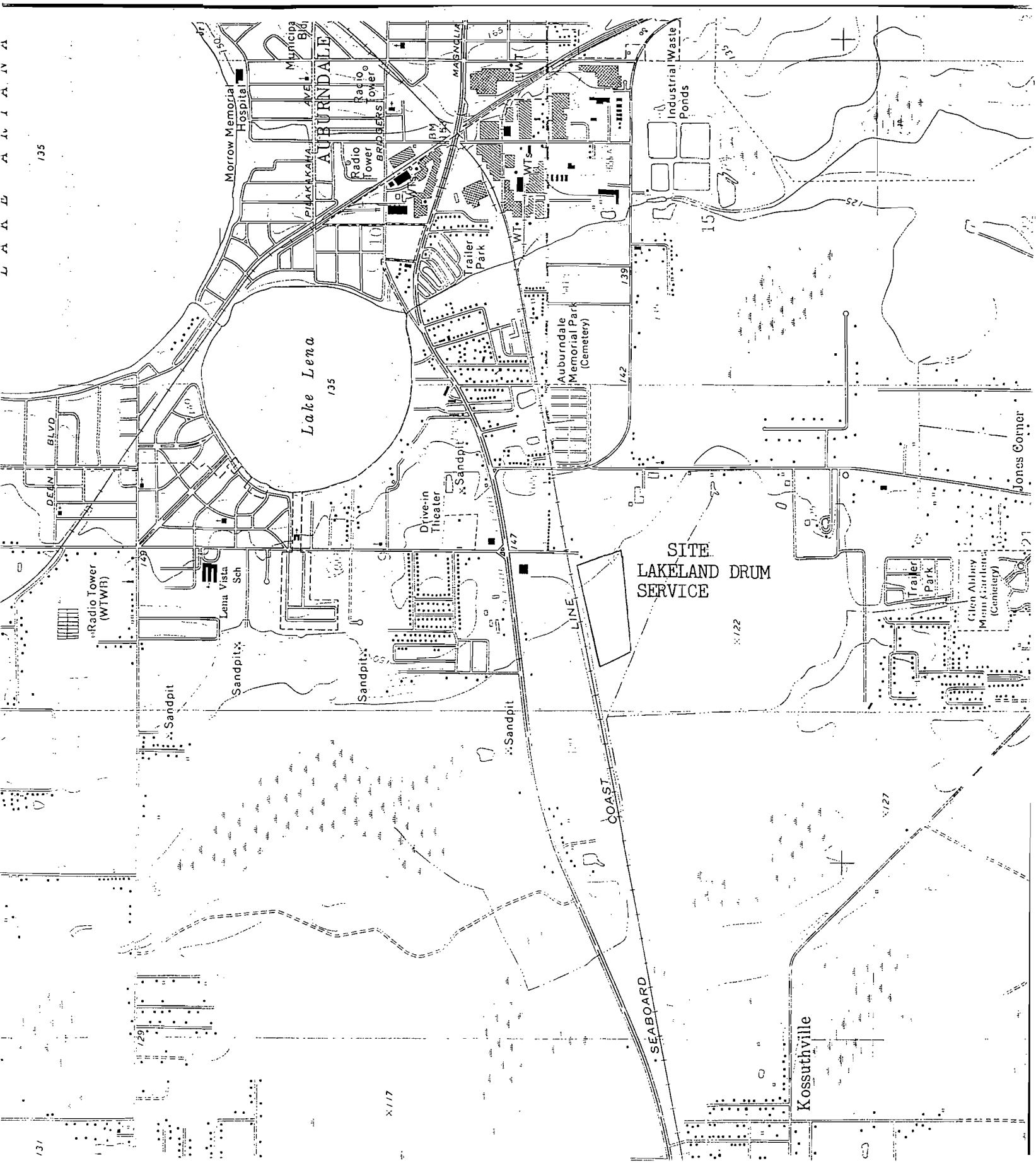
AIRFLOW DIAGRAM

GROVE SCIENTIFIC

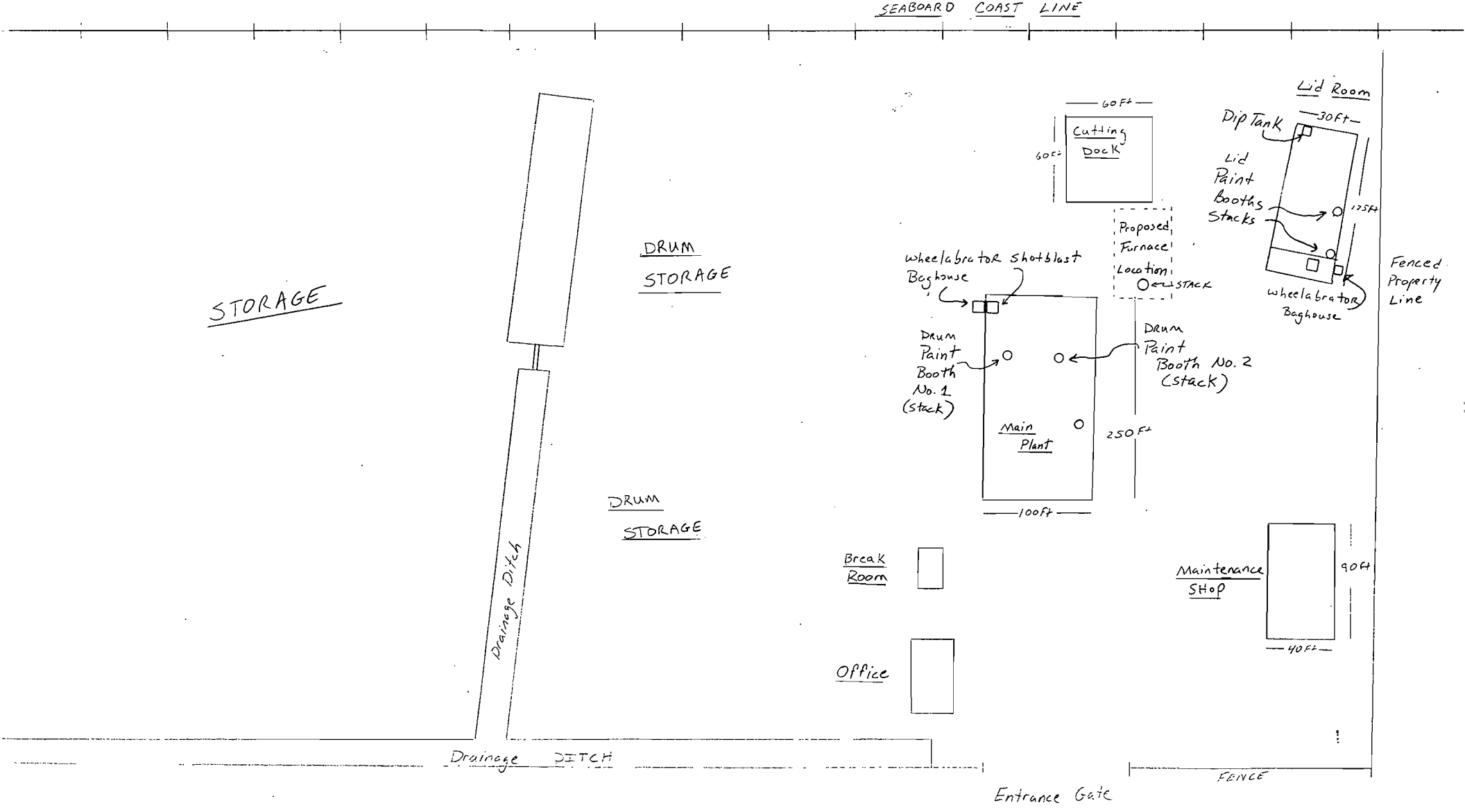
BEST AVAILABLE COPY

COMP. BY: BRUNO FERRARO
CHK. BY: STEVE NECK, P.E.
DATE: 6-27-90
SHEET NO.: 3
JOB NO.: 03-087.01

SUBJECT: SUPPLEMENT 7: PLOT PLAN
LAKELAND DRUM SERVICE source:USGS



LAKELAND DRUM SERVICE PLOT PLAN



Not to Scale

APPENDIX A

DESIGN SPECIFICATIONS

DRUM FURNACE DESIGN & BURNER SIZING
(REF EPA AP-40)

Problem:

Design a continuous-tunnel-type furnace for processing 400 standard 55-gallon, steel, open-top drums per hour with an afterburner operating at 1600^{0}F and a one (1) second retention time.

Given:

Combustible material attached to each drum varies from near zero to 4 pounds (typical of range of combustibles on most drums as received for processing).

All combustible material on the drums is considered to have a composition equivalent to that of US Grade 6 fuel oil.

Solution:

1. Primary ignition chamber:

a. Given: 6000 SCFM required for combustion of material in the drums.

b. Size of ignition burners to raise effluent to 1,000 ^{0}F.

Design ignition burners for most severe operation, that of negligible combustible per drum. Burners must raise temperature of drums to 900 ^{0}F. From Table D1, Appendix D, density of air at 0 ^{0}F and 14.7 psi is 0.076 lb/ft^3. Average specific heat of products of combustion is 0.26 Btu/lb-^{0}F.

(1) Heat required to raise induced air from 0 ^{0}F:

$$Q_1 = W_a C_{pa} (T_2 - T_a)$$

where

Q_1 = heat required, Btu/hr

W_a = Weight of air, lb/hr

C_{pa} = average specific heat over temperature range

T_2 = final temperature, ^0F

T_a = ambient air temperature, ^0F

Q_1 = (6000 scfm)(60 min.)(0.076lb/cu.ft.)(0.26btu/lb.-^0F)(1000^0F)

= 7,113,600 btu/hr

(2) Heat required to raise temperature of drums from 0 ^{0} to 900 ^0F:

The specific heat of steel for this temperature range is 0.12 Btu/lb-^0F.

$$Q_2 = W_d \ C_{pd} \ (T_2 - T_1)$$

where

Q_2 = heat required, Btu/hr

W_d = weight of drums, lb/hr

C_{pd} = specific heat of steel, Btu/lb-^0F

T_2 = final temperature

T_1 = initial temperature

Q_2 = (400 drums/hr)(55lb./drum)(0.12btu/lb.-^0F)(900^0F)

= 2,376,000 Btu/hr

(3) Total heat required in ignition zone:

Assume heat losses through radiation, storage, and so on are 10 percent of total gross heat input.

$$\frac{7,113,600 \text{ Btu/hr} + 2,376,600 \text{ Btu/hr}}{0.90} = 9,753,600 \text{ Btu/hr}$$

(4) Natural-gas capacity of primary burners:

From Table D7, Appendix D, the calorific value of 1 scf natural gas with 20 percent excess air is 736.2 Btu at 1,000 ^{0}F.

$$\text{Total capacity} = \frac{9,753,600 \text{ Btu/hr}}{736.2 \text{ Btu/scf}} = 13,249 \text{ scfh}$$

(5) Individual burner capacity:

Install sixteen (16) burners, eight (8) burners per side

$$\text{Burner capacity} = \frac{13,249 \text{ scfh}}{16} = 828\text{cfh/burner}$$

c. Excess primary combustion air:

Assume all the air for burning the materials in the drums is induced through the tunnel openings.

(1) Maximum design burning rate:

$$\frac{(400\text{drums/hr.})(4\text{lbs./drum})}{60} = 26.67 \text{ lbs./min.}$$

(2) Total combustion air available through tunnel openings:

$$\text{Air} = \frac{6000 \text{ scfm}}{26.7 \text{ lb/min}} = 225 \text{ scf/lb}$$

From Table D6, Appendix D, 1 lb US Grade 6 fuel oil requires 177 scf air 40 percent saturated at 60 ^{0}F.

$$\% \text{ excess air available} = \frac{225 \text{ scf} - 177 \text{ scf}}{177 \text{ scf}} \times 100 = 27\ \%$$

d. Average gas temperature in ignition zone when burning a maximum of 4 pounds combustibles per drum:

Assume first rows of burners on opposite sides of zone are operating at 1 million Btu/hr (910 scfh) to ignite combustibles on drums. Design gas burners to operate with 20 percent excess air. Assume radiation, storage, and other heat losses are 35 percent of gross heat input at furnace temperatures near 2,000 ^{0}F. From Table D5, Appendix D, the gross heat of combustion of 1 pound US Grade 6 fuel oil is 18,000 Btu.

(1) Gross heat:

Primary burner = 1 million Btu/hr

Heat input primary chamber

Combustibles = (1,600 lbs./hr)(18,000btu/lb.)= 28,800,000 Btu/hr

Total = 29,800,000 Btu/hr

potential heat release primary chamber

(2) Heat losses, radiation, storage, and so on:

(0.35)(29,800,000 Btu/hr) = 10,430,000 Btu/hr

(3) Evaporation of moisture contained in drums:

Assume an average of 0.5 lb water per drum. The heat of vaporization of 1 pound of water at 0 ^{0}F and 14.7 psia is 1,060 Btu.

(0.5 lbs./drum)(400 drums/hr)(1,060 Btu/lb.)= 212,000 Btu/lb.

(4) Evaporation of water formed by combustion:

From Tables D7 and D6, Appendix D, 0.099 lb of water is formed by burning 1 scf natural gas with 20 percent excess air while 0.91 lb water is formed from burning 1 lb US Grade 6 fuel oil with 27 percent excess air.

Natural gas:

(910scfh)(0.099lbs. H_2O)(1,060Btu/lb.)= 95,000 Btu/hr

(1600 lbs./hr.)(0.91 lbs. H_2O/lb.)(1,060 Btu/hr)= 1,543,360 Btu/hr

Total = 1,638,360 Btu/hr

(5) Total heat losses:

(2) + (3) + (4) = 12,375,360 Btu/hr

(6) Net heat available to raise temperature of products of combustion:

29,800,000 Btu/hr - 12,375,360 Btu/hr = 17,424,640 Btu/hr

(7) Weight of products of combustion:

From Tables D7 and D6, Appendix D, there is 0.999 lb products of combustion from 1 scf natural gas with 20 percent excess air and there is 21.71 lb products of combustion from 1 pound US Grade 6 fuel oil with 27 percent excess air.

(910 scfh)(0.999 lb/scf) = 909 lb/hr

(1,600 lbs./hr)(21.71 lbs./lbs.)=34,736 lbs./hr.

Total = 35,645 lb/hr

(8) Average gas temperature:

Average specific heat of products of combustion (equivalent to air) is taken to be 0.26 Btu/lb - ^{0}F for the given temperature range.

$$T = \frac{Q_3}{W_t C_{pt}}$$

where

T = temperature rise, ^0F above 0 ^0F

Q_3 = heat available, Btu/hr

W_t = weight of products of combustion, lb hr

C_{pc} = average specific heat, Btu/lb - ^0F

$$T = \frac{17,424,640 \text{ Btu/hr}}{(35,645 \text{ lb/hr})(0.26 \text{ Btu/lb} - {}^0F)} = 1880 \ {}^0F$$

Final Temp = 0 + 1880 = 1880 ^0F

e. Volume of products of combustion at 0 ^0F

(1) With negligible combustibles on drums:

Induced air:

(6000 scfm)(60 min/hr) = 360,000 scfh

Primary burners:

(13,249 scfh)(13.53 scf/scf) = 179,259 scfh

Total = 539,259 scfh

= 8988scfm

= 150 scfs

(2) With 4 pounds combustibles per drum

Assume primary burners are operating at 910 scfh. From Table D6, Appendix D, there is 281.9 ft^3 products of combustion from 1 pound US Grade 6 fuel oil with 54 percent excess air.

Combustibles:

$(1600\ lb/hr)(281.9\ ft^3/lb) = 451{,}040\ scfh$

Primary burners:

$(910\ scfh)(13.53\ scf/scf) = 12{,}300\ scfh$

Total = 463,340 scfh

= 7722 scfm

= 129scfs

The most severe operating conditions exist, therefore, in the ignition chamber when drums with negligible combustible material are processed.

f. Volume of ignition zone:

Assume a heat release factor of 22,000 Btu/hr-ft^3, which is similar to heat release factors for oil-fired furnace fireboxes operating at less than 1,800 ^{0}f. Assume drums contain negligible combustible materials.

$$\text{Volume} = \frac{(13{,}249\ scfh)(1{,}100\ Btu/scf)}{22{,}000\ Btu/hr\text{-}ft^3}$$

$$= 662\ ft^3$$

g. Length of ignition zone:

Assume width = 40 in.; height = 87 in., including the conveyor

$$\text{Length} = \frac{\text{Volume}}{(\text{height})(\text{width})} = \frac{662\ ft^3}{(3.3)(7.25)} = 27\ ft$$

Actual = 40'

h. Cooling zone length:

Assume width = 31 in., height = 45 in., including the conveyor. Design ignition zone and cooling zone for a total residence time of 4 min. Assume a drum spacing of 29 in. (5 in. between drums). Internal cross-sectional dimensions match those of ignition zone.

Conveyor speed = (400 drums/hr.)(2.41 ft/drum)= 16 ft/min.

Length of ignition and cooling zones

Total length = (16 ft/min)(4 min) = 64 ft

Cooling zone length= 64 ft - 40 ft = 24 ft

i. Preheat zone length:

Design this zone to minimize radiation losses and to protect operator. Internal cross- sectional dimensions match those of cooling zone.

Design preheat zone length = 20 ft

Evaluation of existing design shows that a preheat zone length of 20 ft will be adequate.

2. Secondary-combustion chamber (afterburner):

a. Design gas burners for most severe operation (drums contain negligible combustibles). Afterburner will raise temperature of products of combustion from ignition zone from $1,000^0$ to $1600\ ^0F$.

(1) Weight of products of combustion:

from ignition zone:

Induced air:

(6000 scfm)(0.076 lb/ft^3)(60 min/hr) = 27,360 lb/hr

Natural gas:

(13,249)(0.999 lb/scf) = 13,236

Total = 40,596 lb/hr

(2) Heat required to raise temperature of products of combustion to 1600 ^{0}F:

Average specific heat of products of combustion is 0.26 Btu/lb - ^{0}F over the given temperature range.

$$Q_3 = W_t C_{pc} (T_2 - T_1)$$

where:

T_2 = initial temperature, ^{0}F

T_1 = final temperature, ^{0}F

Q_3 = (40,596 lb/hr)(0.26 Btu /lb - ^{0}F)(1600 ^{0}F - 1,200 ^{0}F)

= 4,221,984 Btu/hr

(3) Total heat required in afterburner:

Assume heat losses by radiation, convection, and so on are 10 percent of gross heat supply at 1,400 ^{0}F

$$\text{Total heat} = \frac{4,221,984 \text{ Btu/hr}}{0.90} = 4,691,093 \text{ Btu/hr}$$

(4) Total capacity of secondary burners:

From Table D7, Appendix D, the calorific value of 1 scf natural gas is 615.4 Btu at 1600 ^{0}F with 20 percent excess air.

$$\text{Natural gas} = \frac{4,691,093 \text{ Btu/hr}}{552.9 \text{ Btu/scf}} = 8485 \text{ scfh}$$

(5) Individual secondary burner capacity:

Install 4 burners.

$$\text{Capacity of burner} = \frac{8485 \text{ scfh}}{4 \text{ burners}} = 2121 \text{ scfh each}$$

b. Cross-sectional area:

Design afterburner for a cross-section velocity of 20 fps maximum at 1,600 ^{0}F. From Table in Appendix, there are 13.53 scf products of combustion from 1 scf natural gas with 20 percent excess air.

(1) volume of products of combustion when drums are burned with negligible combustibles:

Induced air:

(6000 scfm)(60 min/hr) = 360,000 scfh

Primary burners:

(13,249 scfh)(13.53 scf/scf) = 179,259 scfh

Secondary Burners:

(8,485 scfh)(13.53 scf/scf) = 114,802 scfh

Total = 654,061 scfh

= 10,901 scfm

= 182 scfs

(2) Internal cross-sectional area and dimensions:

Area = (182 scfs/20 fps)(2060^{0}R/520 ^{0}R) = 36.05 ft^{2}

Diameter = 6.8 ft or 81 in.

c. Length of afterburner:

Design for a minimum residence time of 1.0 second.

Length = (20 fps)(1.0 second) = 20 ft.

d. Fan capacity (with waste heat boiler)

1. Volume of Products of Combustion @ 500 ^{0}F.

$$V = \frac{10,901 \times 960}{520\ ^{0}R} = 20,124\ CFM$$

Design for 21,000 scfm

(3) Static pressure of system, 8 inches W.C.

PRELIMINARY SPECIFICATION FOR DRUM FURNACE & AIR POLLUTION CONTROL SYSTEM

1. Primary Burner (drum furnace) - The furnace will be a dry hearth type with a capacity of 400, 55 gallon drums per hour, and will come complete with a preheat and cool down zone, burners, a hydraulic conveyor system (extending approximately 10 feet beyond the entrance and exit ends of the furnace), and cooling trough. The 10' of conveyor on the exit end will be covered with a refractory lined cover to eliminate fugitive emission from the material left on the chain. The furnace walls will consist of 7 inches of insulating refractory and 6 inches of high density high temperature refractory. The roof will be constructed of 9 inch thick high temperature insulating refractory. The outside walls and roof will be enclosed with a carbon steel 3/16 inch plate with "I" beam supports. The total furnace length, including preheat and cool down zones, will be 84 feet.

2. Secondary Burner (Afterburner) - the afterburner will be designed in accordance with EPA AP-40 and will have the capacity to raise 11,000 SCFM of effluent from 1000^{0}F to 1500^{0}F with a 1.0 second retention time. It will be constructed from an all welded 3/16 carbon steel shell and will be lined with 6" of high temperature insulating refractory.

3. Burners - the twelve (12) burners required for the furnace as well as the four (4) used in the afterburner, will be fully modulating Maxon MVTA Excess Air type (or the equivalent), with individual start up and flame supervision.. They will come complete with Factory Mutual approved gas train and pilot train.

4. Combustion Air Blower - The combustion air blower will be a direct drive, Twin City Model 1406P5, complete with 30h.p. TEFC, 440V,30,motor.

5. Control Panel - The control panel will be a Nema 12 panel and will come complete with disconnect, motor starters, 440V to 110V transformer, flame safeguard system, Barber-Colman modulating temperature controls, hi-limits, alarm, indicating lights and switches. The flame safeguard system will be Fireye controls with pre-purge cycle, limited ignition trial, constant flame supervision with air proving and gas pressure switches. Additional interlocks will be determined during design phase.

6. Induced Draft Fan - The induced draft fan will be a Twin City 445BC and come complete with a 100 H.P. motor, sheaves and OSHA approved belt guard. It will have a capacity of approximately 57,000 CFM at 650 ^{0}F and 4" static.

Note: If a waste heat boiler is used, a different fan will be provided.

MAINTENANCE CHECK LIST
FOR DRUM FURNACE, AFTERBURNER
& WASTE HEAT BOILER

CHECK AND/OR SERVICE DAILY OR AS REQUIRED

1. Scanners must be cleaned with soft cloth.
2. Filters on the combustion air blower must be cleaned or replaced with an alternating set.
3. Blow down boiler water level controls daily and check for unstable condition.
4. Blow down boiler as required by water treatment company.
5. Check "TDS" of boiler.
6. Check water softener hardness.
7. Check modutrol motors and modulating valves to insure proper operation.
8. Check and record gas pressure.
9. Check and record stack temperature
10. Check afterburner, set temperature.
11. Check furnace, set temperature.
12. Check hi-limit, set temperature.

CHECK AND/OR SERVICE WEEKLY OR AS REQUIRED

1. Pilot mixing nozzles (if used) assembly must be removed and cleaned or replaced with an alternating spare set.

2. Pilot and burner flame characteristics must be checked visually.

3. All limits.
   A. Low water cut off (shut off feed pumps).
   B. Gas pressure switches.
   C. Air pressure switches.
   D. Hi steam pressure switches.
   E. Hi temperature limit switches.
4. Check feed water pumps for leaks and lubrication.
5. Check and record condensate receiver and make up tank water temperature.

6. Check belts and lubricate bearings on fans. Also check for vibration
7. Check condition of all electrical wiring.
8. Check and service all motors, pumps, etc.
9. Check condition of all thermocouples.

CHECK AND/OR SERVICE MONTHLY OR AS REQUIRED

1. Static pressure at all fan inlets.
2. Pressure drop accross boiler.
3. All burner adjustments should be cleaned and lubricated.
4. Amplifiers should be checked for strength of output.
5. Check fireside of boiler for soot build up. - clean if necessary.
6. Check refractory in boiler and afterburner.

Check water side of boiler every six months for scale build up or in accordance with insurance company requirements.

Control box must be vacuumed, electrical terminals cleaned and components checked every three months or as required.

Check temperature control for calibration every three months.

Boiler must have proper water treatment to prevent scale build up.

Note: All threaded parts must be coated with "Never-Seez" or equivalent when servicing.

APPENDIX B

STACK TEST RESULTS

South Coast
AIR QUALITY MANAGEMENT DISTRICT
9150 FLAIR DRIVE, EL MONTE, CA 91731 (818) 572-6200

SOURCE TEST REPORT

86-0036

CONDUCTED AT

Cooper Drum Co.
9641 El Poche
South El Monte, CA

EMISSIONS FROM A DRUM BURN-OUT FURNACE SERVED BY AN AFTERBURNER

TESTED: April 10, 1986

ISSUED: MAY 15 1986

REPORT BY: Wayne A. Nakagawa
Acting Air Quality Engineer I

REVIEWED:

Steven Marinoff

Steven Marinoff, Senior Air Quality Engineer

AS

ARNOLD STEIN, ACTING MANAGER
SOURCE TESTING & MONITORING BRANCH

EDWARD CAMARENA
DIRECTOR, ENFORCEMENT DIVISION

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

INTRODUCTION

(a) Firm Tested ..... Cooper Drum Co.

(b) Test Location ..... 9641 El Poche, South El Monte, CA

(c) Unit Tested ..... Afterburner Serving Drum Burn-Out Furnace

(d) Test Requested by ..... S. Muller, Enforcement

(e) Reason for Test Request ..... Verify Compliance

(f) Date of Test ..... April 10, 1986

(g) Source Test Performed by ..... S. Marinoff, W. Nakagawa, P. Chavez

(h) Test Arrangements Made Through ..... Don Eckroad, General Manager, Cooper Drum

(i) Source Test Observed by ..... Ruben Reyes, Cooper Drum

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

Results

Flow Rate 834 dscmm (29457 dscfm)
Process Weight 5978 kg/hr (13182 lbs/hr) *

Contaminant	Emissions		Applicable Rule
	Measured	Allowed	
Particulate Matter Concentration:	29 mg/dscm (0.0127 gr/dscf)	121 mg/dscm (0.0529 gr/dscf)	404
Solid Particulate Matter Mass Flow Rate:	1.27 kg/hr (2.81 lb/hr)	4.43 kg/hr* (9.76 lb/hr)	405
Hydrochloric Acid Concentration	Not Detectable < 0.789 ppm	-	Information
Carbon Monoxide (Dry Basis, 15 minute average)	Not Detectable < 5 ppm	2000 ppm	407
Oxides of Nitrogen as NO_2	15 ppm	-	Information

* SEE TEST CRITIQUE

ALSO SEE TABLE 1

INTRODUCTION

On April 10, 1986, personnel from the South Coast Air Quality Management District (SCAQMD), Source Testing and Monitoring Branch of the Enforcement Division, conducted an announced source test at Cooper Drum Co., South El Monte, CA. The test was conducted on the afterburner serving the drum burn-out furnace to verify compliance with Rules 404, 405, and 407.

EQUIPMENT AND PROCESS DESCRIPTION

Cooper Drum Co. reconditions used 55-gallon 20/18 gauge steel drums for various industrial uses. The used drums contain residual chemicals and other flammable liquid and solid materials. Most of this material falls off the interior into a sludge-collection trough. The drums and lids are manually loaded onto a conveyor which goes through the furnace tunnel (338 drum/hr average). The furnace combustion chamber utilizes 14 burners (10^6 Btu/hr capacity each) to burn-off residual material. The drums and lids are subsequently steam cleaned and abrasive (steel-shot) blasted. The drums and lids are then spray-painted and dried in an oven and reassembled for sale (see Cooper Drum Co. Source Test Report 86-0034).

The hydrocarbon and particulate emissions from the burn-out furnace are controlled by an afterburner maintained at 1700°F. A schematic of the process is shown in FIGURE 1, and the locations of the sampling points on the afterburner and exhaust stack are shown in FIGURE 2. The afterburner outlet, before the stack blower has a provision for cooling air introduction.

The intent of the cooling air introduction is not for circumvention but to reduce the temperature of the exhaust gases exposed to the blower unit. This operation must comply with Rules 404, 405, and 407 concerning particulate matter and gaseous air contaminants.

During the sampling period, the company reported the following operation information:

338 Drums Burned
338 Lids Burned
37½ lb/Drum (Ave. Wt. of Drum)
1½ lb/Lid (Ave. Wt. of Lid)

SAMPLING AND ANALYTICAL PROCEDURER

GAS FLOW RATES

The velocity of the outlet stack of the afterburner was determined using a Pitot tube, Magnehelic gage, and a Digital potentiometer with a type "K" thermocouple. The dry volumetric flow rate was calculated from this data, the area of the exhaust stack, and the moisture content of the gas stream.

GAS SAMPLES - GRAB AND INTEGRATED SAMPLING

Two instantaneous gas samples from the afterburner stack were collected at traverse point #2, after completion of the particulate sampling. The sampling apparatus is shown in FIGURE 3. An integrated gas sample was collected over a 15 minute period into a 30 liter Tedlar bag which contained approximately 50% (VOL.)dry helium as a diluent (FIGURE 4) to prevent condensation.

The contents of the gas bulbs and bag were analyzed by the District's Laboratory for Carbon Monoxide (CO), Carbon Dioxide (CO_2), Methane (CH_4) and Non-Methane Hydrocarbon (NMHC) by Gas Chromatography (GC) and a Non-Dispersive Infrared Detector (NDIR); for Oxygen (O_2) by GC/Thermal Conductivity Detector; for Vinyl Chloride by GC/Flame Ionization Detector; for Benzene and Toluene by GC/Photoionization Detector and for Chlorinated Compounds by GC/Electron Capture.

OXIDES OF NITROGEN

Four instantaneous gas samples were collected over a 20 minute period at the exhaust stack into evacuated two-liter bulbs (FIGURE 3) containing 25 ml of $H_2SO_4.H_2O_2$ liquid absorbent. The liquid absorbent was then analyzed for Oxides of Nitrogen by the Phenoldisulfonic Acid (PDSA) method by the District's Laboratory.

PARTICULATE MATTER SAMPLING

The particulate matter from the exhaust stack was isokinetically sampled with a 15 point traverse for 60 minutes. The sample was collected using the District's conventional wet impingement method and a stainless steel probe with a 316 s.s. nozzle (FIGURE 5).

HYDROCHLORIC ACID AND TOTAL CHLORIDE SAMPLING

The hydrochloric acid (HCl) and total chloride an the exhaust was determined by analyzing an aliquot of the water collected in the particulate sampling train. The "total acids as hydrochloric acid (HCl)" content was determined by titration to a pH 4.2 end point using a pH meter. The total chloride content was determined by the specific ion electrode method. The analyses were performed by the District's Laboratory.

TOTAL COMBUSTION ANALYSIS (TCA)

Duplicate integrated gas samples (District's TCA Method) were collected simultaneously from the afterburner outlet before dilution air, outlet after dilution air (stack) and the dilution air into a pair of eight-liter evacuated cylinders each equipped with a dry ice-cooled trap and a back-flow regulator to insure a constant sample flow rate. The sampling apparatus is shown in FIGURE 6. The samples were analyzed for methane, total organic carbon, carbon dioxide, carbon monoxide, and oxygen, by the District's Laboratory, utilizing total combustion analysis methods. The results of the above samples and the flow rate in the stack were used to calculate the flow rate of the dilution air by a carbon balance.

TEST CRITIQUE

The equipment ran at the maximum rate during the sampling period. The number of drums and lids processed during the sampling period was provided by Mr. D. Eckroad, General Manager, Cooper Drum Co.

The particulate sampling was conducted at 100% of isokinetic. The particulate matter concentration was based upon the flow rate as calculated at the stack outlet and the solid particulate flow rate was based upon the weight of the drums and lids processed as per instructions by Air Quality Engineer, F. Del Rosario.

The permit applications were evaluated using a process weight based on the amount of residue burned off, assuming 4 lb/drum. This would give a process weight of 338 drum/hr processed x 4 lbs/drum = 1352 lb/hr. The Rule 405 allowed would then be 3.0 lb/hr and the test would show only marginal compliance, within the accuracy of the test method.

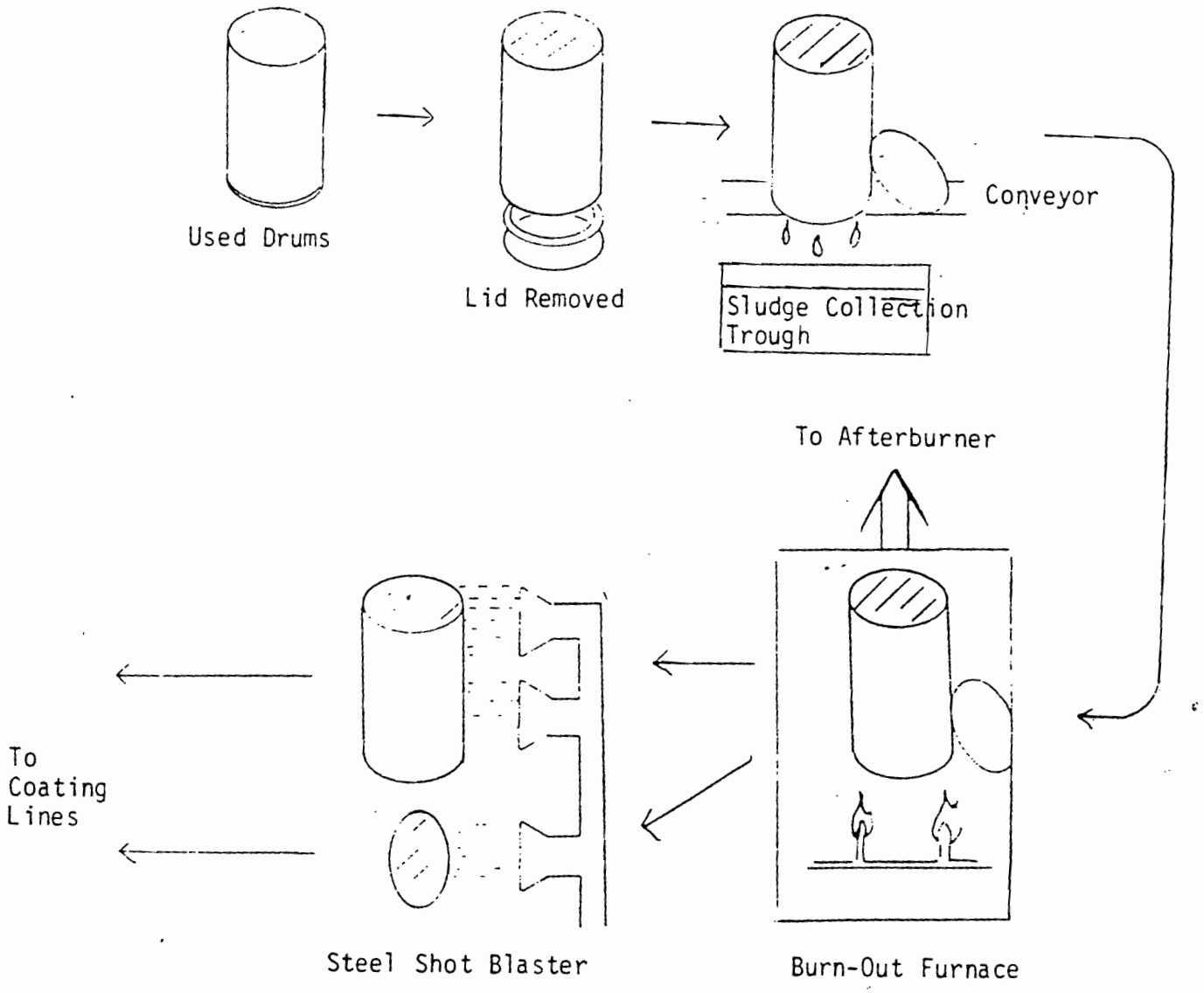
The hydrochloric acid concentration in the exhaust was below the limit of detection. The presence of chlorides in the particulate sample train indicate that chlorinated compounds incinerated in the furnace are emitted as oxidized chlorine compounds.

The total combustion analysis data was collected to provide information concerning the carbon monoxide content of the exhaust stream and to calculate the amount of draft air drawn into the stack. The analysis also indicates that non-methane hydrocarbons are also present in the ambient air around the afterburner.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

Test No. 86-0036 -7- Date 4/10/86

Figure No. 1



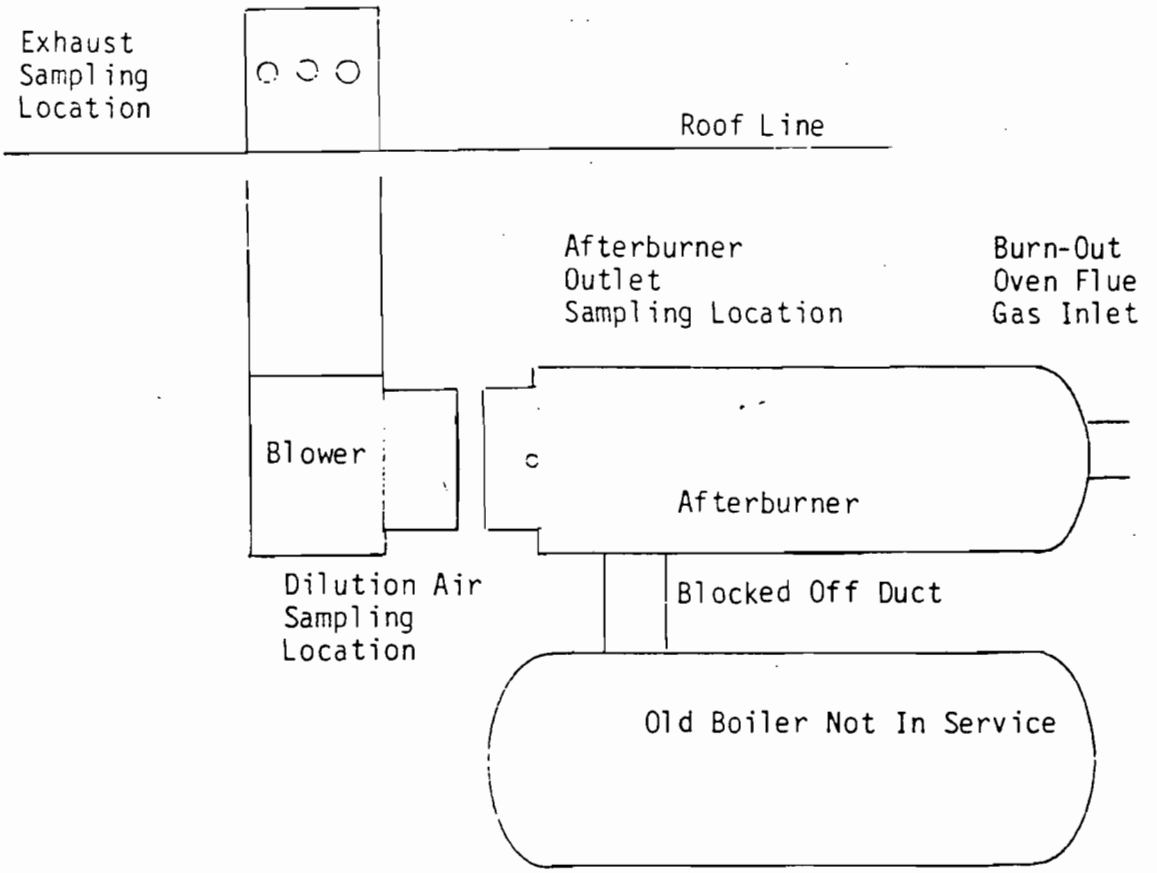
Process Schematic

Cooper Drum Co.
South El Monte, CA

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

Test No. 86-0036 -8- Date 4/10/86

Figure No. 2



Schematic of Sampling Locations

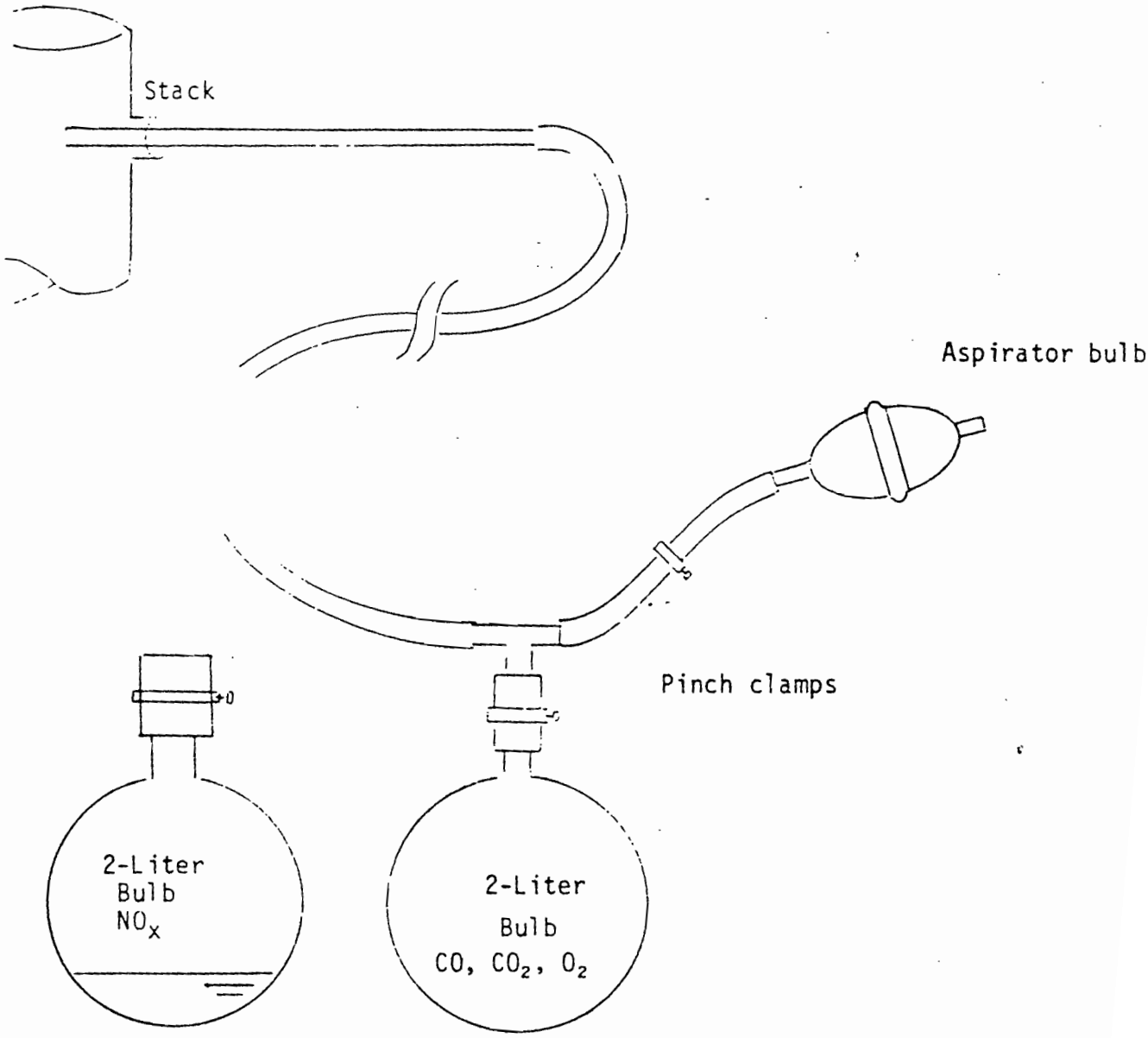
Cooper Drum Co.
South El Monte, CA

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

Test No. 86-0036

Date April 10, 1986

Figure No. 3



Method of Obtaining Gas Samples
(Grab Sample Method)

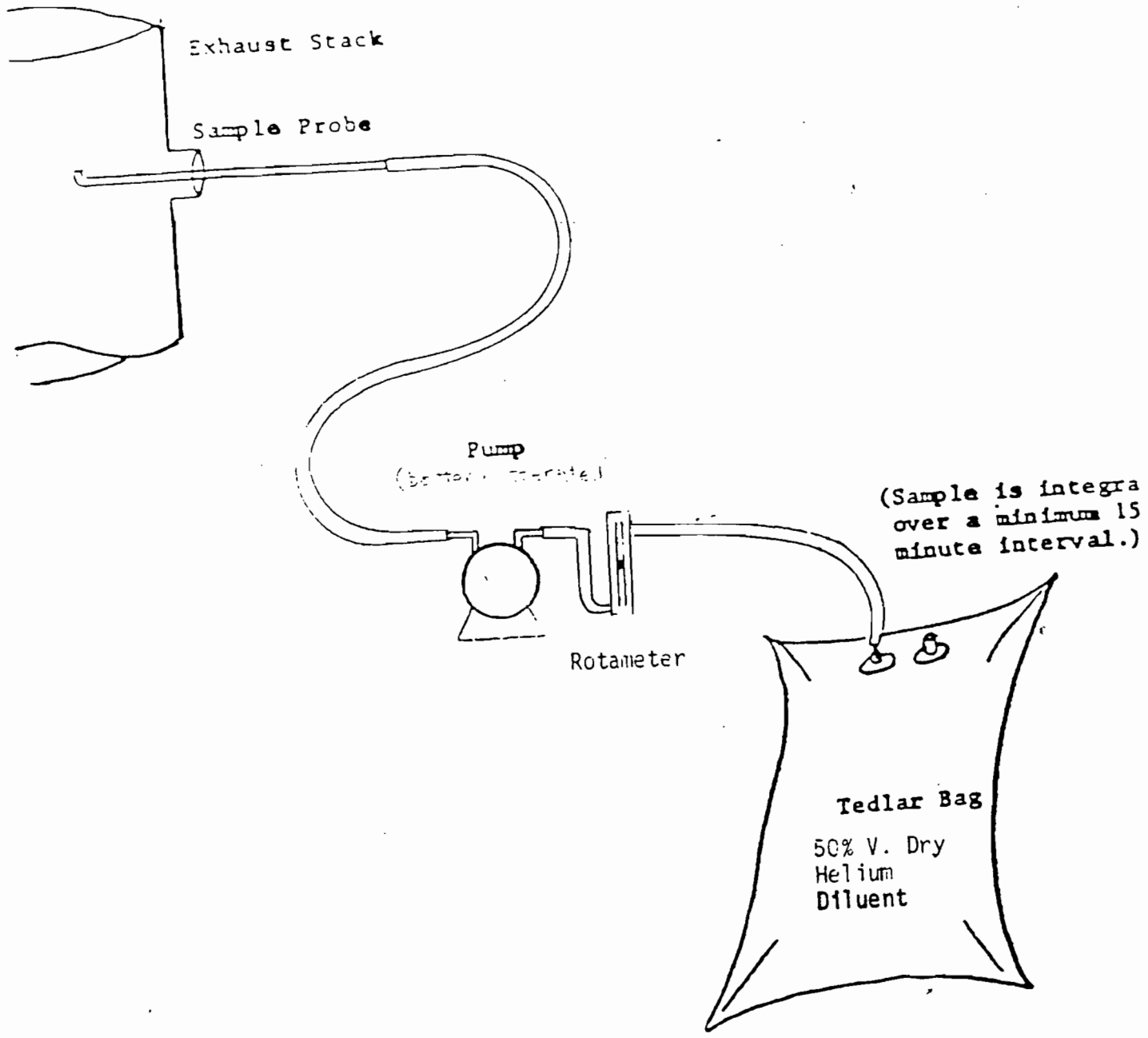
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

Date 4/10/86

Plan No. 10

Test No. 85-036

Figure No. 4

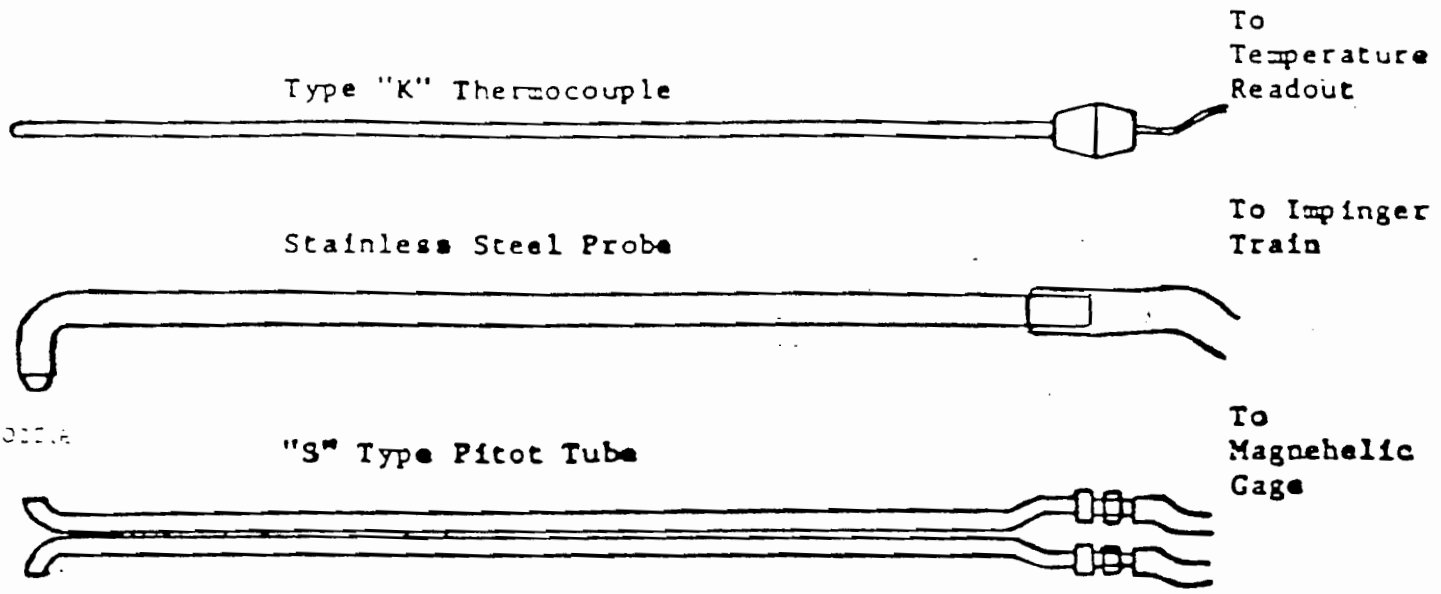


Gas Sample Collection System

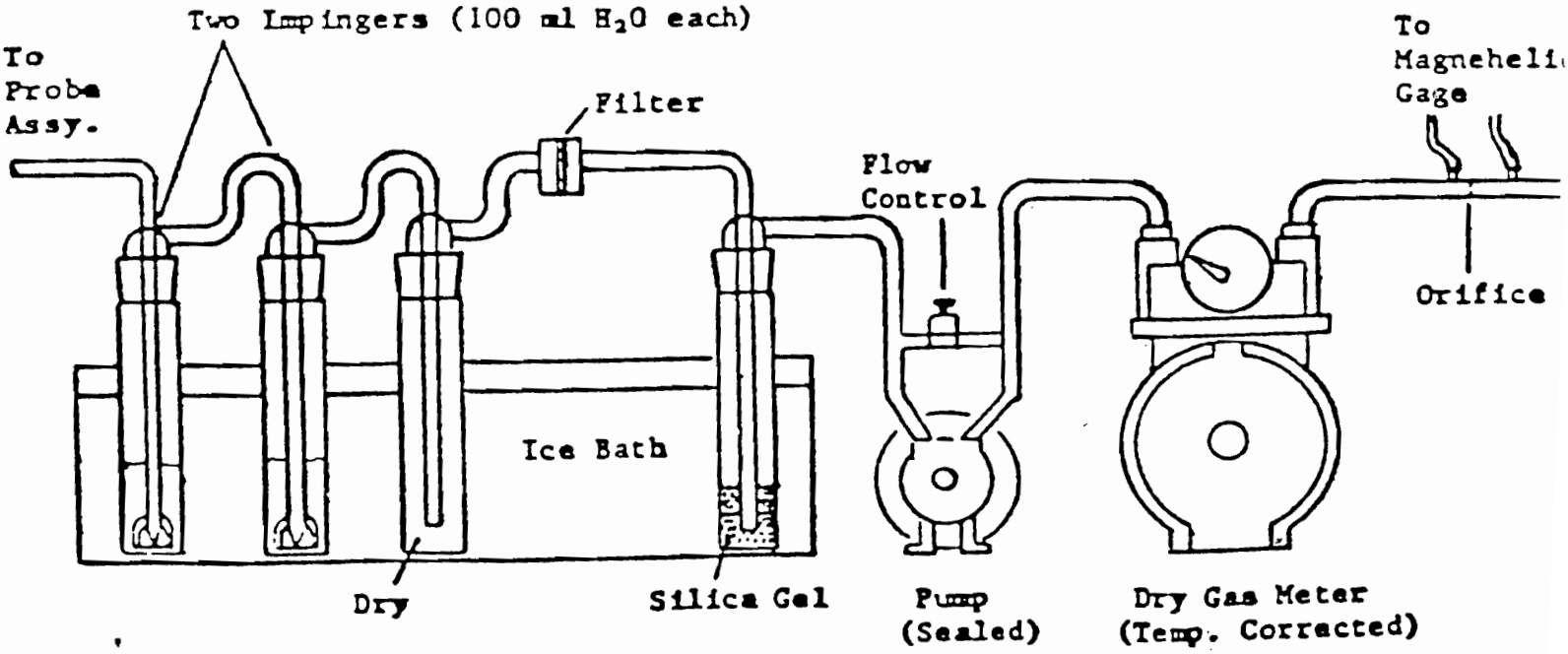
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

Test No. EC-[illegible] Page No. 11 Date APRIL [illegible], 1988

Figure No. 5



Probe Set-up



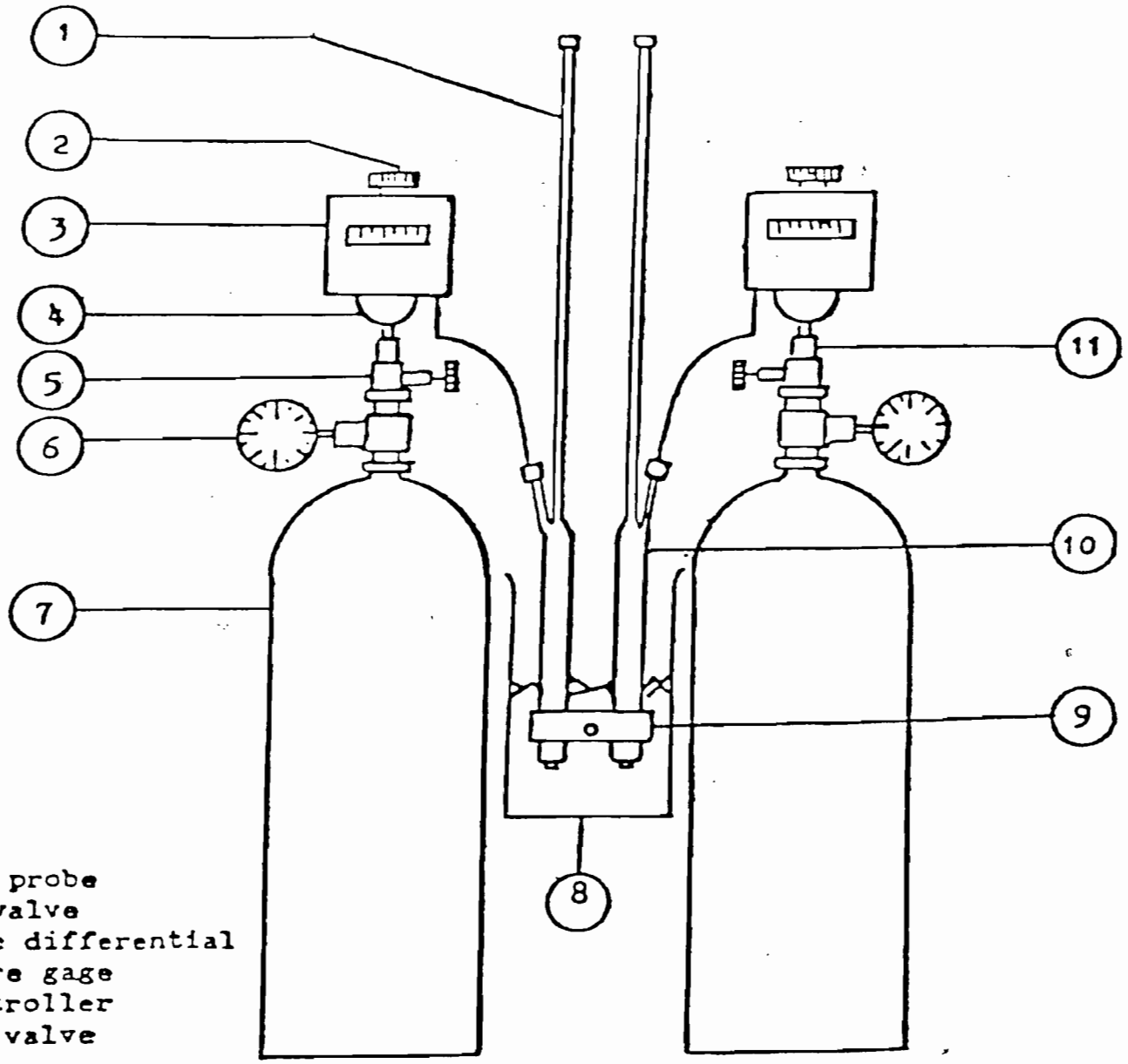
PARTICULATE MATTER/ HYDROCHLORIC ACID-TOTAL CHLORIDES

IMPINGER TRAIN SET-UP
(Wet Impingement Method)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

Test No. 86-0030 Page No. 12 Date April 15, 1986

Figure No. 6



1. Sampling probe
2. Control valve
3. Minihelic differential pressure gage
4. Flow controller
5. Shut-off valve
6. Vacuum gage
7. Eight-liter flask
8. Dry ice container
9. Heat sink clamp
10. Trap
11. Quick disconnect

SAMPLING APPARATUS

FOR

ORGANICS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Test No. EC-0036

Date April 10, 1986

Sampling Location Cenco Drum Co. Burn Out Oven - Afterburner Inlet

Sample Train PARTICULATES

(Lab Results)

Lacquer MEK Extract	14 ml	23 ml	
Silica Gel Fraction	4 g		
Lacquer Particulate	14 mg		
Filter Ash	7 mg	H_2SO_4 2N (Toluene)	<1 mg
Org. Extraction Residue	2 mg	(PT)	4 mg

Calculated By WM

Checked By DM

SOURCE TEST CALCULATIONS

SUMMARY

A.	Average Traverse Velocity (Pre-Test)	109.3	fp		
B.	Average Reference Point Velocity (Pre-Test)		fp		
C.	Average Traverse Velocity (During Test)	107.3	fp		
D.	Average Stack Temperature	602 °F	J.	Sampling Time	60 min
E.	Stack Cross Sectional Area	11.42 ft^2	K.	Nozzle Cross-Sectional Area	0.000 1917 ft^2
F.	Barometric Pressure	29.78 "HgA	L.	Net Sample Collection	24 mg
G.	Gas Meter Pressure	29.75 "HgA	M.	Net Solid Collection	21 mg
H.	Static Pressure	29.74 "HgA	N.	Water Vapor Condensed	23 ml
I.	Pitot Correction Factor	0.835	O.	Gas Volume Metered	29.198 dcf
P.	Correct Gas Volume Metered (O. x G/29.92)	29.06 dscf			

PERCENT MOISTURE - GAS DENSITY

Q. Percent Water Vapor in Gas Sample $\left[\frac{4.64 \times N}{(0.0464 \times N) + P}\right]$ ..... 3.54 %

R. Average Molecular Weight:

(Component)	(Volume % / 100)	x (1 - L/100)	x (Molec. Wt.)	= (Wt./Mole)
Water		1.00	18.0	
Carbon Dioxide	Dry Basis		44.0	
Carbon Monoxide	Dry Basis		28.0	
Oxygen	Dry Basis		32.0	
Nitrogen & Inerts	Dry Basis		28.2	
			(Sum)	

FLOW RATE

S.	Gas Density Correction Factor $\sqrt{28.95/R}$ ..... Assume	1.00
T.	Flue Correction Factor (~~A/B~~) A/C	1.019
U.	Velocity Pressure Correction Factor $\sqrt{29.92/H}$	1.003
V.	Corrected Velocity (C x I x S x T x U)	91.57 fps
W.	Flow Rate (V x E x 60)	62745 cfm
X.	Flow Rate $\left(W \times \frac{H}{29.92} \times \frac{520}{460 + D}\right)$	30538 scfm
Y.	Flow Rate $\left[X \times (1 - Q/100)\right]$	29457 dscfm

SAMPLE CONCENTRATION - EMISSION RATE

Z.	Sample Concentration (0.01543 x L/P)	0.0127 gr/dsc
A.	Sample Concentration (54,143 x Z/ ____ Molec. Wt.)	ppm (c
B.	Sample Emission Rate (0.00857 x Y x Z)	3.22 lb/hr
C.	Solid Emission Rate $\left(\frac{1.322 \times 10^{-4} \times M \times Y}{P}\right)$	2.81 lb/hr
	$\left(\frac{E \times P \times T \times 100}{E \times P \times T \times 100}\right)$	

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Test No. 86-0236 Date April 10, 1986

Sampling Location Cooper Drum Co. - Bunker Out Furnace - Preheater Sample Train HCl-Cl-

(Lab Results)		
Impinger H_2O Gain	14 ml	23 ml
Silica Gel H_2O Gain	9 g	
HCl,	<1 mg	
Cl^-, (84 sol)	12 mg	

Calculated By W/AW

Checked By L.M.

SOURCE TEST CALCULATIONS

SUMMARY

A.	Average Traverse Velocity (Pre-Test)	109.3	fps		
B.	Average Reference Point Velocity (Pre-Test)		fps		
C.	Average Traverse Velocity (During Test) SEE CALC. SHEET	107.3	fps		
D.	Average Stack Temperature	602	°F	J. Sampling Time	60 min
E.	Stack Cross Sectional Area	11.42	ft^2	K. Nozzle Cross-Sectional Area	0.001917 ft^2
F.	Barometric Pressure	29.78	"HgA	L. Net Sample Collection	<1 mg
G.	Gas Meter Pressure	29.78	"HgA	M. Net Solid Collection	mg
H.	Static Pressure	29.74	"HgA	N. Water Vapor Condensed	23 ml
I.	Pitot Correction Factor	0.835		O. Gas Volume Metered	29.198 dcf

P. Correct Gas Volume Metered (O. x G/29.92) ..... 29.06 dscf

PERCENT MOISTURE - GAS DENSITY

Q. Percent Water Vapor in Gas Sample $\left[\frac{4.64 \times N}{(0.0464 \times N) + P}\right]$ ..... 3.54 %

R. Average Molecular Weight:

(Component)	(Volume % / 100)	x (1 - L/100)	x (Molec. Wt.)	= (Wt./Mole)
Water		1.00	18.0	
Carbon Dioxide	Dry Basis		44.0	
Carbon Monoxide	Dry Basis		28.0	
Oxygen	Dry Basis		32.0	
Nitrogen & Inerts	Dry Basis		28.2	
			(Sum)	

FLOW RATE

S.	Gas Density Correction Factor $\sqrt{28.95/R}$	Assume	1.00
T.	Flue Correction Factor (A/B)		1.019
U.	Velocity Pressure Correction Factor $\sqrt{29.92/H}$		1.003
V.	Corrected Velocity (C x I x S x T x U)		91.57 fps
W.	Flow Rate (V x E x 60)		62745 cfm
X.	Flow Rate $\left(W \times \frac{H}{29.92} \times \frac{520}{460 + D}\right)$		30538 scfm
Y.	Flow Rate $[X \times (1 - Q/100)]$		29457 dscfm

SAMPLE CONCENTRATION - EMISSION RATE

Z.	Sample Concentration (0.01543 x L/P)		<0.000531 gr/dscf
AA.	Sample Concentration (54,143 x Z/____ Molec. Wt.)		<0.789 ppm (dry)
BB.	Sample Emission Rate (0.00857 x Y x Z)		<0.1340 lb/hr
CC.	Solid Emission Rate $\left(\frac{1.322 \times 10^{-4} \times M \times Y}{P}\right)$		lb/hr
DD.	Isokinetic Sampling Rate $\left(\frac{E \times P \times T \times 100}{J \times K \times Y}\right)$		99.8 %

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Test No. [illegible] Date [illegible]

Sampling Location [illegible] Calculated By [illegible]

Checked By [illegible]

ORGANIC FLOW RATE CALCULATIONS

NOTE: All concentrations in ppm volume as CO_2, dry basis, unless noted otherwise.

SAMPLE POINT	FLASK					TRAP	TOTAL ORGANICS		% O_2
	CO_2	CO	CH_4	FORE-FLUSH	BACK-FLUSH			LESS CH_4	
STACK	12 800	*	*		*	18	18	18	18.8
OUTLET	13 300	*	*		13	31	44	44	18.8
(Average)	13 000	*	*		6	24	31	31	18.8
AFTER BURNER OUTLET (BEFORE DILUTION AIR)									
(Average)	55 340	93	*		*	151	151	151	10.2
DRAFT AIR (DILUTION AIR)	376	*	*		*	14	14	14	21.1
	336	*	*		*	63	63	63	21.1
(Average)	356	*	*		*	38	38	38	21.1

* Not Detectable

1. Gas Flow Rates:

SAMPLE POINT	FLOW
STACK OUTLET	29 457 dscfm
AFTER BURNER OUTLET	6 745 ** dscfm
DRAFT AIR	22 712 ** dscfm

2. Organic Flow Rates, as Hexane (Non-Methane Hydrocarbons)

SAMPLE POINT					MASS FLOW RATE
STACK OUTLET	= 1.583 x 10^{-7} x (86 A/B) x	31 ppm) x	29457 dscfm)	=	2.01 lb/hr
A/B OUTLET	= 1.583 x 10^{-7} x (86 A/B) x	151 ppm) x	6 745 dscfm)	=	2.25 lb/hr
DILUTION AIR	= 1.583 x 10^{-7} x (86 A/B) x	38 ppm) x	22 712 dscfm)	=	1.903 lb/hr

(Where A = hydrocarbon molecular weight, and B = carbon number)

** See Concentration Sheet

3. Efficiency of Control Device: NA

$$100 \times \left[1 - \left(\frac{\text{outlet mass flow}}{\text{inlet mass flow}}\right)\right] = 100 \times \left[1 - \left(\frac{\quad \text{lb/hr}}{\quad \text{lb/hr}}\right)\right] = \quad \%$$

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
ENFORCEMENT DIVISION
SOURCE TESTING AND MONITORING BRANCH
CALCULATION SHEET

PAGES	PAGE
	16
TEST NO.	DATE
86-0030	April 10, 1986
PROCESSED BY	CHECKED BY
[illegible]	S. M.

Owens Drum Co.

NO_x Calc.

DATA:

4 SAMPLES TAKEN OVER 24 MINUTE PERIOD.

15 ppm conc NO_x as NO_2 IN each

Avg: 15 ppm NO_x as NO_2

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
ENFORCEMENT DIVISION
SOURCE TESTING AND MONITORING BRANCH
CALCULATION SHEET

PAGES	PAGE
	17
TEST NO.	DATE
86-0236	April 15, 1986
PROCESSED BY	CHECKED BY
WHN	S. M

Coolpak Drum Co.

Calculation of Afterburner and Draft Air Flow Rates

Based on Carbon Balance (TCA data) and Stack Flow Rate.

Carbon Concentration.

Stack outlet: 13 000 ppm CO_2 + 31 ppm Trace Constituents. = 13 031 ppm Carbon

A/B outlet: 55 540 ppm CO_2 + 151 ppm Trace Constituents + 93 ppm Co = 55 564 ppm Carbon

Draft Air: 356 ppm CO_2 + 38 ppm Trace Constituents = 394 ppm Carbon

Stack Flow Rate = 29457 dscfm

Carbon Bal:

Stack Flow x Stack Conc of C = A/B out Flow x A/B out Conc of C + Draft Flow x Draft Conc of C

Flow Bal

Stack Flow = A/B out Flow + Draft Flow

Let A = A/B Outlet Flow Rate

D = Draft Flow Rate

The Eqns are:

$55,564\ A + 394\ D = 13031\ (29457)$

$A + D = 29457$

Solving;

A = 6745 dscfm

D = 22712 dscfm

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
ENFORCEMENT DIVISION
SOURCE TESTING AND MONITORING BRANCH
CALCULATION SHEET

PAGES	PAGE
	18
TEST NO.	DATE
E&O 0036.	April 10, 1985
PROCESSED BY	CHECKED BY
WAN	J. M.

Table 1
Cooper Drum Co.

Organic Flow Rate
From Outlet Stack

	Tedlar Bag (15 min. integrated Samples, ~40% H2O Dilution)			Bags (Instantaneous)	
	Uncorrected Conc., ppm	Corrected Conc., ppm *	lb/hr **	Ave. Conc., ppm	lb/hr **
Vinyl Chloride	<0.002	<0.004	<0.0011	<0.002	<0.0005
Benzene	<0.002	<0.004	<0.0014	<0.003	<0.0011
Toluene	0.011	0.023	0.0096	0.059	0.025
Methylene Chloride	0.100	0.207	0.091	0.495	0.217
Chloroform	<0.00040	<0.00083	<0.00045	<0.00055	<0.00030
1,1,1-Trichloroethane	0.0072	0.0149	0.0090	0.066	0.040
Carbon Tetrachloride	0.00007	0.00014	0.00010	0.00041	0.040
Trichloroethylene	<0.00023	<0.00048	<0.00029	0.0011	0.0052
Perchloroethylene	0.0022	0.0045	0.0034	0.014	0.011

* Correction factor = 2.066, based on O_2 content of bag and TCA temp

** lb/hr = 1.583×10^{-7} x MW x conc, ppm x 29457 dscfm

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
ENFORCEMENT DIVISION
SOURCE TESTING AND MONITORING BRANCH
CALCULATION SHEET

PAGES	PAGE
	19
TEST NO.	DATE
EC-036	APRIL 15, 1976
PROCESSED BY	CHECKED BY
L. ARC	S. M.

COOPER DRUM CO.

CALCULATION OF AVERAGE TRAVERSE VELOCITY DURING TEST

BASIS: VELOCITY OF REFERENCE POINT DURING TEST

REF PT.	VEL. HEAD IN H_2O	TEMP. °F	VEL FPS
#2	1.10	617	99.8
	1.05	602	96.8
	1.05	602	96.8
	1.10	602	99.1
		AVG:	98.2

PRE TEST = 100.7

#3	1.70	618	124.1
	1.55	630	119.2
	1.60	640	121.7
	1.50	630	117.3
	2.00	620	134.8
	1.55	630	119.2
	1.65	620	122.4
	1.70	630	124.8
	1.50	630	117.3
		AVG:	122.3

PRE TEST = 117.7

AVG TRAVERSE VEL (TEST) = AVG TRAVERSE VEL (PRE TEST) $\left[\left(\frac{100.7}{98.2}\right)\left(\frac{4}{13}\right)+\left(\frac{117.7}{122.3}\right)\left(\frac{9}{13}\right)\right]$

= 107.3 FPS

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Test No. 86-0036   Date April 10, 1986

Sampling Location Cooper Drum Co - Burnout ~~Box~~ Furnace Afterburner   Sample Train Particulates

TRAVERSE SOURCE TEST DATA

Pre-Test Sample Train Leak Check
0 cfm @ ~10 "Hg Vac   Probe 0 cfm @ ~10 "Hg Vac
(Velocity Leak Check y)

Post- Test Sample Train Leak Check
0 cfm @ ~10 "Hg Vac
(Velocity Leak Check y   Probe tip [illegible] Post test leak check)

On Time	Off Time	Sample Point	Gas Meter Reading (cf)	Calculated: Orifice Δ P ("H_2O)	Calculated: Sampling Rate (cfm)	Calculated: Velocity (fps)	~~Filter~~ Temp. (°F) Ref. Pt	Vel. Head ("H_2O) Ref. Pt.	Stack: Temp (°F)	Stack: Velocity Head ("H_2O) Traverse Average
10:07			544.262				#8			
	+4	1	546.5		0.52	114.5			580	1.50
	+8	2	548.38		0.49	110.9	617	1.10	607	1.37
	+12	3	550.45		0.52	117.7	602	1.05	617	1.53
	+16	4	552.68		0.59	135.2	602	1.05	627	2.00
	+20	5	554.997		0.61	141.2	602	1.10	633	2.17
	10:27					Avg 2-5	603	98.2 Vel		
							#3			
10:32	+24	6	557.0		0.54	119.3	618	1.70	597	1.60
	+28	7	558.86		0.46	102.1	630	1.55	600	1.17
	+32	8	560.71		0.45	100.7	640	1.60	608	1.13
	+36	9	562.84		0.51	115.4	630	1.50	610	1.48
	* +40	10	565.050		0.57	128.3			615	1.82
	10:53									
							#3			
10:55	+44	11	567.6		0.54	116.8	620	2.00	573	1.57
	+48	12	569.09		0.40	87.4	630	1.55	583	0.87
	+52	13	570.46		0.28	60.8	620	1.65	587	0.42
	+56	14	571.76		0.35	77.5	630	1.70	590	0.60
	+60	15	573.460		0.51	114.5	630	1.50	600	1.47
						Avg 6-9, 11-15	628	122.3 Vel		
(Net Volume, Uncorr.)			29.198		(Average)	109.5			602	

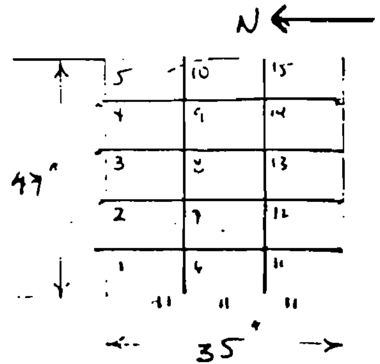
* AT 38 MIN INTO RUN TYGON TUBING AT PROBE END SOFTENED AND PINCHED AND FLOW WAS REDUCED DUE TO RESTRICTION. RUN WAS STOPPED IMMEDIATELY AND 3 INCHES OF DAMAGED TUBING REMOVED, RUN WAS RESUMED

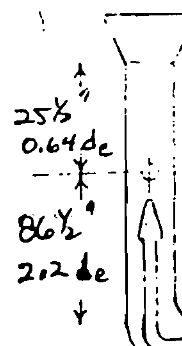
Nozzle Diameter 4.76 mm (3/16 ")   Recorded By W.N.

Barometric Pressure 29.78 "HgA   Pitot Factor 0.835

Static Pressure in Stack .... 29.74 "HgA (+/-) 0.55 "H_2O)

Calibration Data	
Magnehelic No. 10611	(Cal: 3/18/86)
Pitot Tube No. 223	(Cal: 3/5/85)
Potentiometer No. 2-1	(Cal: 7/10/85)
Thermocouple No. 2-1	(Cal: 7/10/85)
Gas Meter No. 351021	(Cal: 10/21/85)





Stack Dimensions

Type Sampling Probe Stainless Steel

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Test No. 86 (illegible) Date April 10, 1986

Sampling Location Copper Drum Co. - Building [illegible] Afterburner

GAS VELOCITY DATA

Pre-Test Velocity Leak Check: Y 6000

Post-Test Velocity Leak Check: Y -6000

T_{AMB} = 66°F

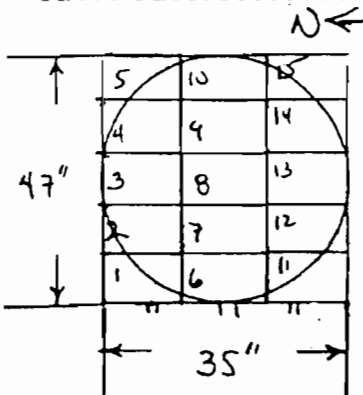
Time	Trav. Point		Vel. Head ("H_2O)	Temp. (°F)	Calc. Vel. (fps)		Vel. Head ("H_2O)	Temp. (°F)	Calc. Vel. (fps)		Vel. Head ("H_2O)	Temp. (°F)	Calc. Vel. (fps)
9:10A	1		1.50	580	114.5		1.50	580	114.5		1.50	580	114.5
	2		1.25	620	106.6		1.35	610	110.2		1.50	590	115.1
	3		1.60	〃	120.6		1.50	620	116.7		1.50	610	116.2
	4		1.90	〃	127.7		2.10	630	138.7		2.00	630	135.7
	5		2.20	625	141.7		2.20	625	141.7		2.10	650	140.0
9:15A	6		1.50	600	115.6		1.65	600	121.3		1.65	590	120.7
	7		1.20	580	102.4		1.10	620	100.0		1.20	600	103.4
	8		1.10	600	99.0		1.20	625	104.6		1.10	〃	99.0
	9		1.40	〃	111.7		1.50	630	117.3		1.55	〃	117.5
	10		1.80	610	127.3		1.90	〃	132.0		1.75	605	125.2
9:25A	11		1.50	580	114.5		1.60	580	118.3		1.60	560	117.2
	12		0.90	590	89.1		0.80	590	84.0		0.90	570	88.3
	13		0.40	〃	59.4		0.45	〃	63.0		0.40	580	59.1
	14		0.65	〃	75.8		0.70	600	79.0		0.70	〃	78.2
	15		1.40	600	111.7		1.55	610	118.1		1.45	590	113.2
	9:30A												
												.602	109.3

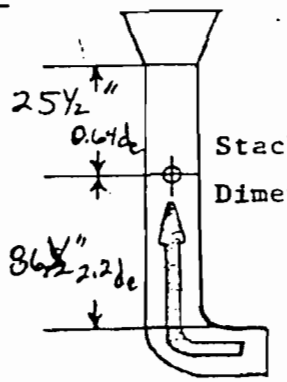
Static Pressure in Stack 29.74 "HgA (+Ø 0.55 "H_2O) (Average)

Barometric Pressure..... 29.78 "HgA Pitot Factor..... 0.835

Recorded By IVAN

Calibration Data		
Magnehelic No. 50606 (16611 0-50)	(Cal:	3/10/86)
Pitot Tube No. 223	(Cal:	3/5/85)
Potentiometer No. 2-1	(Cal:	7/10/85)
Thermocouple No. 2-1	(Cal:	7/10/85)





SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

LABORATORY SERVICES BRANCH
REPORT FOR SOURCE TEST

TO: Arnold Stein, Acting Manager
Source Testing & Monitoring

COMPANY: Cooper Drum Company

EQUIPMENT TESTED: Drum Burn Out Oven
Afterburner

SAMPLE DESCRIPTION: One Particulates Train

LAB REPORT DATE: April 21, 1986

LABORATORY NO. 81006-7

REFERENCE NO. BMC-1-6; FP-14-117

TEST NO. 86-0036

SOURCE TEST DATE: 4-10-86

DATE SAMPLE RECEIVED: 4-10-86

REQUESTED BY: S. Marinoff

ANALYSIS REQUESTED: Particulates & Moisture Gain

SPECIAL INSTRUCTION: HCl, Cl- on H_2O fraction.

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS, AND RESULTS

Particulates by Wet Impingement (Gravimetric (APCD 13-49) and Volumetric):

Total impinger volume, mL	214
Impinger gain, mL	14
Total impinger volume incl. washings, mL	750
Filter residue, mg	7
Silica gel gain, g	9
Organic extraction residue, mg	3
Impinger residue, mg	14
$H_2SO_4 . 2H_2O$ (titration), mg	<1
$H_2SO_4 . 2H_2O$ (precipitation), mg	4
HCl, mg	<1
Cl- (by SIE), mg	10

Approved By: Margil W. Wadley

Margil W. Wadley, Ph.D.
Manager of Laboratory Services

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

LABORATORY SERVICES BRANCH
REPORT FOR SOURCE TEST

TO: Arnold Stein, Acting Manager
Source Testing & Monitoring

COMPANY: Cooper Drum Company

EQUIPMENT TESTED: Drum burn-out oven, A/B

SAMPLE DESCRIPTION: Four NO_x bulbs

ANALYSIS REQUESTED: NO_x as NO_2

SPECIAL INSTRUCTION:

LAB REPORT DATE: April 28, 1986

LABORATORY NO. 81006-8

REFERENCE NO. JM-8-84

TEST NO. 86-036

SOURCE TEST DATE: 4-10-86

DATE SAMPLE RECEIVED: 4-10-86

REQUESTED BY: S. Marinoff

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS, AND RESULTS

NO_x as NO_2 by APCD 12-56:

Bulb	NO_2 (ppm)
AD1	15
AB3	15
AB2	15
AA8	15

Approved By: Margil W. Wadley

Margil W. Wadley, Ph.D.
Manager of Laboratory Services

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Plair Drive, El Monte, California 91731

LABORATORY SERVICES BRANCH
REPORT OF TOTAL COMBUSTION ANALYSIS (TCA) FOR CARBONACEOUS MATTER

TO: Arnold Stein, Acting Manager
Source Testing & Monitoring

Name of Company: Cooper Drum Co.

Equipment Tested: Drum Burnout Oven

Date of Report: April 28, 1986
Test No.: 86-0036
Test Date: 4-10-86
Lab. No. 81006-9
Ref. Book No. TCA 10-14, 231D-110
Requested By: S. Marinoff

Sample Identification Items	Sampling Points					
	STACK		A B		DRAFT	
Nominal Volume-8 Liters:						
Tank Identification	86	87	34	35	20	21
Trap Identification	K2	48	105	M1	62	J4
Tank Pressure, Torr	547	638	015	686	581	726

Breakdown of Sample Items for Analysis:	Results of Analysis of Samples Listed Above as PPM CO_2					
Tank Contents:						
CO_2 actually present[a]	12800	13300	INSUFFICIENT SAMPLE	55340	376	336
CO actually present	*	*		93	*	*
CH_4						
FF (Foreflush)[b]	*	*		*	*	*
Backflush[b]	*	13		*	*	*
Trap Contents[c]	18	31		151	14	63
Total Organic Carbon	18	44		151	14	63
δO_2	18.8	18.8		10.2	21.1	21.1

a) CO_2 present in sample as such. Every other result is expressed as concentration of CO_2 which results from complete oxidation of carbon in each item described.
b) Include all gaseous organic compounds except CH_4.
c) Carbon compounds or carbon-containing materials captured in the dry-ice-cooled trap.
* None detected.

Approved By: Margil W. Wadley
Margil W. Wadley, Ph.D.
Manager of Laboratory Services

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

LABORATORY SERVICES BRANCH

REPORT OF TOTAL COMBUSTION ANALYSIS (TCA) FOR CARBONACEOUS MATTER

TO: Arnold Stein, Acting Manager
Source Testing & Monitoring

Name of Company: Cooper Drum

Equipment Tested: Drum Oven Burnout

Date of Report: April 24, 1986

Test No.: 86-0036

Test Date: 4-10-86

Lab. No. 81006-10

Ref. Book No. TCA 10-16

Requested By: S. Marinoff

Sample Identification Items	Sampling Points					
	O U T L E T					
Nominal Volume-2 Liters:						
Bulb Identification	Tedlar Bag	HF	FD			
Bulb Pressure, Torr	760	700	661			

Breakdown of Sample Items for Analysis:	Results of Analysis of Samples Listed Above as PPM CO_2					
Bulb Contents:						
CO_2 actually present[a]	3320	14400	13000			
CO actually present	*	*	*			
CH_4	*	*	*			
FF (Poreflush)[b]						
Backflush[b]	*	*	*			
Trap Contents[c]						
Total Organic Carbon as CO_2	*	*	*			
	9.1	18.3	18.5			

%N2 29.6

a) CO_2 present in sample as such. Every other result is expressed as concentration of CO_2 which results from complete oxidation of carbon in each item described.

b) Include all gaseous organic compounds except CH_4.

c) Carbon compounds or carbon-containing materials captured in the dry-ice-cooled trap.

* None detected.

Approved By: Margil W. Wadley

Margil W. Wadley, Ph.D.
Manager of Laboratory Services

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, California 91731

LABORATORY SERVICES BRANCH
REPORT FOR SOURCE TEST

TO: Arnold Stein, Acting Manager
Source Testing & Monitoring

COMPANY: Cooper Drum Company

EQUIPMENT TESTED: Drum Burn Out Oven

SAMPLE DESCRIPTION: One each Tedlar Bag

LAB REPORT DATE: April 21, 1986

LABORATORY NO. 81006-5

REFERENCE NO. 67V-20; TCH-23-79

TEST NO. 86-0036

SOURCE TEST DATE: 4-10-86

DATE SAMPLE RECEIVED: 4-10-86

REQUESTED BY: S. Marinoff

ANALYSIS REQUESTED: Vinyl chloride, benzene, toluene, chlorinated hydrocarbons

SPECIAL INSTRUCTION:

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS, AND RESULTS

Vinyl chloride, Aromatics, and chlorinated hydrocarbons by Gas Chromatography (GC with FID, PID, and ECD, respectively).

Concentration in ppb.

UNCORRECTED (WITH RESPECT TO NO DILUENT)

Component	Tedlar Bag
Vinyl Chloride	<2
Methylene Chloride	100
Chloroform	<0.40
1,1,1-Trichloroethane	7.2
Carbon Tetrachloride	0.07
Trichloroethylene	<0.23
Perchloroethylene	2.2
Benzene	<2
Toluene	11

Approved By: Margil W. Wadley

Margil W. Wadley, Ph.D.
Manager of Laboratory Services

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
9150 Plair Drive, El Monte, California 91731

LABORATORY SERVICES BRANCH
REPORT FOR SOURCE TEST

TO: Arnold Stein, Acting Manager
Source Testing & Monitoring

COMPANY: Cooper Drum Company

EQUIPMENT TESTED: Drum Burn Out Oven

SAMPLE DESCRIPTION: Two each 2-L bulbs

LAB REPORT DATE: April 21, 1986

LABORATORY NO. 81046-3

REFERENCE NO. 67V-21; CBC-2-62

TEST NO. 86-0036

SOURCE TEST DATE: 4-10-86

DATE SAMPLE RECEIVED: 4-10-86

REQUESTED BY: S. Marinoff

ANALYSIS REQUESTED: Vinyl chloride, benzene, toluene, chlorinated hydrocarbons

SPECIAL INSTRUCTION:

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS, AND RESULTS

Vinyl chloride, Aromatics, and chlorinated hydrocarbons by Gas Chromatography (GC with PID, PID, and ECD, respectively).

Concentration in ppb.

	Outlet (After Diversion)		
Component	Bulb HF	Bulb FD	Avg.
Vinyl Chloride	<2	<2	<2
Methylene Chloride	580	410	495
Chloroform	<0.55	<0.55	<0.55
1,1,1-Trichloroethane	68	63	66
Carbon Tetrachloride	0.31	0.51	0.41
Trichloroethylene	0.96	1.2	1.1
Perchloroethylene	14	13	14
Benzene	<3	<3	<3
Toluene	51	67	59

Approved By: Margil W. Wadley

Margil W. Wadley, Ph.D.
Manager of Laboratory Services

REPORT

TRUESDAIL LABORATORIES, INC.

CHEMISTS - MICROBIOLOGISTS - ENGINEERS
RESEARCH - DEVELOPMENT - TESTING

14201 FRANKLIN AVEN
TUSTIN, CALIFORNIA 926
AREA CODE 714 • 730-62
AREA CODE 213 • 225-18
CABLE: TRUELA

CLIENT Spencer Boiler & Engineering Co.
P. O. Box 2355
South Gate, CA 90280
Attention: Frank Reed

DATE January 22, 1986

RECEIVED 12-6-85

LABORATORY NO. 05740

SAMPLE

Two exhausts from drum reconditioning incinerator at Rose Cooperage in Montebello

INVESTIGATION

Particulate matter, SO_x, NO_x, Hydrocarbons

RESULTS

On December 9, 1985 representatives of Truesdail Laboratories, Inc. conducted tests to determine the particulate matter, sulfur oxides (SO_x), nitrogen oxides (NO_x), and total hydrocarbon emissions of the two incinerator exhausts serving the drum reconditioning operation at Rose Cooperage in Montebello, California. The incinerator exhaust splits, one part passing through a heat recouperator for the drum furnace, and the other part passing through a waste heat boiler to produce plant steam. Each pathway has a separate exhaust to atmosphere, and both were tested simultaneously.

The particulate matter was determined by collecting a 60-minute isokinetic sample of the flue gas by the wet impingement method. The sampling train consisted of a stainless steel sampling probe connected with Teflon tubing to a set of Greenburg-Smith impingers charged with 200 mls of distilled water and followed by a glass fiber filter, a vacuum pump and a dry gas meter. During the test, three 2-liter grab samples of the flue gas were collected with evacuated glass bulbs containing an NO_x absorbing solution.

The sulfur oxides were determined by collecting a 30-minute sample of the flue gas with a sampling train consisting of a stainless steel sampling probe connected with Teflon tubing to a glass fiber filter maintained at 200°F and followed by a set of Greenburg-Smith impingers charged with 200 mls of 3% hydrogen peroxide solution. The impinger set was followed by a vacuum pump and a dry gas meter.

The total hydrocarbons were determined by collecting concurrent duplicate samples of the flue gas for 30 minutes during the particulate sampling run. The sampling train consisted of stainless steel condensate traps packed in dry ice and connected to evacuated 7-liter aluminum cylinders.

The flue gas flow rate at each sampling location was determined by measuring the average velocity head with an S-type Pitot tube and a Magnehelic differential pressure gage, and by measuring the average temperature with a Chromel-Alumel thermo couple and a micromite potentiometer.

The grab samples were analyzed for carbon dioxide (CO_2) and oxygen (O_2) by Orsat, and the absorbing solutions were analyzed for NO_x by the phenoldisulfonic acid method.

The hydrocarbon sample cylinders were analyzed for volatile hydrocarbons as C_1 by gas chromatography utilizing Tenax adsorption at 0°C to isolate the nonmethane hydrocarbons, followed by desorption at 100°C, combustion-oxidation of the desorbed hydrocarbons to CO_2, and detection of the CO_2 by nondispersive infrared spectrophotometry.

The condensate traps were analyzed for condensable hydrocarbons (as C_1) by volatilization and combustion-oxidation of the trap contents to CO_2 which was collected in an evacuated vessel. Each vessel and sample cylinder was analyzed for carbon monoxide (CO), methane (CH_4), and CO_2 by gas chromatography followed by methanization of the separated components and flame ionization detection of the methane.

The particulate collections were dried at 100°C and desiccated to a constant weight.

The peroxide solutions and extracts of the probe/filter catch were analyzed for sulfur dioxide (SO_2) and total sulfate, as sulfate, by titration with barium chloride solution to a thorin indicator endpoint. The extract was also analyzed for sulfur trioxide (SO_3) as free acid by titration with sodium hydroxide solution to a methyl orange endpoint. The free acid value was subtracted from the total sulfate value and the difference reported as neutral sulfate.

The results were as follows:

ROSE COOPERAGE
12-9-85

Flue Gas:	Main Exhaust	Bypass Exhaust
Temperature, °F	455	247
Static Pressure, in. H_2O	-1.05	-0.10
Velocity, ft/sec	85.1	26.3
Flue Diameter, in.	19.5	19.5
Flue Area, Sq. Ft.	2.07	2.07
Flow Rate, ACFM	10,570	3270
,SCFM	5,940	2390
,DSCFM	5,210	2290
Moisture, % by vol.	12.4	3.9
Particulate Matter	(13:26-14:26)	(13:27-14:27)
Collection, grams		
Impingers	0.0182	0.0216
Filter	0.0040	0.0009
Total	0.0222	0.0225
Sample volume, DSCF	28.52	43.68
Concentration, grains/DSCF	0.0120	0.0079
Emissions, lbs/hr	0.54	0.16
Sulfur Oxides	(12:29-12:59)	(12:13-12:43)
Sample Volume, DSCF	17.30	18.00
Sulfur Dioxide (SO_2), ppm	4	< 1
Sulfur Trioxide (SO_3), ppm	2	< 1
Neutral Sulfate (SO_4), ppm	3	2
Total, ppm	9	2

Grab Samples - Main Stack

Time	CO_2,%	O_2,%	NO_x,ppm
13:42	4.0	13.9	57
13:52	5.2	12.1	73
14:02	3.9	13.8	60
14:12	5.2	12.0	73
Average	4.6	13.0	66
Emission Rate:			2.5 lbs/hr NO_2

Grab Samples - Bypass Stack

Time	CO_2,%	O_2,%	NO_x,ppm
13:30	1.4	18.6	25
13:45	1.4	18.6	31
14:00	1.4	18.6	26
Average	1.4	18.6	27
Emission rate:			0.46 lbs/hr NO_2

Main Stack (13:30-14:00)

Hydrocarbon Samples	Concentration, ppm (as C_1) A 44563	B 44033	AVG. 44298	Emission Rate (Organic Carbon) lbs/hour
Carbon Dioxide (CO_2)				
Carbon Monoxide (CO)	< 1	< 1		
Methane (CH_4)	1	< 1		
Hydrocarbons (as C_1)				
Gaseous	32	19		
Condensable	15	18		
Total Hydrocarbons w/o CH_4	47	37	42	0.42

Bypass Stack (13:30-14:00)

Hydrocarbon Samples	Concentration, ppm (as C_1) A	B	AVG.	Emission Rate (Organic Carbon) lbs/hour
Carbon Dioxide (CO_2)	13212	13185	13199	
Carbon Monoxide (CO)	<1	<1		
Methane (CH_4)	1	1		
Hydrocarbons (as C_1)				
Gaseous	14	12		
Condensable	5	16		
Total Hydrocarbons w/o CH_4	19	28	24	0.10

Respectfully submitted,

TRUESDAIL LABORATORIES, INC.

S. Hugh Brown

S. Hugh Brown, Supervisor
Air Pollution Testing

APPENDIX

Sampling Location: Rose

Static Pressure, Ps:

Test No.: Main Stack

Barometric Pressure:

Point	Vel. Head H_2O"	Temp. °F	Velocity ft/sec	Point	Vel. Head H_2O"	Temp. °F	Velocity ft/sec	Point	Vel. Head H_2O"	Temp. °F	V c ft
1	1.05	394	73.36	1	0.9	420	68.94				
	1.4	456	87.73		1.2	454	81.13				
	1.55	463	92.66		1.30	463	84.86				
	1.5	465	91.25		1.4	466	88.21				
	1.35	465	86.57		1.4	466	88.21				
	1.05	465	86.57		1.45	466	89.77				
	1.25	463	83.21		1.5	465	91.25				
	0.75	452	71.07	8	1.2	457	81.27				

Eliminated

A. AVERAGE VELOCITY (TRAVERSE) ft/sec 83.69

B. REFERENCE POINT VELOCITY (TRAVERSE) ft/sec _____

C. AVERAGE VELOCITY (REFERENCE PT.) ft/sec _____

D. FLUE FACTOR C/B _____

E. PITOT TUBE CORRECTION FACTOR #26 .84

F. GAS DENSITY CORRECTION FACTOR 1.017

G. CORRECTED VELOCITY, AxExF, ft/sec 85.11
or, AxDxExF, ft/sec _____

H. AREA OF FLUE, SQ. FT. 1.07

J. AVERAGE FLUE TEMPERATURE, °F 455

K. FLOW RATE, G x H x 60, CFM 10,571

L. FLOW RATE, K x $\frac{520}{460 + J}$ x $\frac{BP + Ps/13.6}{29.9}$, SCFM 5944

M. FLOW RATE, L x MOISTURE CORR., DSCFM 5207

0.876

19.5

Spencer Boiler

BEST AVAILABLE COPY

Sampling Location: Main West Stack

Barometric Pressure: 29.66

Test No. Party

Nozzle Diameter: 3/16

Time	Gas Meter: Reading cu.ft. V_m	Gas Meter: Press. "H_2O P_m	Gas Meter: Temp. °F T_m	Impinger Temp °F T_i	Sample Point	.51 CFM			
1:26	575.40	0.255	73	45					
1:31	77.90	0.255	73	45					
1:36	80.40	0.255	75	50					
1:41	82.90	0.255	76	49					
1:46	85.40	0.255	77	48					
1:51	87.96	0.255	78	49				NOx	15
1:56	90.43	0.255	80	50					
2:01	92.93	0.255	82	50				Flask#	Time
2:06	95.44	0.255	83	51				1483	1:42
2:11	97.94	0.255	83	50				505	1:52
2:16	600.45	0.255	81	50				518	2:02
2:21	602.95	0.255	80	49				514	2:12
2:26	605.46	0.255	77	46					
	30.06	0.255	78	49					

AQMD Meter *009

18 in in. ϕ_c

K = .7124 .7217

1.4 vH 460

65 Tm

Weight Collected, grams

B.L./Filter tare 0.0971

A. Total Weight 0.0222

B. Condensate Volume, ml. 80

C. Condensate Vapor Volume, $0.00267 \times \frac{460 + T_m}{B.P. + P_m/13.6} \times B$, cu. ft. 3.67

D. Total Sample Volume, $V_m + C$, cu. ft. 33.93

E. Sample Volume, $D \times \frac{520}{460 + T_m} \times \frac{B.P. + P_m/13.6}{29.9} \times$ Moisture corr., DSCF 0.876 30.52

F. Concentration, 15.43 x A/E, grains/DSCF 0.0120

G. Stack Gas Flow Rate, DSCFM 5307

H. Emissions, 60 x G x F/7000, lbs/hr 0.536

Sampling Station [illegible] Date [illegible]

WATER VAPOR AND GAS DENSITY CALCULATIONS

Percent Water Vapor in Gases

A. Gas pressure at meter, In. Hg. (Absolute) 27.68

B. Vapor pressure of water at impinger temp., In. Hg. 0.3493

C. Volume of metered gas, Cu. Ft. 30.06

D. Volume of water vapor metered, B X C/A, Cu. Ft. 0.35

E. Volume of water vapor condensed, Cu. Ft. 3.87

F. Total volume of water vapor in gas sample, D+E, Cu. Ft. 4.22

G. Total volume of gas sample, C+E, Cu. Ft. 33.93

H. Percent water vapor in sampled gas, 100 X F/G 12.4

Gas Density Correction Factor

Component	Volume Percent/100	x Moisture Correction	x Mol. Wt.	= Wt./Mole Wet Basis
Water	0.124	1.0	18.0	2.232
Carbon Dioxide	.046 Dry Basis	0.876	44.0	1.773
Carbon Monoxide	Dry Basis	↓	28.0	
Oxygen	.130 Dry Basis	↓	32.0	3.644
Nitrogen & Inerts	.824 Dry Basis	↓	28.2	20.355
			Average Molecular Weight	28.00

J. Density of gas referred to air = $\frac{\text{Av. Mol. Wt.}}{28.95}$ = .9673

K. Gas density correction factor = $\sqrt{\frac{1.00}{J}}$ = 1.017

Test No.: Bypass Stack

Barometric Pressure: 2

	Point	Vel. Head H_2O"	Temp. °F	Velocity ft/sec	Point	Vel. Head H_2O"	Temp. °F	Velocity ft/sec	Point	Vel. Head H_2O"	Temp. °F	Velocity ft/sec
3.4	1	.20	184	17.77	1	.14	232	24.08				
4.8	2	.24	237	31.65		.14	241	24.24				
6.3	3	.19	255	28.52		.12	250	22.59				
9	4	.16	256	26.19		.12	257	22.63				
16	5	.14	256	24.50		.14	257	24.52				
18.5	6	.15	255	25.34		.17	259	27.05				
20.2	7	.28	255	27.76		.20	259	29.34				
21.6	8	.15	253	25.31		.18	251	27.68				

A. AVERAGE VELOCITY (TRAVERSE) ft/sec (Excluded) 26.20

B. REFERENCE POINT VELOCITY (TRAVERSE) ft/sec _____

C. AVERAGE VELOCITY (REFERENCE PT.) ft/sec _____

D. FLUE FACTOR C/B _____

E. PITOT TUBE CORRECTION FACTOR 0.84

F. GAS DENSITY CORRECTION FACTOR 1.005

G. CORRECTED VELOCITY, AxExF, ft/sec 26.33
or, AxDxExF, ft/sec _____

H. AREA OF FLUE, SQ. FT. 2.07

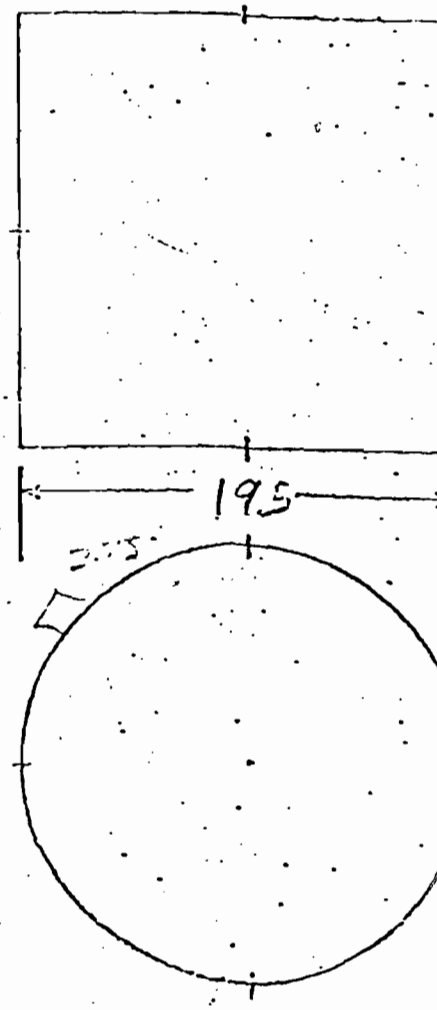
J. AVERAGE FLUE TEMPERATURE, °F 247

K. FLOW RATE, G x H x 60, CFM 3270

L. FLOW RATE, $K \times \frac{520}{460 + J} \times \frac{BP + Ps/13.6}{29.9}$, SCFM 2385

M. FLOW RATE, L x MOISTURE CORR., DSCFM 2292

0.96



TRUESDAIL LABORATORIES, INC.

Date: 12-9-8

Sampling Location: Rose

Barometric Pressure: 29.60

Test No. ROSE Bypass Part 1

Nozzle Diameter: .375

	Time	Gas Meter: Reading cu.ft. V_m	Gas Meter: Press. "H_2O P_m	Gas Meter: Temp. °F T_m	Impinger Temp °F T_i	Sample Point	.74 CFM			
0	1:27	857.45	.56	74						
5	1:32	41.50	.56	75	48					
10	1:39	45.36	.56	77	47		.75			
15	1:42	49.21	.56	79	48					
20	1:47	53.08	.57	82	49					
30	1:57	60.84	.57	84	48					
41	2:08	69.36	.57	84	48					
50	2:17	76.36	.56	87	47					
60	2:27	883.79	.55	85	46					
									Time	Actual
								NOx	1:32	513
									1:45	1193
									2:00	1309
								TCA	Start	1:30
		46.34	.56	81	48				End	2:20

VH .14 256
.7146 .1001

Weight Collected, grams

Tare .0994

A. Total Weight 0.0225

B. Condensate Volume, ml. 28

C. Condensate Vapor Volume, $0.00267 \times \frac{460 + T_m}{B.P. + P_m/13.6} \times B$, cu. ft. 1.32

(T_m = 541)

D. Total Sample Volume, $V_m + C$, cu. ft. 47.7

E. Sample Volume, $D \times \frac{520}{460 + T_m} \times \frac{B.P. + P_m/13.6}{29.9} \times$ Moisture corr., DSCF 43.69

(T_m = 541; Moisture corr. = 0.961)

F. Concentration, 15.43 x A/E, grains/DSCF 0.0079

G. Stack Gas Flow Rate, DSCFM 2292

H. Emissions, 60 x G x F/7000, lbs/hr 0.155

Sampling Station [illegible] ROSE By Pass Date 10-9-85

WATER VAPOR AND GAS DENSITY CALCULATIONS

Percent Water Vapor in Gases

A. Gas pressure at meter, In. Hg. (Absolute) 27.70

B. Vapor pressure of water at impinger temp., In. Hg. [illegible]

C. Volume of metered gas, Cu. Ft. 45.34

D. Volume of water vapor metered, B X C/A, Cu. Ft. 0.52

E. Volume of water vapor condensed, Cu. Ft. 1.36

F. Total volume of water vapor in gas sample, D+E, Cu. Ft. 1.88

G. Total volume of gas sample, C+E, Cu. Ft. 47.70

H. Percent water vapor in sampled gas, 100 X F/G 3.9

Gas Density Correction Factor

Component	Volume Percent/100	x Moisture Correction	x Mol. Wt.	= Wt./Mole Wet Basis
Water	0.039	1.0	18.0	0.702
Carbon Dioxide	.014 Dry Basis	0.961	44.0	0.592
Carbon Monoxide	Dry Basis —	↓	28.0	—
Oxygen	.186 Dry Basis	↓	32.0	5.720
Nitrogen & Inerts	.800 Dry Basis	↓	28.2	21.68
			Average Molecular Weight	28.69

J. Density of gas referred to air = $\frac{\text{Av. Mol. Wt.}}{28.95}$ = .9912

K. Gas density correction factor = $\sqrt{\frac{1.00}{J}}$ = 1.005

#2500 pd
10-2-90
Rec'pt #151141

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form #
Form Title
Effective Date
DER Application No. (Filled in by DER)

AC 53-187548

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Drum painting operation [ ] New[1] [XX] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Lakeland Drum Service COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime 4 paint booths, two wheelabrator and an ABCO Boiler.
Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Natural gas fired.

SOURCE LOCATION: Street 206 Neptune Road City Auburndale, 33823

UTM: East 17-418-78 km North 3103.58 km

Latitude 28 ° 3 ' 23.8 "N Longitude 81 ° 49 ' 35.4"W

APPLICANT NAME AND TITLE: Randy Guy, President

APPLICANT ADDRESS: 206 Neptune Road, Auburndale, FL 33823

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Lakeland Drum Services

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed:

Randy Guy, President
Name and Title (Please Type)

Date: 9-20-90 Telephone No. (813)967-3388

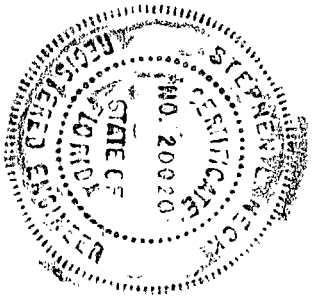
B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

Northwest District 160 Governmental Center Pensacola, Florida 32501-5794 904-436-8300
Northeast District 3426 Bills Rd. Jacksonville, Florida 32207 904-798-4200
Central District 3319 Maguire Blvd. Suite 232 Orlando, Florida 32803-3767 407-894-7555
Southwest District 4520 Oak Fair Blvd. Tampa, Florida 33610-7347 813-623-5561
South District 2269 Bay St. Fort Myers, Florida 33901-2896 813-332-2867
Southeast District 1900 S. Congress Ave., Suite A West Palm Beach, Florida 33406 407-964-9668

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed Stephen L. Neck

Stephen L. Neck, P.E.
Name (Please Type)

Air Consulting and Engineering, Inc.
Company Name (Please Type)

2106 NW 67th Pl., Ste. 4, Gainesville, FL 32606
Mailing Address (Please Type)

Florida Registration No. 20020 Date: 8/27/90 Telephone No. (904)335-1889

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

To permit an existing metal drum refinishing operation which includes two automated paint spray booths, two lid spray booths, one dip tank, two wheelabrator shot blast machines and one ABCO boiler. This project will result in full compliance with 17-2 F.A.C.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction existing Completion of Construction existing

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Baghouse = $10,000 each

Automated Paint Booths = $150,000 each

Lid Paint Booths = $2,000 each

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

N/A

E. Requested permitted equipment operating time: hrs/day 8 ; days/wk 6 ; wks/yr 52 ;

if power plant, hrs/yr_____; if seasonal, describe:_____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? NO

   a. If yes, has "offset" been applied? N/A

   b. If yes, has "Lowest Achievable Emission Rate" been applied? N/A

   c. If yes, list non-attainment pollutants. N/A

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. NO

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. NO

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? NO

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants? N/A

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Aluminum enamel	Particulate	N/A	8.83	A
	VOC	68.9		
Red Drum Liner Paint	Particulate	43.8	78.8	B
	VOC	56.2		
Drum Enamel	Particulate	41.6	96.5	C
Thinner Lacquer thinner	VOC	100	3.35	D
Clean-up Solvent Lacquer Thinner	VOC	100	3.35	E

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (~~lbs/hr~~): 325 drums, lids and rings per hour

2. Product Weight (~~lbs/hr~~): 325 drums, lids and rings per hour

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulates	1.60	1.93	610(2)(a)	20% opacity	1.60	1.93	F
VOC	110	138	620(1)&(2)	110	110	138	G
NOx	0.84	1.05		0.84	0.84	1.05	
SO2	0.005	0.006		0.005	0.005	0.006	
CO	0.17	0.21		0.17	0.17	0.21	

[1]See Section V, Item 2. See Emission Summary Table in Supplement 2 and 3

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) See Supplement 4 & 5 for Details.

	Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
1)	Chemco Paint Filters	Particulate	98.0	N/A	Manufacturer
2)	Wheelabrator #45 Baghouse	Particulate	99.5	1 micron	Manufacturer
3)	Wheelabrator #65 Baghouse	Particulate	99.5	1 micron	Manufacturer

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas	0.0034	0.0084	8.8

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum N/A

G. Indicate liquid or solid wastes generated and method of disposal.

Hazardous solvents are recycled by Laidlaw Environmental Services. Waste paints are disposed of in accordance with 40 CFR Part 261. All drums accepted for reconditioning are "empty" in accordance with the EPA definition of "empty".

Automated Paint Booth 1

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 24 ft. Stack Diameter: 2 ft.

Gas Flow Rate: 13,000 ACFM 12,480 DSCFM Gas Exit Temperature: Ambient 85 °F.

Water Vapor Content: Ambient ≈ 1 % Velocity: 69 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

Automated Paint Booth No. 2

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 24 ft. Stack Diameter: 2 ft.

Gas Flow Rate: 13,000 ACFM 12,480 DSCFM Gas Exit Temperature: Ambient, 85 °F.

Water Vapor Content: Ambient 1 % Velocity: 69 FPS

Wheelabrator Baghouse from Drum Blast - Baghouse #65

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 15 ft. Stack Diameter: 1.0 ft.

Gas Flow Rate: 5,640 ACFM 5,414 DSCFM Gas Exit Temperature: Ambient, 85 °F.

Water Vapor Content: Ambient 1 % Velocity: 30 FPS

Wheelabrator Baghouse from Lid Blast - Baghouse #45

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 15 ft. Stack Diameter: 0.75 ft.

Gas Flow Rate: 3,760 ACFM 3,610 DSCFM Gas Exit Temperature: Ambient, 85 °F.

Water Vapor Content: Ambient 1 % Velocity: 35 FPS

Lid Paint Booth No. 1

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 18 ft. Stack Diameter: 2 ft.

Gas Flow Rate: 11,500 ACFM 11,000 DSCFM Gas Exit Temperature: Ambient 85 °F.

Water Vapor Content: Ambient 1 % Velocity: 61 FPS

Lid Paint Booth No. 2

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 18 ft. Stack Diameter: 2 ft.

Gas Flow Rate: 11,500 ACFM 11,000 DSCFM Gas Exit Temperature: Ambient, 85 °F.

Water Vapor Content: Ambient 1 % Velocity: 61 FPS

BEST AVAILABLE COPY

ABCO Boiler Stack

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 18 ft. Stack Diameter: 0.83 ft.

Gas Flow Rate: 2000 ACFM 1203 DSCFM Gas Exit Temperature: 400 °F.

Water Vapor Content: 2 % Velocity: 62 FPS

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ________ ft. Stack Diameter: ________ ft.

Gas Flow Rate: ________ ACFM ________ DSCFM Gas Exit Temperature: ________ °F.

Water Vapor Content: ________ % Velocity: ________ FPS

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ________ ft. Stack Diameter: ________ ft.

Gas Flow Rate: ________ ACFM ________ DSCFM Gas Exit Temperature: ________ °F.

Water Vapor Content: ________ % Velocity: ________ FPS

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: ________ ft. Stack Diameter: ________ ft.

Gas Flow Rate: ________ ACFM ________ DSCFM Gas Exit Temperature: ________ °F.

Water Vapor Content: ________ % Velocity: ________ FPS

I. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

tack Height: ________ ft. Stack Diameter: ________ ft.

as Flow Rate: ________ ACFM ________ DSCFM Gas Exit Temperature: ________ °F.

ater Vapor Content: ________ % Velocity: ________ FPS

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

_____

_____

_____

_____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/____/____ to _____/____/____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

SOURCE DESCRIPTION

Lakeland Drum Services is an existing metal drum refinishing facility located in Auburndale, Florida. This facility operates several sources of air pollution which are listed as follows:

1. Automated paint spray booth Number 1 used for open head drums.

2. Automated paint spray booth Number 2 used for closed head drums.

3. Two paint spray booths for drum lids.

4. Metal ring dip tank.

5. Wheelabrator shotblast machine (for drums) with baghouse.

6. Wheelabrator shotblast machine (for lids) with baghouse.

7. ABCO 200 HP Boiler, 8.8 mm BTU/hour maximum heat input.

Each source is described below.

Used empty drums are currently processed off-site in a drum furnace. These clean drums are then processed on-site in a wheelabrator shotblast machine and dust is controlled by a baghouse.

After the blasting process, the drums are painted in one of two automated "Binks" paint spray booths and air dried. Overspray is controlled by paint arrestor filters.

Drum lids are similarly processed in a shotblast machine. Dust is controlled by a wheelabrator baghouse. Clean lids are painted in one of two paint spray booths equipped with paint arrestor filters.

These lids are air dried.

Drums rings are painted by dipping them in a dip tank then air dried. There is no stack associated with this dip tank.

A small 200 H.P. natural gas fired ABCO boiler is operated at this facility for steam and hot water production.

SUPPLEMENTAL REQUIREMENTS

SUPPLEMENT 1:
Process input rate is based on historical raw material usage data and is as follows (see Appendix A for MSDS and spec sheets on paints).

Total Paint Usage = 60,000 gal/yr
5% for ring dip (Aluminum Enamel)
40% for drum liner (Red Drum Liner)
55% for drum exteriors (Drum Enamel)

Therefore:

Aluminum Enamel for Ring Dip Process
(60,000 gal/yr)(0.05) = 3,000 gal/yr
(3,000 gal/yr)(1 yr/2,496 hrs/yr) = 1.2 gal/hr

Note: Yearly usage rates represent the most accurate paint consumption data. Hourly rates have been estimated based on the yearly operating schedule and for completing this application.

(1.2 gal/hr)(7.36 lbs/gal) = 8.832 lbs/hr

Red Drum Liner

(60,000 gal/yr)(0.4) = 24,000 gal/yr

(24,000 gal/yr)(1 yr/2,496 hrs) = 9.6 gal/hr

(9.6 gal/hr)(8.2 lbs/gal) = 78.8 lbs/hr

Drum Enamel

(60,000 gal/yr)(0.55) = 33,000 gal/yr

(33,000 gal/yr)(1 yr/2,496 hrs) = 13.2 gal/hr

(13.2 gal/hr)(7.3 lbs/gal) = 96.5 lbs/hr

Thinner - Lacquer Thinner (used in dip tank)

(1,320 gal/yr)(1 yr/2,496 hrs) = 0.53 gal/hr

(0.53 gal/hr)(6.66 lbs/gal) = 3.53 lbs/hr

Cleaner Solvent - Lacquer Thinner

(1,320 gal/yr)(1 yr/2,496) = 0.53 gal/hr

(0.53 gal/hr)(6.66 lbs/gal) = 3.53 lbs/hr

Total drum refinishing is rated as follows:

325 drums/hr, 325 lids/hr and 325 rings/hr
This production rate is applicable to both the shotblast and painting operations.

ABCO Boiler natural gas consumption is 8.8 mm BTU/hr or

(8,800,000 BTU/hr)(1 ft^3/1052 BTU) = 8,365 Ft^3/hr natural gas consumption (maximum)

Actual consumption is estimated at 40% of maximum.

SUPPLEMENT 2 AND 3:

For the purpose of estimating emissions from each paint booth, the quantity of drum enamel and red drum liner paint is divided evenly

between the two automated booths and the two lid booths. Approximately 85% of the paint is used for the drum and 15% for the lids. Therefore:

Drum Enamel

(96.5 lbs/hr)(0.85)(1/2 Automated Booths) = 41.0 lbs/hr per Automated Booth

(96.5 lbs/hr)(0.15) = 14.5 lbs/hr for one lid booth

Red Drum Liner

(78.8 lbs/hr)(0.85)(1/2 automated booths) = 33.5 lbs/hr per Automated Booth

(78.8 lbs/hr)(0.15) = 11.8 lbs/hr for one lid booth

Note: One lid booth sprays drum enamel while the second booth sprays red drum liner paint.

Overspray factors are based on "Modern Pollution Control Technology" Volume 1, 1978 Table 232 (see Appendix B). The method of spraying used is airless and automated, resulting in reduced overspray. Table 232 references an overspray factor of 20% for flat surfaces and is reasonable for this operation.

All 4 paint spray booths are designed to achieve a filter face velocity of 125 FPM. Particulate removal efficiency is based on the manufacturers specification of 98% (see Appendix C) for the "Chemco Overspray Collector Pads".

VOC emissions are based on the solvent content of the paints used. VOC data sheets and MSDS are presented in Appendix A.

Source: Automated Paint Booth Number 1

Particulates - Drum Enamel = 41.6% by wt. solids

(41.0 lbs/hr)(0.416)(0.2)(1-0.98) = 0.07 lbs/hr Particulates

(0.07 lbs/hr)(2,496 hr/yr)(1 ton/2,000 lbs) = 0.09 TPY

VOC - Drum Enamel = 58.4% by wt. VOC

(41.0 lbs/hr)(0.584) = 23.94 lbs VOC/hr

(23.94 lbs VOC/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 29.88 TPY VOC

Particulates - Red Drum Liner = 43.8% solids

(33.5 lbs/hr)(0.438)(0.2)(1-0.98) = 0.06 lbs/hr Particulates

(0.06 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.07 TPY Particulates

VOC - Red Drum Liner = 56.2% VOC

(33.5 lbs/hr)(0.562) = 18.83 lbs VOC/hr

(18.83 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 23.50 TPY VOC

SOURCE: Automated Paint Booth Number 2
(Emissions Same as Booth Number 1)

Particulates - Drum Enamel

0.07 lbs/hr or 0.09 TPY Particulates

VOC - Drum Enamel

23.94 lbs/hr or 29.88 TPY VOC

Particulates - Red Drum Liner

0.06 lbs/hr or 0.07 TPY Particulates

VOC - Red Drum Liner

18.83 lbs/hr or 23.5 TPY VOC

Source: Drum Lid Paint Booth Number 1
Particulate - Drum Enamel

(14.5 lbs/hr)(0.416)(0.2)(1-0.98) = 0.024 lbs/hr Particulates

(0.024 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.030 TPY Particulates

VOC - Drum Enamel

(14.5 lbs/hr)(0.584) = 8.47 lbs VOC/hr

(8.47 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 10.57 TPY VOC

Source: Drum Lid Paint Booth Number 2

Particulates - Red Drum Liner

(11.8 lbs/hr)(0.438)(0.2)(1-0.98) = 0.02 lbs/hr Particulates

(0.02 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.026 TPY Particulates

VOC - Red Drum Liner

(11.8 lbs/hr)(0.562) = 6.63 lbs VOC/hr

(6.63 lbs VOC/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 8.28 TPY VOC

Source: Ring Dip

Particulates - not applicable - no spraying - dip only

VOC - Aluminum Enamel = 68.9% VOC

(8.832 lbs/hr)(0.689) = 6.09 lbs VOC/hr

(6.09 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 7.60 TPY VOC

Thinner = Lacquer Thinner 100% VOC

Used to thin Aluminum Enamel in Dip Tank

(3.53 lbs/hr VOC)(2,496 hrs/yr)(1 ton/2,000 lbs) = 4.4 Tons/yr

Clean-up Solvents = Lacquer Thinner

Used for paint clean-up; spent solvent is collected in drums and recycled by Laidlaw Environmental Services. Evaporation of clean-up solvents is accounted for in the total thinner used (above) in the aluminum enamel dip tank.

Source: Wheelabrator Shotblast Machine (for drums) with Baghouse. Specific emission factors for this operation are not available. However, the manufacturer's design criteria are included in Appendix D. Wheelabrator and Equipment Corp. uses

a grain loading of 4 grains/ft^3 at the inlet of the baghouse with a discharge of 0.015 grains/ft^3. Overall control efficiency is estimated at 99.5%. Details of the baghouse is described in Supplement 5 and Appendix D.

The baghouse for this shotblast machine is collector number 65 having 5,640 CFM of air flow. Therefore emissions are estimated as follows and is based on the manufacturers design criteria:

Particulate Emissions after Controls

(0.015 grains/ft^3)(5,640 ft^3/min)(60 min/hr) = 5,076 grains/hr

(5,076 grains/hr)(1 lb/7,000 grains) = 0.725 lbs/hr

(0.725 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.90 TPY Particulates

Source: Wheelabrator Shotblast Machine (for lids) with Baghouse (Model 45)

Emissions are estimated in the same manner as above, using manufacturers design criterion.

Particulate Emissions After Controls

(0.015 grains/ft^3)(3,760 ft^3/min)(60 min/hr) = 3,384 grains/hr

(3,384 grains/hr)(1 lb/7,000 grains) = 0.48 lbs/hr

(0.48 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.60 TPY Particulates

Source: ABCO Boiler 200 H.P.

Natural gas fired at 6.9 MM BTU/hr output and 8.8 MM BTU/hr maximum heat input (see Appendix E for specifications) or 8,365 ft^3/hr maximum natural gas consumption. Emissions are based on AP-42 Table 1.4-1 "Uncontrolled Emissions Factors for Natural Gas Consumption", Domestic and Commercial boilers.

Particulates

(5 lbs/MMCF)(0.0084 MMCF/hr) = 0.042 lbs/hr

(0.042 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.052 TPY

SO_2

(0.6 lbs/MMCF)(0.0084 MMCF/hr) = 0.005 lbs/hr

(0.005 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = .006 TPY

NO_x

(100 lbs/MMCF)(0.0084 MMCF/hr) = 0.84 lbs/hr

(0.84 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 1.05 TPY

CO

(20 lbs/MMCF)(0.0084 MMCF/hr) = 0.168 lbs/hr

(0.168 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.21 TPY

VOC (non-methane)

(5.3 lbs/MMCF)(0.0084 MMCF/hr) = 0.045 lbs/hr

(0.045 lbs/hr)(2,496 hrs/yr)(1 ton/2,000 lbs) = 0.056 TPY

PARTICULATE EMISSION SUMMARY TABLE

Source	lbs/hr	Tons/yr	Allowable	Per 17-2
Automated Paint Booth No. 1	0.13	0.16	20% opacity	610(2)(a)
Automated Paint Booth No. 2	0.13	0.16	20% opacity	610(2)(a)
Lid Paint Booth No. 1	0.024	0.030	20% opacity	610(2)(a)
Lid Paint Booth No. 2	0.02	0.026	20% opacity	610(2)(a)
Wheelabrator for Drums	0.725	0.90	20% opacity	610(2)(a)
Wheelabrator for Lids	0.48	0.60	20% opacity	610(2)(a)
Boiler	0.042	0.052	20% opacity	600(6)(a)
Total	1.551	1.928		

VOC EMISSION SUMMARY TABLE

Source	lbs/hr	Tons/yr	Allowable	Per 17-2
Automated Paint Booth No. 1	42.77	53.38	53.38	620 (1)&(2)
Automated Paint Booth No. 2	42.77	53.38	53.38	620 (1)&(2)
Lid Paint Booth No. 1	8.47	10.57	10.57	620 (1)&(2)
Lid Paint Booth No. 2	6.63	8.28	8.28	620 (1)&(2)
Ring Dip	6.09	7.60	7.60	620 (1)&(2)
Thinner	3.53	4.4	4.4	620 (1)&(2)
Boiler	0.045	0.056	0.056	600 (6) (a)
Total	110.305	137.666	137.666	

SUPPLEMENT 4 & 5:

Source: Automated Paint Booth Number 1
Automated Paint Booth Number 2
Lid Paint Booth Number 1
Lid Paint Booth Number 2

Chemco Paint overspray collector pads are used to control particulate emissions from the above referenced paint spray booths. Manufacturer's specifications are included in Appendix C and estimate 98% control efficiency of all paint particulates.

Source: Metal ring dip tank-no controls.

Source: Wheelabrator shotblast machine (for drums) with baghouse.

This shotblast machine is equipped with a wheelabrator baghouse Model 65. Design specifications and cross-sectional drawings of a typical model are included in Appendix D and are as follows:

Collector Number	= 65
Inside Length	= 6.0 ft.
Cloth Area	= 1,410 ft^3
Air Flow	= 5,640 ACFM
Air/Cloth Ratio	= 4:1
Number of Tubes	= 144
Collection Efficiency	= 99.5% overall to 1 microns
Serial Number	= Not available

Source: Wheelabrator Shotblast Machine (for lids) with Baghouse

This shotblast machine is equipped with a wheelabrator baghouse Model 45. Design specifications and cross-sectional drawings of a typical model are included in Appendix D and are as follows:

Collector No.	= 45
Inside Length	= 4.0 ft
Cloth Area	= 940
Air Flow	= 3,760 ACFM
Air Cloth Ratio	= 4:1
Number of Tubes	= 96
Collection Efficiency	= 99.5% overall to 1 micron
Serial Number	= Not available

Source: ABCO 200 H.P. Boiler
No pollution control - uses natural gas as fuel

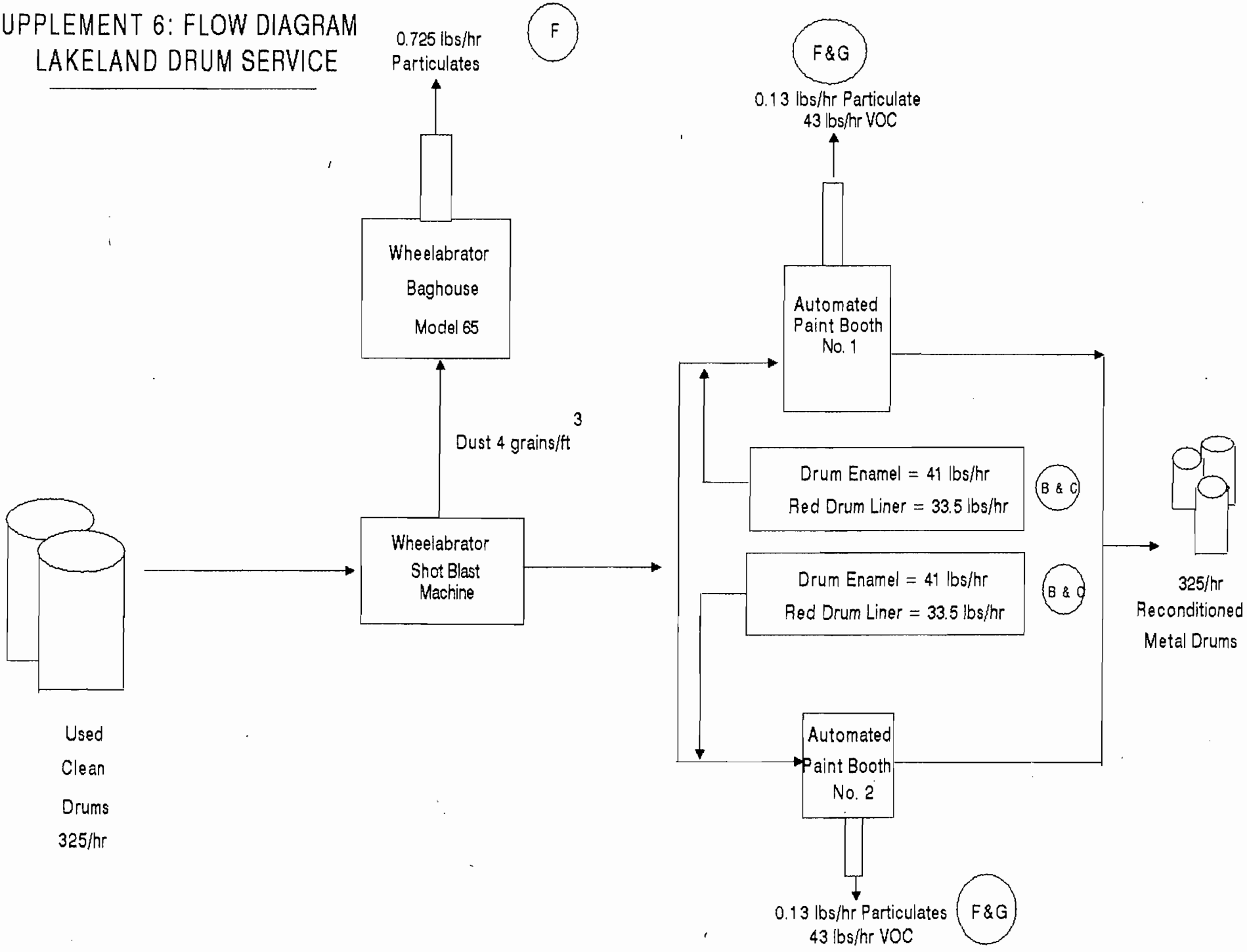
SUPPLEMENT 6, 7, AND 8: Attached

SUPPLEMENT 9: Application Fee

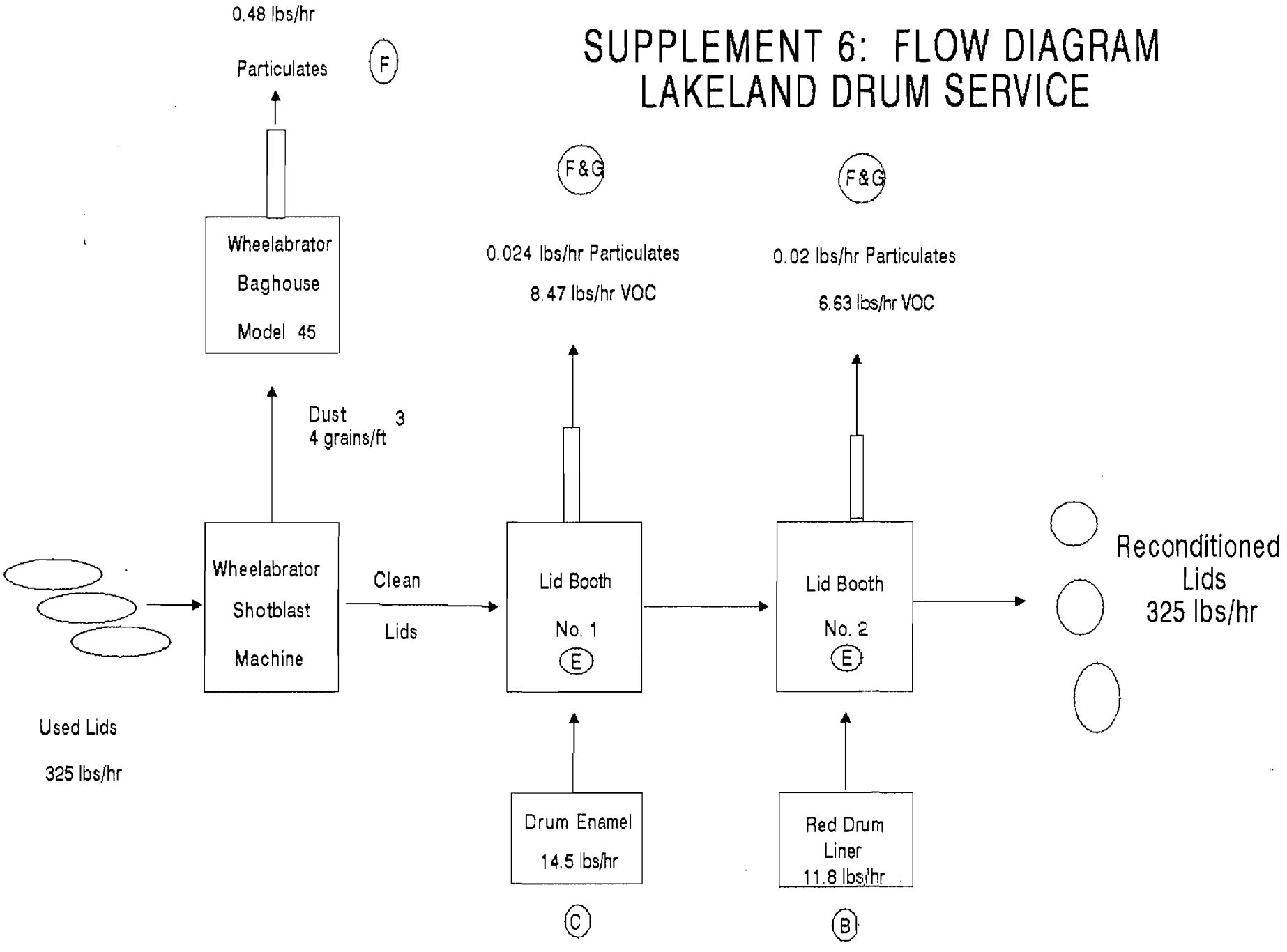
The drum cleaning and painting operation (wheelabrator, paint spray booths and the dip tank) are considered a "source" under 17-2.100 (189). Therefore, the application fee is $2,500.00

LDRUM3/AIRSTUDY/082290

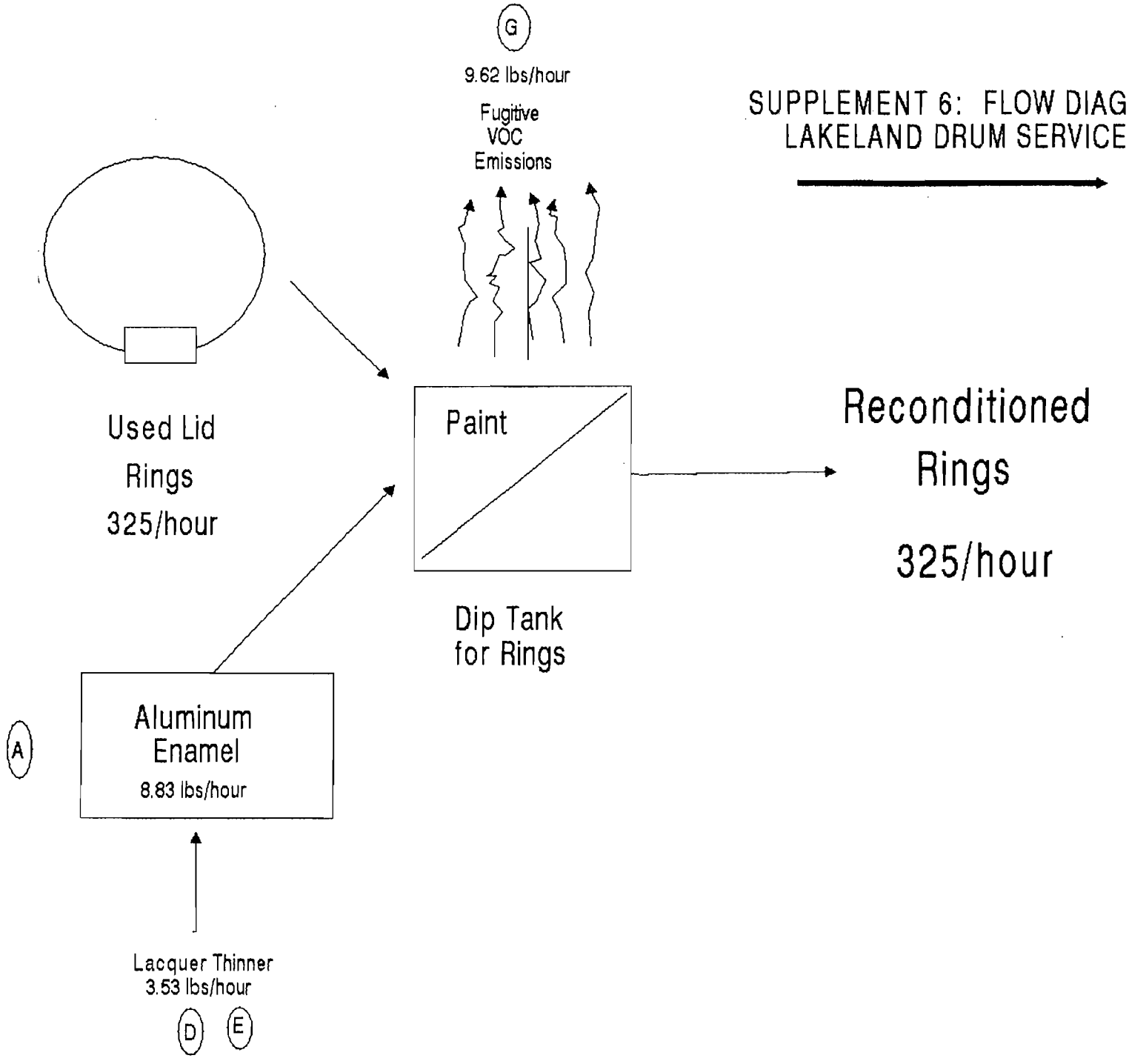
SUPPLEMENT 6: FLOW DIAGRAM
LAKELAND DRUM SERVICE



SUPPLEMENT 6: FLOW DIAGRAM
LAKELAND DRUM SERVICE



SUPPLEMENT 6: FLOW DIAGRAM
LAKELAND DRUM SERVICE

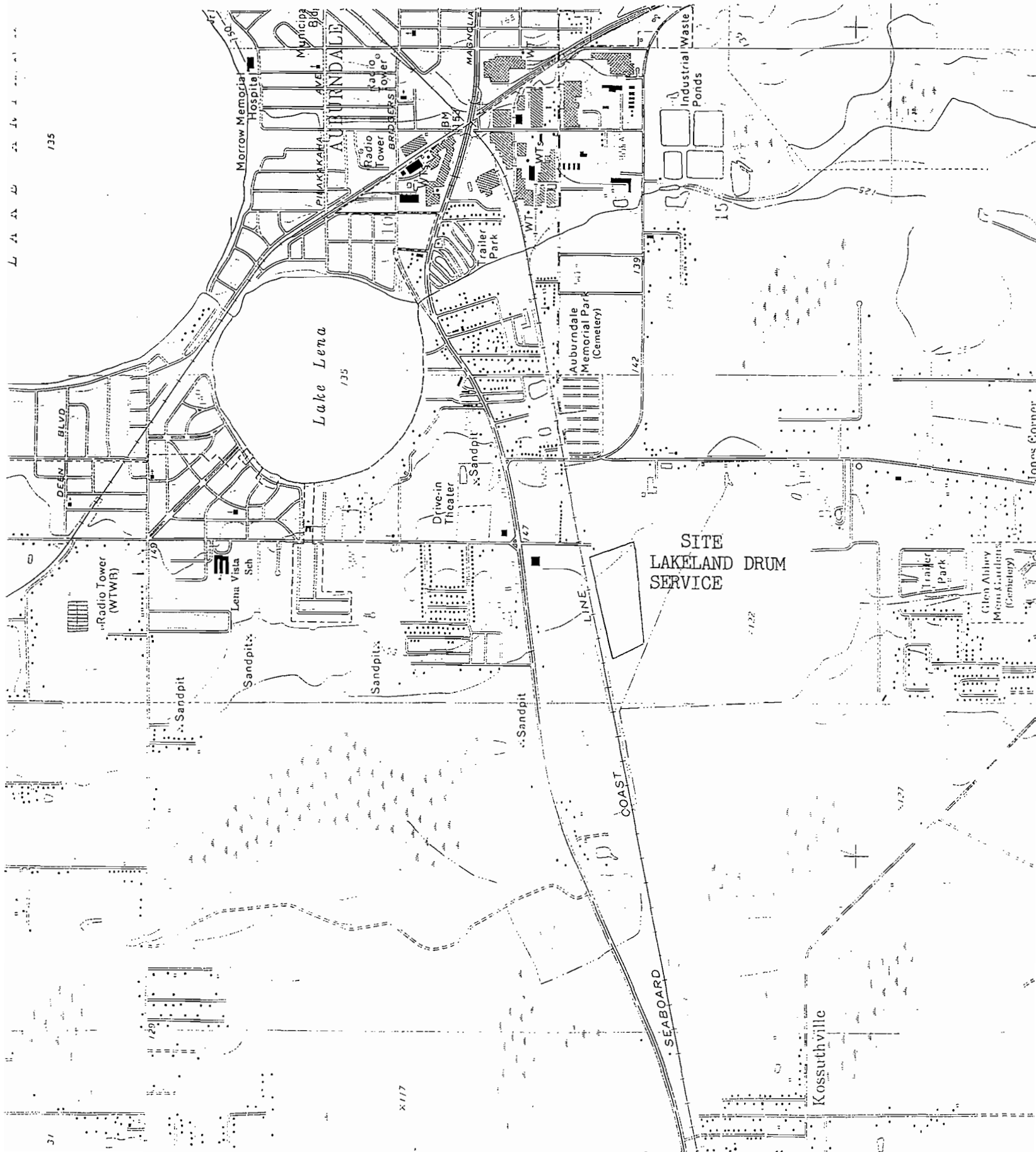


BEST AVAILABLE COPY

GROVE SCIENTIFIC

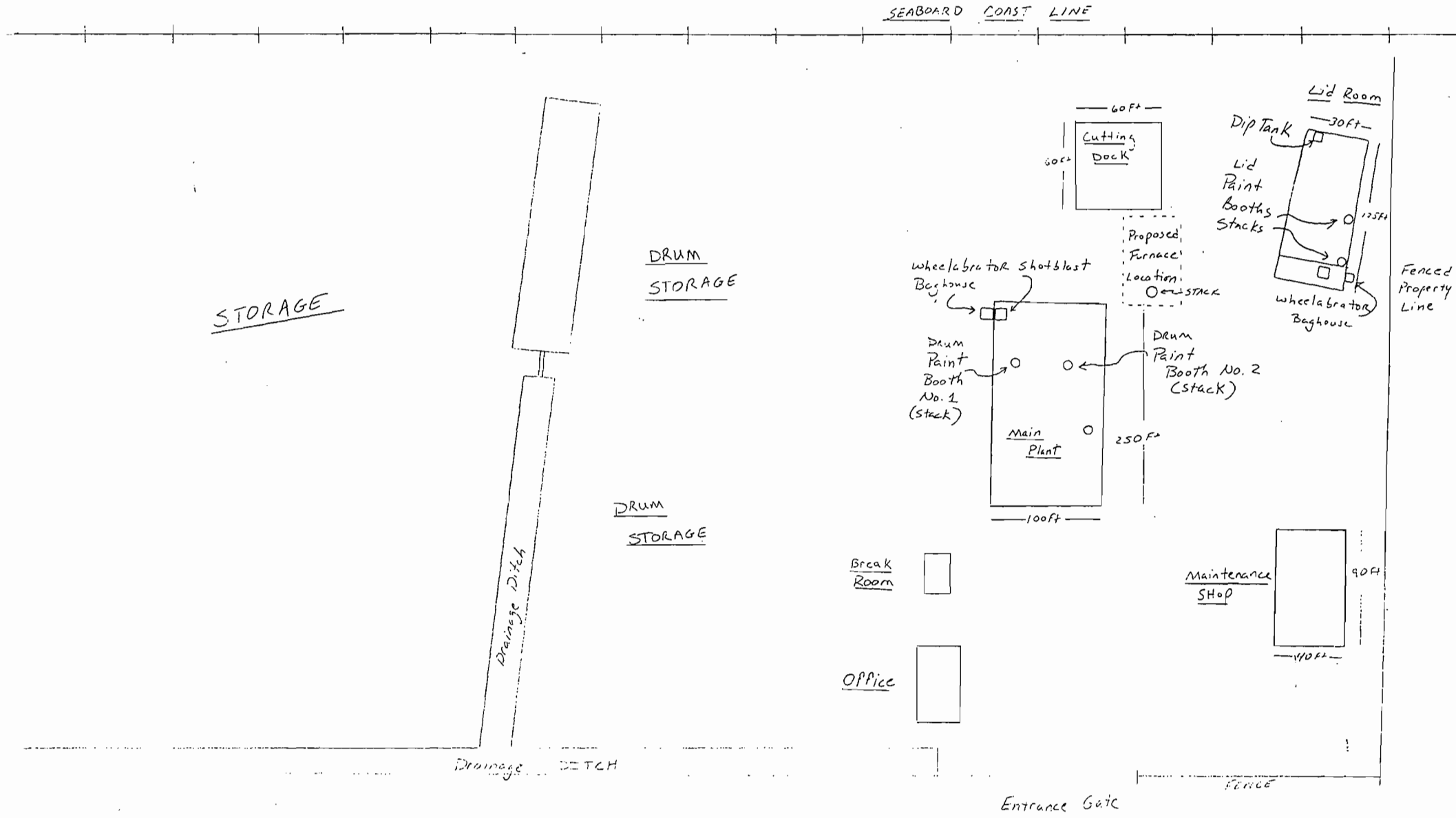
COMP. BY: BRUNO FERRARO
CHK. BY: STEVE NECK, P.E.
DATE: 6-27-90
SHEET NO.: 3
JOB NO.: 03-087.01

SUBJECT: SUPPLEMENT 7: PLOT PLAN
LAKELAND DRUM SERVICE source:USGS



SUPPLEMENT 8

LAKELAND DRUM SERVICE PLOT PLAN



Not to Scale

APPENDIX A

MSDS AND VOC DATA SHEETS

Delta Laboratories, Inc.

PHONE
(904) 629-8101

— Manufacturers Industrial Finishes —
LACQUERS • ENAMELS • PRIMERS • PAINTS • ADHESIVES

P.O. BOX 2258
OCALA, FLORIDA 32678-2258

This (These) Material Safety Data Sheets(MSDS) is (are) being furnished to assist you in complying with your obligation to provide a safe work place under OSHA regulations. **It is important that they be placed into the hands of the person(s) responsible for safety at your location.** A safe work place will only be achieved if this data is known and understood by persons involved with the use of these products. It will be your responsibility to distribute this information and to educate and train your personnel to properly use and store this (these) product(s).

The coatings industry has adopted the MSDS as a uniform and convenient method for communicating the data relative to the hazardous properties of products and the measures to be adopted during their use. It should not, and indeed cannot be taken as the sum total of all protective measures to be taken. Standard reference works on ventilation, toxicology, safety and fire prevention must be consulted to adequately utilize the data contained in the MSDS.

The MSDS also identifies those toxic chemicals subject to the reporting requirements of Section 313 of Title III (also known as the Emergency Planning and Community Right-to-Know Act) of the Superfund Amendments and Reauthorization Act(SARA) and of Title 40 of the Code of Federal Regulations(CFR), Part 372.

This letter must not be detached from the MSDS and any copying or redistribution of the MSDS shall also include copying and redistribution of this notice.

Please discard previous MSDS for this (these) product(s) and replace them with the MSDS enclosed.

If you have questions regarding the MSDS, please call us at the number listed in Section I. If you have questions regarding the use and handling of the product(s), please contact your regular Delta Technical Sales Representative.

Yours truly,

Kevin M. Cox

Kevin M. Cox

05100

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

VOC DATA SHEET:

PROPERTIES OF THE COATING "AS SUPPLIED" BY THE MANUFACTURER

Coating Manufacturer: DELTA LABORATORIES, INC.

Coating Identification: 30R014082 RED DRUM LINER

Batch Identification: _____

Supplied To: LAKELAND DRUM

Properties of the coating as supplied[1] to the customer:

A. Coating Density $(D_c)_s$: 8.2 lb/gal _____ kg/l

[XX] ASTM D1475 [ ] Other[2]

B. Total Volatiles $(W_v)_s$: 56.1 Weight Percent

[XX] ASTM D2369 [ ] Other[2]

C. Water Content: 1. $(W_w)_s$ 0 Weight Percent

[ ] ASTM D3792 [ ] ASTM D4017 [ ] Other[2]

2. $(V_w)_s$ 0 Volume Percent

[ ] Calculated [ ] Other[2]

D. Organic Volatiles $(W_o)_s$: 56.2 Weight Percent

E. Nonvolatiles Content $(V_n)_s$: 26.8 Volume Percent

F. VOC Content $(VOC)_s$: 1. 4.6 lb/gal coating less water

or _____ kg/l coating less water

2. 17.2 lb/gal solids

or _____ kg/l solids

Remarks: (use reverse side)

---

[1]The subscript "s" denotes each value is for the coating "as supplied" by the manufacturer.

[2]Explain the other method used under "Remarks".

Signed: Kevin M. Cox Date 1/5/89

MATERIAL SAFETY DATA SHEET

06/13/90

DataLogiX Formula Systems Inc.

SECTION I - PRODUCT INDENTIFICATION

Manufacturer: DELTA LABORATORIES INC.
P.O. BOX 2258
3710 N.W. COUNTY HWY. 320
OCALA FL 32675

Information Phone: 904 629 8101
Emergency Phone: 904 629 8101

Product Class: PRIMER
Trade Name : RED DRUM LINER
Product Code : 30R014082
C.A.S. Number:

Hazard Ratings: Health = 2
none -> extreme Fire = 3
0 ----> 4 Reactivity = 0

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS #	Weight %	Exposure Limits		Vapor Pr. mm Hg
VM&P NAPHTHA	64742-89-8	20-50	300.	ppm	5.2
TOLUENE**	108-88-3	1-5	100.	ppm	24.
ALIPHATIC HYDROCARBONS	64742-89-8	5-20	200.	ppm	60.

SECTION III - PHYSICAL DATA

Boiling Range: 201 - 300 Deg. F
Evap. Rate: 1.53 x n-Butyl Acetate
Volatiles volume: 73.6 %
Appearance:

Vapor Density: Heavier than Air.
Liquid Density: Lighter than Water.
Wgt per gallon: 8.15 Pounds.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammability Class: 1B Flash Point: 10 F tcc LEL : 0.9

-EXTINGUISHING MEDIA:

THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CLASSIFIES BURNING LIQUIDS AS CLASS B FIRES. THEREFORE, ANY APPROVED CLASS B FIRE EXTINGUISHER OR EXTINGUISHING AGENT MAY BE USED FOR FIREFIGHTING PURPOSES. FOR EXAMPLE: DRY CHEMICAL, FOAM, CARBON DIOXIDE.

-SPECIAL FIREFIGHTING PROCEDURES:

FULL PROTECTIVE EQUIPMENT INCLUDING SELF-CONTAINED BREATHING APPARATUS SHOULD BE USED. WATER SPRAY MAY BE INEFFECTIVE. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT.

-UNUSUAL FIRE & EXPLOSION HAZARDS:

*** FLAMMABLE LIQUID *** KEEP CONTAINERS TIGHTLY CLOSED. MATERIAL IS HIGHLY VOLATILE AND READILY GIVES OFF VAPORS WHICH MAY TRAVEL ALONG THE GROUND OR BE MOVED BY VENTILATION AND CAUSE FLASH FIRES OR BE IGNITED EXPLOSIVELY BY PILOT LIGHTS, OTHER FLAMES, SPARKS, HEATERS, SMOKING, ELECTRIC MOTORS, OR OTHER SOURCES OF IGNITION AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY TO HOT SURFACES. NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY. DURING EMERGENCY CONDITIONS OVEREXPOSURE TO DECOMPOSITION MAY CAUSE A HEALTH HAZARD. SYMPTOMS MAY NOT BE IMMEDIATELY APPARENT. OBTAIN MEDICAL ATTENTION.

(cont.)

SECTION IV - FIRE AND EXPLOSION HAZARD DATA (cont.)

-UNUSUAL FIRE & EXPLOSION HAZARDS: (cont.)

SECTION V - HEALTH HAZARD DATA

-PERMISSIBLE EXPOSURE LEVEL:

**

ANY ITEM IN SECTION II MARKED WITH ** IS A TOXIC CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF SARA TITLE III AND OF 40 CFR 372.

@

ANY ITEM IN SECTION II MARKED WITH @ IS LISTED IN THE NATIONAL TOXICOLOGY PROGRAM (NTP) ANNUAL REPORT ON CARCINOGENS (LATEST EDITION) OR HAS BEEN FOUND TO BE A POTENTIAL CARCINOGEN IN THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) MONOGRAPHS (LATEST EDITION), OR BY OSHA.

****

EXPOSURE LIMITS LISTED IN SECTION II ARE EXPRESSED AS TLV UNLESS NOTED HERE.

VM&P NAPHTHA OSHA PEL=500ppm. ACGIH TLV=300ppm

TOLUENE OSHA PEL=100ppm. TLV=100ppm ACGIH TWA

ALIPHATIC HYDROCARBONS OSHA PEL=500ppm, ACGIH TLV=NOT ESTABLISHD

-EFFECTS OF OVEREXPOSURE:

--EYES-- CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, AND BLURRED VISION.

--SKIN--PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, AND DERMATITIS. REPEATED CONTACT MAY CAUSE SENSITIZATION.

--BREATHING--EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIATION.

--SWALLOWING--CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

OVEREXPOSURE TO VM&P NAPHTHA MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION (IN HIGH VAPOR CONCENTRATIONS).

OVEREXPOSURE TO TOLUENE MAY CAUSE LIVER DAMAGE & KIDNEY DAMAGE, CENTRAL NERVOUS SYSTEM DEPRESSION (IN HIGH CONCENTRATIONS), AND BRAIN CELL DAMAGE FROM LONG TERM INHALATION OF VAPORS.

OVEREXPOSURE TO ALIPHATIC HYDROCARBONS MAY CAUSE REPIRATORY TRACT IRRITATION AND NARCOSIS (IN HIGH VAPOR CONCENTRATIONS).

-FIRST AID:

--IF IN EYES--FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING THE UPPER AND LOWER LIDS OCCASIONALLY.GET MEDICAL ATTENTION.

--IF ON SKIN--THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE RE-USE.

--IF BREATHED--IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN.IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION.

--IF SWALLOWED--DO NOT INDUCE VOMITING. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE PNEUMONITIS WHICH CAN BE FATAL.

SECTION VI - REACTIVITY DATA

STABILITY: [ ] Unstable [X] Stable
HAZARDOUS POLYMERIZATION: [ ] May occur [X] Will not occur
-INCOMPATIBILITY:
STRONG OXIDIZING AGENTS, SULFURIC ACID.
AVOID STRONG ACIDS OR ALKALIS.
AVOID CONTACT WITH STRONG OXIDIZING AGENTS, ACIDS, OR BASES AND SELECTED AMINES
-CONDITIONS TO AVOID:
HIGH TEMPERATURE OR HEAT OR OPEN FLAMES.
DO NOT LEAVE LIDS OFF CONTAINERS FOR EXTENDED PERIODS
-HAZARDOUS DECOMPOSITION PRODUCTS:
THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, AND TOXIC FUMES.

SECTION VII - SPILL OR LEAK PROCEDURES

-STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
REMOVE ALL SOURCES OF IGNITION (FLAMES, HOT SURFACES, PILOT LIGHTS, AND ELECTRIC, STATIC, OR FRICTIONAL SPARKS). AVOID BREATHING VAPORS. VENTILATE AREA. REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS. PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED.
-WASTE DISPOSAL METHOD:
DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL LAW REGULATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION VIII - SPECIAL PROTECTION INFORMATION:

-RESPIRATORY PROTECTION:
IF THE 'TLV' OF THE PRODUCT OR ANY COMPONENT IS EXCEEDED, A NIOSH/MESA JOINTLY APPROVED SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE PIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE IS ADVISED. HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MESA RESPIRATORS UNDER SPECIFIC CONDITIONS. AREAS OF STORAGE AND USE SHOULD BE SURVEYED BY A QUALIFIED INDUSTRIAL HYGIENIST TO ASSURE ADEQUACY OF RESPIRATORY PROTECTION, VENTILATION, AND OTHER PROTECTIVE EQUIPMENT.
-VENTILATION:
PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND PATTERN TO KEEP TLV OF ALL HAZARDOUS INGREDIENTS IN SECTION II BELOW ACCEPTABLE LIMIT; LEL IN SECTION II BELOW STATED LIMIT.
-PROTECTIVE GLOVES:
REQUIRED FOR PROLONGED OR REPEATED CONTACT.
-EYE PROTECTION:
USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUID.
-OTHER PROTECTIVE EQUIPMENT:
WEAR IMPERVIOUS CLOTHING AND BOOTS TO PREVENT REPEATED OR PROLONGED SKIN CONTACT.

SECTION IX - SPECIAL PRECAUTIONS

-PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

KEEP AWAY FROM HEAT, SPARKS, FIRE, AND ALL IGNITION SOURCES. DO NOT LEAVE CONTAINER OPEN. DO NOT STORE ABOVE 120 DEGREES F. STORE IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS I FLAMMABLE LIQUIDS. USE IN AREAS DESIGNED AND PROTECTED FOR USE OF CLASS I FLAMMABLE LIQUIDS.

-OTHER PRECAUTIONS:

USE ONLY WITH ADEQUATE VENTILATION. AVOID PROLONGED OR REPEATED BREATHING OF VAPOR. AVOID CONTACT WITH EYES OR SKIN. DO NOT TAKE INTERNALLY. CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL OF LIQUID IN EXCESS OF A FEW INCHES. STORE, DISPENSE AND USE IN ACCORDANCE WITH NFPA STANDARDS FOR CLASS I FLAMMABLE LIQUIDS. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATA SHEET MUST BE OBSERVED.

*** FOR INDUSTRIAL USE ONLY. NOT FOR HOUSEHOLD USE. ***

NOTICE: REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE AND SUITABLE FOR THEIR CIRCUMSTANCES.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

VOC DATA SHEET:

PROPERTIES OF THE COATING "AS SUPPLIED" BY THE MANUFACTURER

Coating Manufacturer: DELTA LABORATORIES, INC.

Coating Identification: 29B019109 BLACK DRUM ENAMEL

Batch Identification: _____

Supplied To: LAKELAND DRUM

Properties of the coating as supplied[1] to the customer:

A. Coating Density $(D_c)_s$: 7.3 lb/gal _____ kg/l

[XX] ASTM D1475 [ ] Other[2]

B. Total Volatiles $(W_v)_s$: 58.4 Weight Percent

[XX] ASTM D2369 [ ] Other[2]

C. Water Content: 1. $(W_w)_s$ 0 Weight Percent

[ ] ASTM D3792 [ ] ASTM D4017 [ ] Other[2]

2. $(V_w)_s$ 0 Volume Percent

[ ] Calculated [ ] Other[2]

D. Organic Volatiles $(W_o)_s$: 58.4 Weight Percent

E. Nonvolatiles Content $(V_n)_s$: 32.9 Volume Percent

F. VOC Content $(VOC)_s$: 1. 4.3 lb/gal coating less water

or _____ kg/l coating less water

2. 13.1 lb/gal solids

or _____ kg/l solids

Remarks: (use reverse side)

[1]The subscript "s" denotes each value is for the coating "as supplied" by the manufacturer.

[2]Explain the other method used under "Remarks".

Signed: Kevin M. Cox Date 1/5/89

MATERIAL SAFETY DATA SHEET

06/13/90

DataLeafX Formula Systems, Inc.

SECTION I - PRODUCT IDENTIFICATION

Manufacturer: DELTA LABORATORIES INC.
P.O. BOX 2258
3710 N.W. COUNTY HWY. 32A
OCALA FL 32670

Information Phone: 904 629 8101
Emergency Phone: 904 629 8101

Product Class: ENAMEL
Trade Name : BLACK DRUM ENAMEL
Product Code : 20B010100
C.A.S. Number:

Hazard Ratings: Health - 2
none -> extreme Fire - 3
0 ----> 4 Reactivity 0

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS #	Weight %	exposure limits		Vapor Pr. mm Hg
/M&P NAPHTHA	64742-89-8	20-60	300.	ppm	5.2
TOLUENE**	108-88-3	1-5	100.	ppm	24.
STODDARD SOLVENT	8052-41-3	5-20	100.	ppm	2.

SECTION III - PHYSICAL DATA

Boiling Range: 201 - 405 Deg. F
Evap. Rate: 0.69 x n-Butyl Acetate
Volatiles volume: 60.2 %
Appearance:

Vapor Density: Heavier than Air.
Liquid Density: Lighter than Water.
Wgt per gallon: 7.25 Pounds.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammability Class: 1B Flash Point: 45 F tcc LEL : 0.9

-EXTINGUISHING MEDIA:

THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CLASSIFIES BURNING LIQUIDS AS CLASS B FIRES. THEREFORE, ANY APPROVED CLASS B FIRE EXTINGUISHER OR EXTINGUISHING AGENT MAY BE USED FOR FIREFIGHTING PURPOSES. FOR EXAMPLE: DRY CHEMICAL, FOAM CARBON DIOXIDE.

-SPECIAL FIREFIGHTING PROCEDURES:

FULL PROTECTIVE EQUIPMENT INCLUDING SELF-CONTAINED BREATHING APPARATUS SHOULD BE USED. WATER SPRAY MAY BE INEFFECTIVE. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT.

-UNUSUAL FIRE & EXPLOSION HAZARDS:

*** FLAMMABLE LIQUID *** KEEP CONTAINERS TIGHTLY CLOSED. MATERIAL IS HIGHLY VOLATILE AND READILY GIVES OFF VAPORS WHICH MAY TRAVEL ALONG THE GROUND OR BE MOVED BY VENTILATION AND CAUSE FLASH FIRES OR BE IGNITED EXPLOSIVELY BY PILOT LIGHTS, OTHER FLAMES, SPARKS, HEATERS, SMOKING, ELECTRIC MOTORS, OR OTHER SOURCES OF IGNITION AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY TO HOT SURFACES. NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY. DURING EMERGENCY CONDITIONS OVEREXPOSURE TO DECOMPOSITION MAY CAUSE A HEALTH HAZARD. SYMPTOMS MAY NOT BE IMMEDIATELY APPARENT. OBTAIN MEDICAL ATTENTION.

(cont.)

SECTION IV - FIRE AND EXPLOSION HAZARD DATA (cont.)

-UNUSUAL FIRE & EXPLOSION HAZARDS: (cont.)

SECTION V - HEALTH HAZARD DATA

-PERMISSIBLE EXPOSURE LEVEL:

**

ANY ITEM IN SECTION II MARKED WITH ** IS A TOXIC CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF SARA TITLE III AND OF 40 CFR 372.

@

ANY ITEM IN SECTION II MARKED WITH @ IS LISTED IN THE NATIONAL TOXICOLOGY PROGRAM (NTP) ANNUAL REPORT ON CARCINOGENS (LATEST EDITION) OR HAS BEEN FOUND TO BE A POTENTIAL CARCINOGEN IN THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) MONOGRAPHS (LATEST EDITION), OR BY OSHA.

****

EXPOSURE LIMITS LISTED IN SECTION II ARE EXPRESSED AS TWA UNLESS NOTED HERE.

VM&P NAPHTHA OSHA PEL=500ppm, ACGIH TLV=300ppm

TOLUENE OSHA PEL=100ppm, TLV=150ppm ACGIH TWA

STODDARD SOLVENT OSHA PEL=100ppm, TLV=100ppm ACGIH TWA

-EFFECTS OF OVEREXPOSURE:

--EYES-- CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, AND BLURRED VISION.

--SKIN--PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, AND DERMATITIS. REPEATED CONTACT MAY CAUSE SENSITIZATION.

--BREATHING--EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIATION.

--SWALLOWING--CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

OVEREXPOSURE TO VM&P NAPHTHA MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION (IN HIGH VAPOR CONCENTRATIONS).

OVEREXPOSURE TO TOLUENE MAY CAUSE LIVER DAMAGE & KIDNEY DAMAGE, CENTRAL NERVOUS SYSTEM DEPRESSION (IN HIGH CONCENTRATIONS), AND BRAIN CELL DAMAGE FROM LONG TERM INHALATION OF VAPORS.

OVEREXPOSURE TO STODDARD SOLVENT MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION (IN HIGH CONCENTRATIONS).

-FIRST AID:

--IF IN EYES--FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING THE UPPER AND LOWER LIDS OCCASIONALLY.GET MEDICAL ATTENTION.

--IF ON SKIN--THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE RE-USE.

--IF BREATHED--IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN.IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION.

--IF SWALLOWED--DO NOT INDUCE VOMITING. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE PNEUMONITIS WHICH CAN BE FATAL

SECTION VI - REACTIVITY DATA

STABILITY: [ ] Unstable [x] Stable
HAZARDOUS POLYMERIZATION: [ ] May occur [x] Will not occur
-INCOMPATIBILITY:
STRONG OXIDIZING AGENTS. SULFURIC ACID.
AVOID STRONG ACIDS OR ALKALIS.
-CONDITIONS TO AVOID:
HIGH TEMPERATURE OR HEAT OR OPEN FLAMES.
DO NOT LEAVE LIDS OFF CONTAINERS FOR EXTENDED PERIODS.
-HAZARDOUS DECOMPOSITION PRODUCTS:
THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE AND TOXIC FUMES.

SECTION VII - SPILL OR LEAK PROCEDURES

-STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
REMOVE ALL SOURCES OF IGNITION (FLAMES, HOT SURFACES, PILOT LIGHTS, AND ELECTRIC, STATIC OR FRICTIONAL SPARKS). AVOID BREATHING VAPORS. VENTILATE AREA. REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS. PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED.
-WASTE DISPOSAL METHOD:
DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL LAW REGULATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION VIII - SPECIAL PROTECTION INFORMATION:

-RESPIRATORY PROTECTION:
IF THE 'TLV' OF THE PRODUCT OR ANY COMPONENT IS EXCEEDED, A NIOSH/MESA JOINTLY APPROVED SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE PIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE IS ADVISED. HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MESA RESPIRATORS UNDER SPECIFIC CONDITIONS. AREAS OF STORAGE AND USE SHOULD BE SURVEYED BY A QUALIFIED INDUSTRIAL HYGIENIST TO ASSURE ADEQUACY OF RESPIRATORY PROTECTION, VENTILATION, AND OTHER PROTECTIVE EQUIPMENT.
-VENTILATION:
PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND PATTERN TO KEEP TLV OF ALL HAZARDOUS INGREDIENTS IN SECTION II BELOW ACCEPTABLE LIMIT: LEL IN SECTION II BELOW STATED LIMIT.
-PROTECTIVE GLOVES:
REQUIRED FOR PROLONGED OR REPEATED CONTACT.
-EYE PROTECTION:
USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUID.
-OTHER PROTECTIVE EQUIPMENT:
WEAR IMPERVIOUS CLOTHING AND BOOTS TO PREVENT REPEATED OR PROLONGED SKIN CONTACT.

SECTION IX - SPECIAL PRECAUTIONS

-PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

KEEP AWAY FROM HEAT, SPARKS, FIRE, AND ALL IGNITION SOURCES. DO NOT LEAVE CONTAINER OPEN. DO NOT STORE ABOVE 100 DEGREES F. STORE IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS I FLAMMABLE LIQUIDS. USE IN AREAS DESIGNED AND PROTECTED FOR USE OF CLASS I FLAMMABLE LIQUIDS.

-OTHER PRECAUTIONS:

USE ONLY WITH ADEQUATE VENTILATION. AVOID PROLONGED OR REPEATED BREATHING OF VAPOR. AVOID CONTACT WITH EYES OR SKIN. DO NOT TAKE INTERNALLY. CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL OF LIQUID IN EXCESS OF A FEW INCHES. STORE, DISPENSE AND USE IN ACCORDANCE WITH NFPA STANDARDS FOR CLASS I FLAMMABLE LIQUIDS. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID). ALL HAZARD PRECAUTIONS GIVEN IN THIS DATA SHEET MUST BE OBSERVED.

*** FOR INDUSTRIAL USE ONLY. NOT FOR HOUSEHOLD USE. ***

NOTICE: REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE, BUT IS NOT WARRANTED TO BE. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE AND SUITABLE FOR THEIR CIRCUMSTANCES.

M A T E R I A L S A F E T Y D A T A S H E E T
(SIMILAR TO OSHA-20)

12/04/84

3661S

***** SECTION I *****

TRADE NAME/SYNONYMS
N.A.

MANUFACTURER
E. I. DU PONT DE NEMOURS & CO., INC
F & FP DEPARTMENT
WILMINGTON, DE 19898

TELEPHONE
(800) 441 7515

CHEMICAL FAMILY
LACQUER THINNER

FORMULA
3661S

841024

***** SECTION II - HAZARDOUS INGREDIENTS *****

SOLVENT	APPROX WT %	TLV (PPM)
ALIPHATIC ALCOHOL	22	50
ALIPHATIC KETONE	26	750
TOLUENE	12	100
ALIPHATIC ESTER	2	UNK
ETHER ESTER	6	100
ALIPHATIC PET DIST	27	100
AROMATIC PET DIST	6	100

***** SECTION III - PHYSICAL DATA *****

APPROX BOILING RANGE (F)
129- 437
VAPOR PRESSURE PRINCIPAL SOLVENT (MM HG)
10.00
VAPOR DENSITY PRINCIPAL SOLVENT (AIR=1)
2.50
SOLUBILITY IN WATER
APPRECIABLE
APPEARANCE AND ODOR
SEMI-VISCOUS LIQUID WITH CHARACTERISTIC ODOR
SPECIFIC GRAVITY (WATER=1)
0.799 6.66 lbs/gal
PERCENT VOLATILE BY VOLUME
100.00
EVAPORATION RATE
SLOWER THAN ETHER

***** SECTION IV - FIRE & EXPLOSION HAZARD DATA *****

FLASH POINT (METHOD)	APPROX FLAMMABLE LIMITS	LEL	UEL
BELOW 20 F (CC)		1.00	18.00

M A T E R I A L S A F E T Y 12/04/84

D A T A S H E E T 3661S
(SIMILAR TO OSHA-20)

EXTINGUISHING MEDIA
FOAM, CARBON DIOXIDE, DRY CHEMICAL
SPECIAL FIRE FIGHTING PROCEDURES
WATER FROM FOG NOZZLES MAY BE USED TO COOL
CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP.
UNUSUAL FIRE AND EXPLOSION HAZARDS
N.A.

***** SECTION V - HEALTH HAZARD DATA *****

EFFECTS OF OVEREXPOSURE
HEADACHE, NAUSEA, IMPAIRMENT OF REACTION TIME AND COORDINATION
EMERGENCY AND FIRST AID PROCEDURES
INHALATION - MOVE TO FRESH AIR TO IMPROVE BREATHING
SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING.
EYE CONTACT- FLUSH WITH WATER FOR AT LEAST 15 MIN; CALL A PHYSICIAN

***** SECTION VI - REACTIVITY DATA *****

STABILITY
STABLE
CONDITIONS TO AVOID
N.A.
INCOMPATIBILITY (MATERIALS TO AVOID)
NONE REASONABLY FORESEEABLE
HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO2, SMOKE
HAZARDOUS POLYMERIZATION
WILL NOT OCCUR
CONDITIONS TO AVOID FOR HAZARDOUS POLYMERIZATION
N.A.

***** SECTION VII - SPILL OR LEAK PROCEDURES *****

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
AVOID PROLONGED CONTACT WITH SKIN AND BREATHING OF VAPOR.
REMOVE SOURCES OF IGNITION. REMOVE WITH INERT ABSORBENT.
VENTILATE AREA.
WASTE DISPOSAL METHOD
DISPOSAL METHOD MUST COMPLY WITH LOCAL, STATE AND FEDERAL REGULATIONS.

***** SECTION VIII - SPECIAL PROTECTION INFORMATION *****

RESPIRATORY PROTECTION
IF AIR CONTAMINANTS CONTROL IS NOT FEASIBLE
USE NIOSH/MSHA RESPIRATOR TC-23C
TILATION: LOCAL & MECHANICAL
PROVIDE SUFFICIENT
VENTILATION TO KEEP BELOW TLV/LEL

VENTILATION: SPECIAL
REMOVE IGNITION SOURCES
VENTILATION: OTHER
N.A.
PROTECTIVE GLOVES
PROLONGED OR REPEATED CONTACT
EYE PROTECTION
USE SAFETY EYEWEAR
OTHER PROTECTIVE EQUIPMENT
USE APPROPRIATE INDUSTRIAL HYGIENE PRACTICES

***** SECTION IX - SPECIAL PRECAUTIONS *****

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAME.
CLOSE CONTAINER AFTER EACH USE. DO NOT STORE ABOVE 120 F.
OTHER PRECAUTIONS
WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR SMOKING
OBSERVE LABEL PRECAUTIONS. CONTAINERS SHOULD BE GROUNDED WHEN POURING.

NOTICE FROM DUPONT

THESE DATA RELATE ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN AND

DO NOT RELATE TO USE IN COMBINATION WITH ANY OTHER MATERIAL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

VOC DATA SHEET:

PROPERTIES OF THE COATING "AS SUPPLIED" BY THE MANUFACTURER

Coating Manufacturer: DELTA LABORATORIES, INC.

Coating Identification: 29M009177 ALUMINUM ENAMEL

Batch Identification: _____

Supplied To: LAKELAND DRUM

Properties of the coating as supplied[1] to the customer:

A. Coating Density $(D_c)_s$: 7.36 lb/gal _____ kg/l

[ ] ASTM D1475 [X] Other[2]

B. Total Volatiles $(W_v)_s$: 68.9 Weight Percent

[ ] ASTM D2369 [X] Other[2]

C. Water Content: 1. $(W_w)_s$ 0 Weight Percent

[ ] ASTM D3792 [ ] ASTM D4017 [ ] Other[2]

2. $(V_w)_s$ 0 Volume Percent

[ ] Calculated [ ] Other[2]

D. Organic Volatiles $(W_o)_s$: 68.9 Weight Percent

E. Nonvolatiles Content $(V_n)_s$: 23.8 Volume Percent

F. VOC Content $(VOC)_s$: 1. 5.07 lb/gal coating less water

or _____ kg/l coating less water

2. 21.3 lb/gal solids

or _____ kg/l solids

Remarks: (use reverse side)
(2) Supplier Data

[1]The subscript "s" denotes each value is for the coating "as supplied" by the manufacturer.

[2]Explain the other method used under "Remarks".

Signed: Kevin M. Cox Date 8/17/90

MATERIAL SAFETY DATA SHEET 08/17/90

DataLogiX Formula Systems Inc.

SECTION I - PRODUCT INDENTIFICATION

Manufacturer: DELTA LABORATORIES INC.
P.O. BOX 2258
3710 N.W. COUNTY HWY. 326
OCALA FL 32675

Information Phone: 904 629 8101
Emergency Phone: 904 629 8101

Product Class: ENAMEL
Trade Name : ALUMINUM ENAMEL
Product Code : 29M009177
C.A.S. Number:

Hazard Ratings: Health - 2
none -> extreme Fire - 3
0 ----> 4 Reactivity - 1

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS #	Weight %	Exposure Limits		Vapor Pr. mm Hg
XYLENE**	1330-20-7	20-50	100.	ppm	6.6
ALUMINUM FLAKE**	7429-90-5	5-20	10.	mg/M3	
STODDARD SOLVENT	8052-41-3	1-5	100.	ppm	2.
VM&P NAPHTHA	64742-89-8	20-50	300.	ppm	5.2

SECTION III - PHYSICAL DATA

Boiling Range: 250 - 405 Deg. F
Evap. Rate: 0.71 x n-Butyl Acetate
Volatiles volume: 77.4 %
Appearance:

Vapor Density: Heavier than Air.
Liquid Density: Lighter than Water.
Wgt per gallon: 7.36 Pounds.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammability Class: 1B Flash Point: 54 F tcc LEL : 0.9

-EXTINGUISHING MEDIA:

THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CLASSIFIES BURNING LIQUIDS AS CLASS B FIRES. THEREFORE, ANY APPROVED CLASS B FIRE EXTINGUISHER OR EXTINGUISHING AGENT MAY BE USED FOR FIREFIGHTING PURPOSES. FOR EXAMPLE: DRY CHEMICAL, FOAM, CARBON DIOXIDE. IF THESE EXTINGUISHING AGENTS ACCELERATE THE FIRE, OR IF THE FIRE EXHIBITS THE CHARACTERISTICS OF A POWDER FIRE, DISCONTINUE USE OF THESE AGENTS. DO NOT DISTURB THE BURNING POWDER. APPLY A CLASS D EXTINGUISHING AGENT WITH A LOW VELOCITY NOZZLE, OR APPLY DRY INERT GRANULAR MATERIAL (EG SAND).

-SPECIAL FIREFIGHTING PROCEDURES:

FULL PROTECTIVE EQUIPMENT INCLUDING SELF-CONTAINED BREATHING APPARATUS SHOULD BE USED. COVER AND RING FIRE AND ALLOW IT TO BURN ITSELF OUT. IF THE FIRE SHOWS EVIDENCE OF GOING OUT OF CONTROL AND THE PREFERRED EXTINGUISHING AGENTS HAVE FAILED OR ARE UNAVAILABLE, USE FOAM OR WATER AS A LAST RESORT. FOR WATER, USE ONLY LOW VELOCITY SPRAY OR FOG. WATER MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL.

-UNUSUAL FIRE & EXPLOSION HAZARDS:

*** FLAMMABLE *** KEEP CONTAINERS TIGHTLY CLOSED.
*** WATER REACTIVE *** MATERIAL IS HIGHLY VOLATILE AND READILY GIVES OFF VAPORS WHICH MAY TRAVEL ALONG THE GROUND OR BE MOVED BY VENTILATION AND CAUSE FLASH FIRES OR BE IGNITED EXPLOSIVELY BY PILOT LIGHTS, OTHER FLAMES, SPARKS, HEATERS, SMOKING, ELECTRIC MOTORS, OR OTHER SOURCES OF IGNITION AT LOCATIONS DIS-

(cont.)

SECTION IV — FIRE AND EXPLOSION HAZARD DATA (cont.)

-UNUSUAL FIRE & EXPLOSION HAZARDS: (cont.)

TANT FROM MATERIAL HANDLING POINT. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY TO HOT SURFACES. NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY. DURING EMERGENCY CONDITIONS OVEREXPOSURE TO DECOMPOSITION MAY CAUSE A HEALTH HAZARD. SYMPTOMS MAY NOT BE IMMEDIATELY APPARENT. OBTAIN MEDICAL ATTENTION.

SECTION V — HEALTH HAZARD DATA

-PERMISSIBLE EXPOSURE LEVEL:

** ANY ITEM IN SECTION II MARKED WITH ** IS A TOXIC CHEMICAL SUBJECT TO THE REPORTING REOUIREMENTS OF SECTION 313 OF SARA TITLE III AND OF 40 CFR 372.

@ ANY ITEM IN SECTION II MARKED WITH @ IS LISTED IN THE NATIONAL TOXICOLOGY PROGRAM (NTP) ANNUAL REPORT ON CARCINOGENS (LATEST EDITION) OR HAS BEEN FOUND TO BE A POTENTIAL CARCINOGEN IN THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) MONOGRAPHS (LATEST EDITION), OR BY OSHA.

EXPOSURE LIMITS LISTED IN SECTION II ARE EXPRESSED AS TLV UNLESS NOTED HERE.

XYLENE OSHA PEL=100ppm, ACGIH TLV=100ppm

ALUMINUM FLAKE OSHA PEL=15mg/M3, ACGIH TLV=10mg/M3 (AS NUISANCE DUST)

STODDARD SOLVENT OSHA PEL=100ppm, TLV=100ppm ACGIH TWA

VM&P NAPHTHA OSHA PEL=500ppm, ACGIH TLV=300ppm

-EFFECTS OF OVEREXPOSURE:

—EYES— CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, AND BLURRED VISION.

—SKIN—PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, AND DERMATITIS. REPEATED CONTACT MAY CAUSE SENSITIZATION.

—BREATHING—EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIATION.

—SWALLOWING—CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

OVEREXPOSURE TO XYLENE MAY CAUSE CARDIAC ABNORMALITIES, LIVER AND KIDNEY DAMAGE IN HUMANS.

OVEREXPOSURE TO ALUMINUM FLAKE MAY CAUSE EYE, SKIN, AND RESPIRATORY TRACT IRRITATION. INHALATION OF FINELY DIVIDED POWDER HAS BEEN REPORTED AS A CAUSE OF PULMONARY FIBROSIS.

OVEREXPOSURE TO STODDARD SOLVENT MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION (IN HIGH CONCENTRATIONS).

OVEREXPOSURE TO VM&P NAPHTHA MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION (IN HIGH VAPOR CONCENTRATIONS).

SECTION V – HEALTH HAZARD DATA (cont.)

-FIRST AID:

---IF IN EYES---FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING THE UPPER AND LOWER LIDS OCCASIONALLY.GET MEDICAL ATTENTION.

---IF ON SKIN---THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE RE-USE.

---IF BREATHED---IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN.IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION.

---IF SWALLOWED---DO NOT INDUCE VOMITING, KEEP PERRSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE PNEUMONITIS WHICH CAN BE FATAL.

SECTION VI – REACTIVITY DATA

STABLITY: [ ] Unstable [x] Stable

HAZARDOUS POLYMERIZATION: [ ] May occur [x] Will not occur

-INCOMPATIBILITY:

INCOMPATIBLE WITH LEAD, COPPER AND ITS ALLOYS, STRONG ACIDS AND ALKALIES, AND CERTAIN AMINES.

REACTIVITY WITH WATER: POSSIBLE SLOW REACTION DEPENDENT ON PH OR COMPOUNDS DISSOLVED IN WATER WITH GENERATION OF HYDROGEN AND HEAT.

REACTIVITY WITH HALOGENATED COMPOUNDS: HALOGENATED HYDROCARBONS, INCLUDING FIRE EXTINGUISHING AGENTS, CAN REACT VIOLENTLY WITH FINELY DIVIDED ALUMINUM.

-CONDITIONS TO AVOID:

HIGH TEMPERATURE OR HEAT OR OPEN FLAMES.

DO NOT LEAVE LIDS OFF CONTAINERS FOR EXTENDED PERIODS.

-HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF NITROGEN, AMMONIA.

SECTION VII – SPILL OR LEAK PROCEEDURES

-STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

REMOVE ALL SOURCES OF IGNITION (FLAMES, HOT SURFACES, PILOT LIGHTS, AND ELECTRIC, STATIC, OR FRICTIONAL SPARKS). AVOID BREATHING VAPORS. VENTILATE AREA. REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS. PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED.

-WASTE DISPOSAL METHOD:

DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL LAW REGULATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAINERS.

SECTION VIII - SPECIAL PROTECTION INFORMATION:

-RESPIRATORY PROTECTION:

IF THE 'TLV' OF THE PRODUCT OR ANY COMPONENT IS EXCEEDED, A NIOSH/MESA JOINTLY APPROVED SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE PIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE IS ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MESA RESPIRATORS UNDER SPECIFIC CONDITIONS. AREAS OF STORAGE AND USE SHOULD BE SURVEYED BY A QUALIFIED INDUSTRIAL HYGIENIST TO ASSURE ADEQUACY OF RESPIRATORY PROTECTION, VENTILATION, AND OTHER PROTECTIVE EQUIPMENT.

-VENTILATION:

PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND PATTERN TO KEEP TLV OF ALL HAZARDOUS INGREDIENTS IN SECTION II BELOW ACCEPTABLE LIMIT; LEL IN SECTION II BELOW STATED LIMIT.

-PROTECTIVE GLOVES:

REQUIRED FOR PROLONGED OR REPEATED CONTACT.

-EYE PROTECTION:

USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUID.

-OTHER PROTECTIVE EQUIPMENT:

WEAR IMPERVIOUS CLOTHING AND BOOTS TO PREVENT REPEATED OR PROLONGED SKIN CONTACT.

SECTION IX - SPECIAL PRECAUTIONS

-PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

KEEP AWAY FROM HEAT, SPARKS, FIRE, AND ALL IGNITION SOURCES. DO NOT LEAVE CONTAINER OPEN. DO NOT STORE ABOVE 100 DEGREES F. STORE IN BUILDINGS DESIGNED AND PROTECTED FOR STORAGE OF NFPA CLASS I FLAMMABLE LIQUIDS. USE IN AREAS DESIGNED AND PROTECTED FOR USE OF CLASS I FLAMMABLE LIQUIDS.

-OTHER PRECAUTIONS:

USE ONLY WITH ADEQUATE VENTILATION. AVOID PROLONGED OR REPEATED BREATHING OF VAPOR. AVOID CONTACT WITH EYES OR SKIN. DO NOT TAKE INTERNALLY. CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL OF LIQUID IN EXCESS OF A FEW INCHES. STORE, DISPENSE AND USE IN ACCORDANCE WITH NFPA STANDARDS FOR CLASS I FLAMMABLE LIQUIDS. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATA SHEET MUST BE OBSERVED.

*** FOR INDUSTRIAL USE ONLY. NOT FOR HOUSEHOLD USE. ***

NOTICE: REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE, BUT IS NOT WARRANTED TO BE. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE FOR THEIR CIRCUMSTANCES.

APPENDIX B

OVERSPRAY FACTORS

ing coated. An advantage of electrocoating compared with dipping, flowcoating, or electrostatic spraying is its built-in property of producing uniform thickness on all solution-wetted surfaces, including sharp edges and remote areas.

Roller Coating Machines

Roller coating machines are similar to printing presses in principle. The machines usually have three or more power-driven rollers. One roller runs partially immersed in the coating and transfers the coating to a second, parallel roller. The strip or sheet to be coated is run between the second and third roller and is coated by transfer of coating from the second roller. The quantity of coating applied to the sheet or strip is established by the distance between the rollers.

THE AIR POLLUTION PROBLEM

Air Contaminants from Paint Spray Booths

The discharge from a paint spray booth consists of particulate matter and organic solvent vapors. The particulate matter, representing solids in the coating, derives from that portion of the coating which does not adhere to the target of the spraying, the inside of the booth, or its accessories. The organic solvent vapors derive from the organic solvent, diluent, or thinner which is used with the coating and evaporates from coating suspended in the airstream, on the target of the spraying, or on the inside surfaces of the booth and its accessories. The choice of the spraying method, air atomization, electrostatic, or other, is a factor in determining the amount of overspray, that is, the amount of sprayed coating which misses the article being coated. The configuration of the surface to be sprayed is another factor influencing the amount of overspray. Table 232 gives some typical overspray percentages.

The particulate matter consists of fine coating particles, whose concentration seldom exceeds 0.01 grain per scf of unfiltered exhaust. Despite this small concentration, the location of the exhaust stack must be carefully selected so as to prevent the coating from depositing or spotting on neighboring or company property.

Solvent concentrations in spray booth effluents vary from 100 to 200 ppm. Solvent emissions from the spray booth stacks vary widely with extent of operation, from less than 1 to over 3,000 pounds per day. Organic solvent vapors, in general, take part in atmospheric photochemical reactions leading to eye irritation and other photochemical smog effects. A more detailed discussion and listing of the principal photochemically reactive and nonphotochemically reactive solvents

Table 232. PERCENT OF OVERSPRAY AS A FUNCTION OF SPRAYING METHOD AND SPRAYED SURFACE

Method of spraying	Flat surfaces	Table leg surface	Bird cage surface
Air atomization	50	85	90
Airless	20 to 25	90	90
Electrostatic			
Disc	5	5 to 10	5 to 10
Airless	20	30	30
Air-atomized	25	35	35

are found in the section "Solvents and Their Uses." Solvent odors also may cause local public nuisances.

Essentially, all the solvent in or added to the coating mixture eventually is evaporated and emitted to the atmosphere. A notable exception, however, would be the styrene diluent in a polyester resin coating mixture. The styrene diluent is polymerized along with the polyester resin, thus classifying it as a reactant. Although organic solvents have different evaporation rates, solvent emissions by flash-off can be estimated at various times following the coating operation from the specific composite solvent formulation. Figure 655 relates solvent flash-off time with percent solvent emission for various classifications of coatings. Flash-off can be defined as that quantity (in terms of percent or weight) of solvent evaporated, under ambient or forced conditions, from the surfaces of coated parts during a specified time period.

The following examples show some factors to be considered in determining the solvent control measures required to operate the surface coating equipment in compliance with air pollution emission standards. Note that the solvent emission due to flash-off of solvent in the air space surrounding the coated article after it leaves a spray booth is added to other emissions because of the provisions of Rule 66(b) and (c).

Problem:

1. Calculate the weight of solvent emitted from a spray booth and associated oven.

2. Evaluate spray booth emissions with respect to Rule 66.

Given:

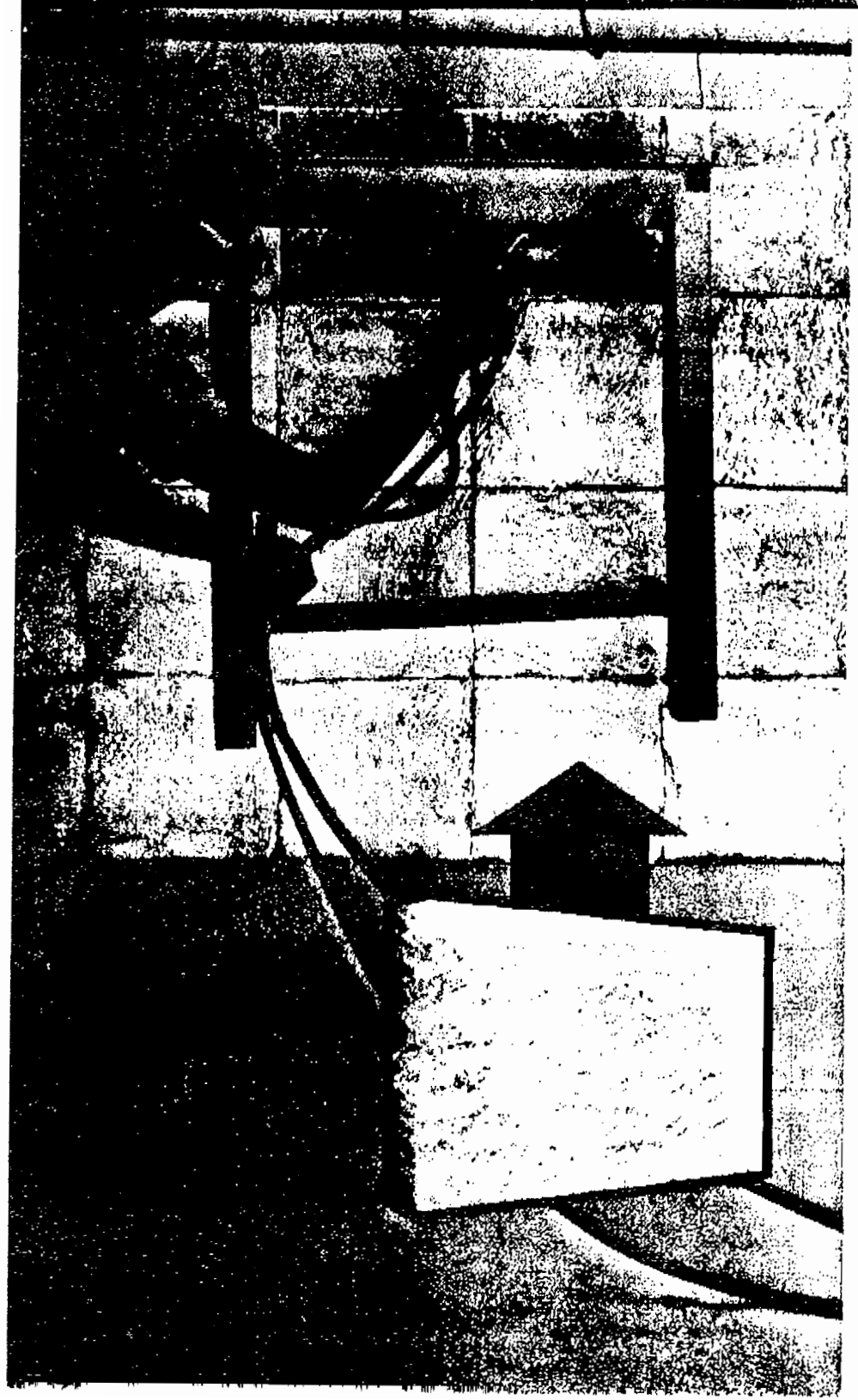
A conveyorized air-atomized electrostatic spray booth in which 15 gallons per day of reduced alkyd enamel (5 gallons of enamel plus 10 gallons of

APPENDIX C

MANUFACTURERS SPECIFICATIONS ON PAINT ARRESTOR FILTERS

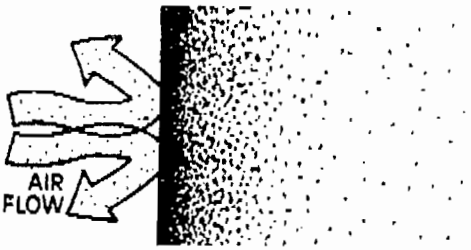
PROTECT SPRAY BOOTH EXHAUST SYSTEMS

OVERSPRAY COLLECTOR



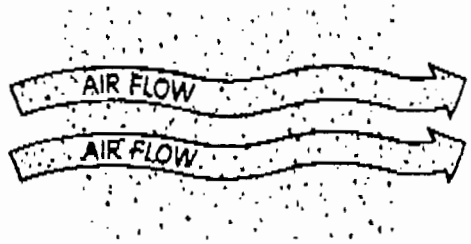
Conventional paper pads and fiberglass air filters fail to provide the filtration required in a spray booth for one of two reasons:

1. **THEY FAIL TO LET PAINT PARTICLES PENETRATE INTO THE PAD**



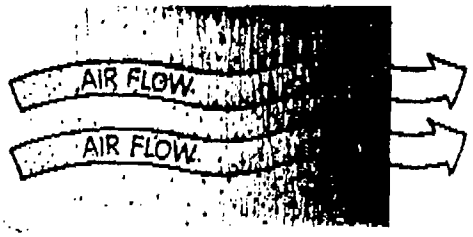
These overspray "filters" don't collect paint particles, they simply stop them. Such pads quickly face load and then nothing gets through—not even air! Exhaust fans start working overtime. Overspray particles bounce back into the booth. This affects visibility and booth efficiency.

2. **OTHER "FILTERS" LET TOO MUCH OVERSPRAY THROUGH**



Here are filters that last a long time—but they don't do anything! Overspray particles pass through these filters and paint builds up on fans, fan motors and vent stacks. Overspray particles that escape are vented into the outside area. The result is expensive downtime for extensive cleaning and replacement of system components, liability problems and EPA headaches.

Chemco overspray collector pads are specifically designed for spray booths

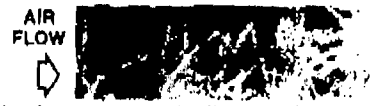


Chemco offers several types of overspray collector pads designed to meet specific spraying needs. These pads stop an average of 98% of all paint particles and *collect them inside the pad.* Chemco pads have continuous filament glass fibers and gradually increase in density from the front of the pad to the back. Overspray particles get in, but they don't get out!

Chemco overspray collector pad users gain these important benefits

1. Paint particles don't escape into the outside environment.
2. Paint particles don't bounce back into the booth. Visibility and productivity are increased. Product rejects are reduced.
3. Booth shutdowns and exhaust system maintenance are significantly reduced.
4. Individual overspray collector pads can be selectively changed.
5. Chemco overspray collectors cost less than other filters.

HUSKY™ HIGH SOLIDS COLLECTORS



Designed specifically for high solids sprays, these collectors work effectively up to six times longer than other filters in a high solids environment.

DUO-PAD COLLECTORS

These popular overspray collectors are recommended for multi-purpose baked and air dry types of coatings. If face of pad becomes loaded with paint, it can be peeled away, almost doubling the effective life of the pad.

MONO-PAD COLLECTORS

The Mono-Pad's open weave is recommended for excessively wet materials, fast-dry coatings, water reducible coatings and lacquer fillers and sealers.

PD (PROGRESSIVE DENSITY) COLLECTORS

These unique pads are ideal where booth location demands maximum filtration of overspray because of venting into residential areas, parking lots or other sensitive areas.

SLIM PAD COLLECTORS

Designed specifically to meet OSA requirements for two filter layers. Two SLIM PADS are far more effective than two layers of other filters.

ANDREA CONVERSION COLLECTORS

CHEMCO's Andrea Conversion Overspray Collectors are more efficient and cost effective than Andrea "pleated cardboard" filters. With Chemco's specially designed snap-in grids, Andrea booth systems can be quickly and economically converted. No tools or fasteners are required. CHEMCO's Andrea Conversion Overspray Collectors provide immediate payoffs:

- ☐ A direct saving of 50% to 75% compared to the cost of Andrea pleated filters.
- ☐ Installation and individual replacement of Chemco's Andrea Conversion (AC) Collectors is faster and easier.
- ☐ Disposal is more convenient.

CONVERSION GRIDS: Specially sized snap-in grids are available to easily convert Andrea type booths to use the more efficient, lower cost Chemco collectors.

For maximum spray booth efficiency and conformance with OSHA and EPA requirements, use CHEMCO's overspray collector pads

OVERSPRAY COLLECTORS

TYPE	PAD SIZE* (INCHES)	PADS PER CARTON
HUSKY HIGH SOLIDS PAD	20 X 20 X 2	100 or 250
	20 X 25 X 2	100 or 200
	16 X 20 X 2	100 or 250
	16 X 25 X 2	100 or 200
DUO-PAD	20 X 20 X 2	100 or 250
	20 X 25 X 2	100 or 200
	16 X 20 X 2	100 or 250
	16 X 25 X 2	100 or 200
MONO-PAD	20 X 20 X 2	100 or 250
	20 X 25 X 2	100 or 200
	16 X 20 X 2	100 or 250
	16 X 25 X 2	100 or 200
PD (PROGRESSIVE DENSITY) PAD	20 X 20 X 2	100 or 200
	20 X 25 X 2	100 or 200
	16 X 20 X 2	100 or 200
	16 X 25 X 2	100 or 200
SLIM PAD	20 X 20 X 1½	100 or 250
	20 X 25 X 1½	100 or 200
	16 X 20 X 1½	100 or 250
	16 X 25 X 1½	100 or 200
A.C. (ANDREA CONVERSION) PAD	25 X 36 X 2	50

* Sizes are nominal. All pads are cut ½" oversize for good edge sealing.

CUSTOM SIZES: All types of Chemco overspray collectors can be cut to any size required. They are also available in roll form and can be cut in any width ranging from 12" to 96".

APPENDIX D

WHEELABRATOR AND EQUIPMENT, CORP.
BAGHOUSE DESIGN CRITERIA
AND SPECIFICATIONS

This MANUAL Has Been Prepared for

GOLD COOPERAGE

NEWARK, NEW JERSEY

To Insure Proper Operation and Service of

MACHINE #45 Knocked Down Dust Collector

SERIAL NO. A-28303

CUSTOMER ORDER NO. _____ DATE SHIPPED _____

THE AMERICAN MOLDER
TRADE MARK REG U S PAT OFF

American
WHEELABRATOR & EQUIPMENT CORP.
MISHAWAKA, INDIANA

Engine for Shot Blast Machine

BAGHOUSE DESIGN DATA FOR METAL BLAST CLEANING APPLICATIONS

MICRON RANGE AND PERCENT BY WEIGHT AT INLET OF DUST COLLECTOR	FRACTIONAL EFFICIENCY OF A WELL MAINTAINED BAGHOUSE
0 - 0.5 Microns Up to 10%	92%
0.5 - 1.5 Microns Up to 10%	97%
1 - 5.0 Microns Up to 40%	99.9%
5.0 - 10.0 Microns Approx. 17%	99.97%
10.0 - 20.0 Microns Up to 12%	99.97%
Over 20.0 Microns Up to 11%	99.99%

Typical grain loading at inlet of dust collector is 4 grains/ft.^{3}

Typical grain loading out of dust collector (discharge) is 0.015 grains/ft.^{3}

Threshold of visibility is 0.15 grain/ft.^{3}

Overall unit efficiency (estimated) 99.5% by weight.

Estimated based on summarization of tests performed by various metal blast cleaning users and consultants during the past 20 to 30 years.

AMERICAN FOUNDRY EQUIPMENT COMPANY
MISHAWAKA, INDIANA

SALES-ENGINEERING DATA NEW DUSTUBE COLLECTOR SPECIFICATIONS.

COLLECTOR NUMBER	INSIDE LENGTH	CLOTH AREA SQ. FT.	CAPACITY 3:1 RATIO C.F.M.	CAPACITY 4:1 RATIO C.F.M.	NO. TUBES	NO. HOPPERS	SHAKER MOTORS 1800 R.P.M.	WEIGHT COLLECTOR	WEIGHT INC. 10'-SUPP.	SHIPPING WEIGHT WITH SUPPORTS
45	4'-0"	940	2820	3760	96	1	1-½ HP.	2992	4218	4850
55	5'-0"	1175	3525	4700	120	1	1-½ HP.	3420	4671	5375
65	6'-0"	1410	4230	5640	144	1	1-½ HP.	3848	5124	5900
75	7'-0"	1645	4935	6580	168	1	1-¾ HP.	4276	5577	6400
85	8'-0"	1880	5640	7520	192	2	1-¾ HP.	4704	6030	6925
95	9'-0"	2115	6345	8460	216	2	1-¾ HP.	5132	6483	7450
105	10'-0"	2350	7050	9400	240	2	1-1 HP.	5560	6936	7975
115	11'-0"	2585	7755	10340	264	2	1-1 HP.	5988	7903	9100
125	12'-0"	2820	8460	11280	288	2	1-1 HP.	6416	8356	9625
135	13'-0"	3055	9165	12220	312	2	2-¾ HP.	7044	9009	10380
145	14'-0"	3290	9870	13160	336	2	2-¾ HP.	7472	9462	10900
155	15'-0"	3525	10575	14100	360	3	2-¾ HP.	7900	9915	11400
165	16'-0"	3760	11280	15040	384	3	2-¾ HP.	8328	10368	11925
175	17'-0"	3995	11985	15980	408	3	2-¾ HP	8756	10821	12450
185	18'-0"	4230	12690	16920	432	3	2-¾ HP.	9184	11274	12950
195	19'-0"	4465	13395	17860	456	3	2-1 HP.	9612	11727	13525
205	20'-0"	4700	14100	18800	480	4	2-1 HP.	10040	12180	14000
215	21'-0"	4935	14805	19740	504	4	2-1 HP.	10468	12633	14525
225	22'-0"	5170	15510	20680	528	4	2-1 HP.	10896	13086	15050
235	23'-0"	5405	16215	21620	552	4	2-1 HP.	11324	14049	16150
245	24'-0"	5640	16920	22560	576	4	2-1 HP.	11752	14502	16700

LARGER UNITS MAY BE FIGURED FROM ABOVE DATA. FOR EXAMPLE, A #305. COLLECTOR WOULD BE EQUIVALENT TO A #205 AND #105 COMBINED.

DATE 5-4-38
APPR'D
NO. SD-508

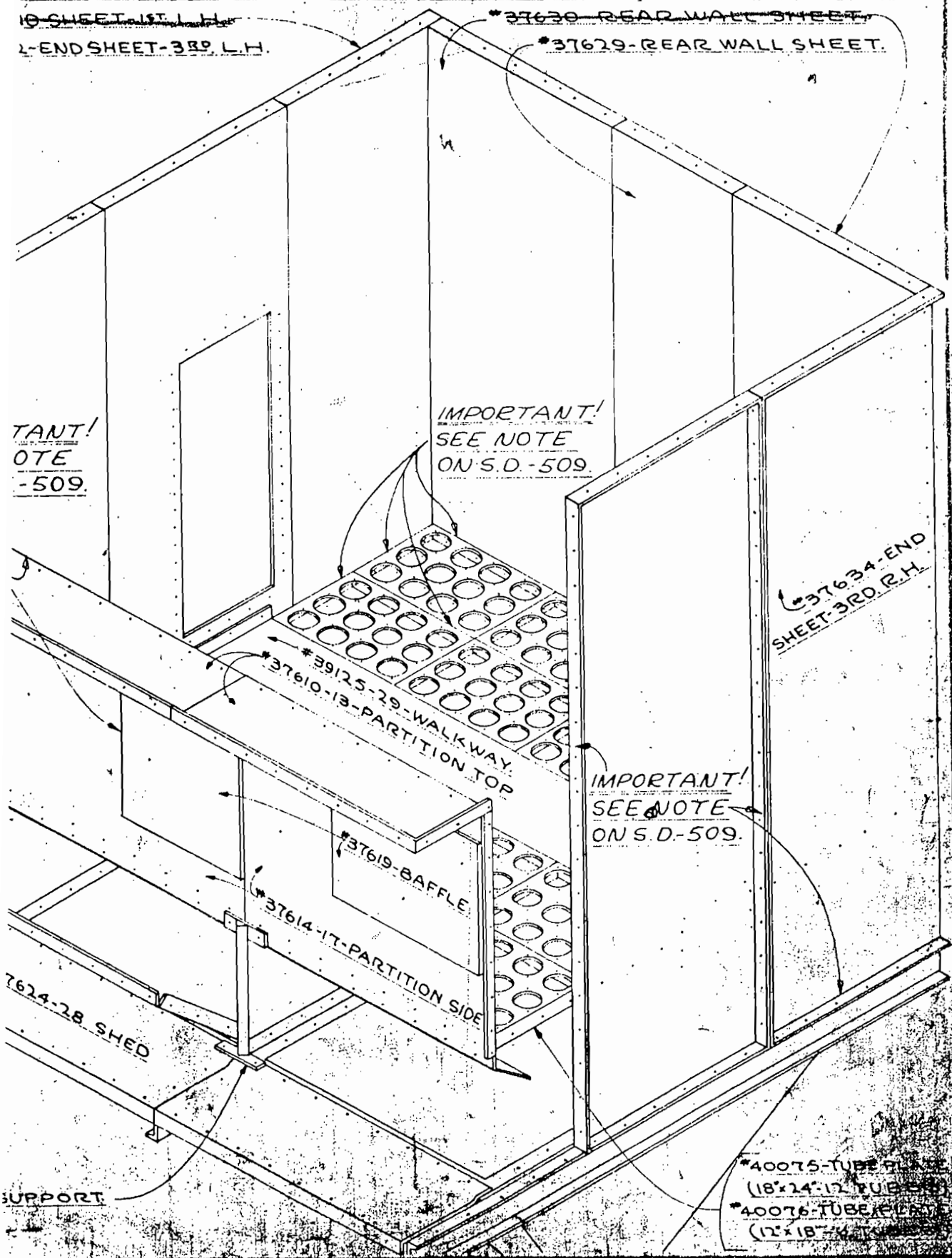
AMERICAN FOUNDRY EQUIPMENT COMPANY

MISHAWAKA, INDIANA

BEST AVAILABLE COPY

AIRPLANE VIEW SHOWING ASSEM. OF CELL PLATES, REAR WALL SHEETS, AND BAFFLE CHAMBER.

NGINEERING DATA



Loaned subject to return upon demand. It is understood that it shall not be used for any purpose detrimental to the interests of

APPROVED 3-10-37

NO. S.D-690

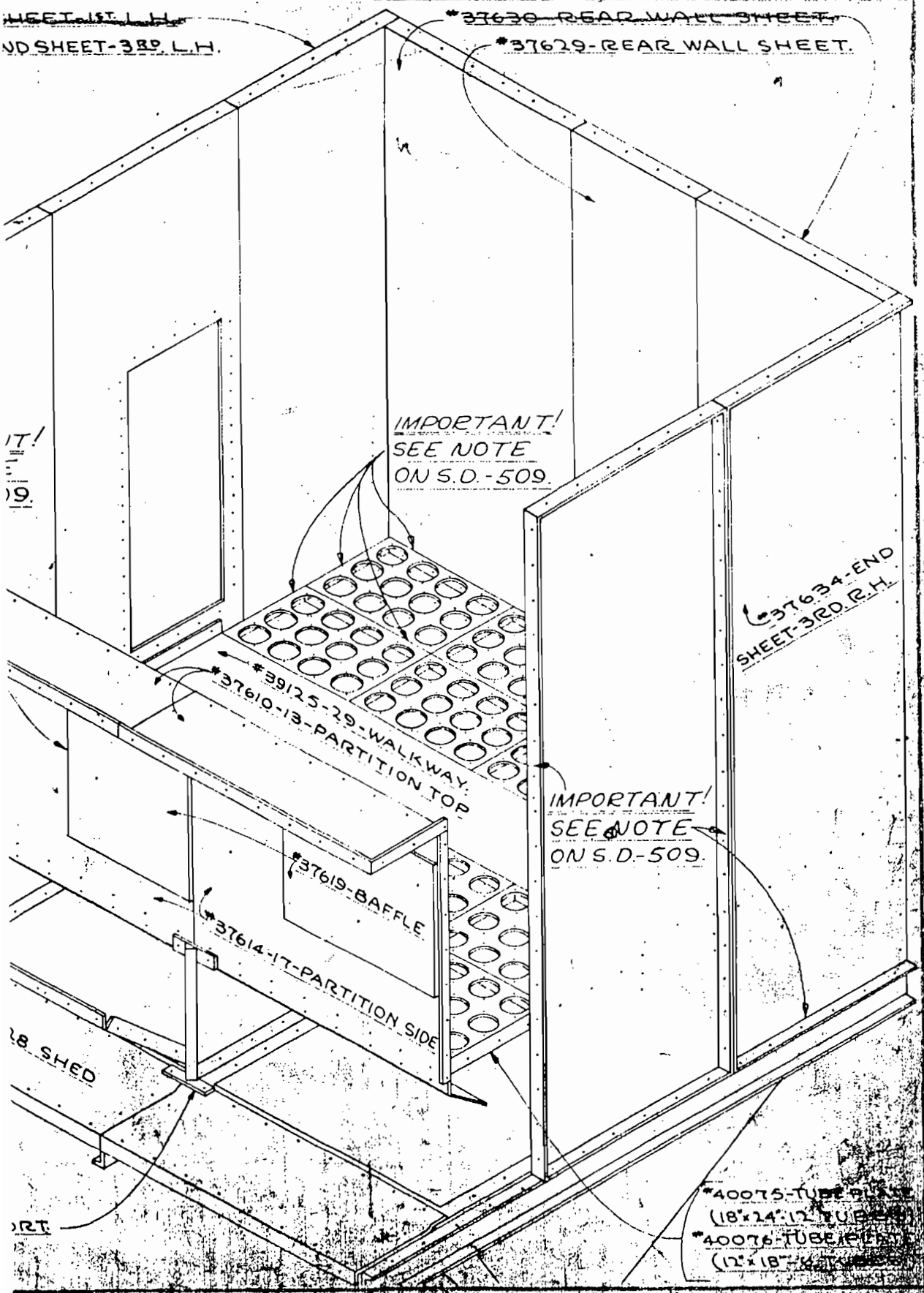
DRAWING No. 2135

DATE

AMERICAN FOUNDRY EQUIPMENT COMPANY

MISHAWAKA, INDIANA

AIRPLANE VIEW SHOWING ASSEM. OF CELL PLATES, REAR WALL SHEETS, AND BAFFLE CHAMBER.



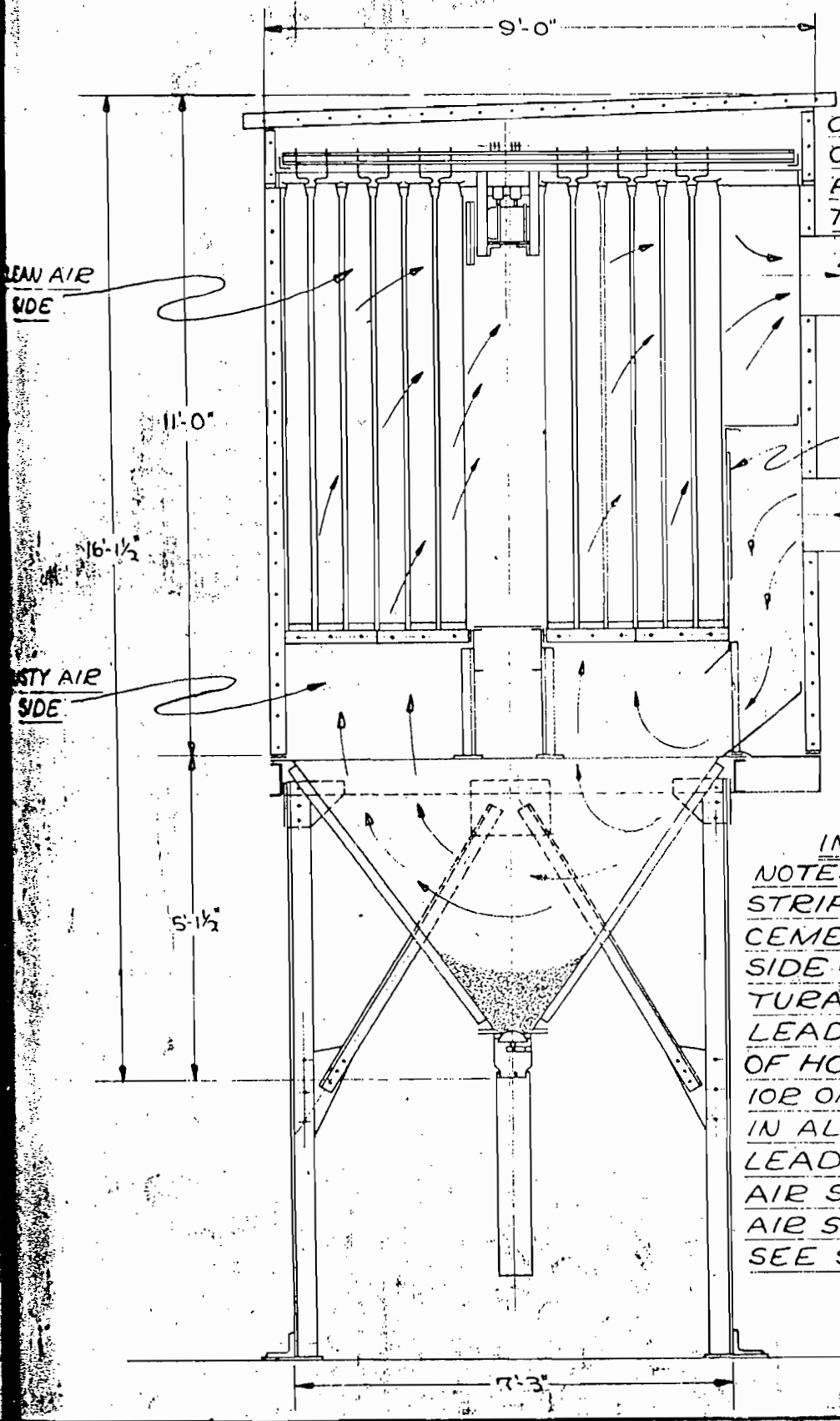
Subject to return upon demand. It is understood that [illegible] and for any purpose detrimental to the interests of [illegible]

DRWN 3-10-37 APPR'D

NO. S.D.-690

AMERICAN FOUNDRY EQUIPMENT COMPANY
MISHAWAKA, INDIANA

SALES—ENGINEERING DATA CROSS SECTION - NEW DUSTUBE COLLECTOR.



CONNECT TO ROUND COLLAR ON SIDE OF FAN CASING CENTERED WITH FAN SHAFT.

BAFFLE PLATE

INLET PIPE FROM DUST SOURCE. BE SURE THAT BAFFLE PLATE IS DIRECTLY IN LINE WITH PIPE.

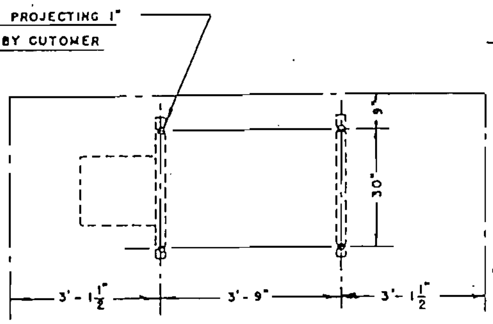
IMPORTANT!

NOTE:- USE SOFT FELT STRIP WITH PLASTIC CEMENT ON EACH SIDE OF ALL STRUCTURAL JOINTS WHICH LEAD FROM OUTSIDE OF HOUSING TO INTERIOR OF HOUSING, ALSO IN ALL JOINTS WHICH LEAD FROM DUSTY AIR SIDE TO CLEAN AIR SIDE OF HOUSING. SEE S.D. 509.

DATE 11-30-37
APPR'D [illegible]
NO. S.D.-510

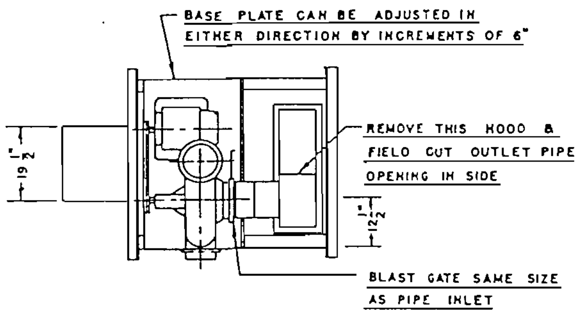
60 C 1993

FAN SIZE	FAN INLET	FAN OUTLET	A	B	C
#6 C.I.	6" O.D.	6" O.D.	14 15/16"	14'-4 11/16"	14'-4 5/8"
#7 C.I.	7" O.D.	7" O.D.	16 13/16"	14'-8 3/16"	14'-7 15/16"
#8 C.I.	8" O.D.	8" O.D.	18 7/16"	14'-11 1/4"	14'-10 15/16"
#9 C.I.	9" O.D.	9" O.D.	20 3/16"	15'-2 11/16"	15'-2 1/16"
Ⓐ #111 XL	11" O.D.	9 7/8" X 10 7/8"	22 3/16"	15'-5 7/8"	15'-3 1/2"
7-LS	7" O.D.	6 1/16" x 6 7/8"	21 3/16"	14'-11 7/8"	
#9 C.B. DES.16	9" O.D.	7 11/16" X 8 11/16"	21 3/16"	15'-2 3/16"	15'-0 7/8"
#25 C.B.F.	9 3/8" O.D.	8 1/4" X 8 1/4"	18 7/16"	14'-11 1/4"	
#141 H.Y.B.	9" O.D.	7 7/8" X 8 1/4"	21 3/16"	15'-1 3/16"	
12 1/4 C.B.	13 1/2" O.D.	10 7/8" X 12 1/8"	19 11/16"	15'-0 1/8"	



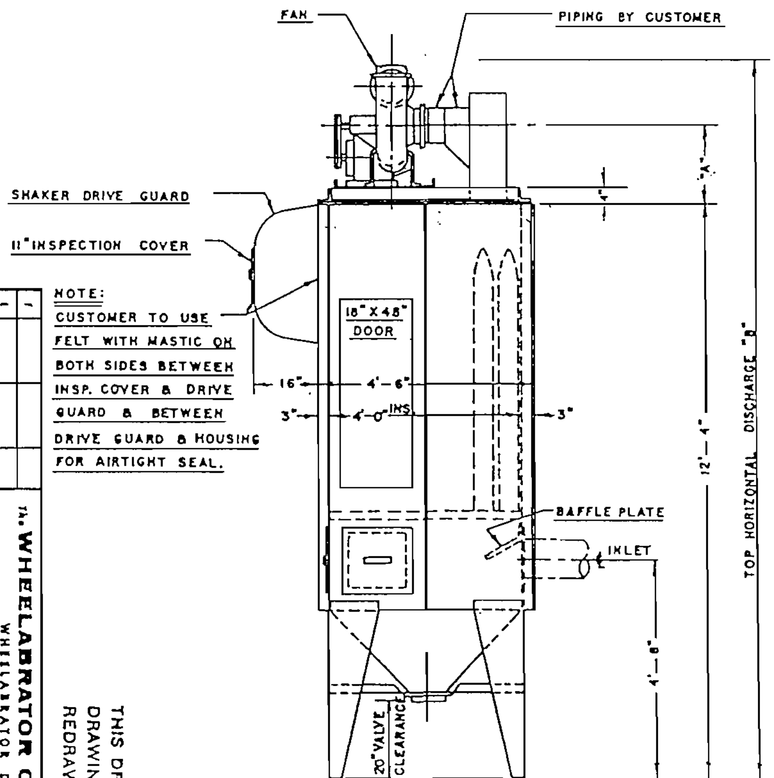
ANCHOR BOLT LAYOUT & CLEARANCE DIMENSIONS

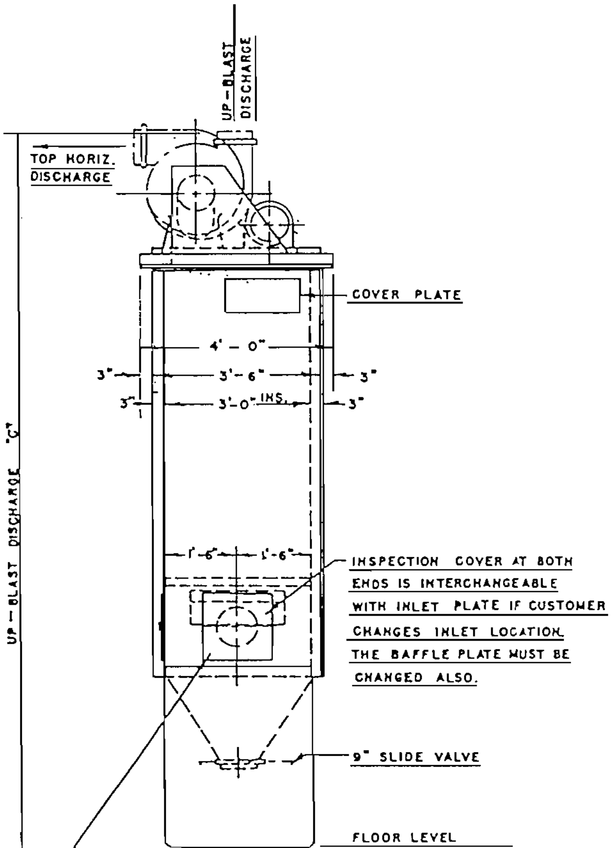
APPROX. WT. OF COLLECTOR — 2070#



INSTALLATION NOTE:
CUSTOMER TO REMOVE SHIPPING ANGLE FROM TOP OF SHAKER CHANNELS BEFORE MOUNTING SHAKER FRAME. WHEN BOLTING SHAKER FRAME TO HOUSING, MAKE SURE HEADS OF BOLTS ARE ON INSIDE OF HOUSING. FAN, MOTOR, DRIVE BLAST GATE & CLAMP BANDS BY CUSTOMER UNLESS SPECIFICALLY LISTED ON SALES ORDER.

NOTE:
CUSTOMER TO USE FELT WITH MASTIC ON BOTH SIDES BETWEEN INSP. COVER & DRIVE GUARD & BETWEEN DRIVE GUARD & HOUSING FOR AIRTIGHT SEAL.





IMPORTANT NOTE:
CUSTOMER TO REMOVE 17 1/2" SQ. COVER PLATE & CUT INLET OPENING IN PLATE & SUPPLY AN AIRTIGHT INLET CONNECTION. PIPING DIA. TO BE DETERMINED BY SIZE OF PIPING ON EQUIPMENT BEING VENTILATED

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE (PLUS OR MINUS) MACHINING .010" — STRUCTURAL OVERALL 1/4" — ALL OTHERS 1/16" NON-ACCUMULATIVE

THIS DRAWING SUPERSEDES DRAWING OF SAME NUMBER REDRAWN 1/5/66 BY ATH

THE WHEELABRATOR CORPORATION
WHEELABRATOR DIVISION
MISHAWAKA INDIANA U.S.A.
WHEELABRATOR CORPORATION OF CANADA, LTD. SCARBOROUGH, ONTARIO

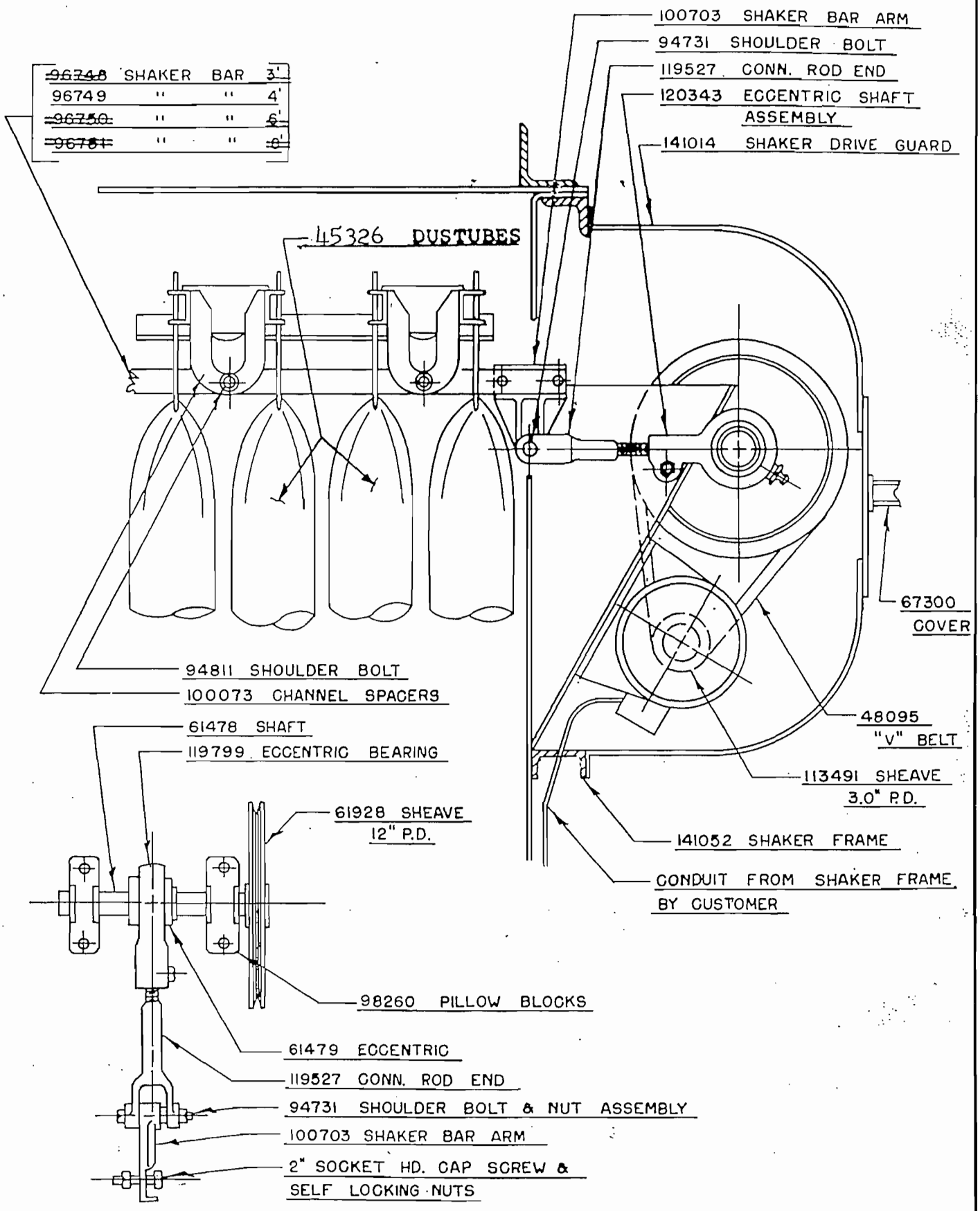
GENERAL ARRANGEMENT
#4 MODEL TO-AC D/C (OVERMOUNT)

111 XL FAN ADDED	1-15-63	HOM	
SCALE 1/2" = 1'	DRAWN DLR	TRACED ATH	
DATE 12-1-60			

60 C 1993

NO. MODEL 70 -A ASSEM. DUST COLLECTOR

BEST AVAILABLE COPY



DETAILS OF ECCENTRIC SHAFT ASSEMBLY

WHEELABRATOR CORPORATION
MISHAWAKA, INDIANA

R.D.M. 4-21-54

S.D. 2594

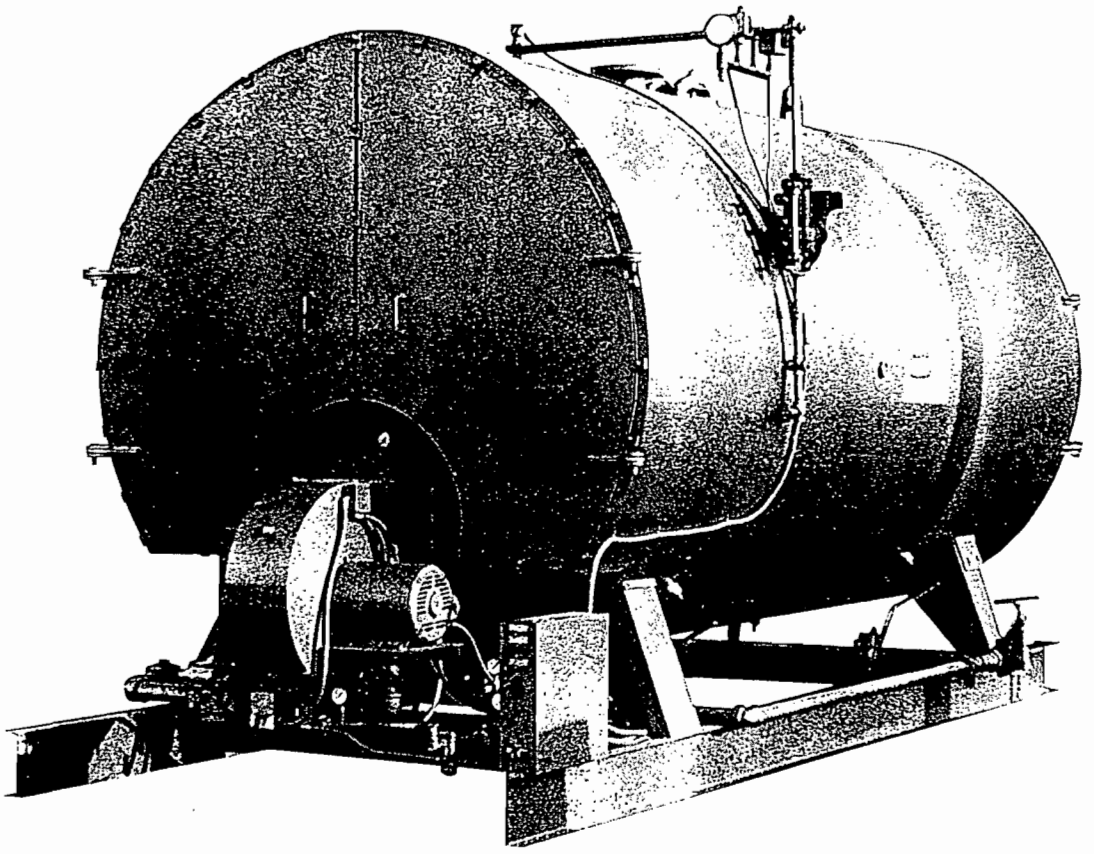
APPENDIX E

ABCO BOILER SPECIFICATIONS

abco TYPE AMA BOILER

SCOTCH MARINE THREE PASS WET BACK PACKAGE

Forced Draft Gas Fired
Gas and/or Pressure Atomized Light Oil Fired
Gas and/or air Atomized Light/Heavy Oil Fired

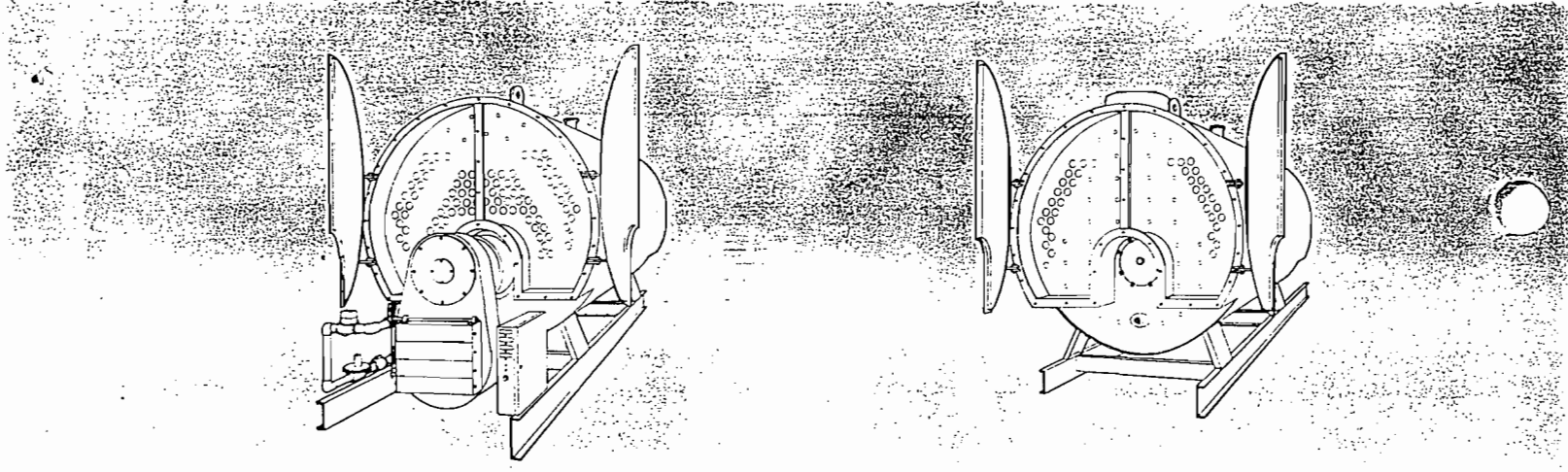


15-200 PSI Steam
30-160 PSI Water
100-500 Horsepower
3,360,000-16,800,000 BTU/HR
3,450-17,250 Lbs. Steam/HR

abco

2675 E. Hwy. 80 • P.O. Box 268 • ABILENE, TEXAS 79604 • (915) 677-2011 • Telex 73-9421

Boilers and Process Oil Heaters



The ▢▢▢▢ Type AMA Three Pass Fire Tube Scotch Marine Boiler-Burner Package Unit is built according to the ASME Code for Boilers and inspected by Hartford Steam Boiler Inspection and Insurance Company's National Board Inspector.Each boiler has these features and distinct advantages:

- No Refractory
- ASME Code
- National Board
- X Ray Quality Welds
- Stress Relieved
- 2 1/2'' O.D 11BWG SA 178 Tubes
- SA 285C or SA515 Fire Box Quality Steel
- Hydrostatically Tested to 1.5 Times Design Pressure
- 5 Sq. Ft. of Heating Surface Per Horsepower
- 80% Efficiency Minimum
- Rear Crawl in Door
- Low Heat Release
- 3'' Insulation with Steel Jacket
- Hinged Doors Front & Rear With Insulation
- 6-3x4 Hand Hole Plates
- 1-11x15 Man Hole Plate
- Rolled & Beaded Tube Ends
- Skid Mounted
- Large Furnace Volumes

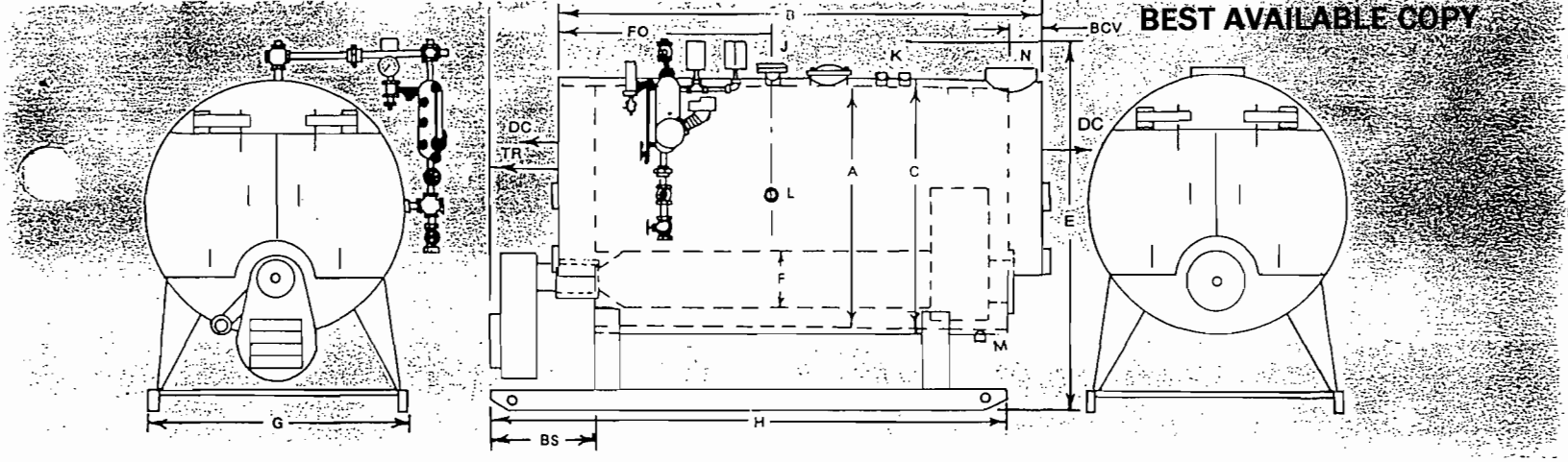
THE FAMOUS ▢▢▢▢ FORCED DRAFT BURNER, long known for it's low noise level, has been designed to meet the important requirements of the modern boiler user. It is ideally suited for firing under any load demand. It is a master of efficiency and economy, being simple to operate and maintain. These burners are designed to operate against a positive pressure, with the blower supplying all the combustion air. All burners have electronic flame safeguard combustion controls with pre- and post-purge, gas electric pilot, UV scanner, and full modulation.

The swirling corkscrew flame produced is relativ short and intense, making maximum use of h transfer by radiation through the fire tube wall, which is twice as effective as heat transferred through the return tubes. Air for combustion is controlled automatically by the modulation motor and linkage through the entire firing range. The flame travels up to three times the length of the firing tube before actually leaving it, giving higher overall efficiencies of combustion and lower stack temperatures.

Burner Equipped

	Gas	Pressure Atomizing	Air Atomizing
Programming Relay R414OG	✓	✓	✓
Modulation Motor	✓	✓	✓
Gas Electric Pilot	✓	✓	✓
Fuel Pressure Regulator	✓	✓	✓
Fuel Stop	✓	✓	✓
Control Panel NEMA 1	✓	✓	✓
UV Scanner	✓	✓	✓
Blower, Motor & Starter	✓	✓	✓
Air Interlock Switch	✓	✓	✓
Panel Switches & Lights	✓	✓	✓
Main Fuel Valve	✓	✓	✓
Fuel Pressure Gauge	✓	✓	✓
Remote Oil Pump		✓	✓
Oil Nozzle		✓	✓
Oil Strainer		✓	✓
Remote Air Compressor Assy.			✓
Electric Preheater			✓
Air Purge, Filter & Relief			✓*

* Heavy Oil Only

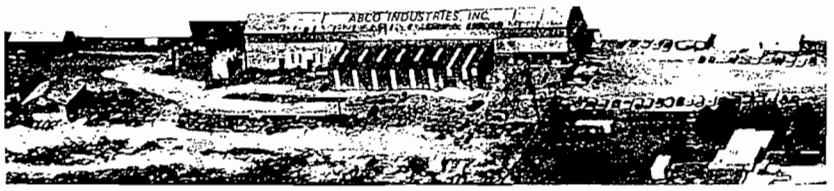


WATER COLUMN & DRAIN VALVE
LOW WATER CUTOFF
PUMP CONTROLLER
WATER GAUGE GLASS
TRI COCKS
PRESSURE GAUGE
SYPHON & TEST COCK
BLOWDOWN VALVES
MODULATION CONTROLLER
HIGH LIMIT
RELIEF VALVE (S)

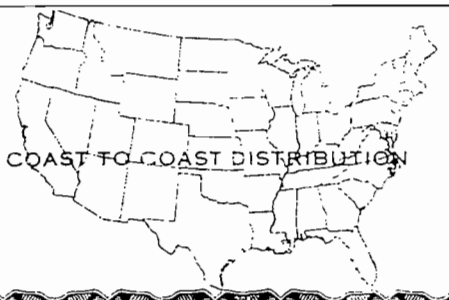
LOW WATER CUTOFF
COMBINATION TEMPERATURE AND PRESSURE GAUGE
BOILER DRAIN VALVE
MODULATING CONTROLLER
HIGH LIMIT
RELIEF VALVE (S)

Horsepower		100	125	150	200	250	300	350	400	500	600	700
Gross Output — MBH		3360	4200	5050	6730	8400	10000	11780	13480	16800	20,200	23,520
Steam Lbs./HR from and at 212 °F		3450	4312	5175	6900	8625	10350	12075	13800	17250	20,700	24,150
Heating Surface — Sq. Ft.		500	625	750	1000	1250	1500	1750	2000	2500	3,000	3,500
Heat Release — BTU/cu ft. of Furnace Volume		86,192	87,939	84,905	80,152	83,333	81,290	84,385	88,188	88,778	84,478	86,217
Firing Rate — Gas 1000 BTU-GFH		4200	5250	8300	8400	10500	12600	14700	16800	21000	25,200	29,400
LPG 91,5000 BTU-GPH		45.9	57.3	68.8	91.8	114.7	137.7	160.6	183.6	229.5	275.4	321
No. 2 Oil — 140,000 BTU-GPH		30	37.5	45	60	75	90	105	120	150	180	210
Heavy Oil - 150,000 BTU-GPH		28	35	42	56	70	84	98	112	140	168	196
Furnace Volume — cu. ft.		49.3	59.7	74.2	104.8	126.0	155.0	174.2	190.5	242.0	298	341
Boiler Diameter — inches	A	54	64	64	73	73	77	77	90	90	96	96
Length	B	153	146	167	175	205	217	243	221	265	275	326
Diameter over Insulation	C	58	68	68	77	77	82	82	94	94	100	100
Width Over Controls		68	78	78	87	87	92	92	104	104	110	110
Length Overall	D	170	162	186	194	230	241	267	245	289	301	351
Height Outlet and Vent		79	89	89	98	98	101	101	109	109	113	113
Height Over Controls	E	85	95	95	105	105	110	110	118	118	122	122
Fire Tube Diameter	F	24	26	25	32	32	34	34	36	36	40	40
Skids Width	G	54	64	64	74	74	78	78	90	90	96	96
Length	H	163	154	180	188	223	234	260	238	280	295	344
Height		20	20	20	20	20	14	14	12	12	12	12
Openings * Outlet												
High Pressure	J	3	3	4	4	4	4	4	4	6	6	6
Low Pressure		4	4	6	6	8	8	10	10	10	12	12
Front to Outlet	FO	56	44	63	65	79	85	93	87	108	134	154
Safety, High Pressure	K	1½	1 & 1¼	2-1¼	1¼ & 1½	2-1½	2 & 1½	2-2"	2-3 & 1	2-2 & 4	2-3 & 2	2-4&2-2
Low Pressure		1½ & 2	2-2	3-2	3-2 & 1¼	4-2	5-2	6-2	6-2	7-2	5-2	5-2&1¼
Feed, Steam	L	2	2	2	2	2	2	2	2	2	2	2
Water		4	4	4	4	4	4	4	6	6	6	6
Blowdown	M	2	2	2	2	2	2	2	2	2	2	2
Vent	N	18	18	20	20	22	26	26	30	30	34	36
Gas Line		2	2½	2½	3	3	3	3	3	2	3	3
Door Clearance, Front and Rear	DC	31	36	36	41	41	43	43	49	49	28	28
Burner front to front Skid	BS	28	28	28	28	28	35	35	35	35	42	42
Blower Motor-HP		1½	1½	1½	3	3	5	7½	7½	10	15	15
Approx. Weight Dry wt. cwt		140	160	200	235	270	310	340	400	460	500	520
Wet wt.cwt		190	210	260	310	370	410	470	536	680	740	860
Tube Removal Space Front	TR	107	100	124	130	158	164	100	162	206	223	258

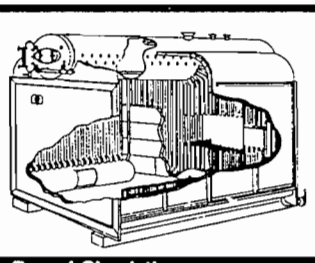
* All connections above 3" IPS are 150PSI flange! All motors to 1 HP 110/60; 1 HP and over 240-480/60-3.
All specifications subject to change without notice.

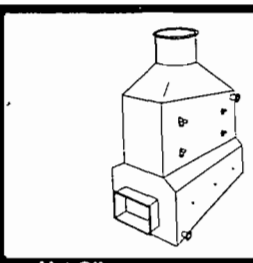


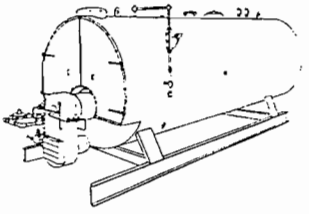
- LOW POWER REQUIREMENTS
- LOW NOISE LEVEL
- NO REFRACTORY IN REAR WALL
- 80% MINIMUM EFFICIENCY
- LARGE FURNACE VOLUME
- 5 SQUARE FEET OF HEATING SURFACE PER HORSEPOWER
- SIMPLE DESIGN & OPERATION
- LOW MAINTENANCE

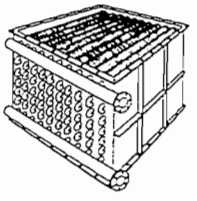


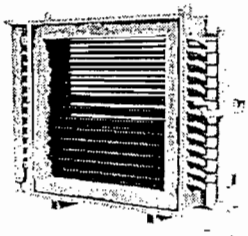
WARRANTY: All workmanship and materials of standard manufacture are under warranty under proper use for one year from date of shipment and will be repaired or replaced by the factory providing the defective part is first returned prepaid by the customer to the factory at Abilene, Texas. Replaced or repaired parts will be return shipped by the lowest cost transportation collect, but no other claim whatsoever will be allowed nor will ABCO be subject to any other or further liability on account of such defection. No cash reimbursements will be allowed for defective parts returned. The warranty herein extends to the original customer-purchaser and is not assignable or transferable. Goods of other manufacturers sold by ABCO Industries, Inc. are not guaranteed by ABCO beyond their manufacturer's warranty and should be sent directly to them for handling. The warranty shall not apply to parts or components that have previously been repaired or replaced by other than factory authorized distributors or to any part that has been altered or defaced in any way. ABCO Industries, Inc. assumes no responsibility for consequential damages of any kind, and the purchaser or user by acceptance of the equipment assumes responsibility for the consequences of its use or misuse. All statutory and implied warranties, except of title, are negatived and excluded. The foregoing provisions are in lieu of all other warranties, guarantees, obligations or liabilities on the part of the company.

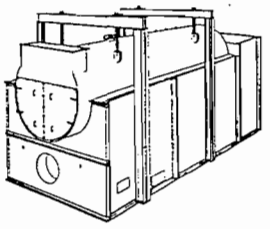

Forced Circulation

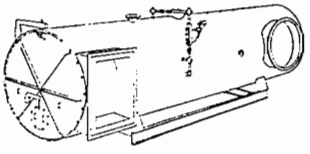

Hot Oil

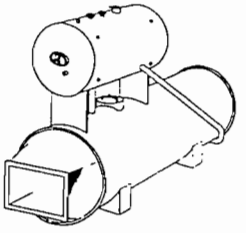

Package Scotch


Economisers


Superheaters


Solid Fuel Fired


Waste Heat Recovery Boiler Fire Tube Integral Drum


Waste Heat Recovery Boiler Fire Tube Elevated Drum