

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD  
OF THE STATE OF ILLINOIS**

CITATION OIL & GAS CORPORATION )  
Bio Desulfurization Unit )  
 ) PCB 09-  
 ) (Tax Certification)  
PROPERTY IDENTIFICATION NUMBER )  
15-06-200-11 or portion thereof )

**NOTICE**

TO: *[Electronic filing]*  
John Therriault, Assistant Clerk  
Illinois Pollution Control Board  
State of Illinois Center  
100 W. Randolph Street, Suite 11-500  
Chicago, Illinois 60601

*[Service by mail]*  
Susette M. Harris  
Citation Oil & Gas  
8223 Willow Place Drive S  
Houston, Texas 77070-4631

*[Service by mail]*  
Steve Santarelli  
Illinois Department of Revenue  
101 West Jefferson  
P.O. Box 19033  
Springfield, Illinois 62794

PLEASE TAKE NOTICE that I have today electronically filed with the Office of the Pollution Control Board the APPEARANCE and RECOMMENDATION of the Illinois Environmental Protection Agency, a copy of which is herewith served upon the applicant and a representative of the Illinois Department of Revenue.

Respectfully submitted by,

*/s/ Robb H. Layman*  
Robb H. Layman  
Assistant Counsel

Date: March 12, 2009

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276  
Telephone: 217/524-9137

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD  
OF THE STATE OF ILLINOIS**

CITATION OIL & GAS CORPORATION	)	
Bio Desulfurization Unit	)	
	)	PCB 09-
	)	(Tax Certification)
PROPERTY IDENTIFICATION NUMBER	)	
15-06-200-11 or portion thereof	)	

**APPEARANCE**

I hereby file my Appearance in this proceeding on behalf of the Illinois Environmental Protection Agency.

Respectfully submitted by,

/s/ Robb H. Layman  
Robb H. Layman  
Assistant Counsel

Date: March 12, 2009

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**RECOMMENDATION**

NOW COMES the ILLINOIS ENVIRONMENTAL PROTECTION AGENCY (“Illinois EPA”), through its attorneys, and pursuant to 35 Ill. Adm. Code 125.204 of the ILLINOIS POLLUTION CONTROL BOARD’S (“Board”) procedural regulations, files the Illinois EPA’s Recommendation in the above-referenced request for tax certification of pollution control facilities. The Illinois EPA recommends a **grant** of the applicant’s request. In support thereof, the Illinois EPA states as follows:

1. On December 26, 2006, the Illinois EPA received a request and supporting information from CITATION OIL & GAS CORPORATION (“Citation Oil”) concerning the proposed tax certification of certain air emission sources and/or equipment associated with a natural gas liquids (“NGL”) manufacturing plant. The plant is located near Odin in Marion County, Illinois. A copy of the relevant portions of the application is attached hereto. **[Exhibit A]**.

2. The registered address of Citation Oil is:

Citation Oil & Gas  
8223 Willow Place Drive S  
Houston, Texas 77070-4631

3. The address of the NGL gas plant located in Illinois is:

Citation Oil & Gas Corporation  
2302 Hoots Chapel Road  
Odin, Illinois 62870

4. The pollution control facilities involved in this request consist of the construction and installation of a Bio Desulfurization Unit. As a part of the NGL manufacturing plant, the Bio Desulfurization Unit employs an innovative control technology to control process emissions, using absorption techniques in combination with biological treatment (i.e., hydrogen sulfide-eating bugs). The control technology removes and breaks down the highly-concentrated hydrogen sulfide that is found in the sour casing head gas that is processed in NGL manufacturing. The process produces both elemental sulfur, which will be sent to a landfill, and a sweet residue gas, which will be flared. As a result of the project's implementation, neither the acid gas from the NPL manufacturing plant nor the existing well sites will need to be flared. Moreover, the resulting reduction in hydrogen sulfide will reduce ambient sulfur dioxide emissions within a five square mile area by an estimated 1,200 tons per year.

5. Section 11-10 of the Property Tax Code, 35 ILCS 200/11-10 (2002), defines "pollution control facilities" as:

"any system, method, construction, device or appliance appurtenant thereto, or any portion of any building or equipment, that is designed, constructed, installed or operated for the primary purpose of: (a) eliminating, preventing, or reducing air or water pollution... or (b) treating, pretreating, modifying or disposing of any potential solid, liquid, gaseous pollutant which if released without treatment, pretreatment, modification or disposal might be harmful, detrimental or offensive to human, plant or animal life, or to property."

6. Pollution control facilities are entitled to preferential tax treatment, as provided by 35 ILCS 200/11-5 (2002).

7. Based on information in the application and the underlying purpose of the Bio Desulfurization Unit to prevent, eliminate or reduce air pollution, it is the Illinois EPA's engineering judgment that the described project and/or equipment may be considered "pollution control facilities" in accordance with the statutory definition and consistent with the Board's regulations at 35 Ill. Adm. Code 125.200. **[Exhibit B].**

8. Because the Bio Desulfurization Unit will satisfy the aforementioned criteria, the Illinois EPA recommends that the Board **grant** the applicant's requested tax certification.

Respectfully submitted by,

ILLINOIS ENVIRONMENTAL PROTECTION  
AGENCY

/s/ Robb H. Layman  
Robb H. Layman  
Assistant Counsel

DATED: March 12, 2009

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9276  
Telephone: 217/524-9137

**CERTIFICATE OF SERVICE**

I hereby certify that on the 12th day of March 2009, I electronically filed the following instruments entitled **NOTICE, APPEARANCE** and **RECOMMENDATION** with:

John Therriault, Assistant Clerk  
Illinois Pollution Control Board  
100 West Randolph Street  
Suite 11-500  
Chicago, Illinois 60601

and, further, that I did send a true and correct copy of the same foregoing instruments, by First Class Mail with postage thereon fully paid and deposited into the possession of the United States Postal Service, to:

Steve Santarelli  
Illinois Department of Revenue  
101 West Jefferson  
P.O. Box 19033  
Springfield, Illinois 62794

Susette M. Harris  
Citation Oil & Gas Corporation  
8223 Willow Place Drive S  
Houston, Texas 77070-4631

/s/ Robb H. Layman  
Robb H. Layman  
Assistant Counsel



December 19, 2006

Illinois EPA  
Attn: Donald E. Sutton, Manager  
Permit Section  
Division of Air Pollution Control  
PO Box 19276  
Springfield, IL 62794-9276

Re: Citation Oil & Gas Corp.'s Form APC 151 Application for Certification (Property Tax Treatment), Pollution Control Facility

Dear Mr. Sutton:

Enclosed for filing with the Permit Section, Bureau of Air is Citation Oil & Gas Corp.'s ("Citation") application for Certification (Property Tax Treatment) Pollution Control Facility. Citation operates oil and gas wells located in Marion County, Raccoon Township.

In July 2005, Citation was granted a permit (Application Number 05060022) to construct a gas plant, the Salem Gas Plant, for the recovery natural gas liquids (NGLs) from casing head gas collected from existing crude oil pumping wells. The construction permit also includes three existing gas production facilities: Water Injection Plant, South Battery, and the North Battery. The existing facilities operate under a lifetime operating permit number 73030968.

The construction phase of the gas plant was completed in July 2006. The facility is currently undergoing testing.

Please let me know if you have any questions or need further information in aid of reviewing this application.

Respectfully submitted,

Susette M. Harris, CPA  
Senior Tax Accountant

**RECEIVED**

DEC 26 2006

IEPA DAPC SPFLD

CMRRR# 7006 0810 0000 9574 2450

Enclosures

IL EPA Application for Tax Certification 12192006.doc

- 1 -

— Exhibit A —

### INDEX OF ATTACHEMENTS

1. **June 7, 2005** –Transmittal to Original Construction Permit Application
2. **June 2005**-Construction Permit Application prepared by Kane Environmental Engineering, Inc.
3. **June 8, 2005**-Application for Construction Permit- Form 199-CAAPP
4. **July 20, 2005**-Notice of Additional Construction Permit Application Fees
5. **September 6, 2005**-Construction Permit granted

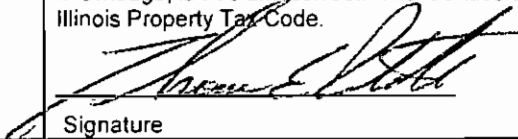


**APPLICATION FOR CERTIFICATION (PROPERTY TAX TREATMENT)  
POLLUTION CONTROL FACILITY  
AIR  WATER**

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
P. O. Box 19276, Springfield, IL 62794-9276**

This Agency is authorized to request this information under Illinois Revised Statutes, 1979, Chapter, 120, Section 502a-5. Disclosure of this information is voluntary. However, failure to comply could prevent your application from being processed or could result in denial of your application for certification.

FOR AGENCY USE			
File No.	Date Received	Certification No.	Date
Sec. A          APPLICANT	Company Name Citation Oil & Gas Corp.		
	Person Authorized to Receive Certification Susette M. Harris		Person to Contact for Additional Details Le Ann Elsom
	Street Address 8223 Willow Place Drive S		Street Address 8223 Willow Place Drive S
	Municipality, State & Zip Code Houston, TX 77070-4631		Municipality, State & Zip Code Houston, TX 77070-4631
	Telephone Number (281) 517-7513		Telephone Number (281) 517-7800
	Location of Facility Quarter Section      Township      Range		Municipality      Township
	Street Address 2302 Hoots Chapel Road		County      Book Number
	Property Identification Number		Parcel Number 15-06-200-11
	Sec. B     MANUFACTURING OPERATIONS	Nature of Operations Conducted at the Above Location  Gas gathering system and NGL sales project with bio-desulfurization. See Attached Construction Permit prepared by Kane Environmental Engineering, Inc. June 2005.	
Water Pollution Control Construction Permit No.		Date Issued	
NPDES PERMIT No. ILR00		Date Issued	Expiration Date 05/31/08
Air Pollution Control Construction Permit No. 05060022		Date Issued 07/20/05	
Air Pollution Control Operating Permit No. Pending		Date Issued	
Sec. C    MANUFACTURING PROCESS	Describe Unit Process  See Attachment in Support of Tax Application.		
	Materials Used in Process  See Attachment in Support of Tax Application.		
Sec. D   POLLUTION CONTROL FACILITY DESCRIPTION	Describe Pollution Abatement Control Facility  The pollution control facility includes a bio-desulfurization unit. See Attached Construction Permit prepared by Kane Environmental Engineering, Inc. June 2005.		

Sec. E POLLUTION CONTROL FACILITY - CONTAMINANTS	(1) Nature of Contaminants or Pollutants sulfides			
			Material Retained, Captured or Recovered	
	Contaminant or Pollutant	DESCRIPTION	DISPOSAL OR USE	
	hydrogen sulfide	sulfide	bio-desulfurization	
	sulfur dioxide	sulfide	bio-desulfurization	
	(2) Point(s) of Waste Water Discharge			
			Plans and Specifications Attached	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
	(3)	Are contaminants (or residues) collected by the control facility?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	No <input type="checkbox"/>
(4)	Date installation completed <u>07/01/06</u> status of installation on date of application _____			
ACCOUNTING DATA	(5) a.	FAIR CASH VALUE IF CONSIDERED REAL PROPERTY:	\$ 7,374,000.00	
	b.	NET SALVAGE VALUE IF CONSIDERED REAL PROPERTY:	\$ 0.00	
	c.	PRODUCTIVE GROSS ANNUAL INCOME OF CONTROL FACILITY:	\$ 0.00	
	d.	PRODUCTIVE NET ANNUAL INCOME OF CONTROL FACILITY:	\$ 0.00	
	e.	PERCENTAGE CONTROL FACILITY BEARS TO WHOLE FACILITY VALUE:	% 100	
Sec. F SIGNATURE	The following information is submitted in accordance with the Illinois Property Tax Code, as amended, and to the best of my knowledge, is true and correct. The facilities claimed herein are "pollution control facilities" as defined in Section 11-10 of the Illinois Property Tax Code.			
	 Signature		Vice-President Taxation Title	
Sec. G	INSTRUCTIONS FOR COMPILING AND FILING APPLICATION			
	General: Separate applications must be completed for each control facility claimed. Do not mix types (water and air). Where both air and water operations are related, file two applications. If attachments are needed, record them consecutively on an index sheet.			
Sec. A	Information refers to applicant as listed in the tax records and the person to be contacted for further details or for inspection of facilities. Define facility location by street address or legal description. A plat map location is required for facilities located outside of municipal boundaries. The property identification number is required.			
Sec. B	Self-explanatory. Submit copies of all permits issued by local pollution control agencies. (e.g. MSD Construction Permit)			
Sec. C	Refers to manufacturing processes or materials on which pollution control facility is used.			
Sec. D	Narrative description of the pollution control facility, indicating that its primary purpose is to eliminate, prevent or reduce pollution. State the type of control facility. State permit number, date, and agency issuing permit. A narrative description and a process flow diagram describing the pollution control facility. Include a listing of each major piece of equipment included in the claimed fair cash value for real property. Include an <u>average</u> analysis of the influent and effluent of the control facility stating the collection efficiency.			
INSTRUCTIONS	Sec. E			
	List air contaminants, or water pollution substances released as effluents to the manufacturing processes. List also the final disposal of any contaminants removed from the manufacturing processes. Item (1) - Refers to pollutants and contaminants removed from the process by the pollution control facility. Item (2) - Refers to water pollution but can apply to water-carried wastes from air pollution control facilities. Submit drawings, which clearly show (a) Point(s) of discharge to receiving stream, and (b) Sewers and process piping to and from the control facility. Item (3) - If the collected contaminants are disposed of other than as wastes, state the disposition of the materials, and the value in dollars reclaimed by sale or reuse of the collected substances. State the cost of reclamation and related expense. Item (4) - State the date which the pollution control facility was first placed in service and operated. If not, explain. Item (5) - This information is essential to the certification and assessment actions. This accounting data must be completed to activate project review prior to certification by this Agency.			
Sec. F	Self-explanatory. Signature must be a corporate authorized signature.			
	Submit to:	Attention:	Attention:	
	Illinois EPA P.O. Box 19276 Springfield, IL 62794-9276	Al Keller Permit Section Division of Water Pollution Control	Donald E. Sutton Permit Section Division of Air Pollution Control	

12/19/2006  
1:58 PM

ATTACHMENT IN SUPPORT OF TAX CERTIFICATION APPLICATION

**Section C. Describe Unit Process. Unit.** Process described in attached Construction Permit Application ID No. 121813AAA beginning at page 5.

The new Salem Gas Plant is located at 2302 Hoots Chapel Road, Marion County, Illinois. The plant was constructed to gather sour casing head gas to process into a saleable product: natural gas liquids (NGLs). 38 miles of pipelines were installed to gather casing head gas from existing oil pumping wells. This gas has been flared at the well site since 1938. The process consists of six separate sub processes (See Attachment 2 for more details):

1. Inlet gas heating and separation.
2. Gas treating/Sulfur Recovery.
3. Refrigeration Unit/Process Cooling
4. Liquids recovery from Process Gas
5. Liquids Stabilization
6. Hydrate Inhibition and Stabilizer Heat Medium Supply

**Section C. Materials used in process.** Materials described in attached Construction Permit Application ID No. 121813AAA.

Shell-Pacques/Thopaq® solvent for removal of H<sub>2</sub>S. MRU unit and dual purpose ethylene glycol heating and injection unit. Thiopaq® process uses bacteria of the genera Thiobacillus to oxidize the hydrogen sulfide.

**Section D. Pollution Control Facility Description.** Pollution control facility described in attached Construction Permit Application ID No. 121813AAA beginning at page 5.

*Salem Gas Plant*

The Salem Gas Plant pollution control facility consists of a bio-desulfurization unit that removes entrained H<sub>2</sub>S for gathered casing head gas. There are three sections to the bio-desulfurization facility: Absorption section, Reaction section, aerobic section, and the Sulfur Recovery Section.

The absorption section washes the gas in an absorption tower. The laden washing liquid is led to the aerobic reactor in which the sulfides are oxidized.

12/19/2006

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The reaction section, aerobic reactor contains micro-organism that oxidizes the absorbed sulfides into elemental sulfur. Reactor internals are used to ensure complete mixing and optimal mass transfer of the oxygen in to the liquid phase. Exhaust air from the reactor can be normally emitted without further processing.

The produced sulfur is separated from the liquid by means of a settling unit. Solids content of the settler underflow is typically between 10 and 20%. The sulfur slurry can be furthered dewatered by means of a decanter centrifuge or filter press to obtain a dry solid concentration of about 60-65%.

The sulfur product can use as a raw material for the production of sulfuric acid at sulfuric acid plants for burning waste acid and slurries. Citation plans to dispose of the sulfur by truck to a nearby solid waste landfill.

#### *South Battery*

The South Battery had an existing non-assisted flare that was converted to a vapor recovery unit that will route vapors into the gas gathering system.

A 210-BBL vertical fixed roof condensate tank will be installed that will include a vapor recovery unit that will also route vapors back into the gas gathering system.



June 7, 2005

Illinois Environmental Protection Agency  
Division Of Air Pollution Control -- Permit Section  
P.O. Box 19506  
Springfield, Illinois 62794-9506

*RE: Air Permitting Construction Application - Salem Unit - Gas Gathering and NGL Sales Project*

To Whom It May Concern:

Citation Oil & Gas Corp. (Citation) is pleased to present this permit application for the Salem Unit - Gas Gathering and NGL Sales Project. This project will be classified as a synthetic minor source and will require a FESOP (Federally Enforceable State Operating Permit) since the facility's uncontrolled emissions would be major without the pollution control device.

Citation Oil & Gas Corp. (Citation) operates three oil and gas production facilities located southwest of Salem, Illinois in Marion County. The facilities are the North Battery, South Battery and Water Injection Plant that operate under a Lifetime Operating Permit (Permit No. 73030968) and are engaged in the separation of oil from water that is extracted from the crude oil pumping wells in the surrounding area. With this application, Citation proposes to construct a gas plant, the Salem Gas Plant, for the recovery of natural gas liquids (NGLs) from casing head gas collected from existing crude oil pumping wells. Due the existing Lifetime Operating Permits for the North and South Batteries and Water Injection Plant, guidance from the IEPA was to include these facilities in this construction application. For the purposes of creating consistent and accurate representation of these operations, Citation is providing revised plot plans and emission calculations for these facilities.

**Background**

Since approximately 1938, pumping wells in the Salem area have been producing crude oil. These wells are currently owned and operated by Citation and produce crude from over 200 active well sites. Current operations include the extraction of a water and crude oil mixture from the wells. The mixture is sent to one of two locations, the North Battery or the South Battery, depending on the geographic location of the wells. At each respective tank battery, water is separated from the crude oil after passing through a series of freewater knockout tanks, gunbarrels and crude oil stock tanks. Crude oil is transferred to sales via a lease automated custody transfer (LACT) unit. Produced water is transported to a centralized location, the Water Injection Plant, which stores the water prior to pumping into water injection wells located throughout the field. Gas from the freewater knockouts and the gunbarrel tanks are collected and sent to a combustion flare. The sour casing head gas that is produced from the extraction of the liquids is flared at the wellhead in small flares. These flares are not regulated under the air rules of the Illinois EPA and have operated in this mode throughout the life of the field.

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SEP 26 2005

IEPA DAPC SPFLD

*Gas Gathering and NGL Sales Project*

Since 2000, Citation has been actively conducting a study to evaluate the technical and economical feasibility of collecting, processing and selling the casing head gas and the associated NGLs that can be extracted from the gas. In 2001, Citation completed a Gas Gathering Pilot program to determine if the recovery of the casing head gas would be feasible. It was determined that with the current economic conditions and the quantity of gas that is currently produced at the well sites that the project was feasible. Since that time, Citation has developed a plan, the Salem Gas Gathering and NGL Sales Project, to collect the sour casing head gas to a central location and process the gas for the collection of natural gas liquids (NGLs). The proposed location is the subject of this construction permit application, the Salem Gas Plant, which is to be located adjacent to the existing South Battery. Note that the processing of the casing head gas is independent of the crude oil production operations. The operation of the batteries and water injection plant is essentially unaffected by this proposed construction.

Citation is proposing to use an innovative control technology that is provided by NATCO called bio-desulfurization. This technology has been permitted and operated in the United States and Canada and utilizes absorption technology in combination with biological treatment in the form of H<sub>2</sub>S-eating bugs. The process achieves over 99% reduction in H<sub>2</sub>S with the by-product of elemental sulfur and a sweet residue gas instead of highly concentrated H<sub>2</sub>S gas. The elemental sulfur is removed from the site as a moist cake while the residue gas is flared. This technology eliminates the need to flare acid gas at the plant and consequently eliminates the flaring of H<sub>2</sub>S at the existing well sites. It is expected that the Salem Unit Gas Gathering and NGL Sales Project is one of the most significant environmentally beneficial projects in the history of Marion County, as it will contribute to the reduction of over 1,200 tons per year of actual SO<sub>2</sub> emissions that have been emitted annually since 1938. Using innovative technology and vision, Citation has proposes to construct this project that will:

- *Reduce ambient SO<sub>2</sub> emissions in a 5 square mile area by over 1,200 tons per year;*
- *Recover otherwise wasted natural resources to generate nearly 350 barrels per day of saleable NGLs;*
- *Generate ~600 Mcf/day of sweet, high-Btu residue gas that has the potential to be used for future power generation, feedstock for ethanol production, or supply of clean burning natural gas to the city of Salem;*  
*and*
- *Improve the ambient air quality in the Marion County by eliminating over 200 ground flares located throughout the area.*

Enclosed is a fee check for \$12,000 along with an original and two additional copies of the application for your review. Thank you in advance for you consideration of this permit application. If you have any questions about this application, or need additional information please do not hesitate to contact me directly at (281) 517-7196, or Mr. Paul DeCiutiis of Kane Environmental at (512) 401-2444.

Sincerely,



Lee Ann Elsom  
Environmental Coordinator

cc: Mr. Clyde Finch, Citation Oil & Gas, Corp. Oklahoma City, OK



Citation Oil & Gas Corp.  
8223 WILLOW PLACE SOUTH  
HOUSTON, TEXAS 77070-5623

Electronic Filing - Received, Clerk's Office, March 12, 2009

PCB 2009-068

Wells Fargo Bank  
115 Hospital Drive  
Van Wert, OH 45891  
Payable Account

VENDOR NO.	VENDOR NAME	CHECK DATE	CHECK NUMBER	AMOUNT
10615	STATE OF ILLINOIS	Jun-01-2005	132291	\$12,000.00

VOUCHER	VENDOR INV #	INV DATE	TOTAL AMOUNT	PRIOR PMTS & DISCOUNTS	NET AMOUNT
06-AP-18	IEPA060105	06/01/05	12,000.00	0.00	12,000.00
	DP00001828				
TOTAL INVOICES PAID					12,000.00

PAYEE: DETACH THIS STATEMENT BEFORE DEPOSITING



Citation Oil & Gas Corp.  
8223 WILLOW PLACE SOUTH  
HOUSTON, TEXAS 77070-5623

Wells Fargo Bank  
115 Hospital Drive  
Van Wert, OH 45891  
Payable Account

55-382  
412

Check No. 132291

**WARNING**

Do not accept this document unless you can see a ghost feature when held at a 45 degree angle to the light. The back of this document has an artificial watermark.  
**VOID AFTER 90 DAYS**

CHECK NO.	DATE	PAY EXACTLY
132291	Jun-01-2005	\$12,000.00

PAY EXACTLY **\$12,000dols00cts**  
TWELVE THOUSAND DOLLARS AND NO CENTS

COUNTER SIGNATURE REQUIRED IF AMOUNT GREATER THAN \$50,000

TO THE ORDER OF

STATE OF ILLINOIS  
OFFICE OF STATE TREASURER  
ENVIRONMENTAL PROTECTION AGENCY  
P O BOX 19276  
SPRINGFIELD, IL 62794-9276

By *CAHance*

By \_\_\_\_\_

⑈ 132291 ⑈ ⑆ 04 1 2038 24 ⑆ 9600034226 ⑈

# ***Construction Permit Application***

**Salem Unit – Gas Gathering and NGL Sales Project  
Salem, Marion County  
ID No. 121813AAA**

*Prepared for:*



**Citation Oil & Gas Corp.  
8223 Willow Place South, Suite 250  
Houston, Texas 77070-5623**

*Prepared by:*



**Kane Environmental Engineering, Inc.  
2801 Welton Cliff  
Cedar Park, Texas 78613-4324  
Project No. 04-035**

**RECEIVED**

DEC 26 2006

**June 2005**

IEPA - DAPC - SPF



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Appendix A: Required IEPA Forms and Tables

Appendix B: Emissions Calculations and Data

Appendix C: Supporting Documentation

Appendix D: Supporting Data for Alternative Control Technology

## 1.0 INTRODUCTION

---

Citation Oil & Gas Corp. (Citation) operates three oil and gas production facilities located southwest of Salem, Illinois in Marion County. The facilities are the North Battery, South Battery and Water Injection Plant that operate under a Lifetime Operating Permit (Permit No. 73030968) and are engaged in the separation of oil from water that is extracted from the crude oil pumping wells in the surrounding area. With this application, Citation proposes to construct a gas plant, the Salem Gas Plant, for the recovery of natural gas liquids (NGLs) from casing head gas collected from existing crude oil pumping wells.

### **Background**

Since approximately 1938, pumping wells in the Salem area have been producing crude oil. These wells are currently owned and operated by Citation and produce crude from over 200 active well sites. Current operations include the extraction of a water and crude oil mixture from the wells. The mixture is sent to one of two locations, the North Battery or the South Battery, depending on the geographic location of the wells. At each respective tank battery, water is separated from the crude oil after passing through a series of freewater knockout tanks, gunbarrels and crude oil stock tanks. Crude oil is transferred to sales via a lease automated custody transfer (LACT) unit. Produced water is transported to a centralized location, the Water Injection Plant, which stores the water prior to pumping into water injection wells located throughout the field. Gas from the freewater knockouts and the gunbarrel tanks are collected and sent to a combustion flare. The sour casing head gas that is produced from the extraction of the liquids is flared at the wellhead in small flares. These flares are not regulated under the air rules of the Illinois EPA and have operated in this mode throughout the life of the field.

### **Gas Gathering and NGL Sales Project**

Since 2000, Citation has been actively conducting a study to evaluate the technical and economical feasibility of collecting, processing and selling the casing head gas and the associated NGLs that can be extracted from the gas. In 2001, Citation completed a Gas Gathering Pilot program to determine if the recovery of the casing head gas would be feasible. It was determined that with the current economic conditions and the quantity of gas that is currently produced at the well sites that the project was feasible. Since that time, Citation has developed a plan, the Salem Gas Gathering and NGL Sales Project, to collect the sour casing head gas to a central location and process the gas for the collection of natural gas liquids (NGLs). The proposed location is the subject of this construction permit application, the Salem Gas Plant, which is to be located adjacent to the existing South Battery. Note that the processing of the casing head gas is independent of the crude oil production operations. The operation of the batteries and water injection plant is essentially unaffected by this proposed construction.

In evaluating the feasibility of this project, Citation has conducted studies of the production and gas composition of the casing head gas. The analytical results of sampling conducted in February 2004 is included in Appendix C. Because of the sour composition of the casing

head gas and need to remove the entrained hydrogen sulfide (H<sub>2</sub>S) for recovery of saleable NGLs, a concentrated sour vent stream would be created and posed a complex air pollution control issue. The casing head gas that is currently flared at the wellheads creates, in aggregate, over 1,200 tons per year of sulfur dioxide (SO<sub>2</sub>) by combusting the H<sub>2</sub>S which ranges in concentration from 2% to 5%, by volume. In order to flare this gas collectively at the Salem Gas Plant, compliance with Illinois EPA Rule 214.301 could not be demonstrated. Therefore, Citation explored all options in controlling the acid gas created from removing the H<sub>2</sub>S.

After significant review and analysis of control options, Citation is proposing to use an innovative control technology that is provided by NATCO called bio-desulfurization. This technology has been permitted and operated in the United States and Canada and utilized absorption technology in combination with biological treatment in the form of H<sub>2</sub>S-eating bugs. The process achieves over 99% reduction in H<sub>2</sub>S with the by-product of elemental sulfur and a sweet residue gas instead of highly concentrated H<sub>2</sub>S gas. The elemental sulfur is removed from the site as a moist cake while the residue gas is flared. This technology eliminates the need to flare acid gas at the plant and consequently eliminates the flaring of H<sub>2</sub>S at the existing well sites. It is expected that the Salem Unit Gas Gathering and NGL Sales Project is one of the most significant environmentally beneficial projects in the history of Marion County, as it will contribute to the reduction of over 1,200 tons per year of actual SO<sub>2</sub> emissions that have been emitted annually since 1938. Using innovative technology and vision, Citation has proposed to construct this project that will:

- Reduce ambient SO<sub>2</sub> emissions in a 5 square mile area by over 1,200 tons per year;
- Recover otherwise wasted natural resources to generate nearly 350 barrels per day of saleable NGLs; ~
- Generate ~600 Mcf/day of sweet, high-Btu residue gas that has the potential to be used for future power generation, feedstock for ethanol production, or supply of clean burning natural gas to the city of Salem; and
- Improve the ambient air quality in the Marion County area by eliminating over 200 ground flares located throughout the area.

Due to the existing Lifetime Operating Permits for the North and South Batteries and Water Injection Plant, guidance from the IEPA was to include these facilities in this construction application. For the purposes of creating consistent and accurate representation of these operations, Citation is providing revised plot plans and emission calculations for these facilities. A summary of the equipment at the existing and proposed Salem Gas Plant is provided below.

### **Equipment Summary**

Existing equipment at the North Battery is listed below

- (2) 400-bbl vertical fixed-roof oil stock tanks;
- (2) 600-bbl vertical fixed-roof gunbarrel tanks;
- (1) 3,300-bbl vertical open-roof overflow tank;
- (6) 420-bbl freewater knockout tanks;
- (1) non-assisted flare;
- Equipment fugitive components

Existing equipment at the Water Injection Facility is listed below

- (2) 5,000-bbl vertical fixed-roof water tanks;
- (1) 5,000-bbl vertical open-roof overflow tank;
- (1) 20,000-bbl vertical open-roof overflow tank;
- (1) fluid separation pit\*;
- Equipment fugitive components

*\*Note: This unit was previously authorized but has been closed and is no longer operational.*

Existing equipment at the South Battery is listed below

- (2) 400-bbl vertical fixed-roof oil stock tanks;
- (2) 600-bbl vertical fixed-roof gunbarrel tanks;
- (1) 3,300-bbl vertical open-roof overflow tank;
- (6) 420-bbl free water knockout tanks;
- (1) non-assisted flare\*;
- Equipment fugitive components

*\*Note: This flare will be eliminated and will be replaced with a VRU that will route vapors into the gas gathering system.*

New equipment is proposed to construct the Salem Gas Plant and is listed below:

- (3) 30,000 gal pressurized NGL product tanks;
- (1) mechanical refrigeration unit with gas-fired reboiler for glycol dehydration;
- (1) bio-desulfurization unit with ancillary equipment;
- (1) propane refrigeration compressor – electric motor drive
- (1) chilled water skid;
- (1) 210-bbl vertical fixed-roof condensate tank\*;
- (1) air-assisted flare (located ~1,600 feet north of the plant);
- (1) 250 hp electric drive, 2-stage gas compressor;
- Equipment fugitive components

*\*Note: This tank will be located at the South Battery and equipped with a VRU that will route vapors into the gas gathering system.*

### **Emissions Summary**

The emissions generated at the Salem Gas Plant include carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S), and volatile organic compounds (VOC). The sitewide emissions associated with the proposed production increase will not trigger CAAPP (Title V) applicability since the emissions of all criteria pollutants are below 100 tpy. Single HAP emissions are not above 10 tons per year (tpy) and the aggregate HAP emissions are below 25 tpy, so MACT will not apply to the Salem Gas Plant. Since the Water Injection Plant and North Battery are located over ¼ mile from the Salem Gas Plant, the potential emissions from these facilities are not included in determining federal permit applicability. Since the South Battery is located adjacent to the Salem Gas Plant, emissions from both locations will be evaluated together to determine federal permit applicability.

This document includes the required IEPA forms, area maps, plot plans, emissions data, permit fee, process flow diagrams, and process descriptions, to demonstrate compliance

with all applicable state and federal air permitting requirements. A summary of the existing and proposed emissions is summarized in Tables 1-1 – 1-5 below.

**Table 1-1 Proposed Emissions - Salem Gas Plant**

EPN	Equipment	NO <sub>x</sub>		CO		VOM		SO <sub>2</sub>		H <sub>2</sub> S		PM <sub>10</sub>	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
PV1	Bioreactor Vent Emissions	0.00	0.00	0.00	0.00	0.002	0.007	0.000	0.000	0.01	0.01	0.00	0.00
PH1	300 MBtu/hr Dehy Reboiler	0.02	0.08	0.02	0.07	0.001	0.004	0.000	0.000	0.00	0.00	0.001	0.006
PFL1	Facility Flare	4.55	8.36	39.04	71.64	51.61	59.10	307.28	75.46	3.34	0.80	0.000	0.000
PF1	Equipment Fugitives	0.00	0.00	0.00	0.00	6.91	30.28	0.00	0.00	0.263	1.150	0.000	0.000
<b>Totals:</b>		<b>4.57</b>	<b>8.43</b>	<b>39.05</b>	<b>71.71</b>	<b>58.52</b>	<b>89.40</b>	<b>307.28</b>	<b>75.46</b>	<b>3.61</b>	<b>1.96</b>	<b>0.001</b>	<b>0.006</b>

**Table 1-2 Existing Emissions - North Battery**

EPN	Equipment	NO <sub>x</sub>		CO		VOM		SO <sub>2</sub>		H <sub>2</sub> S		PM <sub>10</sub>	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
NT1	400 bbl Oil Stock Tank #1	0.00	0.00	0.00	0.00	0.57	2.49	0.00	0.00	0.021	0.09	0.00	0.00
NT2	400 bbl Oil Stock Tank #2	0.00	0.00	0.00	0.00	0.572	2.49	0.00	0.00	0.021	0.09	0.00	0.00
NFL1	Facility Flare	0.004	0.02	0.03	0.13	0.04	0.20	0.19	0.85	0.002	0.01	0.00	0.00
NF1	Equipment Fugitives	0.00	0.00	0.00	0.00	0.79	3.44	0.00	0.00	0.046	0.201	0.00	0.00
<b>Totals:</b>		<b>0.004</b>	<b>0.02</b>	<b>0.03</b>	<b>0.13</b>	<b>1.97</b>	<b>8.61</b>	<b>0.19</b>	<b>0.85</b>	<b>0.09</b>	<b>0.40</b>	<b>0.00</b>	<b>0.00</b>

**Table 1-3 Existing Emissions - Water Injection Plant**

EPN	Equipment	NO <sub>x</sub>		CO		VOM		SO <sub>2</sub>		H <sub>2</sub> S		PM <sub>10</sub>	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
WFL1	Tank Vent	0.00	0.00	0.00	0.00	2.97	14.54	0.00	0.00	0.11	0.55	0.00	0.00
WL1	Loading Emissions	0.00	0.00	0.00	0.00	9.50	5.13	0.00	0.00	1.05	0.57	0.00	0.00
WF1	Equipment Fugitives	0.00	0.00	0.00	0.00	0.47	2.06	0.00	0.00	0.029	0.129	0.00	0.00
<b>Totals:</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>12.94</b>	<b>21.74</b>	<b>0.00</b>	<b>0.00</b>	<b>1.19</b>	<b>1.24</b>	<b>0.00</b>	<b>0.00</b>

**Table 1-4 Existing Emissions - South Battery**

EPN	Equipment	NO <sub>x</sub>		CO		VOM		SO <sub>2</sub>		H <sub>2</sub> S		PM <sub>10</sub>	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
ST1	400 bbl Oil Stock Tank #1	0.00	0.00	0.00	0.00	0.57	2.49	0.00	0.00	0.021	0.09	0.00	0.00
ST2	400 bbl Oil Stock Tank #2	0.00	0.00	0.00	0.00	0.57	2.49	0.00	0.00	0.02	0.09	0.00	0.00
PFL1	Facility Flare	0.004	0.02	0.03	0.13	0.04	0.20	0.19	0.85	0.002	0.01	0.00	0.00
SL1	Loading Emissions	0.00	0.00	0.00	0.00	9.50	1.60	0.00	0.00	11.62	0.06	0.00	0.00
SF1	Equipment Fugitives	0.00	0.00	0.00	0.00	0.79	3.44	0.00	0.00	0.046	0.20	0.00	0.00
<b>Totals:</b>		<b>0.004</b>	<b>0.02</b>	<b>0.03</b>	<b>0.13</b>	<b>11.47</b>	<b>10.21</b>	<b>0.19</b>	<b>0.85</b>	<b>11.71</b>	<b>0.461</b>	<b>0.00</b>	<b>0.00</b>

**Table 1-5 Total Emissions from the Salem Gas Plant and South Tank Battery**

NO <sub>x</sub>		CO		VOM		SO <sub>2</sub>		H <sub>2</sub> S		PM <sub>10</sub>	
lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
4.57	8.45	39.08	71.84	69.99	99.61	307.47	76.31	15.32	2.42	0.001	0.006

## 2.0 PROCESS DESCRIPTION

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### OVERVIEW OF THE PROCESS

The equipment supplied by NATCO for this project will integrate with existing and new equipment to be supplied by Citation Oil and Gas to enable value to be captured from casing head gas. *The following process description is taken from the design documentation provided by NATCO, Proposal No. 2M994181 Rev. 2.*

#### 1. Inlet Gas Heating and Separation

Associated (sour) process gas and liquids from field compression will enter the plant at approximately 50 psig. It is expected that a primary gas-liquids separator will be supplied by the client at this point of the system. Gas from the primary separator will be routed to the NATCO Shell-Paques unit. Free liquids are removed from the gas stream by a NATCO vertical separator, followed by a NATCO MistTrap coalescer. These separators are vital to the overall performance of the system by preventing hydrocarbon liquids from entering the H<sub>2</sub>S contactors / scrubbers. Because of the configuration of the system with first-stage field compression and buried flow lines to the main plant, it is expected that the gas will enter the plant at a temperature value of between 60-70°F. Optimum process gas temperature range for this Shell Paques design is 60-85°F to allow for suitable temperature difference between the process gas and Paques process solution. An in-line electric gas heater is supplied within the pre-treat system to provide suitable gas temperature conditions to the Shell Paques unit. The PLC control panel will have the capabilities to operate the heater if the gas temperature is lower than 60°F, and/or to maintain a constant 85°F gas temperature to the H<sub>2</sub>S Gas Scrubbers.

Wet (sour) liquids from the plant inlet gas separator and the two NATCO supplied separators are recycled back into the process. Treated gas from the H<sub>2</sub>S Scrubbers is routed to a conventional gas-liquid separator that uses a coarse vane pack demister (in lieu of a wire mesh demister). A spray nozzle is provided in this separator to enable in-situ water-washing of the demister section to scrub out any residual Paques solvent from the treated gas.

#### 2. Gas Treating / Sulfur Recovery

Scrubbed process gas is routed to the two H<sub>2</sub>S Scrubber vessels (piped in series), where the gas is allowed to contact the Paques solvent for removal of H<sub>2</sub>S from the process stream. The Paques solvent is discharged from the H<sub>2</sub>S Scrubbers to the Bio-regeneration system, which regenerates the solvent and the bacteria produce elemental sulfur.

A slipstream of solvent is routed to a decanting centrifuge (supplied by client) for collection and removal of elemental sulfur in solid (paste) form. The sulfur is suitable for dumping into a waste bin. Filtrate liquid from this process is allowed to drain into a Filtrate Tank, where it is pumped back to the regeneration system.

### **3. Refrigeration Unit / Process Cooling**

Process cooling for the MRU and process cooling for the NATCO Shell Paques Unit are supplied by a closed loop refrigerant compression / condensing unit. This unit is a two-stage Aial compressor with a discharge cooler / condenser and a receiver / accumulator vessel. Refrigerant liquid from the receiver / accumulator are discharged in parallel to the MRU Chiller (evaporator) and to the Chilled Water evaporator.

Refrigerant vapors from the MRU chiller are routed to the compressor first stage suction. The refrigerant compressor controls the pressure on the evaporator shell. This indirectly controls the process temperature in the Cold Separator, which essentially controls the amount of liquids allowed to condense from the process gas stream.

Refrigerant vapors from the Chilled Water evaporator are routed to the compressor second stage suction, thus acting somewhat as an economizer. Routing to the second stage suction is vital to prevent over-cooling of the chilled water to prevent inadvertent freezing of the Paques solvent. A back-pressure valve is supplied on the refrigerant vapor line to provide further means of controlling the refrigerant bath temperature.

### **4. Liquids Recovery from Process Gas**

The treated gas, with an H<sub>2</sub>S concentration of 4-10 ppmv, is further compressed in two stages to a pressure of 550 – 785 psig, which is more suitable for recovery of LPG and heavier fractions. At these pressures the process gas is chilled to a temperature of -20°F in a conventional Mechanical Refrigeration Unit (MRU). The outlet gas is combined from the MRU, stabilizer overhead, and wet condensate feed drum. At this time it is expected that this gas stream will be flared or possibly used to generate electrical power in the future.

### **5. Liquids Stabilization**

Liquids from the Stabilizer Feed Drum, and liquids from the MRU Cold Separator are routed to the Stabilizer Column. The Stabilizer is a non-refluxed reboiled absorber. Depending on the operating conditions of the stabilizer system, the product liquids may be discharged to LPG storage tanks, or they may be "spiked" into the crude oil storage tanks. Overhead gas from the Stabilizer is routed to the outlet gas system.

### **6. Hydrate Inhibition and Stabilizer Heat Medium Supply**

The MRU unit is equipped with a dual-purpose Ethylene Glycol (EG) heating and injection unit. The injection unit functions as a conventional reconcentrator to deliver a controlled rate of lean (80%) EG to the MRU Gas-Gas Heat Exchanger and Chiller. The lean EG is distributed as a thin film on the cold surfaces of the heat exchangers and piping, and function to dissolve into solution any hydrates that form from the gas stream due to the cooling processes. The rate is controlled to insure that the maximum dilution of EG is 10% (thus minimum 70% rich EG). The diluted EG solution is collected in the three-phase MRU Cold Separator and returned to the EG reconcentrator unit.

A separate closed-loop hot EG stream is pumped through the Stabilizer Reboiler tube bundle. This stream provides the energy required to condition the liquid product to the

desired vapor pressure value. The return EG stream is returned directly to the EG reboiler firetube section.

## THE BIO-DESULFURIZATION PROCESS

The following is taken from the Paques document entitled, **REMOVAL OF H<sub>2</sub>S FROM GAS STREAMS Using THIOPAQ<sup>®</sup> TECHNOLOGY**, dated March 2003.

The THIOPAQ process can be summarized in a simplified block diagram:

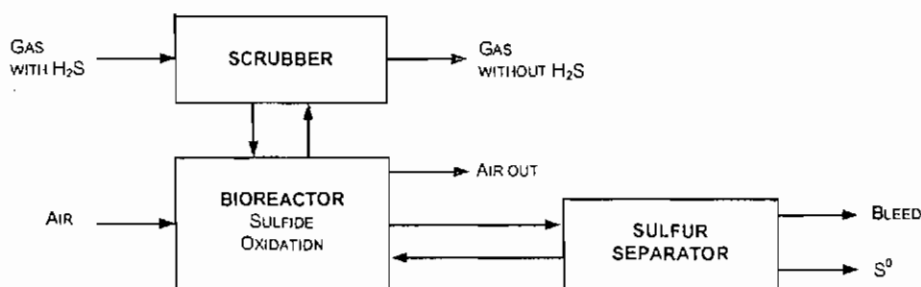


Figure 2-1 Block diagram of the THIOPAQ<sup>®</sup> process.

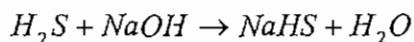
The gas enters a wet scrubber, typically a packed column, and is desulfurized with a slightly alkaline fluid. A demister section prevents carry-over of fluid. The cleaned gases leave the scrubber at the top.

The spent scrubber liquid is collected in the bottom of the scrubber and directed to the bioreactor. In the reactor bacteria convert, under the consumption of oxygen, the dissolved sulfide into solid elemental sulfur, thereby regenerating caustic soda. The sulfur is separated as a solid and the sulfur slurry can optionally be pumped into a sulfur recovery unit. In this unit the slurry can be dewatered and discharged as a cake for further use. The liquor is returned to the reactor. The bioreactor effluent is recycled to the scrubber for renewed removal of H<sub>2</sub>S. From the system a small bleed stream is taken in order to prevent built up of formed salts.

### Process Chemistry

The THIOPAQ<sup>®</sup> process for treatment of gas can be considered as a caustic scrubber combined with a bioreactor in which the spent caustic solution is regenerated. A flow diagram of the process is shown in Figure 2-1.

In a scrubber hydrogen sulfide is absorbed under alkaline conditions, i.e. at pH 8-9. The absorption of H<sub>2</sub>S proceeds according to the following equation:

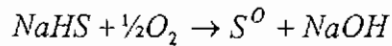


From this equation it follows that alkalinity is consumed.



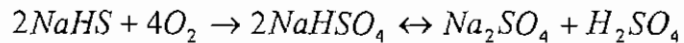
High H<sub>2</sub>S removal efficiencies are feasible, because the H<sub>2</sub>S concentration in the washing liquid entering the scrubber will be virtually zero due to the high activity in the bioreactor.

In the THIOPAQ<sup>®</sup> process, the alkalinity consumption due to the absorption of H<sub>2</sub>S, is completely compensated as a result of the oxidation of hydrogen sulfide to elemental sulfur which proceeds under oxygen limited circumstances:



The THIOPAQ<sup>®</sup> process uses bacteria of the genera *Thiobacillus* to oxidize the hydrogen sulfide. Since there is a significant biological overcapacity in the reactor, variations in the H<sub>2</sub>S loading rate can easily be handled.

A small part (<5%) of the dissolved sulfide will be completely oxidized to sulfate according to:



As a result of this reaction, caustic soda is required to neutralize the formed sulfuric acid. This leads to the production of a small bleed stream. The bleed stream (containing sodium salts and some sulfur) is harmless and can in most cases easily be discharged.

Compared to caustic scrubbers the bleed stream is negligible and expensive treatment of spent caustic is not necessary. Obviously caustic consumption figures for THIOPAQ<sup>®</sup> technology are significantly lower as for caustic scrubbers (savings are greater than 94%).

After dewatering, the produced sulfur can be used for the production of sulfuric acid or as a fertilizer.

#### Process Configuration

The process of removing H<sub>2</sub>S from biogas consists of three main sections. These include an absorber, an aerobic (biological) reactor and a sulfur separation step. A schematic overview of the system is shown in Figure 2-2.

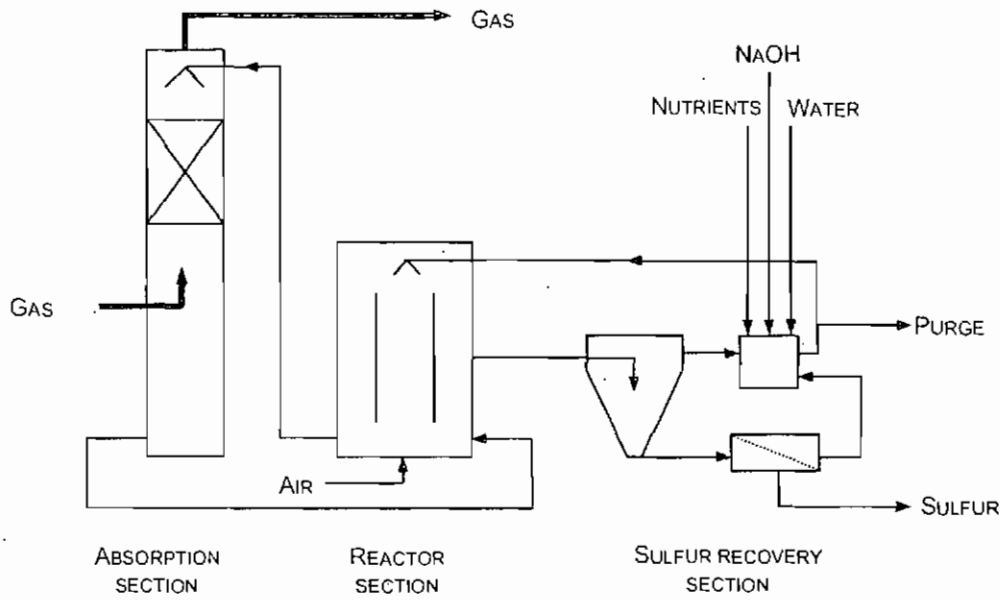


Figure 2-2 THIOPAQ<sup>®</sup> process for biogas desulfurization.

### 1. Absorption section

Hydrogen sulfide is absorbed in an absorption tower. The gas enters at the bottom of the column and flows upwards. The washing liquid is sprayed downwards from the top by means of nozzles. The laden washing liquid is led to the aerobic reactor in which the sulfides are oxidized.

### 2. Reaction section, aerobic reactor

The aerobic reactor contains the micro-organisms that oxidize the absorbed sulfides into elemental sulfur. Reactor internals are used to ensure complete mixing and optimal mass transfer of oxygen into the liquid phase. The volume of the aerobic reactor is designed in accordance with the optimal activity of the bacteria.

The exhaust air from the reactor can normally be emitted without further treatment. The reactor effluent is recycled to the absorber column to serve as scrubbing liquid.

An important process parameter is the amount of air being pumped into the reactor. This is controlled accurately in order to minimize the formation of sulfate. The air dosage is therefore automated based on the oxygen content. This, and all other controls are controlled by a PLC.

### 3. Sulfur recovery section

The produced sulfur is separated from the liquid by means of a settling unit. Part of the reactor contents is circulated over the settler to maintain the desired dry solid content in the system. The dry solids content of the settler underflow is typically between 10 and 20%.

The sulfur slurry can be dewatered further by means of a decanter centrifuge or filter press to obtain a dry-solid concentration of about 60-65%.

The sulfur will have a purity of about 95-98% on dry basis, the remainder is biomass. The sulfur product can be used as a raw material for the production of sulfuric acid at sulfuric acid plants with facilities for burning waste acid and slurries. In some countries the biological produced sulfur can be applied as a fertilizer. At this time, Citation proposes to remove the sulfur by truck for disposal in a nearby solid waste landfill.

### 3.0 PROCESS FLOW

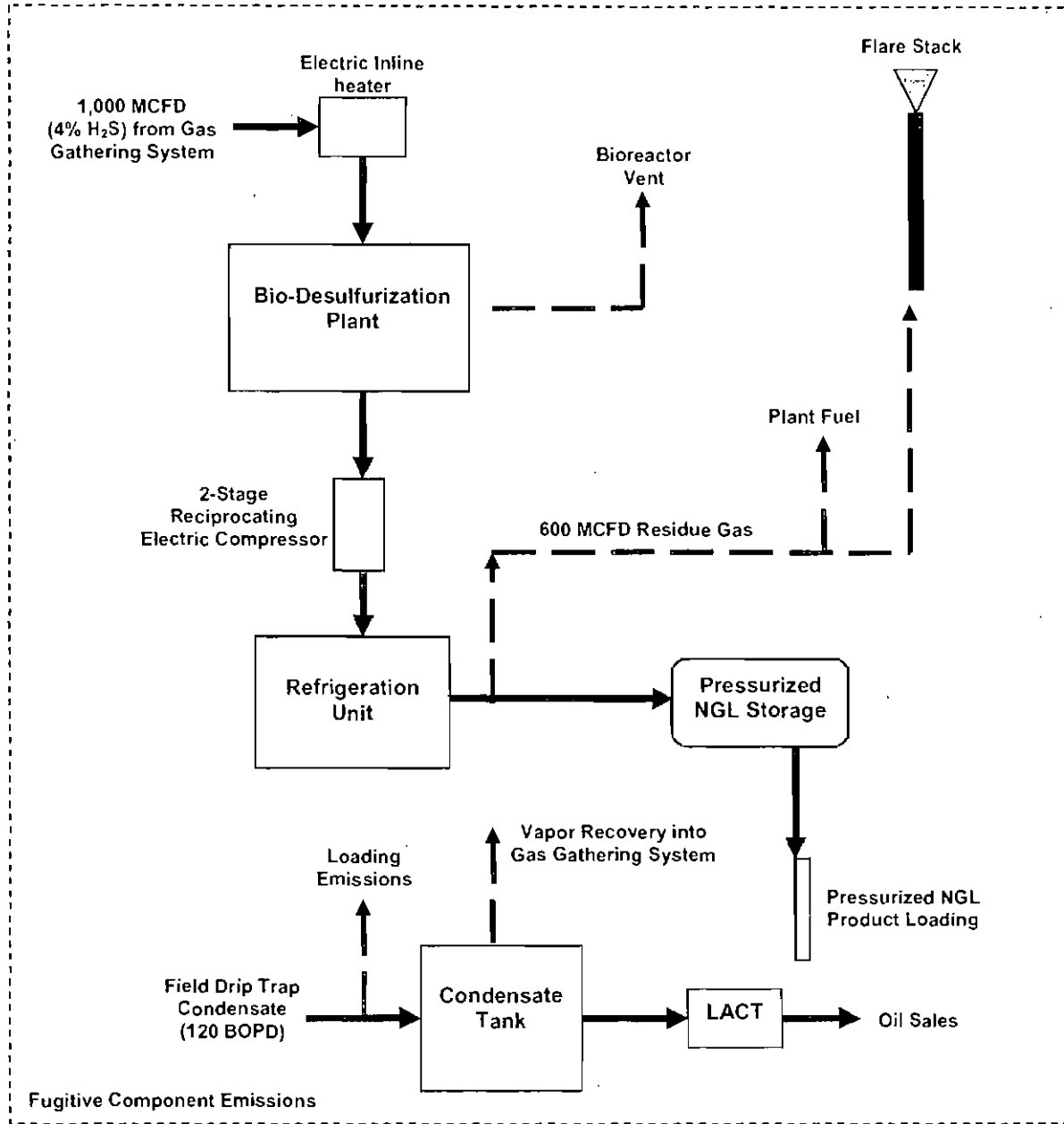
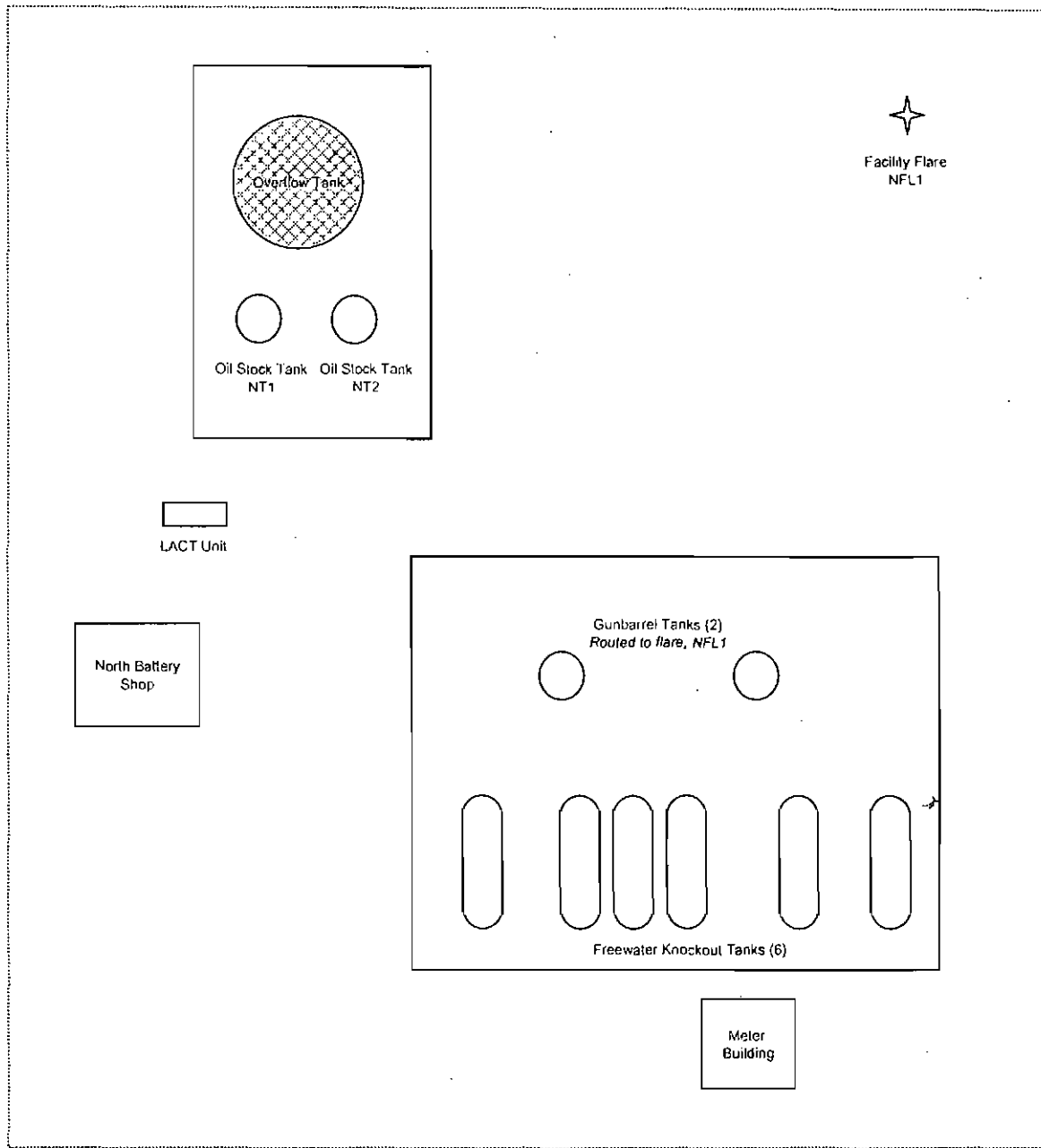


Figure 3-1 Simplified Process Flow Diagram of the Salem Gas Plant

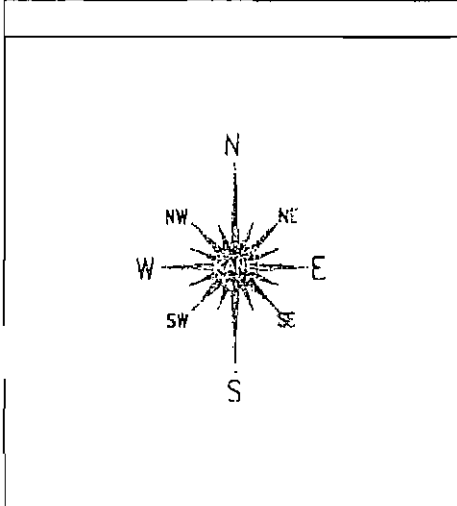
#### 4.0 FACILITY DIAGRAMS

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- Plot Plan – North Battery
- Plot Plan – Water Injection Facility
- Plot Plan – South Battery
- Plot Plan – Salem Gas Plant
- Aerial Photo – North Battery
- Aerial Photo – South Battery and Proposed Flare and Gas Plant Locations
- USGS Topographic Map



Equipment Leak Fugitives  
NF1

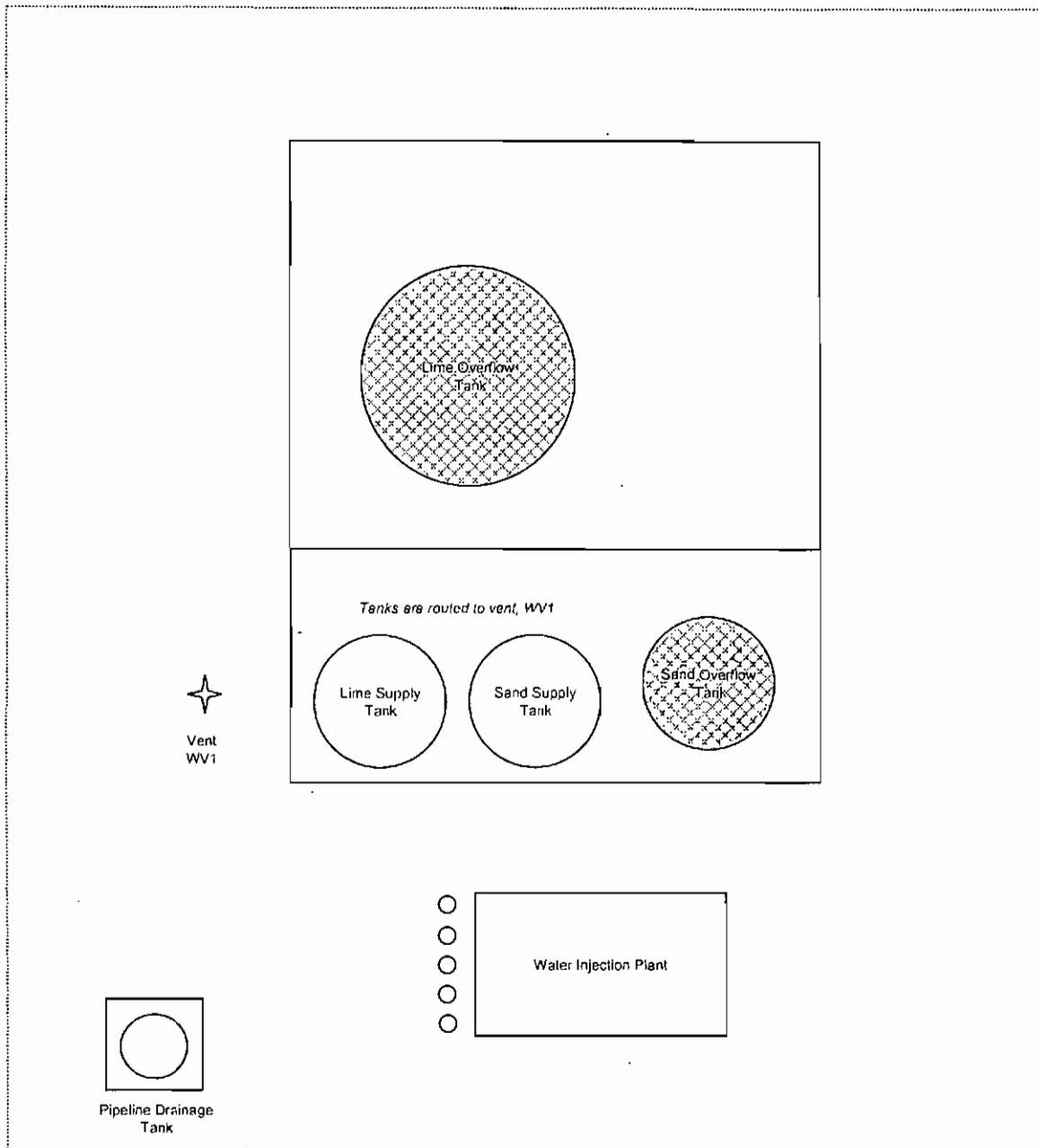


EQUIPMENT LEGEND		
NT1	OIL STOCK TANK	400 bbl
NT2	OIL STOCK TANK	400 bbl
NFL1	NORTH BATTERY FLARE	
	OVERFLOW TANK	3,300 bbl
	GUNBARREL TANK #1	600 bbl
	GUNBARREL TANK #2	600 bbl
	FREEWATER KNOCKOUT TANK #1	420 bbl
	FREEWATER KNOCKOUT TANK #2	420 bbl
	FREEWATER KNOCKOUT TANK #3	420 bbl
	FREEWATER KNOCKOUT TANK #4	420 bbl
	FREEWATER KNOCKOUT TANK #5	420 bbl
	FREEWATER KNOCKOUT TANK #6	420 bbl
NF1	NORTH BATTERY FUGITIVES	

**Citation**  
OIL & GAS CORP.  
**North Battery Plot Plan**  
Marion County, Illinois  
N 38° 34' 49.3" W 89° 0' 32.1"

**KANE**  
Environmental Engineering, Inc.

DRAWN BY: PED	PROJECT: 04-035
DATE: 05/16/05	APPROVED: PED
REVISED:	NOT TO SCALE



Equipment Leak Fugitives  
WF1

**EQUIPMENT LEGEND**

LIME SUPPLY TANK	5,000 bbl
SAND SUPPLY TANK	5,000 bbl
SAND OVERFLOW TANK	5,000 bbl
LIME OVERFLOW TANK	20,000 bbl
PIPELINE DRAINAGE TANK	2,000 bbl
WV1 WATER INJECTION PLANT VENT	
WF1 WATER INJECTION PLANT FUGITIVES	

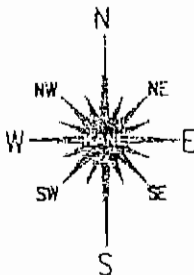


**Water Injection Plant Plot Plan**

Marion County, Illinois  
N 38° 33' 58.8" W 89° 1' 25.2"



Environmental Engineering, Inc.



DRAWN BY: PED

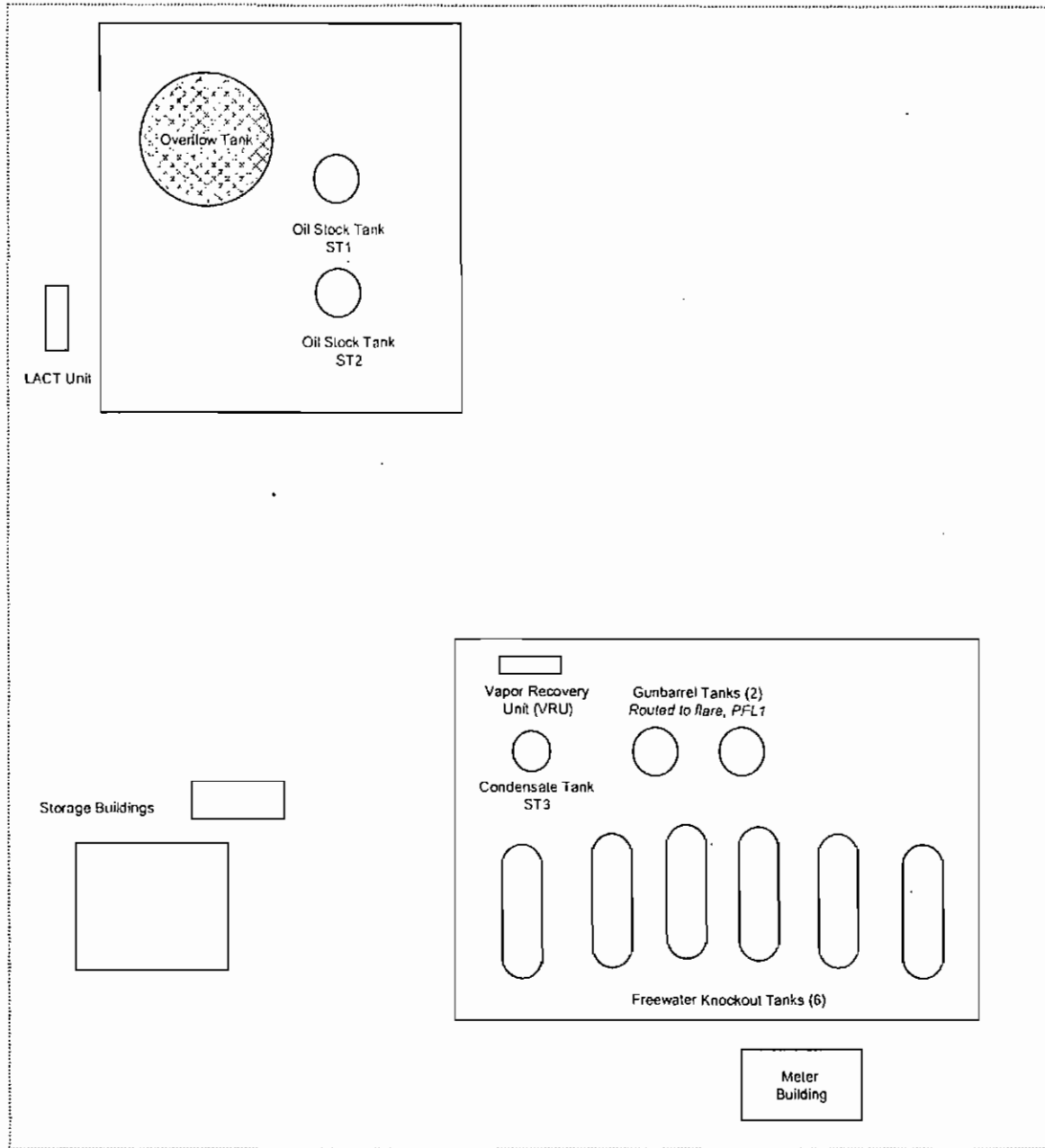
PROJECT: 04-035

DATE: 05/16/05

APPROVED: PED

REVISED:

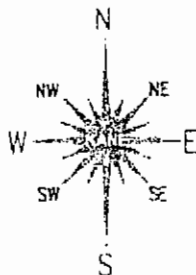
NOT TO SCALE



Equipment Leak Fugitives  
SF1

**EQUIPMENT LEGEND**

ST1	OIL STOCK TANK	400 bbl
ST2	OIL STOCK TANK	400 bbl
ST3	CONDENSATE TANK	210 bbl
	OVERFLOW TANK	3,300 bbl
	GUNBARREL TANK #1	600 bbl
	GUNBARREL TANK #2	600 bbl
	FREEWATER KNOCKOUT TANK #1	420 bbl
	FREEWATER KNOCKOUT TANK #2	420 bbl
	FREEWATER KNOCKOUT TANK #3	420 bbl
	FREEWATER KNOCKOUT TANK #4	420 bbl
	FREEWATER KNOCKOUT TANK #5	420 bbl
	FREEWATER KNOCKOUT TANK #6	420 bbl
SF1	SOUTH BATTERY FUGITIVES	



**South Battery Plot Plan**

Marion County, Illinois

N 38° 33' 19.9" W 89° 0' 50.2"

**KANE**

Environmental Engineering, Inc.

DRAWN BY: PED

PROJECT: 04-035

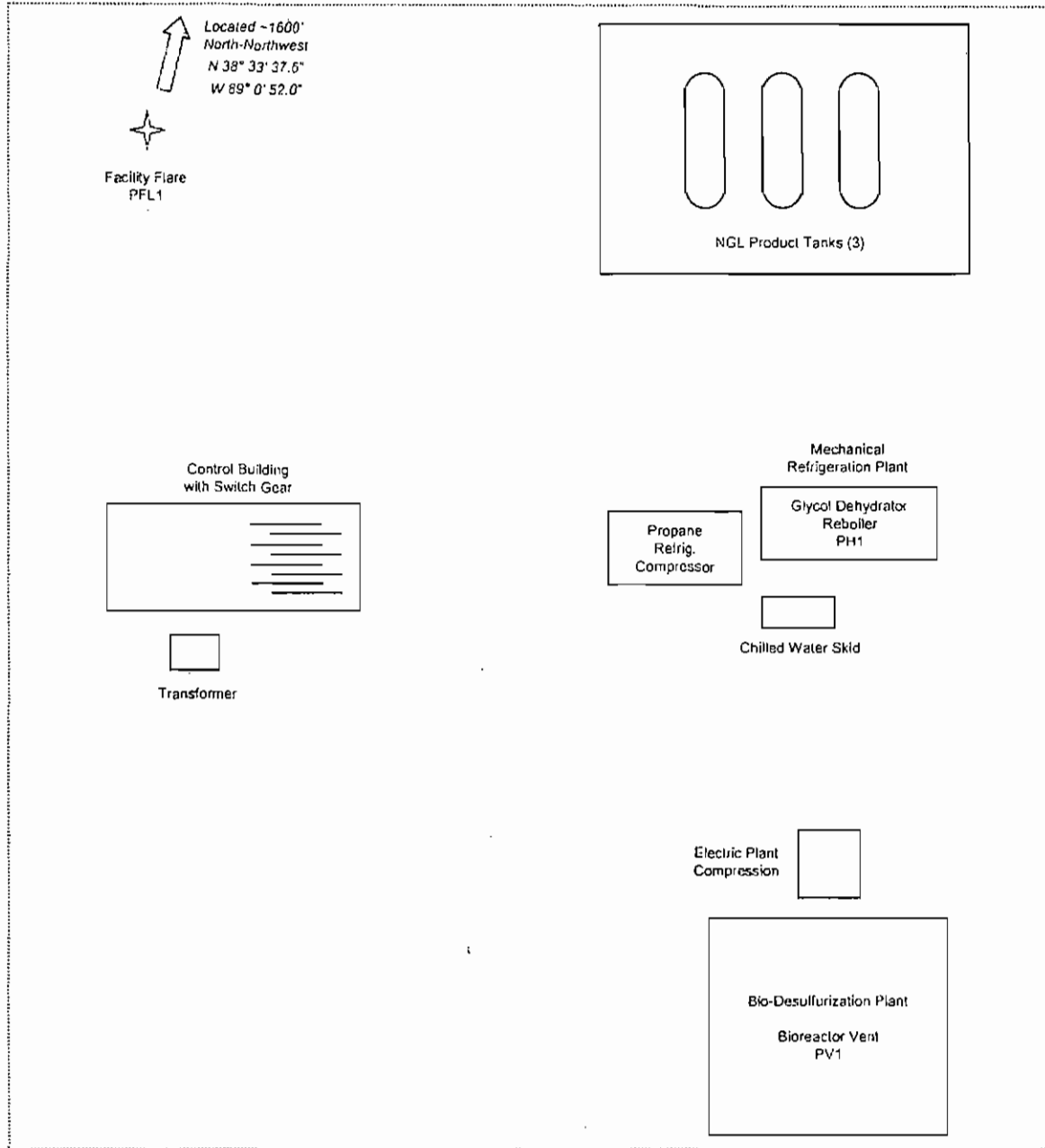
DATE: 05/16/05

APPROVED: PED

REVISED:

NOT TO SCALE

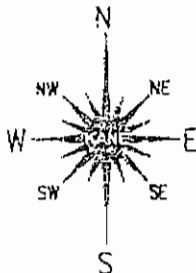




Equipment Leak Fugitives  
PF1

**EQUIPMENT LEGEND**

PH1	GLYCOL DEHYDRATOR REBOILER	300 MBtu/hr
	NGL PRODUCT TANK#1	30,000 gal
	NGL PRODUCT TANK#2	30,000 gal
	NGL PRODUCT TANK#3	30,000 gal
PV1	BIOREACTOR VENT	
PFL1	GAS PLANT FLARE	
PF1	GAS PLANT FUGITIVES	



**Salem Gas Plant Plot Plan**

Marion County, Illinois  
N 38° 33' 21.8" W 89° 0' 52.0"



Environmental Engineering, Inc.

DRAWN BY: PED

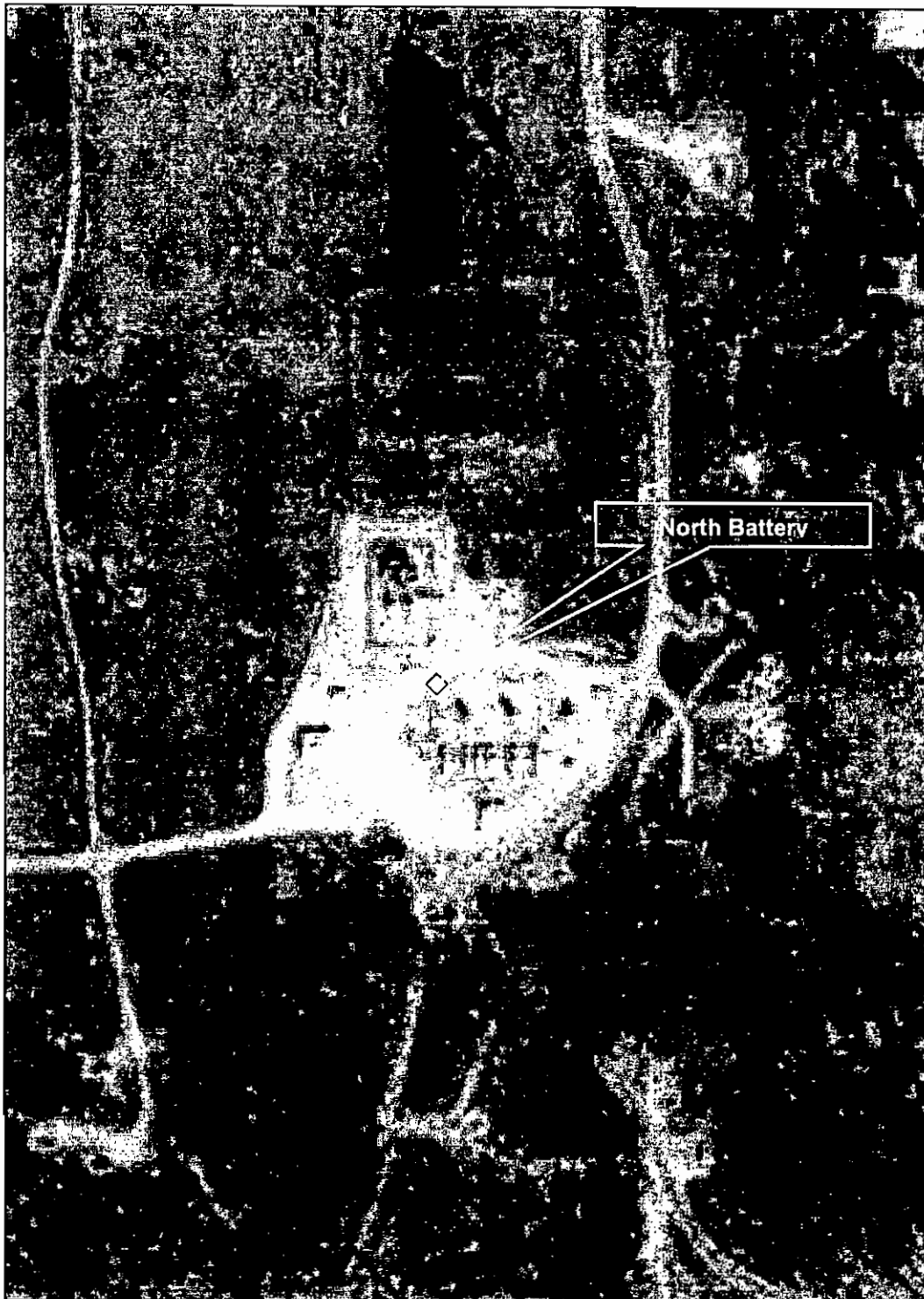
PROJECT: 04-035

DATE: 05/16/05

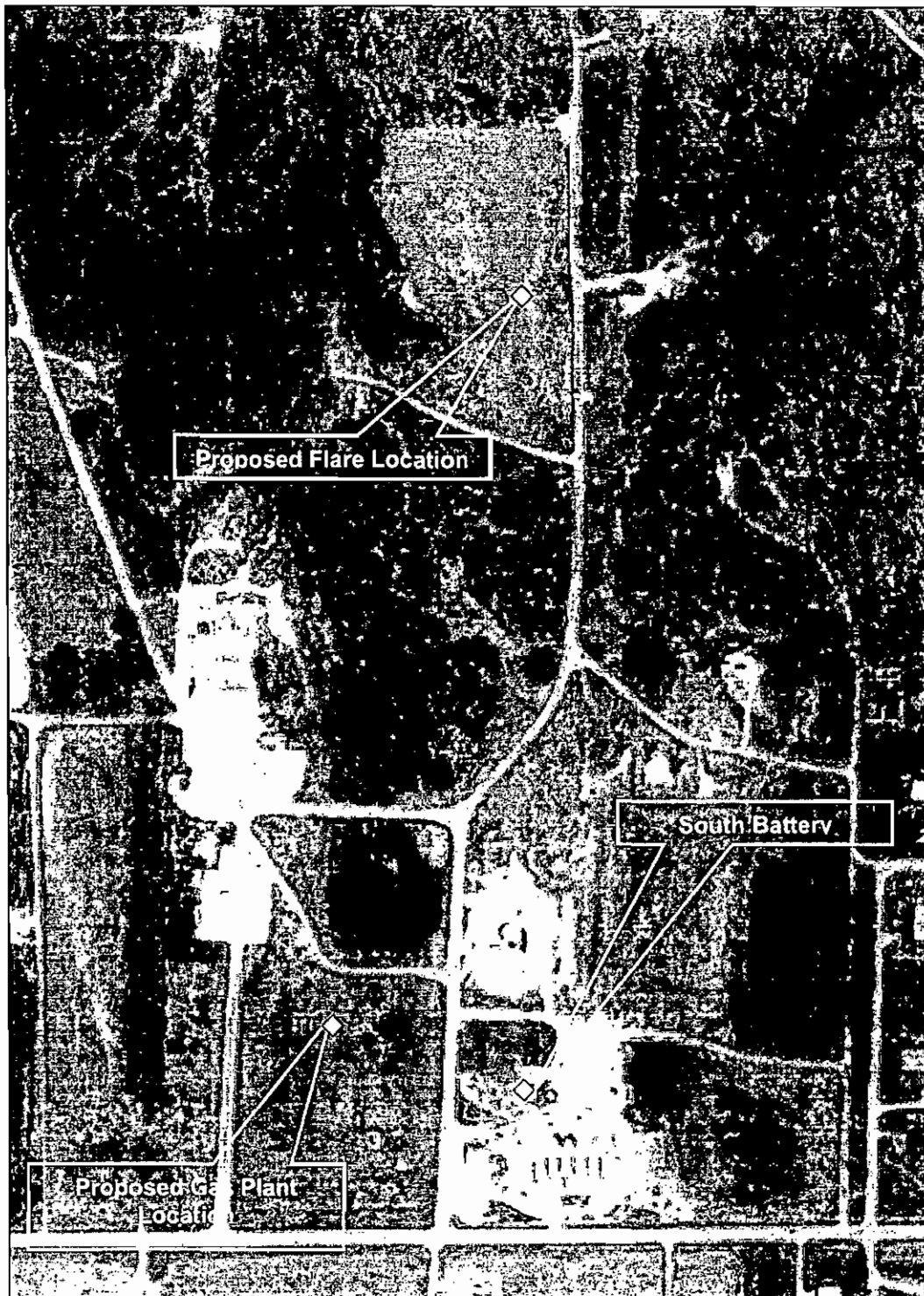
APPROVED: PED

REVISED:

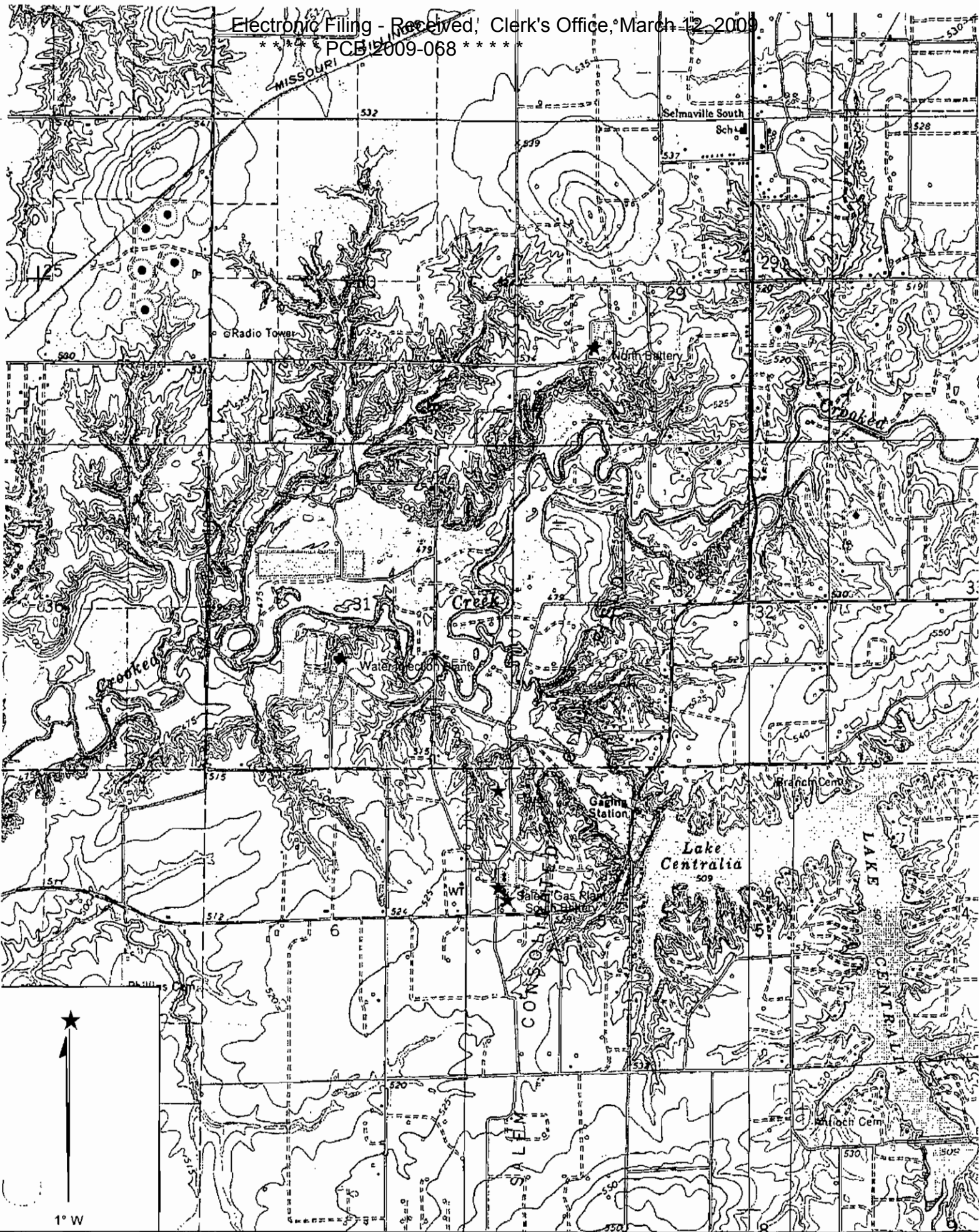
NOT TO SCALE



Aerial Photo – North Battery



Aerial Photo – South Battery and Proposed Salem Gas Plant Site



Name: CENTRALIA EAST  
Date: 6/4/2005  
Scale: 1 inch equals 2000 feet

Location: 038° 34' 05.96" N 089° 00' 55.46" W  
Caption: Citation Oil and Gas Corp.  
Salem Unit Area Map  
Marion County, Illinois

## 5.0 STATE REQUIREMENTS FOR PERMIT TO CONSTRUCT

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In reviewing the potential applicability of state emissions standards, Citation has summarized the pertinent Subparts and Sections that are included below.

### **TITLE 35, SUBTITLE B: AIR POLLUTION, CHAPTER I: POLLUTION CONTROL BOARD SUBCHAPTER a: PERMITS AND GENERAL PROVISIONS**

#### **SUBPART C: PROHIBITIONS**

Section 201.146 Exemptions from State Permit Requirements

- c) Each fuel burning emission unit for indirect systems and for heating and reheating furnace systems used exclusively for residential, or commercial establishments using gas and/or fuel oil exclusively with a design heat input capacity of less than 14.6 MW (50 MMBtu/hr) , except that a permit shall be required for any such emission unit with a design heat input capacity of at least 10 MMBtu/hr that was constructed, reconstructed or modified after June 9, 1989 and that is subject to 40 CFR 60, Subpart D;

*Citation will be operating a gas-fired glycol dehydrator reboiler (PH1) rated at 300 MBtu/hr. Therefore, this unit is exempt from state permitting requirements.*

- k) Safety devices designed to protect life and limb, provided that a permit is not otherwise required for the emission unit with which the safety device is associated;

*Citation is proposing to operate the proposed air-assisted flare during times that the plant experiences mechanical malfunction, power outages, or other causes that are beyond their operational control. The operation of the flare in these scenarios will be required to prevent the release of highly concentrated H<sub>2</sub>S gas to the atmosphere.*

- n) Storage tanks of:
  - 1) Organic liquids with a capacity of less than 37,850 l (10,000 gal), provided the storage tank is not used to store any material listed as a hazardous air pollutant pursuant to Section 112(b) of the Clean Air Act, and provided the storage tank is not subject to the requirements of 35 Ill. Adm. Code 215.583(a)(2), 218.583(a)(2) or 219.583(a)(2);
  - 2) Any size containing exclusively soaps, detergents, surfactants, waxes, glycerin, vegetable oils, greases, animal fats, sweetener, corn syrup, aqueous salt solutions or aqueous caustic solutions, provided an organic solvent has not been mixed with such materials; or
  - 3) Any size containing virgin or re-refined distillate oil, hydrocarbon condensate from natural gas pipeline or storage systems, lubricating oil or residual fuel oils.

- o) Threaded pipe connections, vessel manways, flanges, valves, pump seals, pressure relief valves, pressure relief devices and pumps;
- p) Sampling connections used exclusively to withdraw materials for testing and analyses;
- q) All storage tanks of Illinois crude oil with capacity of less than 151,400 l (40,000 gal) located on oil field sites;
- r) All organic material-water single or multiple compartment effluent water separator facilities for Illinois crude oil of vapor pressure of less than 34.5 kPa absolute (5 psia);
- uu) Piping and storage systems for natural gas, propane and liquefied petroleum gas;

*Citation is proposing a 210-bbl (8,820 gallon) condensate tank (ST3) for collecting condensate produced from the collection of casing head gas in the field. In addition, ancillary equipment associated with the bio-desulfurization unit, separators, fugitive components, and NGL product tanks are exempt from state permitting requirements.*

**TITLE 35, SUBTITLE B: AIR POLLUTION, CHAPTER I: POLLUTION CONTROL BOARD  
SUBCHAPTER c: EMISSION STANDARDS AND LIMITATIONS FOR STATIONARY  
SOURCES**

**PART 212 VISIBLE AND PARTICULATE MATTER EMISSIONS**

Subpart B Visible Emissions

Section 212.123 Visible Emissions Limitations for All Other Emission Units

*Citation will be operating a gas-fired glycol dehydrator reboiler (PH1) and air-assisted flare (PFL1) that will comply with the requirements of this Section.*

**PART 214 SULFUR LIMITATIONS**

SUBPART K: PROCESS EMISSION SOURCES

Section 214.301 General Limitation

*Citation will be operating a biovent (PV1) with trace amounts of H<sub>2</sub>S and air-assisted flare that will combust sweet residue gas during normal operations. These units will comply with the requirements of this Section.*

**PART 216 CARBON MONOXIDE EMISSIONS**

SUBPART B: FUEL COMBUSTION EMISSION SOURCES

Section 216.121 Fuel Combustion Emission Sources

*This section does not apply to the fuel combustion sources at the Salem Gas Plant.*

**PART 217 NITROGEN OXIDES EMISSIONS**

**SUBPART B: NEW FUEL COMBUSTION EMISSION SOURCES**

**Section 217.121 New Emission Sources**

*This section does not apply to the fuel combustion sources at the Salem Gas Plant as they are rated < 250 MMBtu/hr.*

**PART 232 TOXIC AIR CONTAMINANTS**

**SUBPART D: SOURCE IDENTIFICATION AND REPORTING REQUIREMENTS**

**Section 232.430 Emissions Report**

*This section does not apply to the emission sources at the Salem Gas Plant as they are de minimis.*

**PART 243 AIR QUALITY STANDARDS**

**SUBPART B: STANDARDS AND MEASUREMENT METHODS**

**Section 243.120 PM-10**

- a) Standards. The ambient air quality standards for PM-10 are:
  - 1) An annual arithmetic mean concentration of 50 micrograms per cubic meter; and
  - 2) A maximum 24-hour concentration of 150 micrograms per cubic meter, not to be exceeded more than once per year

*The emissions sources at the Salem Gas Plant will comply with these standards.*

**Section 243.122 Sulfur Oxides (Sulfur Dioxide)**

- a) Primary Standards. The primary ambient air quality standards for sulfur oxides measured as sulfur dioxide are:
  - 1) An annual arithmetic mean concentration of 80 micrograms per cubic meter (0.03 ppm); and,
  - 2) A maximum 24-hour concentration not to be exceeded more than once per year of 365 micrograms per cubic meter (0.14 ppm).
- b) Secondary Standard. The secondary ambient air quality standard for sulfur oxides measured as sulfur dioxide is a maximum 3-hour concentration not to be exceeded more than once per year of 1,300 micrograms per cubic meter (0.5 ppm).

*The emissions sources at the Salem Gas Plant will comply with these standards. In particular, the operation of the air-assisted flare (PFL1) for safety purposes during times of plant shutdowns or mechanical failure have been modeled to demonstrate compliance with the SO<sub>2</sub> standards. The resulting predicted impacts are included in Section 8.0 of this document.*

**Section 243.123 Carbon Monoxide**

- a) Standards. The ambient air quality standards for carbon monoxide are:
  - 1) A maximum 8-hour concentration not to be exceeded more than once per year of 10 milligrams per cubic meter (9 ppm); and,
  - 2) A maximum 1-hour concentration not to be exceeded more than once per year of 40 milligrams per cubic meter (35 ppm).

*The emissions sources at the Salem Gas Plant will comply with these standards.*

**Section 243.124 Nitrogen Dioxide**

- a) Standard. The ambient air quality standard for nitrogen dioxide is an annual arithmetic mean concentration of 100 micrograms per cubic meter (0.05 ppm).

*The emissions sources at the Salem Gas Plant will comply with these standards.*

**Section 243.125 Ozone**

- a) Standard. The ambient air quality standard for ozone is 0.12 ppm (235 micrograms per cubic meter) maximum 1-hour concentration not to be exceeded on more than one day per year.

*The emissions sources at the Salem Gas Plant will comply with these standards.*

**Section 243.126 Lead**

- a) Standard. The ambient air quality standards for lead and its compounds are 1.5 micrograms per cubic meter, maximum arithmetic mean average over a calendar quarter.

*The emissions sources at the Salem Gas Plant will comply with these standards.*



## 6.0 FEDERAL REQUIREMENTS FOR A PERMIT TO CONSTRUCT

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### **New Source Performance Standards (NSPS)**

The emissions from the proposed facility will meet the requirements of any applicable NSPS as listed under Title 40 Code of Federal Regulations (CFR) Part 60, promulgated by the EPA under FCAA, §111, as amended.

### **Subpart Dc--STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS**

*Citation will be operating a gas-fired glycol dehydrator reboiler (PH1) rated at 300 MBtulhr. Therefore, this section does not apply per 60.40c(a) since it is rated <10MMBtulhr.*

### **Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984**

*Citation is proposing a 210-bbl (8,820 gallon) condensate tank (ST3) for collecting condensate produced from the collection of casing head gas in the field and pressurized NGL product tanks. These tanks are exempt from Kb standards under 60.630b*

*(d) This subpart does not apply to the following:*

*(2) Pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere.*

*(4) Vessels with a design capacity less than or equal to 1,589.874 m<sup>3</sup> used for petroleum or condensate stored, processed, or treated prior to custody transfer.*

### **Subpart KKK—Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants.**

*Citation will be extracting natural gas liquids from the casing head gas and will therefore be required to comply with the requirements of this section. However, since the Salem Gas Plant has a maximum production rate of 1.0 MMscfd, it will qualify for an exemption of some monitoring and recordkeeping pursuant to 60.633(d):*

*(d) Pumps in light liquid service, valves in gas/vapor and light liquid service, and pressure relief devices in gas/vapor service that are located at a nonfractionating plant that does not have the design capacity to process 283,200 standard cubic meters per day (scmd) (10 million standard cubic feet per day) or more of field gas are exempt from the routine monitoring requirements of §§60.482-2(a)(1) and 60.482-7(a), and paragraph (b)(1) of this section.*

*Since the air-assist flare will be used to control certain components applicable to NSPS KKK standards, the flare will comply with the applicable requirements of 40 CFR 60, Subpart A, Section 60.18 regarding exit velocity and heating value.*

### **Subpart LLL—Standards of Performance for Onshore Natural Gas Processing: SO<sub>2</sub> Emissions**

NSPS Subpart LLL is applicable to the gas sweetening operations at the Salem Gas Plant. Citation will certify that the facility is exempt from the control requirements of the LLL standards because it has a design capacity less than 2.0 LT/D of H<sub>2</sub>S in the acid gas (expressed as sulfur). Therefore, Citation shall keep, for the life of the facility, an analysis demonstrating that the facility's design capacity is less than 2.0 LT/D of H<sub>2</sub>S expressed as sulfur pursuant to § 60.640(b):

*(b) Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H<sub>2</sub>S) in the acid gas (expressed as sulfur) are required to comply with §60.647(c) but are not required to comply with §§60.642 through 60.646.*

### **40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP).**

The emissions from the proposed facility will meet the requirements of any applicable NESHAP, as listed under 40 CFR Part 61, promulgated by EPA under FCAA, §112, as amended.

*There are no NESHAPs under 40 CFR 61 applicable to the Salem Gas Plant.*

**40 CFR Part 63, NESHAP for source categories.** The emissions from the proposed facility will meet the requirements of any applicable maximum achievable control technology standard as listed under 40 CFR Part 63, promulgated by the EPA under FCAA, §112 or as listed under Chapter 113, Subchapter C of this title (relating to National Emissions Standards for Hazardous Air Pollutants for Source Categories (FCAA §112, 40 CFR 63)).

*The Salem Gas Plant will not constitute a major source of hazardous air pollutants as defined by 40 CFR 63 or FCAA §112. Therefore, the plant will not be subject to any emission standards under Subpart HH of 40 CFR 63.*

### **40 CFR Part 51.165, Nonattainment Review**

If the proposed facility is located in a nonattainment area, it shall comply with all applicable requirements in this chapter concerning nonattainment review.

*The Salem Gas Plant is located in Marion County which is not a designated nonattainment area.*

**40 CFR Part 52.21, Prevention of Significant Deterioration (PSD) Review**

If the proposed facility is located in an attainment area, it shall comply with all applicable requirements in this chapter concerning PSD review.

*This facility is a new source that will not exceed the major source threshold of 250 tons per year. Therefore, PSD is not applicable to this project.*

## 7.0 EMISSION SOURCES AND CONTROLS

Emission sources from the Salem Gas Plant will include truck loading, gas flare, glycol dehydrator reboiler, glycol dehydrator, bioreactor and equipment fugitive components. The proposed controls and the emissions bases for the affected sources are listed below.

### Compression

Citation will operate one 250 hp, 2-stage electric driven compressor for inlet compression. There will be no emissions associated with the operation of this unit. X

### Line Heater

An electric line heater will be used to provide heat to the inlet gas at the plant. There will be no emissions associated with the operation of this unit. X

### Combustion Units (Glycol Dehydrator Reboiler)

Citation will operate a gas fired reboiler to supply heat to the glycol dehydration unit. The reboiler is rated at 300 MBtu/hr and will burn sweet residue gas. NO<sub>x</sub> and CO emissions from these units will be quantified using current emission factors from AP-42, Fifth Edition, Tables 1.4-1 (NO<sub>x</sub> & CO) and 1.4-2 (VOC, SO<sub>2</sub>, & PM). NO<sub>x</sub> emissions will be controlled to 100 lb-NO<sub>x</sub>/MMscf of natural gas burned and 84 lb-CO/MMscf of natural gas burned. *fuel source*

**Table 7-1 Combustion Unit Operation**

Pollutant	Controls	Control/ Emission rate	Basis
NO <sub>x</sub>	Good combustion and sweet gaseous fuels	100 lb/MMscf	AP-42 factor
CO	Good combustion and sweet gaseous fuels	84 lb/MMscf	AP-42 factor
VOC	Good combustion and sweet gaseous fuels	5.5 lb/MMscf	AP-42 factor
PM <sub>10</sub>	Good combustion and sweet gaseous fuels	7.6 lb/MMscf	AP-42 factor
SO <sub>2</sub>	Good combustion and sweet gaseous fuels	0.6 lb/MMscf	AP-42 factor

### Flare System

The flare at the Salem Gas Plant will be designed and operated according NSPS 60.18 requirements. Streams that will be vented to the facility flare will qualify as high Btu streams. Typical Btu content for vent streams will range between 1,100 and 1,250 Btu/scf. Composition of flared streams is listed in Appendix B. The flare calculation worksheet in Appendix B demonstrates compliance with the maximum tip velocity and minimum heating value requirements of 60.18. Air-assist will be employed to maintain smokeless operation. (1)

Citation is proposing to operate the proposed air-assisted flare during times that the plant experiences mechanical malfunction, power outages, or other causes that are beyond their control. The operation of the flare in these scenarios will be required to prevent the release of highly concentrated H<sub>2</sub>S gas. Emissions are based on a maximum production of 1.0 MMscfd inlet gas and are estimated using gas volume and composition data provided by NATCO process simulation software and mass balance of all contributing vent sources. Two scenarios were run for the flare including the flaring of residue gas during normal operation and the worst-case SO<sub>2</sub> emissions that will occur during the flaring of sour inlet gas during plant downtime. The worst-case emissions from each scenario are listed in the emissions summary with the maximum allowed operation of the flare while burning sour gas of 480 hours per year, or the equivalent of approximately 20 days of continuous flaring.

**Table 7-2 Flare Operation**

Pollutant	Controls	Control/ Emission rate	Basis
NO <sub>x</sub>	Good combustion, compliance with NSPS 60.18	0.0641 lb/MMBtu	TCEQ Flare Guidance, 10/2000
CO	Good combustion, compliance with NSPS 60.18	0.5496 lb/MMBtu	TCEQ Flare Guidance, 10/2000
VOC	Good combustion, compliance with NSPS 60.18	98 % DRE	TCEQ Flare Guidance, 10/2000
H <sub>2</sub> S and SO <sub>2</sub>	Good combustion, compliance with NSPS 60.18	98 % DRE	TCEQ Flare Guidance, 10/2000

Bioreactor Vent – Bioreactor vent will emit trace quantities of hydrocarbon emissions and H<sub>2</sub>S. Because of the relatively insignificant quantities of these pollutants, the vent will emit uncontrolled to the atmosphere. Emissions are based on a maximum production of 1.0 MMscfd inlet gas and are estimated using gas volume and composition data provided by NATCO process simulation software. (2)

Glycol Dehydrator Vent - The glycol dehydrator vent is routed to the facility flare. The flare will control the trace organics in the vent stream with at least 98% destruction efficiency. Emissions are based on a maximum production of 1.0 MMscfd inlet gas and are estimated using gas volume and composition data provided by NATCO process simulation software. (3) routed to flare N. Comiso

#### Tank Working and Breathing Losses

A 210-bbl condensate storage tank is used for collection of drip trap condensate in the field. Vapors from the tank are collected with a vapor recovery unit and routed back into the Gas Gathering System. Therefore, there are no emissions from the tank released to the atmosphere. Annual working and breathing losses from the tanks are estimated using the EPA Tanks 4.09b emissions model. Short-term emissions from the tanks (L<sub>max</sub>) are calculated using TCEQ Storage Tank Technical Guidance by multiplying the working losses

by the maximum fill rate and dividing by the tank capacity and number of tank turnovers. Potential emissions are based on a maximum production of 120 BOPD.

#### Condensate Loading Losses

Condensate loading will be accomplished using submerged fill-pipe to atmospheric trucks. Uncontrolled emissions are estimated using current AP-42 emission factors from Chapter 5, Section 5.2.2.1.1 and site-specific data. Since loading of the collected drip trap condensate will occur at this location, loading emissions are based on a maximum loading rate of 120 BOPD. (3)

#### Equipment Fugitives

Equipment fugitive emissions were estimated using facility component counts and the emissions factors derived for oil and gas production facilities from SOCM! w/o ethylene factors. Emissions from fugitives are estimated using a laboratory analysis of the inlet gas and estimated compositions of the tank vapors. (4)

Since the Salem Gas Plant will trigger NSPS KKK applicability, Citation will implement a Leak Detection and Repair program pursuant to the referenced section with a 10,000 ppm leak definition and daily walkthroughs to visually inspect for leaks. The proposed fugitive emission counts for the plant are very conservative and will be refined after construction.

**Table 7-3 Equipment Leak Fugitives**

<b>Pollutant</b>	<b>Controls</b>	<b>Control/ Emission rate</b>	<b>Basis</b>
VOC	NSPS KKK, daily walkthrough	Component emission factors	TCEQ Fugitive Guidance, 10/2000
H <sub>2</sub> S	Daily walkthrough	Component emission factors	TCEQ Fugitive Guidance, 10/2000

## 8.0 AIR DISPERSION MODELING

Upon request, Citation will conduct refined air dispersion modeling to demonstrate that the emissions of all pollutants from the Salem Gas Plant are in compliance with applicable state and federal standards. Citation has run preliminary dispersion modeling to determine with impact of the proposed worst-case SO<sub>2</sub> emissions associated with the flaring of sour gas during times that the plant experiences downtimes due to mechanical failure, electrical outages, or other conditions beyond their control. The results of the initial modeling are included in the table below. The maximum predicted ground level concentrations (GLCs) of SO<sub>2</sub> that occur from the flare stack are less than 5% of the 3-hr standard of 1,300 µg/m<sup>3</sup>.

**Model Conditions:** Flare stack modeled @ 40.0 feet and emission rate = 307 lb/hr.

### National Ambient Air Quality Standards (NAAQS) Analysis

Pollutant	1-Hour High-1 <sup>st</sup> High Predicted GLC [µg/m <sup>3</sup> ]	1-Hour Limit [µg/m <sup>3</sup> ]	3-Hour High-2 <sup>nd</sup> High Predicted GLC [µg/m <sup>3</sup> ]	3-Hour NAAQS Limit [µg/m <sup>3</sup> ]	24-Hour High-2 <sup>nd</sup> High Predicted GLC [µg/m <sup>3</sup> ]	24-Hour Limit [µg/m <sup>3</sup> ]	Annual High-2 <sup>nd</sup> High Predicted GLC [µg/m <sup>3</sup> ]	Annual Limit [µg/m <sup>3</sup> ]
SO <sub>2</sub>	---	---	58.03	1,300	20.78	365	2.31	80

**Notes:**

- [1] SO<sub>2</sub> GLCs compared to federal SO<sub>2</sub> NAAQS 3-hour, 24-hour and annual limits.
- [2]. Background concentrations not considered in this analysis but expected to be insignificant.
- [3]. GLCs do not include "nearby" retrieval source contributions.

## 9.0 PERMIT FEE

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Citation has completed a 197-FEE Form - Fee Determination for Construction Permit Application which is included in Appendix A of this document. The amount submitted includes a fee of \$5,000 for the synthetic minor construction permit application with an additional \$4,000 for the first emission unit (flare, PFL-1) and an additional \$3,000 for the other proposed emission units (glycol dehydrator reboiler PH-1, bioreactor vent PV-1 and 210-bbl condensate tank ST-3). Thus, the fee submitted with this application is \$12,000.





<b>Application For                  Construction Permit</b> (For CAAPP & FESOP Sources only)	For Illinois EPA use only
	ID number:
	Permit number:
	Date received:

This form is to be used by CAAPP and FESOP sources to supply information necessary to obtain a construction permit. Please attach other necessary information and completed CAAPP forms regarding this construction/modification project.

Source Information		
1. Source name: Salem Unit - Gas Gathering and NGL Sales Project		
2. Source street address: 2302 Hoots Chapel Road, Odin, IL 62870		
3. City: Salem	4. Zip code: 62870	
5. Is the source located within city limits? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
6. Township name:	7. County: Marion	8. ID number: 121813AAA

Owner Information		
9. Name: Citation Oil & Gas Corp.		
10. Address: 8223 Willow Place South, Suite 250		
11. City: Houston	12. State: Texas	13. Zip code: 77070-5623

Operator Information (if different from owner)		
14. Name:		
15. Address:		
16. City:	17. State:	18. Zip code:

Applicant Information	
19. Who is the applicant? <input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator	20. All correspondence to: (check one) <input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Source
21. Attention name and/or title for written correspondence: Lee Ann Elsom, Environmental Coordinator	
22. Technical contact person for application: Lee Ann Elsom	23. Contact person's telephone number: (281) 517-7196

RECEIVED  
 DEC 26 2006  
 IEPA DAPC SPFLD

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Summary Of Application Contents	
24. Does the application address whether the proposed project would constitute a new major source or major modification under each of the following programs: a) Non-attainment New Source Review – 35 IAC Part 203; b) Prevention of Significant Deterioration (PSD) – 40 CFR 52.21; c) Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources – 40 CFR Part 63?	X Yes <input type="checkbox"/> No
25. Does the application identify and address all applicable emissions standards, including those found in the following: a) Board Emission Standards – 35 IAC Chapter I, Subtitle B; b) Federal New Source Performance Standards – 40 CFR Part 60; c) Federal Standards for Hazardous Air Pollutants – 40 CFR Parts 61 and 63?	X Yes <input type="checkbox"/> No
26. Does the application include a process flow diagram(s) showing all emission units and control equipment, and their relationship, for which a permit is being sought?	X Yes <input type="checkbox"/> No
27. Does the application include a complete process description for the emission units and control equipment for which a permit is being sought?	X Yes <input type="checkbox"/> No
28. Does the application include the information as contained in completed CAAPP forms for all appropriate emission units and air pollution control equipment, listing all applicable requirements and proposed exemptions from otherwise applicable requirements, and identifying and describing any outstanding legal actions by either the USEPA or the Illinois EPA? Note: The use of "APC" application forms is not appropriate for applications for CAAPP sources. CAAPP forms should be used to supply information.	X Yes <input type="checkbox"/> No
29. If the application contains TRADE SECRET information, has such information been properly marked and claimed, and have two separate copies of the application suitable for public inspection and notice been submitted, in accordance with applicable rules and regulations?	<input type="checkbox"/> Yes <input type="checkbox"/> No  X Not Applicable, No TRADE SECRET information in this application
30. Does the application include a complete form 197-FEE, "FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION" for the emission units and control equipment for which a permit for construction or modification is being sought?	X Yes <input type="checkbox"/> No

Note 1 : Answering "No" to any of the above may result in the application being deemed incomplete.

Signature Block	
This certification must be signed by a responsible official. Applications without a signed certification will be deemed incomplete.	
31. I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete.	
Authorized Signature:	
BY: <u>Lee Ann Elsom</u>	<u>Environmental Coordinator</u>
AUTHORIZED SIGNATURE	TITLE OF SIGNATORY
<u>Lee Ann Elsom</u>	<u>06 / 08 / 2005</u>
TYPED OR PRINTED NAME OF SIGNATORY	DATE

Note 2: An operating permit for the construction/modification permitted in a construction permit must be obtained by applying for the appropriate revision to the source's CAAPP permit, if necessary.



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

P.O. Box 19506, SPRINGFIELD, ILLINOIS 62794-9506

Douglas P. Scott, Director

217/782-2113

CERTIFIED MAIL

7002 3150 0000 1106 7193

NOTICE OF ADDITIONAL CONSTRUCTION PERMIT APPLICATION FEES

July 20, 2005

Citation Oil & Gas Corp  
Attn: Lee Ann Elsom  
8223 Willow Place South, Suite 250  
Houston, Texas 77070-5623

Application No.: 05060022  
I. D. No.: 121813AAA  
Applicant's Designation:  
Received: June 10, 2005  
Construction of: Gas Gathering and NGL Sales  
Location: 2302 Hoots Chapel Road, Odin  
Additional Fee Now Due: \$1,000.00

This letter provides written notice that the Illinois EPA has determined that the application for construction permit referenced above is subject to additional application fees under Section 9.12 of Illinois' Environmental Protection Act (Act).

Based on its initial review of the application for purposes of fees, the Illinois EPA has determined that an additional fee of \$1,000.00 is due.

You have 60 days to remit the assessed fee and revised Form 197-FEE to the Illinois EPA. Please submit payment to the Illinois EPA at the following address. Make either a check or money order payable to: "Illinois Environmental Protection Agency" and reference both the application and I.D. numbers assigned above. The Illinois EPA will not accept cash payments.

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Permit Section (MC 11)  
P.O. Box 19506  
Springfield, Illinois 62794-9506

If the additional fee is not submitted within 60 days, the Illinois EPA is not required to further review or process this application and the statutory deadlines in Section 39(a) of the Act cease to apply to the application until such time as the proper fee is submitted. The Illinois EPA may also deny the application for failure to pay the appropriate fees. Also, please be aware that the Illinois EPA's continuing review of the application during this 60-day period may identify additional fees that are due or deficiencies in the technical information that has been submitted in the application.

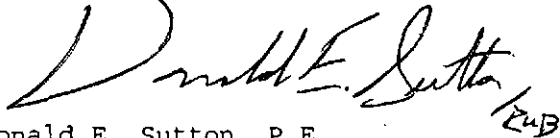
The following explains the Illinois EPA's determination with respect to the fees that are due for this application.

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1. A construction permit for a new synthetic minor (\$5,000.00) plus first new emission unit (\$4,000.00) plus additional four units (4 x \$1,000.00 = \$4,000.00) for a fee total of \$13,000.00. The \$12,000.00 payment, submitted by you, will be applied as a credit toward the \$13,000.00 total construction permit application fee.

If you do not agree with the Illinois EPA's fee determination for this application, you may ask for reconsideration. A request for fee reconsideration must include a new certified estimate (e.g., Form 197-FEE) of the fees that are due and payment for any additional fees that are due based on your new estimate. Two copies of this fee reconsideration request must be submitted and must include any supporting material used in the new estimate. On all submittals, please reference both the application and I.D. numbers assigned above.

If you have any questions on this fee determination, please call George Kennedy at 217/782-2113.



Donald E. Sutton, P.E.  
Manager of Permit Section  
Division of Air Pollution Control

DES:GMK:jar

cc: Illinois EPA, FOS Region 3  
Paulette Blakes

\*\*\*\*\* PCB 2009-068 \*\*\*\*\*  
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

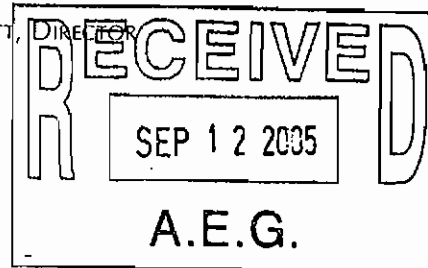
1021 NORTH GRAND AVENUE EAST, P.O. Box 19506, SPRINGFIELD, ILLINOIS 62794-9506 - (217) 782-2113

ROD R. BLAGOJEVICH, GOVERNOR

DOUGLAS P. SCOTT, DIRECTOR

217/782-2113

CONSTRUCTION PERMIT



PERMITTEE

Citation Oil and Gas Corporation  
Attn: Lee Ann Elsom  
8223 Willow Place South, Suite 250  
Houston, Texas 77070-5623

Application No.: 05060022 :

I.D. No.: 121813AAA

Applicant's Designation:

Date Received: June 9, 2005

Subject: Gas Gathering and NGL Sales Project

Date Issued: September 6, 2005

Expiration Date: See Condition 4

Location: 2302 Hoots Chapel Road, Odin



This permit is hereby granted to the above-designated Permittee to CONSTRUCT emission unit(s) and/or air pollution control equipment consisting of:

IEPA DAPC SPFLD

- Bioreactor Vent Emissions (PV1)
- 0.3 mmBtu/Hour Dehydrator Reboiler (PH1)
- Facility Flares (PFL1)
- Equipment Fugitives (PF1)
- 8,820 Gallon Condensate Storage Tank (ST-3)

pursuant to the above-referenced application. This permit is subject to standard conditions attached hereto and the following special condition(s):

- No person shall cause or allow any visible emissions of fugitive particulate matter from any process, including any material handling or storage activity beyond the property line of the emission source, pursuant to 35 Ill. Adm. Code 212.301.
- This permit is issued based upon emissions of photochemically reactive organic materials, as defined under 35 Ill. Adm. Code 211.4690, from any emission source or operation using organic material, being less than 8 pounds per hour, pursuant to 35 Ill. Adm. Code 218.301.
- No person shall cause or allow the emission of sulfur dioxide in the atmosphere from any process emission source to exceed 2000 ppm pursuant to 35 Ill. Adm. Code 214.301.
- Equipment Fugitive Emissions shall not exceed the following limits:

E M I S S I O N S					
VOM		H <sub>2</sub> S		HAPs	
(Tons/Mo)	(Tons/Yr)	(Tons/Mo)	(Tons/Yr)	(Tons/Mo)	(Tons/Yr)
3.03	30.29	0.12	1.16	0.15	1.42

Xc:

Page 2

These limits are based on number of sources i.e. valves, flanges etc., Texas Commission on Environmental Quality (TCEQ), American Petroleum Institute. and 8760 hours/year of operation. Compliance with the annual limits shall be determined from a running total of 12 months of data.

5. Emissions from the facility flares shall not exceed the following limits:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Tons/Month)</u>	<u>(Tons/Year)</u>
VOM	5.91	59.1
NO <sub>x</sub>	0.84	8.4
CO	7.16	71.6
SO <sub>2</sub>	7.55	75.5
H <sub>2</sub> S	0.08	0.8

These limits are based on 227 mmscf/yr residue and sour plus 0.13 mmscf/year pilot gas, and gas analysis provided in application. Compliance with annual limits shall be determined from running total of 12 months of data

6. Emissions and operation of the dehydrator reboiler emissions shall not exceed the following limits:

<u>Pollutant</u>	<u>Emission Rate (Lb/10<sup>6</sup> scf)</u>	<u>Emissions</u>	
		<u>(Tons/Month)</u>	<u>(Tons/Year)</u>
NO <sub>x</sub>	100.0	0.008	0.08
CO	84.0	0.007	0.07
PM	7.6	0.001	0.01

These limits are based on maximum reboiler operations, standard emission factors AP-42, and 8,760 hours/year of operation. Compliance with the annual limits shall be determined from a running total of 12 months of data.

7. This permit is issued based on negligible emissions of volatile organic materials (VOM) from the condensate storage tank. For this purpose, emissions shall not exceed nominal emissions rate of 0.1 lb/hour and 0.44 tons/year.
8. The flares shall have a heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light to indicate continuous presence of a flame.
- 9a. The Permittee shall maintain monthly records of the following items:
- i. Amount of gas burned in the facility flares (mmBtu/month, scf/month, scf/year and mmBtu/year);

Page 3

- ii. Amount of gas burned in the dehydrator reboiler (mmBtu/month, scf/month, scf/year and mmBtu/year); and
  - iii. Monthly and annual VOM, NO<sub>x</sub>, H<sub>2</sub>S, and CO emissions with supporting calculations (tons/month, tons/year).
- b. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Illinois EPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA request for records during the course of a source inspection.
10. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.
11. Two (2) copies of required reports and notifications concerning equipment operation or repairs, performance testing or a continuous monitoring system shall be sent to:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Compliance Section (#40)  
P.O. Box 19276  
Springfield, Illinois 62794-9276

and one (1) copy shall be sent to the Illinois EPA's regional office at the following address unless otherwise indicated:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
9511 West Harrison  
Des Plaines, Illinois 60016

It should be noted that during the analysis of this permit application, it was determined that your facility has the potential to emit more than 100 tpy of VOM and will be classified as a major source under the Clean Air Act Permit Program (CAAPP). To avoid the CAAPP permitting requirements, you may want to consider immediately applying for a Federally Enforceable State Operating Permit (FESOP). A FESOP is an operating permit which contains Federally enforceable limits in the form of permit conditions which effectively restrict the potential emissions of a source to below major source thresholds, thereby excluding the source from the CAAPP. Please

Page 4

contact the Permit Section at 217/782-2113 to request the necessary application forms. Please note that this permit will expire one year from the initial date of issuance.

If you have any questions on this permit, please contact George Kennedy at 217/782-2113.

A handwritten signature in black ink that reads "Donald E. Sutton" with a date "1/2-13" written below it.

Donald E. Sutton, P.E.  
Manager, Permit Section  
Division of Air Pollution Control

DES:GMK:psj

cc: Region 3





STATE OF ILLINOIS  
ENVIRONMENTAL PROTECTION AGENCY  
DIVISION OF AIR POLLUTION CONTROL  
P. O. BOX 19506  
SPRINGFIELD, ILLINOIS 62794-9506

**STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS  
ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY**

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.
2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act and Regulations adopted by the Illinois Pollution Control Board.
3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.
4. The permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:
  - a. to enter the permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,
  - b. to have access to and to copy any records required to be kept under the terms and conditions of this permit,
  - c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,
  - d. to obtain and remove samples of any discharge or emissions of pollutants, and
  - e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.
5. The issuance of this permit:
  - a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,
  - b. does not release the permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,
  - c. does not release the permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,
  - d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

# Directory Environmental Protection Agency Bureau of Air

May 22, 2003

*For assistance in preparing a permit application, contact the Permit Section:*

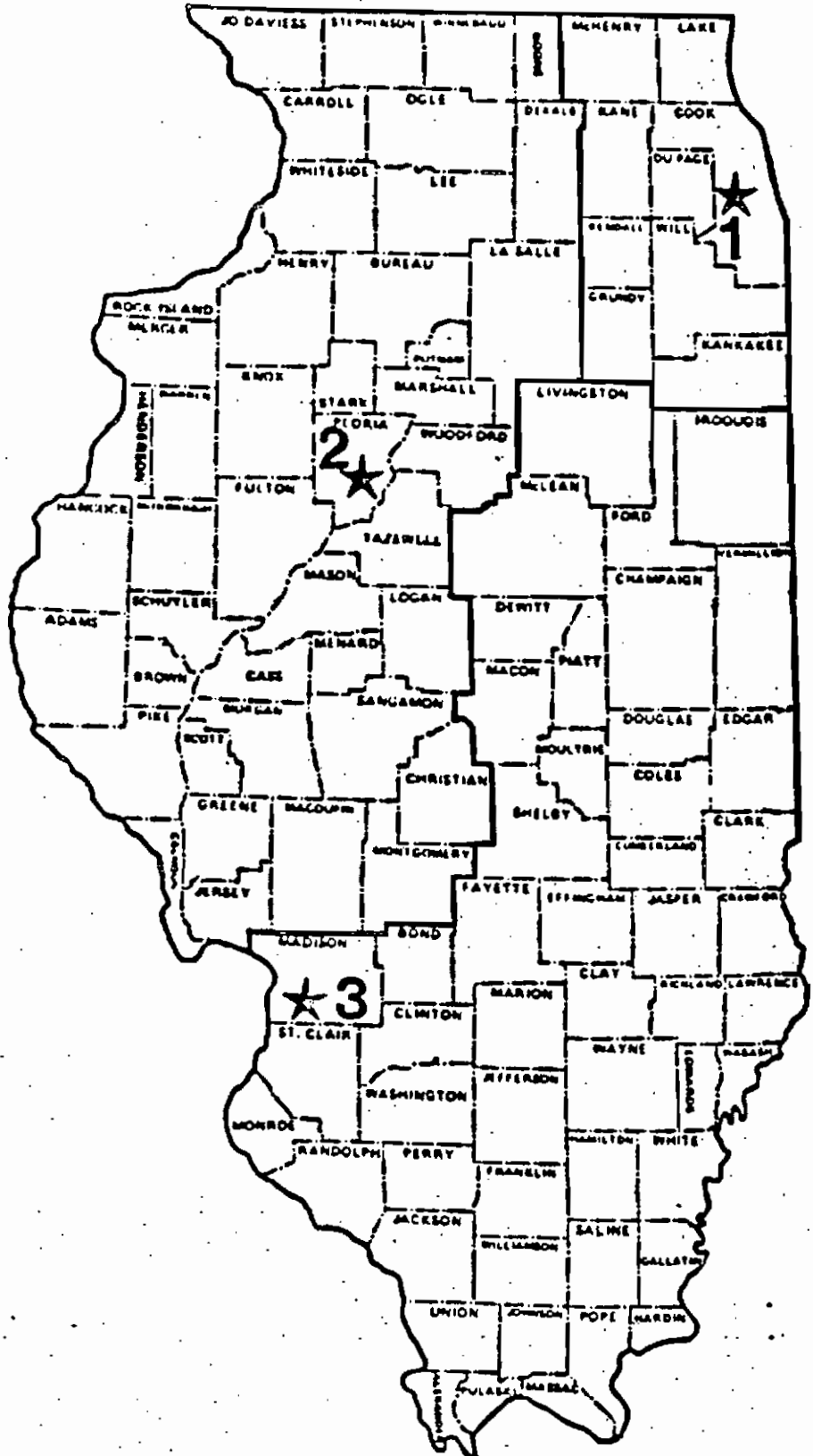
**Illinois EPA**  
Division of Air Pollution Control  
Permit Section  
1021 N. Grand Ave E.  
P.O. Box 19506  
Springfield, Illinois 62794-9506  
217/782-2113

*Or contact a regional office of the Field Operations Section. The regional offices and their areas of responsibility are shown on the map. The addresses and telephone numbers of the regional offices are as follows:*

**Illinois EPA**  
Region 1  
Bureau of Air, FOS  
9511 West Harrison  
Des Plaines, Illinois 60016  
847/294-4000

**Illinois EPA**  
Region 2  
5415 North University  
Peoria, Illinois 61614  
309/693-5461

**Illinois EPA**  
Region 3  
2009 Mall Street  
Collinsville, Illinois 62234  
618/346-5120



1021 NORTH GRAND AVENUE EAST, P.O. BOX 19506, SPRINGFIELD, ILLINOIS 62794-9506 - (217) 782-2113

ROD R. BLAGOJEVICH, GOVERNOR

DOUGLAS P. SCOTT, DIRECTOR

**Memorandum**

**Technical Recommendation for Tax Certification Approval**

Date: December 05, 2007

To: Robb Layman

From: Edwin C. Bakowski

Subject: Citation Oil & Gas Corporation TC-06-12-26

This Agency received a request on December 26, 2006 from Citation Oil & Gas Corporation for an Illinois EPA recommendation regarding tax certification of air pollution control facilities pursuant to 35 Ill. Adm. Code 125.204. I offer the following recommendation.

The air pollution control facilities in this request include the following:

Bio Desulfurization Unit which reduces SO<sub>2</sub> emissions by removing sulfur while the residue gas is flared. Because the primary purpose of this unit is to reduce or eliminate air pollution, it is certified as a pollution control facility.

This facility is located at 2302 Hoots Chapel Road, Odin, Marion County  
The property identification number is 15-06-200-011

Based on the information included in this submittal, it is my engineering judgement that the proposed facility may be considered "Pollution Control Facilities" under 35 IAC 125.200(a), with the primary purpose of eliminating, preventing, or reducing air pollution, or as otherwise provided in this section, and therefore eligible for tax certification from the Illinois Pollution Control Board. Therefore, it is my recommendation that the Board issue the requested tax Certification for this facility.

- Exhibit B -