

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM  
GOVERNOR

Victoria J. Tschinkel  
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

December 23, 1982

CERTIFIED MAIL-RETURN RECEIPT REQUESTED


Mr. P. W. Moldenhauer  
Belcher Oil Company  
Post Office Box 525500  
Miami, Florida 33152

Dear Mr. Moldenhauer:

Enclosed is Permit Number AC 06-58230, dated December 22, 1982  
to Belcher Oil Company  
issued pursuant to Section 403, Florida Statutes.

Acceptance of the permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement actions for violation of the conditions and requirements thereof.

Sincerely,

  
C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

CHF/pa

Enclosure

cc: Edward E. Clark, P.E., Clark Engineers-Scientists  
Gary Carlson, Broward County Environmental Quality  
Control Board  
Jim Williams, DER Southeast Florida District

Belcher Oil Company-Port Everglades

Gasoline Bulk Terminal

Broward County

The construction application has been reviewed by the Department. Public notice of the Department's intent to issue was published in the Ft. Lauderdale News on November 13, 1982. The preliminary determination and technical evaluation were available for public inspection at the DER Southeast Florida District Office, the DER Bureau of Air Quality Management Office, and the Broward County Environmental Quality Control Board Office.

The following comments requesting revisions in two Specific Conditions were received from Mr. Tom Tittle with the DER Southeast Florida District Office:

Specific Conditions:

#1. From: Maximum allowable VOC emissions from the loading rack/vapor recovery system shall not exceed 15.7 lbs/hr (27.7 milligrams/liter, 1.62 grains/gallon) and 17.4 TPY (tons per year) of gasoline loaded.

To: Maximum allowable VOC emissions from the loading rack/vapor recovery system shall not exceed 27.7 milligrams/liter (1.62 grains/gallon, equivalent to 15.7 lbs/hr at maximum loading rate) and 17.4 TPY (tons per year) based on gasoline loaded.

#3. From: The average gasoline loading rate of the loading rack, total of the two loading positions, shall not exceed 68,000 gallons per hour.

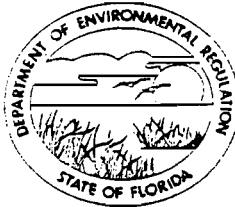
To: The maximum gasoline loading rate of the loading rack, total of the two loading positions, is 68,000 gallons per hour. Total annual gasoline throughput at the rack shall not exceed 3,600,000 barrels per year (bbls/yr).

Attachment #5. Interoffice Memorandum from Tom Tittle dated December 16, 1982.

The Bureau agrees with the comments and will incorporate these changes in the Specific Conditions of the Construction Permit AC 06-58230 in the final determination. It is recommended that the construction permit be issued as drafted, with the above revisions and Attachment incorporated.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM  
GOVERNOR  
VICTORIA J. TSCHINKEL  
SECRETARY

APPLICANT:

Belcher Oil Company  
Port Everglades Bulk Gasoline Terminal  
P. O. Box 525500  
Fort Lauderdale, Florida 33152

PERMIT/CERTIFICATION  
NO. AC 06-58230

COUNTY: Broward

PROJECT: Vapor Recovery  
Unit for Bulk Gasoline  
Terminal Loading Rack.

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2  
17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to  
perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and  
made a part hereof and specifically described as follows:

For the construction/installation of a vapor recovery unit for servicing the gasoline loading rack at the applicant's existing facility located at 2401 Eisenhower Blvd., Fort Lauderdale, Florida. The UTM coordinates are Zone 17-587.3 km East and 2886.3 km North.

Construction shall be in accordance with the permit application and plans, documents, amendments, and drawings except as otherwise noted on pages 3 and 4 of the "Specific Conditions".

Attachments are as follows:

1. Application to Construct Air Pollution Sources, DER Form 17-1.122(16).
2. C. H. Fancy's Letter of Incompleteness dated August 6, 1982.
3. John McNally's letter of response dated September 24, 1982.
4. Attachment to Specific Condition No. 5.
5. Interoffice Memorandum from Tom Tittle dated December 16, 1982.

PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions; and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.
3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.
4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.
6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.
7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.
9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.
10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.
11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.
12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
13. This permit also constitutes:
  - Determination of Best Available Control Technology (BACT)
  - Determination of Prevention of Significant Deterioration (PSD)
  - Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

SPECIFIC CONDITIONS:

1. Maximum allowable VOC emissions from the loading rack/vapor recovery system shall not exceed 27.7 milligrams/liter (1.62 grains/gallon, equivalent to 15.7 lbs/hr at maximum loading rate) and 17.4 TPY (tons per year) based on gasoline loaded.
2. Compliance with the mass emission limitation of Specific Condition No. 1 shall be determined in accordance with the method referred in 17-2.700(6)(c)2.b.(i), FAC (EPA 450/2-77-026, Appendix A). At least 30 days prior to the date of compliance testing, the DER Southeast Florida District Office or its designee shall be notified in order to witness the test.
3. The maximum gasoline loading rate of the loading rack, total of the two loading positions, is 68,000 gallons per hour. Total annual gasoline throughput at the rack shall not exceed 3,600,000 barrels per year (bbls/yr).
4. Annual operating reports shall be submitted to the DER Southeast Florida District Office or its designee. This report shall contain records of the gasoline throughput.
5. During the compliance test, the gasoline loading rate shall be representative of "normal operation" as outlined in the attached EPA test method guideline, EPA 450/2-77-026, Appendix A, section 5-2.
6. Prior to 90 days before the expiration of this permit a complete application for an operating permit and compliance test results shall be submitted to the DER Southeast Florida District Office or its designee. Full operation of the source may then be conducted in compliance with the terms of this permit until expiration or receipt of an operating permit.

PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

Expiration Date: June 1, 1983

Issued this 22 day of December, 1982

1 Pages Attached.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

Terry Cole  
Signature

PAGE 4 OF 4

ATTACHMENT 4

## **5.2 Terminal Status During Test Period**

The test procedure is designed to measure control system performance under conditions of normal operation. Normal operation will vary from terminal-to-terminal and from day-to-day. Therefore, no specific criteria can be set forth to define normal operation. The following guidelines are provided to assist in determining normal operation.

### **5.2.1 Closing of Loading Racks**

During the test period, all loading racks shall be open for each product line which is controlled by the system under test. Simultaneous use of more than one loading rack shall occur to the extent that such use would normally occur.

**5.2.2 Simultaneous use of more than one dispenser on each loading rack shall occur to the extent that such use would normally occur.**

**5.2.3 Dispensing rates shall be set at the maximum rate at which the equipment is designed to be operated. Automatic product dispensers are to be used according to normal operating practices.**

## **5.3 Vapor Control System Status During Tests**

Applicable operating parameters shall be monitored to demonstrate that the processing unit is operating at design levels. For intermittent vapor processing units employing a vapor holder, each test repetition shall include at least one fully automatic operation cycle of the vapor holder and processing device. Tank trucks shall be essentially leak free as determined by EPA Mobile Source Enforcement Division.



ATTACHMENT 5

State of Florida  
DEPARTMENT OF ENVIRONMENTAL REGULATION

**INTEROFFICE MEMORANDUM**

For Routing To District Offices And/Or To Other Than The Addressee		
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
From: _____	Date: _____	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due: _____	Date Due: _____	

TO: Bruce Mitchell, BAQM  
FROM: Tom Tittle/John Gaidry  
DATE: December 16, 1982  
SUBJECT: Application No. AC06-58230, Belcher Oil Gasoline Loading Rack

As discussed this morning, we are enclosing the suggested changes to specific conditions 1 and 3.

JG:ttbj

PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

SPECIFIC CONDITIONS:

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3. The maximum gasoline loading rate of the loading rack, total of the two loading positions, is 68,000 gallons per hour. Total annual gasoline throughput at the rack shall not exceed 3.6 million barrels/yr.
4. Annual operating reports shall be submitted to the DER Southeast Florida District Office or its designee. This report shall contain records of the gasoline throughput.
5. During the compliance test, the gasoline loading rate shall be representative of "normal operation" as outlined in the attached EPA test method guideline, EPA 450/2-77-026, Appendix A, section 5-2.
6. Prior to 90 days before the expiration of this permit a complete application for an operating permit and compliance test results shall be submitted to the DER Southeast Florida District Office or its designee. Full operation of the source may then be conducted in compliance with the terms of this permit until expiration or receipt of an operating permit.

3/20/82

John McNally signed

*[Handwritten signature]*

# Avoid Verbal Orders

"SAY IT IN WRITING"

No. 169

Date 12-16-82

To John J. McNally

Clark Engineers-Scientists, Inc.

7520 SW 57 Avenue

Miami, FL 33143

BRUCE MITCHELL SUGGESTED I COPY YOU WITH

OUR RECOMMENDATIONS ON THE WORDING OF THE

SPECIFIC CONDITIONS (ATTACHED).


Signed *[Handwritten signature]*



State of Florida  
DEPARTMENT OF ENVIRONMENTAL REGULATION

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From: _____	Date: _____	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due: _____	Date Due: _____	

TO: Victoria J. Tschinkel  
FROM: Clair Fancy   
DATE: December 22, 1982  
SUBJ: Approval and Signature of Air Construction Permit

Attached please find one Air Construction Permit for which the applicant is Belcher Oil Company - Port Everglades Bulk Gasoline Terminal. The proposed construction is for a vapor recovery unit for the gasoline loading rack at the applicant's existing facility in Ft. Lauderdale, Broward County, Florida.

Day 90, after which the permit would be issued by default, is December 26, 1982.

The Bureau recommends your approval and signature.

CF/bjm

Attachment

Belcher Oil Company-Port Everglades

Gasoline Bulk Terminal

Broward County

The construction application has been reviewed by the Department. Public notice of the Department's intent to issue was published in the Ft. Lauderdale News on November 13, 1982. The preliminary determination and technical evaluation were available for public inspection at the DER Southeast Florida District Office, the DER Bureau of Air Quality Management Office, and the Broward County Environmental Quality Control Board Office.

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**ATTACHMENT 5**

State of Florida  
DEPARTMENT OF ENVIRONMENTAL REGULATION

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Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due: _____	Date Due: _____	

TO: Bruce Mitchell, BAQM

FROM: Tom Tittle/John Galdry

DATE: December 16, 1982

SUBJECT: Application No. AC06-58230, Belcher Oil Gasoline Loading Rack

DER  
23 1982  
JG

As discussed this morning, we are enclosing the suggested changes to specific conditions 1 and 3.

JG:ttbj



PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

SPECIFIC CONDITIONS:

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Bruce,

John McNally copied

THT

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"SAY IT IN WRITING"

No. 169

Date 12-16-82

To John J. McNally

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7520 SW 57 Avenue

Miami, FL 33143

BRUCE MITCHELL SUCCEEDED I COPY YOU WITH

OUR RECOMMENDATIONS ON THE WORDING OF THE

SPECIFIC CONDITIONS (ATTACHED).

Signed Tom Little

TOPS



FORM 3373 LITHO IN U.S.A.

NOTICE—Keep This For Reference

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32301



BOB GRAHAM  
GOVERNOR  
VICTORIA J. TSCHINKEL  
SECRETARY

APPLICANT:

Belcher Oil Company  
Port Everglades Bulk Gasoline Terminal  
P. O. Box 525500  
Fort Lauderdale, Florida 33152

PERMIT/CERTIFICATION  
NO. AC 06-58230

COUNTY: Broward

PROJECT: Vapor Recovery  
Unit for Bulk Gasoline  
Terminal Loading Rack.

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction/installation of a vapor recovery unit for servicing the gasoline loading rack at the applicant's existing facility located at 2401 Eisenhower Blvd., Fort Lauderdale, Florida. The UTM coordinates are Zone 17-587.3 km East and 2886.3 km North.

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3. John McNally's letter of response dated September 24, 1982.
4. Attachment to Specific Condition No. 5.
5. Interoffice Memorandum from Tom Tittle dated December 16, 1982.

PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.

6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.

7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.

9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

13. This permit also constitutes:

- Determination of Best Available Control Technology (BACT)
- Determination of Prevention of Significant Deterioration (PSD)
- Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

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PERMIT NO.: AC 06-58230

APPLICANT: Belcher Oil Company-Port Everglades Bulk Gasoline Terminal

Expiration Date: June 1, 1983

Issued this 22 day of December, 1982

1 Pages Attached.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

Terry Cole  
Signature

**ATTACHMENT 4**

## **5.2 Terminal Status During Test Period**

The test procedure is designed to measure control system performance under conditions of normal operation. Normal operation will vary from terminal-to-terminal and from day-to-day. Therefore, no specific criteria can be set forth to define normal operation. The following guidelines are provided to assist in determining normal operation.

### **5.2.1 Closing of Loading Racks**

During the test period, all loading racks shall be open for each product line which is controlled by the system under test. Simultaneous use of more than one loading rack shall occur to the extent that such use would normally occur.

**5.2.2 Simultaneous use of more than one dispenser on each loading rack shall occur to the extent that such use would normally occur.**

**5.2.3 Dispensing rates shall be set at the maximum rate at which the equipment is designed to be operated. Automatic product dispensers are to be used according to normal operating practices.**

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**CLARK**

**engineers - scientists**

# CLARK

DER

JUL 19 1982

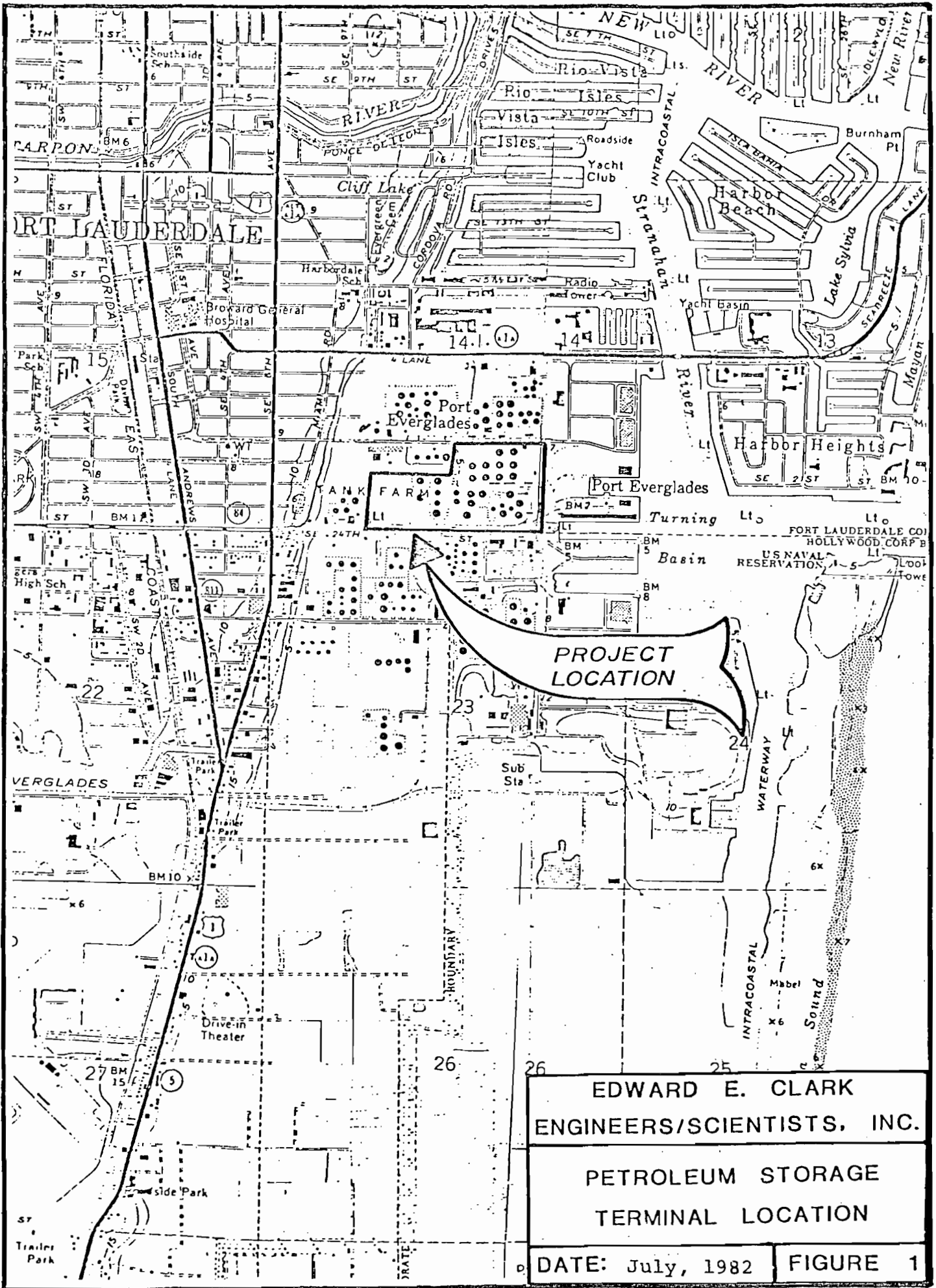
BAQM

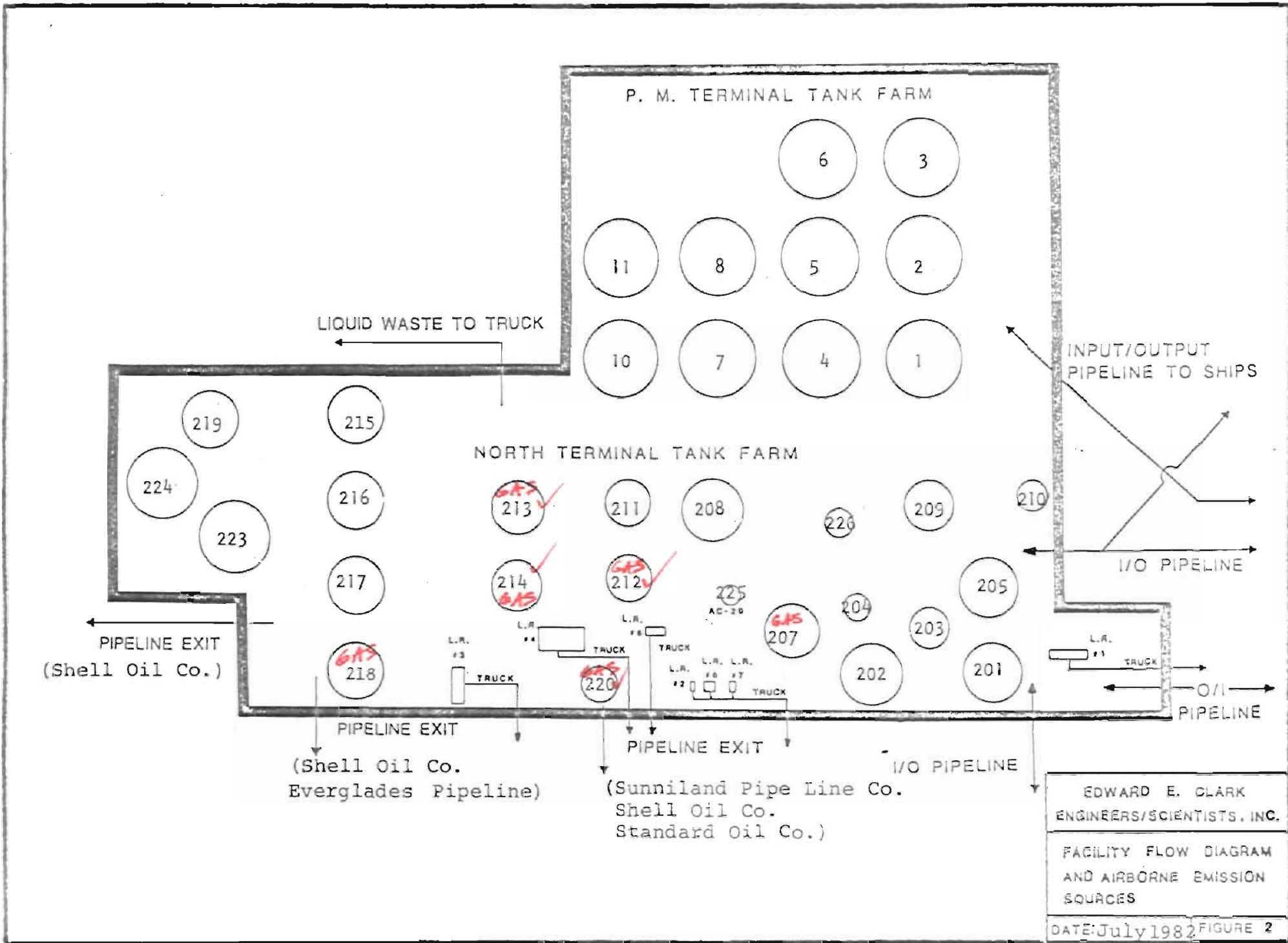
Air Pollution Source  
Construction Permit Application  
for  
Belcher Oil Company  
Port Everglades Terminal

July, 1982

## INTRODUCTION

Belcher Oil Company operates a petroleum storage/transfer terminal at Port Everglades, Florida. The location of this facility is indicated in Figure 1. The facility includes a tank farm consisting of numerous storage tanks as well as several loading racks used for product transfer. The location of these storage tanks and loading racks is presented in Figure 2. Table 1 lists tank characteristics and product information. Gasoline is one of the products handled at the facility and requires the installation of a vapor recovery unit for the loading of this product. The installation of this vapor recovery unit requires an Air Pollution Source Permit from the Department of Environmental Regulation.





6/7/82

*underlined as subject to AACT storage*

TABLE 1-PORT EVERGLADES-North Terminal-Tank and Loading Rack Information

Tank No.	Tank Type	Capacity	Product	Tank Dim. (ft)
201	Cone	81,120	Bunker "C"	117' x 42'
202	Cone	80,722	Bunker "C"	117' x 42'
203	Float	29,392	<u>Crude</u>	72' x 40'
204	Cone	15,084	Diesel	50' x 40'
205	Int. Pan	92,468	<u>Crude</u>	120' x 48'
207	<i>Ext.</i> Float <i>(prim + sec)</i>	55,000	<u>Gasoline</u>	100' x 40'
208	Cone	80,315	<u>AC-20</u>	120' x 40'
209	Cone	55,953	AC-20	100' x 40'
210	Cone	20,069	Beloil (#5)	60' x 40'
211	Int. Pan	54,247	<u>JP-4</u>	90' x 48'
212	Int. Pan <i>(single sec)</i>	51,361	<u>Gasoline</u>	90' x 48'
213	<i>Ext.</i> Float <i>(prim + sec)</i>	53,866	<u>Gasoline</u>	90' x 40'
214	<i>Ext.</i> Float <i>(prim + sec)</i>	53,898	<u>Gasoline</u>	90' x 40'
215	Float	80,485	<u>JP-4</u>	110' x 48'
216	Float	80,501	<u>JP-4</u>	110' x 48'
217	Float	80,509	<u>JP-4</u>	110' x 48'
218	<i>Ext.</i> Float <i>(prim + sec)</i>	80,552	<u>Gasoline</u>	110' x 48'
219	Float	80,510	<u>JP-4</u>	110' x 48'
220	Int. Pan <i>(prim. sec)</i>	41,879	<u>Gasoline</u>	72' x 44'
223	Float	119,649	<u>Crude</u>	134' x 48'
224	Float	119,800	<u>Crude</u>	134' x 48'
225	Cone	5,130	AC-20 (rundown)	35' x 30'
226	Cone	20,000	RC-70	56' x 48'
PM-1	Cone	95,833	Diesel	144' x 34'
PM-2	Cone	96,024	Bunker "C"	144' x 34'
PM-3	Cone	96,501	Bunker "C"	144' x 34'
PM-4	Cone	95,000	Jet A	144' x 34'
PM-5	Cone	95,874	No. 2	144' x 34'
PM-6	Cone	96,133	Bunker "C"	144' x 34'
PM-7	Cone	96,403	Diesel	144' x 34'
PM-8	Cone	96,003	Diesel	144' x 34'
PM-10	Cone	96,427	Jet A	144' x 34'
PM-11	Cone	96,017	Diesel	144' x 34'
		2,392,725 Bbls.		

LOADING RACKS

Load Rack Number

Load Rack Number	Product		
	(#2)	(#6)	(#5)
Load Rack #1	Diesel	Bunker "C"	Beloil
Load Rack #2	RC-70		
Load Rack #3	JP-4 Fuel		
Load Rack #4	Jet A Fuel, <u>Gasoline</u>		
Load Rack #5	<u>Out of service</u>		
Load Rack #6	Asphalt		
Load Rack #7*	Crude Oil		

*op. permit says gasoline loaded on #4*

\* (emergency use only)  
(last used-1978)

Note: Tank contents represent products stored at facility at present time.



AG 06-58230

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION  
APPLICATION TO OPERATE/CONSTRUCT  
AIR POLLUTION SOURCES

DER

JUL 17 1982

BAQM

SOURCE TYPE: Gasoline Loading Racks with VRU [ ] New<sup>1</sup> [X] Existing<sup>1</sup>

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

COMPANY NAME: Belcher Oil Company (Port Everglades Facility) COUNTY: Broward

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) Vapor Recovery Unit servicing gasoline loading rack

SOURCE LOCATION: Street 2401 Eisenhower Blvd. City Fort Lauderdale

UTM: East 587.3 km North 2886.3 km

Latitude 26 ° 05 ' 40 " N Longitude 80 ° 07 ' 39 " W

APPLICANT NAME AND TITLE: P.W. Moldenhauer, Corporate Engineer

APPLICANT ADDRESS: P.O. Box 525500, Miami, FL 33152

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative\* of Belcher Oil Company

I certify that the statements made in this application for a construction/modification 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: [Signature]

P.W. Moldenhauer, Corporate Engineer  
Name and Title (Please Type)

Date: 7/14/82 Telephone No. (305) 551-5444

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 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: [Signature]

Edward E. Clark, Ph.D., P.E.  
Name (Please Type)

Clark Engineers-Scientists, Inc.

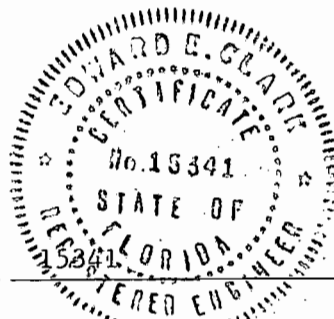
Company Name (Please Type)

7520 SW 57 Avenue, Miami, FL 33143

Mailing Address (Please Type)

Date: 7/13/82 Telephone No. (305) 665-5736

(Affix Seal)



Florida Registration No. \_\_\_\_\_

<sup>1</sup>See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

**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.  
A carbon absorption/adsorption vapor recovery unit will be installed to recover displaced contaminated air during transport truck loading operations. The VRU will be in full compliance.

B. Schedule of project covered in this application (Construction Permit Application Only)  
 Start of Construction approx. 6 months Completion of Construction approx. 3 to 6 months

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.)  
Total cost of pollution control system and installation:  
\$163,000 equipment  
\$127,000 installation  
\$290,000 total

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.  
AO 06-47127 issued: 11/13/81 expires: 11/13/82  
Industrial Waste Permit: application on file (IO-06-55002)

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? Yes  No

F. Normal equipment operating time: hrs/day —; days/wk —; wks/yr —; if power plant, hrs/yr —;  
 if seasonal, describe: Vapor Recovery Unit will be operated to accommodate transport truck loading of gasoline product.

G. 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?  | <u>Yes</u> |
| a. If yes, has "offset" been applied?   | <u>N/A</u> |
| b. If yes, has "Lowest Achievable Emission Rate" been applied?  | <u>N/A</u> |
| c. If yes, list non-attainment pollutants.<br><u>Volatile Organic Compounds</u>   |            |
| 2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.  | <u>No</u>  |
| 3. Does the State "Prevention of Significant Deterioration" (PSD) requirements apply to this source? If yes, see Sections VI and VII. | <u>No</u>  |
| 4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?  | <u>No</u>  |
| 5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?                                       | <u>No</u>  |

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: Not 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: See Attachment A

Name of Contaminant	(1) Emission <sup>1</sup>		Allowed Emission <sup>2</sup> Rate per Ch. 17-2, F.A.C.	(3) Allowable <sup>3</sup> Emission lbs/hr	(4) Potential Emission <sup>4</sup>		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Volatile	62.3	43.6	Good practice in	72.1	747.9	523.6	Loading
Organic			accordance with				Rack with
Compounds			FAC section 17.2;				VRU
			80 mg/l product				
	(calc sht. 2)		loaded	(calc sht 3)	(calc sht 3)		

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles <sup>5</sup> Size Collected (in microns)	Basis for Efficiency (Sec. V, It <sup>5</sup> )
Vapor Recovery Unit (McGill-Carbon Absorp- tion/Adsorption System- Model No. MRC-404HS)	V.O.C.	98*	Not Applicable	See Calc.

<sup>1</sup>See Section V, Item 2.

<sup>2</sup>Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. - 0.1 pounds per million BTU heat input)

<sup>3</sup>Calculated from operating rate and applicable standard

<sup>4</sup>Emission, if source operated without control (See Section V, Item 3)

<sup>5</sup>If Applicable

\*This efficiency value is based on manufacturer's specifications. Actual efficiency value used in calculations is 95%.

ATTACHMENT A

Notes:

1. Column (1) represents maximum hourly emissions with pollution controls. Loading losses are based on maximum loading rack design throughputs for each product.
2. Column (2) represents actual annual emissions for each product with pollution controls. Loading losses are based on actual annual product throughput rates.
3. Column (3) represents allowable loading emissions for gasoline (80 mg/l product loaded) based on maximum loading rack throughput for gasoline.
4. Column (4) represents maximum hourly emissions resulting from operations without pollution control. Loading losses are based on maximum loading rack throughput rates for each product.
5. Column (5) represents the potential annual emissions without pollution control equipment. Loading losses are based on actual annual product throughputs.

E. Fuels Not Applicable

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

\*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, 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 \_\_\_\_\_ Maximum \_\_\_\_\_

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

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

Stack Height: 2 @ 12' above ground \_\_\_\_\_ ft. Stack Diameter: 6" at outlet T \_\_\_\_\_ ft.

Gas Flow Rate: max. 264.7/stack \_\_\_\_\_ ACFM Gas Exit Temperature: approx. ambient \_\_\_\_\_ °F.

Water Vapor Content: \_\_\_\_\_ % Velocity: 22.5 \_\_\_\_\_ FPS

\*Above values represent flow rate at maximum loading rate. The flow rate will vary depending on actual loading rate.

SECTION IV: INCINERATOR INFORMATION Not Applicable

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs/hr Incinerated							

Description of Waste \_\_\_\_\_

Total Weight Incinerated (lbs/hr) \_\_\_\_\_ Design Capacity (lbs/hr) \_\_\_\_\_

Approximate Number of Hours of Operation per day \_\_\_\_\_ days/week \_\_\_\_\_

Manufacturer \_\_\_\_\_

Date Constructed \_\_\_\_\_ Model No. \_\_\_\_\_

	Volume (ft) <sup>3</sup>	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: \_\_\_\_\_ ft. Stack Diameter \_\_\_\_\_ 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) \_\_\_\_\_

Brief description of operating characteristics of control devices: \_\_\_\_\_

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

### SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

- Total process input rate and product weight – show derivation. N/A
- 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. (See calculation sheets).
- Attach basis of potential discharge (e.g., emission factor, that is, AP42 test). (See manufacturer's description)
- 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, etc.). (See manufacturer's description)
- 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). (See manufacturer's description)
- An 8½" 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. (See Figure 2 – Facility Site Plan)
- An 8½" 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). (See Figure 1 – Location Map)
- An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. (See Figure 2 – Facility Site Plan)

- 9. An application fee of \$20, unless exempted by Section 17-4.05(3), F.A.C. 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**    Not Applicable

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: | 4. Capital Costs:    |
| 2. Operating Principles:  | 6. Operating Costs:  |
| 3. Efficiency: *          | 8. Maintenance Cost: |
| 5. Useful Life:           |                      |
| 7. Energy:                |                      |
| 9. Emissions:             |                      |

Contaminant	Rate or Concentration
_____	_____
_____	_____
_____	_____

\* Explain method of determining D 3 above.

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\*:
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy\*:
- 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\*:
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy\*\*:
- h. Maintenance Costs:
- 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:

\*Explain method of determining efficiency.

\*\*Energy to be reported in units of electrical power – KWH design rate.

3.

- a. Control Device:
- b. Operating Principles:
  
- c. Efficiency\*:
- d. Capital Cost:
- e. Life:
- f. Operating Cost:
- g. Energy:
- h. Maintenance Cost:

\*Explain method of determining efficiency above.

- 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\*:
- d. Capital Cost:
- e. Life:
- f. Operating Cost:
- g. Energy:
- 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\*:
- 3. Capital Cost:
- 4. Life:
- 5. Operating Cost:
- 6. Energy:
- 7. Maintenance Cost:
- 8. Manufacturer:
- 9. Other locations where employed on similar processes:

a.

- (1) Company:
- (2) Mailing Address:
- (3) City:
- (4) State:
- (5) Environmental Manager:
- (6) Telephone No.:

\*Explain method of determining efficiency above.

(7) Emissions\*:

Contaminant	Rate or Concentration

(8) Process Rate\*:

b.

- (1) Company:
- (2) Mailing Address:
- (3) City:
- (4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions\*:

Contaminant	Rate or Concentration
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

(8) Process Rate\*:

10. Reason for selection and description of systems:

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





W. W. WELLS & ASSOCIATES ENGINEERS - SCIENTISTS, INC.  
MIAMI, FLORIDA

JOB Belcher Oil Company JOB NO. 8015.1 COMPUTED BY JJM DATE 7/13/82  
DESCRIPTION Port Everglades - Vapor CHECKED BY KML DATE \_\_\_\_\_  
Recovery Unit Emissions SHEET \_\_\_\_\_ OF \_\_\_\_\_

Belcher Oil Company  
Port Everglades Terminal  
Vapor Recovery Unit Emission  
Calculations

**BEST AVAILABLE COPY**

ENVIRONMENTAL SYSTEMS CORPORATION - MIAMI, FLORIDA

JOB Belcher Oil Company JOB NO. 8015-1 COMPUTED BY JJM DATE 7/13/02  
 DESCRIPTION Port Everglades - Vapor Recovery Unit CHECKED BY KML DATE \_\_\_\_\_  
 SHEET 1 OF 3

Gasoline Loading Losses:

loading rack no. 4  
 vapor recovery unit  
 design throughput flow = 300,000 bbls/mo *single rack*  
 maximum throughput flow = 600 gal/min. per  
 loading position ∴ 3 positions = 1800 gal/min.

Loading Loss Equation:

$$L_L = 12.46 \frac{S P M}{T} \left( 1 - \frac{EFF}{100} \right)$$

- $L_L$  = loading loss,  $lb/10^3$  gal liquid loaded
- $S$  = saturation factor = 0.60; submerged loading; normal dedicated service *should be 1.0*
- $M$  = vapor molecular weight = 63.3  $lb/lb\text{-mole}$
- $T$  =  $73^\circ F = 533^\circ R$
- $EFF$  = control efficiency *8.0?*
- $P$  = vapor pressure = 7.8 psia, RVP 12

Product data and loading rates from  
 Belcher Oil Company

\* Loading loss equation from U.S. Environmental Protection Agency Publication No. AP-42.

ENVIRONMENTAL ENGINEERING, INC.  
MIAMI, FLORIDA

JOB: Belcher Oil Company JOB NO. 8015.1 COMPUTED BY JJM DATE 7/13/82  
DESCRIPTION: Port Everglades - Vapor Recovery Unit CHECKED BY KML DATE \_\_\_\_\_  
SHEET 2 OF 3

Section III Air Pollution Sources and Control  
Item C Devices - Airborne Contaminants Emitted

Maximum Hourly Emission (with vapor recovery)

$$L_L = \frac{(22.46)(2.0)(7.8)(63.3)}{(533)} (1 - .95) (108,000 \frac{\text{gal}}{\text{hr.}})$$

$1800 \times 60 = \rightarrow$

$$L_L = (0.5771 \frac{\text{lbs}}{10^3 \text{ gal}}) (108,000 \text{ gal/hr.})$$

$$L_L = \underline{62.3 \text{ lbs./hr.}}$$

used to be, uncontrolled  
 $(6.975 \# / 10^3 \text{ gal}) \sqrt{7.3 \times 10^6 \text{ gal/yr}}$   
 $= 25.3 \text{ TPY}$

Actual Annual Emission: (with vapor recovery)

$$L_L = (0.5771 \frac{\text{lbs}}{10^3 \text{ gal}}) (300,000 \text{ bb/s/mo}) (12)$$

actual or design  
vap.?

$$L_L = 7271.6 \frac{\text{lbs}}{\text{mo.}} \times 12 = 87,259 \text{ lbs/yr}$$

$$L_L = \underline{43.6 \text{ tons/yr}}$$

$3.6 \times 10^6 \text{ lbs/yr}$

W. W. WARDEN CO. CHEMICAL ENGINEERS - SCIENTISTS, INC.  
MIAMI, FLORIDA

JOB Belcher Oil Company JOB NO. 8015.1 COMPUTED BY JJM DATE 7/13/82  
DESCRIPTION Port Everglades - Vapor CHECKED BY KML DATE \_\_\_\_\_  
Recovery Unit SHEET 3 OF 3

### Allowable Emission

$$L_{L \text{ Allowable}} = (80 \text{ mg/l}) \left( \frac{3.785 \text{ l}}{\text{gal}} \right) \left( \frac{1 \text{ lb}}{453,592 \text{ mg}} \right) (108,000 \text{ gal/hr})$$

$$L_{L \text{ Allowable}} = \underline{\underline{72.1 \text{ lbs/hr}}}$$

### Potential Emission: (no vapor recovery)

#### Maximum Hourly:

$$L_{L \text{ Max}} = \frac{(12.46)(0.6)(6.3.3)(7.8)(1 \text{ lb.})}{(533)(10^3 \text{ gal})} (108,000 \text{ gal/hr})$$

$$L_{L \text{ Max}} = \frac{(6.9253)(108,000 \text{ gal/hr})}{10^3 \text{ gal}} = 747.9 \text{ lbs/hr.}$$

$$L_{L \text{ Max}} = \underline{\underline{747.9 \text{ lbs/hr}}}$$

### Annual Potential (no vapor recovery)

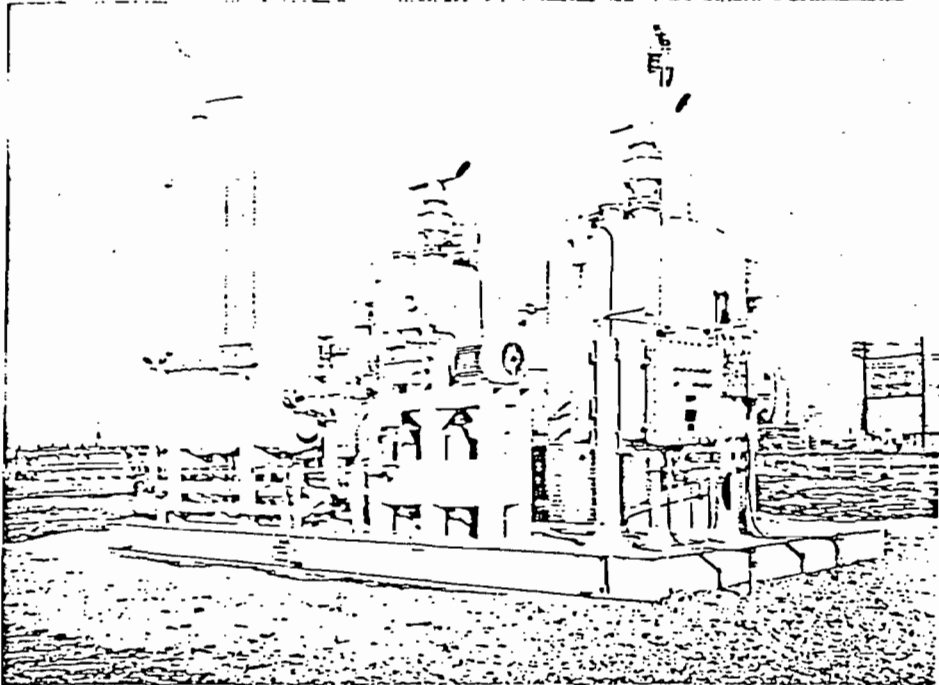
$$L_{L \text{ Annual}} = \left( \frac{6.9253 \text{ lbs}}{10^3 \text{ gal}} \right) \left( 300,000 \frac{\text{gal}}{\text{mo}} \right) (12)(42)$$

$$L_{L \text{ Annual}} = \underline{\underline{1,047,110 \text{ lbs./yr.} = 523.6 \text{ tons/yr.}}}$$

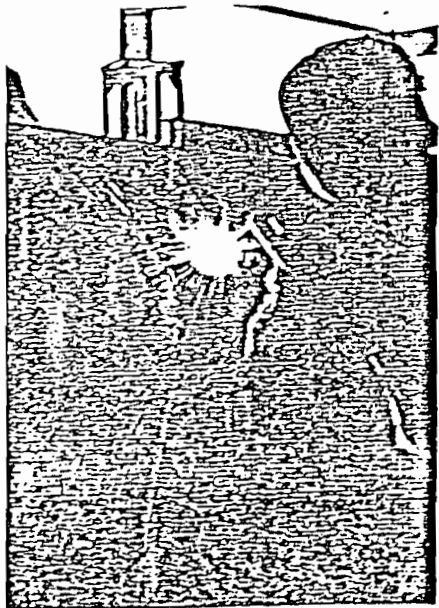
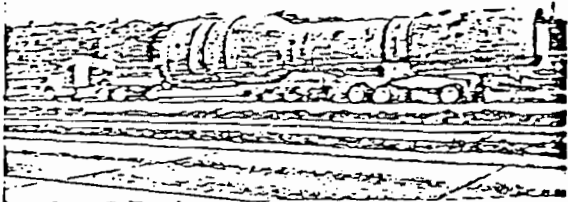
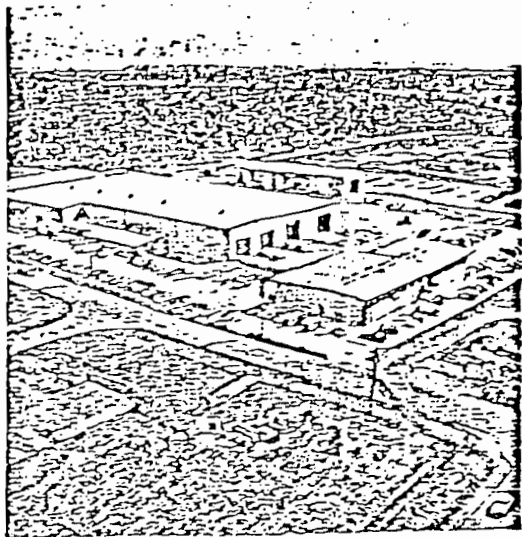
II. VAPOR RECOVERY SYSTEM-  
MANUFACTURER'S PROCESS  
DESCRIPTION



# The McGill Adsorption/Absorption Gasoline Vapor Recovery System



# McGILL INCORPORATED THE TECHNOLOGY PEOPLE



McGILL INCORPORATED  
P.O. Box 9667  
Tulsa, OK 74107  
918-445-2431  
Telex 79-6434

**BROCK EASLEY, INC.**  
80 Inverness Drive East  
Englewood, Colorado 80112  
303-773-2333  
Telex 910-935-0119

Other Offices in

- Casper, Wyoming 307-234-8500
- Irvine, California 714-752-7333
- Kirkland, Washington 206-828-4588
- Salt Lake City, Utah 801-521-9464
- Tempe, Arizona 602-966-2461
- Lafayette, California 415-284-9315

**EQUIPMENT SPECIALISTS, INC.**  
35 Walnut Avenue  
Clark, New Jersey 07066  
201-388-8300  
Telex 13-8927

**GOBLE & BROWN, INC.**  
6400 SW Freeway, Suite 300  
Houston, Texas 77074  
713-780-4448  
Telex 79-1071

Other Offices in

- Baton Rouge, Louisiana 504-292-7596
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918-622-3500  
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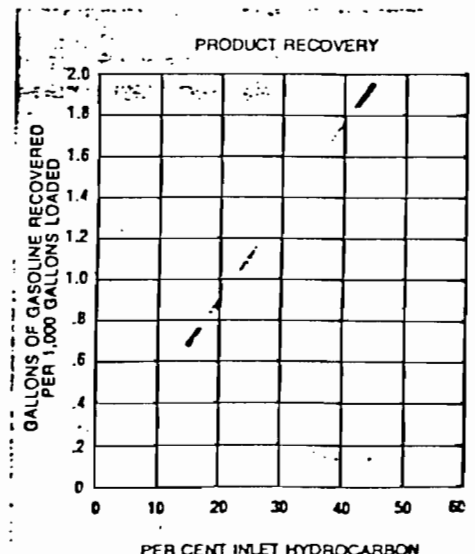
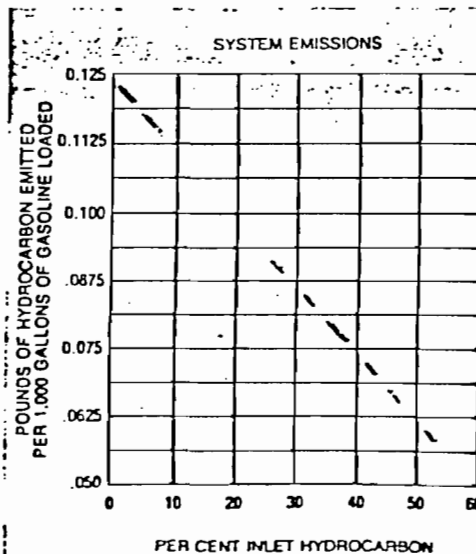
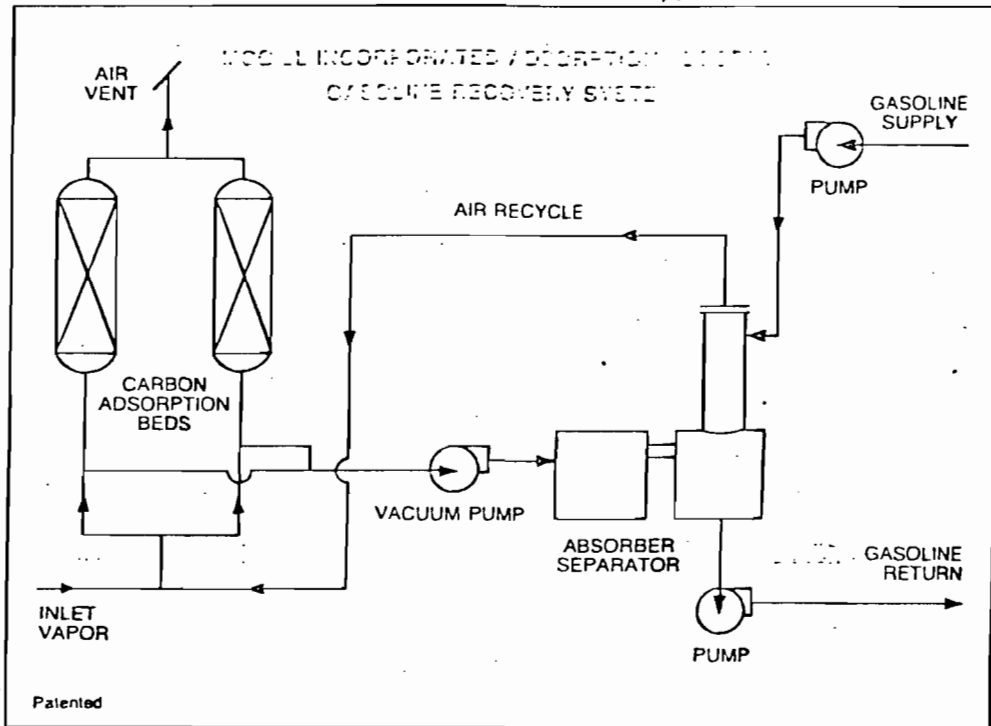
The basic operation utilizes dual activated carbon adsorption beds, which remove hydrocarbons from the incoming contaminated air. An absorber combines these hydrocarbons with gasoline from the bulk storage tank. The combined hydrocarbons and gasoline are then circulated back into the original storage tank.

Under normal conditions, the vented air from the McGill system contains less than 3000 ppm (v) of hydrocarbons, producing a clean air vent with over 99% of the fumes removed from the inlet vapor.

The Patented McGill  
Gasoline Vapor Recovery

McGill Incorporated developed the carbon Adsorption/Absorption Vapor Recovery System in 1976. And we patented it. It meets all EPA standards. It is working for many satisfied customers at refineries and bulk gasoline loading terminals. It is a remarkable success. By 1977 this patented system made McGill the undisputed industry leader in the gasoline vapor recovery field. This was no fluke or accident. But a direct result of the way we think; the way we approach a problem. With simplicity.

The simplest design is normally the most difficult to engineer. That's why so few process systems manage to incorporate this basic virtue. But McGill has always been dedicated to doing what no one else could do. We achieved simplicity. And simplicity means ease of operation, reliability, reduction of maintenance. It also means minimum operating expense, maximum operating efficiency. Is it any wonder a company would patent such a design?



# ADSORPTION/ABSORPTION GASOLINE RECOVERY SYSTEM

## PROCESS DESCRIPTION

### STEP 1 - EQUALIZE

In Step 1, air contaminated with gasoline fumes (inlet vapor) flows from a loading or storage facility to two carbon adsorption beds, "A" and "B". Bed "B" has been receiving inlet vapor for several minutes and a considerable portion of the carbon is saturated with recovered hydrocarbon. Bed "A" has just completed a regeneration process and has little recovered hydrocarbons adsorbed on its carbon. The air portion of the inlet vapors flows from beds "A" and "B" and to the atmosphere. Under normal conditions, this air contains less than 3000 ppm (v) of hydrocarbons (over 99% of the fumes have been removed from the inlet vapor to produce the clean air vent).

A liquid ring vacuum pump operates continuously while the system operates. The suction of the vacuum pump during the "Equalize Step" is atmospheric air which is drawn into the system across the minimum flow valve. Motive force for the liquid ring vacuum pump is water which is separated from the air in the separator and flows through the cooler and back to the vacuum pump. The cooler is a shell and tube heat exchanger which uses gasoline to cool the water. The air flows to the absorber after being separated from the water in the separator. The air is contacted with gasoline in the absorber and becomes saturated with hydrocarbons after which it passes out of the absorber and flows back to beds "A" and "B" after mixing with inlet vapor.

The gasoline which provides cooling in the cooler and contact with air in the absorber is pumped from gasoline storage. After passing through the cooler and absorber, the gasoline flows to a chamber of the separator which is separated from the vacuum pump cooling water by a weir. From this chamber, the gasoline is pumped back to the storage tank from which it was drawn originally.

STEP 2 - "A" BED PROCESSING  
"B" BED REGENERATING

In Step 2, all of the inlet vapor is directed through bed "A" by closing the inlet valve of bed "B". The outlet valve of bed "B" is also closed, and the suction valve which connects bed "B" to the liquid ring vacuum pump is opened. Hydrocarbons which were adsorbed on the carbon in bed "B" are removed by application of vacuum. A portion of these hydrocarbons condense in the liquid ring vacuum pump and float on the vacuum pump cooling water surface. These heavy hydrocarbons flow over a weir which divides the chambers of the separator, mix with gasoline, and are pumped to gasoline storage.

A portion of the hydrocarbons which are vacuumed from bed "B" flow through the separator as vapors and pass up the absorber. These hydrocarbon vapors are absorbed into the gasoline and are also pumped back to gasoline storage. A small amount of air is also vacuumed from bed "B". This air passes through the absorber, is saturated with gasoline, and flows to the inlet vapor stream.

STEP 3 - "A" BED PROCESSING  
"B" BED REGENERATING WITH PURGE

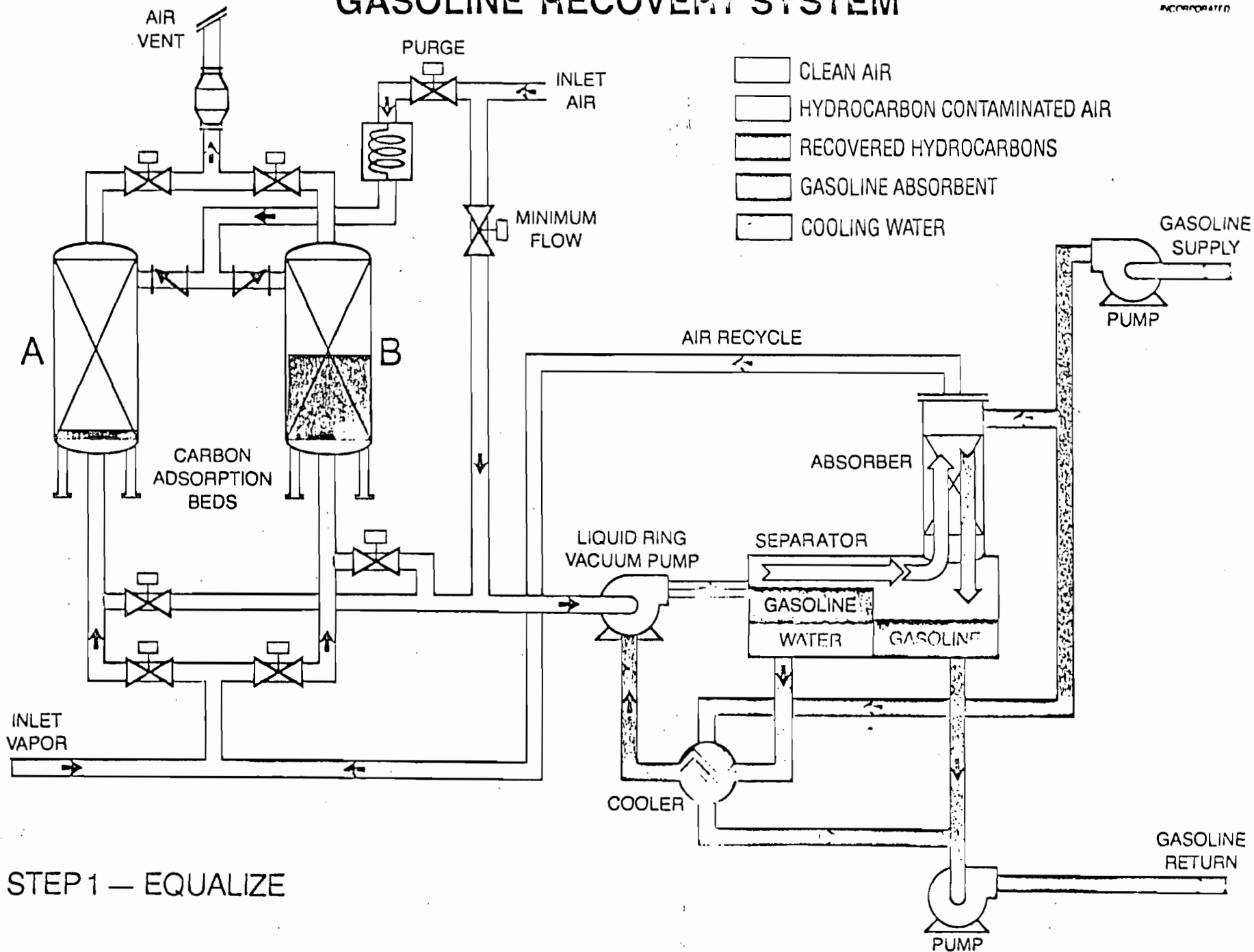
In Step 3, inlet vapors continue to flow only to bed "A" and hydrocarbons collect on the carbon surface. Most of the hydrocarbons have been removed from bed "B" and only the high boiling or "heavy" hydrocarbons remain on the carbon. The heavy hydrocarbons are removed from the carbon with hot air. The air flows from the atmosphere, across the purge valve, and through a heater. The heated air flows to bed "B" which is now at a pressure of about 25 mm Hg absolute. This hot air applied at low vacuum acts as a stripping agent to clean the heavy hydrocarbons from the carbon. The hydrocarbons removed by the hot air are blended into the gasoline as described in Step 2, and the hot air flows back to the inlet vapor line.

STEP 4 - EQUALIZE

Step 4 is identical to Step 1 except that bed "A" will be regenerated following Step 4. The system will continue to cycle for a short period of time after all loading stops in order to prepare the system for the next surge of loading.

# HYDROTECH ADSORPTION - ABSORPTION GASOLINE RECOVERY SYSTEM

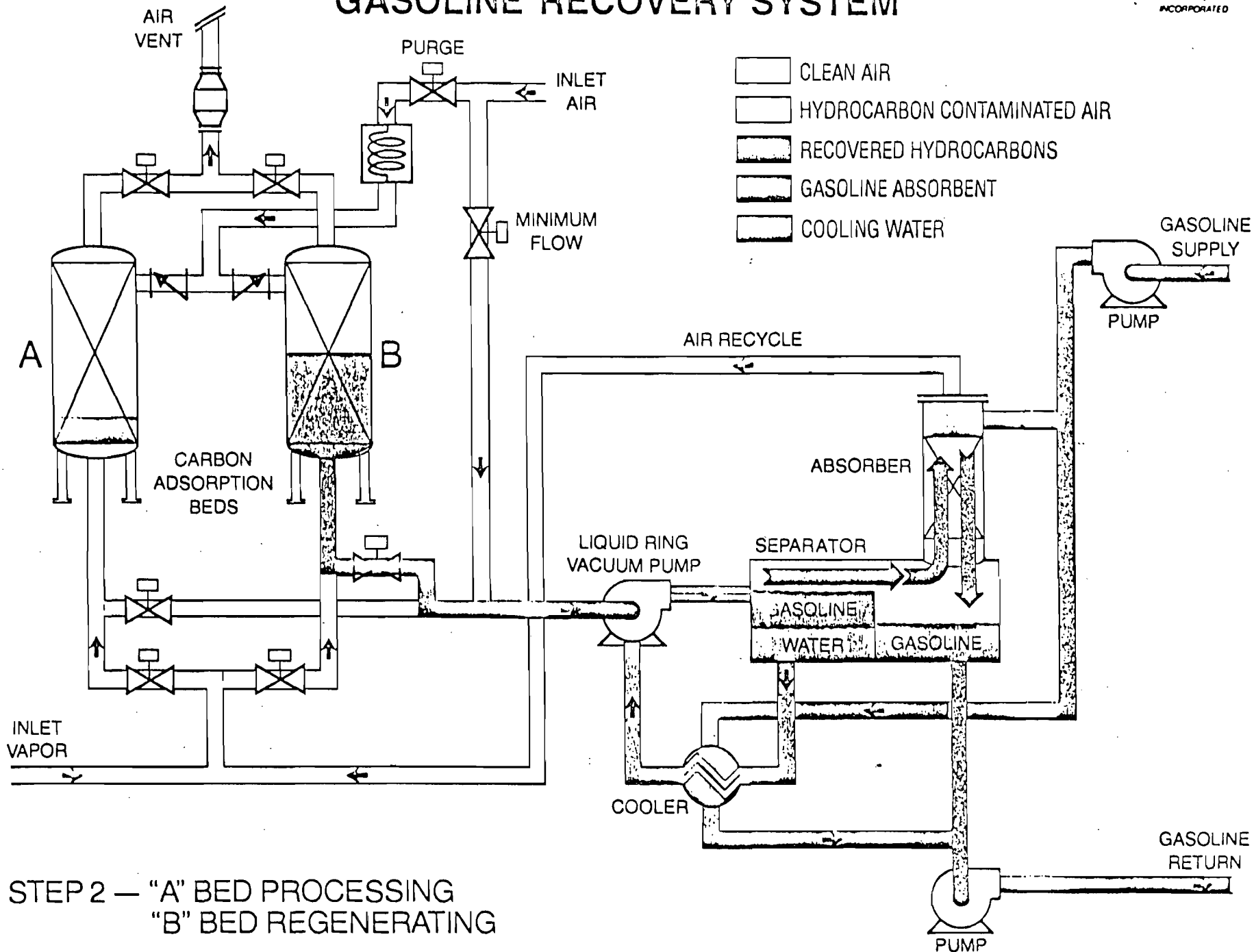
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STEP 1 - EQUALIZE

# HYDROTECH ADSORPTION – ABSORPTION GASOLINE RECOVERY SYSTEM

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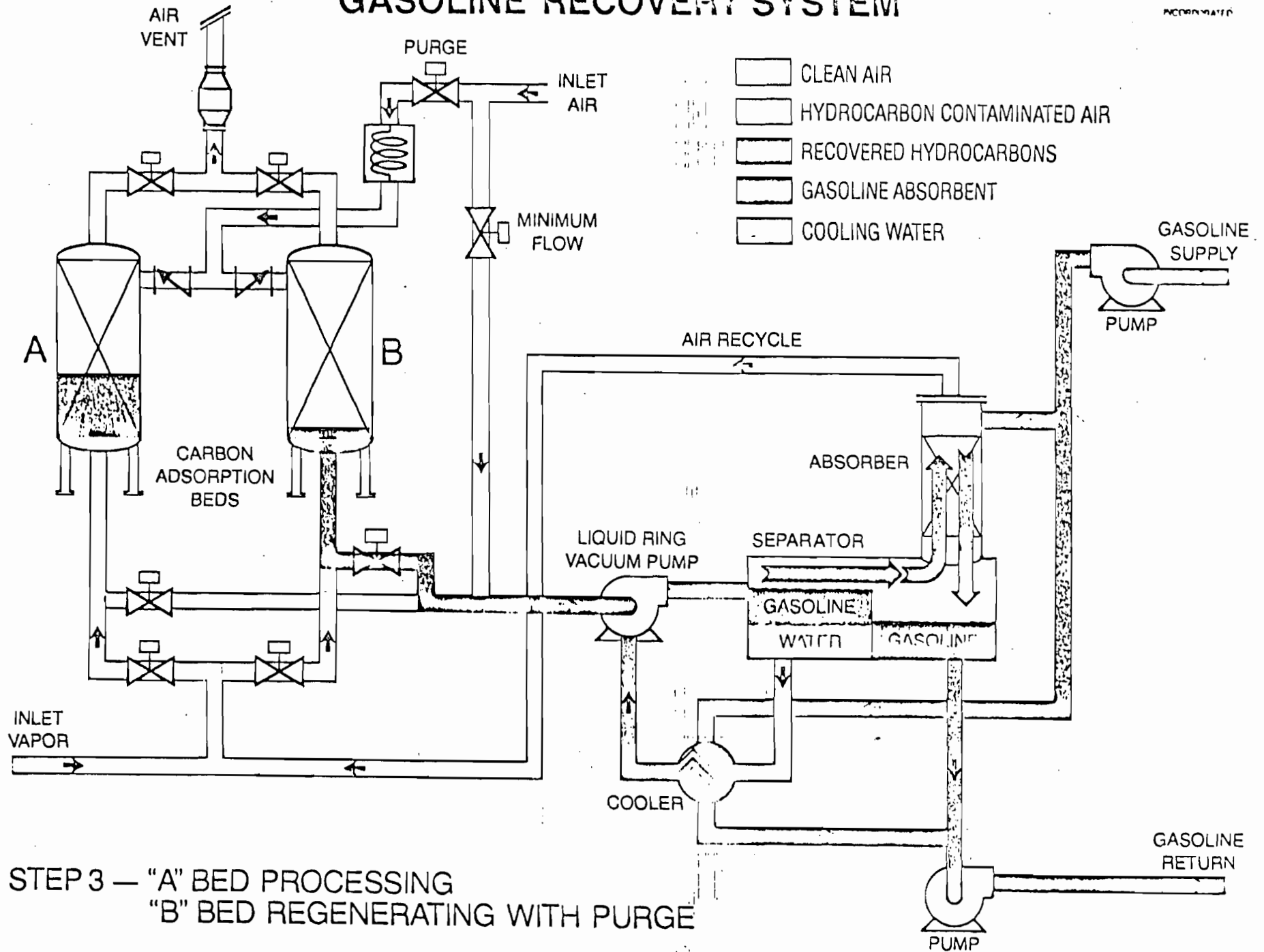


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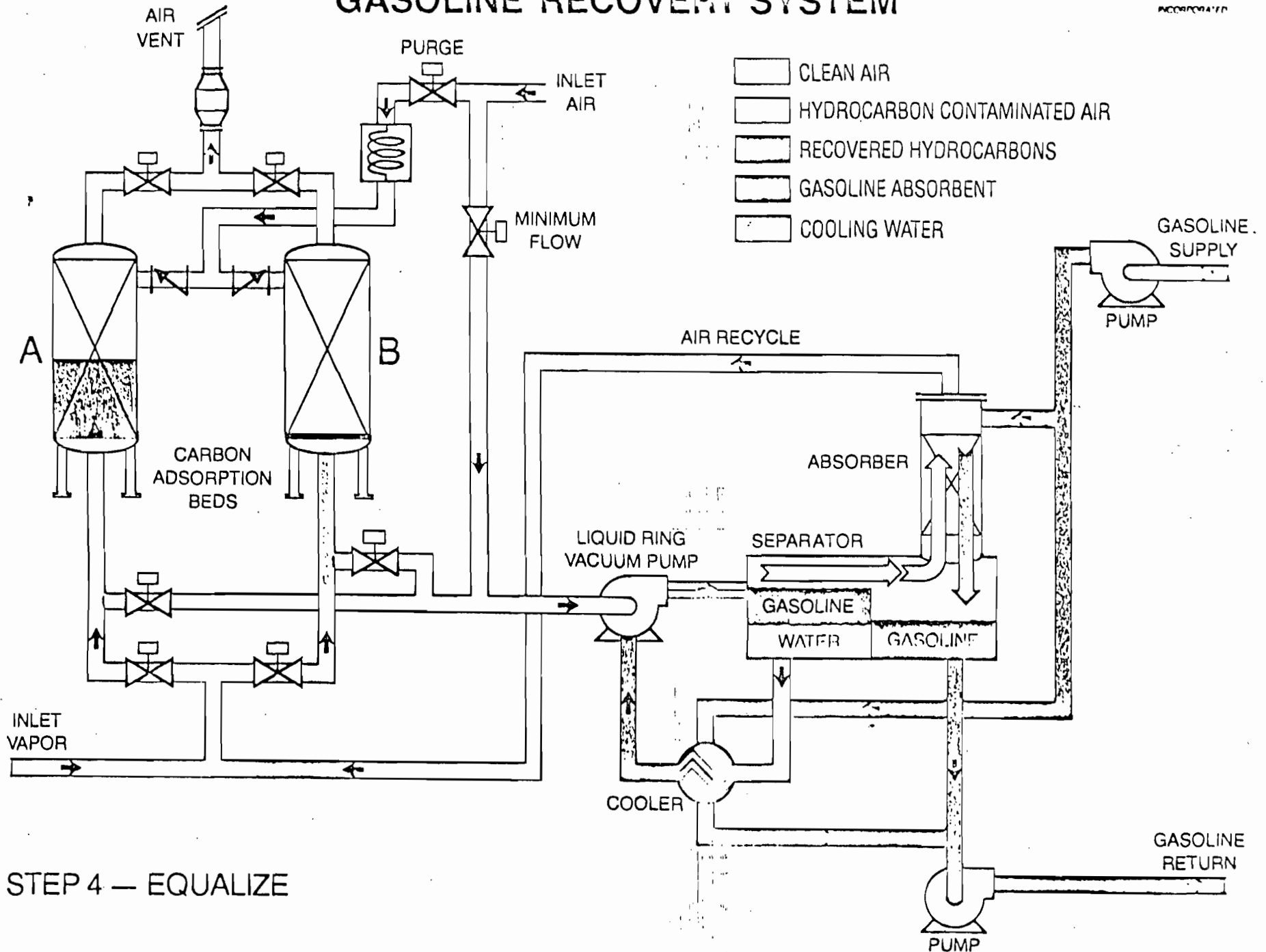
# HYDROTECH ADSORPTION — ABSORPTION GASOLINE RECOVERY SYSTEM

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**CLARK**  
engineers-scientists