GW - 22

GENERAL CORRESPONDENCE

YEAR(S):

2006 - 1999

Empire Abo Gas Plant
Evaporation Pond Classification

Frontier Field Services

May 10, 2006

TOPO @ SPRING LAKE

Outline of Presentation

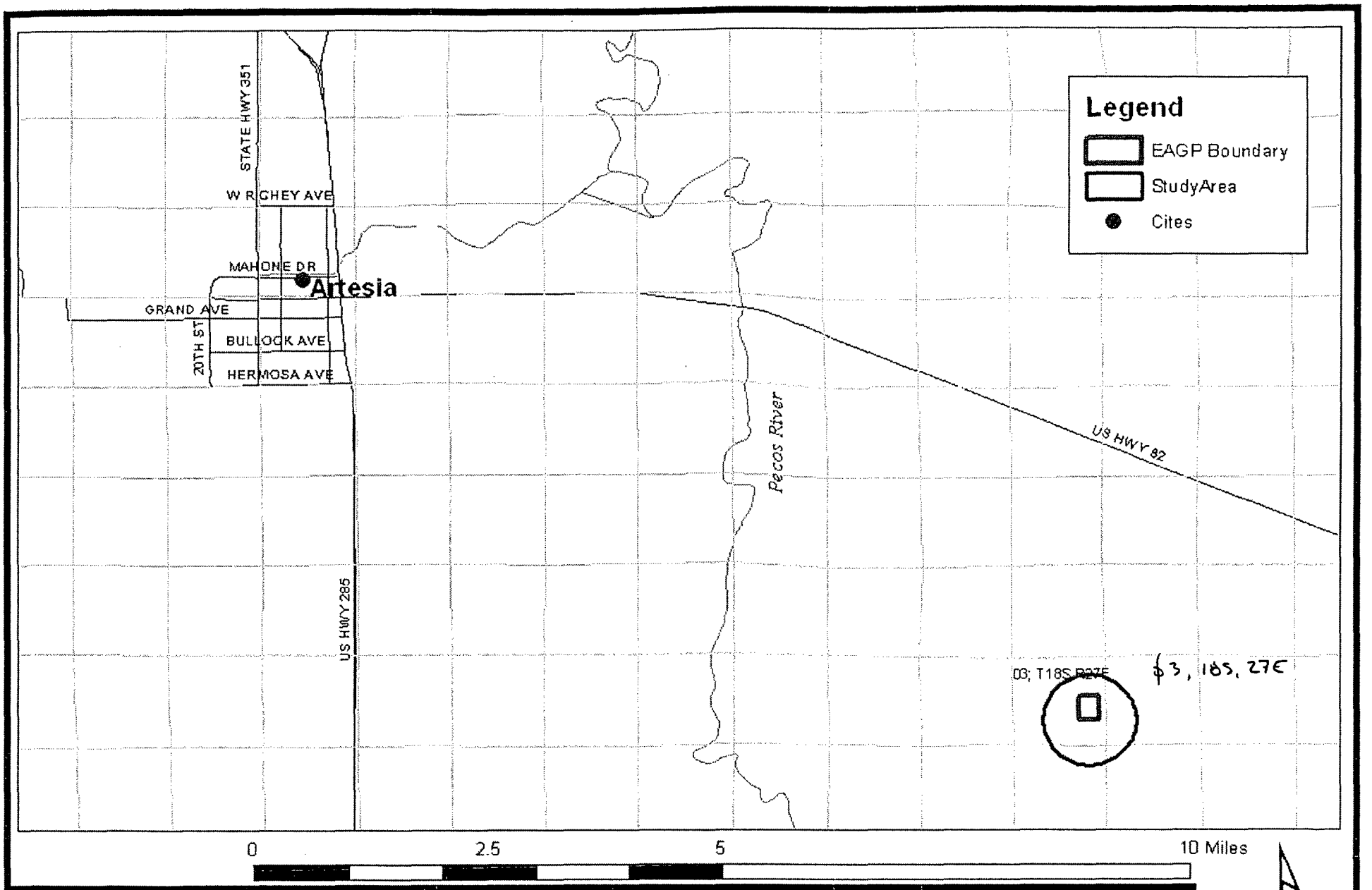
- Site Orientation/Location
- 2005/2006 Activities (MW installation; GW pumping)
- Proposed Activities 2006
- Eleven slides that summarize the hydrogeology and ground water chemistry
- Three Slides showing the existing well network
- The WQCC "Sewerage System" Definition
- Outline of the Path Forward

Recent Activities

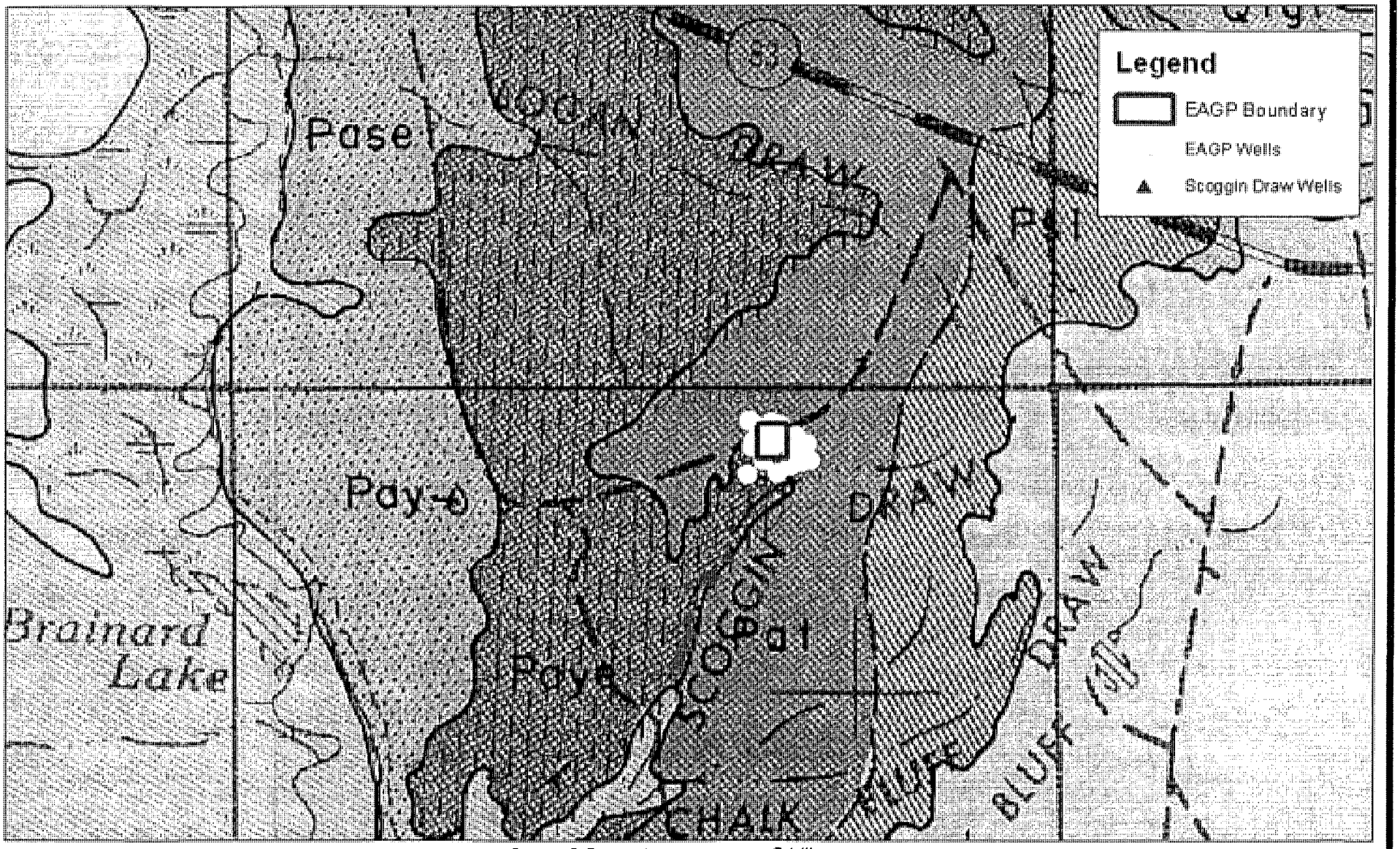
- December 2005: Installed 1st dewatering pump at MW-03-01
- December 2005: Installed borings/MWs to define extent and magnitude of dissolved hydrocarbons
- Jan-April 2006: Evaluate potential for existing Evaporation Pond to treat BTEXN from dewatering pilot test
- May 2006: Performed ground water sampling at seven off-site wells.

Proposed Activities

- Quarterly: GW monitoring in seven off-site wells and proposed NPDES outfall (north end of evaporation pond)
- May 2006: Install 2nd dewatering pump at MW-08
- June 2006: Install 3rd and 4th dewatering pumps, MW-05 and MW-03-03
- July 2006: Install 5th dewatering pump, MW-02-03
- Continue to discharge pilot testing water to BP's Injection Well until approval of NPDES permit



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Location Map: EAGP Relative to Artesia, New Mexico	
	Frontier Field Services: Empire Abo Gas Plant	May 2006

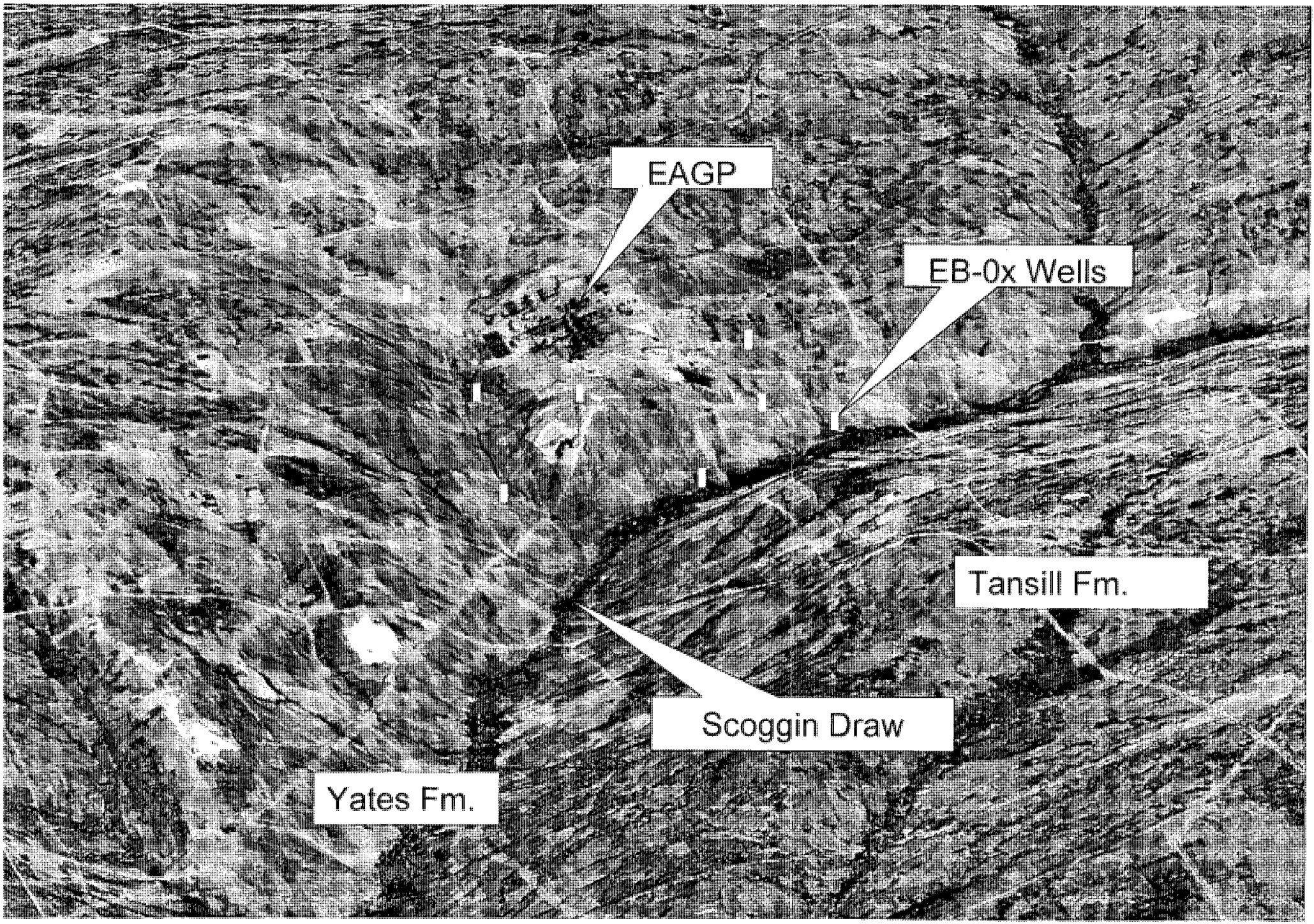


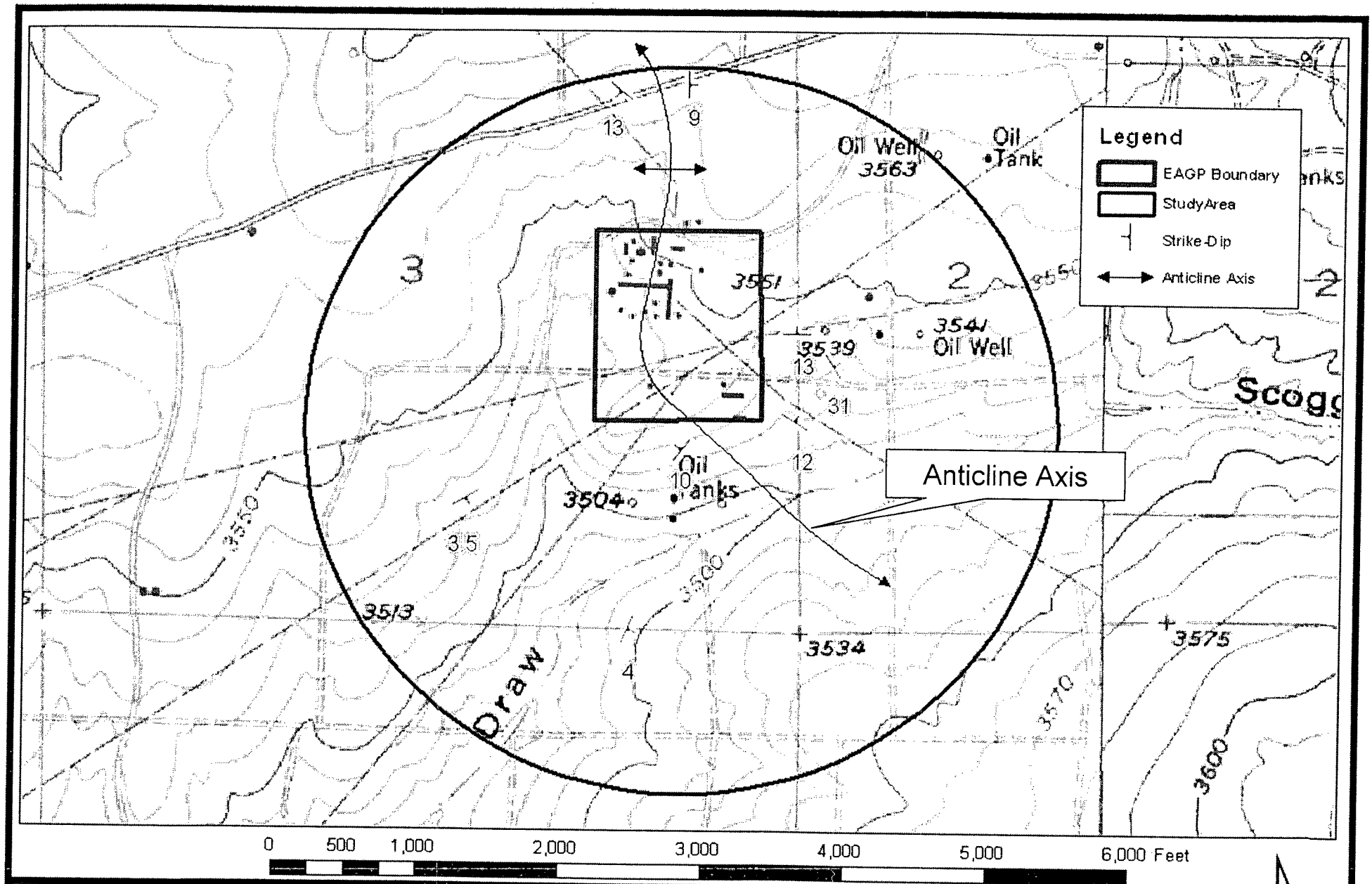
Source: Kelly, 1991. Geology of the Pecos Country

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Goelogic Map	
	Frontier Field Services: Empire Abo Gas Plant	May 2006

Tansill Fm.

Yates Fm.


EAGP
EB-0x Wells
Tansill Fm.
Scoggin Draw
Yates Fm.

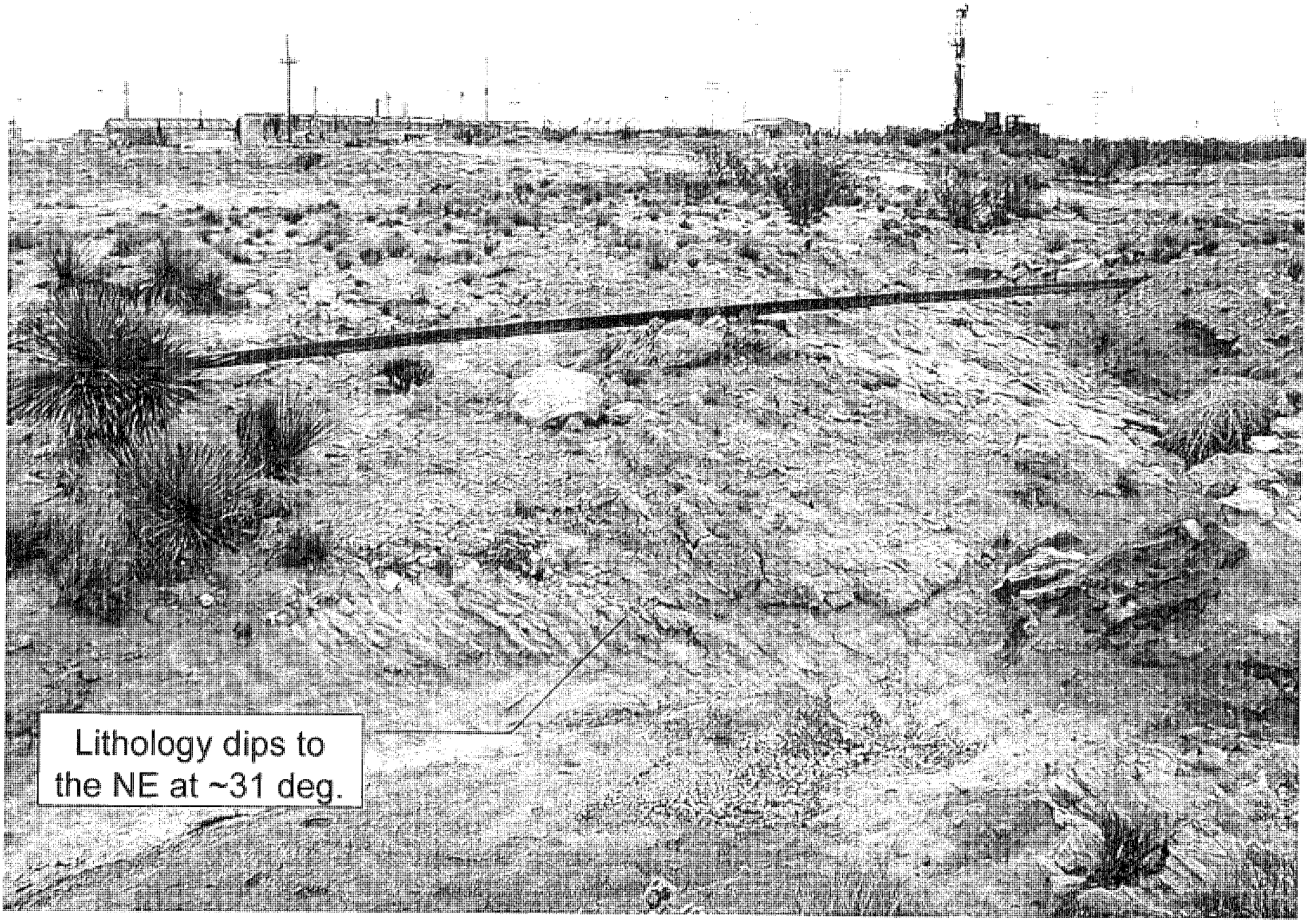


R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Study Area Showing Strike-Dip

Frontier Field Services: Empire Abo Gas Plant

May 2006

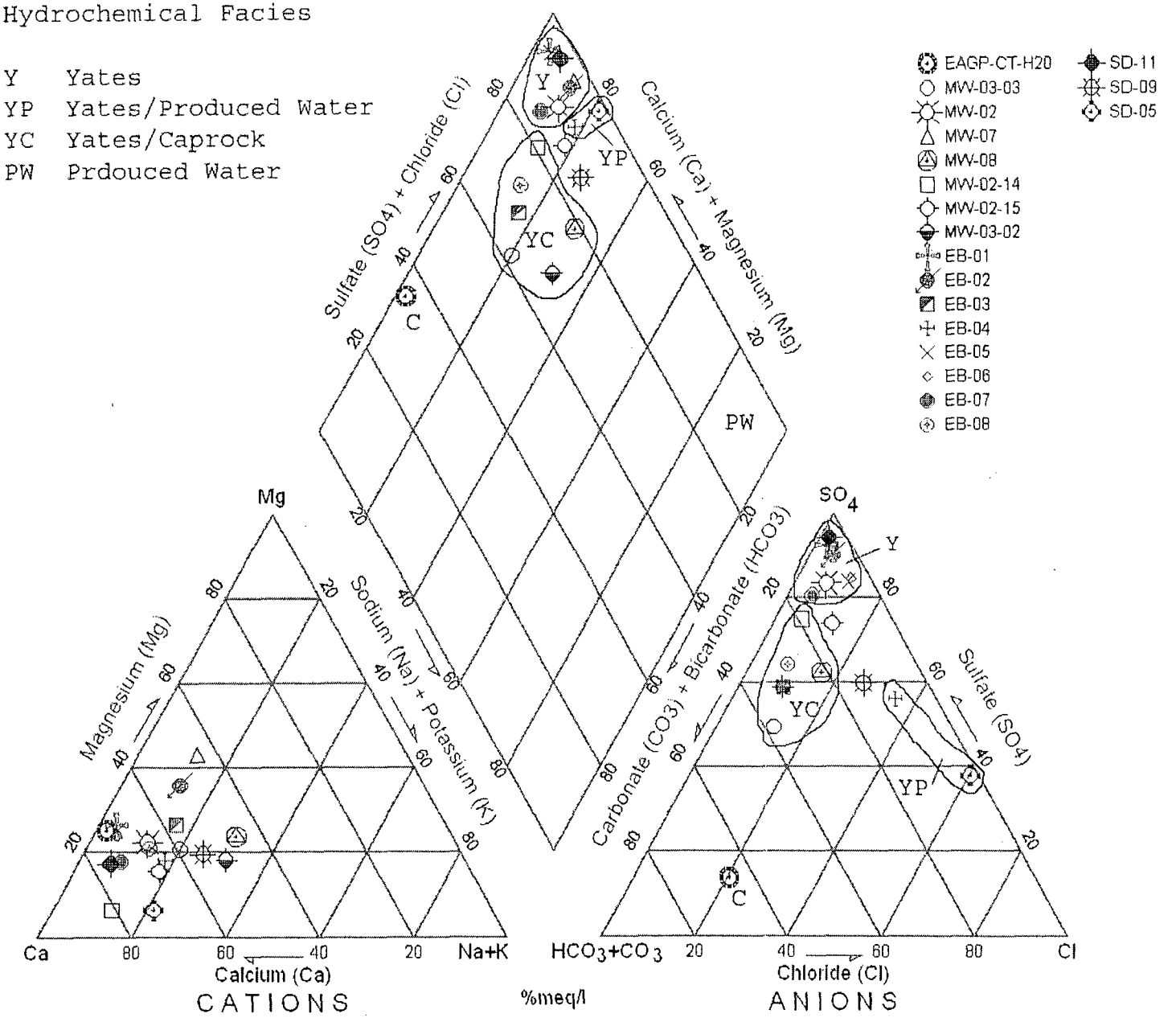

Lithology dips to
the NE at ~31 deg.

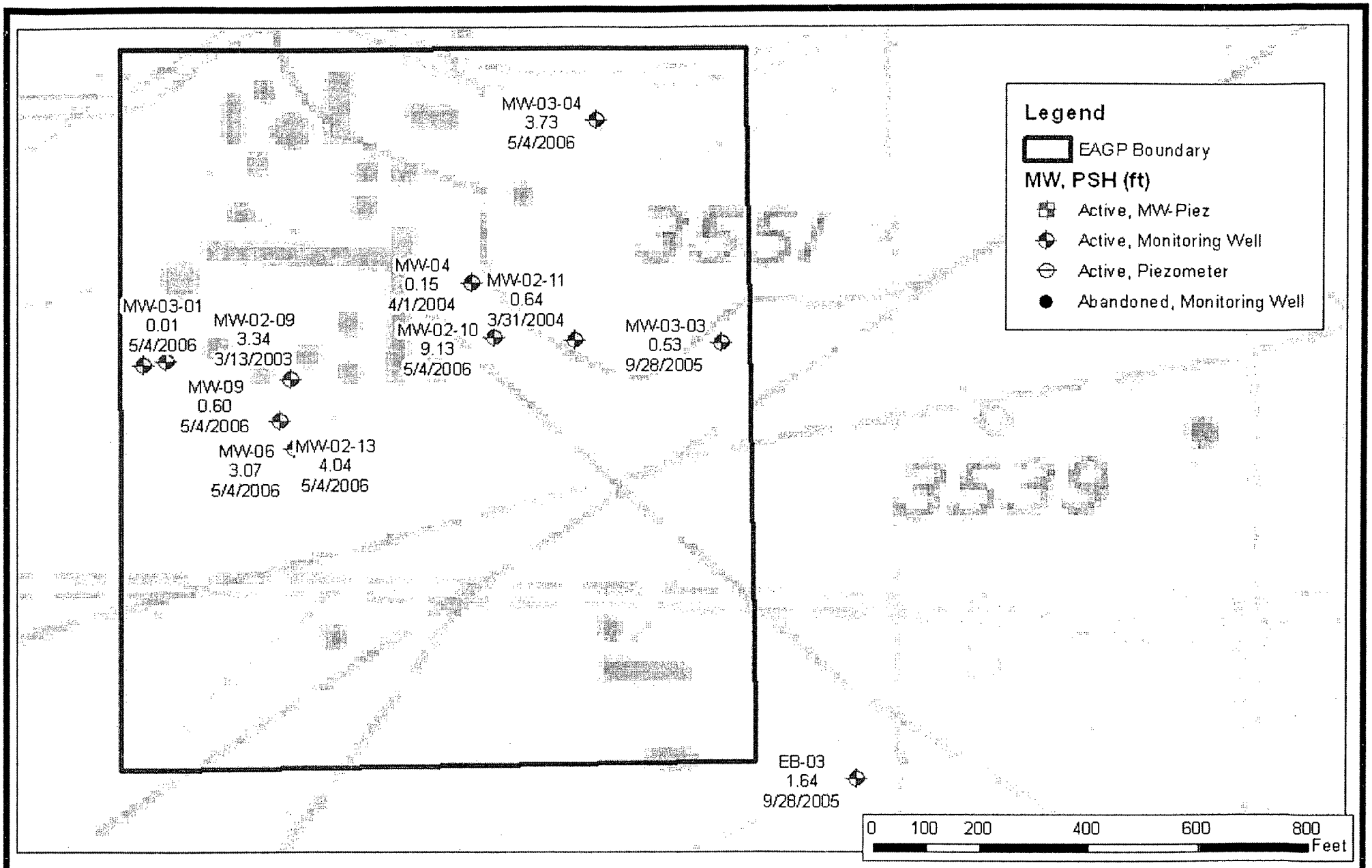
Piper Diagram

Empire Abo Gas Plant

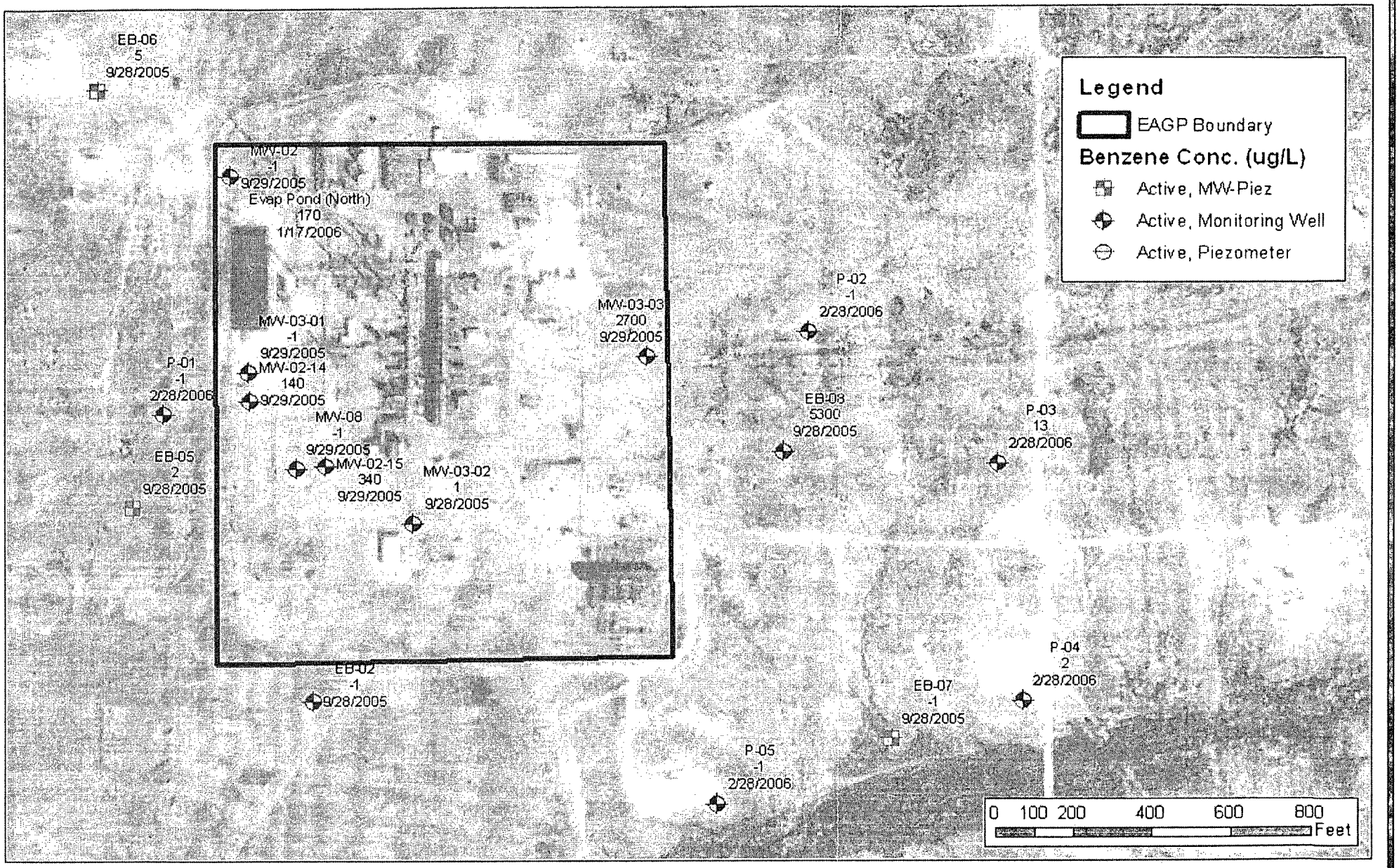
Hydrochemical Facies

Y Yates
YP Yates/Produced Water
YC Yates/Caprock
PW Prdouced Water

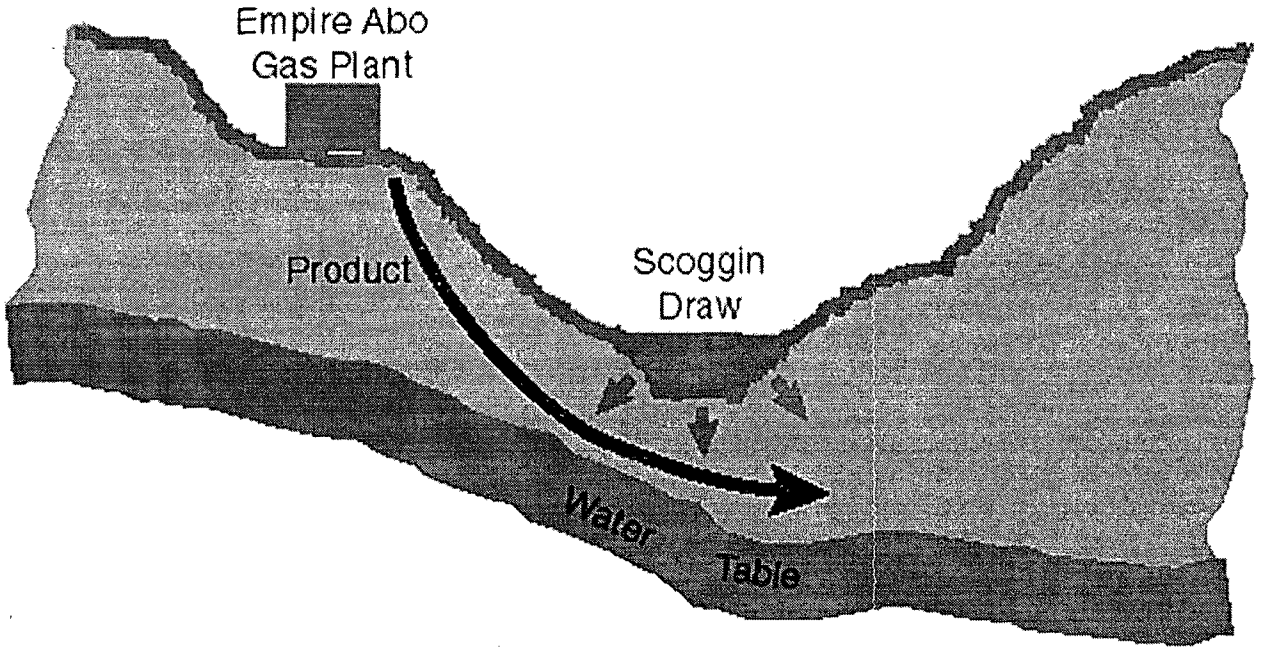




R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	PSH Thickness (Feet)	
	Frontier Field Services: Empire Abo Gas Plant	May 2006



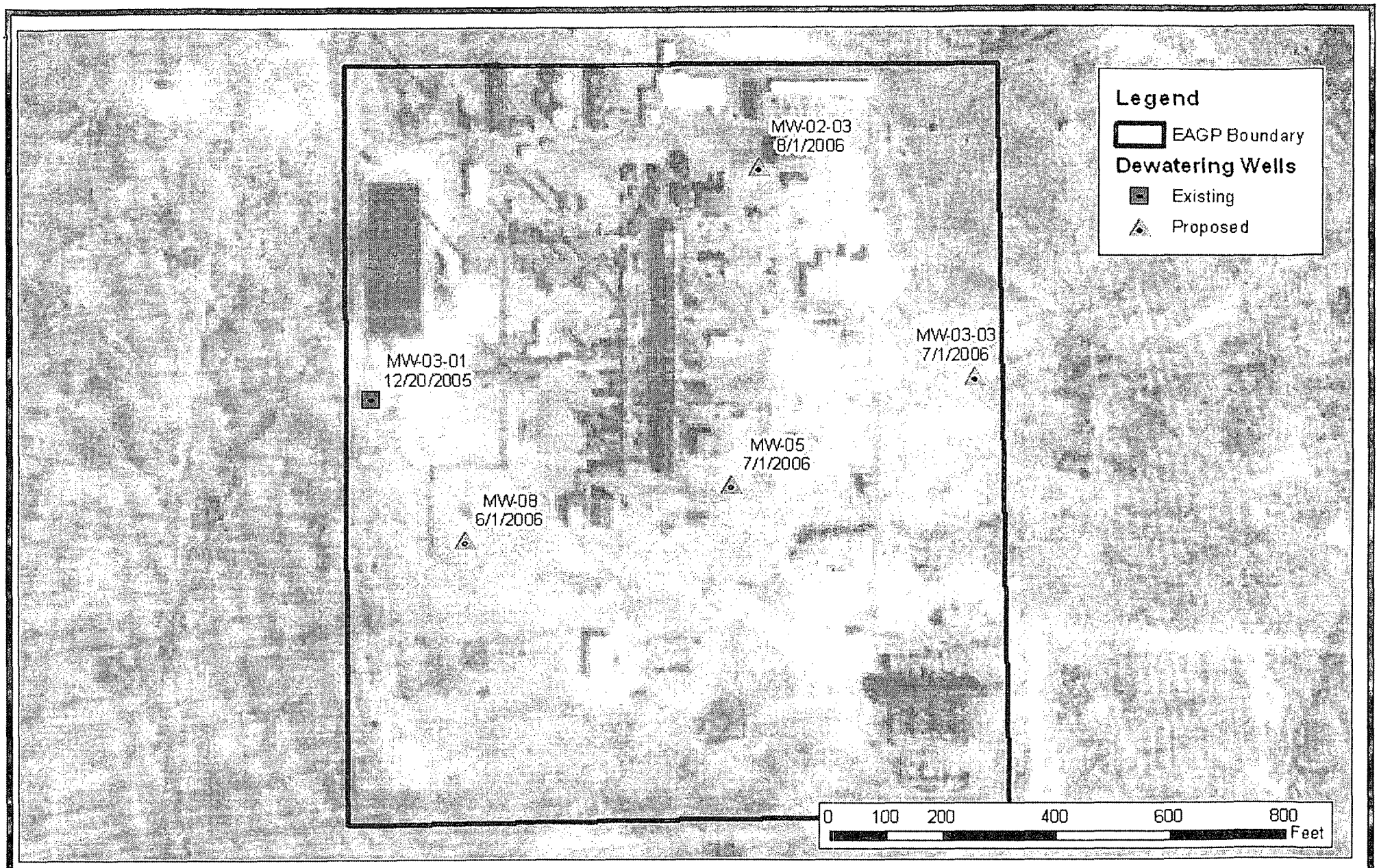
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Benzene Concentration (ug/L)	
	Frontier Field Services: Empire Abo Gas Plant	May 2006



Note: Drawing Not to Scale

R.T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd. NW Suite F-142 Albuquerque, NM 87104
505.266.6004 Fax: 505.266.0745

Frontier Field Services	Plate 1
Loosing Stream Drawing	June, 2005

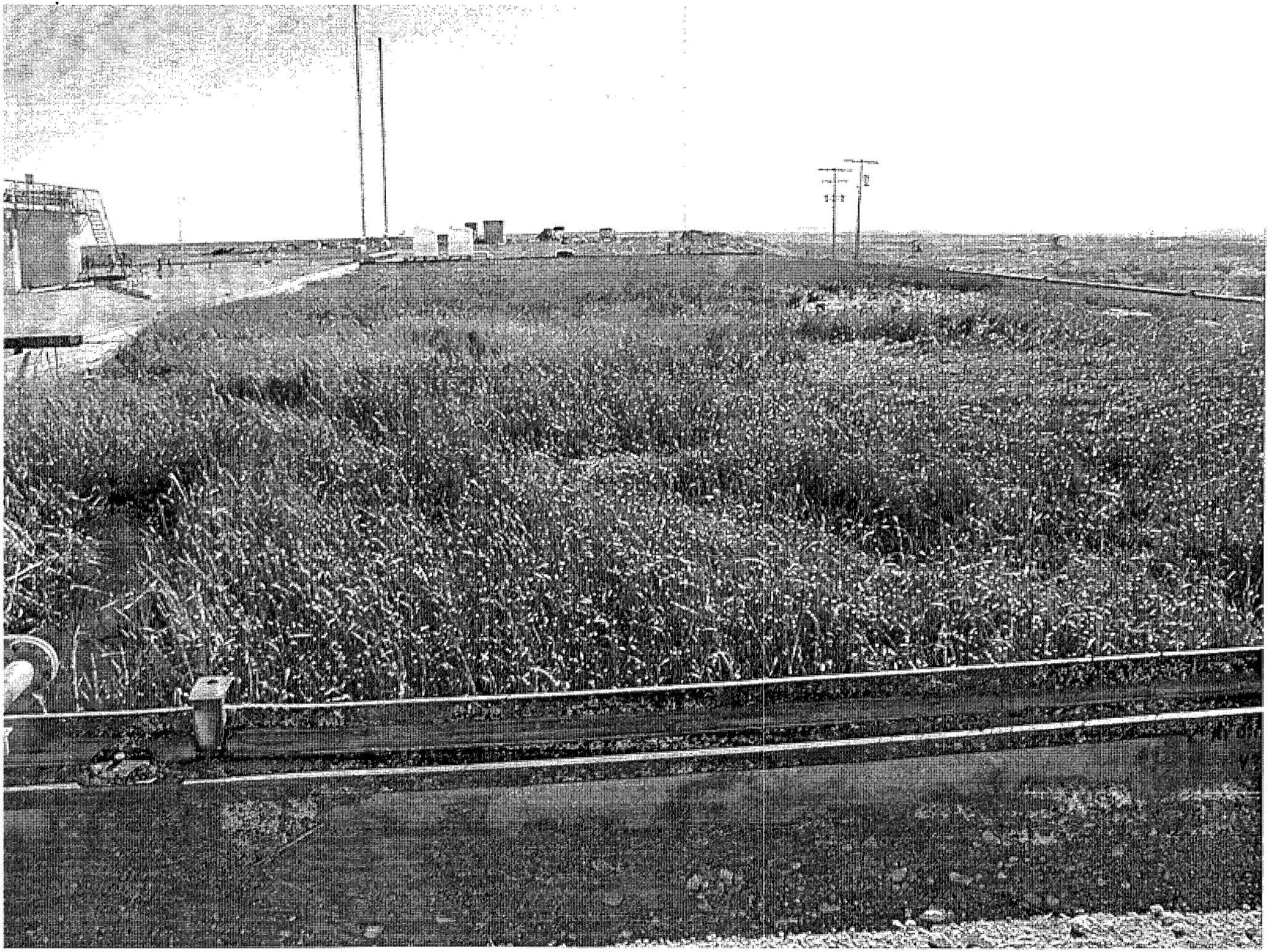


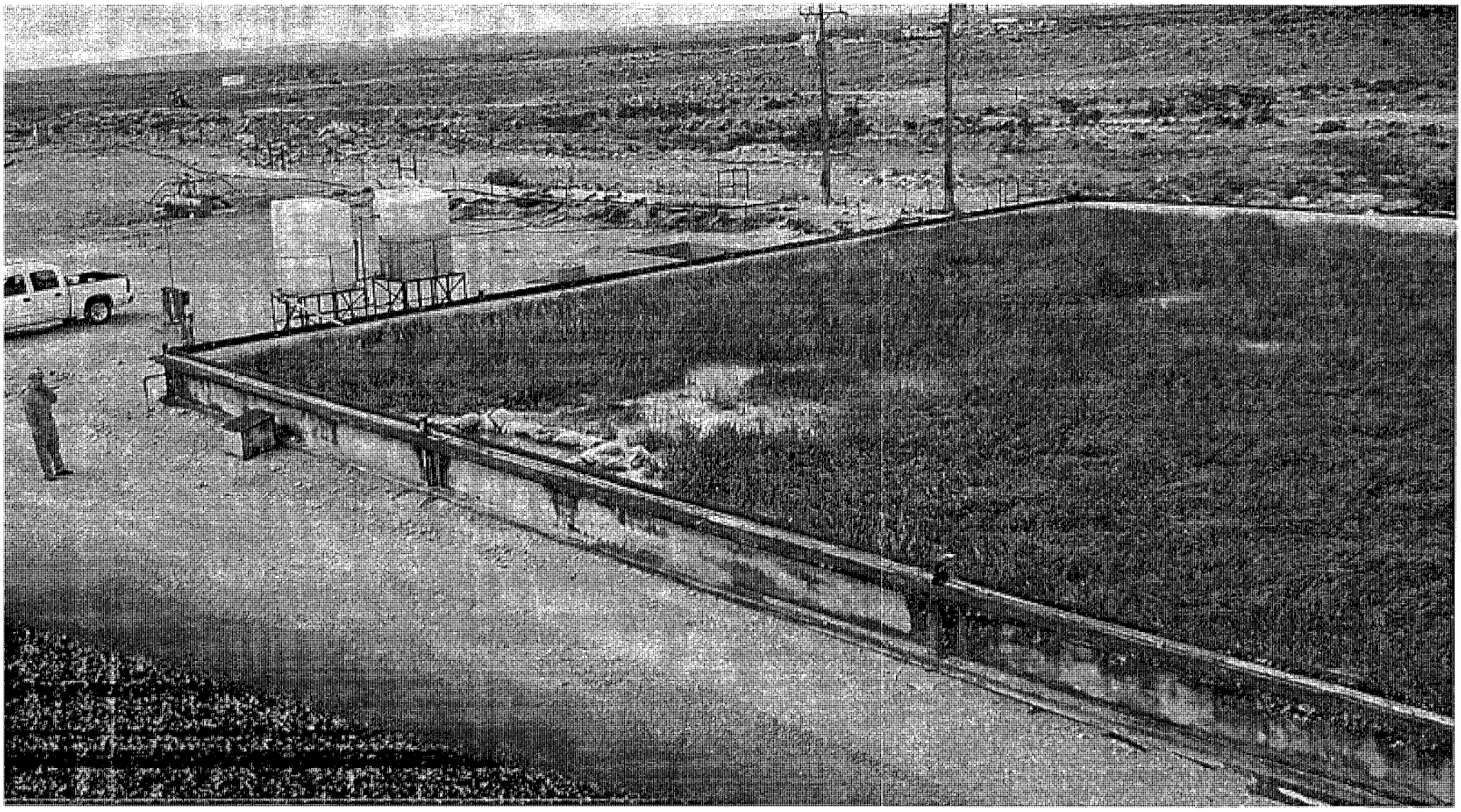
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Dewatering Well Network

Frontier Field Services: Empire Abo Gas Plant

May 2006





Fate of Evaporation Pond

- The WQCC defines a "sewerage system" as any pipelines, conduits, pumping stations, force mains, or other structures, devices, appurtenances or facilities used for collecting or conducting wastes to an ultimate point for treatment or disposal.
- The WQCC regulations state "Any person proposing to construct a sewerage system or proposing to modify any sewerage system in a manner that will change substantially the quantity or quality of the discharge from the system shall file plans and specifications of the construction or modification with Ground Water Quality Bureau of the department for discharges that may affect ground water, and/or the Surface Water Quality Bureau of the department for discharges that may affect surface water."

Path Forward

- Submit a draft Stage 1 & 2 Abatement Plan (June 2006)
- Abatement plan will include:
  - Lowering the head *beneath the Plant* to reduce the potential for hydrocarbon transport.
  - Examine feasibility of PSH removal
  - Provision for Alternate Abatement Standards (AAS)

Path Forward (Cont)

- After approval of NPDES permit, expand dewatering infrastructure with discharge into the wetlands and arroyo (Summer 2006)
- Approval of Stage 1 & 2 Abatement Plan (August 2005)
- After 6-months of data collection, full-scale dewatering activities, and ground water sampling, submit a Petition for AAS to the WQCC. (Fall 2006)

Questions and Comments

- What does NMOCD require for approval to discharge ground water into evaporation pond - a minor modification to the approved discharge plan?
- What kind of rationale and data are required to gain NMOCD support of AAS where PSH remains on ground water?
- NMOCD Questions and comments

Empire Abo Gas Plant
Outline of Stage 1 & 2 Abatement Plan

Frontier Field Services

Outline of Presentation

- Summarize DRAFT Stage 1&2 Abatement Plan
- Seven slides that summarize the hydrogeology
- Four slides that describe the water quality
- Two slides showing the proposed exploratory borings and the existing well network
- Outline of the Path Forward

DRAFT Stage 1 & 2 Abatement Plan (October 2004)

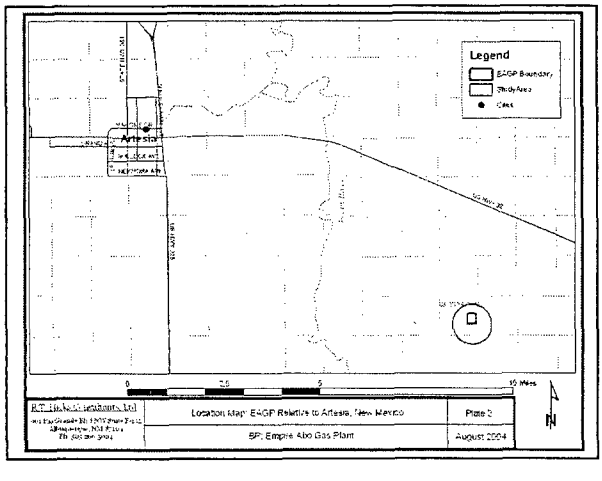
- Presentation of hydrogeologic data
- Five well exploratory program with three possible "step-out" wells to define extent and magnitude
- Install pump and dispose (via injection) system to reduce head and potential for expansion of hydrocarbons

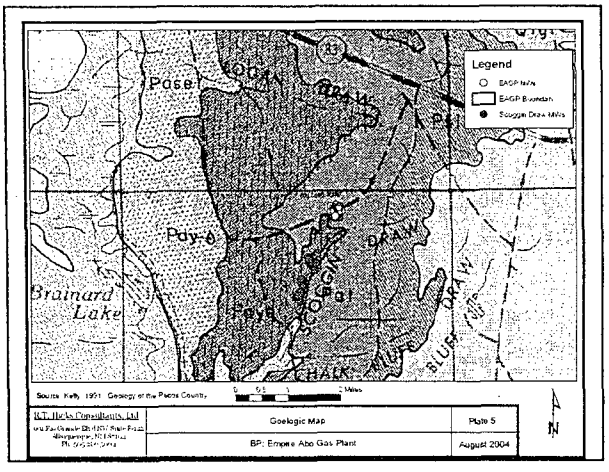
DRAFT Stage 1 & 2 Abatement Plan (October 2004)

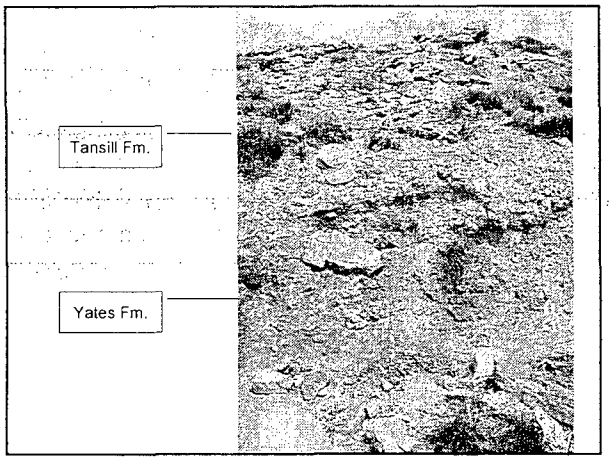
- Determine feasibility of a meaningful ground water restoration program versus a contaminant containment program through the ground water pumping experiment
- Determine if there is a reasonable relationship between the economic and social costs and benefits of restoration to ground water standards

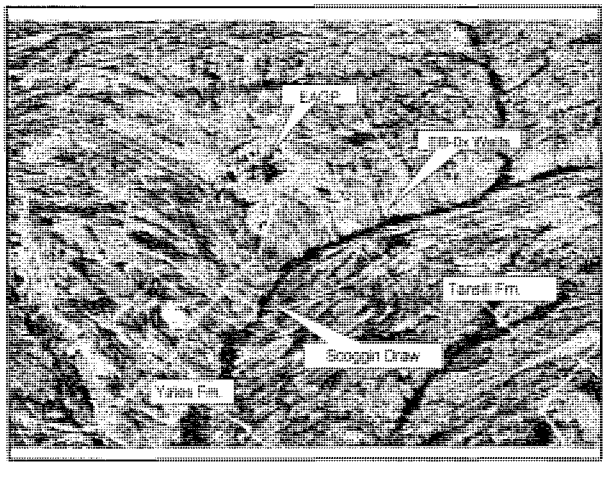
Changes from DRAFT Stage 1 & 2 Abatement Plan (October 2004)

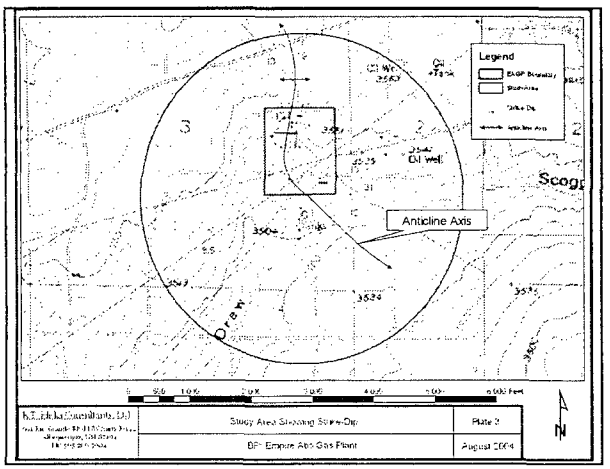
- Frontier Field Services acquires the EAGP from British Petroleum (BP)
- No cost-effective access to injection for disposal of pumped water
- NPDES Permitting for discharge makes more sense
- Start-up of investigation delayed from Fall to July

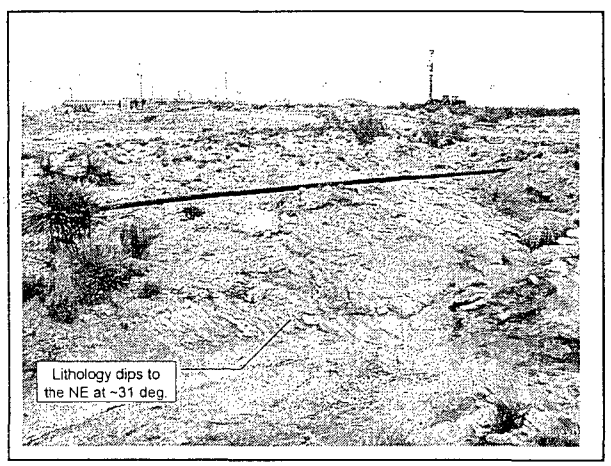


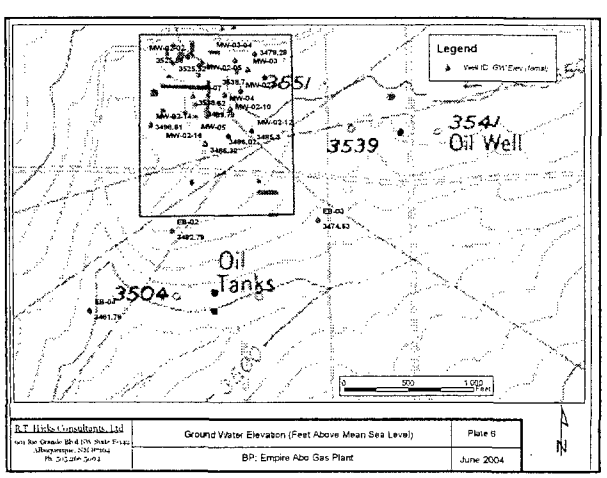

Legend
Pase
Pay-o
Brainard Lake
Source: Kelly, 1951 Geology of the Pecos Country
R.T. Hicks Consultants, Ltd
Geologic MAP
Plate 5
BP, Empire Abo Gas Plant
August 2004
N

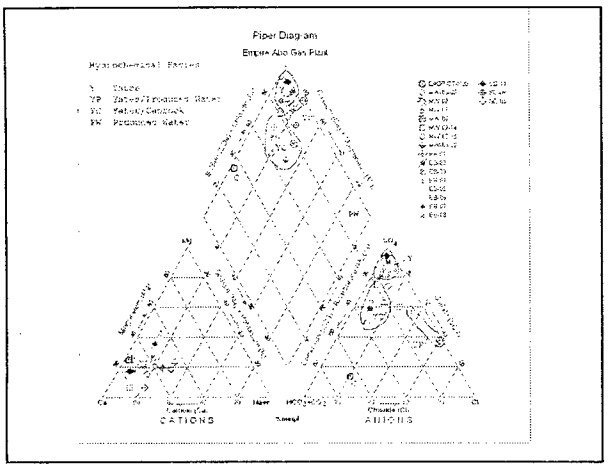

Tansill Fm.
Yates Fm.

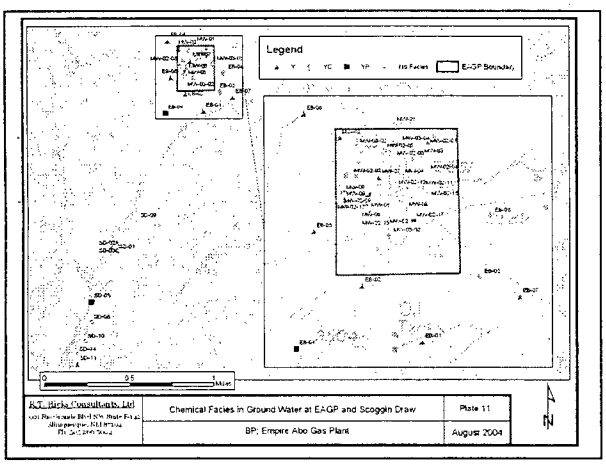

Tansill Fm.
Yates Fm.

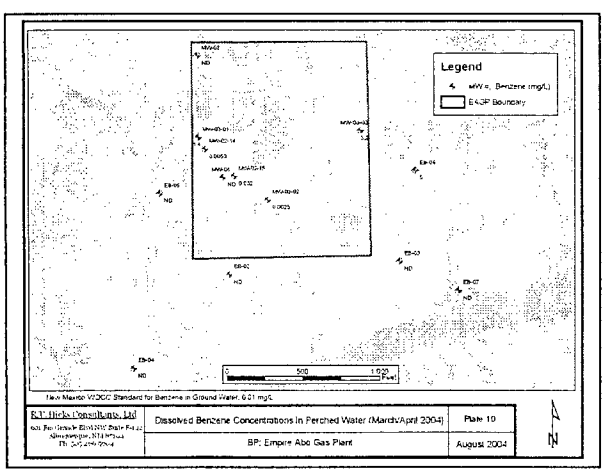

Legend
Oil well
Anticline Axis
Study Area Showing Structure
Plate 2
BP: Empire Abo Gas Plant
August 2004
N

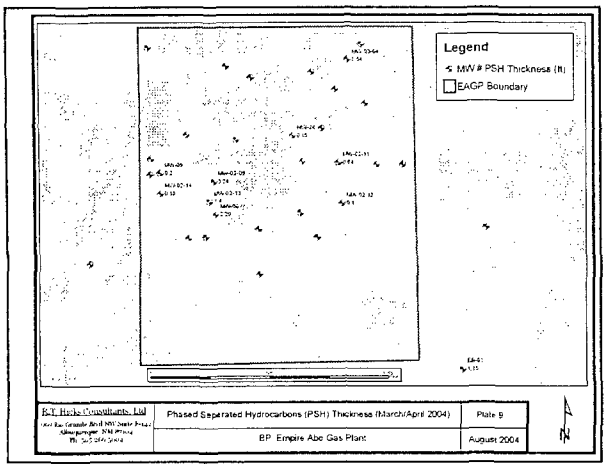

Lithology dips to the NE at ~31 deg.

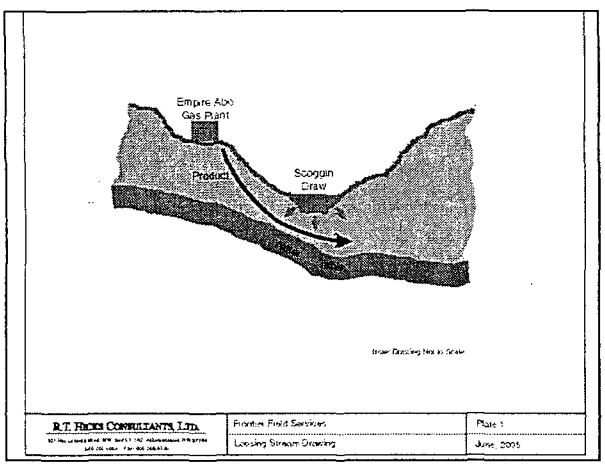

Legend
3651
3541
Oil Well
3539
Oil Tanks
3504
Ground Water Elevation (Feet Above Mean Sea Level)
Plate 6
BP: Empire Abo Gas Plant
June 2004
N

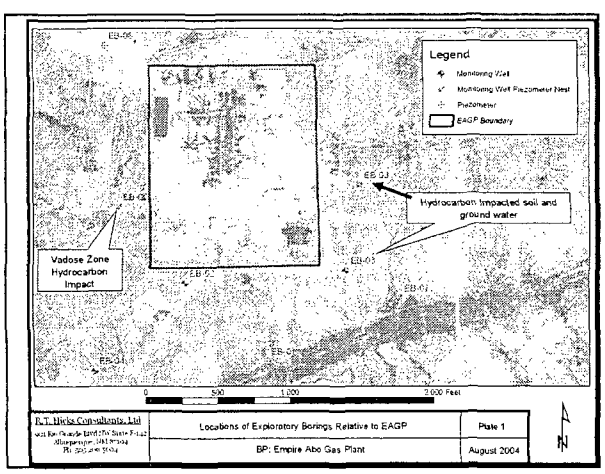

Piper Diagram
Empire Abo Gas Plant
CATIONS
ANIONS

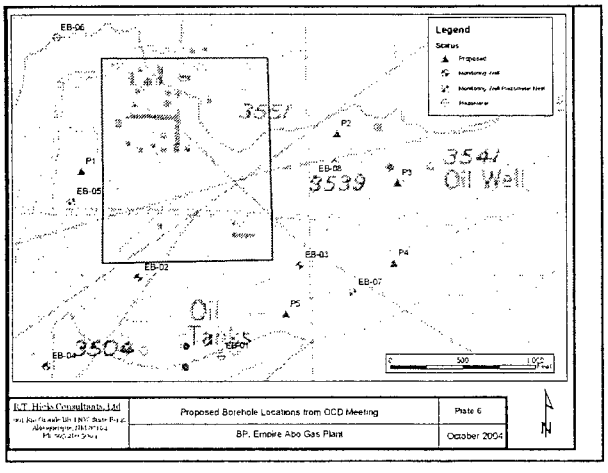

Legend
EAGP Boundary
0
1 Miles
R.T. Hicks Consultants, Ltd
Chemical Facies in Ground Water at EAGP and Scoggin Draw
Plate 11
BP; Empire Abo Gas Plant
August 2004
N

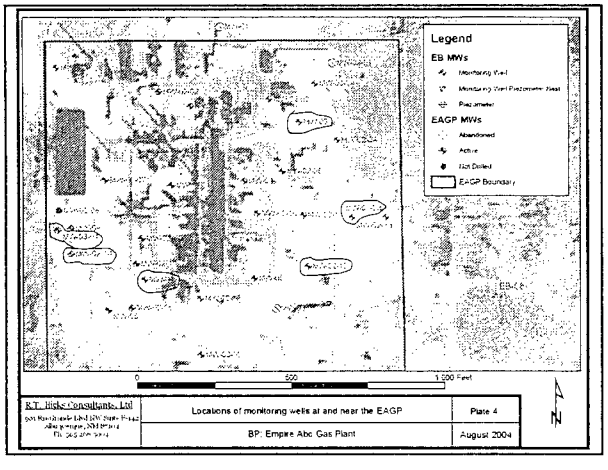

Legend
EAGP Boundary
0
500
1000 Feet
New Mexico WQCC Standard for Benzene in Ground Water, 0.01 mg/L
R.T. Hicks Consultants, Ltd
Dissolved Benzene Concentrations in Perched Water (March/April 2004)
Plate 10
BP; Empire Abo Gas Plant
August 2004
N


Legend
MW # PSH Thickness (ft)
EAGP Boundary
R.T. Hicks Consultants, Ltd
Phased Seperated Hydrocarbons (PSH) Thickness (March/April 2004)
Plate 9
BP Empire Abe Gas Plant
August 2004


Empire Abo Gas Plant
Product
Scoggin Draw
R.T. Hicks Consultants, Ltd.
Frontier Field Services
Plate 1
Loosing Stream Drawing
June, 2005


Legend
Monitoring Well
Monitoring Well Piezometer Nest
Piezometer
EAGP Boundary
Hydrocarbon Impacted soil and ground water
Vadose Zone Hydrocarbon Impact
EB-03
0
500
1,000
2,000 Feet
R.T. Hicks Consultants, Ltd
Locations of Exploratory Borings Relative to EAGP
Plate 1
BP; Empire Abo Gas Plant
August 2004





Path Forward

- Prepare and submit NPDES Permitting Documents. (June 2005)
- Perform 5-8 well program to determine magnitude and extent of hydrocarbons as verbally approved by NMOCD. (July 2005)
- Prepare MW-03-01 for discharge into evaporation pond wetlands for 120-days without an approved plan "for good cause". (July 2005)

Path Forward

- After two months of dewatering MW-03-01 and July ground water chemistry data, submit a Stage 1 & 2 Abatement Plan for public notice (September 2005.)
- Abatement plan will include:
  - Lowering the head *beneath the Plant* to reduce the potential for hydrocarbon transport.
  - Examine feasibility of PSH removal
  - Provision for Alternate Abatement Standards (AAS)

Path Forward (Cont)

- After approval of NPDES permit, expand dewatering infrastructure with discharge into the wetlands and arroyo (September 2005)
- Approval of Stage 1 & 2 Abatement Plan (Before November 2005)
- After 6-months of data collection, full-scale dewatering activities, and ground water sampling, submit a Petition for AAS to the WQCC. (Summer 2006)

Questions and Comments

- What does NMOCD require for approval to discharge ground water into evaporation pond wetlands- a minor modification to the approved discharge plan?
- What kind of rationale and data are required to gain NMOCD support of AAS where PSH remains on ground water?
- NMOCD Questions and comments

PowerPoint Presentation available for download at:

http://home.comcast.net/~aparker1969/index.html

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

CERTIFIED MAIL
RETURN RECEIPT NO: 3929 4012

DECEMBER 8, 2006

Mr. Randy McCollum
Manager of Compliance
Frontier Field Services, LLC
1001 Conoco Road
Maljamar, NM 88264

RE: REQUIREMENT TO SUBMIT MAJOR MODIFICATION TO DISCHARGE PLAN GW022
FRONTIER FIELD SERVICES, LLC - EMPIRE ABO GAS PLANT
SECTION 3, TOWNSHIP 18 SOUTH, RANGE 37 EAST
EDDY COUNTY, NEW MEXICO

Dear Mr. McCollum:

The New Mexico Oil Conservation Division (OCD) has determined that Frontier Field Services, LLC (Frontier) must submit a major modification to its existing permit (GW022) for the Empire Abo Gas Plant located in NE/4/SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico, pursuant to Water Quality Control Commission Regulations (WQCC) 20.6.2.3109E(1) NMAC. OCD determined during a review of the administrative record for this facility that Frontier's permit renewal application dated August 16, 2004, was deficient in the following areas:

1. Frontier's application did not include a ground water monitoring plan pursuant to WQCC 20.6.2.3107 NMAC (*Monitoring, Reporting, And Other Requirements*).

2. Frontier's did not provide adequate public notice, pursuant to WQCC 10.6.2.3108 (*Public Notice*). The notice failed to address the issue of ground water contamination and future abatement.

3. Frontier's application did not provide the required "detailed information on site geologic and hydrologic conditions," pursuant to WQCC 20.6.2.3106C(7) NMAC (*Application For Discharge Permits And Renewals*).

4. Because of known ground water contamination, Frontier's discharge plan must provide for closure and post-closure care. Therefore, Frontier must provide for Financial Assurance, pursuant to WQCC 20.6.2.3107A(11) NMAC, to ensure that the state of New Mexico will be capable of removing all of the plant's equipment including buried piping, restoring the site to its natural condition, and the completion of the abatement of ground water contamination. Frontier must submit a third-party cost estimate to determine these costs and document that it has adequate financial assurance for that amount.

5. Frontier's application indicated that a Stage 1 and 2 Abatement Plan would be submitted in the future to address the ground water contamination. Facilities operating under a WQCC discharge permit, such as Frontier's Empire Abo Gas Plant, are exempted by OCD Rule 19D from the requirement to submit an Abatement Plan. Frontier's permit must be modified to include a ground water investigation and abatement program. Frontier is required to provide public notice of this major modification of its Discharge Permit.

6. Frontier's discharge plan specifies that certain products and waste will be stored in a manner that does not meet OCD's current best management practices (BMPs) for storing products and waste. For example, Table 1 (Attachment 6) of the permit renewal application indicates that Frontier will use earthen berms. Frontier's discharge plan must be modified to include impermeable secondary containment for such products and waste, except for fresh water and certain products that are gaseous at atmospheric conditions.

7. Attachment IX of the discharge plan proposed that Frontier would discharge a wastewater stream on-site directly to the ground rather than continue to dispose of it at an off-site UIC Class II disposal well. This approach would also include Frontier concurrently obtaining a NPDES permit from EPA Region 6. At the request of Frontier's consultant R.T. Hicks, Consultants, OCD attended a technical meeting concerning this issue. After review, OCD has determined that discharges of this type will require a separate additional major modification of the permit, public notice, financial assurance, and a public hearing.

8. The current SPCC plan is out of date and includes names and telephone numbers of personnel with BP Amoco, rather than those of Frontier.

As a result of these discharge permit application deficiencies, OCD hereby orders Frontier Field Services to submit a major modification to its Discharge Permit (GW022), pursuant to WQCC 20.6.2.3109 NMAC, within 60 days of receipt of this certified letter. The permit modification must include a complete, stand alone discharge permit application and a $100.00 filing fee made out to the New Mexico Water Quality Management Fund.

If you have any questions, please contact Glenn von Gonten of my staff at (505) 476-3488.

Sincerely,

Wayne Price
Environmental Bureau Chief
Oil Conservation Division

WP/gvg

cc: Tim Gum, OCD Artesia District Supervisor
Andrew Parker, R. T. Hicks, Consultants

Frontier Field Services, LLC
Southern Ute Indian Tribe

Randy McCollum
Manager of Compliance

Phone: 505-676-3505
Cell: 505-361-0128
rmccollum@frontierfieldservices.com

CERTIFIED MAIL: **7004 0750 0002 5384 7189**
Return Receipt Requested

December 18, 2006

Mr. Wayne Price
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

2006 DEC 20 AM 11 19

Re: Notice of Change of Contractor/Representative
Frontier Field Services, LLC
Empire ABO Gas Plant
Discharge Permit GW022

Dear Mr. Price:

Frontier Field Services, owner of Empire ABO Gas Plant, discontinued its relationship with R.T. Hicks effective December 18, 2006. R.T. Hicks will not longer directly represent Frontier in matters relating to that facility.

Effective immediately, Larson & Associates, Inc. assumed the groundwater project at Empire ABO Gas Plant. Larson will represent and advise Frontier in meetings and communications with OCD. Your letter dated December 8, 2006 was forwarded to Mark Larson for review and he will help Frontier respond appropriately.

Mr. Larson will contact you to coordinate a meeting between OCD, Larson, and Frontier to establish actions required and to agree on a path forward. He is currently reviewing the site's history and developing a reasonable compliance plan.

I am sure you are familiar with Mr. Larson's work. I see his addition as a positive step that will move this project ahead.

Sincerely,

Randy L. McCollum
Manager Compliance

Cc: Mr. Glenn Von Gonten
Mr. Mike Hicks
Mr. Mark Larson

bp

BP America Production Company
501 WestLake Park Blvd. (77079)
Post Office Box 3092
Houston, Texas 77253-3092
USA

February 7, 2005

New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Attention: Mr. W. Jack Ford

Non-Hazardous Waste
Empire Abo Gas Plant
Eddy County, New Mexico

Your approval is requested to dispose of non-hazardous material generated from our Empire Abo Gas Plant. The material will consist of approximately 5-7 cubic yards of sludge to be removed from the basin of the water cooling tower at the plant.

Attached is the TCLP analysis report on the sludge which indicates it to be within the limits for a non-hazardous waste. This material would be spread inside the fence at the south end of the plant as has been approved by the NMOCD in previous disposal requests of this material. The sludge will be spread to minimize surface runoff. BP America Production Company owns the plant surface property.

Please confirm your approval in writing and send to the above address, attention Mike McKinley, Room 4.514, WL1.

Yours very truly,

M. F. McKinley

Mike F. McKinley
HSSE Coordinator
Natural Gas Liquids Business Unit

Attachment

cc: Forrest Noah – Empire Abo Gas Plant
Dan Norman – Hobbs Fractionation Complex

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ELKHORN OPERATING
ATTN: FORREST NOAH
P.O. BOX 70
ARTESIA, NM 88211
FAX TO: (505) 677-5162

Receiving Date: 02/02/05
Reporting Date: 02/04/05
Project Number: NOT GIVEN
Project Name: COOLING TOWER SLUDGE
Project Location: ARTESIA, NM

Sampling Date: 02/02/05
Sample Type: SLUDGE
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: AH

TCLP METALS

LAB NO.	SAMPLE ID	As ppm	Ag ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm
ANALYSIS DATE:		02/04/05	02/04/05	02/04/05	02/04/05	02/04/05	02/04/05	02/04/05	02/04/05
EPA LIMITS:		5	5	100	1	5	5	0.2	1
H9520-1	SLUDGE	<1	<1	<5	<0.1	<1	<1	<0.02	<0.1
Quality Control		0.048	5.014	25.16	0.923	4.963	5.252	0.0100	0.144
True Value QC		0.050	5.000	25.00	1.000	5.000	5.000	0.0100	0.150
% Recovery		96.0	100	101	92.3	99.3	105	100	96.0
Relative Standard Deviation		5.8	0.3	0.3	0.4	1.1	1.4	1.1	4.8
METHODS: EPA 1311, 600/4-91/		206.2	272.1	208.1	213.1	218.1	239.1	245.1	270.2

Amy Hill
Chemist

2/4/05
Date

H9520

CARDINAL LABORATORIES

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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ELKHORN OPERATING CO.
ATTN: FORREST NOAH
P.O. BOX 70
ARTESIA, NM 88211
FAX TO: (505) 677-6152

Receiving Date: 02/02/05
Reporting Date: 02/04/05
Project Number: NOT GIVEN
Project Name: COOLING TOWER SLUDGE
Project Location: ARTESIA, NM
Lab Number: H9520-1
Sample ID: SLUDGE

Analysis Date: 02/04/05
Sampling Date: 02/02/05
Sample Type: SLUDGE
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: BC

TCLP SEMIVOLATILES (ppm)	EPA LIMIT	Sample Result H9520-1	Method Blank	QC	% Recov.	True Value QC
Pyridine	5.00	<0.020	<0.005	0.013	26	0.050
1,4-Dichlorobenzene	7.50	<0.020	<0.005	0.027	54	0.050
o-Cresol	200	<0.020	<0.005	0.035	70	0.050
m, p-Cresol	200	0.109	<0.005	0.034	68	0.050
Hexachloroethane	3.00	<0.020	<0.005	0.026	52	0.050
Nitrobenzene	2.00	<0.020	<0.005	0.040	80	0.050
Hexachloro-1,3-butadiene	0.500	<0.020	<0.005	0.033	66	0.050
2,4,6-Trichlorophenol	2.00	<0.020	<0.005	0.041	82	0.050
2,4,5-Trichlorophenol	400	<0.020	<0.005	0.040	80	0.050
2,4-Dinitrotoluene	0.130	<0.020	<0.005	0.042	84	0.050
Hexachlorobenzene	0.130	<0.020	<0.005	0.042	84	0.050
Pentachlorophenol	100	<0.020	<0.005	0.044	88	0.050

	% RECOVERY
Fluorophenol	41
Phenol-d5	38
Nitrobenzene-d5	80
2-Fluorobiphenyl	82
2,4,6-Tribromophenol	55
Terphenyl-d14	103

METHODS: EPA SW-846 1311, 8270, 3510

Burgess J. A. Cooke, Ph. D.

2/4/05
Date

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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ELKHORN OPERATING CO.
ATTN: FORREST NOAH
P.O. BOX 70
ARTESIA, NM 88211
FAX TO: (505) 677-5152

Receiving Date: 02/02/05
Reporting Date: 02/04/05
Project Number: NOT GIVEN
Project Name: COOLING TOWER SLUDGE
Project Location: ARTESIA, NM
Lab Number: H9520-1
Sample ID: SLUDGE

Analysis Date: 02/03/05
Sampling Date: 02/02/05
Sample Type: SLUDGE
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: BC

TCLP VOLATILES (ppm)	EPA LIMIT	Sample Result H9520-1	Method Blank	QC	%Recov.	True Value QC
Vinyl Chloride	0.20	<0.005	<0.005	0.090	90	0.100
1,1-Dichloroethylene	0.7	<0.005	<0.005	0.089	89	0.100
Methyl Ethyl Ketone	200	<0.050	<0.050	0.013	13	0.100
Chloroform	6.0	0.006	<0.005	0.081	81	0.100
1,2-Dichloroethane	0.5	<0.005	<0.005	0.088	88	0.100
Benzene	0.5	<0.005	<0.005	0.083	83	0.100
Carbon Tetrachloride	0.5	<0.005	<0.005	0.084	84	0.100
Trichloroethylene	0.5	<0.005	<0.005	0.099	99	0.100
Tetrachloroethylene	0.7	<0.005	<0.005	0.087	87	0.100
Chlorobenzene	100	<0.005	<0.005	0.089	89	0.100
1,4-Dichlorobenzene*	7.5	0.006	0.008	0.096	85	0.100

*Analyte detected at comparable levels in leachate & sample blank.

% RECOVERY	
Dibromofluoromethane	93
Toluene-d8	103
Bromofluorobenzene	109

METHODS: EPA SW 846-8260, 1311

Burgess J. A. Cooke, Ph. D.

2/4/05
Date

THE SANTA FE
NEW MEXICAN
Founded 1849

OIL CONSERVATION DIVISION

NM OIL CONSERVATION DIV.
Attn: Ed Martin
1220 ST. FRANCIS DR

SANTA FE NM 87505

ALTERNATE ACCOUNT: 56689
AD NUMBER: 00105634 ACCOUNT: 00002212
LEGAL NO: 76597 P.O. #: 05-199-050185
223 LINES 1 TIME(S) 98.12
AFFIDAVIT: 5.50
TAX: 7.58
TOTAL: 111.20

AFFIDAVIT OF PUBLICATION

OK to pay Ed Martin 2-11-05

STATE OF NEW MEXICO
COUNTY OF SANTA FE

I, B. Perner, being first duly sworn declare and say that I am Legal Advertising Representative of THE SANTA FE NEW MEXICAN, a daily newspaper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication # 76597 a copy of which is hereto attached was published in said newspaper 1 day(s) between 02/04/2005 and 02/04/2005 and that the notice was published in the newspaper proper and not in any supplement; the first date of publication being on the 4th day of February, 2005 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/ B Perner
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 4th day of February, 2005

Notary Laura E. Harding

Commission Expires: 11/23/09

NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to the New Mexico Water Quality Control Commission Regulations, the following discharge permit application has been submitted to the Director of the Oil Conservation Division, 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

(GW-022) - BP America Production Company, Ms. Jeanne M. Johns, 501 Westlake Park Blvd., P.O. Box 3092, Houston, Texas 77253-3092, has submitted a discharge renewal application for the Empiro Abo Gas Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The Empiro Abo Gas Plant was formerly operated by ARCO Permian. Approximately 200 to 400 barrels of water are created daily and collected in an open top above ground steel tank for evaporation. Approximately 158 barrels per day of waste and produced are collected in closed above ground steel tanks prior to transport off-site for disposal in an OCD approved facility. Ground water most likely to be affected in the event of an accidental discharge is at a depth of approximately 50 feet with a total dissolved solids concentration of approximately 3000 mg/l. The discharge permit addresses how spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge permit application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday thru Friday. Prior to ruling on any proposed discharge permit or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and public hearing may be requested by any interested person. Request for public hearing shall set forth the reasons why a hearing shall be held. A hearing will be held if the director determines that there is significant public interest.

If no hearing is held, the Director will approve or disapprove the permit based on the information available. If a public hearing is held, the Director will approve the permit based on the information in the permit and information presented at the hearing.

GIVEN under the Seal of New Mexico Conservation Commission at Santa Fe, New Mexico, on this 18th day of January 2005.

STATE OF
NEW MEXICO
OIL CONSERVATION
DIVISION

Mark Feismire, P.E.,
Director

SEAL
Legal #76597
Pub. February 4, 2005

Ford, Jack

From: Martin, Ed
Sent: Monday, January 31, 2005 10:29 AM
To: Carlsbad Current Argus (E-mail)
Cc: Ford, Jack
Subject: Legal Notice

Please publish the attached legal notice, one time only, on or before Friday, February 4, 2005.
Upon publication, please forward to this office:
1. Affidavit of publication
2. Invoice. Purchase order number is **05-199-050192**

If you have any questions, please contact me.
Thank you.

Publ. Notice
GW-022.doc

Ed Martin
New Mexico Oil Conservation Division
Environmental Bureau
1220 S. St. Francis
Santa Fe, NM 87505
Phone: 505-476-3492
Fax: 505-476-3462

Ford, Jack

From: Martin, Ed
Sent: Monday, January 31, 2005 10:24 AM
To: Santa Fe New Mexican (E-mail)
Cc: Ford, Jack
Subject: Legal Notices

Please publish the attached legal notices, one time only, on or before Friday February 4, 2005.
Upon publication, forward to this office:
1. Affidavit of publication
2. Your invoice. Purchase order number is **05-199-050185**

If you have any questions, please contact me.
Thank you.


Publ. Notice
GW165_166.doc


Publ. Notice
GW-022.doc

Ed Martin
New Mexico Oil Conservation Division
Environmental Bureau
1220 S. St. Francis
Santa Fe, NM 87505
Phone: 505-476-3492
Fax: 505-476-3462

Frontier
Field Services, LLC

RECEIVED
APR 1 4 2005
Per.....

April 8, 2005
PROJ2003/271-03

Mr. Jack Ford, C.P.G
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Notification and Commitment letter
Discharge Plan GW-022
Frontier Field Services
Empire Abo Gas Plant
Eddy County, New Mexico

Dear Mr. Ford:

Frontier Field Services is in the final negotiation phase with BP America Production Company about acquiring the ownership and operation of the Empire Abo Gas plant located in Eddy County, New Mexico. Frontier plans on closing this deal on April 28, 2005. Frontier Field Services submits this notification and commitment letter to NM OCD Division as required by the approved Discharge Permit. Frontier Field Services requests an expedited approval from OCD so that closure of this sale can be completed as scheduled.

The Empire Abo Gas Plant operates under a Discharge Plan that was re-approved on January 18, 2005. Frontier Field services has reviewed the Discharge Plan Renewal Application and the approved Discharge Plan and required conditions.

Frontier Field Services accepts the conditions of the Discharge Plan, and is committed to implementing the following referenced conditions:

1. Payment of Discharge Plan Fees: Records indicate that, in addition to the $100.00 permit application fee, the first installment ($800.00) of the total fee of $4,000.00 has been paid by BP America production Company. Frontier Field Services will meet its obligations and make payments of the balance ($3,200.00) as scheduled.

2. Frontier Field Services Commitments: Frontier Field Services will abide by all commitments submitted in the discharge permit renewal application dated August 16, 2004 and the required conditions below.

3. Waste Disposal: All wastes generated at the Empire Abo Gas plant will be disposed off at an OCD approved facility as required by the Discharge Permit. Only oilfield exempt wastes shall be disposed off down Class II Injection wells. Non-exempt oilfield wastes that are non- hazardous may be disposed off at an

4200 East Skelly Drive • Suite 700 • Tulsa, Oklahoma 74135 • Phone (918) 492-4450 • Fax (918) 492-4701

OCD approved facility upon proper waste determination per 40 CFR Part 261. Any waste stream that is not listed in the discharge permit will be approved by OCD on a case-by case basis

4. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums will be stored on their sides with the bungs in and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets will also be stored on impermeable pad equipped with curb type containment.

5. Process areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.

6. Aboveground Tanks: All aboveground tanks which contain fluids other than fresh water must be bermed to contain a volume of one third more than the total volume of the largest tank of all interconnected tanks. All new tanks or existing tanks that undergo a major modification, as determined by the Division, must be placed within an impermeable bermed enclosure.

7. Aboveground Saddle Tanks: Aboveground saddle tanks that contain fluids other than fresh water or gases at atmospheric pressure and temperature, must have impermeable pad and curb type containment.

8. Labeling: All tanks, drums and containers will be clearly labeled to identify their contents and other emergency notification information.

9. Below grade Tanks and Sumps: All below grade tanks, sumps, and pits must be approved by NM OCD prior to installation or upon modification, and must incorporate secondary containment and leak detection into the design. All pre-existing sumps and below grade tanks must demonstrate integrity on an annual basis. Integrity tests shall include pressure testing to three (3) pounds per square inch (psi) above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least seventy two (72) hours prior to all testing.

10. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity every five (5) years. Frontier Field Services may propose various methods for testing such as pressure testing to 3 psi above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to any testing.

11. Class V Wells: No Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be closed unless it can be demonstrated that the groundwater will not be impacted in the reasonably foreseeable future. Leach fields and other wastewater disposal systems at OCD regulated facilities that inject non-hazardous fluid into or above an underground source of drinking water are considered Class V Injection Wells under EPA UIC

program. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.

12. Housekeeping: All systems designed for spill collection/prevention will be inspected by Frontier Field Services representative on a regular basis and after each storm event to ensure proper operation and to prevent overtopping, or system failure. A record of inspections will be retained on site for a period of five years.

13. Spill Reporting: All spills/releases will be reported pursuant to NM OCD Rule 116 and WQCC 1203 to the OCD Artesia District Office.

14. Transfer of Discharge Plan: The NM OCD must be notified prior to any transfer of ownership, control or possession of a facility with an approved discharge permit. A written commitment to comply with the terms and conditions of the previously approved discharge permit must be submitted by the purchaser and approved by the OCD prior to transfer.

15. Storm Water Permit: Frontier Field Services shall maintain storm water run-off controls. As a result of Frontier Field Services' operations, any contaminant that exceeds the WQCC standards listed in 20 NMAC 6.2.3101 is discharged in any storm water runoff then Frontier Field Services shall notify the OCD within 24 hours, modify the permit within 15 days and submit for OCD approval. Frontier Field services shall also take immediate corrective actions pursuant to item 12 (housekeeping) of these conditions.

16. Closure: The NM OCD will be notified when operations of the Empire Abo Gas Plant are discontinued for a period in excess of six months. Prior to closure of the Empire Abo Gas Plant, a closure plan will be submitted for approval by the Director. Closure and waste disposal will be in accordance with the statutes, rules and regulations in effect at the time of closure.

17. Certification: Frontier Field Services, by the official, whose signature appears below, accepts this permit (GW-022) and agrees to comply with all terms and conditions contained herein. Frontier Field Services further acknowledges that these conditions and requirements of this permit may be changed administratively by the Division for good cause as shown as necessary to protect fresh water, human health and the environment.

Accepted by:

Frontier Field Services

Mike Hicks, Director of operations

Mike Hicks 4/13/05

Signature Date

bp

BP America Production Company
501 WestLake Park Blvd. (77079)
Post Office Box 3092
Houston, Texas 77253-3092
USA

May 9, 2005

New Mexico Energy, Minerals and
Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Attention: Mr. Roger Anderson
Environmental Bureau Chief

Empire Abo Gas Plant Discharge Plan GW-022
Eddy County, New Mexico

Dear Mr. Anderson,

BP America Production Company closed the sale of the Empire Abo Gas Plant to Frontier Field Services, LLC on April 28. BP had previously made Frontier aware of the existence of the facility Discharge Plan and provided a copy thereof to Frontier. Please remove BP America Production Company as the operator for this plan.

Please contact Mike McKinley at (281) 366-3907 if any additional information is required.

Sincerely,

Cheryl L. Dimpault-Darcy
Southern Operations Manager
Natural Gas Liquids Business Unit

cc: Frontier Field Services, LLC
4200 E. Skelly Drive, Suite 700
Tulsa , Oklahoma 74135-3256

Orig. DP App. 12-13-84
Mod. " " 7-15-86
Ren. " " 9-14-90
Ren " " 1-4-95
Mod. " " 7-31-98

ELKHORN FIELD SERVICES
Empire Abo Gas Plant

Dorthy did you set this?

Andrea.

04-28-2005

New Mexico Oil Conservation Division
1220 South St. Francis Drive

Santa Fe, NM 87505

NOTICE: CHANGE OF OPERATOR

Elkhorn Field Services has contract operated the Empire Abo Gas Plant since September 1, 1996. The current owner, BP America Production Company has sold this facility and therefore cancelled our contract. The new owner will take control and operation of this facility effective 04/28/2005.

Any further questions or communications with Elkhorn Field Services will be with Mr. Ken Allen, Manager of Operations, Elkhorn Field Services at:

Elkhorn Field Services
ATTN: MR. KEN ALLEN
8801 South Yale, Suite 420
Tulsa, OK 74137
(918) 492-4418

Sincerely,

Forrest C. Noah

Forrest C. Noah
EAGP Plant Manager

September 20, 2004

DRAFT Stage I/II Abatement Plan

EMPIRE ABO GAS PLANT
ARTESIA, NEW MEXICO

Prepared for:

BP America Production Company
501 Westlake Park Blvd
Houston, Texas 77253

R.T. HICKS CONSULTANTS, LTD.
901 RIO GRANDE BLVD. NW, SUITE F-142, ALBUQUERQUE, NM 87104

1.0 EXECUTIVE SUMMARY

BP America Production Company (BP) contracted with R.T. Hicks Consultants (Hicks Consultants) to examine historical data, conduct field activities to collect additional data, and prepare this Stage I/II Abatement Plan for the Empire Abo Gas Plant (EAGP) located near Artesia, New Mexico (see Plate 1). Because data suggests that releases of hydrocarbons originated from oil and gas pipelines, not EAGP processes, New Mexico Oil Conservation Division Rule 19 governs abatement activities at the site. Our conclusions are:

1. Neither the evaporite facies of the Yates Formation nor the overlying Tansil Formation is a productive aquifer in the area of the EAGP.

2. Ground water below the EAGP is confined within 1-5 foot thick, fine-grained porous zones that exist between massive gypsum layers. Most hydrogeologists would not consider these water-bearing zones aquifers and we do not define them as such. We refer to these water-bearing zones as hydrostratigraphic units.

3. Ground water below Scoggin Draw, which exists within a thin veneer of alluvium, leaks into fine-grained porous strata of the underlying Yates Formation. Scoggin Draw is a losing stream and hydrocarbons beneath the EAGP will not migrate into surface water.

4. An anticline, solution cavities, and collapse features below the EAGP create a relatively complex series of discontinuous hydrostratigraphic units. Within these different units, ground water may flow east, west, south or southeast, depending upon location within the study area. Regionally, ground water within the Yates Formation flows southeast, coincident with the regional dip.

5. Fresh water releases from ruptured pipelines have created a ground water mound beneath the northern portion of the EAGP. In this area, ground water flows radially in a southward direction from the apex of this artificial ground water mound.

6. Near an area of hydraulic stress, such as a shallow pumping well, the hydrostratigraphic units beneath the EAGP can behave like porous matrix. If a similar stress (e.g. a freshwater

pipeline release) occurred 100-200 feet distant from the pumping well described above, the hydrostratigraphic units can behave like karst units. However, on a scale of thousands of feet, this heterogeneity of the saturated zone is less pronounced. We believe that on a large scale, the hydrostratigraphic units behave like a porous matrix.

7. Separate phase hydrocarbons (SPH) exist in several wells on and near the EAGP. Dissolved-phase hydrocarbons also exist in ground water beneath and adjacent to the EAGP. Chromatographic "fingerprinting" of these hydrocarbons identifies them as weathered natural gas condensate.

8. Most of the pipelines and process vessels that hold or contain hydrocarbons at the plant are above the ground surface. The EAGP has no evidence of large, uncontained releases of hydrocarbons. Many natural gas condensate pipelines owned by different operators exist below the EAGP. Finding the source(s) that caused the release of hydrocarbons to ground water would be very difficult and is probably unimportant because the weathered nature of the hydrocarbon suggests a historic release rather than an on-going release.

9. The monitoring well network at and near the EAGP permit a reasonable definition of the magnitude and extent of SPH and dissolved-phase hydrocarbons. Hydrocarbon concentrations above New Mexico ground water standards do not exist in ground water north, due south or west of the EAGP property. Ground water exhibits SPH and dissolved-phase hydrocarbons (e.g. benzene) above the ground water standards within the plant site and several hundred feet east and southeast of the EAGP. Ground water beneath or adjacent to Scoggin Draw is not impaired by hydrocarbons that were released below or near the EAGP.

10. Our hydrogeologic model of the study area suggests that natural processes have halted transport of dissolved-phase hydrocarbons beneath and near the EAGP. Fresh water releases at the EAGP, while not desirable, have caused dilution of dissolved-phase hydrocarbons within the saturated zone. Further transport of dissolved-phase hydrocarbons that would cause ground water to exceed standards beyond the current extent is highly unlikely.

11. The saturated zone is composed of fine-grained, low-transmissivity, confined hydrostratigraphic units. Significant transport of SPH under these conditions is improbable and transport of SPH beyond the current extent is highly unlikely.

12. We determined the Net Environmental Benefit of 4 possible remedies to address the observed impairment of ground water.

- Pump and dispose of hydrocarbon impacted ground water via well injection
- Pump, treat and discharge ground water to Scoggin Draw
- Pump, treat, and then use the treated ground water at the EAGP
- Obtain Alternative Abatement Standards for the ground water zone beneath and adjacent to the EAGP

13. We found that recovery of released water from selected wells for use at the EAGP is cost-effective provided the plant remains operational. After cessation of operation, alternative abatement standards provide the best alternative to address the localized impairment of ground water quality.

1.0 INTRODUCTION

Large-scale mapping (e.g. Kelly, 1971) shows Permian Rocks dipping gently east-southeast, toward the center of the Permian Basin. However, flexures and faulting are not uncommon, with one large flexure trending northeast near the EAGP (see Plate 2). Published maps show that the evaporite facies of the Yates Formation and a thin veneer of the Tansil Formation underlie the EAGP (see Plate 3). Publications describe these rocks as dominated by gypsum with minor amounts of limestone, sandstone and siltstone.

Figure 1. View looking northwest towards Empire Abo Gas Plant - Gypsum dipping to northeast with overlying red clay bed in upper right gully.

Our surface geological mapping and borehole observations demonstrate that the geology of the area is relatively complex on the small scale of the EAGP site (see Plate 4). Our examination suggests that local folding, faulting, or slump features due to subsurface solution have caused strata to dip in a variety of ways. East of the EAGP, the dip is generally about 12 degrees to the northeast. Rocks southwest of the EAGP dip 3-4 degrees southeast, consistent with the regional trend. North of the plant, one observes a small anticline which appears to trend and plunge to the south.

Observations from borehole logging and surface mapping within a one-mile radius of the site (the study area) demonstrate that gypsum dominates the subsurface with 1- to 5-foot layers of interbeded fine sand, silt, and limestone (hydrostratigraphic units). We encountered confined ground water within these hydrostratigraphic units at all eight recently drilled borehole locations (EB-01 through EB-08; Plate 1). We believe the 5- to 15-foot thick gypsum beds are the aquitards that cause confining pressure within the observed fine sand and silt water-bearing zones. See Appendix A for additional figures of lithology.

Figure 2. Looking north northeast towards EAGP, gypsum bed forms the hillside. Underlying thin limestone and red clay bed are visible in the foreground.

We conclude that a series of fresh water pipeline leaks, which occurred over many decades, created a mound of perched ground water beneath the EAGP. Recently, documented fresh water pipeline leaks occurred in

December 2000; July 2002; March, May, and November 2003; and May and June 2004. The pipeline failure of November released as much as 60,000 barrels of water over a three-month period. In addition, fire suppression activities contributed to the observed perched water mound. All of the fresh water comes from the Ogallala Aquifer via the Caprock Pipeline.

During drilling operations, we observed no hydrocarbon impact to soil and/or ground water in the two exploratory borings that are adjacent to Scoggin Draw and south of the EAGP (EB-01 and EB-07) (see Plate 5). We did not observe hydrocarbon impact to soil and/or ground water in EB-02, EB-04, and EB-06, which are south, southwest, and northwest of the EAGP. Due west of the EAGP in EB-5, we observed hydrocarbon staining in the vadose zone but chemical analyses of ground water did not detect hydrocarbons. We encountered hydrocarbons within the hydrostratigraphic units at borings EB-03, and EB-08, which are respectively southeast, and east of the EAGP.

Figure 3. East of Empire Abo Gas Plant, looking north, thin limestone interbedded with red clays. Overlying gypsum forms upper hillside.

Chromatographic evaluation of the SPH from EB-03 and MW-2-13 indicates the origin of the SPH is natural gas condensate. Although the Empire Abo Gas Plant released hydrocarbons to the subsurface the volume of known releases does not correlate well with the observed magnitude and extent of hydrocarbons on ground water. Numerous existing and abandoned natural gas condensate pipelines exist beneath and adjacent to the gas plant. We conclude that releases from the pipelines contributed hydrocarbons to the subsurface and probably caused the majority of the observed hydrocarbons on ground water.

Solution cavities within these tilted strata complicate the conceptual hydrogeologic model for the EAGP study area. Where we conducted a 12-hour pumping test (MW-3-01) on the west side of the plant, the water-bearing zone behaved as a porous matrix (see Plate 6). However, the wells on the EAGP reacted independently to the stress caused by the 2003-2004 release of fresh water. Water levels in some wells rose, as though they were connected to the release area by solution cavities while some wells closer to the fresh-water release were not affected. Although one cannot accurately predict how two monitoring wells may react to a stress (release or pumping), we conclude that prediction of large-scale phenomenon, such as the migration of hydrocarbons from the EAGP, is predictable.

We carefully examined the hydrochemistry of the ground water in an effort to better understand the flow regime. Out of the nineteen wells selected to

represent the geography at and near the EAGP, we identified five hydrochemical facies. Two of the five facies are composed of native ground water from the Yates Formation (sulfate rich) and released Ogallala Aquifer ground water that is imported to the EAGP via the Caprock Water Pipeline (carbonate rich). The other three facies are a mixture of the Ogallala, Yates, and/or produced water (chloride rich). Using these data, we can conclude that ground water in Scoggin Draw and ground water in the Yates Formation south and west of the EAGP have not been influenced by water or hydrocarbon releases from the EAGP.

Using data from the investigations conducted to date, we can conclude that the hydrostratigraphic units beneath and adjacent to Scoggin Draw do not contribute water to the surface flow of this ephemeral stream. Instead, leakage of surface water from Scoggin Draw recharges regional ground water. We hypothesize that the hydrostratigraphic units beneath and east of the EAGP dip to the east-northeast and are not connected to the near surface ground water (less than 10-feet below ground surface) of Scoggin Draw. To test this hypothesis, we recommend further hydrogeological investigations to determine the relationship of the confined ground water zones between the EAGP and Scoggin Draw; and the relationship of observed hydrocarbons in EB-05 (west of the EAGP) and the EAGP.

If the proposed investigation documents the lack of a hydraulic connection between the hydrostratigraphic units beneath the EAGP (which contain hydrocarbons) and the shallow ground water beneath Scoggin Draw, then our remedy evaluation shows that Alternative Abatement Standards and institutional controls provide the greatest net environmental benefit at the site. If our proposed investigation shows a hydraulic connection between the subsurface hydrocarbons and ground water beneath Scoggin Draw, the leakage of surface water into the ground water system may create a natural barrier to the migration of subsurface hydrocarbons. This barrier could be a hydraulic barrier, a microbiologic barrier, or both.

2.0 MAGNITUDE AND EXTENT OF GROUND WATER IMPAIRMENT

Ground water in the area exceeds New Mexico Water Quality Control Commission numerical standards for the constituents shown in bold on Table 1. An examination of Table 1 shows that all monitoring wells, including wells that are unaffected by any man-caused discharges, exceed the 1000 ppm TDS standard. The elevated TDS is generally a result of high sulfate concentrations, although chloride exceeds WQCC standards in many samples. Metals, such as iron and chromium, exceed standards in some wells. Concentrations of benzene above 10 ug/L are not uncommon.

With respect to inorganic constituents, differentiating between naturally poor-quality water, due to high soluble salts in the bedrock and the man-caused perturbations in water quality proved to be a challenging task. We elected to examine the inorganic chemistry of the ground water within our area of interest using a trilinear diagram in an attempt to create this differentiation. Plate 7 presents the 2004 inorganic chemistry in ground water of selected wells to represent extent of EAGP study area. Table 1 displays the data from which we created Plate 7.

From Plate 7, we identified three hydrochemical facies beneath the EAGP. Wells with high sulfate relative to carbonate plot on the top of the trilinear diagram and represent Yates Formation ground water unaffected by releases of fresh water or production fluids (Facies Y). Ogallala Aquifer ground water that is imported to the EAGP via the Caprock Water Pipeline is dominated by carbonate and plots on the left side of the trilinear diagram (Facies C). Sodium and chloride dominate the ions of produced water and if plotted on the trilinear diagram, produced water from the Empire Abo field would occupy the right side of the diagram in the region marked PW. These three hydrochemical facies are the primary facies and other facies are mixtures of these three. The dominance of calcium in the water (see the lower left triangle of Plate 7) limits our ability to define facies based upon cations.

Seven wells comprise the sulfate-dominant Facies Y. With the exception of MW 07, the geographic distribution of these wells shown on Plate 8 and their lack of hydrocarbons in ground water allow us to determine that this chemistry represents the natural ground water quality in the study area. These wells are relatively distant from the EAGP, especially SD-11 in Scoggins Draw. The average TDS in these wells is about 3000 mg/L, with sulfate comprising nearly 2000 mg/L of these dissolved solids. The divalent calcium ion, which averages slightly less than 600 mg/L, balances the

chemistry of this natural water. The natural ground water is not fit for human consumption, livestock, or agriculture.

Six monitoring wells completed in the Yates Formation beneath the EAGP plot in the center left of the diagram between the FaciesY the Facies C. These wells represent ground water that is a mixture of accidentally-released Caprock water and natural Yates Formation water (Facies YC in Plate 7). As shown on Plate 8, this facies occurs within and east of the EAGP. The TDS of this water is essentially the same as the Y facies, about 3000 mg/L. Sulfate concentration is about 1300 mg/L and carbonate is slightly more than 750 mg/L. Sodium is nearly 300 mg/L, three times the concentration observed in the Facies Y. However chloride concentration in this facies is essentially the same as the Facies Y, about 300 mg/L.

On the upper right side of the Plate 7 trilinear diagram are two wells that appear to be a mixture of produced water and natural ground water: SD-05, and EB-04. We identified this facies as YP. These two wells were identified as influenced by produced water due to their relatively high chloride concentrations (slightly less than 1000 mg/L) rather than their ionic composition. However, both wells show more than 20% chloride ion relative to sulfate plus carbonate. The TDS of samples from these wells range from 3800 to 4840 mg/L. Well SD-05 lies within the area affected by a documented release of produced water and hydrocarbons. EB-04 is located between two oilfield pipelines, just east of a "low spot", where these pipelines cross an arroyo.

Wells 2-15 and SD-9 are mongrels, exhibiting some characteristics of all facies. These wells contain less sulfate and more chloride than natural water but the calcium ionic strength suggests inclusion with natural water. Carbonate concentration is relatively high in SD-9 relative to other wells in Scoggins Draw. Well 2-15 is on the south side of the EAGP. Both exhibit a higher concentration of sodium than natural ground water.

Although fresh water releases from the EAGP appear to have improved the natural water quality with respect to TDS (e.g. MW 2-15), other historic releases at the site and from pipelines contributed chloride and/or sulfate. MW-2-02, for example, is located adjacent to the location where accidental releases from the water conditioning system have created a highly localized area of high TDS water (212,000 mg/L sulfate). At MW 2-02 and MW 2-05, the ground water is better described as slurry. The chemistry of three wells near MW 2-02 and MW 2-05 (MW-2-03, MW- 07 and MW-04) do not suggest any influence from the historic discharges of the water softening system.

The fact that the chemistry of a given well can be markedly different from that of nearby wells is illustrated in the area of MW-09, MW-03-01 and MW-02-14. In this area, where we documented hydraulic connection between these wells in a pumping test, the chloride varies by 100% between

wells 2-14 and 3-01 (2004 analyses). From the TDS and chloride values for MW 3-01, one can also identify the impact of fresh water releases (see also historical data for MW 2-15). In MW 3-01, TDS and chloride have declined by nearly 30% since 1998.

Plate 9 displays the distribution of separate phase hydrocarbons (SPH) in all monitoring wells. Plate 10 shows the extent and magnitude of dissolved-phase benzene, which is the primary hydrocarbon constituent of concern in ground water. Hydrocarbons in ground water are not uncommon within the EAGP. East of the plant, EB-08 and EB-03 show evidence of hydrocarbons. Hydrocarbons are not present in ground water north, west or south of the EAGP.

Clearly benzene in ground water is due to releases from natural gas pipelines and/or releases from the EAGP. Like benzene, boron can be used to identify produced water contributions to natural water systems. At and near the EAGP, two wells exceed the WQCC numerical standard for boron. Although EB-02 exhibits a boron concentration of 1.2 mg/L and this well sits between two petroleum pipelines, the major cation/anion chemistry of the well suggests the water is unaffected by produced water. EB-02 shows no evidence of hydrocarbons in ground water or in the boring log. In Scoggins Draw, within a zone impacted by a release of produced water and hydrocarbons, several wells display boron and three wells exceed the numerical standard.

Wells that have more than one chromium analysis show a decline in chromium concentration over time; probably due to the introduction of fresh water from Caprock Water System releases. The concentration of chromium in samples is relatively low and could be due to the dissolution of metal oxides from the matrix of the ground water zone. Most, but not all, of the samples that show chromium concentrations above standards also contain relatively high concentrations of iron. In an oxygen-poor environment, such as where hydrocarbons are present in ground water, metals such as iron and chromium that normally reside as oxides on grain surface dissolve into ground water. Perhaps this phenomenon explains the high iron and chromium concentrations in certain wells. With respect to other metals, one sample exceeds the manganese standard and one sample exceeds the WQCC limit for silver. Finally, three samples show nitrate levels above numerical standards.

While we believe that the magnitude of ground water impairment beneath and adjacent to the EAGP is defined, the eastern extent of impairment requires better definition. We propose one monitoring well north and east of EB-08, a second well north and east of EB-03 and a third well due south of EB-03.

3.0 FATE AND TRANSPORT OF CONSTITUENTS OF CONCERN

Based upon our 2004 sampling, we have identified these constituents of concern in ground water beneath and east of the EAGP:

- Separate Phase Hydrocarbon,
- Benzene,
- Ethylbenzene, and
- Xylene.

Sulfate and TDS are naturally above WQCC Standards and are not candidates for any abatement program. Chloride concentration exceeds WQCC Standards in only two wells sampled: EB 04 and MW 08. EB 04 is distant from the EAGP and may be affected by produced water releases. In 2004, samples from MW 08 range from 252 to 261 mg/L, slightly above the 250 mg/L standard. Other constituents, such as nitrate, chromium or boron are present in only a few samples and are also not candidates for abatement under this plan. Plates 9 and 10 display the geographic distribution of separate phase hydrocarbons and benzene, respectively. These constituents of concern reside within and east of the EAGP. At least nine natural gas and crude pipelines are beneath or adjacent to the EAGP. Many of these pipelines transport gas and gas liquids to or from the plant. One of the most likely places for pipelines to release fluids is where the gas or gas liquids move from the transportation system to the processing plant. We believe a large percentage of the hydrocarbons observed in the subsurface originated from these pipeline releases.

Once released beneath, on or near the EAGP, the site geology effectively prevents migration to the west or south. The anticline that trends through the EAGP directs ground water flow to the north and east (down dip). The three proposed boreholes east and southeast of the EAGP will provide more definition of the eastern transport and fate of constituents of concern.

4.0 EVALUATION OF REMEDIAL ALTERNATIVES

4.1 IDENTIFICATION OF ALTERNATIVES

We selected the following alternatives for evaluation:

1. Pump and dispose of hydrocarbon impacted ground water via well injection
2. Pump, treat and discharge to Scoggin Draw or Pecos River plus Natural Restoration
3. Pump, treat, then use ground water at the EAGP
4. Obtain Alternative Abatement Standards for the ground water zone beneath and adjacent to the EAGP
5. A Combination of the above strategies

4.2 DESCRIPTION OF ALTERNATIVE 1: PUMP AND DISPOSE

Much of the (ground) water below and adjacent to the EAGP originated from fresh water releases, the gas processing operation at the EAGP, or releases of produced water from pipelines. Additionally, we believe that the hydrocarbons within and on top of ground water originated from pipeline releases. Although recovery pumping of the hydrocarbons will entrain some natural ground water and released fresh water from the EAGP, we believe that all of the recovered water may be injected into BP's Class II Injection Well and the hydrocarbon separated and held in tanks for resale.

The concept of this remedy is as simple as its title: pump the water and hydrocarbons from beneath the EAGP and dispose of the water in the Class II injection well and sell the hydrocarbon. We propose pumping from the following wells:

Well Name	Total Depth	Depth to SPH (2004)	Benzene Concentration (mg/L)
MW-3-01 or 2-14	72 or 76	44 or 47	0.02 (2004)
MW-3-03	82	n/a	5 (2004)
MW-03	91.5	68.5	3.7 (1999)
MW-06	53	37	n/a
MW-2-12	82	58	3.1 (1999)

We selected these wells because:

- All exhibit benzene concentrations above standards or SPH,
- All have a sufficient water column in the well to support pumping,
- The distribution of these wells provide an efficient capture program without causing a disturbance to plant operations, and
- All may be plumbed to the North Slop Oil System for disposal of the pumped water.

We propose setting the pumps near the top of the water column to maximize the volume of hydrocarbons removed from the ground water system. Pumps would be lowered as the ground water potentiometric surface declined in response to the withdrawal. The pumping program would cease when the constituents of concern meet ground water standards.

4.3 DESCRIPTION OF ALTERNATIVE 2: PUMP, TREAT AND DISCHARGE TO SCOGGINS DRAW OR PECOS RIVER PLUS NATURAL RESTORATION

In this alternative, the objective is not to remove the highest concentration of the constituents of concern via pumping. Instead, pumping lowers the potentiometric surface beneath the EAGP thereby mitigating off site migration of constituents to the east and north. With the cessation of off site migration, natural biologic restoration of ground water quality will return ground water to WQCC Standards over time.

We propose to use the same wells described above to pump ground water. However, we plan to set the pumps at the bottom of each well to minimize the mass of pumped hydrocarbons and maximize the volume of pumped water. Ground water flows from each well to storage tanks, which subsequently discharge to the evaporation pond. The storage tanks permit separation of any unexpected separate phase hydrocarbon prior to discharge to the pond. In the pond, which is essentially an artificial wetland, the biota metabolize any dissolved phase hydrocarbons. Periodically, perhaps daily, staff at the EAGP would use field techniques to analyze a composite sample from the pond. If the water quality meets criteria established by an approved NPDES permit, staff would open valves and create a batch discharge to the adjacent arroyo or the Pecos River.

Pumping continues until ground water meets WQCC Standards or until the potentiometric surface is lower than the surrounding area. Monitoring will cease when natural restoration of ground water quality is complete.

While the plant remains in operation, submersible pumps will remove ground water at a relatively rapid rate. If the plant closes, we anticipate batch discharges from the artificial wetland treatment system (the evaporation pond) will occur monthly.

4.4 ALTERNATIVE 3: PUMP, TREAT, THEN USE GROUND WATER AT THE EAGP

Because the quality of ground water beneath the EAGP varies from well to well, the quality of water delivered to a treatment system could vary from day to day. Moreover, an unexpected release from the plant could change the water chemistry as well. Due to these uncertainties, we concluded that this abatement strategy is not feasible.

4.5 ALTERNATIVE 4: OBTAIN ALTERNATIVE ABATEMENT STANDARDS FOR THE GROUND WATER ZONE BENEATH AND ADJACENT TO THE EAGP

The natural ground water beneath the EAGP is unfit for any use. Pipelines from the Ogallala Aquifer deliver potable water to the area. No ground water supply wells exist within miles of the EAGP. The potentiometric surface of ground water impaired by pipeline releases beneath or adjacent to the EAGP is well below Scoggins Draw and the released constituents cannot enter surface water. Ground water and the constituents of concern are effectively sequestered within thin, discontinuous, confined, permeable zones that are encased in the massive gypsum units of the Yates Formation. The constituents of concern will degrade over time. Under this abatement strategy we petition the New Mexico Oil Conservation Commission to grant Alternative Abatement Standards to the site because:

> *"there is no reasonable relationship between the economic and social costs and benefits (including attainment of the standard(s) set forth in Subsection B of Section 19.15.1.19 NMAC) to be obtained, and*
>
> *(ii) the proposed alternative abatement standard(s) is/are technically achievable and cost-benefit justifiable; and*
> *(iii) compliance with the proposed alternative abatement standard(s) will not create a present or future hazard to public health or undue damage to property" (19.15.1.19.B.6.a.1)*

An integral part of this strategy is establishment of institutional controls at the site and on government land to the east of the site. These controls would prevent construction of water supply wells. Upon NMOCC

approval of Alternative Abatement Standards, we propose to plug and abandon all monitoring wells.

5.0 PROPOSED ALTERNATIVE REMEDY & JUSTIFICATION OF ALTERNATIVE ABATEMENT STANDARDS

We believe the time requirement to obtain an NPDES permit under Alternative 2 will simply delay any ground water remedy. The uncertainty of the water quality pumped from the ground water system not only eliminates the potential of employing the ground water at the plant (Alternative 3) but would also complicate and extend the NPDES permitting process.

We propose implementing Alternative 1, pump and dispose, for 12 months, beginning in January 2005. We will set the pumps in all five wells to maintain the pumping water level at about 15 feet below static. We will place a block below each pump in an effort to concentrate the water withdrawal in the uppermost portion of the ground water zone. We will collect four quarters of the following monitoring data:

1. Fluid levels in all wells
2. BTEXN in all pumping wells and in all wells exhibiting hydrocarbons in 2004
3. The total volume of water pumped from each well

Upon approval of this Abatement plan, we will prepare a petition for Alternative Abatement Standards for the EAGP site and any adjacent property where the constituents of concern exceed ground water standards. The petition will call for Alternative Standards that are equal to the highest concentrations or separate-phase hydrocarbon thickness observed in 2004. We believe the proposed drilling program will provide further evidence that the observed hydrocarbons in ground water represent no threat to human health or the environment and will not cause an undue risk to property.

At the time of writing, the proposed Alternative Abatement Standards are:

- Separate Phase Hydrocarbon 3.5 feet
- Benzene 5.0 ppm
- Ethylbenzene 1.6 ppm
- Xylene 2.8 ppm

TABLES

Table 1:
EAGP Chemistry

R.T. Hicks Consultants

Well_ID	Date	Facies	Benz_ppm	E_Benz_ppm	Xylene_ppm	Tolu_ppm	Napth_ppm	TDS_ppm	Cl_ppm	SO4_ppm	Cl/SO4_ppm	HCO3_ppm
EAGP-CT-H20	6/17/2004	C						322	34.5	31.5		189
EAGP-CT-H20	4/28/2004	C						***2140***	196	417	613	NS
EB-01	7/21/2004	Y	ND	ND	ND	ND						
EB-01	6/23/2004	Y						***2820***	32	***1780***		130
EB-02	6/23/2004	Y						***3790***	102	***2520***		187
EB-02	3/31/2004	Y	ND	ND	ND	ND	ND	***3890***	97.9	***2330***	2427.9	
EB-03	7/21/2004	YC	***2.1***	***0.77***	0.56	ND		***2340***	121	***995***		673
EB-03	6/23/2004	YC						***2720***	84.7	***1250***		752
EB-03	4/28/2004	YC	***0.021***	0.1	0.1	ND	ND					
EB-03	3/31/2004	YC	ND	0.25	0.32	ND	ND	***2420***	48.1	***1310***	1358.1	
EB-04	7/20/2004	YP	ND	ND	ND	ND						
EB-04	6/23/2004	YP						***3810***	***748***	***1620***		327
EB-04	4/28/2004	YP	ND	ND	ND	ND	ND	***3860***	***761***	***1620***	2381	
EB-04	3/31/2004	YP	***0.011***	ND	ND	ND	ND	***3800***	***767***	***1550***	2317	
EB-05	7/20/2004	Y						***2810***	167	***1680***		130
EB-05	6/23/2004	Y						***2880***	170	***1690***		135
EB-05	4/28/2004	Y	ND	ND	ND	ND	ND	***2690***	92.1	***1580***	1672.1	
EB-06	6/23/2004	Y						***3070***	182	***1820***		114
EB-07	6/23/2004	Y						***2790***	75.3	***1610***		366
EB-07	4/16/2004	Y	ND	ND	ND	ND	ND	***2980***	71.8	***1490***	1561.8	
EB-08	7/21/2004	YC										
EB-08	6/23/2004	YC						***3340***	150	***1650***		896
EB-08	4/16/2004	YC	***5***	***1.6***	***2.81***	0.75	ND	***3770***	154	***1490***	1644	
MW-02	6/17/2004	Y						***3000***	101	***1710***		260
MW-02	3/30/2004	Y	ND	ND	ND	ND	ND	***3070***	119	***1640***	3141	
MW-02	3/11/2003	Y	ND	ND	ND	ND		***2820***		***1630***		
MW-02	12/17/2001	Y	ND	ND	0.0078	0.0027	ND	***2820***				
MW-02	7/12/2001	Y	ND	ND	ND	ND	ND	***2800***				
MW-02	11/1/2000	Y	ND	ND	ND	ND		***3700***				
MW-02	8/1/2000	Y	ND	ND	ND	ND		***2210***				
MW-02	12/13/1999	Y	ND	ND	ND	ND	ND	***2960***	***691***	***2450***		
MW-02	8/17/1999	Y	ND	ND	ND	ND	ND	***3130***				
MW-02	12/4/1998	Y	***0.027***	0.0057	0.0106	0.0071		***2850***				
MW-02	12/18/1997	Y	ND	ND	ND	ND		***3100***				
MW-02	1/13/1993	Y									4200	
MW-02-02	12/13/1999		ND	ND	ND	ND	ND	***344000***	***11200***	***212000***		
MW-02-02	12/18/1997		0.001	ND	ND	ND		***555000***				
MW-02-03	12/13/1999		***0.063***	0.0081	0.0252	0.0082	ND	***2860***	***655***	***2430***		
MW-02-03	12/18/1997		ND	ND	ND	ND		***3180***				
MW-02-04	12/14/1999		***0.1***	0.068	0.0429	0.045	ND	***2910***	208	***1470***		
MW-02-04	12/18/1997		***0.21***	0.0091	ND	ND						
MW-02-05	12/13/1999		ND	ND	ND	ND	ND	***398000***	***13800***	***203000***		
MW-02-05	12/18/1997		0.0011	ND	ND	ND		***567000***	***14000***	***234000***		

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

Table 1:
EAGP Chemistry

R.T. Hicks Consultants

Well_ID	Date	Facies	Benz_ppm	E_Benz_ppm	Xylene_ppm	Tolu_ppm	Napth_ppm	TDS_ppm	Cl_ppm	SO4_ppm	Cl/SO4_ppm	HCO3_ppm
MW-02-06	12/14/1999		***35***	***1.4***	***2.37***	***3.6***	ND					
MW-02-07	12/14/1999		***4***	0.11	0.111	0.54	ND	***3570***	***374***	***1910***		
MW-02-10	12/14/1999											
MW-02-11	12/14/1999		***49***	***1.4***	***2.26***	***2.7***	ND	***3860***	221	***1730***		
MW-02-12	12/14/1999		***3.1***	0.62	***0.898***	0.63	0.054					
MW-02-13	12/14/1999		***3.6***	***3.6***	***2.11***	0.14	0.18	***2660***	***318***	***1770***		
MW-02-14	6/17/2004	YC						***2730***	80.2	***1460***		478
MW-02-14	3/31/2004	YC	0.0053	0.014	0.1	ND	ND	***2810***	83.4	***1320***		
MW-02-14	3/13/2003	YC	***0.024***	0.004	0.049	0.0019		***2830***				
MW-02-14	12/17/2001	YC	***0.23***	0.016	0.25	ND	ND	***3090***				
MW-02-14	12/1/2001	YC	***0.23***	0.016	0.25	ND		***3090***				
MW-02-14	11/1/2000	YC	***1***	0.049	0.18	ND		***3570***				
MW-02-14	12/14/1999	YC	***0.41***	0.31	0.26	0.018	0.07					
MW-02-14	12/4/1998	YC										
MW-02-15	7/21/2004	YP						***3100***	209	***1660***	1869	380
MW-02-15	3/30/2004	YP	***0.032***	0.022	0.029	ND	ND	***3140***	197	***1550***	1747	
MW-02-15	3/13/2003	YP	***0.12***	0.03	0.034	0.0053		***3080***				
MW-02-15	12/17/2001	YP	***1.4***	0.14	0.177	0.039	ND	***3380***				
MW-02-15	11/1/2000	YP	***0.5***	0.33	0.584	0.19		***4190***				
MW-02-15	12/1/1999	YP	ND									
MW-02-15	12/4/1998	YP	ND									
MW-02-16	12/14/1999		***0.014***	0.012	0.021	0.0039	ND	***3280***	***703***	***2570***		
MW-02-16	1/28/1998		0.0049	0.007	0.0034	0.011						
MW-02-16	12/18/1997		0.0045	ND	0.0072	ND		***3540***				

Table 1:
EAGP Chemistry

Well_ID	Date	Facies	Benz_ppm	E_Benz_ppm	Xylene_ppm	Tolu_ppm	Napth_ppm	TDS_ppm	Cl_ppm	SO4_ppm	Cl/SO4_ppm	HCO3_ppm
MW-02-18	12/14/1999		***25***	0.51	0.14	0.025	ND	***2940***	229	***1330***		
MW-03	12/14/1999		***3.7***	0.24	0.469	0.024	ND					
MW-03-01	3/30/2004		***1.4***	0.12	0.094	ND	ND	***2930***	214	***1410***	1624	
MW-03-01	3/12/2003		***0.25***	0.0078	0.0096	0.002		***2990***		***1620***		
MW-03-01	12/17/2001		***1.5***	0.18	0.18	ND	ND	***3290***				
MW-03-01	11/1/2000		***1***	0.16	0.13	ND		***3870***				
MW-03-01	12/13/1999		***3.5***	0.48	0.274	0.011	0.0064	***4510***	***1090***	***2400***		
MW-03-01	12/4/1998		***0.097***	0.0038	0.0068	0.0026		***4150***				
MW-03-02	6/17/2004	YCP						***3180***	167	***1390***		942
MW-03-02	3/30/2004	YCP	0.0025	0.0048	0.0078	0.0024	ND	***3520***	240	***1680***	1920	
MW-03-02	3/13/2003	YCP	0.0028	0.0029	0.0035	0.0014		***3390***				
MW-03-02	12/17/2001	YCP	0.005	0.0036	0.0072	0.0012	ND	***3550***				
MW-03-02	11/1/2000	YCP	***0.048***	0.083	0.152	0.044		***3520***				
MW-03-02	12/14/1999	YCP	***8.8***	***1.6***	***2.96***	***4.3***	0.027					
MW-03-02	12/4/1998	YCP										
MW-03-03	6/17/2004	YC						***2950***	208	***1130***		1100
MW-03-03	3/30/2004	YC	***3.2***	0.14	0.22	ND	ND	***2350***	182	***799***	981	
MW-03-03	3/13/2003	YC	***2.8***	***0.82***	***0.75***	0.098		***2800***				
MW-03-03	12/18/2001	YC	***3.1***	0.17	0.231	0.0071	ND	***2590***				
MW-03-03	11/1/2000	YC	***2.7***	0.06	0.11	ND		***1990***				
MW-03-03	12/14/1999	YC	***3.8***	0.047	0.124	0.11	ND	***2090***	***425***	***1050***		
MW-03-03	12/4/1998	YC	***4.6***	ND	ND	ND		***2590***				
MW-03-04	12/13/1999		***0.11***	0.069	0.1	0.013	ND	***3200***	***633***	***2590***		
MW-03-04	12/30/1997		ND	ND	ND	ND		***3120***	126	***1800***		
MW-04	12/14/1999		***2.7***	***1.6***	***0.878***	ND	ND	***3590***	***346***	***1440***		
MW-05	12/14/1999		***0.16***	0.092	0.0573	0.0056	ND	***3140***	***294***	***1650***		

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

Table 1:
EAGP Chemistry

R.T. Hicks Consultants

Well_ID	Date	Facies	Benz_ppm	E_Benz_ppm	Xylene_ppm	Tolu_ppm	Napth_ppm	TDS_ppm	Cl_ppm	SO4_ppm	Cl/SO4_ppm	HCO3_ppm
MW-07	7/21/2004	Y						***4600***	67.1	***3220***		161
MW-07	12/14/1999	Y	***3.8***	0.4	0.2573	0.12	ND	***2850***	***556***	***2430***		
MW-08	7/21/2004	YCP	ND	ND	ND	ND		***2910***	***252***	***1320***		572
MW-08	6/17/2004	YCP						***3080***	***255***	***1290***		785
MW-08	3/30/2004	YCP	ND	0.001	ND	ND	ND	***3220***	***261***	***1360***	1621	
MW-08	3/11/2003	YCP	0.0078	0.0032	0.0074	0.001		***2370***				
MW-08	12/17/2001	YCP	ND	ND	0.0044	0.0013	ND	***3380***				
MW-08	7/12/2001	YCP	ND	ND	ND	0.0011	ND	***3530***				
MW-08	11/1/2000	YCP	***0.019***	0.0026	0.0048	ND		***3670***				
MW-08	8/1/2000	YCP	ND	ND	ND	ND		***3910***				
MW-08	12/14/1999	YCP	0.0037	0.0044	0.0076	0.0013	ND	***3460***	***727***	***2500***		
MW-08	8/17/1999	YCP	ND	ND	ND	ND	ND	***3500***				
MW-08	12/4/1998	YCP	0.0012	0.0012	0.0021	0.0011		***3480***				
MW-08	12/18/1997	YCP	ND	ND	ND	ND		***3370***	224	***1540***	1764	
MW-08	1/13/1993	YCP									3577	
MW-09	12/14/1999		***1.2***	0.16	***1.17***	0.18	0.11					
Pond	7/18/2002							***1800***	249	384		
Pond	7/1/1997							***3120***	***1170***	***667***		
Pond	6/5/1997		ND	ND	ND	ND		***3500***	***1080***	599		
SD-01	3/29/2004		***1.3***	0.16	0.371	0.069	0.028	***4060***	***395***			
SD-02A	3/29/2004		***0.71***	0.21	0.395	0.013	ND	***4820***	***835***	***1890***		
SD-03C	3/29/2004		***0.14***	***14***	0.026	ND	ND	***3840***	***383***			
SD-05	6/23/2004	YP						***4840***	***1650***	***1400***		90.3
SD-05	3/29/2004		0.0085	ND	0.022	ND	ND	***4020***	***570***	***1680***		
SD-08	3/29/2004		***0.79***	0.35	***0.8***	0.038	ND	***3970***	***441***			
SD-09	6/23/2004	YP						***3590***	***522***	***1610***		470
SD-09	3/29/2004	YP	***0.023***	ND	0.11	ND	ND	***3840***	***570***	***1550***		
SD-10	3/29/2004		***0.23***	ND	0.041	ND	ND	***2510***	***671***			
SD-11	6/17/2004	Y						***2440***	23.8	***1570***		82.9
SD-11	3/29/2004	Y	ND	ND	ND	ND	ND	***2510***	38.5	***1800***		
WQCC Stand.			0.01	0.75	0.62	0.75		1000	250	600		

Table 1:
EAGP Chemistry

Well_ID	Date	CO3_ppm	Na_ppm	Ca_ppm	Mg_ppm	K_ppm	F_ppm	NO3_ppm	NO2_ppm	As_ppm	Ba_ppm	B_ppm	Cd_ppm	Cr_ppm
EAGP-CT-H20	6/17/2004	ND	ND	50.5	10.6	3								
EAGP-CT-H20	4/28/2004	NS	220	305	56.7	59.4	2.97	***131***	5.47			0.44		
EB-01	7/21/2004													
EB-01	6/23/2004	ND	32.7	586	134	5.5								
EB-02	6/23/2004	ND	197	732	307	9.8								
EB-02	3/31/2004						0.99	4.04	ND			***1.2***	ND	ND
EB-03	7/21/2004	ND	134	432	121	12.2								
EB-03	6/23/2004	ND	163	647	108	4.6								
EB-03	4/28/2004													
EB-03	3/31/2004						0.69	ND	ND			ND		ND
EB-04	7/20/2004													
EB-04	6/23/2004	ND	300	928	159	7.4								
EB-04	4/28/2004		253	1090	240		0.52	3.27	ND			ND		ND
EB-04	3/31/2004						0.61	2.8	ND			ND	ND	
EB-05	7/20/2004	ND	42.9	626	134	4.4								ND
EB-05	6/23/2004	ND	69.2	607	121	4.2								
EB-05	4/28/2004		44.2	728	94.2		0.61	ND	ND			ND		
EB-06	6/23/2004	ND	50.6	641	132	4.7								
EB-07	6/23/2004	ND	87	620	91.7	ND								
EB-07	4/16/2004		74.9	78.4	14.8		0.68	ND	ND			ND		
EB-08	7/21/2004													ND
EB-08	6/23/2004	ND	172	746	144	5.9								
EB-08	4/16/2004		174	81.2	14		ND	0.53	ND			0.08		
MW-02	6/17/2004	ND	131	608	126	ND								
MW-02	3/30/2004		101	634	81.2	14.2	1.09	2.39	ND	ND	ND	ND	ND	***0.1***
MW-02	3/11/2003							9.15						
MW-02	12/17/2001													
MW-02	7/12/2001													
MW-02	11/1/2000													
MW-02	8/1/2000													
MW-02	12/13/1999													0.03
MW-02	8/17/1999													
MW-02	12/4/1998													
MW-02	12/18/1997													
MW-02	1/13/1993													
MW-02-02	12/13/1999													ND
MW-02-02	12/18/1997													
MW-02-03	12/13/1999						ND							***0.07***
MW-02-03	12/18/1997													
MW-02-04	12/14/1999													ND
MW-02-04	12/18/1997													
MW-02-05	12/13/1999													ND
MW-02-05	12/18/1997		24200	717	122	9.1	ND	ND	11			ND		

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

Table 1:
EAGP Chemistry

Well_ID	Date	CO3_ppm	Na_ppm	Ca_ppm	Mg_ppm	K_ppm	F_ppm	NO3_ppm	NO2_ppm	As_ppm	Ba_ppm	B_ppm	Cd_ppm	Cr_ppm
MW-02-06	12/14/1999													
MW-02-07	12/14/1999													***0.07***
MW-02-10	12/14/1999													
MW-02-11	12/14/1999													***0.15***
MW-02-12	12/14/1999													
MW-02-13	12/14/1999						0.011							0.01
MW-02-14	6/17/2004	ND	124	693	34.3	ND								
MW-02-14	3/31/2004						0.5	ND	ND			ND		ND
MW-02-14	3/13/2003													
MW-02-14	12/17/2001													
MW-02-14	12/1/2001													
MW-02-14	11/1/2000													
MW-02-14	12/14/1999													
MW-02-14	12/4/1998													
MW-02-15	7/21/2004	ND	172	562	80.4	6.5								ND
MW-02-15	3/30/2004		214	753	99.6	8.6	0.59	ND	ND	ND	0.14	ND	ND	***0.27***
MW-02-15	3/13/2003													
MW-02-15	12/17/2001													
MW-02-15	11/1/2000													
MW-02-15	12/1/1999													
MW-02-15	12/4/1998													
MW-02-16	12/14/1999						ND							ND
MW-02-16	1/28/1998													
MW-02-16	12/18/1997													

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

Table 1:
EAGP Chemistry

Well_ID	Date	CO3_ppm	Na_ppm	Ca_ppm	Mg_ppm	K_ppm	F_ppm	NO3_ppm	NO2_ppm	As_ppm	Ba_ppm	B_ppm	Cd_ppm	Cr_ppm
MW-02-18	12/14/1999						ND							ND
MW-03	12/14/1999													
MW-03-01	3/30/2004			ND			0.53	ND	ND	ND	ND	ND	ND	ND
MW-03-01	3/12/2003							ND						
MW-03-01	12/17/2001													
MW-03-01	11/1/2000													
MW-03-01	12/13/1999													0.01
MW-03-01	12/4/1998													
MW-03-02	6/17/2004	ND	376	537	117	ND								
MW-03-02	3/30/2004		274	652	124	11.4	0.98	ND	ND	ND	ND	0.62	ND	ND
MW-03-02	3/13/2003													
MW-03-02	12/17/2001													
MW-03-02	11/1/2000													
MW-03-02	12/14/1999													
MW-03-02	12/4/1998													
MW-03-03	6/17/2004	ND	234	604	128	ND								
MW-03-03	3/30/2004			ND			0.5	ND	ND	ND	0.02	***0.78***	ND	ND
MW-03-03	3/13/2003													
MW-03-03	12/18/2001													
MW-03-03	11/1/2000													
MW-03-03	12/14/1999													ND
MW-03-03	12/4/1998													
MW-03-04	12/13/1999													0.02
MW-03-04	12/30/1997		85.4	735	123	ND	ND							
MW-04	12/14/1999						0.0025							***3.27***
MW-05	12/14/1999													***0.18***

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

Table 1:
EAGP Chemistry

Well_ID	Date	CO3_ppm	Na_ppm	Ca_ppm	Mg_ppm	K_ppm	F_ppm	NO3_ppm	NO2_ppm	As_ppm	Ba_ppm	B_ppm	Cd_ppm	Cr_ppm
MW-07	7/21/2004	ND	144	495	290	26								
MW-07	12/14/1999													***0.06***
MW-08	7/21/2004	ND	335	445	139	5.8								ND
MW-08	6/17/2004	ND	414	409	127	ND								
MW-08	3/30/2004		382	490	124	7.1	0.5	ND	ND	ND	0.02	0.54	ND	0.04
MW-08	3/11/2003													
MW-08	12/17/2001													
MW-08	7/12/2001													
MW-08	11/1/2000													
MW-08	8/1/2000													
MW-08	12/14/1999													0.02
MW-08	8/17/1999													
MW-08	12/4/1998													
MW-08	12/18/1997				107	4.4	ND	ND	ND					
MW-08	1/13/1993													
MW-09	12/14/1999													
Pond	7/18/2002							***26.6***		0.044	0.48	0.63	ND	0.02
Pond	7/1/1997		586	224										
Pond	6/5/1997		1080	199	28.7			0.5		ND	0.21	0.6	ND	ND
SD-01	3/29/2004											0.72		
SD-02A	3/29/2004		412	686	208	10.8	0.79	ND				***1890***		
SD-03C	3/29/2004											0.58		
SD-05	6/23/2004	ND	374	1160	63.5	38								
SD-05	3/29/2004		379	669	147	8.1	0.84	ND				0.53		
SD-08	3/29/2004											0.65		
SD-09	6/23/2004	ND	378	725	157	13								
SD-09	3/29/2004		366	632	164	13.3	0.57	ND				***0.94***		
SD-10	3/29/2004											***0.89***		
SD-11	6/17/2004	ND	61.1	578	80.4	ND								
SD-11	3/29/2004		53.9	634	171	6.1	0.67	6.97				0.7		
WQCC Stand.								10		0.1	1	0.75	0.01	0.05

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

Table 1:
EAGP Chemistry

Well_ID	Date	Fe_ppm	Pb_ppm	Se_ppm	Ag_ppm	Mn_ppm	Hg_ppm	Trit_pCi	PO4_ppm	1Mnaphth	2Mnaphth	TKN_ppm	PCB	NaF_ppm	Alk_ppm
EAGP-CT-H20	6/17/2004														
EAGP-CT-H20	4/28/2004	0.51						-75.23							
EB-01	7/21/2004														
EB-01	6/23/2004														
EB-02	6/23/2004														
EB-02	3/31/2004							-56.65							
EB-03	7/21/2004														
EB-03	6/23/2004														
EB-03	4/28/2004														
EB-03	3/31/2004							-3.72							
EB-04	7/20/2004														
EB-04	6/23/2004														
EB-04	4/28/2004	***17.9***						-67.57							
EB-04	3/31/2004							0.046							
EB-05	7/20/2004														
EB-05	6/23/2004														
EB-05	4/28/2004	***6.03***						-106.38							
EB-06	6/23/2004														
EB-07	6/23/2004														
EB-07	4/16/2004	0.23													
EB-08	7/21/2004														
EB-08	6/23/2004														
EB-08	4/16/2004	0.18													
MW-02	6/17/2004														
MW-02	3/30/2004	ND	ND	ND	ND			-91.951							
MW-02	3/11/2003	0.13	ND			0.01									
MW-02	12/17/2001									ND	ND				
MW-02	7/12/2001														
MW-02	11/1/2000														
MW-02	8/1/2000														
MW-02	12/13/1999	***10.1***										0.5			
MW-02	8/17/1999														
MW-02	12/4/1998														
MW-02	12/18/1997														
MW-02	1/13/1993														
MW-02-02	12/13/1999	ND										29.4			
MW-02-02	12/18/1997								0						
MW-02-03	12/13/1999	***5.2***								0.0009	0.001	1.1			
MW-02-03	12/18/1997								ND						
MW-02-04	12/14/1999	0.57										1			
MW-02-04	12/18/1997														
MW-02-05	12/13/1999	***8.01***										35.9			
MW-02-05	12/18/1997														

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

Table 1:
EAGP Chemistry

Well_ID	Date	Fe_ppm	Pb_ppm	Se_ppm	Ag_ppm	Mn_ppm	Hg_ppm	Trit_pCi	PO4_ppm	1Mnaphth	2Mnaphth	TKN_ppm	PCB	NaF_ppm	Alk_ppm
MW-02-06	12/14/1999												ND		
MW-02-07	12/14/1999	0.81										44.9			
MW-02-10	12/14/1999												ND		
MW-02-11	12/14/1999	***134***										1.7			
MW-02-12	12/14/1999												ND		
MW-02-13	12/14/1999	***3.64***								0.074	0.035	1.6	ND		
MW-02-14	6/17/2004														
MW-02-14	3/31/2004														
MW-02-14	3/13/2003														
MW-02-14	12/17/2001									0.0054	ND				
MW-02-14	12/1/2001														
MW-02-14	11/1/2000														
MW-02-14	12/14/1999														
MW-02-14	12/4/1998														
MW-02-15	7/21/2004														
MW-02-15	3/30/2004	***76.8***	ND	ND	***0.34***		ND	-143.96							
MW-02-15	3/13/2003														
MW-02-15	12/17/2001									ND	ND				
MW-02-15	11/1/2000														
MW-02-15	12/1/1999														
MW-02-15	12/4/1998														
MW-02-16	12/14/1999	***1.87***										7.8	ND		
MW-02-16	1/28/1998														
MW-02-16	12/18/1997														

Bold Blue Italics indicate analytes above New Mexico Ground Water Standards (WQCC)

August 12, 2004

Application for Discharge Plan Renewal

EMPIRE ABO GAS PLANT
ARTESIA, NEW MEXICO

Prepared for:

BP America Production Company
Houston, Texas 77253

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104

Table of Contents

TABLES

APPENDICES

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Revised June 10, 2003

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES,GAS PLANTS, REFINERIES, COMPRESSOR, GEOTHERMAL FACILITES AND CRUDE OIL PUMP STATIONS

(Refer to the OCD Guidelines for assistance in completing the application)

☐ New ☒ Renewal ☐ Modification

1. Type:

The Empire Abo Gas Plant uses a cryogenic process to remove ethane, propanes, butanes, pentanes, and hexanes from natural gas and third party y-grade, both of which are delivered to the plant via pipelines. The gas is compressed, sweetened (to remove carbon dioxide and hydrogen sulfide), dehydrated, and then cooled to remove ethane and heavier hydrocarbons. The gas is sweetened using an amine system, dehydrated using mole sieves and cooled using a cryogenic process. Scrubbers, exchangers, separators, chillers, flash tanks, and compressors are used in the process. Design capacity of the plant is 56 MMscfd. Natural gas liquid and residue gas leave the plant by pipeline as products. Natural gas liquid and sulfur are trucked from the plant.

2. Operator:

The legally responsible parties:

BP America Production Company
Natural Gas Liquids Business Unit
Attention: Mike McKinley - Room 4.514
P.O. Box 3092
Houston, Texas 77253

Local Representative:
Dan Norman
BP America Production Company
Natural Gas Liquids Business Unit
PO Box 810
Hobbs, NM 88241
806-732-2745

Operator:
Elkhorn Operating Company
Empire Abo Gas Plant
Attn: Forest Noah
Artesia, New Mexico 88210
505 677 2161

3. Location:
The Empire Abo Gas Plant is in the NE/4/SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The center of the EAGP is 32° 46.6' North, 104 ° 15.6' West.

4. Name, telephone number and address of the landowner of the facility site.
BP America Production Company
Attention: Mike McKinley - Room 4.514
P.O. Box 3092
Houston, Texas 77253

5. Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility.

6. Attach a description of all materials stored or used at the facility.

7. Attach a description of present sources of effluent and waste solids. Average quality and daily volume of waste water must be included.

8. Attach a description of current liquid and solid waste collection/treatment/disposal procedures.

9. Attach a description of proposed modifications to existing collection/treatment/disposal systems.

10. Attach a routine inspection and maintenance plan to ensure permit compliance.

11. Attach a contingency plan for reporting and clean-up of spills or releases.

12. Attach geological/hydrological information for the facility. Depth to and quality of ground water must be included.

13. Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

14. CERTIFICATION I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Jeanne M. Johns Title: President, NA NGLs

Signature: Jeanne M. Johns Date: 8/16/04

E-mail Address: johnsjm@bp.com

Attachment 5: Facility Description

Appendix A contains a drawing of the EAGP. The process units shown on the site plan of Appendix A generates all of the wastewater and most of the solid waste at the EAGP. Wastewater, depending on its origin, drains to the Process Drain Tank, the evaporation pond or the North or South Slop Oil Tanks. The Process Drain Tank and the evaporation pond are on the west side of the Plant. The Slop Oil Tanks are on the southeast side of the Plant.

Attachment 6: Description of Materials Stored or Used at the Facility

Table 1 outlines the fluid storage locations at the facility, their capacity, and the types of fluids kept. See Appendix A for a map showing the locations of the pond and tanks.

Attachment 7: Description of Present Sources of Effluent and Waste Solids Generated at the Facility

There exist four sources of waste water produced at the EAGP. From blowdown and backwash, 200 to 400 barrels of water are created daily and sent to the evaporation pond. The chemical quality of this water is available in Appendix B.

From Plant processes, five to eight barrels per day of water is produced to the Process Drain Tank and ten to fifteen barrels per day are produced to the South (dirty) Slop Oil Tank. Much of this water is from blowdown operations and has a chemical quality similar to water sent to the evaporation pond.

Approximately 150 barrels per day of fluid is produced to the North (clean) Slop Oil Tank. This fluid contains produced water with entrained hydrocarbons and is sent to the BP M-13 tank battery. As such, this water is exempt.

Waste solids generated at the facility are listed in Table 2.

Attachment 8: Description of Current Liquid and Solid Waste Collection/ Treatment/ Disposal Procedures

The closed drain system collects process hydrocarbon fluids from drains and vents. Drawings 63830-207 and 63830-208 in Appendix C show the sources of effluent collected by this system. The collected liquids are transferred to the closed drain header tank. Gases released in the tank are vented to the flare system. The liquids are pumped to the north (clean) slop oil tank. These liquids are pumped to the BP M-13 tank battery (formerly ARCO). The hydrocarbons go to oil storage tanks and are products. Water separated from these natural gas liquids are sent to the BP injection wells, B48, B49, C48 and C50, or to the Walter Solt State Well No.1 or to an approved Class II disposal well.

The open drain system collects plant process waste liquids from blowdowns and drains in the caustic, amine, and coolant systems. Drawing 63630-203 (Figure 94-4) in Appendix C) shows the sources of this effluent. The collected liquids flow through below grade atmospheric lines to the open drain sump. These lines have been tested for mechanical integrity (See AGRA drain line testing report, Appendix D). The liquids are pumped from the open drain sump to the process drain tanks. At appropriate times, the contents of the tanks are trucked to Walter Solt State Well No.1, BP owned injection wells, or approved Class II disposal wells.

The amine drain system collects all waste amine from the two amine systems in underground sumps (Fig.94-5, Appendix C). These liquids are stored in the sumps until pressurized and sent back to the amine system or the open drain system and thence to the Walter Solt State Well No.1, BP owned injection wells, or approved Class II disposal wells. The underground lines in the amine systems have been tested for mechanical integrity (See Appendix D).

As shown in Figure 94-6 in Appendix C (Drawing 63630-201), the blowdown system collects blowdown from the five main boilers, the waste heat boiler and the sulfur plant's condenser. All of this effluent flows to the evaporation pond. Although not specifically shown in Figure 94-6, the sulfur plant condenser line drains into

the north end of the evaporation pond. Boiler blowdown water, backwash water from the reverse osmosis unit, and backwash water from process water coolers is sent to the east side of the evaporation pond. Cooling tower blowdown water is sent to the waste water tank. When necessary, this tank is allowed to overflow to the evaporation pond. All underground lines have been tested for mechanical integrity.

Excess water in the evaporation pond is pumped into the waste water tank immediately north of the evaporation pond. Water from the waste water tank is periodically pumped to BP injection wells or trucked to Walter Solt State Well No.1 or to another Class II disposal well.

The north slop oil system (clean) collects liquids from the closed drain header tank; #1, #2 and #9 inlet scrubbers; and the flare sump (Fig.94-7, Appendix C). The flare sump, in a concrete secondary containment, receives liquids from the flare knockout tanks. Separated hydrocarbons in the clean slop oil tank are products and sold. Water in the tank is exempt wastewater and is discharged to the BP disposal wells B48, B49, C48 and C50 or to Walter Solt State Well No.1 or to another Class II disposal well.

The south slop oil system (dirty) collects plant compressor pit fluids, synthetic oil from the starting air system, and oils from the containment at the product storage area, as shown in Figure 94-8 in Appendix C. For compressors E4-301 to 309 and E4-351 to 353, 30 inch steel sumps act as catchments for the packing case drains. The compressor pits act as catchments for any leaking fluids. Air diaphragm pumps move the contents of these catchments to the south slop oil tank. Water from this tank is trucked to the Walter Solt State Well No.1 or to another approved Class II disposal well. The oil is periodically trucked away by US Filter or a similar company.

The backwash system collects discharge fluids from the backwashing of water coolers and condensers (Figure 94-9, Appendix C). Water from the west side of the compressor building is drained into the evaporation pond. Water from the east side of the compressor building is drained into the compressor pits and then to the south slop oil tank. All underground lines have been tested for mechanical integrity (Appendix D).

Waste water from the office and the Cryo Room is disposed of through two septic tanks and leach fields located east and west of the respective buildings.

Produced sulfur is a product and is trucked away by various customers.

As discussed in Attachment 9, BP proposes to collect samples to accurately characterize the chemistry of certain waste streams to determine if alternate discharge strategies are appropriate.

In general, we know that the discharges to the closed drain system contain abundant dissolved-phase hydrocarbons and dissolved solids. Discharges to the open drain system contain dissolved solids and contaminants such as spent amine and caustic. Wastewater in both of the slop oil systems will contain dissolved hydrocarbons and dissolved solids. Because the appropriate disposal of wastewater in these systems is Class II disposal well injection, we have not created a chemical characterization.

The evaporation pond contains reeds, water plants and an active invertebrate community. Redwing blackbirds and water fowl use the pond. The pond was constructed by laying a synthetic plastic liner over steel sides with a sand bottom. There is no evidence that the pond leaks. Water levels are kept low in order to minimize the size of any accidental discharge.

MW-02, MW-2-07, MW-3-1, MW-09 and MW-2-14 are 200 feet or less from the north, east and south sides of the evaporation pond. We conclude from a comparison of water quality between water from the monitoring wells and water from the evaporation pond that leakage from the pond to ground water would improve ground water quality (See Appendix B).

Attachment 9: Description of Proposed Modifications to Solid Waste Collection/ Treatment/ Disposal Systems

BP plans to explore modifications to the effluent management system described herein. The purpose of such modifications is to minimize the volume of water that could be used beneficially but is now flowing to down hole disposal. We first plan to collect samples of various effluent streams. If, as we suspect, the quality of some

effluent streams permits beneficial use or meets WQCC ground water standards, we plan to use the water or discharge these waste streams to the ground surface.

Attachment 10: Routine Inspection and Maintenance Plan

Inspection and maintenance of the facility occurs on a daily basis (See SPCCP, Appendix E). Below ground and non-pressurized process and wastewater lines are tested every 5 years (See Drain Line Testing Report, Appendix D).

Groundwater Monitoring

All wastewater is stored in tanks with secondary containment or the lined evaporation pond. All wastewater is transported from the point of generation to the storage units via pipelines with documented mechanical integrity. Therefore, ground water monitoring is not necessary. Ground water monitoring will be addressed separately in the Stage I/II Abatement Plan.

Precipitation Runoff Control

The plant has levees around its southern and western sides to contain storm water runoff. These act as a tertiary containment for other spills at the plant. Any oil liquid that accumulates in this area is recovered with vacuum trucks and portable pumps. This is disposed at an approved offsite facility or added to the production stream.

Attachment 11: Contingency Plan for Reporting and Clean-up of Spills or Releases

The Spill Prevention, Control and Countermeasures Plan for The EAGP is contained in Appendix E.

Attachment 12: Geological and Hydrological Site Characteristics

We refer the reader to the forthcoming Stage I/II Abatement Plan for a detailed description of the environmental setting of the EAGP.

Attachment 13: Facility Closure Plan

All reasonable and necessary measures will be taken to prevent the exceedance of 20 NMAC 6.2.3103 quality standards should BP

choose to permanently close the facility. Closure measures will include removal or closure in place of all underground piping and equipment. All tanks will be emptied. No potentially toxic materials or effluents will remain on the site. All potential sources of toxic pollutants will be inspected. Should contaminated soil be discovered, any necessary reporting under NMOCD Rule 116 and 20 NMAC 6.2.1203 will be made and clean-up activities will commence. Post-closure maintenance and monitoring plans would not be necessary unless contamination is encountered.

Table 1. Surface Fluid Storage

Type of Liquid	Stored Liquid	Type of Storage	Maximum Capacity	Location	Secondary Containment Type
Amine					
	Monoethanolamine	Tank	2 at 280 bbl.	East of Evap.Pond	Earthern berm
Acids					
	Sulphuric Acid	Tank	1000 gal.	East of cooling towers	Concrete berm
Caustics					
	Caustic	Tank	5000 gal.	South of #1 Propanizer	Concrete Berm
Oils					
	Lubrication Oils, misc.	Barrel	55 gal.ea.	East of #9 Inlet Gas Compressor Building	On grates w./concrete berm
	ISO 22	Tank	1000 gal.	East of Compressor Building	Concrete berm
	Rental Lube Oil	Tank	500 gal.	S.E. corner of plant	Fiberglass containment
	Chevron 541	Tank	2 at 322 bbls each	South of Shop	Earthern berm
Fuels					
	Diesel fuel	Tank	12.5 bbls	S.E. of Compressor Building	Fiberglass containment
	Gasoline	Tank	12 bbls	South of Shop	Fiberglass containment w./Earthern berm
	Propane	Tank	24 bbls	South of Shop	Earthern berm
Solvents					
	MR Solvent	Tank	12 bbls	South of Shop	Fiberglass containment w./Earthern Berm
	Safety Kleen	Vats		Comp. Bldg, Welding , Warehouse	
Soaps					
	Bio-degradable Industrial Detergent	Tank	500 gal.	East of Compressor Building	Concrete berm

Table 1. Surface Fluid Storage

Type of Liquid	Stored Liquid	Type of Storage	Maximum Capacity	Location	Secondary Containment Type
Others					
	Propylene Glycol (engine coolant)	Barrel	55 gal. each	East of #9 Inlet Gas Compressor Building	On grates w./concrete berm
	Ethyl Mercaptain	Tank	15 bbls	Loading Rack	Enclosed system, w./concrete berm
	Gasoline	Tank	2 at 1000 bbls each	East of Compressor Building	Earthern berm
	Butane	Tank	2 at 1280 bbls each	East of Compressor Building	Earthern berm
	Propane	Tank	5 at 1458, 1408, 1039, 1036, 1502 bbls.	East of Compressor Building	Earthern berm
	Methanol	Tank	1000 gal.	Cryo	Concrete berm
	Process Drains	Tank	500 and 210 bbls.	West side of Plant	Earthen berm

Table 2. Waste Solids Generated at the Facility

Description of Solid Waste	Disposal Facility
Used Amine, Oil, Regen Gas and Process Filters	U.S. Filter, an approved filter recycling facility
Construction Waste	Approved landfill
Refuse	City of Roswell Landfill

TABLES

Table 1. Surface Fluid Storage

Type of Liquid	Stored Liquid	Type of Storage	Maximum Capacity	Location	Secondary Containment Type and Capacity
Amine					
	Monoethanolamine	Tank	2 at 280 bbl.	East of Evap.Pond	Earthern berm
Acids					
	Sulphuric Acid	Tank	1000 gal.	East of cooling towers	Concrete berm
Caustics					
	Caustic	Tank	5000 gal.	South of #1 Propanizer	Concrete Berm
Oils					
	Lubrication Oils, misc.	Barrel	55 gal.ea.	East of #9 Inlet Gas Compressor Building	On grates w./concrete berm
	ISO 22	Tank	1000 gal.	East of Compressor Building	Concrete berm
	Rental Lube Oil	Tank	500 gal.	S.E. corner of plant	Fiberglass container
	Chevron 541	Tank	2 at 322 bbls each	South of Shop	Earthern berm
Fuels					
	Diesel fuel	Tank	12.5 bbls	S.E. of Compressor Building	Fiberglass container
	Gasoline	Tank	12 bbls	South of Shop	Fiberglass cont. w./Earthern berm
	Propane	Tank	24 bbls	South of Shop	Earthern berm
Solvents					
	MR Solvent	Tank	12 bbls	South of Shop	Fiberglass cont. w./Earthern Berm
	Safety Kleen	Vats		Comp. Bldg, Welding , Warehouse	
Soaps					
	Bio-degradable Industrial Detergent	Tank	500 gal.	East of Compressor Building	Concrete berm

Table 1. Surface Fluid Storage

Type of Liquid	Stored Liquid	Type of Storage	Maximum Capacity	Location	Secondary Containment Type and Capacity
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	Propylene Glycol (engine coolant)	Barrel	55 gal. each	East of #9 Inlet Gas Compressor Building	On grates w./concrete berm
	Ethyl Mercaptain	Tank	15 bbls	Loading Rack	Enclosed system, w./concrete berm
	Gasoline	Tank	2 at 1000 bbls each	East of Compressor Building	Earthern berm
	Butane	Tank	2 at 1280 bbls each	East of Compressor Building	Earthern berm
	Propane	Tank	5 at 1458, 1408, 1039, 1036, 1502 bbls.	East of Compressor Building	Earthern berm
	Methanol	Tank	1000 gal.	Cryo	Concrete berm
	Process Drains	Tank	500 and 210 bbls.	West side of Plant	Earthen berm

Table 2. Waste Solids Generated at the Facility

Description of Solid Waste	Disposal Facility
Used Amine, Oil, Regen Gas and Process Filters	U.S. Filter, an approved filter recycling facility
Construction Waste	Approved landfill
Refuse	City of Roswell Landfill

APPENDIX A

R.T. HICKS CONSULTANTS, LTD. 901 Rio Grande Blvd. NW Suite F-142 Albuquerque, NM 87104 505.266.5004 Fax: 505.246.1816	BPNGL Unit	Plate 1
	Site Plan	August 2004

APPENDIX B

Well_ID	Date	K_ppm	TDS_ppm	Benz_ppm	Cl_ppm	SO4_ppm	HCO3_ppm	Na_ppm	Ca_ppm	Mg_ppm	E_Benz_ppm	Napth_ppm	T_xyl_ppm	Tolu_ppm	F_ppm
MW-02	1/13/1993														
MW-02	12/18/1997		3100	-99							-99		-99	-99	
MW-02	12/4/1998		2850	0.027							0.0057		0.0106	0.0071	
MW-02	8/17/1999		3130	-99							-99	-99	-99	-99	
MW-02	12/1/1999		2960	-99							-99		-99	-99	
MW-02	12/13/1999		2960		691	2450									
MW-02	12/13/1999		2960	-99	691	2450					-99	-99	-99	-99	
MW-02	8/1/2000		2210	-99							-99		-99	-99	
MW-02	11/1/2000		3700	-99							-99		-99	-99	
MW-02	7/1/2001		2800	-99							-99		-99	-99	
MW-02	7/12/2001		2800	-99							-99	-99	-99	-99	
MW-02	12/1/2001		2820	-99							-99		-99	-99	
MW-02	12/17/2001		2820	-99							-99	-99	0.0078	0.0027	
MW-02	3/11/2003		2820	-99		1630					-99		-99	-99	
MW-02	3/30/2004	14.2	3070	-99	119	1640		101	634	81.2	-99	-99	-99	-99	1.09
MW-02	6/17/2004	-99	3000		101	1710	260	131	608	126					
MW-02-07	12/14/1999		3570	4	374	1910					0.11	-99	0.111	0.54	
MW-03-01	12/4/1998		4150	0.097							0.0038		0.0068	0.0026	
MW-03-01	12/1/1999		4510	3.5							0.48		0.274	0.011	
MW-03-01	12/13/1999		4510	3.5	1090	2400					0.48	0.0064	0.274	0.011	
MW-03-01	12/13/1999		-99	3.5	1090	2400					0.48	0.0064	0.0274	0.011	
MW-03-01	11/1/2000		3870	1							0.16		0.13	-99	
MW-03-01	12/1/2001		3290	1.5							0.18		0.18	-99	
MW-03-01	12/17/2001		3290	1.5							0.18	-99	0.18	-99	
MW-03-01	3/12/2003		2990	0.25		1620					0.0078		0.0096	0.002	
MW-03-01	3/30/2004		2990	1.4	214	1410			-99		0.12	-99	0.094	-99	0.53
MW-03-01_g	3/30/2004		2930	0.02	189	1510					-99	-99	-99	-99	0.62
MW-09	12/14/1999			1.2							0.16	0.11	1.17	0.18	
MW-09_g	3/30/2004		3340	1.2	345	1120					1.5	0.76	2.94	0.28	-99
MW-02-14	12/4/1998														
MW-02-14	12/1/1999			0.41							0.31		0.26	0.018	
MW-02-14	12/14/1999			0.41							0.31	0.07	0.26	0.018	
MW-02-14	11/1/2000		3570	1							0.049		0.18	-99	
MW-02-14	12/1/2001		3090	0.23							0.016		0.25	-99	
MW-02-14	12/17/2001		3090	0.23							0.016	-99	0.25	-99	
MW-02-14	3/13/2003		2830	0.024							0.004		0.049	0.0019	
MW-02-14	3/31/2004		2810	0.0053	83.4	1320					0.014	-99	0.1	-99	0.5
MW-02-14	6/17/2004	-99	2730		80.2	1460	478	124	693	34.3					
MW-02-14_g	3/29/2004	5.7	3000	-99	38.9	1800		49.9	571	163	-99	-99	-99	-99	0.68
MW-02-14_g	3/31/2004		2590	0.0078	77.5	1310					0.0057	-99	0.058	-99	0.52
Pond	6/5/1997		3500	-99	1080	599		1080	199	28.7	-99		-99	-99	
Pond	7/1/1997		3120		1170	667		586	224						
Pond	7/18/2002		1800		249	384									
Z_NM Ground			1000	0.01	250	600					0.75		0.62	0.75	

(-99 means ND)

Well_ID	Date	NO3_ppm	As_ppm	Ba_ppm	B_ppm	Cd_ppm	Cr_ppm	Fe_ppm	Pb_ppm	Se_ppm	Ag_ppm	Mn_ppm	Hg_ppm	Trit_pCi	Cl/SO4_ppm
MW-02	1/13/1993														4200
MW-02	12/18/1997														
MW-02	12/4/1998														
MW-02	8/17/1999														
MW-02	12/1/1999														3141
MW-02	12/13/1999	10.6					0.03	10.1							
MW-02	12/13/1999						0.03	10.1							
MW-02	8/1/2000														
MW-02	11/1/2000														
MW-02	7/1/2001														
MW-02	7/12/2001														
MW-02	12/1/2001														
MW-02	12/17/2001														
MW-02	3/11/2003	9.15						0.13	-99			0.01			
MW-02	3/30/2004	2.39	-99	-99	-99	-99	0.1	-99	-99	-99	-99			-91.951	3141
MW-02	6/17/2004														
MW-02-07	12/14/1999						0.07	0.81							
MW-03-01	12/4/1998														
MW-03-01	12/1/1999														
MW-03-01	12/13/1999						0.01	3.79							
MW-03-01	12/13/1999						0.01	3.79							
MW-03-01	11/1/2000														
MW-03-01	12/1/2001														
MW-03-01	12/17/2001														
MW-03-01	3/12/2003	-99						2.11	-99			1.84			
MW-03-01	3/30/2004	-99	-99	-99	-99	-99	-99		-99	-99	-99				1624
MW-03-01_g	3/30/2004	-99													
MW-09	12/14/1999														
MW-09_g	3/30/2004	-99													
MW-02-14	12/4/1998														
MW-02-14	12/1/1999														
MW-02-14	12/14/1999														
MW-02-14	11/1/2000														
MW-02-14	12/1/2001														
MW-02-14	12/17/2001														
MW-02-14	3/13/2003														
MW-02-14	3/31/2004	-99			-99		-99								
MW-02-14	6/17/2004														
MW-02-14_g	3/29/2004	7.22			0.54			-99						-103.09	
MW-02-14_g	3/31/2004	-99													
Pond	6/5/1997	0.5	-99	0.21	0.6	-99	-99	-99	-99	-99	-99	-99	-99		
Pond	7/1/1997														
Pond	7/18/2002	26.6	0.044	0.48	0.63	-99	0.02		0.001	0.045			-99	-99	
Z_NM Ground		10	0.1	1	0.75	0.01	0.05	1	0.5	0.05	0.05	0.2			

(-99 means ND)

Well_ID	Date	PO4_ppm	1Mnaphth	2Mnaphth	TKN_ppm	NaF_ppm	Alk_ppm	pH	SC_umhos	TH_ppm	T_P_ppm	Sb_ppm	U_ppm	Mo_ppm	Be_ppm	Co_ppm	Cu_ppm
MW-02	1/13/1993																
MW-02	12/18/1997																
MW-02	12/4/1998																
MW-02	8/17/1999																
MW-02	12/1/1999																
MW-02	12/13/1999				0.5												
MW-02	12/13/1999				0.5												
MW-02	8/1/2000																
MW-02	11/1/2000																
MW-02	7/1/2001																
MW-02	7/12/2001																
MW-02	12/1/2001																
MW-02	12/17/2001		-99	-99													
MW-02	3/11/2003																
MW-02	3/30/2004																
MW-02	6/17/2004																
MW-02-07	12/14/1999				44.9												
MW-03-01	12/4/1998																
MW-03-01	12/1/1999																
MW-03-01	12/13/1999				117												
MW-03-01	12/13/1999				117												
MW-03-01	11/1/2000																
MW-03-01	12/1/2001																
MW-03-01	12/17/2001		-99	-99													
MW-03-01	3/12/2003																
MW-03-01	3/30/2004																
MW-03-01_g	3/30/2004																
MW-09	12/14/1999																
MW-09_g	3/30/2004																
MW-02-14	12/4/1998																
MW-02-14	12/1/1999																
MW-02-14	12/14/1999																
MW-02-14	11/1/2000																
MW-02-14	12/1/2001																
MW-02-14	12/17/2001		0.0054	-99													
MW-02-14	3/13/2003																
MW-02-14	3/31/2004																
MW-02-14	6/17/2004																
MW-02-14_g	3/29/2004																
MW-02-14_g	3/31/2004																
Pond	6/5/1997					2.2	329	8.9	4740	615	0.72			-99		-99	-99
Pond	7/1/1997																
Pond	7/18/2002							8.8	2250			0.001	0.026	0.014	0.004	0.01	0.02
Z_NM Ground																	

(-99 means ND)

Well_ID	Date	Ni_ppm	V_ppm	GA_pCiL	R226	R228	Sr_pCiL
MW-02	1/13/1993						
MW-02	12/18/1997						
MW-02	12/4/1998						
MW-02	8/17/1999						
MW-02	12/1/1999						
MW-02	12/13/1999						
MW-02	12/13/1999						
MW-02	8/1/2000						
MW-02	11/1/2000						
MW-02	7/1/2001						
MW-02	7/12/2001						
MW-02	12/1/2001						
MW-02	12/17/2001						
MW-02	3/11/2003						
MW-02	3/30/2004						
MW-02	6/17/2004						
MW-02-07	12/14/1999						
MW-03-01	12/4/1998						
MW-03-01	12/1/1999						
MW-03-01	12/13/1999						
MW-03-01	12/13/1999						
MW-03-01	11/1/2000						
MW-03-01	12/1/2001						
MW-03-01	12/17/2001						
MW-03-01	3/12/2003						
MW-03-01	3/30/2004						
MW-03-01_g	3/30/2004						
MW-09	12/14/1999						
MW-09_g	3/30/2004						
MW-02-14	12/4/1998						
MW-02-14	12/1/1999						
MW-02-14	12/14/1999						
MW-02-14	11/1/2000						
MW-02-14	12/1/2001						
MW-02-14	12/17/2001						
MW-02-14	3/13/2003						
MW-02-14	3/31/2004						
MW-02-14	6/17/2004						
MW-02-14_g	3/29/2004						
MW-02-14_g	3/31/2004						
Pond	6/5/1997	-99					
Pond	7/1/1997						
Pond	7/18/2002	0.03	0.22	23.15+/-3.53	3.66+/-0.85	3.56+/-+0.42	6.11+/-0.76
Z_NM Ground							

(-99 means ND)

APPENDIX C

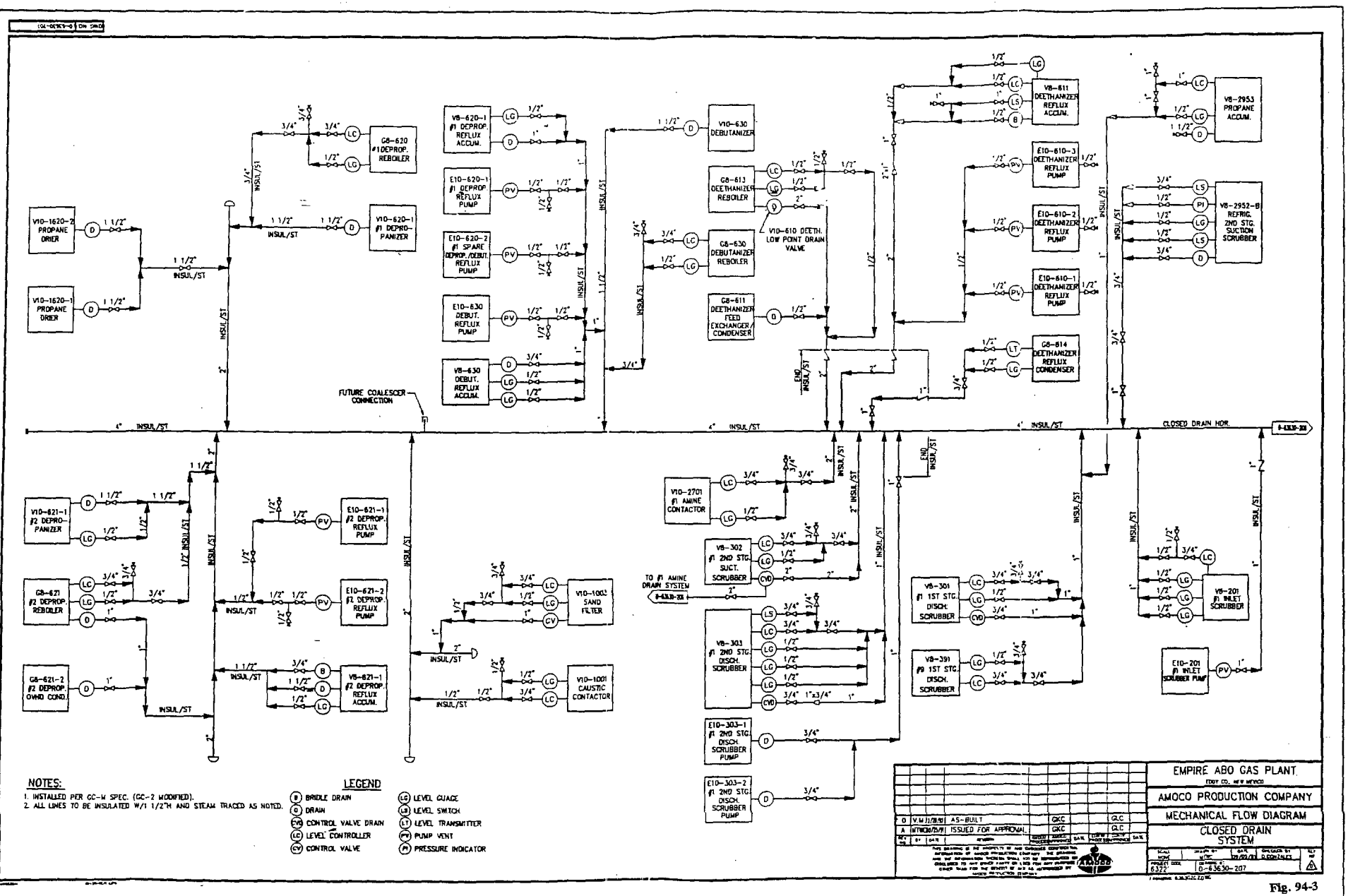
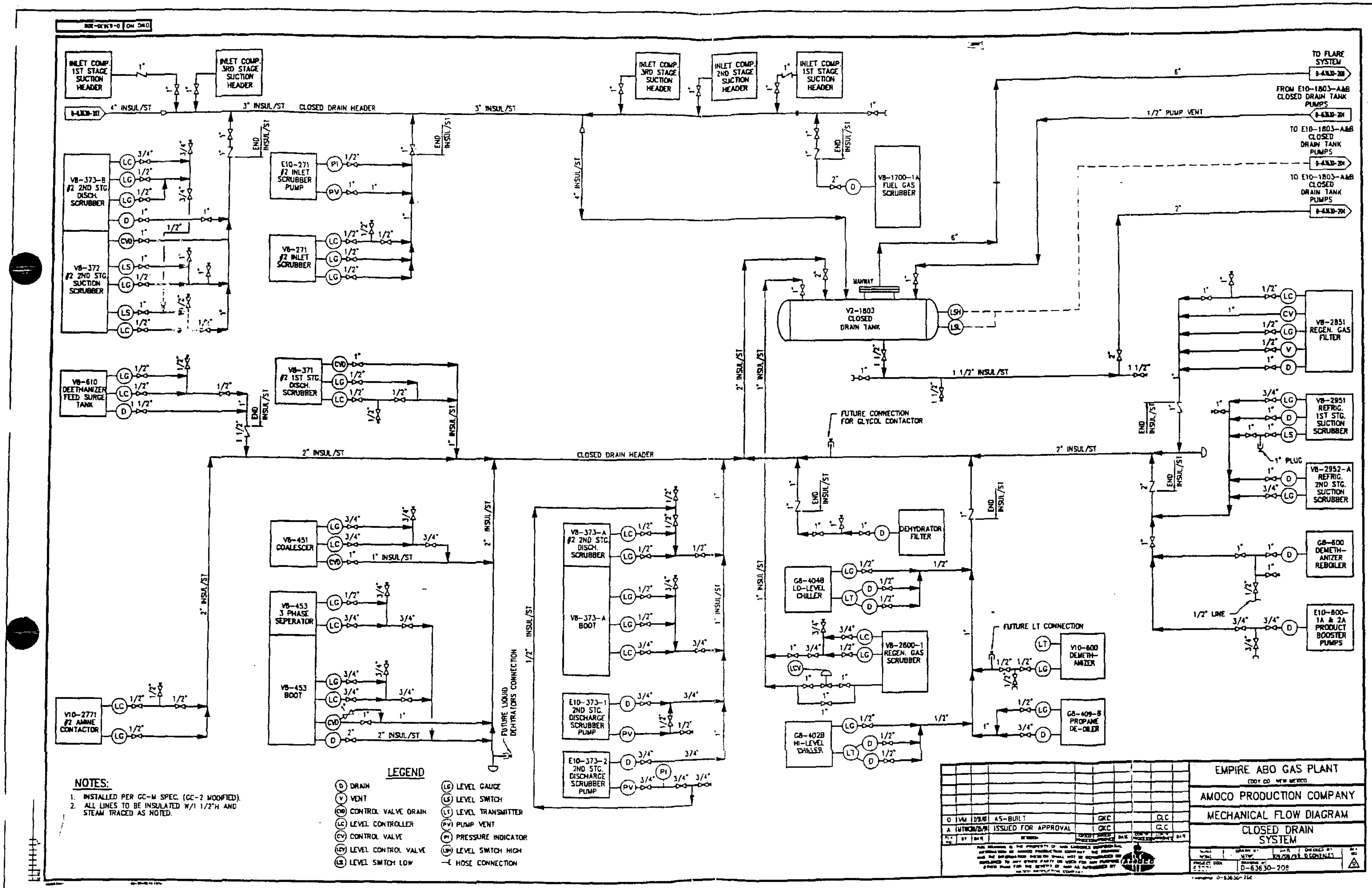
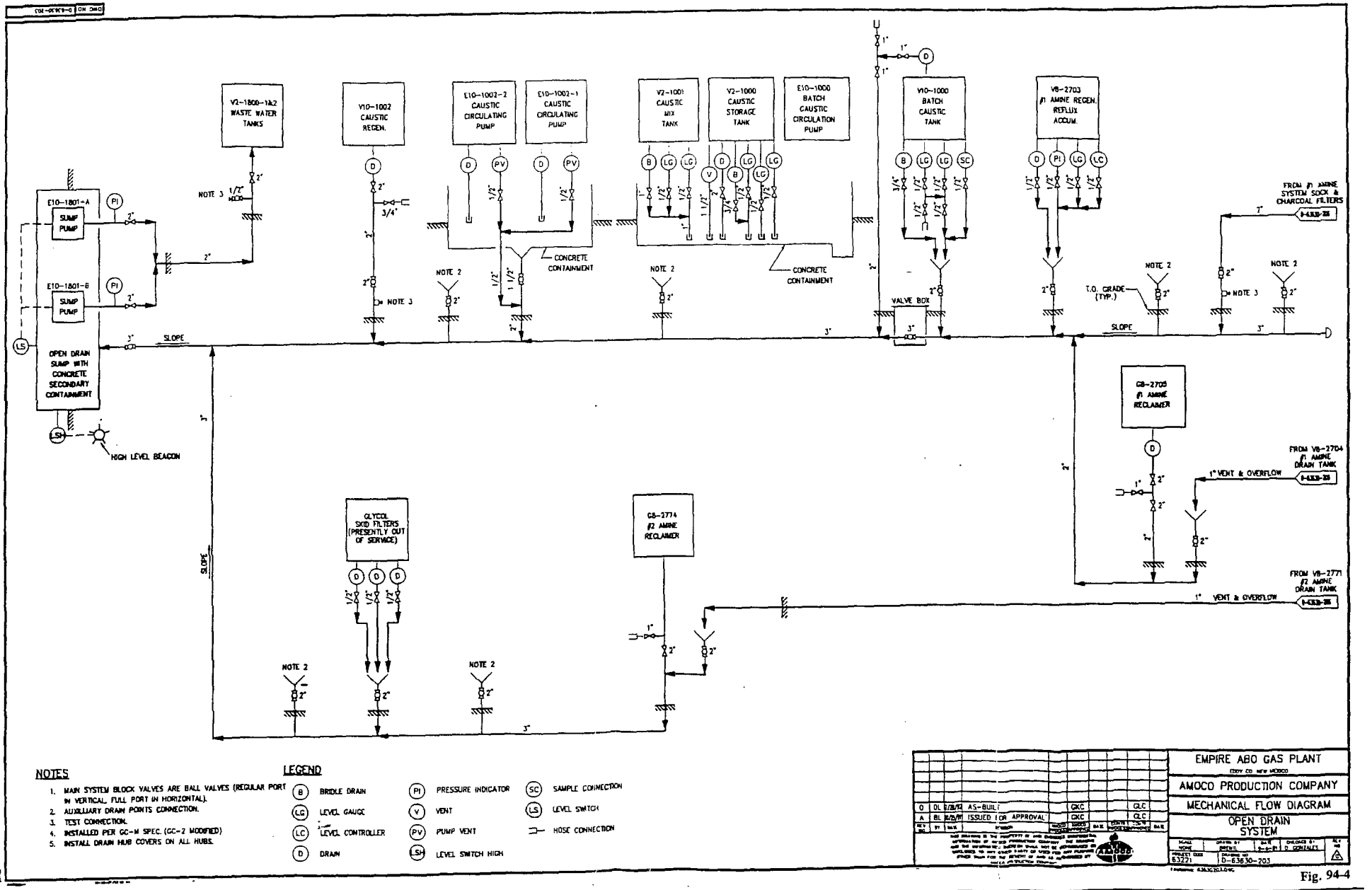

V10-1620-2 PROPANE DRIER
V10-1620-1 PROPANE DRIER
G8-620 #1 DEPROP. REBOILER
V10-620-1 #1 DEPRO-PANIZER
V8-620-1 #1 DEPROP. REFLUX ACCUM.
E10-620-1 #1 DEPROP. REFLUX PUMP
E10-620-2 #1 SPARE DEPROP./DEBUT. REFLUX PUMP
E10-630 DEBUT. REFLUX PUMP
V8-630 DEBUT. REFLUX ACCUM.
V10-630 DEBUTANIZER
G8-613 DEETHANIZER REBOILER
G8-630 DEBUTANIZER REBOILER
G8-611 DEETHANIZER FEED EXCHANGER/ CONDENSER
V10-610 DEETH. LOW POINT DRAIN VALVE
V8-611 DEETHANIZER REFLUX ACCUM.
E10-610-3 DEETHANIZER REFLUX PUMP
E10-610-2 DEETHANIZER REFLUX PUMP
E10-610-1 DEETHANIZER REFLUX PUMP
G8-614 DEETHANIZER REFLUX CONDENSER
V8-2953 PROPANE ACCUM.
V8-2952-B REFRIG. 2ND STG. SUCTION SCRUBBER
FUTURE COALESCER CONNECTION
4" INSUL/ST
CLOSED DRAIN HDR.
V10-621-1 #2 DEPRO-PANIZER
G8-621 #2 DEPROP. REBOILER
G8-621-2 #2 DEPROP. OVHD COND.
E10-621-1 #2 DEPROP. REFLUX PUMP
E10-621-2 #2 DEPROP. REFLUX PUMP
V8-621-1 #2 DEPROP. REFLUX ACCUM.
V10-1002 SAND FILTER
V10-1001 CAUSTIC CONTACTOR
V10-2701 #1 AMINE CONTACTOR
V8-302 #1 2ND STG. SUCT. SCRUBBER
TO #1 AMINE DRAIN SYSTEM
V8-303 #1 2ND STG. DISCH. SCRUBBER
E10-303-1 #1 2ND STG. DISCH. SCRUBBER PUMP
E10-303-2 #1 2ND STG. DISCH. SCRUBBER PUMP
V8-301 #1 1ST STG. DISCH. SCRUBBER
V8-391 #2 1ST STG. DISCH. SCRUBBER
V8-201 #1 INLET SCRUBBER
E10-201 #1 INLET SCRUBBER PUMP
NOTES:
1. INSTALLED PER GC-M SPEC. (GC-2 MODIFIED).
2. ALL LINES TO BE INSULATED W/1 1/2"H AND STEAM TRACED AS NOTED.
LEGEND
(B) BRIDLE DRAIN
(D) DRAIN
(CVD) CONTROL VALVE DRAIN
(LC) LEVEL CONTROLLER
(CV) CONTROL VALVE
(LG) LEVEL GUAGE
(LS) LEVEL SWITCH
(LT) LEVEL TRANSMITTER
(PV) PUMP VENT
(PI) PRESSURE INDICATOR
0 WMJ/DWH AS-BUILT GKC GLC
A WMJ/DWH ISSUED FOR APPROVAL GKC GLC
EMPIRE ABO GAS PLANT
EDDY CO., NEW MEXICO
AMOCO PRODUCTION COMPANY
MECHANICAL FLOW DIAGRAM
CLOSED DRAIN SYSTEM
6372
0-63630-207

Fig. 94-3


INLET COMP. 1ST STAGE SUCTION HEADER
INLET COMP. 3RD STAGE SUCTION HEADER
INLET COMP. 2ND STAGE SUCTION HEADER
CLOSED DRAIN HEADER
4" INSUL/ST
3" INSUL/ST
TO FLARE SYSTEM
FROM E10-1803-A&B CLOSED DRAIN TANK PUMPS
1/2" PUMP VENT
TO E10-1803-A&B CLOSED DRAIN TANK PUMPS
V8-373-B #2 2ND STG. DISCH. SCRUBBER
V8-372 #2 2ND STG. SUCTION SCRUBBER
E10-271 #2 INLET SCRUBBER PUMP
V8-271 #2 INLET SCRUBBER
V8-1700-1A FUEL GAS SCRUBBER
V2-1803 CLOSED DRAIN TANK
MANWAY
V8-610 DEETHANIZER FEED SURGE TANK
V8-371 #2 1ST STG. DISCH. SCRUBBER
V8-2851 REGEN. GAS FILTER
1 1/2" INSUL/ST
FUTURE CONNECTION FOR GLYCOL CONTACTOR
V8-2951 REFRIG. 1ST STG. SUCTION SCRUBBER
1" PLUG
V8-2952-A REFRIG. 2ND STG. SUCTION SCRUBBER
2" INSUL/ST
V8-451 COALESCER
V8-453 3 PHASE SEPERATOR
V8-453 BOOT
V8-373-A #2 2ND STG. DISCH. SCRUBBER
V8-373-A BOOT
E10-373-1 2ND STG. DISCHARGE SCRUBBER PUMP
E10-373-2 2ND STG. DISCHARGE SCRUBBER PUMP
DEHYDRATOR FILTER
G8-404B LO-LEVEL CHILLER
V8-2600-1 REGEN. GAS SCRUBBER
G8-402B HI-LEVEL CHILLER
FUTURE LT CONNECTION
V10-600 DEMETHANIZER
G8-409-B PROPANE DE-OILER
G8-600 DEMETHANIZER REBOILER
1/2" LINE
E10-600-1A & 2A PRODUCT BOOSTER PUMPS
V10-2771 #2 AMINE CONTACTOR
FUTURE LIQUID DEHYRATORS CONNECTION
NOTES:
1. INSTALLED PER GC-M SPEC. (GC-2 MODIFIED).
2. ALL LINES TO BE INSULATED W/1 1/2"H AND STEAM TRACED AS NOTED.
LEGEND
D DRAIN
V VENT
CVD CONTROL VALVE DRAIN
LC LEVEL CONTROLLER
CV CONTROL VALVE
LCV LEVEL CONTROL VALVE
LSL LEVEL SWITCH LOW
LG LEVEL GAUGE
LS LEVEL SWITCH
LT LEVEL TRANSMITTER
PV PUMP VENT
PI PRESSURE INDICATOR
LSH LEVEL SWITCH HIGH
HOSE CONNECTION
0 AS-BUILT GKC CLC
A ISSUED FOR APPROVAL GKC CLC
EMPIRE ABO GAS PLANT
AMOCO PRODUCTION COMPANY
MECHANICAL FLOW DIAGRAM
CLOSED DRAIN SYSTEM
D. GONZALES
D-63630-208



NOTES

1. MAIN SYSTEM BLOCK VALVES ARE BALL VALVES (REGULAR PORT IN VERTICAL, FULL PORT IN HORIZONTAL).
2. AUXILLIARY DRAIN POINTS CONNECTION.
3. TEST CONNECTION.
4. INSTALLED PER GC-M SPEC. (GC-2 MODIFIED)
5. INSTALL DRAIN HUB COVERS ON ALL HUBS.

LEGEND

- (B) BRIDLE DRAIN
- (LG) LEVEL GAUGE
- (LC) LEVEL CONTROLLER
- (D) DRAIN
- (PI) PRESSURE INDICATOR
- (V) VENT
- (PV) PUMP VENT
- (LSH) LEVEL SWITCH HIGH
- (SC) SAMPLE CONNECTION
- (LS) LEVEL SWITCH
- HOSE CONNECTION

REV	BY	DATE	REVISION	ENGR'D	DRAWN	CHK'D
0	DL	8/28/91	AS-BUILT	GKC		GLC
A	BL	8/25/91	ISSUED FOR APPROVAL	GKC		GLC

EMPIRE ABO GAS PLANT
EDDY CO. NEW MEXICO
AMOCO PRODUCTION COMPANY
MECHANICAL FLOW DIAGRAM
OPEN DRAIN SYSTEM

SCALE	DRAWN BY	DATE	CHECKED BY
NONE	DETAIL	8-6-91	D. GONZALES

PROJECT CODE 63221 | DRAWING NO. D-63630-203 | REV. A

Fig. 94-4

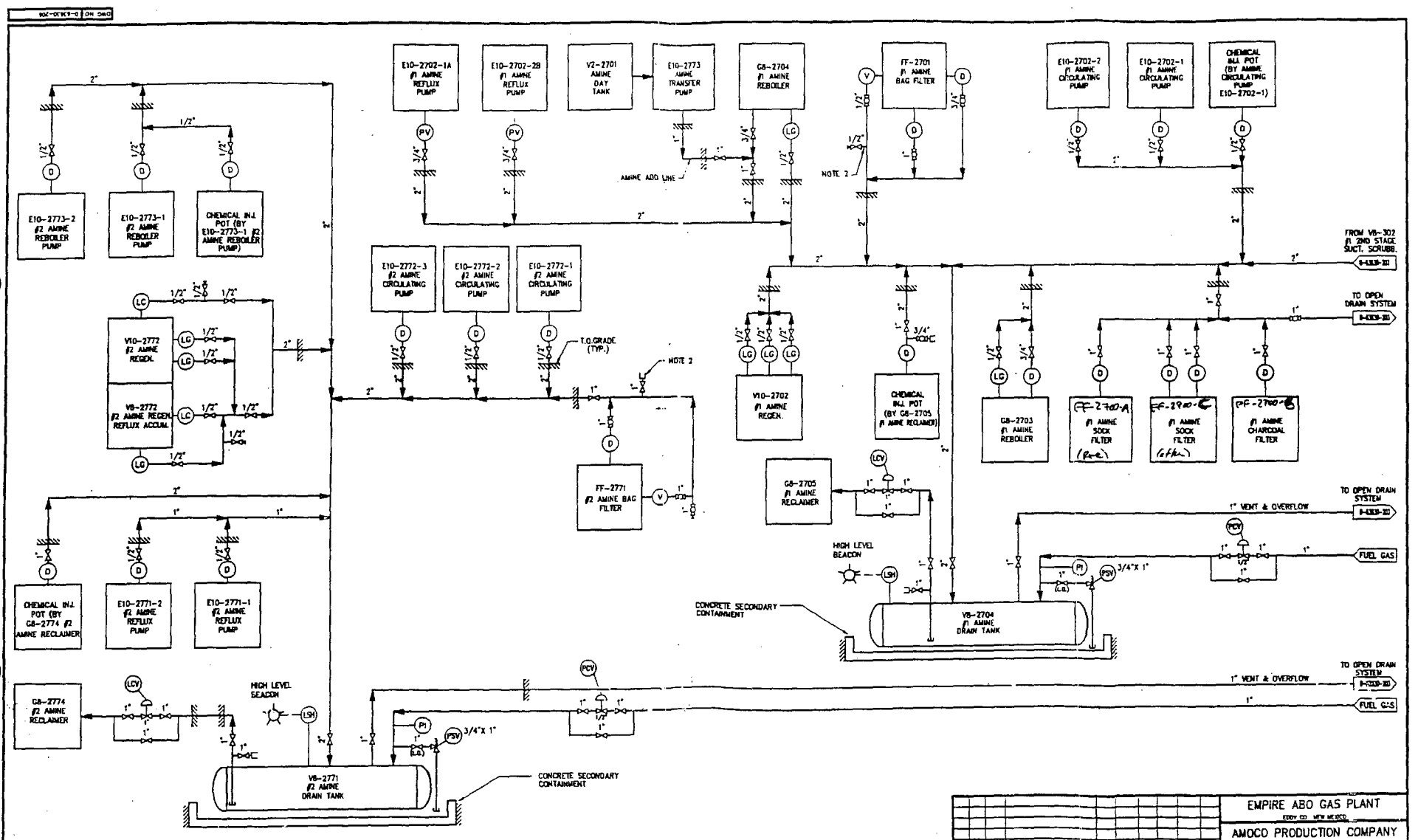
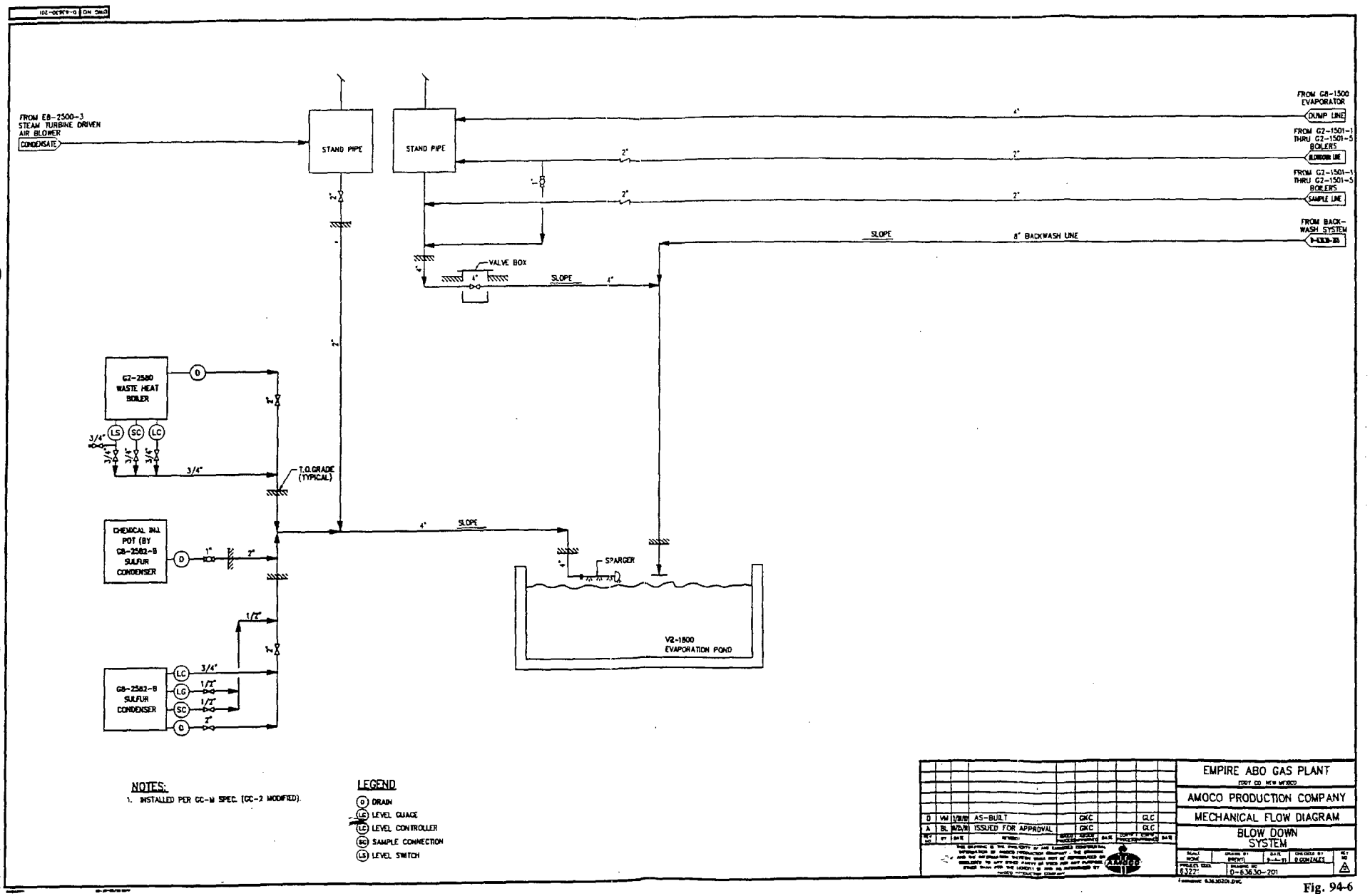

E10-2702-1A #1 AMINE REFLUX PUMP
E10-2702-2B #1 AMINE REFLUX PUMP
V2-2701 AMINE DAY TANK
E10-2773 AMINE TRANSFER PUMP
G8-2704 #1 AMINE REBOILER
FF-2701 #1 AMINE BAG FILTER
E10-2702-2 #1 AMINE CIRCULATING PUMP
E10-2702-1 #1 AMINE CIRCULATING PUMP
CHEMICAL INJ. POT (BY AMINE CIRCULATING PUMP E10-2702-1)
E10-2773-2 #2 AMINE REBOILER PUMP
E10-2773-1 #1 AMINE REBOILER PUMP
CHEMICAL INJ. POT (BY E10-2773-1 #2 AMINE REBOILER PUMP)
AMINE ADD LINE
NOTE 2
FROM V8-302 #1 2ND STAGE SUCT. SCRUBB.
TO OPEN DRAIN SYSTEM
E10-2772-3 #2 AMINE CIRCULATING PUMP
E10-2772-2 #2 AMINE CIRCULATING PUMP
E10-2772-1 #2 AMINE CIRCULATING PUMP
T.O.GRADE (TYP.)
V10-2772 #2 AMINE REGEN.
V8-2772 #2 AMINE REGEN. REFLUX ACCUM.
V10-2702 #1 AMINE REGEN.
CHEMICAL INJ. POT (BY G8-2705 #1 AMINE RECLAIMER)
G8-2703 #1 AMINE REBOILER
FF-2700-A #1 AMINE SOCK FILTER (Pre)
FF-2700-C #1 AMINE SOCK FILTER (after)
FF-2700-B #1 AMINE CHARCOAL FILTER
FF-2771 #2 AMINE BAG FILTER
G8-2705 #1 AMINE RECLAIMER
1" VENT & OVERFLOW
FUEL GAS
HIGH LEVEL BEACON
3/4"X 1"
CONCRETE SECONDARY CONTAINMENT
V8-2704 #1 AMINE DRAIN TANK
CHEMICAL INJ. POT (BY G8-2774 #2 AMINE RECLAIMER)
E10-2771-2 #2 AMINE REFLUX PUMP
E10-2771-1 #2 AMINE REFLUX PUMP
G8-2774 #2 AMINE RECLAIMER
V8-2771 #2 AMINE DRAIN TANK
NOTES:
1. INSTALLED PER GC-M SPEC. (GC-2 MODIFIED).
2. TEST CONNECTION.
LEGEND
D DRAIN
LC LEVEL CONTROLLER
LG LEVEL GUAGE
PI PRESSURE INDICATOR
PSV PRESSURE SAFETY VALVE
LCV LEVEL CONTROL VALVE
LSH LEVEL SWITCH HIGH
V VENT
PCV PRESSURE CONTROL VALVE
PV PUMP VENT
(LO) LOCK OPEN
HOSE CONNECTION
0 VM 7/28/92 AS-BUILT GKC GLC
A RL 10/2/91 ISSUED FOR APPROVAL GKC GLC
EMPIRE ABO GAS PLANT
EDDY CO. NEW MEXICO
AMOCO PRODUCTION COMPANY
MECHANICAL FLOW DIAGRAM
AMINE DRAIN SYSTEM
PROJECT CODE 63271
DRAWING NO. D-63630-706
REV. A

Fig. 94-5



NOTES:

1. INSTALLED PER GC-M SPEC. (GC-2 MODIFIED).

LEGEND

- (D) DRAIN
- (LG) LEVEL GUAGE
- (LC) LEVEL CONTROLLER
- (SC) SAMPLE CONNECTION
- (LS) LEVEL SWITCH

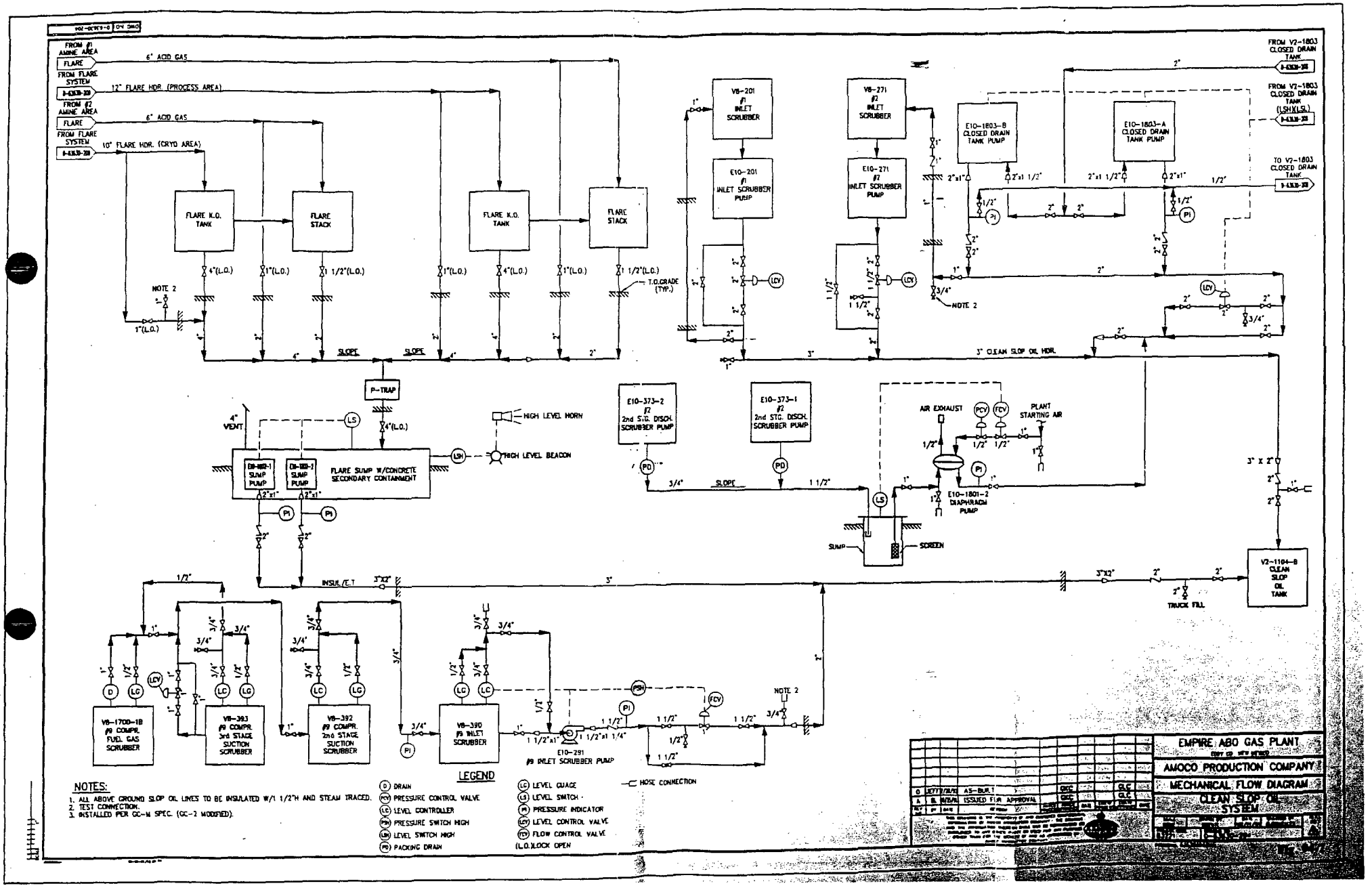
REV	BY	DATE	REVISION	CHECKED	APPROVED
D	VM	1/28/88	AS-BUILT	GKC	GLC
A	BL	8/5/87	ISSUED FOR APPROVAL	GKC	GLC

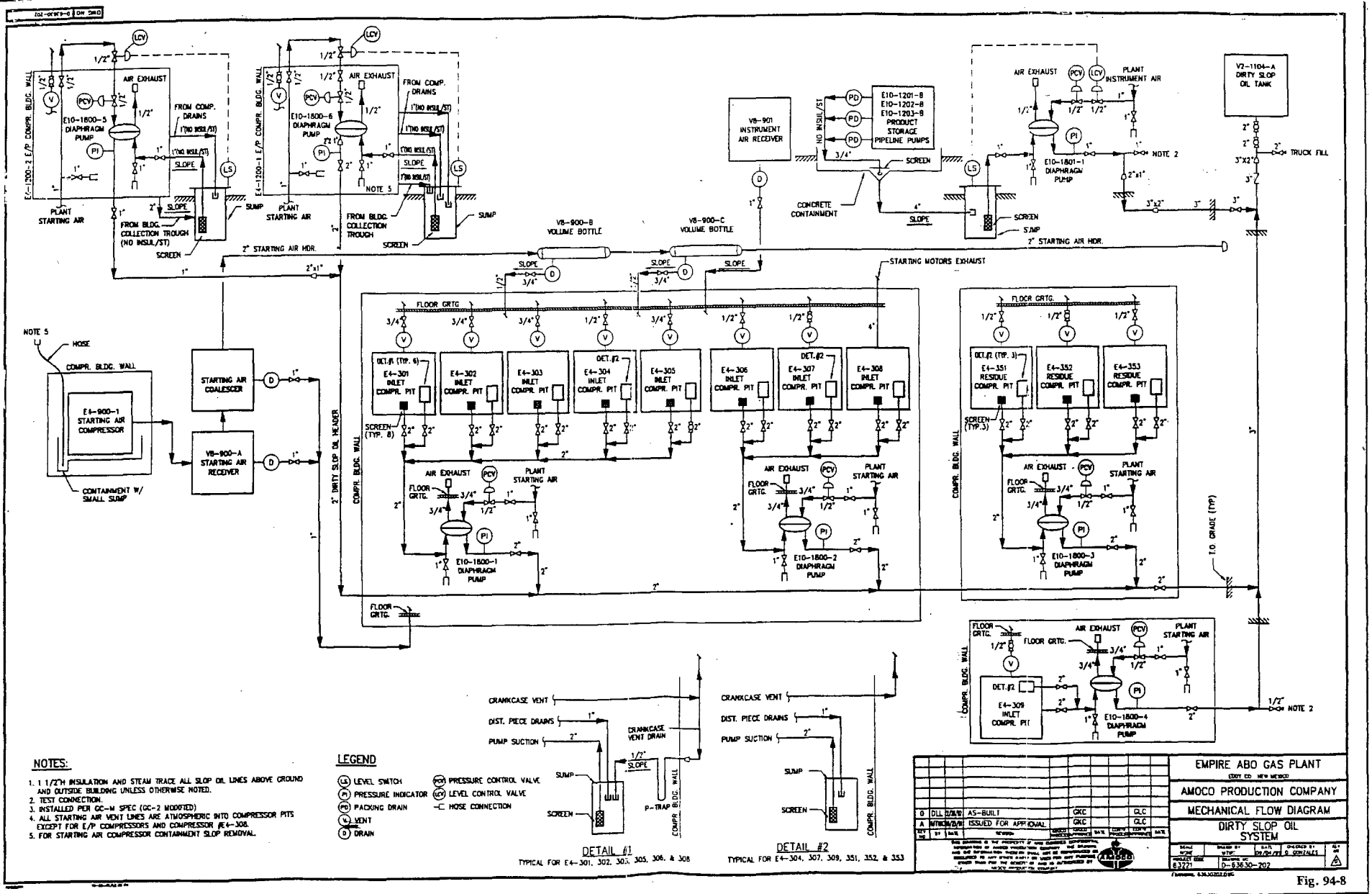
EMPIRE ABO GAS PLANT
TODY CO NEW MEXICO
AMOCO PRODUCTION COMPANY
MECHANICAL FLOW DIAGRAM
BLOW DOWN
SYSTEM

DRAWN BY	DATE	CHECKED BY	REV NO
NOW	3-4-71	D CONTRACT	A

PROJECT CODE 6327
DRAWING NO D-63630-201

Fig. 94-6


FROM #1 AMINE AREA
FLARE
FROM FLARE SYSTEM
6" ACID GAS
12" FLARE HDR. (PROCESS AREA)
FROM #2 AMINE AREA
10" FLARE HDR. (CRYO AREA)
FLARE K.O. TANK
FLARE STACK
T.O.GRADE (TYP.)
NOTE 2
SLOPE
P-TRAP
4" VENT
HIGH LEVEL HORN
HIGH LEVEL BEACON
FLARE SUMP W/CONCRETE SECONDARY CONTAINMENT
V8-201 #1 INLET SCRUBBER
E10-201 #1 INLET SCRUBBER PUMP
V8-271 #2 INLET SCRUBBER
E10-271 #2 INLET SCRUBBER PUMP
E10-1803-B CLOSED DRAIN TANK PUMP
E10-1803-A CLOSED DRAIN TANK PUMP
FROM V2-1803 CLOSED DRAIN TANK
FROM V2-1803 CLOSED DRAIN TANK (LSH)(LSL)
TO V2-1803 CLOSED DRAIN TANK
3" CLEAN SLOP OIL HDR.
E10-373-2 #2 2nd STG. DISCH. SCRUBBER PUMP
E10-373-1 #2 2nd STG. DISCH. SCRUBBER PUMP
AIR EXHAUST
PLANT STARTING AIR
E10-1801-2 DIAPHRAGM PUMP
SUMP
SCREEN
3" X 2"
V2-1104-B CLEAN SLOP OIL TANK
TRUCK FILL
INSUL/E.T
V8-1700-1B #9 COMPR. FUEL GAS SCRUBBER
V8-393 #9 COMPR. 3rd STAGE SUCTION SCRUBBER
V8-392 #9 COMPR. 2nd STAGE SUCTION SCRUBBER
V8-390 #9 INLET SCRUBBER
E10-291 #9 INLET SCRUBBER PUMP
NOTES:
1. ALL ABOVE GROUND SLOP OIL LINES TO BE INSULATED W/1 1/2"H AND STEAM TRACED.
2. TEST CONNECTION.
3. INSTALLED PER GC-M SPEC. (GC-2 MODIFIED).
LEGEND
(D) DRAIN
(PCV) PRESSURE CONTROL VALVE
(LC) LEVEL CONTROLLER
(PSH) PRESSURE SWITCH HIGH
(LSH) LEVEL SWITCH HIGH
(PD) PACKING DRAIN
(LG) LEVEL GUAGE
(LS) LEVEL SWITCH
(PI) PRESSURE INDICATOR
(LCV) LEVEL CONTROL VALVE
(FCV) FLOW CONTROL VALVE
(L.O.) LOCK OPEN
HOSE CONNECTION
EMPIRE ABO GAS PLANT
AMOCO PRODUCTION COMPANY
MECHANICAL FLOW DIAGRAM
CLEAN SLOP OIL SYSTEM



NOTES:

1. 1 1/2"H INSULATION AND STEAM TRACE ALL SLOP OIL LINES ABOVE GROUND AND OUTSIDE BUILDING UNLESS OTHERWISE NOTED.
2. TEST CONNECTION.
3. INSTALLED PER GC-M SPEC (GC-2 MODIFIED)
4. ALL STARTING AIR VENT LINES ARE ATMOSPHERIC INTO COMPRESSOR PITS EXCEPT FOR E/P COMPRESSORS AND COMPRESSOR #E4-308.
5. FOR STARTING AIR COMPRESSOR CONTAINMENT SLOP REMOVAL.

LEGEND

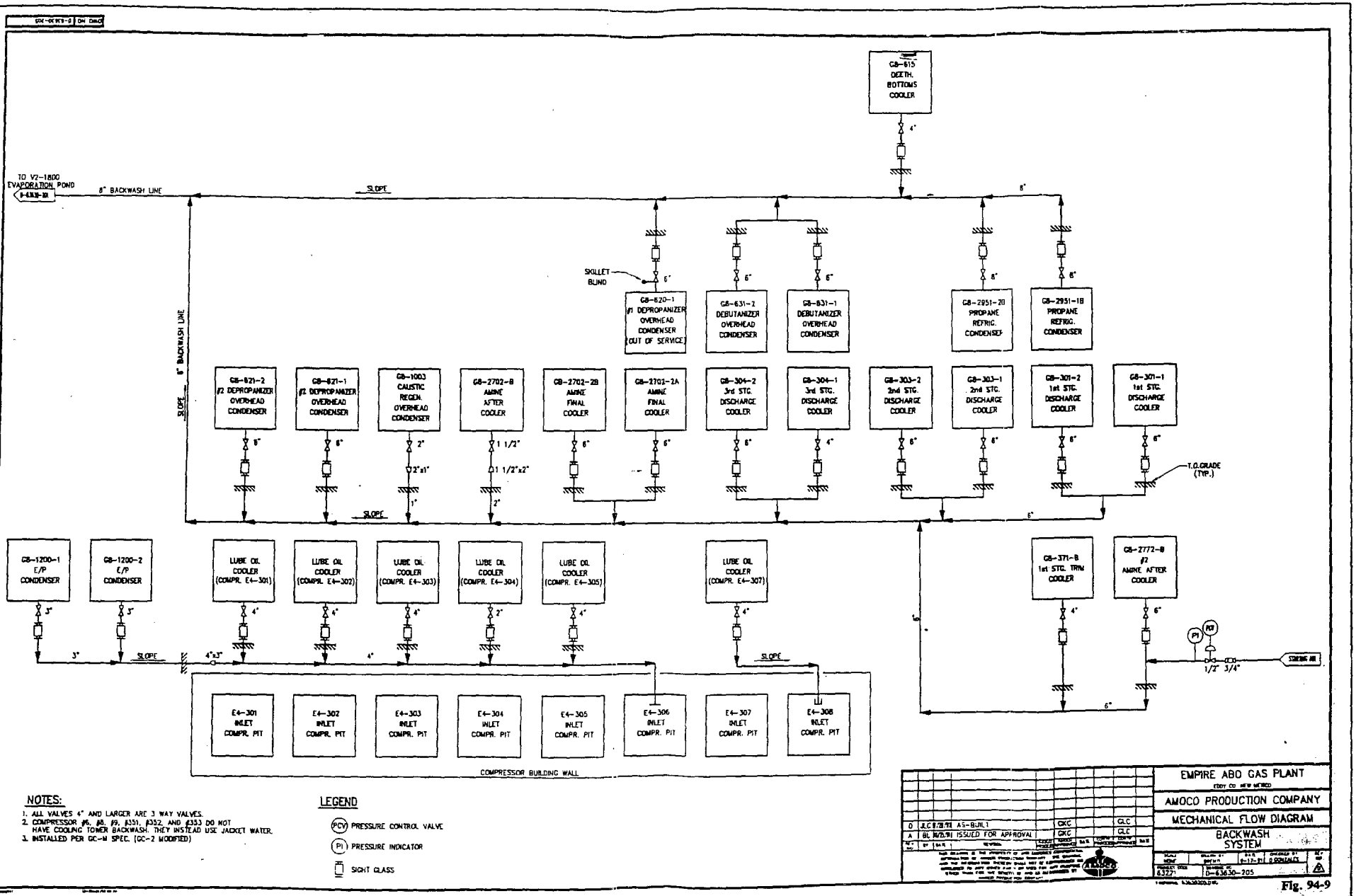
- (LS) LEVEL SWITCH
- (PI) PRESSURE INDICATOR
- (PD) PACKING DRAIN
- (V) VENT
- (D) DRAIN
- (PCV) PRESSURE CONTROL VALVE
- (LCV) LEVEL CONTROL VALVE
- HOSE CONNECTION

REV	BY	DATE	REMARKS	ENGR	DATE	CHK'D	DATE	APP'D	DATE
0	DLL	8/8/91	AS-BUILT	GKC		GLC			
A	MTM/DLL	8/8/91	ISSUED FOR APPROVAL	GKC		GLC			

EMPIRE ABO GAS PLANT
EDDY CO. NEW MEXICO
AMOCO PRODUCTION COMPANY
MECHANICAL FLOW DIAGRAM
DIRTY SLOP OIL SYSTEM

SCALE	DRAWN BY	DATE	CHECKED BY	ALT. NO.
NONE	WTP	09/04/91	D. GOMEZ	
PROJECT CODE 63727	DRAWING NO. D-63630-202			

Fig. 94-8



NOTES:

1. ALL VALVES 4" AND LARGER ARE 3 WAY VALVES.
2. COMPRESSOR #6, #8, #9, #351, #352, AND #353 DO NOT HAVE COOLING TOWER BACKWASH. THEY INSTEAD USE JACKET WATER.
3. INSTALLED PER GC-M SPEC. (GC-2 MODIFIED)

LEGEND

(PCV) PRESSURE CONTROL VALVE

(PI) PRESSURE INDICATOR

SIGHT GLASS

0	J.C 9/28/93 AS-BUILT	CKC		CLC
A	BL 10/2/91 ISSUED FOR APPROVAL	CKG		CLC

EMPIRE ABO GAS PLANT

EDDY CO. NEW MEXICO

AMOCO PRODUCTION COMPANY

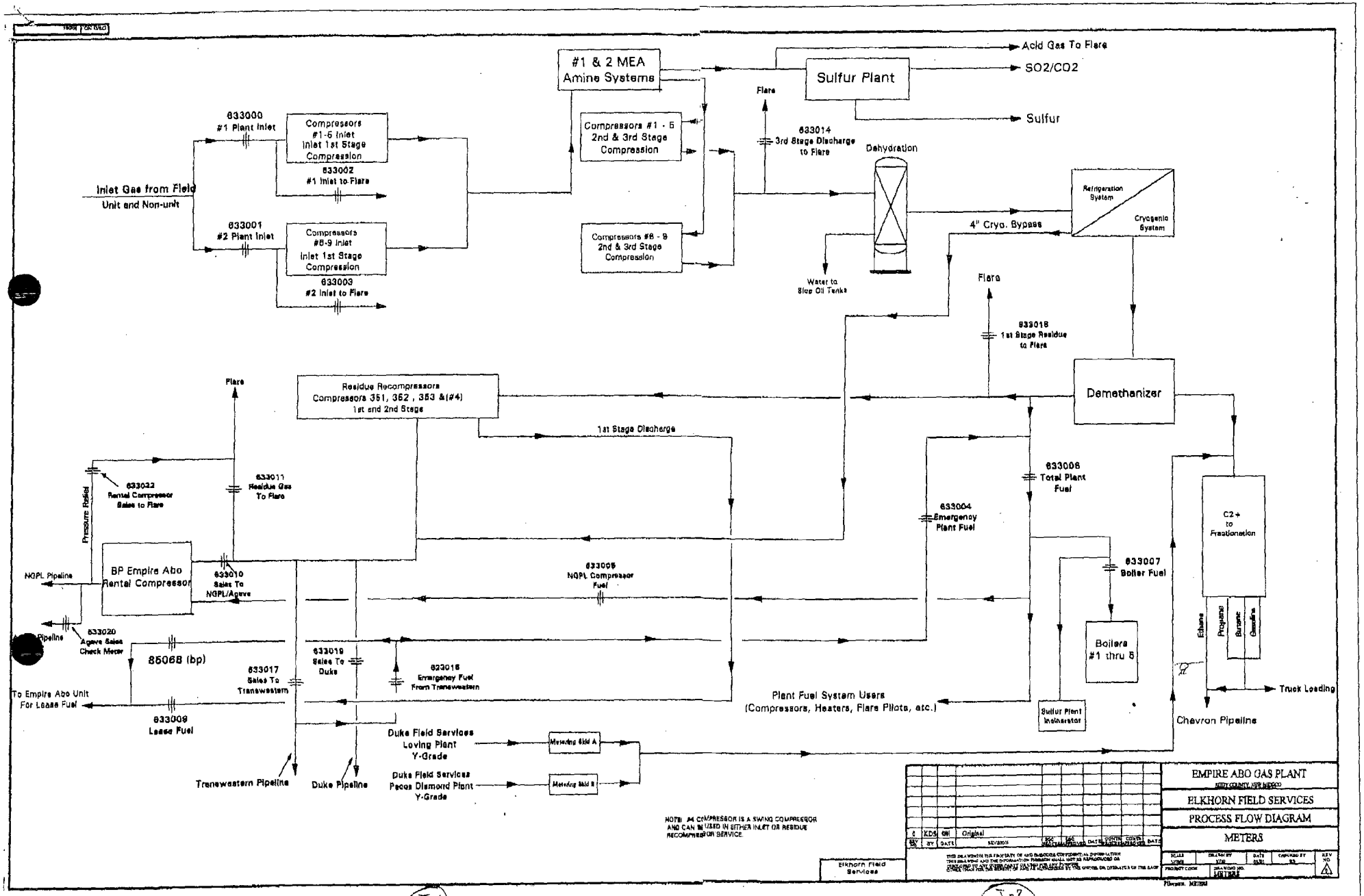
MECHANICAL FLOW DIAGRAM

BACKWASH SYSTEM

PROJECT DRG. 63721

DRAWING NO. D-63630-205

Fig. 94-9



J-1

J-2

APPENDIX D

AGRA
ENGINEERING GLOBAL SOLUTIONS

AGRA Earth & Environmental, Inc.
8519 Jefferson, N.E.
Albuquerque
New Mexico 87113
Tel (505) 821-1801
Fax (505) 821-7371

2 June 2000
AGRA Project No. 0-517-000039

Elkhorn Operating Co.
P.O. Box 70
Artesia, New Mexico 88211-0070

Attention: Randy McCollum

RE: DRAIN LINE TESTING
EMPIRE ABO GAS PLANT
ARTESIA, NEW MEXICO

AGRA Earth & Environmental, Inc. (AGRA) is pleased to provide you with results of hydrostatic testing for the below ground, non-pressurized, process and wastewater drain system at the Empire Abo Gas Plant located near Artesia, New Mexico. Only below ground non-pressurized process and wastewater lines were tested as proposed to New Mexico Oil Conservation Division (OCD) by ARCO Permian, owner of the site.

The underground pipelines carrying process or wastewater were isolated. Each isolated system was filled with clean water and air removed. A water-filled riser was of sufficient height to provide a minimum of 3 pounds per square inch above normal operating pressure. A schematic showing a typical test system layout is attached. A system is considered sound when the height of the water column held steady for a period of 30 minutes.

Notice to proceed on this project was granted by Mr. Randy McCollum on 29 March, 2000. AGRA mobilized to the site on 19 April and began line testing on 20 April 2000. AGRA's on-site crew consisted of George Friend (Project Manager), Cole Armstrong (technician level 3), and Bill Leslie (technician level 3) a resume for Mr. Friend is also attached. Each of these individuals are 40 hour OSHA and H_2S trained.

In keeping with Elkhorn Operation Company policy, along with AGRA's own internal Health and Safety policies, all on-site employees participated in reviewing a 30 minute safety video, completed a health and safety related test, presented individual H_2S training cards and attended daily safety meetings. Records pertaining to the video, test and H_2S training are on file at the referenced Elkhorn plant. Copies of the daily safety meeting attendees and topics discussed are attached.

All drain lines tested with the exception of line WW-4-FB-2-13502 recorded no leaks. On line WW-4-FB-2-13502, a leak in the above ground 3-inch site glass was detected and reported to on-site personnel. Results of each drain line tested are summarized in the attached Table. In addition,

AGRA has indicated on the enclosed mechanical flow diagrams provided by Elkhorn, which lines were tested.

On 21 April, 2000 Mr. Mike Stubblefield of the OCD, Artesia office, visited the referenced plant. Mr. Stubblefield was present for a portion of the line test extending from the sulfur condensers to the evaporation pond. Mr. Stubblefield stated that he approved of the line testing methodology and procedures. The line being tested during Mr. Stubblefield's visit showed a leak in this system. A leaking above ground valve was found and repaired, the line was then retested and no leaks detected.

Should you have any questions, please feel free to contact our office.

Respectfully submitted,

AGRA Earth & Environmental, Inc.

George A. Friend
Project Manager

Reviewed by:

Frederick T. Schelby, P.E.
Manager of Engineering

Attachments: Summary of Line Testing
Daily Safety Meetings
Schematic of typical Test System
Daily Time Sheets
Supporting Documents for Supply Charges
Resume of George Friend
Mechanical Flow Diagrams

GAF:rrg

RESULTS OF DRAIN LINE TESTING
HYDROSTATIC TESTING

Drain Line From	Drain Line To	Line Size/Length/Type	Test Date/Time	Line Results/Comments
Product storage containment sump	Dirty slop oil tank	2 & 3-inch/35 feet/steel	4/20/00 11:30 - 12:00 hours	**No leaks detected**
Compressor building sumps	Dirty slop oil tank	3-inch/690 feet/steel	4/20/00 13:30 - 14:00 hours	**No leaks detected**
Wastewater process tanks (north and south)	Open drain sump tank	2-inch/216 feet/steel	4/21/00 15:30 - 16:00 hours	**No leaks detected**
Sulfur condensers	Evaporation pond	2-inch/171 feet/steel 4-inch/110 feet/steel	4/21/00 13:30 - 14:00 hours	A leaking above ground valve was found and repaired, the line was then retested and **no leaks detected.**
Flare system	Flare sump tank	4-inch/335 feet/steel	4/22/00 09:15 - 09:45 hours	**No leaks detected.** The flare system was opened and tested for hazardous conditions prior to testing by Elkhorn Operating Co.
Glycol, Amine and Caustic Drain System	Open drain sump tank	2-inch/283 feet/steel 3-inch/284 feet/steel 4-inch/18 feet/steel	4/24/00 11:45 - 12:15 hours	**No leaks detected.**
NOTE: All line lengths are approximations.				

RESULTS OF DRAIN LINE TESTING
HYDROSTATIC TESTING

Drain Line From	Drain Line To	Line Size/Length/Type	Test Date/Time	Line Results/Comments
Flare sump tank	Clean slop oil tank	3-inch/871 feet/steel 1.5-inch/80 feet/steel	4/24/00 14:45 - 15:15 hours	**No leaks detected**
Scrubber coolers, deethanizer system, propane system, debutanizer system, amine system and boiler drains	Evaporation pond	3-inch/16 feet/steel 4-inch/332 feet/steel 6-inch/1120 feet/steel 8-inch/660 feet/steel	4/28/00 11:30 - 12:00 hours	After removing air from the system, a small loss in test head level was noted. A leak was found in an above ground 3-inch site glass that accounted for the loss of water level in test head. **No other leaks were detected.**
Ethane product cooler, lube oil and air compressor drain systems	Compressor building cellar	1-inch/40 feet/steel 3-inch/20 feet/steel 4-inch/180 feet/steel	5/1/00 11:00 - 11:30 hours	**No leaks detected**
Product storage containment sump	Dirty slop oil tank	2-inch/27 feet/steel	5/1/00 13:00 - 13:30 hours	**No leaks detected**
Compressor skid	Fiber glass holding tank	2-inch/93 feet/steel	5/1/00 16:30 - 17:00 hours	**No leaks detected**

Safety Meeting

Attendance Sheet

Date: 4 - 20 - 00 Topic: LOCK OUT TAG OUT

Presenter: GEORGE KAIRIS

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE KAIRIS	
Kyle Stevenson	
Cole Armstrong	
R-II Leslie	

Safety Meeting

Attendance Sheet

Date: 4-21-00 Topic: HOT LINES / STEAM PRESSURE

Presenter: GEORGE FRIEND

Please **Print** Your Name:	Please **Sign** Your Name:
Kyle Stevenson	Kyle D. Stevenson
Bill Leslie	Bill Leslie
Cole Armstrong	Cole Armstrong
GEORGE FRIEND	George Friend

Safety Meeting

Attendance Sheet

Date: 4-22-00 Topic: FIRE / H2S.

Presenter: GEORGE FAIENZ

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE FAIENZ	
Jackie Clifton	
Kyle Stevenson	
Ronny McCollum	
DONALD DUTCHOVER	
David Lewis	
BILL LESLIE	
COLE ARMSTRONG	

Safety Meeting

Attendance Sheet

Date: 4-24-00 Topic: CAUSTICS / AMINES

Presenter: GEORGE FRIEND

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE FRIEND	
BILL LESLIE	
Kyle Stevenson	
Robert Livingston	
Cole Armstrong	

Safety Meeting

Attendance Sheet

Date: 2-26-00 Topic: H_2S

Presenter: GEORGE FRIEND

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE FRIEND	
BILL LESLIE	
COLE ARMSTRONG	
KYLE STEVENSON	

Safety Meeting

Attendance Sheet

Date: 4-25-02 Topic: Access courtesy.

Presenter: GEORGE FRIEND

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE FRIEND	
BILL LESLIE	
Cole Armstrong	
Kyle Stevenson	
Robert Livingston	

Safety Meeting

Attendance Sheet

Date: 4-27-00 Topic: BIO HAZARDS

Presenter: GEORGE FRIEND

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE FRIEND	
BOB ARMSTRONG	
Kyle STEVENSON	Kyle D. Stevenson
BILL LESLIE	

Safety Meeting

Attendance Sheet

Date: 4-24-00 Topic: CONFINED SPACE.

Presenter: GEORGE FRIEND

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE FRIEND	George Friend
Kyle Stevenson	Kyle D. Stevenson
Bill Leslie	Bill Leslie
Cole Armstrong	Cole Armstrong

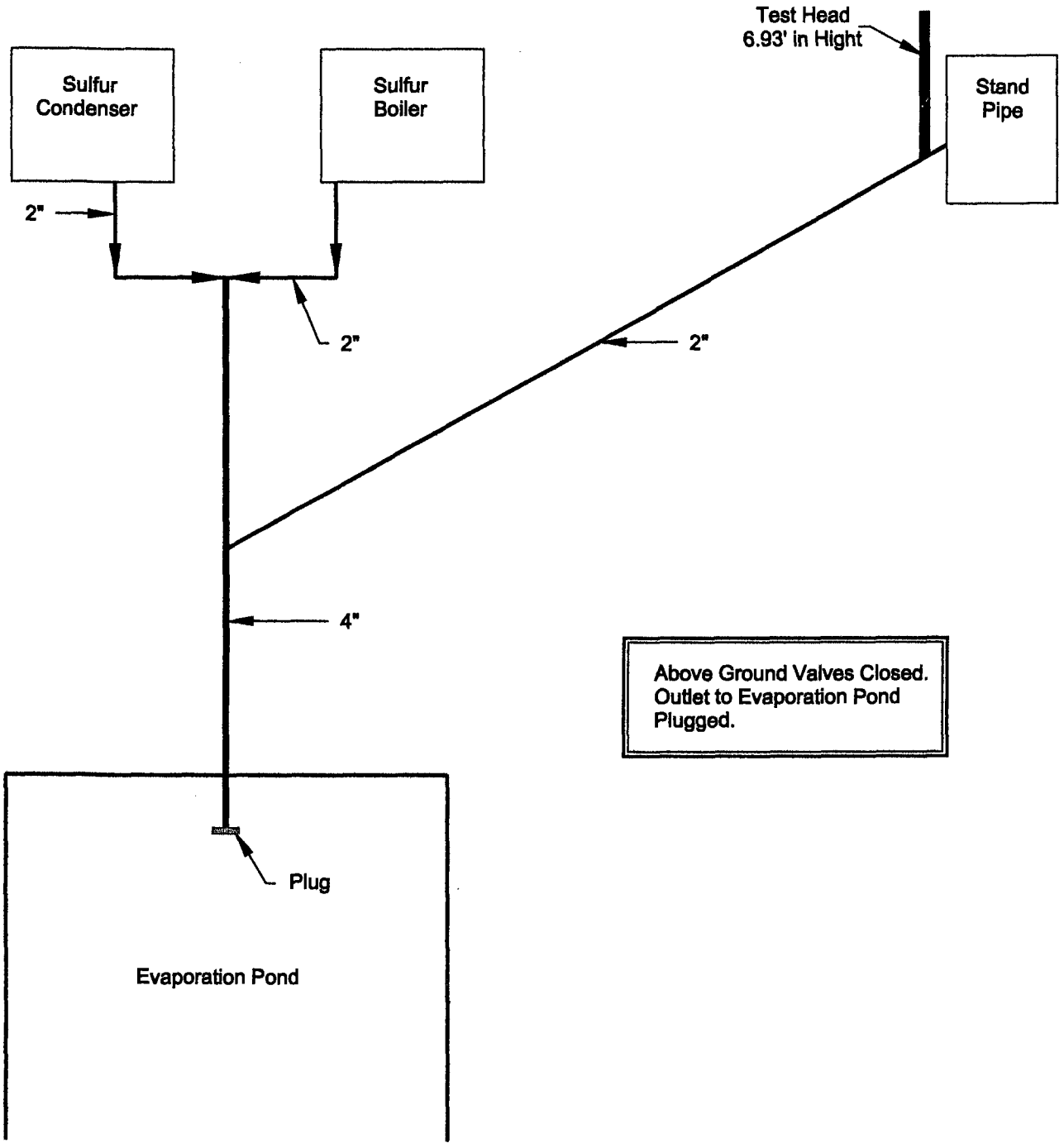
Safety Meeting

Attendance Sheet

Date: 5-1-00 Topic: BACK SAFETY

Presenter: GEORGE FAIEAU

Please **Print** Your Name:	Please **Sign** Your Name:
GEORGE FAIEAU	
COLE ARMSTRONG	
KYLE STEVENSON	



Drain Line Testing
Artesia, New Mexico
AGRA Project No. 0-517-000039

Drain Line Testing Diagram

AGRA
ENGINEERING GLOBAL SOLUTIONS

(WHITE - Payroll) PINK - Expenses)

Employee Name William F. Leslie Employee No. 6384 Dept. 6517 Week Ending 4/21/00

PROJECT DESCRIPTION	PROJECT NO. X-XXX-XXXXX-X	TASK NO. XX	ACTV CODE	OVRD DEPT CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	* BILBL HOURS	MILEAGE QTY.	RATE	TOTAL
DRAIN LINE TESTING: ELKHORN OPERATING	0-517-000039			D	R					8	8	10	R 26	* 26			
					O								O	*			
				C 73	M					502	-0-	-0-	→		M 502	0.325	163.15
				D	R								R	*			
					O								O	*			
				C	M								→		M		
				D	R								R	*			
					O								O	*			
				C	M								→		M		
				D	R								R	*			
					O								O	*			
				C	M								→		M		
				D	R								R	*			
					O								O	*			
				C	M								→		M		
SUBTOTAL FROM ADDITIONAL PAGES:				D	R								R	*			
					O								O	*			
				C	M								→		M		
Non-Tracked Proposal	0-0PROPOSAL			D	R								R	*			
					O								O	*			
				C	M								→		M		
Non-Chargeable	0-008-11000			D	R												
					O												
				C	M								→			0.310	0.00
REGULAR HRS WORKED	→				R					8	8	10	R 26				
OVERTIME HRS WORKED	→				O								O				
HOLIDAY HRS TAKEN	0-008-13000				H								H				
VACATION HRS TAKEN	0-008-15000				V								V				
SICK LEAVE HRS TAKEN	0-008-14000				S								S				
TOTAL HOURS and MILEAGE:	→				T					8	8	10	26	26	502		163.15

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #	OVRD	SAT	SUN	MON	TUE	WED	THR	FRI	PER DIEM DESC	QTY	RATE	TOTAL
Elkhorn	0517000039		D					1	1	1		3	$75	225
			D											

(PER DIEM QTY spans SAT–FRI)

EMPLOYEE SIGNATURE William F. Leslie

I certify the above to be a true statement of my hours worked and mileage driven.

☐ Salary
☑ Hourly

Supervisor's Signature Fred Schultz

Revised August 1, 1999

* Billable columns for office use only

Employee Name *Bill F. Leslie* Employee No. *10704* Dept. *6916* Week Ending *4-28-00*

PROJECT DESCRIPTION	PROJECT NO. X - XXX - XXXXX - X	TASK NO. XX	ACTV CODE	OVRD DEPT CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	* BILBL HOURS	MILEAGE QTY.	MILEAGE RATE	MILEAGE TOTAL	# OF TRP CHRGS * BILBL MILES
DRAIN LINE TESTING ELKHORN OPER	*0-517-000039*			D	R	*3*		*9*	*11*	*11*	*6*		R *40*	* *40*				T
					O						*4*	*10*	O *14*	* *14*				
				C *T3*	M								→		M			M *
				D	R								R	*				T
					O								O	*				
				C	M								→		M			M *
				D	R								R	*				T
					O								O	*				
				C	M								→		M			M *
				D	R								R	*				T
					O								O	*				
				C	M								→		M			M *
				D	R								R	*				T
					O								O	*				
				C	M								→		M			M *
				D	R								R	*				T
					O								O	*				
				C	M								→		M			M *
SUBTOTAL FROM ADDITIONAL PAGES:				D	R								R	*				T
					O								O	*				
				C	M								→		M			M *
Non-Tracked Proposal	0-0PROPOSAL			D	R								R	*				T
					O								O	*				
				C	M								→		M			M *
Non-Chargeable	0-008-11000			D	R													T
					O													
				C	M								→			0.310	0.00	M *
REGULAR HRS WORKED	→				R	*3*		*9*	*11*	*11*	*6*		R *40*					
OVERTIME HRS WORKED	→				O						*4*	*10*	O *14*					
HOLIDAY HRS TAKEN	0-008-13000				H								H					
VACATION HRS TAKEN	0-008-15000				V								V					
SICK LEAVE HRS TAKEN	0-008-14000				S								S					
TOTAL HOURS and MILEAGE:	→				T	*3*		*9*	*11*	*11*	*10*	*10*	*54*	*54*			0.00	

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #		OVRD		PER DIEM QTY							PER DIEM DESC	QTY	RATE	TOTAL	* BILBL PD
ELKHORN OPER	*0-517-000039*			D		*1*	*1*	*1*	*1*	*1*	*1*	*1*		*7*	*75*	*525*	* *525*
				D													*

EMPLOYEE SIGNATURE *William F. Leslie*

I certify the above to be a true statement of my hours worked and mileage driven.

☐ Salary

☒ Hourly

Supervisor's Signature *[signature]*

* Billable columns for office use only

Revised August 1, 1999

04/28/2000 14:45

Employee Name *William F. Leslie* Employee No. *6384* Dept. *6517* Week Ending *5-5-00*

PROJECT DESCRIPTION	PROJECT NO. X - XXX - XXXXX - X	TASK NO. XX	ACTV CODE	OVRID DEPT CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	*BILBL HOURS	MILEAGE QTY.	RATE	TOTAL	# OF TRV CHRGS *BILBL MILES
Pipeline Testing Elkhorn Operators	*0-517-000039*			D	R			*8*	*8*				R *16*	* *16*				
					O								O	*				T
				C *T3*	M			*-0-*	*502*				→		M *502*	*0.325*	*163.15*	M* *502*
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M*
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M*
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M*
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M*
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M*
SUBTOTAL FROM ADDITIONAL PAGES:				D	R								R	*				
					O								O	*				T
				C	M								→		M			M*
Non-Tracked Proposal	0-0PROPOSAL			D	R								R	*				
					O								O	*				T
				C	M								→		M			M*
Non-Chargeable	0-008-11000			D	R													
					O													
				C	M								→			0.310	0.00	M*
REGULAR HRS WORKED	→				R								R					
OVERTIME HRS WORKED	→				O								O					
HOLIDAY HRS TAKEN	0-008-13000				H								H					
VACATION HRS TAKEN	0-008-15000				V								V					
SICK LEAVE HRS TAKEN	0-008-14000				S								S					
TOTAL HOURS and MILEAGE:					T			*8*	*8*				*16*	*16*	*502*		*163.15* ~~0.00~~	

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #	OVRID		SAT	SUN	MON	TUE	WED	THR	FRI	PER DIEM DESC	QTY	RATE	TOTAL	*BILBL PD
Elkhorn Operators	*0-517-000039*		D		*1*	*1*	*1*						*3*	*$75*	*$225*	*$225*
			D													*

EMPLOYEE SIGNATURE *William F. Leslie*

I certify the above to be a true statement of my hours worked and mileage driven.

☐ Salary
☒ Hourly

Supervisor's Signature *[signature]*

Revised August 1, 1999

* Billable columns for office use only

T-166 P.02/02 F-721

EMPLOYEE TIME CARD

Employee Name: Cole Armstrong Employee No: 500240 Dept: 6517 Week Ending: May-5-00

PROJECT DESCRIPTION	PROJECT NO X-XXX-XXXXX-X	TASK NO. XX	ACTIV CODE	CREW / DEPT / CLASS		SAT	SUN	MON	TUE	WED	THU	FRI	TOTAL HOURS	BILLABLE HOURS	MILEAGE QTY	RATE	TOTAL	OUT OF TOWN COST / TRAVEL AMT
Drain line testing Elkhorn Operating	0-517-000039			T3	R			10					10	10		0.325	$0.00	
					R								0			0.325	$0.00	
					R								0			0.325	$0.00	
					R								0			0.325	$0.00	
					R								0			0.325	$0.00	
					R								0			0.325	$0.00	
SUBTOTAL FROM ADDITIONAL PAGES					R								0			0.325	$0.00	
Non-Tracked Proposal	00-PROPOSAL				R								0			0.325	$0.00	
Non-Chargeable	0-006-11000				R								0			0.325	$0.00	
REGULAR HRS WORKED					R	0	0	10	0	0	0	0	10					
OVERTIME HRS WORKED					O	0	0	0	0	0	0	0	0					
HOLIDAY HRS TAKEN	0-006-13000												0					
VACATION HRS TAKEN	0-006-15000												0					
SICK LEAVE HRS TAKEN	0-006-14000												0					
TOTAL HOURS and MILEAGE:						0	0	10	0	0	0	0	10	10	0		$0.00	

PER DIEM PROJECT DESCR	PROJECT NO	TASK #		CREW		SAT	SUN	MON	TUE	WED	THU	FRI	QTY	RATE	TOTAL	PER DIEM
Elkhorn Operating	0-517-000039						1	1					2	$75.00	$150.00	150

$150.00

EMPLOYEE SIGNATURE x [signature]

I certify the above to be a true statement of my hours worked and mileage driven.

☐ Salary
☒ Hourly

Supervisor's Signature [signature]

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H:\timecard\...wb2

Employee Name [illegible] Employee No. ______ Dept. [illegible] Week Ending [illegible]

04/28/2000 14:45

PROJECT DESCRIPTION	PROJECT NO. X-XXX-XXXXX-X	TASK NO. XX	ACTV CODE	OVRID DEPT CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	* BILBL HOURS	MILEAGE QTY.	RATE	TOTAL	# OF TRP CHRGS * BILBL MATS
DRAIN LINE TESTING ELKHORN OPER	0-517-000039			D	R	3		7	11	11	8		R 40	*40				
					O						2	8	O 10	*10				T
				C T3	M										M			M*
				D	R								R	*				
					O								O	*				T
				C	M										M			M*
				D	R								R	*				
					O								O	*				T
				C	M										M			M*
				D	R								R	*				
					O								O	*				T
				C	M										M			M*
				D	R								R	*				
					O								O	*				T
				C	M										M			M*
				D	R								R	*				
					O								O	*				T
				C	M										M			M*
SUBTOTAL FROM ADDITIONAL PAGES:				D	R								R	*				
					O								O	*				T
				C	M										M			M*
Non-Tracked Proposal	0-0PROPOSAL			D	R								R	*				
					O								O	*				T
				C	M										M			M*
Non-Chargeable	0-008-11000			D	R													
					O													T
				C	M											0.000	0.00	M*

			SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL	BILBL	MILEAGE
REGULAR HRS WORKED		R	3		7	11	11	8		R 40		
OVERTIME HRS WORKED		O						2	8	O 10		
HOLIDAY HRS TAKEN	0-008-13000	H								H		
VACATION HRS TAKEN	0-008-15000	V								V		
SICK LEAVE HRS TAKEN	0-008-14000	S								S		
TOTAL HOURS and MILEAGE:		T	3		7	11	11	10	8	50	50	0.00

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #		OVRID		SAT	SUN	MON	TUE	WED	THR	FRI	PER DIEM DESC	QTY	RATE	TOTAL	* BILBL
ELKHORN OPER.	0-517-000039			D		1		1	1	1	1			5	75	375	*375
				D													*

EMPLOYEE SIGNATURE [signature]

I certify the above to be a true statement of my hours worked and mileage driven.

☐ Salary
☑ Hourly

Supervisor's Signature [signature]

Revised August 1, 1999

* Billable columns for office use only

Employee Name COLE ARMSTRONG Employee No. ____ Dept. 0717 Week Ending 4-21-00

PROJECT DESCRIPTION	PROJECT NO. X - XXX - XXXXX - X	TASK NO. XX	ACTV CODE	OVRD DEPT / CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	*BILBL HOURS	MILEAGE QTY.	MILEAGE RATE	MILEAGE TOTAL	# OF TRIP CHRGS / *BILBL MILES
DRAIN LINE TESTING EARTHQUAKE-DRILL	0-517-000039			D / C T3	R						10	10	R 20	*20				
				D / C	R								R					
				D / C	R								R					
				D / C	R								R					
				D / C	R								R					
				D / C	R								R					
SUBTOTAL FROM ADDITIONAL PAGES:				D / C	R								R					
Non-Tracked Proposal	0-0PROPOSAL			D / C	R								R					
Non-Chargeable	0-008-11000			D / C	R													
REGULAR HRS WORKED					R						10	10	R 20					
OVERTIME HRS WORKED					O								O					
HOLIDAY HRS TAKEN	0-008-13000				H								H					
VACATION HRS TAKEN	0-008-15000				V								V					
SICK LEAVE HRS TAKEN	0-008-14000				S								S					
TOTAL HOURS and MILEAGE:					T						10	10	20	20		~~0.370~~	0.00	

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #	OVRD	PER DIEM QTY							PER DIEM DESC	QTY	RATE	TOTAL	*BILBL
EQK HDAV OPER	0-517-000039		D						1	1		2	75	150	*150
			D												

EMPLOYEE SIGNATURE Cole Armstrong ☐ Salary ☑ Hourly Supervisor's Signature Dwight Schuh

I certify the above to be a true statement of my hours worked and mileage driven.

Revised August 1, 1999

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04/28/2000 14:45 5056775152 ELNTOWN OF EARTHQ 02

EMPLOYEE TIME CARD

Employee Name: George Friend Employee No: 6298 Dept: 6517 Week Ending: May-5-00

PROJECT DESCRIPTION	PROJECT NO. X-XXX-XXXXX-X	TASK NO. XX	ACTV CODE	OVRID DEPT CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	*BILBL HOURS	MILEAGE QTY.	MILEAGE RATE	MILEAGE TOTAL	# OF TRIP CHGS / *BILBL MILES
Drain line testing Elkhorn operating Co.	0-517-000039			D	R			10	5				15	* 15				
					O									*				T
				C P4	M			275	275						M 550	0.325	$178.75	M 550
Set up job for welding inspector with Citizen's Pipeline	0-006-11000		04 AM	D	R					4			4	*				
					O									*				T
				C	M										M 0	0.325	$0.00	M
Marketing Phone Calls	0-006-11000		04 AM	D	R						4		4	*				
					O								O 0	*				T
				C	M										M 0	0.325	$0.00	M
Trip to Salt Lake City for Pipeline and Energy meeting	0-006-11000		04 AM	D	R						5		R 5	*				
					O								O 0	*				T
				C	M										M 0	0.325	$0.00	M
Pipeline and Energy meeting Salt Lake City	0-006-11000		04 AM	D	R							10	R 10	*				
					O								O 0	*				T
				C	M										M 0	0.325	$0.00	M
				D	R								R 0	*				
					O								O 0	*				T
				C	M										M 0	0.325	$0.00	M
SUBTOTAL FROM ADDITIONAL PAGES:				D	R								R 0	*				
					O								O 0	*				T
				C	M										M 0	0.325	$0.00	M
Non-Tracked Proposal	00-PROPOSAL			D	R								R 0	*				
					O								O 0	*				T
				C	M										M	0.325	$0.00	M
Non-Chargeable	0-006-11000			D	R					5			5	*				
					O								O 0	*				T
				C	M										O 0	0.325	$0.00	M
REGULAR HRS WORKED					R	0	0	10	5	9	9	10	O 43					
OVERTIME HRS WORKED					O	0	0	0	0	0	0	0	O 0					
HOLIDAY HRS TAKEN	0-006-13000												H 0					
VACATION HRS TAKEN	0-006-15000												V 0					
SICK LEAVE HRS TAKEN	0-006-14000												S 0					
TOTAL HOURS and MILEAGE:						0	0	10	5	9	9	10	T 43	15	550		$178.75	

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #	OVRID	PER DIEM QTY	QTY	RATE	TOTAL	* BILBL P.D.
Elkhorn operating Co.	0-517-000039		D	1	1	75	$75	$75

EMPLOYEE SIGNATURE George Friend

I certify the above to be a true statement of my hours worked and mileage driven.

☑ Salary ☐ Hourly

Supervisor's Signature Dud Sibley

* Billable columns for office use only

H:\time 55.wb3

Employee Name GEORGE FRIEND Employee No 6274 Dept 0217 Week Ending ~~4/7.4~~ 0-00

PROJECT DESCRIPTION	PROJECT NO. X - XXX - XXXXX - X	TASK NO. XX	ACTV CODE	OVRD DEPT CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	* BILBL HOURS	MILEAGE QTY.	MILEAGE RATE	MILEAGE TOTAL	# OF TRIP CHRGS * BILBL MILES
DRAIN LINE TESTING ELKHORN OPER	0-517-000039			D	R	3		9	11	11	10	10	R 54	* 54				
					O								O	*				T
				54	M	30		30	30	30	30	276	→		M 426	0.325	138.45	M * 426
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M *
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M *
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M *
				D	R								R	*				
					O								O	*				T
				C	M								→		M			M *
				D	R								R	*				
					O								O	*				T
SUBTOTAL FROM ADDITIONAL PAGES:				C	M								→		M			M *
				D	R								R	*				
					O								O	*				T
Non-Tracked Proposal	0-0PROPOSAL			C	M								→		M			M *
				D	R								R	*				
					O								O	*				T
Non-Chargeable	0-006-11000			C	M								→		M			M *
				D	R													
					O													T
				C	M								→			~~0.325~~	0.00	M *
REGULAR HRS WORKED	→				R	3		9	11	11	10	10	R 54					
OVERTIME HRS WORKED	→				O								O					
HOLIDAY HRS TAKEN	0-006-13000 →				H								H					
VACATION HRS TAKEN	0-006-15000 →				V								V					
SICK LEAVE HRS TAKEN	0-006-14000 →				S								S				138.45	
TOTAL HOURS and MILEAGE:	→				T	3		9	11	11	10	10	54	54	426		138.45	

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #		OVRD		PER DIEM QTY							PER DIEM DESC	QTY	RATE	TOTAL	* BILBL P.D.
ELKHORN OPER	0-517-000039			D		1	1	1	1	1	1			6	75	450	* 450
				D													*

EMPLOYEE SIGNATURE [signature]

I certify the above to be a true statement of my hours worked and mileage driven.

☑ Salary
☐ Hourly

Supervisor's Signature [signature]

Revised August 1, 1999

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04/28/2000 14:45

Employee Name GEORGE FRIEND Employee No 6288 Dept. 6917 Week Ending 4-21-00 Page 1 of 1

PROJECT DESCRIPTION	PROJECT NO. X - XXX - XXXXX - X	TASK NO. XX	ACTV CODE	OVRD DEPT CLASS		SAT	SUN	MON	TUE	WED	THR	FRI	TOTAL HOURS	*BILL HOURS	MILEAGE QTY.	MILEAGE RATE	MILEAGE TOTAL
RATIO LINE TESTING				D	R			5	7		8	10	R 30	*30			
ELKHORN OPERATING	0-517-000039			84	O								O	*			
					M			246	80		30	30			M396	0.325	128.45
EL PASO ENERGY				D	R					6	2		R 8	*			
TOW SHOWING	0-0PROPOSAL.				O								O	*			
				C	M					26					M26	0.325	8.45
				D	R								R	*			
					O								O	*			
				C	M												
				D	R								R	*			
					O								O	*			
				C	M												
				D	R								R	*			
					O								O	*			
				C	M												
				D	R								R	*			
					O								O	*			
				C	M												
SUBTOTAL FROM ADDITIONAL PAGES:				D	R								R	*			
					O								O	*			
				C	M												
Non-Tracked Proposal	0-0PROPOSAL			D	R								R	*			
					O								O	*			
				C	M												
Non-Chargeable	0-008-11000			D	R			3					3				
					O												
				C	M												
REGULAR HRS WORKED					R			8	7	6	10	10	R 41			0.310	0.00
OVERTIME HRS WORKED					O								O				
HOLIDAY HRS TAKEN	0-008-13000				H								H				
VACATION HRS TAKEN	0-008-15000				V								V				
SICK LEAVE HRS TAKEN	0-008-14000				S								S				
TOTAL HOURS and MILEAGE:					T			8	7	6	10	10	41	30	412	X	133.90

PER DIEM: PROJECT DESCR.	PROJECT NO.	TASK #	OVRD	PER DIEM QTY						PER DIEM DESC	QTY	RATE	TOTAL
ELKHORN OPERATING	0-517-000039		O			1	1	1	1	1		5	75	375
			D											

EMPLOYEE SIGNATURE [signature] I certify the above to be a true statement of my hours worked and mileage driven.

☑ Salary ☐ Hourly

Supervisor's Signature [signature]

Revised August 1, 1999

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515

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AUTOMATED VALVE PRODUCTS
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Dallas, TX 75320-0822

WILSON
THE 24-HOUR COMPANY

AVP

D TO: 0200500
AGRA EARTH AND ENVIRONMENTAL
8519 JEFFERSON NE

ALBUQUERQUE, NM 87113

DI SALES ORDER NO.: 0141368826001

STORE: CARLSBAD

CUSTOMER PURCHASE ORDER NO.:

DATE: 04/04/00

ORDERED BY: GOERGE FREIND

DATE SHIPPED: 04/24/00

PPED VIA:

SHIPPED TO:
CARLSBAD NM
EDDY CO,

F.O.B.

PPD/COL MILEAGE
PPD

RIG NO.

LD AND LEASE:

ORDERED	SHIP	B/O	UM	ITEM	DESCRIPTION OF MATERIAL			UNIT LIST	DISC.		UNIT NET	NET AMOUNT
1.00	1.00	0.00	EA	650	3V5/8" X 500' HOSE,VIN			141.790	0.00		141.790	141.79
1.00	1.00	0.00	EA	650	SWIVEL,3/4PS X 3/4H.			3.990	0.00		3.990	3.99
4.00	4.00	0.00	EA	89008	FLG- BLIND, A105	RF 150# FRN	6"	21.940	0.00	0	21.940	87.76
4.00	4.00	0.00	EA	84874	FLG- BLIND, A105	RF 150# FRN	4"	14.060	0.00	0	14.060	56.24
4.00	4.00	0.00	EA	35255	GSKT-FLG,304SS & MICA/GRAPH. CS CTR RING	150#	6"	7.380	-25.00	0	5.540	22.16
4.00	4.00	0.00	EA	35252	GSKT-FLG,304SS & MICA/GRAPH. CS CTR RING	150#	4"	5.330	-25.00	0	4.000	16.00
1.00	1.00	0.00	EA	400	8" CHERNE TEST BALL.			124.380	0.00		124.380	124.38
1.00	1.00	0.00	LT	999	GREYHOUND 602529.			13.650	0.00		13.650	13.65
4.00	4.00	0.00	EA	400	2" SURE TEST INFLATABLE PLUG.			31.730	0.00		31.730	126.92
1.00	1.00	0.00	EA	133	AIR PUMP			24.950	0.00		24.950	24.95
1.00	1.00	0.00	EA	216	SIZE #10 HIP WADERS.			105.840	0.00		105.840	105.84
1.00	1.00	0.00	EA	16305	ELBOW- STD, 90 DEGREE BLACK MALL IRON		2"	12.880	-70.00	0	3.860	3.86
1.00	1.00	0.00	EA	16852	NIP- PIPE, B/W STD BLK TBE		2 X 4	2.770	-40.00	0	1.660	1.66
1.00	1.00	0.00	EA	16277	CAP- PIPE, STANDARD BLACK MALL IRON		1"	1.170	0.00	0	1.170	1.17
1.00	1.00	0.00	EA	16279	CAP- PIPE, STANDARD BLACK MALL IRON		1-1/2"	4.920	-65.00	0	1.720	1.72
1.00	1.00	0.00	EA	16280	CAP- PIPE, STANDARD BLACK MALL IRON		2"	7.180	-65.00	0	2.510	2.51
1.00	1.00	0.00	EA	400	1-1/2" STEEL LAMANATED LOCKS			31.100	0.00		31.100	31.10
1.00	1.00	0.00	EA	133	4 10' PEICES OF 2" PVC PIPE.			13.950	0.00		13.950	13.95
4.00	4.00	0.00	EA	46870	ELBOW- PVC, 90 DEG S/40	SOC	2"	1.860	0.00	0	1.860	7.44
2.00	2.00	0.00	EA	46876	COUPLING- PVC, S40	SOC	2"	1.110	0.00	0	1.110	2.22

IVERED BY: P/U

RECEIVED BY:

UNDER LINED ITEMS.
NOT CHARGED TO
CLIENT

789.31USD

271-4/99

ORDER IS SUBJECT TO THE TE AND CONDITIONS SET FORTH ON THE REVERSE SIDE
OF WHICH TERMS AND CONI DEAL WITH (AMONG OTHER MATTERS) QUOTATIONS
YMENT TERMS, WARRANTIES, G & DELIVERY, INSURANCE AND TAXES. BY PLACING
OR TOMER SO G I SAID ID CONI CONSTI
SOLE AGREEMENT APPLICABLE TO THIS ORDER.

D INA L S RE R

CONTINUED

SMITH WILSON SUPPLY

WILSON

Business Unit of Smith International, Inc.

WILSON SUPPLY, WILSON INTERNATIONAL DEPARTMENT
AUTOMATED VALVE PRODUCTS
Main Office 1302 Conti, P.O. Box 1492, Houston, TX 77251-1492 Phone (713) 237-3700

Remit To:
P.O. Box 200822
Dallas, TX 75320-0822

WILSON
THE 24-HOUR COMPANY

AVP

SOLD TO: 0200500
AGRA EARTH AND ENVIRONMENTAL
8519 JEFFERSON NE

ALBUQUERQUE, NM 87113

DI SALES ORDER NO.: 014136826001

STORE: CARLSBAD

CUSTOMER PURCHASE ORDER NO.:

DATE: 04/04/00

ORDERED BY: GOERGE FREIND

DATE SHIPPED: 04/24/00

SHIPPED VIA: P/U

SHIPPED TO:
CARLSBAD NM
EDDY CO,

F.O.B. PPD/COL MILEAGE PPD

RIG NO.

FIELD AND LEASE:

LINE	ORDERED	SHIP	B/O	UM	ITEM	DESCRIPTION OF MATERIAL	UNIT LIST	DISC.	UNIT NET	NET AMOUNT
21	1.00	1.00	0.00	EA	202	1/2 PINT 705 MED BOND CEMENT.	3.160	0.00	3.160	3.16
22	1.00	1.00	0.00	EA	55170	CLEANER- PVC, C-10 C-65 1/2-PINT CAN	3.210	0.00 D	3.210	3.21
23	4.00	4.00	0.00	EA	400	PCX5622 2 X 2 CPLNG,FLEX.	3.240	0.00	3.240	12.96
24	2.00	2.00	0.00	EA	400	2" CANTEX ADAPTER.	3.750	0.00	3.750	7.50

THANK YOU FOR YOUR BUSINESS!!!!!!!!!

( ) SACKS ( ) BUNDLES ( ) COILS ( ) DRUMS ( ) PALLETS ( ) BOXES ( ) JOINTS

DELIVERED BY: P/U

RECEIVED BY:

816.14USD

6.1875% NEW MEXICO RECEIPTS IN CARLSBAD/EDDY ON 816.14USD 50.52USD

SII 271-4/99

THIS ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SET FORTH ON THE REVERSE SIDE HEREOF WHICH TERMS AND CONDITIONS DEAL WITH (AMONG OTHER MATTERS) QUOTATIONS [illegible] RANTIES, NG & DI INSURA TAXES CING THIS ORDER CUSTOMER AND WILSON AGREE THAT SAID TERMS AND CONDITIONS CONSTITUTE THE SOLE AGREEMENT APPLICABLE TO THIS ORDER.

D

OR COMPLETE SALES ORDER

866.66USD

RED MAN

PIPE AND SUPPLY

CREDIT CARD

19688990

PAGE 1

CUSTOMER ORDER NO.	ORDERED BY:	SHIPPED FROM:	TAX CODE	DATE SHIPPED	INVOICE DATE
4154665240008577060l		RED MAN PIPE AND S	050003	04/28/2000	04/28/2000

LOCATION REFERENCE	FREIGHT	TERMS
SUPPLIES	PREPAID	NET 30 DAYS

CUSTOMER NUMBER	FOB	SHIP VIA
19100601	DEST	P/U

SOLD TO:	SHIP TO:
CREDIT CARD MISC.	P/U 4/28/00

ITEM	QUANTITY	DESCRIPTION AND COMMENTS	PART I.D.	UNIT PRICE	UNITS	DISC. %	AMOUNT PAYABLE
1	1.00	2 835-020 SCH/80 PVC FIP ADPT	2550298	$51.1800	EA	70.00%	$15.35
002	1.00	1 X 1/2 STD BLK MALL RED	3260280	$4.7500	EA	67.00%	$1.57
003	1.00	2 X 1 STD SMLS SWAGE	2809820	$39.1300	EA	68.00%	$12.52
				SUB-TOTAL			$29.44
		TAX: 6.188% = 5.00% NM, 1.1876% ARTESIA					$1.82
***		END OF TICKET 19688990		TOTAL AMOUNT DUE			$31.26
		PRICES SUBJECT TO REVIEW AND MODIFICATION					
		PAID BY CREDIT CARD					
		**** CREDIT CARD TRANSACTION ****					
		**********					
		INQUIRIES TO: RED MAN PIPE AND SUPPLY CO.					
		* 605-748-3307 *					
		**********					

P.O. Box 35632
Tulsa, Oklahoma 74153-0632
(918) 250

SIGNATURE: _____

RM-221 Rev. 9/98

Limited warranties, terms and conditions of Red Man, as revised March 4, 1982, are incorporated by reference.

www.redman.com

George A. Friend

2 Tara Rd.
Belen, NM 87002
e-mail friend82@juno.com
(505)864-9677

Career Objective

Environmental Project Manager for medium to large corporation.

Education

BA Chemistry - 1991
Western State College

Professional Registration

National Registry of Environmental Professionals, Registered Environmental Property Assessor(REPA) #2930

Environmental Project Experience - 10 Years

- Planned, directed and coordinated the activities of contractors involved in remediation projects.
- Maintained excellent track record of project completion.
- Contributed to profitability by controlling project cost.
- Researched and recommended alternative methods of remediation.
- Approved expenditures necessary for completion of project.
- Conferred with local regulatory agencies.
- Identified problems, diagnosed causes and determined corrective actions.
- Maintained project records and produced reports for the Federal Energy Regulatory Commission (FERC).
- Prepared and presented FERC, OSHA and EPA training courses.
- Maintained and operated soil vapor extraction systems.
- Installed ground water monitoring wells.

Related Work Experience

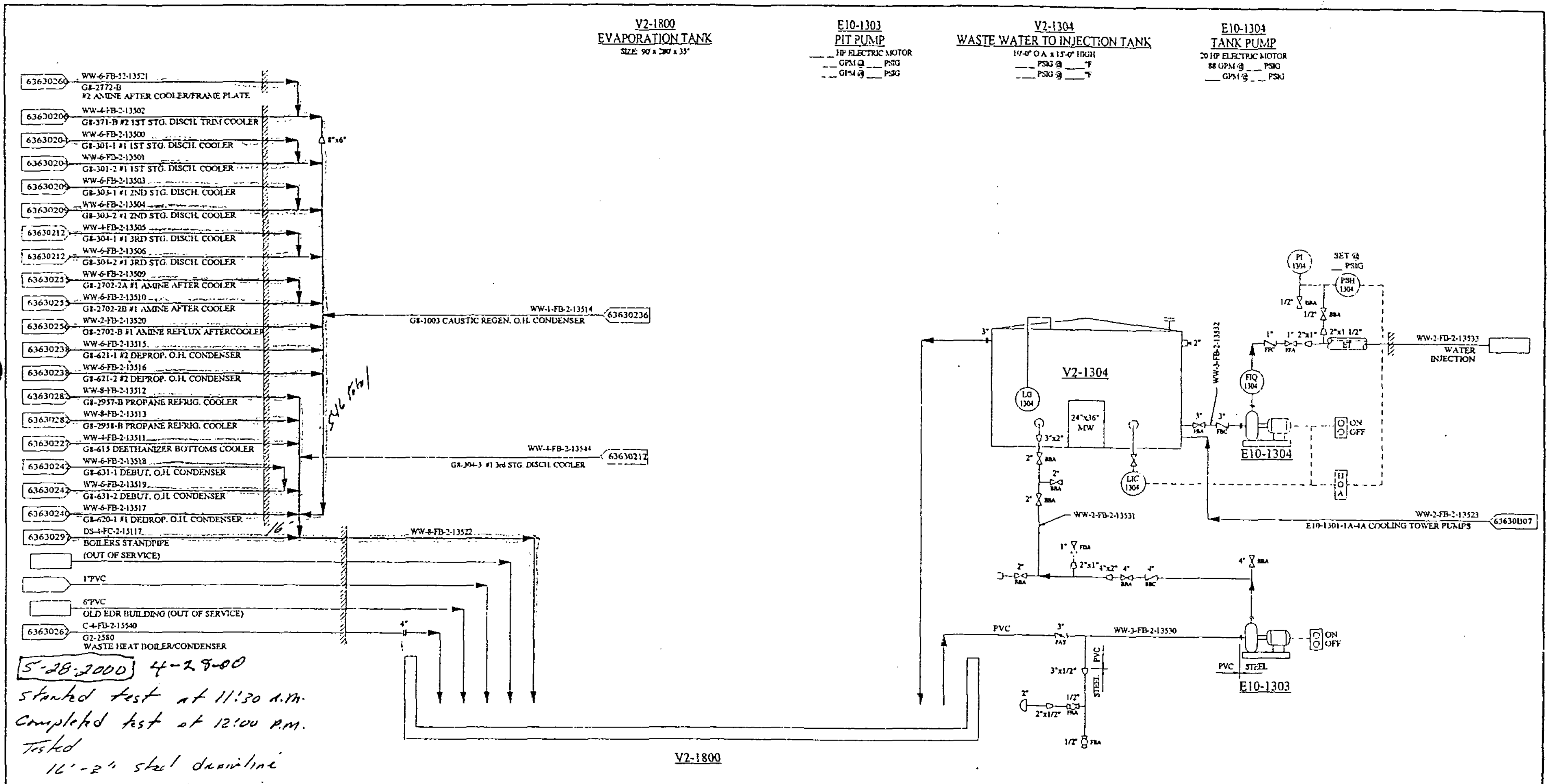
- Oil and Gas exploration - 8 years
- Over the road truck driver - 7 years
- Bridge construction iron worker - 3 years
- U.S. Navy heavy equipment operator - 4 years

Training Certificates Held

- OSHA 29 CFR 1910.120 40 hour Hazardous Waste Operations and Emergency Response
- EPA 165.15 Emergency Response to Hazardous Materials Incidents
- OSHA Hazardous Materials First Responder Incident Commander
- OSHA Permit Required Confined Space Entry
- Hazardous Waste Operations Management/Supervisor
- NESHAP Asbestos Training
- EPA/AHERA Contractor/Supervisor for Asbestos Control
- NORM Radiation Surveying and Control

References

References and work history available upon request.



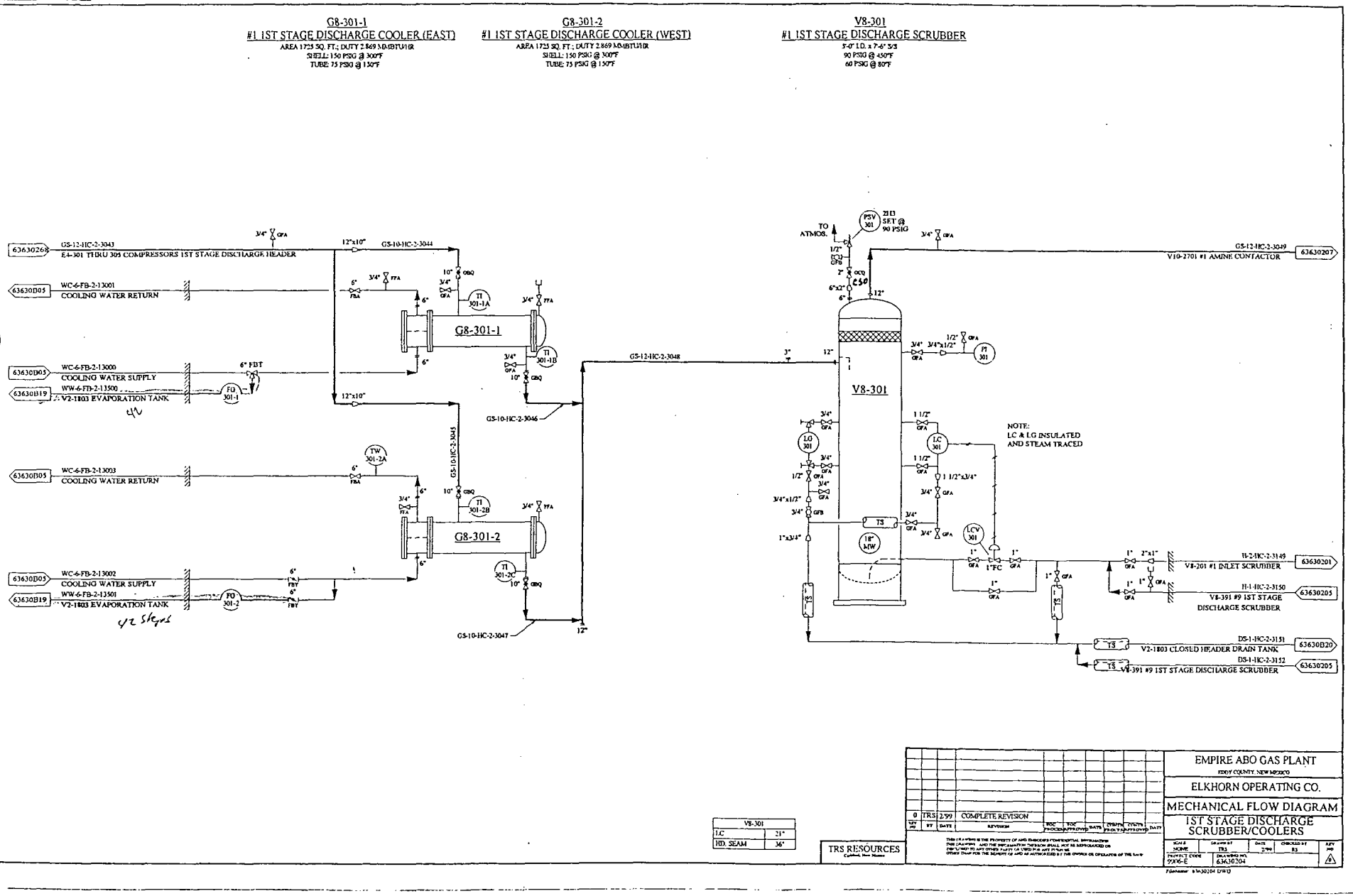
5-28-2000 4-28-00
Started test at 11:30 A.M.
Completed test at 12:00 P.M.
Tested
16' - 2" Steel drainline
332' - 4" Steel drainline
1120' - 6" Steel drainline
660' - 8" Steel drainline

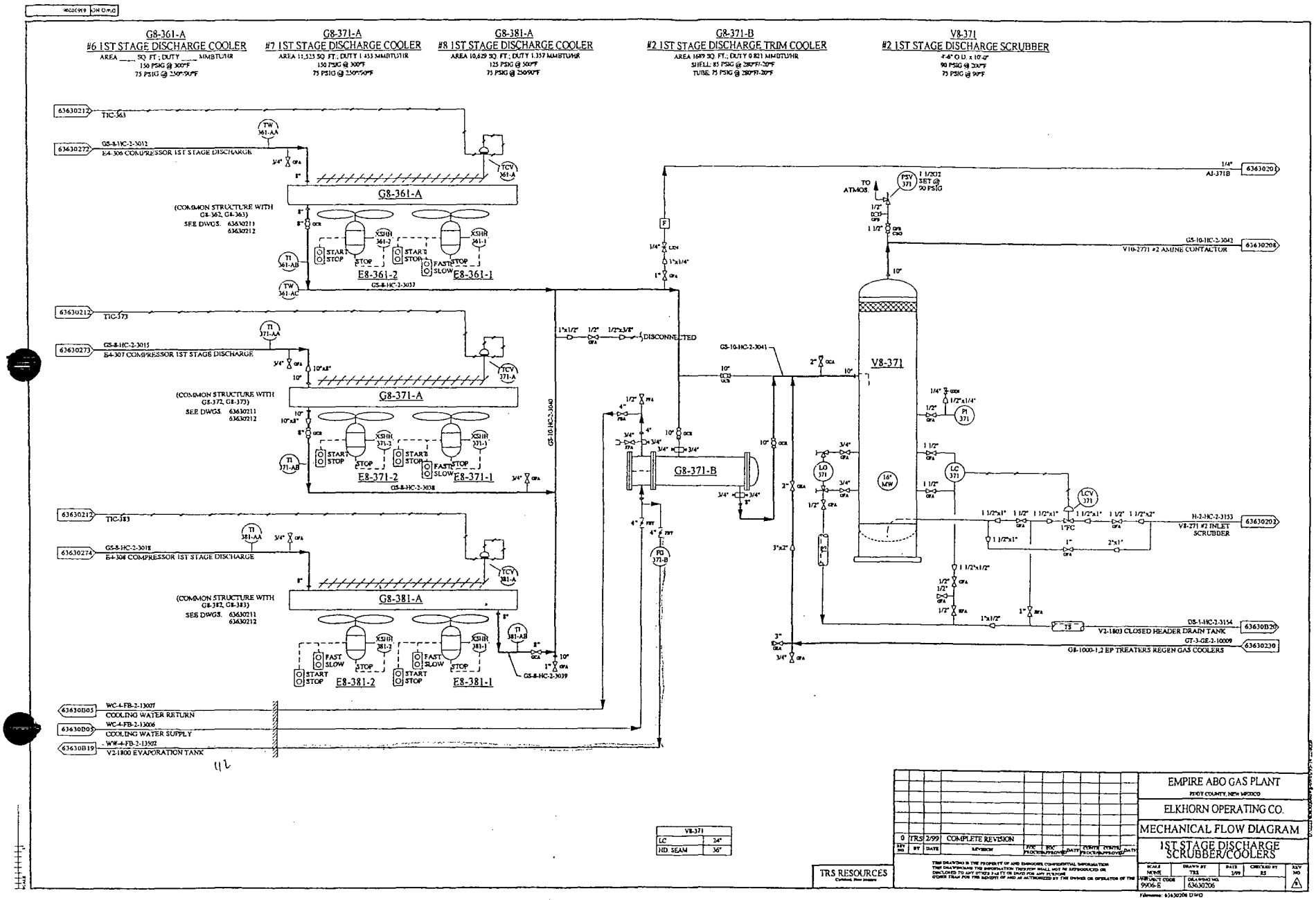
Note: Found minimal leak on 4" sight glass. Discussed problems with operator and determined that the test results were still good.

TRS RESOURCES

0	TKS		COMPLETE REVISION

EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
EVAPORATION TANK


G8-301-1
#1 1ST STAGE DISCHARGE COOLER (EAST)
AREA 1725 SQ. FT.; DUTY 2.869 MMBTU/HR
SHELL: 150 PSIG @ 300°F
TUBE: 75 PSIG @ 150°F
G8-301-2
#1 1ST STAGE DISCHARGE COOLER (WEST)
AREA 1725 SQ. FT.; DUTY 2.869 MMBTU/HR
SHELL: 150 PSIG @ 300°F
TUBE: 75 PSIG @ 150°F
V8-301
#1 1ST STAGE DISCHARGE SCRUBBER
3'-0" I.D. x 7'-6" S/S
90 PSIG @ 450°F
60 PSIG @ 80°F
63630268
GS-12-HC-2-3043
E4-301 THRU 305 COMPRESSORS 1ST STAGE DISCHARGE HEADER
GS-10-HC-2-3044
WC-6-FB-2-13001
COOLING WATER RETURN
63630B05
G8-301-1
TI 301-1A
TI 301-1B
WC-6-FB-2-13000
COOLING WATER SUPPLY
WW-6-FB-2-13500
V2-1803 EVAPORATION TANK
63630B19
FQ 301-1
GS-12-HC-2-3048
GS-10-HC-2-3046
WC-6-FB-2-13003
COOLING WATER RETURN
TW 301-2A
GS-10-HC-2-3045
G8-301-2
TI 301-2B
TI 301-2C
WC-6-FB-2-13002
COOLING WATER SUPPLY
WW-6-FB-2-13501
V2-1803 EVAPORATION TANK
FQ 301-2
GS-10-HC-2-3047
TO ATMOS.
PSV 301
2ND SET @ 90 PSIG
V8-301
PI 301
LG 301
LC 301
LCV 301
18" MW
NOTE:
LC & LG INSULATED
AND STEAM TRACED
GS-12-HC-2-3049
V10-2701 #1 AMINE CONTACTOR
63630207
H-2-HC-2-3149
V8-201 #1 INLET SCRUBBER
63630201
H-1-HC-2-3150
V8-391 #9 1ST STAGE DISCHARGE SCRUBBER
63630205
DS-1-HC-2-3151
V2-1803 CLOSED HEADER DRAIN TANK
63630B20
DS-1-HC-2-3152
V8-391 #9 1ST STAGE DISCHARGE SCRUBBER
63630205
V8-301
I.C. 21'
HD. SEAM 36'
TRS RESOURCES
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
1ST STAGE DISCHARGE SCRUBBER/COOLERS
0 TRS 2/99 COMPLETE REVISION
SCALE NONE
DRAWN BY TRS
DATE 2/99
CHECKED BY RS
PROJECT CODE 99AK-E
DRAWING NO. 634.10.204
REV NO 0
Filename: 634.10.204 DWG


G8-361-A
#6 1ST STAGE DISCHARGE COOLER
AREA ____ SQ FT ; DUTY ____ MMBTU/HR
150 PSIG @ 300°F
75 PSIG @ 250°/90°F
G8-371-A
#7 1ST STAGE DISCHARGE COOLER
AREA 11,525 SQ FT ; DUTY 1.453 MMBTU/HR
150 PSIG @ 300°F
75 PSIG @ 250°/90°F
G8-381-A
#8 1ST STAGE DISCHARGE COOLER
AREA 10,629 SQ FT ; DUTY 1.357 MMBTU/HR
125 PSIG @ 300°F
75 PSIG @ 250/90°F
G8-371-B
#2 1ST STAGE DISCHARGE TRIM COOLER
AREA 1689 SQ FT ; DUTY 0.821 MMBTU/HR
SHELL: 85 PSIG @ 280°FT-20°F
TUBE: 75 PSIG @ 280°FT-20°F
V8-371
#2 1ST STAGE DISCHARGE SCRUBBER
4'-6" O.D. x 10'-0"
90 PSIG @ 200°F
75 PSIG @ 90°F
63630212
TIC-363
63630272
GS-8-HC-2-3032
E4-306 COMPRESSOR 1ST STAGE DISCHARGE
TW 361-AA
TCV 361-A
G8-361-A
(COMMON STRUCTURE WITH G8-362, G8-363)
SEE DWGS. 63630211 63630212
XSH 361-2
XSH 361-1
START STOP
FAST SLOW
E8-361-2
E8-361-1
TI 361-AB
TW 361-AC
GS-8-HC-2-3033
63630213
TIC-373
63630273
GS-8-HC-2-3035
E4-307 COMPRESSOR 1ST STAGE DISCHARGE
TI 371-AA
TCV 371-A
G8-371-A
(COMMON STRUCTURE WITH G8-372, G8-373)
SEE DWGS. 63630211 63630212
XSH 371-2
XSH 371-1
E8-371-2
E8-371-1
TI 371-AB
GS-8-HC-2-3038
GS-10-HC-2-3040
1"x1/2" 1/2" 1/2"x3/8"
DISCONNECTED
63630212
TIC-383
63630274
GS-8-HC-2-3018
E4-308 COMPRESSOR 1ST STAGE DISCHARGE
TI 381-AA
TCV 381-A
G8-381-A
(COMMON STRUCTURE WITH G8-382, G8-383)
SEE DWGS. 63630211 63630212
XSH 381-2
XSH 381-1
FAST SLOW
START STOP
E8-381-2
E8-381-1
TI 381-AB
GS-8-HC-2-3039
63630B05
WC-4-FB-2-13007
COOLING WATER RETURN
63630B09
WC-4-FB-2-13006
COOLING WATER SUPPLY
WW-4-FB-2-13502
63630B19
V2-1800 EVAPORATION TANK
G8-371-B
FQ 371-B
GS-10-HC-2-3041
V8-371
TO ATMOS.
PSV 371
1 1/2x2 SET @ 90 PSIG
AI-371B
63630201
GS-10-HC-2-3042
V10-2771 #2 AMINE CONTACTOR
63630208
PI 371
LC 371
LCV 371
LG 371
LSH 371
LSL 371
TS
H-2-HC-2-3153
V8-271 #2 INLET SCRUBBER
63630202
DS-1-HC-2-3154
V2-1803 CLOSED HEADER DRAIN TANK
63630B20
GT-3-GE-2-10009
G8-1000-1,2 EP TREATERS REGEN GAS COOLERS
63630230
V8-371
LC 24"
HD. SEAM 36"
TRS RESOURCES
0 TRS 2/99 COMPLETE REVISION
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
1ST STAGE DISCHARGE SCRUBBER/COOLERS
DRAWING NO. 63630206
Filename: 63630206.DWG

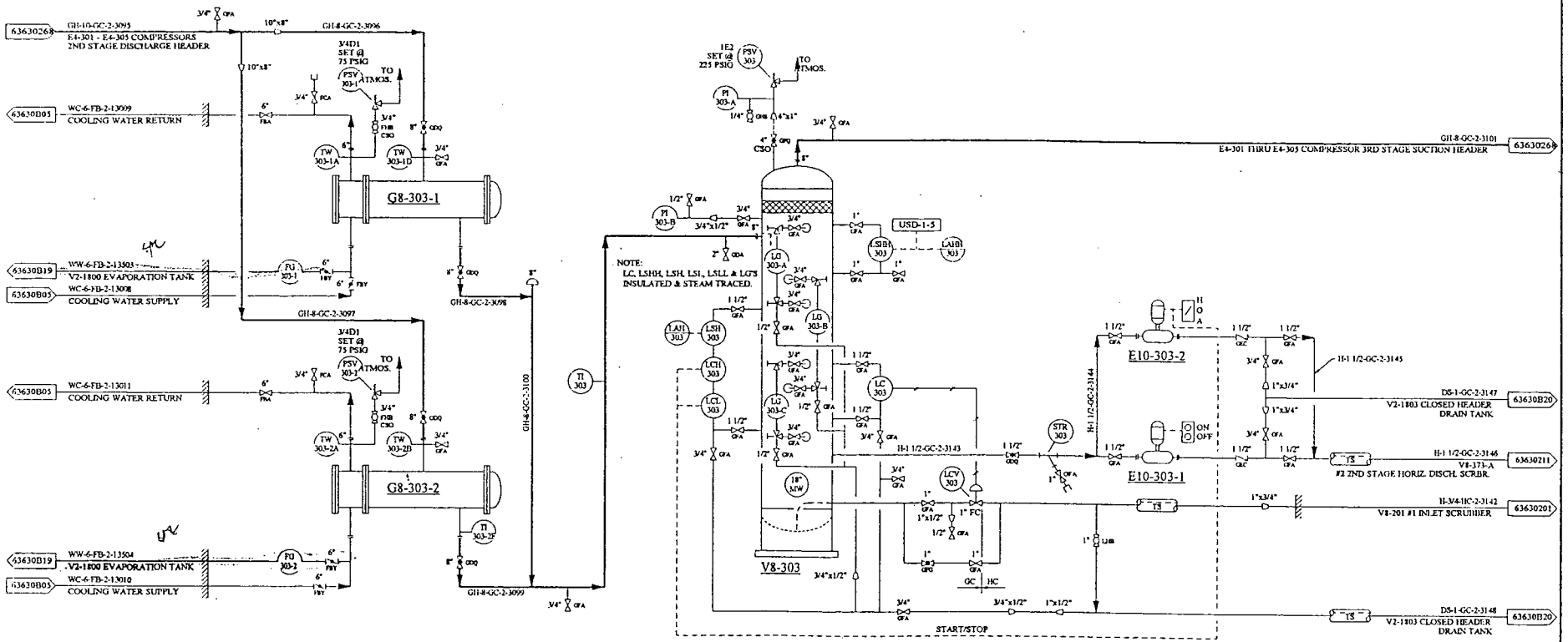
G8-303-1
#1 2ND STAGE DISCHARGE COOLER (EAST)
AREA 1048 SQ. FT.; DUTY 2.146 MMBTU/HR
SHELL: 250 PSIG @ 300°F/200 PSIG @ 250°F/75°F
TUBE: 45 PSIG @ 150°F/33 PSIG @ 70°F/90°F

G8-303-2
#1 2ND STAGE DISCHARGE COOLER (WEST)
AREA 1048 SQ. FT.; DUTY 2.146 MMBTU/HR
SHELL: 250 PSIG @ 300°F/200 PSIG @ 250°F/75°F
TUBE: 45 PSIG @ 150°F/33 PSIG @ 70°F/90°F

V8-303
#1 2ND STAGE DISCHARGE SCRUBBER
42" I.D. x 10'-0" S/S
225 PSIG @ 450°F
210 PSIG @ 78°F

E10-303-1
#1 2ND STAGE DISCHARGE PUMP (NORTH)
2"x1 1/2"-6" 3 HP ELECTRIC MOTOR
7 GPM @ ____ PSIG
____ GPM @ ____ PSIG

E10-303-2
#1 2ND STAGE DISCHARGE PUMP (SOUTH)
2"x1 1/2"-6" 3 HP ELECTRIC MOTOR
7 GPM @ ____ PSIG
____ GPM @ ____ PSIG



V8-303	
LSHH	68"
LSH	47"
LC	15"
LCH	44"
LCL	28"
HD. SEAM	3'-0"

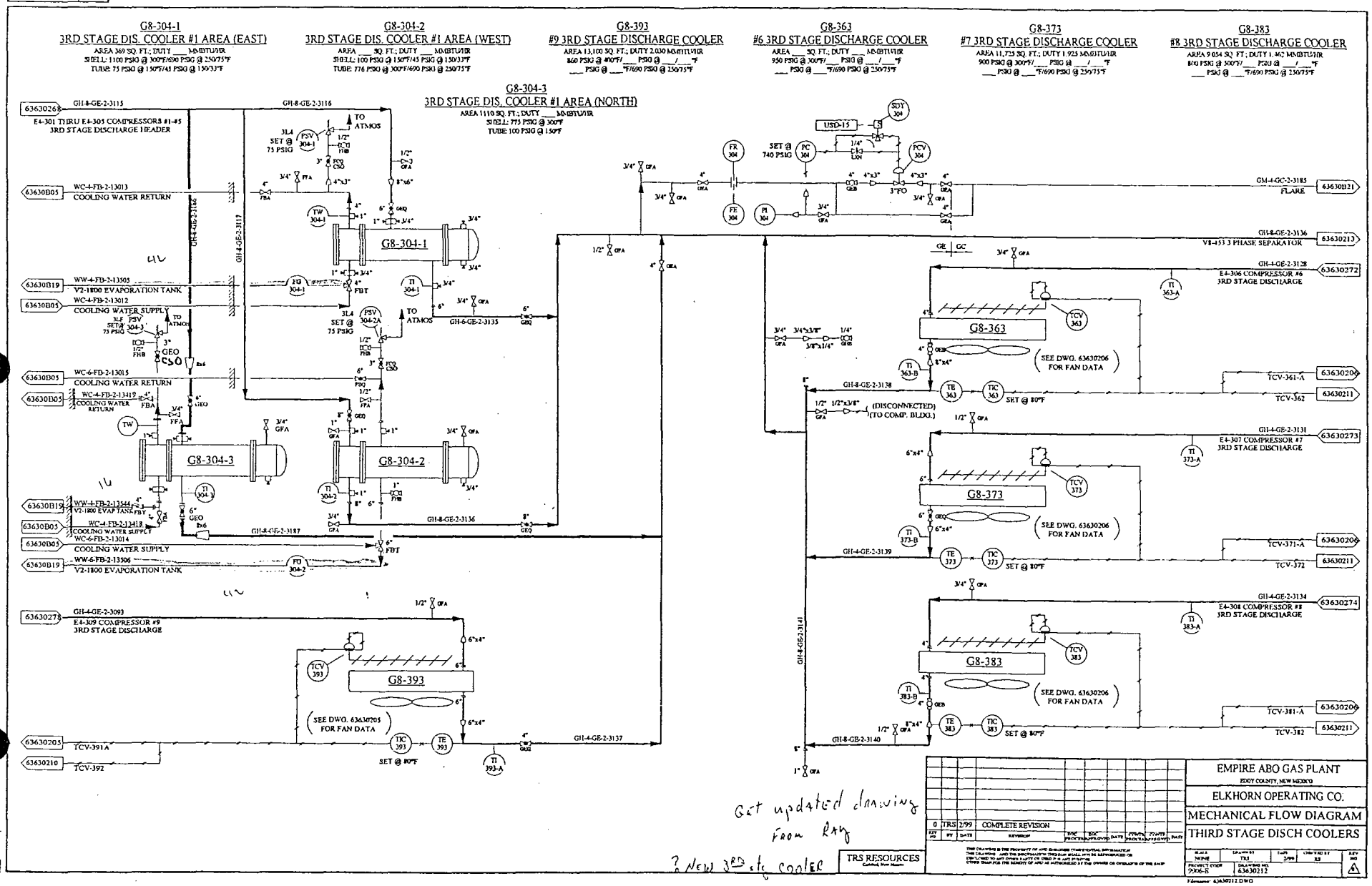
NO	BY	DATE	REVISION	ENGR PROCESS APPROVED	DATE	CONSTR PROCESS APPROVED	DATE
0	TRS	2/99	COMPLETE REVISION				

TRS RESOURCES
Carlsbad, New Mexico

EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
2ND STAGE DISCHARGE COOLERS/SCRUBBER

DRAWN BY	TRS	DATE 2/99	VERSION 03
PROJECT CODE 9906-B	DRAWING NO 6,630,209		REV NO 0

Filename: 6630209.DWG


G8-304-1
3RD STAGE DIS. COOLER #1 AREA (EAST)
AREA 369 SQ. FT.; DUTY ___ MMBTU/HR
SHELL: 1100 PSIG @ 300°F/690 PSIG @ 250/775°F
TUBE: 75 PSIG @ 150°F/45 PSIG @ 150/33°F
G8-304-2
3RD STAGE DIS. COOLER #1 AREA (WEST)
AREA ___ SQ. FT.; DUTY ___ MMBTU/HR
SHELL: 100 PSIG @ 150°F/45 PSIG @ 150/33°F
TUBE: 776 PSIG @ 300°F/690 PSIG @ 250/75°F
G8-393
#9 3RD STAGE DISCHARGE COOLER
AREA 13,100 SQ. FT.; DUTY 2.030 MMBTU/HR
860 PSIG @ 400°F/___ PSIG @ ___/___°F
___ PSIG @ ___°F/690 PSIG @ 250/75°F
G8-363
#6 3RD STAGE DISCHARGE COOLER
AREA ___ SQ. FT.; DUTY ___ MMBTU/HR
950 PSIG @ 300°F/___ PSIG @ ___/___°F
___ PSIG @ ___°F/690 PSIG @ 250/75°F
G8-373
#7 3RD STAGE DISCHARGE COOLER
AREA 11,725 SQ. FT.; DUTY 1.925 MMBTU/HR
900 PSIG @ 300°F/___ PSIG @ ___/___°F
___ PSIG @ ___°F/690 PSIG @ 250/75°F
G8-383
#8 3RD STAGE DISCHARGE COOLER
AREA 9,054 SQ. FT.; DUTY 1.462 MMBTU/HR
870 PSIG @ 300°F/___ PSIG @ ___/___°F
___ PSIG @ ___°F/690 PSIG @ 250/75°F
G8-304-3
3RD STAGE DIS. COOLER #1 AREA (NORTH)
AREA 1110 SQ. FT.; DUTY ___ MMBTU/HR
SHELL: 775 PSIG @ 300°F
TUBE: 100 PSIG @ 150°F
63630268
GH-8-GE-2-3115
E4-301 THRU E4-305 COMPRESSORS #1-#5
3RD STAGE DISCHARGE HEADER
GH-8-GE-2-3116
TO ATMOS
3L4 SET @ 75 PSIG
PSV 304-1
63630B05
WC-4-FB-2-13013
COOLING WATER RETURN
63630B19
WW-4-FB-2-13505
V2-1800 EVAPORATION TANK
63630B05
WC-4-FB-2-13012
COOLING WATER SUPPLY
3L4 SET @ 75 PSIG
PSV 304-2A
TO ATMOS
GH-6-GE-2-3135
63630B05
WC-6-FB-2-13015
COOLING WATER RETURN
63630B05
WC-4-FB-2-13419
COOLING WATER RETURN
G8-304-1
G8-304-2
G8-304-3
TW 304-1
TI 304-1
TI 304-2
TI 304-3
63630B19
WW-4-FB-2-13544
V2-1800 EVAP TANK
63630B05
WC-4-FB-2-13418
COOLING WATER SUPPLY
63630B05
WC-6-FB-2-13014
COOLING WATER SUPPLY
63630B19
WW-6-FB-2-13506
V2-1800 EVAPORATION TANK
FQ 304-2
GH-8-GE-2-3187
GH-8-GE-2-3136
63630278
GH-4-GE-2-3093
E4-309 COMPRESSOR #9
3RD STAGE DISCHARGE
G8-393
TCV 393
SEE DWG. 63630205 FOR FAN DATA
TIC 393
SET @ 80°F
TE 393
TI 393-A
63630205
TCV-391A
63630210
TCV-392
GH-4-GE-2-3137
USD-15
SDV 304
FR 304
FE 304
PC 304
SET @ 740 PSIG
PI 304
PCV 304
GM-4-GC-2-3185
FLARE
63630B21
GH-8-GE-2-3136
V8-453 3 PHASE SEPARATOR
63630213
GH-4-GE-2-3128
E4-306 COMPRESSOR #6
3RD STAGE DISCHARGE
63630272
TI 363-A
G8-363
TCV 363
SEE DWG. 63630206 FOR FAN DATA
TI 363-B
TE 363
TIC 363
SET @ 80°F
TCV-361-A
63630206
TCV-362
63630211
GH-8-GE-2-3138
(DISCONNECTED) (TO COMP. BLDG.)
GH-4-GE-2-3131
E4-307 COMPRESSOR #7
3RD STAGE DISCHARGE
63630273
TI 373-A
G8-373
TCV 373
SEE DWG. 63630206 FOR FAN DATA
TI 373-B
TE 373
TIC 373
SET @ 80°F
TCV-371-A
63630206
TCV-372
63630211
GH-4-GE-2-3139
GH-4-GE-2-3134
E4-308 COMPRESSOR #8
3RD STAGE DISCHARGE
63630274
TI 383-A
G8-383
TCV 383
SEE DWG. 63630206 FOR FAN DATA
TI 383-B
TE 383
TIC 383
SET @ 80°F
TCV-381-A
63630206
TCV-382
63630211
GH-4-GE-2-3140
GH-4-GE-2-3141
Get updated drawing from Ray
? NEW 3RD stg cooler
TRS RESOURCES
0 TRS 2/99 COMPLETE REVISION
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
THIRD STAGE DISCH COOLERS
PROJECT ORDER 99XK-15
DRAWING NO. 63630212
Filename: 63630212.DWG

LEGEND ON DWG

G8-611
DEETHANIZER FEED EXCHANGER/CONDENSER

17' x 240" 871 SQ.FT., DUTY: 2.31 MMBTU
SHELL: 600 PSIG @ -20°/200°F/500 PSIG @ 90/75°F
TUBE: 600 PSIG @ -50°/200°F/500 PSIG @ 27/75°F

G8-615
DEETHANIZER BOTTOMS COOLER

8" x 384" 333 SQ.FT., DUTY: 1.33 MMBTU
SHELL: 535 PSIG @ 250°F/500 PSIG @ 130/110°F
TUBE: 75 PSIG @ 150°F/___ PSIG @ 130/100°F

G8-608
DEETHANIZER FEED/AMINE EXCHANGER

10' x 240" 243 SQ.FT., DUTY: 925 MMBTU
SHELL: 600 PSIG @ 535°F/500 PSIG @ 130/150°F
TUBE: 150 PSIG @ 500°F/120 PSIG @ 148/140°F

G8-612
DEETHANIZER FEED HEATER

240 SQ. FT., DUTY: 1.45 MMBTU
SHELL: 600 PSIG @ 200°F/-20 PSIG @ 75/250°F
TUBE: 600 PSIG @ 200°F/-50 PSIG @ 130/130°F

63630228 GT-4-GD-2-6032 V10-610 DEETHANIZER TOWER

63630229 GT-6-GD-2-6033 G8-614 DEETHANIZER OVERHEAD CONDENSER

63630228 DS-1/2-GC-2-6030 CLOSED DRAIN HEADER

63630222 H-4-GD-2-6007 E10-600-1B,2B DEETHANIZER FEED PUMPS

63630B05 WC-4-FB-2-13025 COOLING WATER RETURN

63630B19 WW-4-FB-2-13511 V2-1800 EVAPORATION TANK

63630B03 WC-4-FB-2-13024 COOLING WATER SUPPLY

63630233 H-3-GD-2-6027 V10-1000 BATCH CAUSTIC TANK

H-4-GD-2-6016

H-4-GD-2-6017

H-3-GD-2-6026

63630228 H-4-GD-2-6018 V8-610 DEETHANIZER FEED TANK

63630255 FY-608C

63630254 KM-3-GC-2-27019 F-2700C AFTER-CHARCOAL FILTER

63630253 KM-3-GC-2-27020 G8-2702-1A,B #1 AMINE AERIAL COOLERS

63630228 H-3-GD-2-6025 G8-613 DEETHANIZER REBOILER

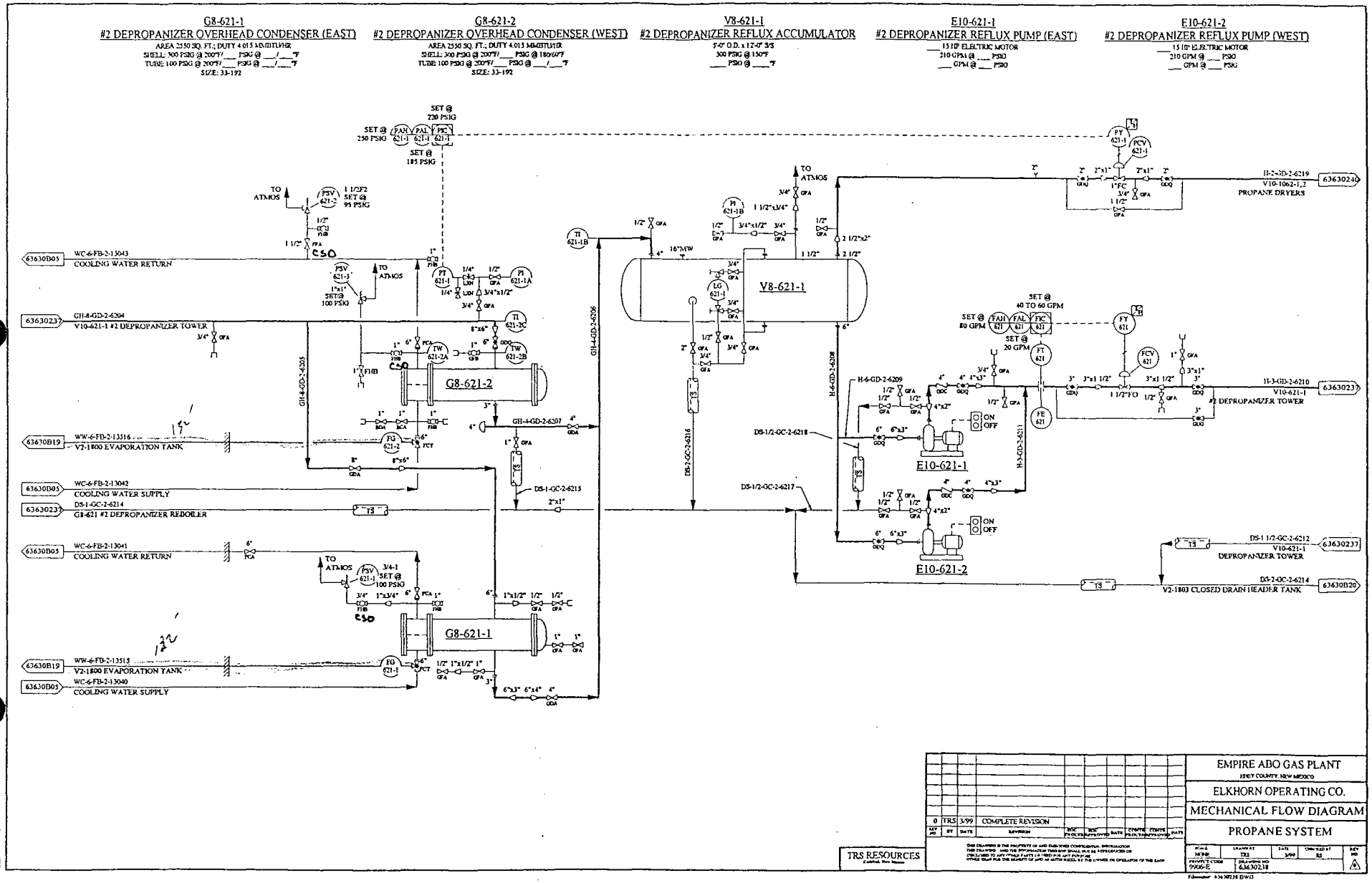
REV NO	BY	DATE	REVISION	DRC CHECKED/APPROVED	DATE	QC/PE CHECKED/APPROVED	DATE
0	TRS	3/99	COMPLETE REVISION				

TRS RESOURCES
Farmington, New Mexico

EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
DEETHANIZER EXCHANGERS

SCALE	DRAWN BY	DATE	CHECKED BY	REV NO
NONE	TRS	3/99	RS	0
PROJECT CODE 99146-E	DRAWING NO 636302?7			

Filename: 636302?7.DWG



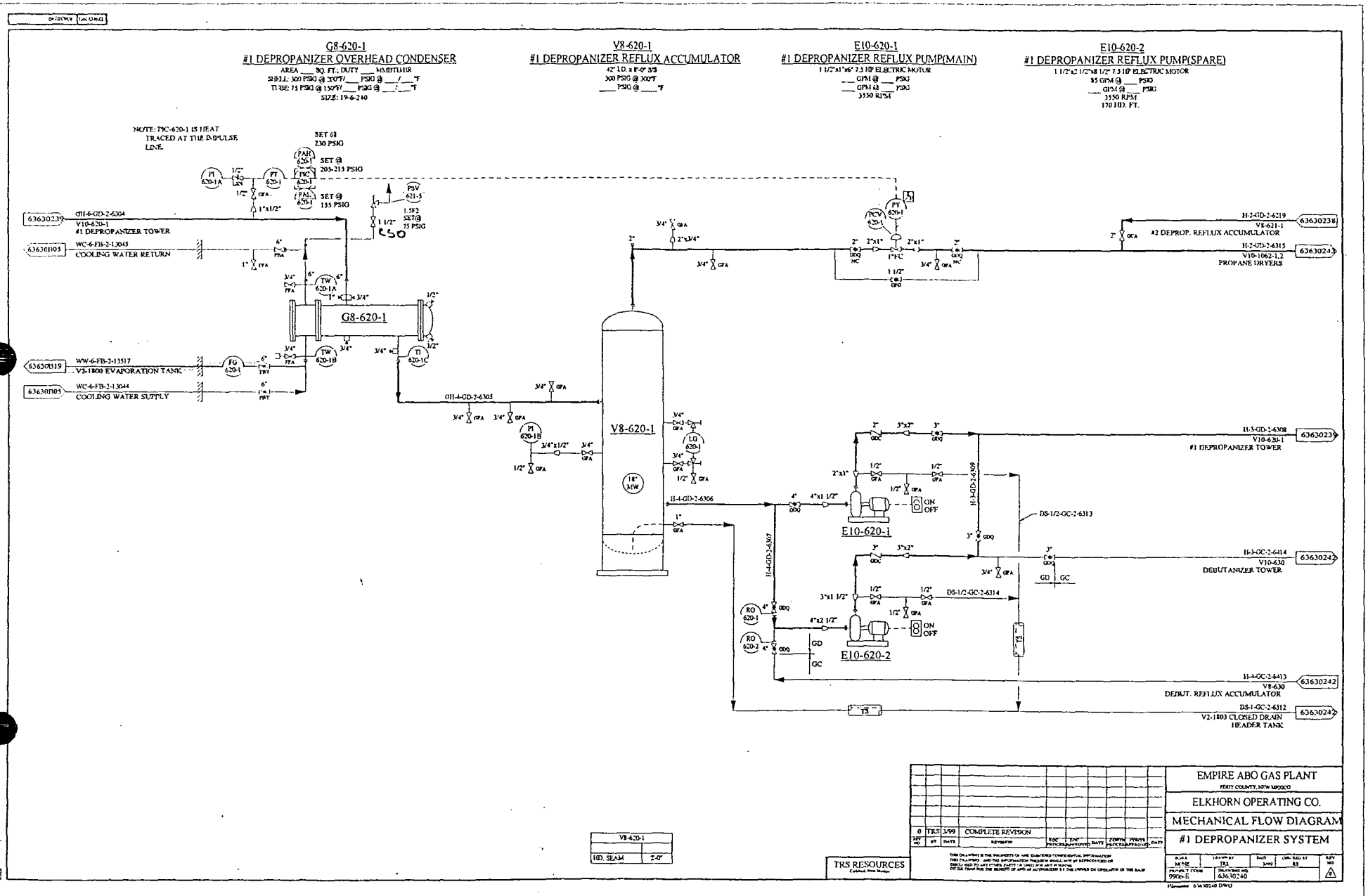
REV	BY	DATE	REVISION
0	TRS	3-99	COMPLETE REVISION

TRS RESOURCES

EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
PROPANE SYSTEM

SCALE	DRAWN BY	DATE	CHK'D BY
NONE	TRS	3-99	RS

PROJECT CODE 9906-E
DRAWING NO 63630238
REV NO A


G8-620-1
#1 DEPROPANIZER OVERHEAD CONDENSER
AREA ___ SQ. FT.; DUTY ___ MM BTU/HR
SHELL: 300 PSIG @ 370°F/___ PSIG @ ___/___°F
TUBE: 75 PSIG @ 150°F/___ PSIG @ ___/___°F
SIZE: 19-6-240
V8-620-1
#1 DEPROPANIZER REFLUX ACCUMULATOR
42" I.D. x 8'-0" S/S
300 PSIG @ 300°F
___ PSIG @ ___°F
E10-620-1
#1 DEPROPANIZER REFLUX PUMP(MAIN)
1 1/2"x1"x6" 7.5 HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
3550 RPM
E10-620-2
#1 DEPROPANIZER REFLUX PUMP(SPARE)
1 1/2"x1 1/2"x8 1/2" 7.5 HP ELECTRIC MOTOR
85 GPM @ ___ PSIG
___ GPM @ ___ PSIG
3550 RPM
170 HD. FT.
NOTE: TSC-620-1 IS HEAT TRACED AT THE IMPULSE LINE.
SET @ 230 PSIG
SET @ 205-215 PSIG
SET @ 155 PSIG
SET @ 75 PSIG
150
G8-620-1
V8-620-1
E10-620-1
E10-620-2
#2 DEPROP. REFLUX ACCUMULATOR
PROPANE DRYERS
#1 DEPROPANIZER TOWER
DEBUTANIZER TOWER
DEBUT. REFLUX ACCUMULATOR
V2-1803 CLOSED DRAIN HEADER TANK
V2-1800 EVAPORATION TANK
COOLING WATER RETURN
COOLING WATER SUPPLY
ON
OFF
V8-620-1
HD. SEAM 2'-0"
TRS RESOURCES
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
#1 DEPROPANIZER SYSTEM
0 TRS 3/99 COMPLETE REVISION
7906-E
63630240

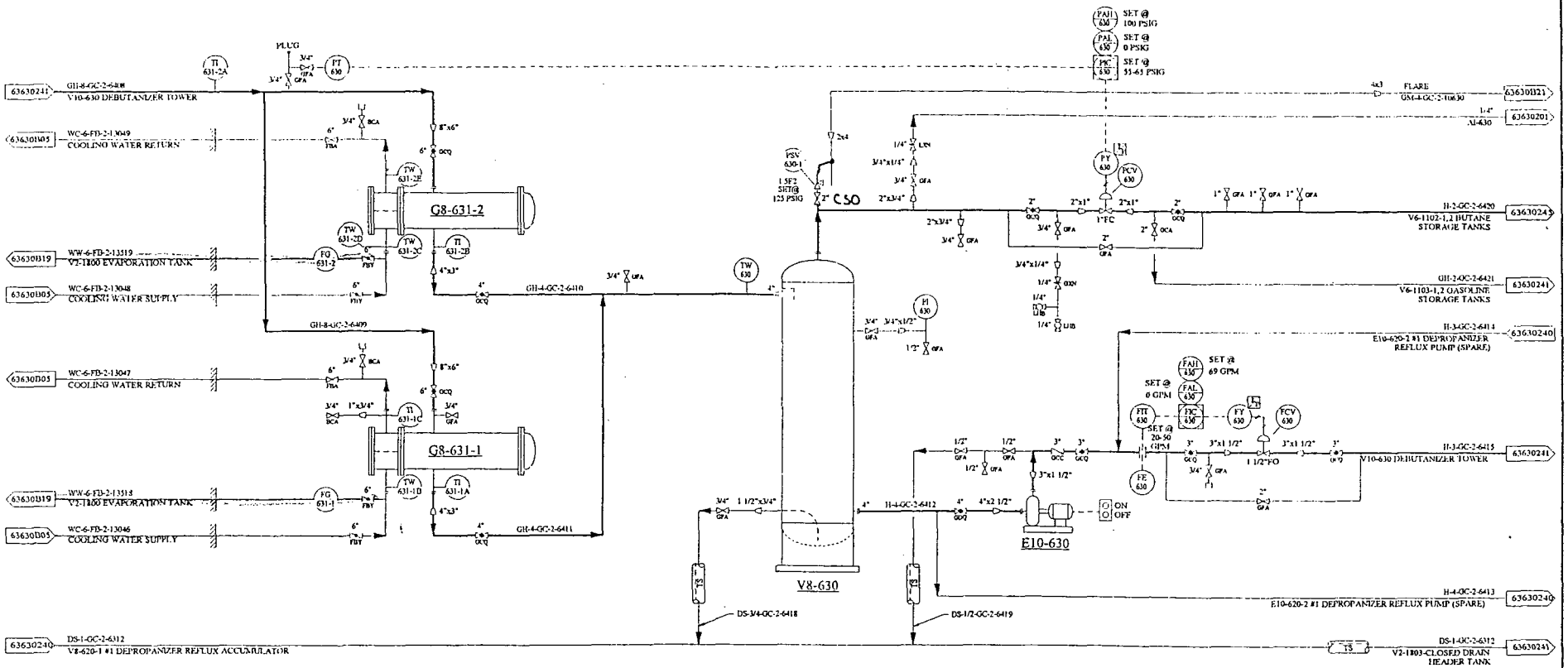
DRAWN | ON DWG

G8-631-1
DEBUTANIZER OVERHEAD CONDENSER (EAST)
AREA ___ SQ. FT.; DUTY ___ MMBTU/HR
SHELL: 150 PSIG @ 200°F/ ___ PSIG @ ___/___ °F
TUBE: 100 PSIG @ 200°F/ ___ PSIG @ ___/___ °F

G8-631-2
DEBUTANIZER OVERHEAD CONDENSER (WEST)
AREA ___ SQ. FT.; DUTY ___ MMBTU/HR
SHELL: 150 PSIG @ 200°F/ ___ PSIG @ ___/___ °F
TUBE: 100 PSIG @ 200°F/ ___ PSIG @ ___/___ °F

V8-630
DEBUTANIZER REFLUX ACCUMULATOR
30" I.D. x 8'-0" S/S
125 PSIG @ 300°F
55 PSIG @ ___ °F

E10-630
DEBUTANIZER REFLUX PUMP (MAIN)
1 1/2x2 1/2x8 1/2 5 HP ELECTRIC MOTOR
50 GPM @ ___ PSIG
___ GPM @ ___ PSIG
3500 RPM
147 HD. FT.



V8-630	
HD. SEAM	2'-0"

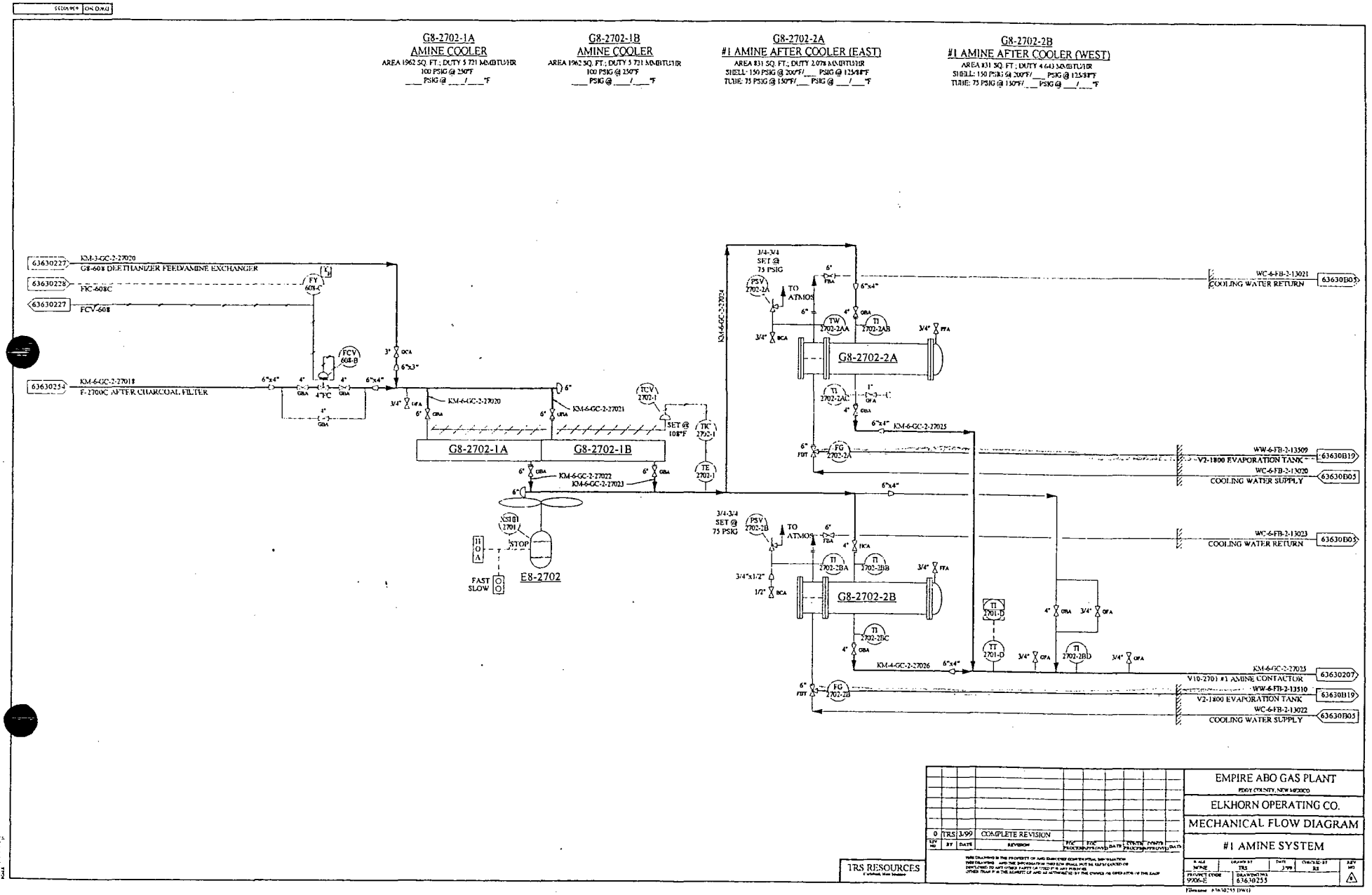
REV NO	BY	DATE	REVISION
0	TRS	3/99	COMPLETE REVISION

TRS RESOURCES
Caldwell, New Mexico

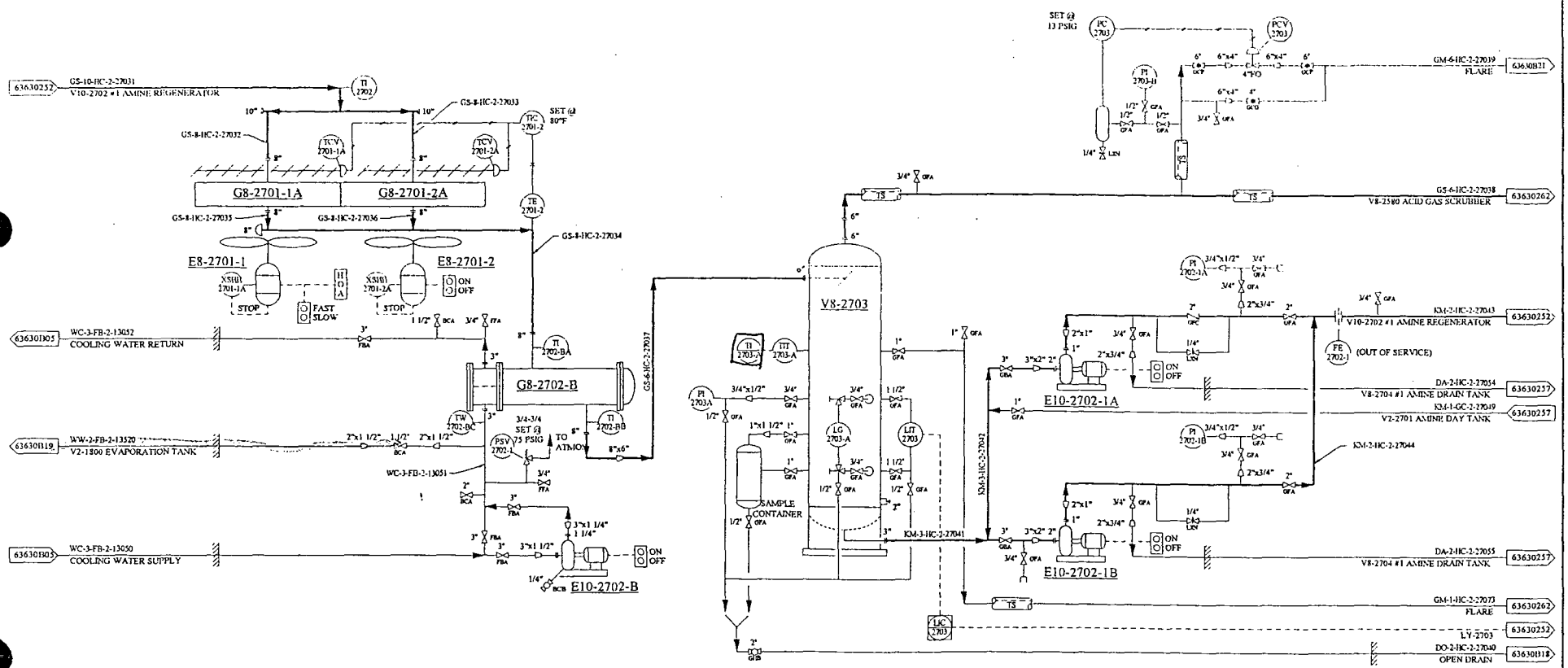
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
DEBUTANIZER SYSTEM

SCALE	DRAWN BY	DATE	CHECKED BY	REV NO
NONE	TRS	3/99	RS	0
PROJECT CODE 9906-E	DRAWING NO 63630242			

Filename: 63630242.DWG


G8-2702-1A
AMINE COOLER
AREA 1962 SQ. FT.; DUTY 5.721 MMBTU/HR
100 PSIG @ 250°F
___ PSIG @ ___/___ °F
G8-2702-1B
AMINE COOLER
AREA 1962 SQ. FT.; DUTY 5.721 MMBTU/HR
100 PSIG @ 250°F
___ PSIG @ ___/___ °F
G8-2702-2A
#1 AMINE AFTER COOLER (EAST)
AREA 831 SQ. FT.; DUTY 2.078 MMBTU/HR
SHELL: 150 PSIG @ 200°F/___ PSIG @ 125/8°F
TUBE: 75 PSIG @ 150°F/___ PSIG @ ___/___ °F
G8-2702-2B
#1 AMINE AFTER COOLER (WEST)
AREA 831 SQ. FT.; DUTY 4.643 MMBTU/HR
SHELL: 150 PSIG @ 200°F/___ PSIG @ 125/8°F
TUBE: 75 PSIG @ 150°F/___ PSIG @ ___/___ °F
63630227
KM-3-GC-2-27020
G8-608 DEETHANIZER FEED/AMINE EXCHANGER
63630228
FIC-608C
63630227
FCV-608
63630254
KM-6-GC-2-27018
F-2700C AFTER CHARCOAL FILTER
FCV 608-B
FY 608-C
KM-6-GC-2-27020
KM-6-GC-2-27021
KM-6-GC-2-27022
KM-6-GC-2-27023
KM-6-GC-2-27024
KM-6-GC-2-27025
KM-6-GC-2-27026
G8-2702-1A
G8-2702-1B
G8-2702-2A
G8-2702-2B
FCV 2702-1
SET @ 108°F
TIC 2702-1
TE 2702-1
XSH 2701
STOP
FAST
SLOW
E8-2702
PSV 2702-2A
PSV 2702-2B
3/4-3/4 SET @ 75 PSIG
TO ATMOS
TW 2702-2AA
TI 2702-2AB
TI 2702-2AC
FG 2702-2A
TI 2702-2BA
TI 2702-2BB
TI 2702-2BC
FG 2702-2B
TI 2701-D
TT 2701-D
TI 2702-2BD
WC-6-FB-2-13021
COOLING WATER RETURN
63630B05
WW-6-FB-2-13509
V2-1800 EVAPORATION TANK
63630B19
WC-6-FB-2-13020
COOLING WATER SUPPLY
63630B05
WC-6-FB-2-13023
COOLING WATER RETURN
63630B05
KM-6-GC-2-27025
V10-2701 #1 AMINE CONTACTOR
63630207
WW-6-FB-2-13510
V2-1800 EVAPORATION TANK
63630B19
WC-6-FB-2-13022
COOLING WATER SUPPLY
63630B05
TRS RESOURCES
0 TRS 3/99 COMPLETE REVISION
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
#1 AMINE SYSTEM
PROJECT CODE 9906-E
DRAWING NO. 63630255

G8-2701-1A	G8-2701-2A	G8-2702-B	E10-2702-B	V8-2703	E10-2702-1A	E10-2702-1B
#1 AMINE REFLUX COND. (EAST)	#1 AMINE REFLUX COND. (WEST)	#1 AMINE REFLUX AFTERCOOLER	#1 AMINE REFLUX AFTERCOOLER WATER CIRC. PUMP	#1 AMINE REFLUX ACCUM.	#1 AMINE REFLUX PUMP (EAST)	#1 AMINE REFLUX PUMP (WEST)
AREA 2452 SQ. FT., DUTY 10.3 MMBTU/HR 50 PSIG @ 300°F ___ PSIG @ ___/___°F	AREA 2452 SQ. FT.; DUTY 10.3 MMBTU/HR 50 PSIG @ 300°F ___ PSIG @ ___/___°F	AREA 301 SQ. FT.; DUTY 0.473 MMBTU/HR SHELL: 50 PSIG @ 200°F/___ PSIG @ 60/60°F TUBE: 75 PSIG @ 300°F/___ PSIG @ ___/___°F	1.25x1.5x3 2 HP ELECTRIC MOTOR ___ GPM @ ___ PSIG ___ GPM @ ___ PSIG	36" O.D. x 7'-6" S/S 50 PSIG @ 450°F 5 PSIG @ 60°F	1x6 1/2 3 HP ELECTRIC MOTOR 30 GPM @ ___ PSIG ___ GPM @ 55 PSIG	1x6 1/2 3 HP ELECTRIC MOTOR 30 GPM @ ___ PSIG ___ GPM @ 55 PSIG



V8-2703	
OT	30"
HEAD SEAM	24"

NO	BY	DATE	REVISION	ENG APPROVED	PROD APPROVED	DATE
0	TRS	3-99	COMPLETE REVISION			

TRS RESOURCES

EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO

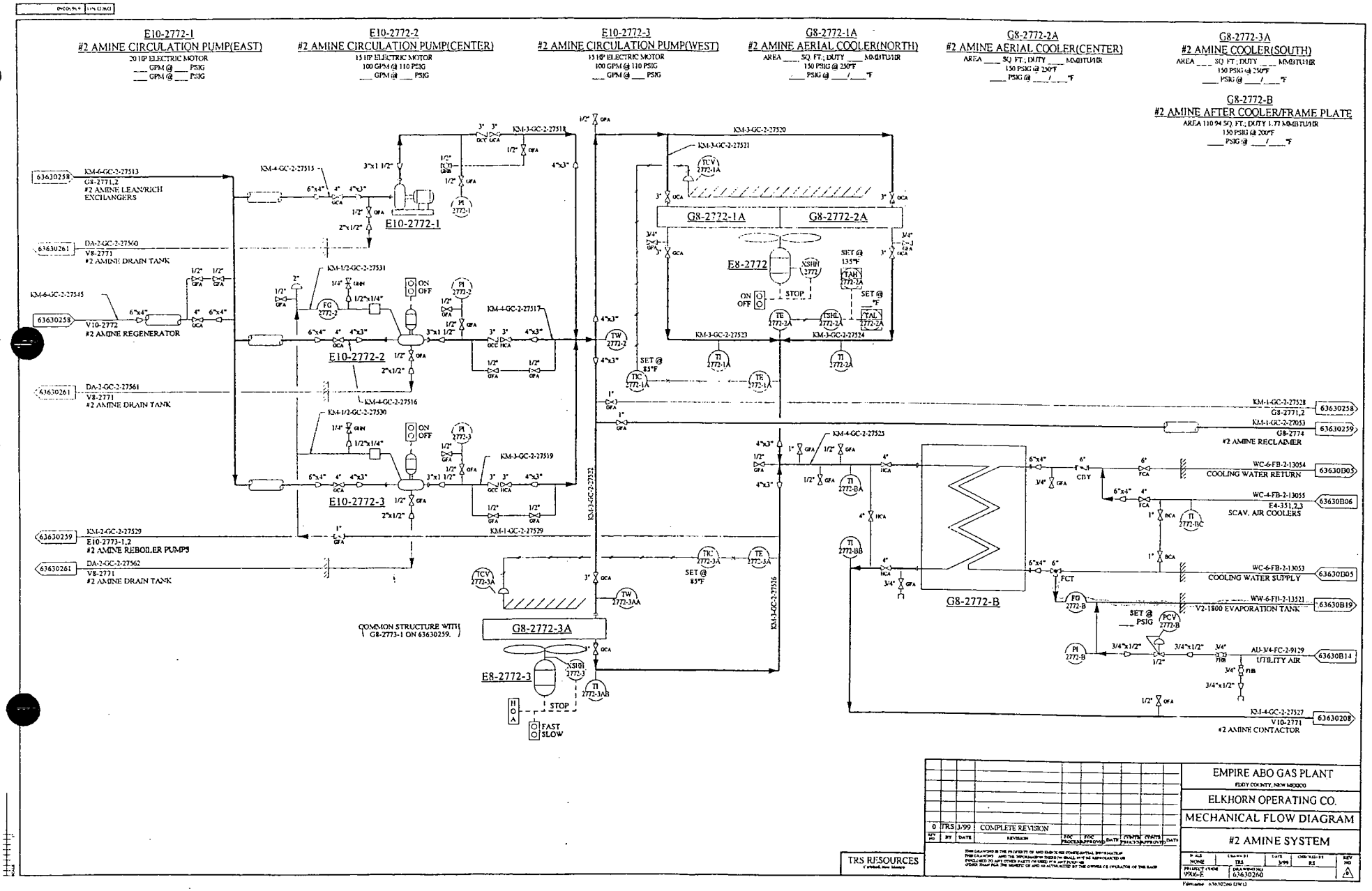
ELKHORN OPERATING CO.

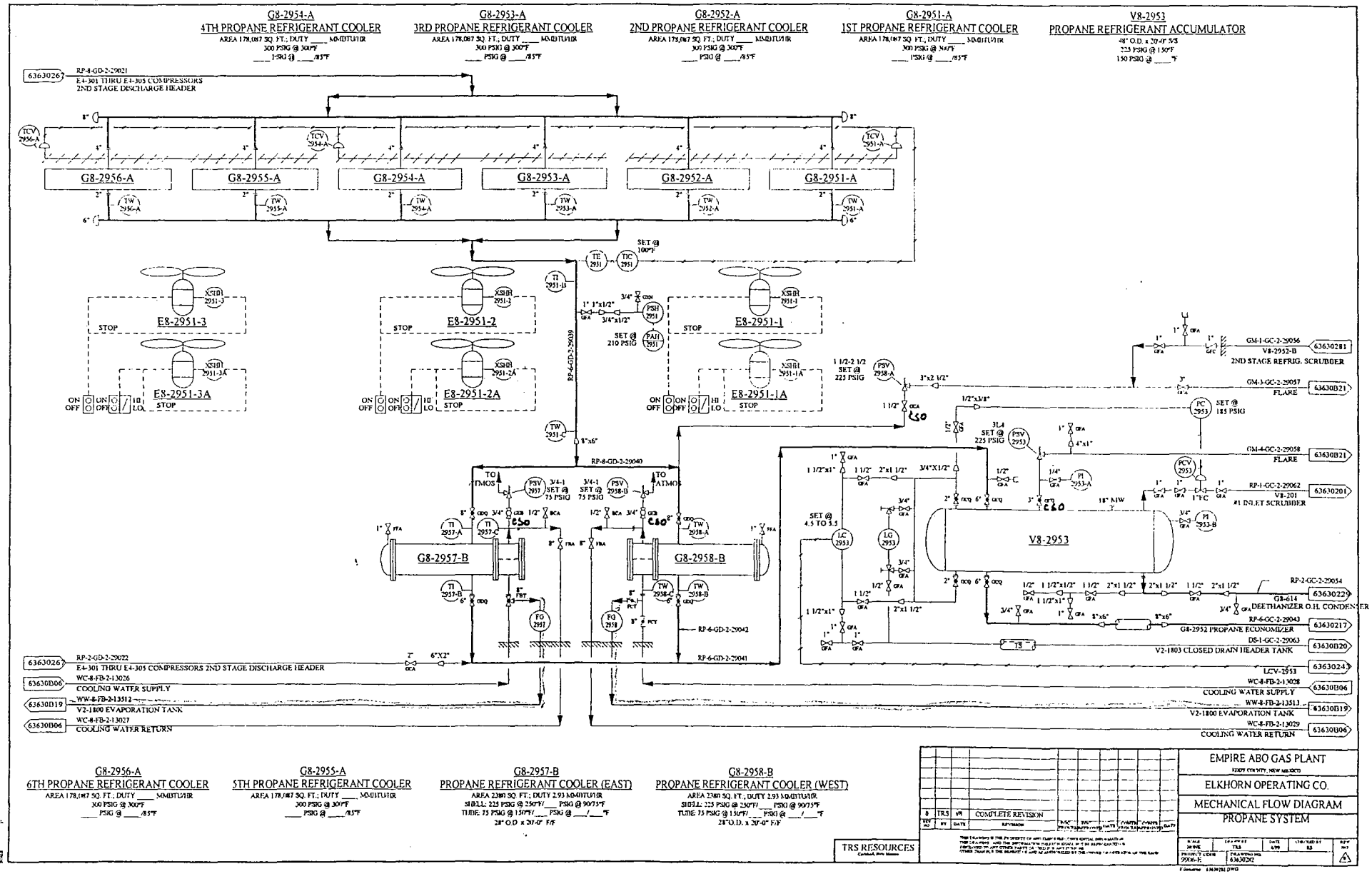
MECHANICAL FLOW DIAGRAM

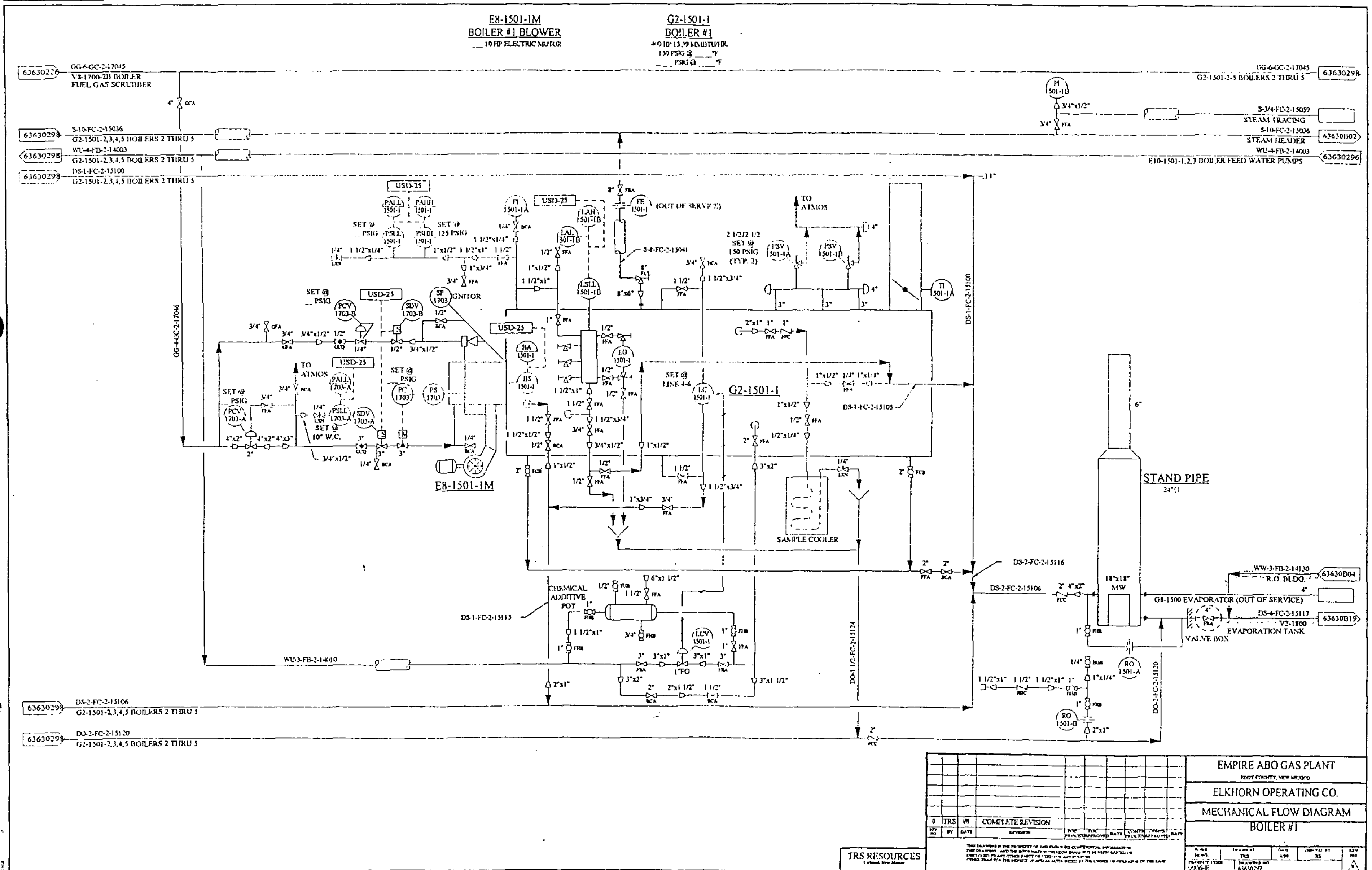
#1 AMINE SYSTEM

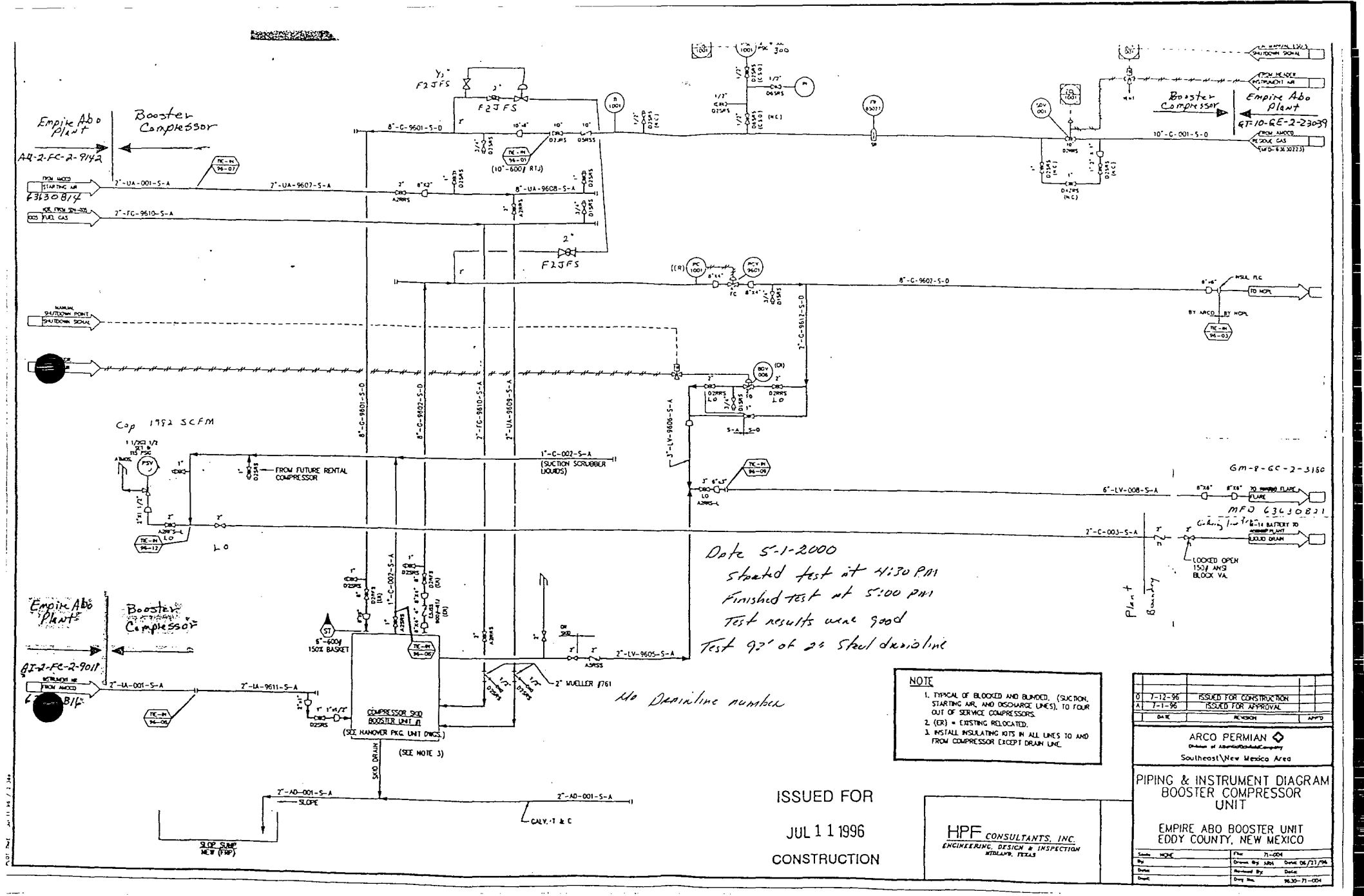
SCALE	DRAWN BY	DATE	CHECKED BY	REV NO
NONE	TRS	3-99	RS	0
PROJECT CODE 99XE-E	DRAWING NO 63630256			

J:\drawings\63630256.DWG


E10-2772-1
#2 AMINE CIRCULATION PUMP(EAST)
20 HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
E10-2772-2
#2 AMINE CIRCULATION PUMP(CENTER)
15 HP ELECTRIC MOTOR
100 GPM @ 110 PSIG
___ GPM @ ___ PSIG
E10-2772-3
#2 AMINE CIRCULATION PUMP(WEST)
15 HP ELECTRIC MOTOR
100 GPM @ 110 PSIG
___ GPM @ ___ PSIG
G8-2772-1A
#2 AMINE AERIAL COOLER(NORTH)
AREA ___ SQ. FT.; DUTY ___ MMBTU/HR
150 PSIG @ 250°F
___ PSIG @ ___/___ °F
G8-2772-2A
#2 AMINE AERIAL COOLER(CENTER)
AREA ___ SQ. FT.; DUTY ___ MMBTU/HR
150 PSIG @ 250°F
___ PSIG @ ___/___ °F
G8-2772-3A
#2 AMINE COOLER(SOUTH)
AREA ___ SQ. FT.; DUTY ___ MMBTU/HR
150 PSIG @ 250°F
___ PSIG @ ___/___ °F
G8-2772-B
#2 AMINE AFTER COOLER/FRAME PLATE
AREA 110.94 SQ. FT.; DUTY 1.77 MMBTU/HR
150 PSIG @ 200°F
___ PSIG @ ___/___ °F
63630258
KM-6-GC-2-27513
G8-2771,2
#2 AMINE LEAN/RICH EXCHANGERS
63630261
DA-2-GC-2-27560
V8-2771
#2 AMINE DRAIN TANK
KM-6-GC-2-27545
63630258
V10-2772
#2 AMINE REGENERATOR
63630261
DA-2-GC-2-27561
V8-2771
#2 AMINE DRAIN TANK
63630259
KM-2-GC-2-27529
E10-2773-1,2
#2 AMINE REBOILER PUMPS
63630261
DA-2-GC-2-27562
V8-2771
#2 AMINE DRAIN TANK
KM-4-GC-2-27515
KM-3-GC-2-27518
KM-1/2-GC-2-27531
KM-4-GC-2-27517
KM-1/2-GC-2-27530
KM-4-GC-2-27516
KM-3-GC-2-27519
KM-1-GC-2-27529
KM-3-GC-2-27520
KM-3-GC-2-27521
KM-3-GC-2-27523
KM-3-GC-2-27524
KM-3-GC-2-27522
KM-3-GC-2-27536
KM-4-GC-2-27525
KM-1-GC-2-27528
G8-2771,2
63630258
KM-1-GC-2-27053
G8-2774
#2 AMINE RECLAIMER
63630239
WC-6-FB-2-13054
COOLING WATER RETURN
63630B05
WC-4-FB-2-13055
E4-351,2,3
SCAV. AIR COOLERS
63630B06
WC-6-FB-2-13053
COOLING WATER SUPPLY
63630B05
WW-6-FB-2-13521
V2-1800 EVAPORATION TANK
63630B19
AU-3/4-FC-2-9129
UTILITY AIR
63630B14
KM-4-GC-2-27527
V10-2771
#2 AMINE CONTACTOR
63630208
E10-2772-1
E10-2772-2
E10-2772-3
E8-2772
E8-2772-3
G8-2772-1A
G8-2772-2A
G8-2772-3A
G8-2772-B
TCV 2772-1A
TCV 2772-3A
PCV 2772-B
TIC 2772-1A
TIC 2772-3A
TE 2772-1A
TE 2772-2A
TE 2772-3A
TI 2772-1A
TI 2772-2A
TI 2772-3AB
TI 2772-BA
TI 2772-BB
TI 2772-BC
TW 2772-2
TW 2772-3AA
PI 2772-1
PI 2772-2
PI 2772-3
PI 2772-B
FG 2772-2
FG 2772-B
FCT
TAH 2772-2A
TAL 2772-2A
TSHL 2772-2A
XSHH 2772
XSHH 2772-3
SET @ 85°F
SET @ 135°F
SET @ ___ PSIG
STOP
FAST
SLOW
ON
OFF
COMMON STRUCTURE WITH G8-2773-1 ON 63630259.
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
#2 AMINE SYSTEM
0 TRS 3/99 COMPLETE REVISION
TRS RESOURCES
NONE
TRS
3/99
RS
9900-E
63630260
A


G8-2954-A
4TH PROPANE REFRIGERANT COOLER
AREA 178,087 SQ. FT.; DUTY ____ MMBTU/HR
300 PSIG @ 300°F
____ PSIG @ ____/85°F
G8-2953-A
3RD PROPANE REFRIGERANT COOLER
AREA 178,087 SQ. FT.; DUTY ____ MMBTU/HR
300 PSIG @ 300°F
____ PSIG @ ____/85°F
G8-2952-A
2ND PROPANE REFRIGERANT COOLER
AREA 178,087 SQ. FT.; DUTY ____ MMBTU/HR
300 PSIG @ 300°F
____ PSIG @ ____/85°F
G8-2951-A
1ST PROPANE REFRIGERANT COOLER
AREA 178,087 SQ. FT.; DUTY ____ MMBTU/HR
300 PSIG @ 300°F
____ PSIG @ ____/85°F
V8-2953
PROPANE REFRIGERANT ACCUMULATOR
48" O.D. x 20'-0" S/S
225 PSIG @ 150°F
150 PSIG @ ____°F
63630D26
RP-8-GD-2-29021
E4-301 THRU E4-305 COMPRESSORS
2ND STAGE DISCHARGE HEADER
G8-2956-A
G8-2955-A
G8-2954-A
G8-2953-A
G8-2952-A
G8-2951-A
E8-2951-3
E8-2951-3A
E8-2951-2
E8-2951-2A
E8-2951-1
E8-2951-1A
STOP
SET @ 100°F
SET @ 210 PSIG
RP-8-GD-2-29039
RP-8-GD-2-29040
TO ATMOS
SET @ 75 PSIG
SET @ 225 PSIG
SET @ 185 PSIG
SET @ 4.5 TO 5.5
G8-2957-B
G8-2958-B
V8-2953
RP-8-GD-2-29042
RP-8-GD-2-29041
GM-1-GC-2-29056
V8-2952-B
2ND STAGE REFRIG. SCRUBBER
63630281
GM-3-GC-2-29057
FLARE
63630D21
GM-4-GC-2-29058
FLARE
63630D21
RP-1-GC-2-29062
V8-201
#1 INLET SCRUBBER
63630201
RP-2-GC-2-29054
G8-614
DEETHANIZER O.H. CONDENSER
63630222
RP-6-GC-2-29043
G8-2952 PROPANE ECONOMIZER
63630217
DS-1-GC-2-29063
V2-1803 CLOSED DRAIN HEADER TANK
63630D20
LCV-2953
63630243
WC-8-FB-2-13028
COOLING WATER SUPPLY
63630D06
WW-8-FB-2-13513
V2-1800 EVAPORATION TANK
63630D19
WC-8-FB-2-13029
COOLING WATER RETURN
63630D06
63630D26
RP-2-GD-2-29022
E4-301 THRU E4-305 COMPRESSORS 2ND STAGE DISCHARGE HEADER
63630D06
WC-8-FB-2-13026
COOLING WATER SUPPLY
63630D19
WW-8-FB-2-13512
V2-1800 EVAPORATION TANK
63630D06
WC-8-FB-2-13027
COOLING WATER RETURN
G8-2956-A
6TH PROPANE REFRIGERANT COOLER
AREA 178,087 SQ. FT.; DUTY ____ MMBTU/HR
300 PSIG @ 300°F
____ PSIG @ ____/85°F
G8-2955-A
5TH PROPANE REFRIGERANT COOLER
AREA 178,087 SQ. FT.; DUTY ____ MMBTU/HR
300 PSIG @ 300°F
____ PSIG @ ____/85°F
G8-2957-B
PROPANE REFRIGERANT COOLER (EAST)
AREA 2380 SQ. FT.; DUTY 2.93 MMBTU/HR
SHELL: 225 PSIG @ 250°F/____ PSIG @ 90/75°F
TUBE: 75 PSIG @ 130°F/___ PSIG @ ___/___°F
28" O.D. x 20'-0" T/T
G8-2958-B
PROPANE REFRIGERANT COOLER (WEST)
AREA 2380 SQ. FT.; DUTY 2.93 MMBTU/HR
SHELL: 225 PSIG @ 250°F/____ PSIG @ 90/75°F
TUBE: 75 PSIG @ 130°F/___ PSIG @ ___/___°F
28"O.D. x 20'-0" T/T
TRS RESOURCES
0 TRS 6/9 COMPLETE REVISION
EMPIRE ABO GAS PLANT
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
PROPANE SYSTEM
63630282


E8-1501-1M
BOILER #1 BLOWER
G2-1501-1
BOILER #1
63630226
GG-6-GC-2-17045
V8-1700-2B BOILER
FUEL GAS SCRUBBER
63630298
S-10-FC-2-15036
G2-1501-2,3,4,5 BOILERS 2 THRU 5
WU-4-FB-2-14003
DS-1-FC-2-15100
G2-1501-2-5 BOILERS 2 THRU 5
S-3/4-FC-2-15059
STEAM TRACING
STEAM HEADER
E10-1501-1,2,3 BOILER FEED WATER PUMPS
63630296
USD-25
TO ATMOS
(OUT OF SERVICE)
IGNITOR
G2-1501-1
E8-1501-1M
SAMPLE COOLER
STAND PIPE
CHEMICAL ADDITIVE POT
DS-1-FC-2-15113
WU-3-FB-2-14010
DS-2-FC-2-15116
DS-2-FC-2-15106
WW-3-FB-2-14130
R.O. BLDG.
G8-1500 EVAPORATOR (OUT OF SERVICE)
DS-4-FC-2-15117
V2-1800
EVAPORATION TANK
VALVE BOX
DO-2-FC-2-15120
G2-1501-2,3,4,5 BOILERS 2 THRU 5
TRS RESOURCES
COMPLETE REVISION
EMPIRE ABO GAS PLANT
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
BOILER #1



NOTE

1. TYPICAL OF BLOCKED AND BLOWDOWN, (SUCTION, STARTING AIR, AND DISCHARGE LINES), TO FOUR OUT OF SERVICE COMPRESSORS.
2. (ER) = EXISTING RELOCATED.
3. INSTALL INSULATING KITS IN ALL LINES TO AND FROM COMPRESSOR EXCEPT DRAIN LINE.

0	7-12-96	ISSUED FOR CONSTRUCTION
A	7-1-96	ISSUED FOR APPROVAL
DATE	REVISION	APP'D

ARCO PERMIAN
Southeast\New Mexico Area

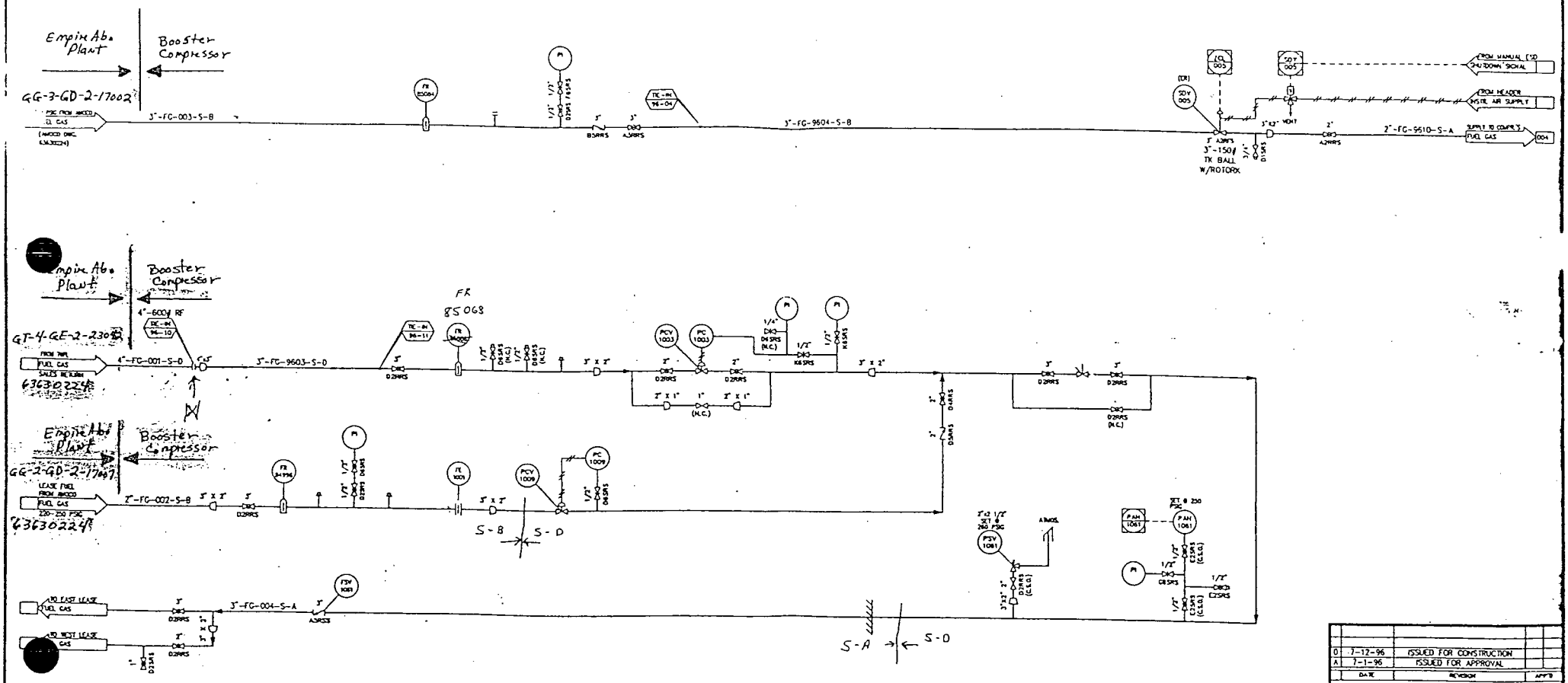
PIPING & INSTRUMENT DIAGRAM BOOSTER COMPRESSOR UNIT

EMPIRE ABO BOOSTER UNIT
EDDY COUNTY, NEW MEXICO

ISSUED FOR
JUL 1 1 1996
CONSTRUCTION

HPF CONSULTANTS, INC.
ENGINEERING, DESIGN & INSPECTION
MIDLAND, TEXAS

Scale	NONE	Proj.	71-004
By		Drawn By	ABH
Date		Date	06/27/96
Check		Reviewed By	Date
		Dwg. No.	96.30-71-004



ISSUED FOR

JUL 1 1 1996

CONSTRUCTION

HPF CONSULTANTS, INC.
ENGINEERING, DESIGN & INSPECTION
MIDLAND, TEXAS

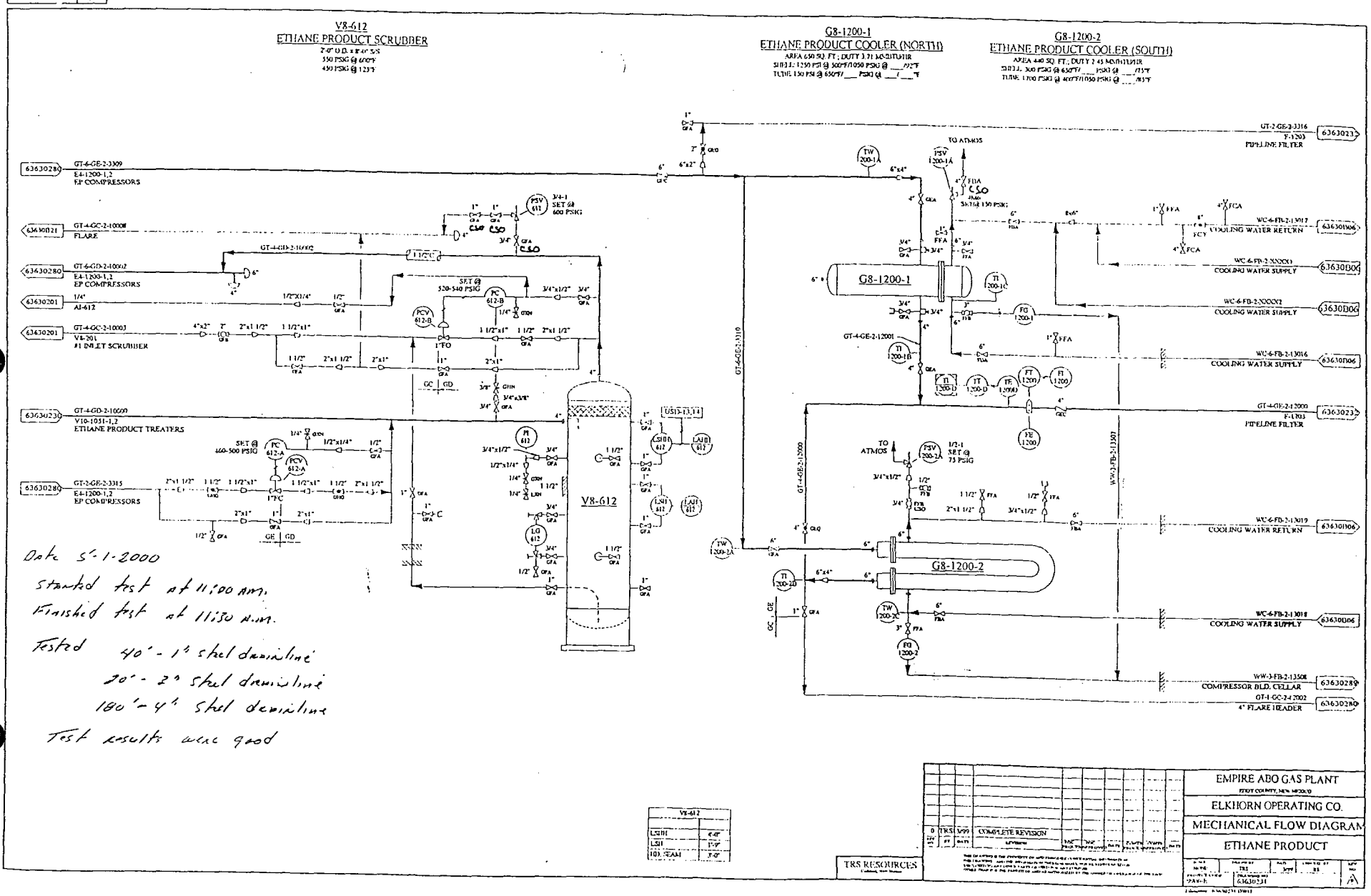
0	7-12-96	ISSUED FOR CONSTRUCTION
A	7-1-96	ISSUED FOR APPROVAL
	DATE	REVISION

ARCO PERMIAN
Division of Atlantic Richfield Company
Southeast\New Mexico Area

PIPING & INSTRUMENT DIAGRAM BOOSTER COMPRESSOR UNIT

EMPIRE ABO BOOSTER UNIT
EDDY COUNTY, NEW MEXICO

Scale: NONE	File: 71-005
By:	Drawn By: MRH Date: 06/27/96
Date:	Reviewed By: Date:
Dwg#:	Dwg No. 9630-71-005



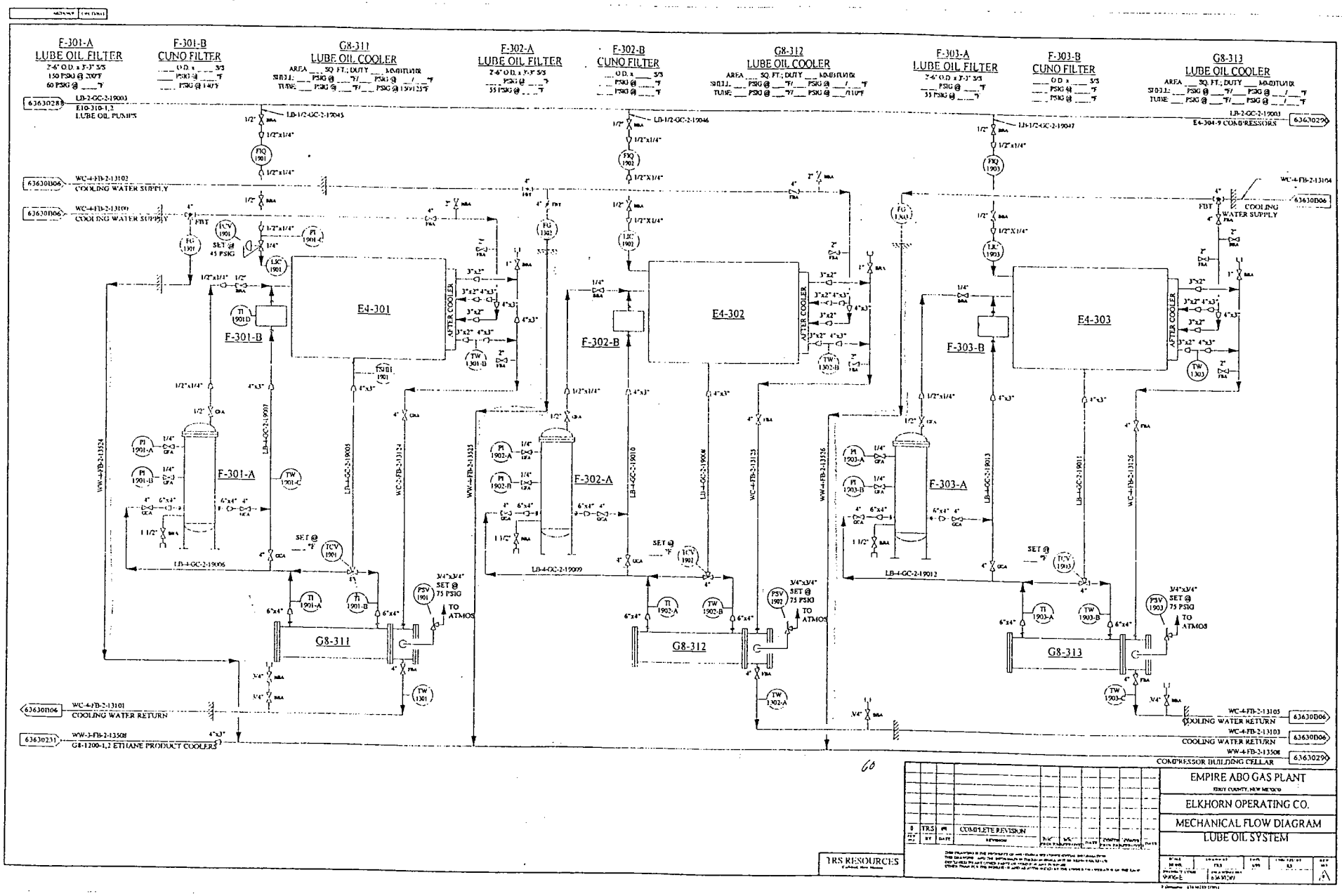
Date 5-1-2000

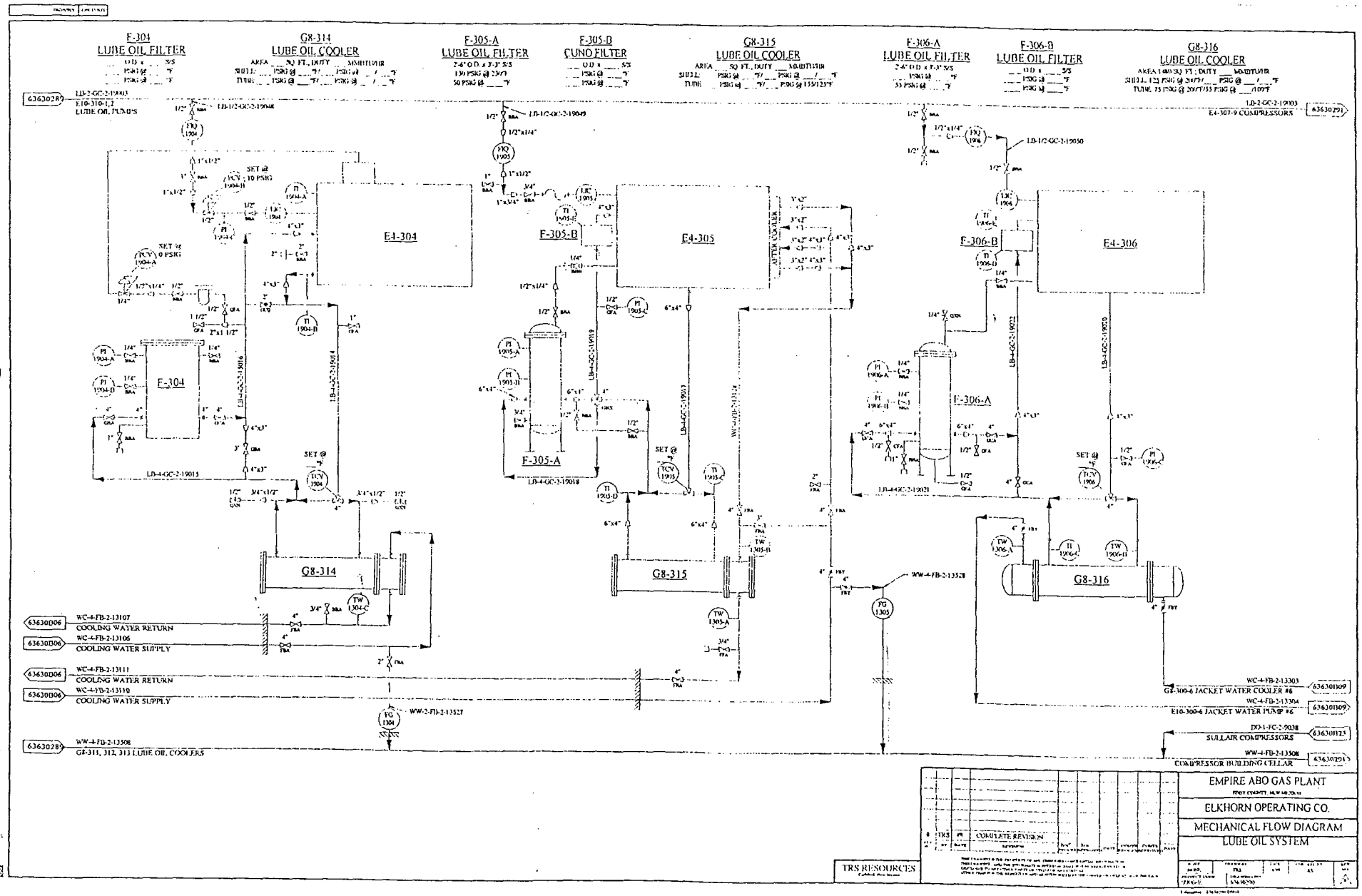
Started test at 11:00 A.M.

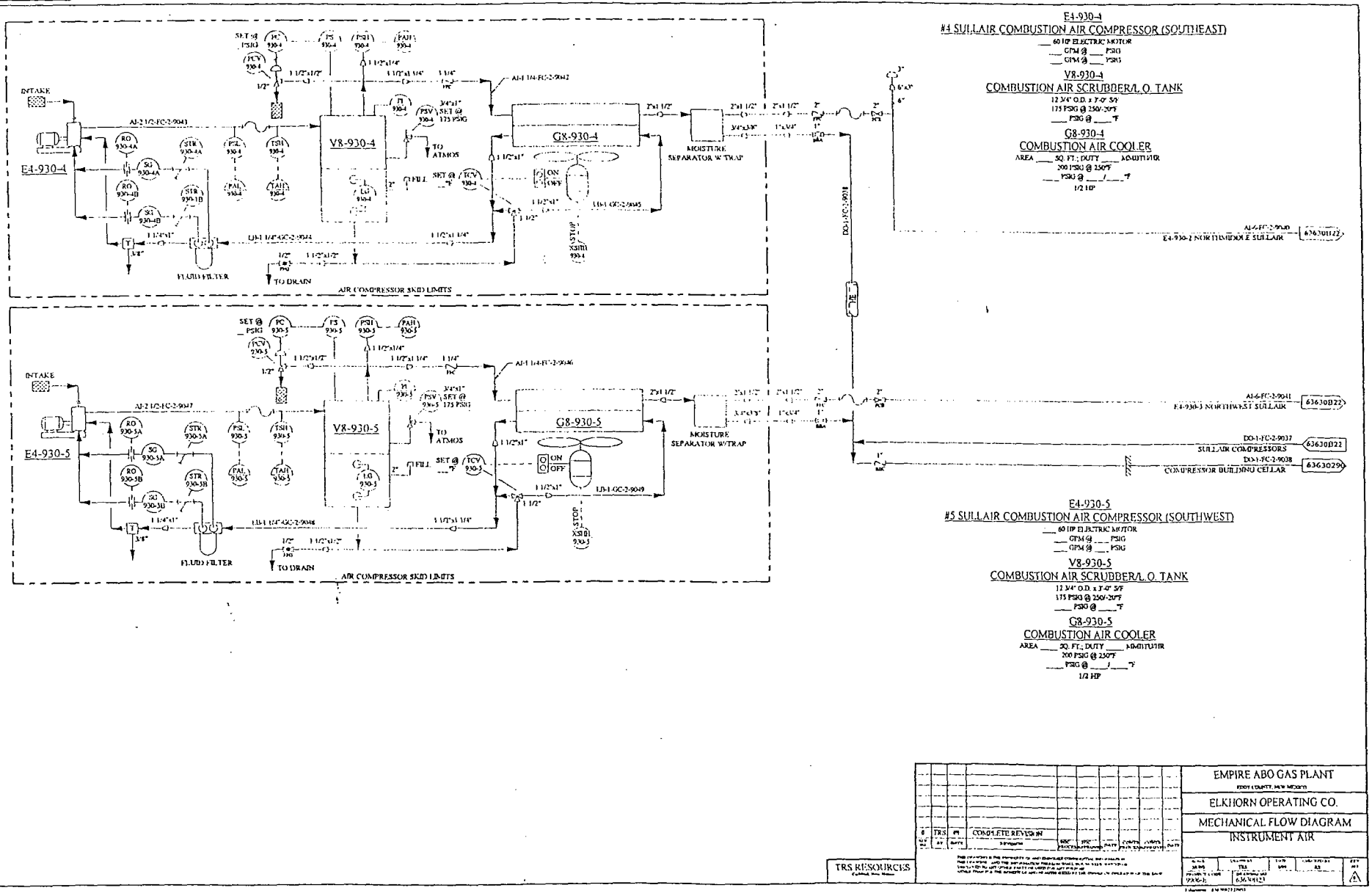
Finished test at 11:50 A.M.

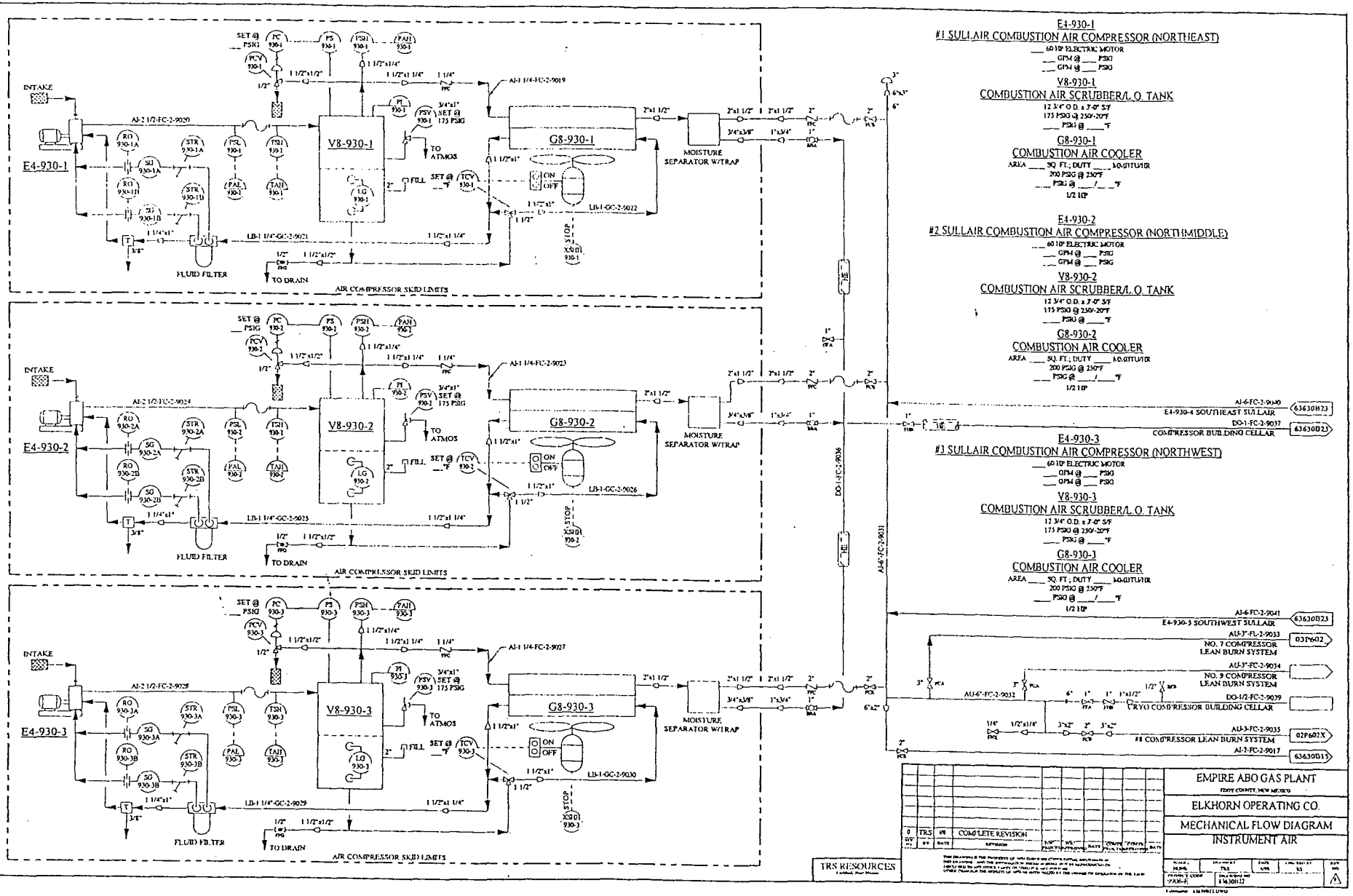
Tested 40' - 1" steel downline
20' - 2" steel downline
180' - 4" steel downline

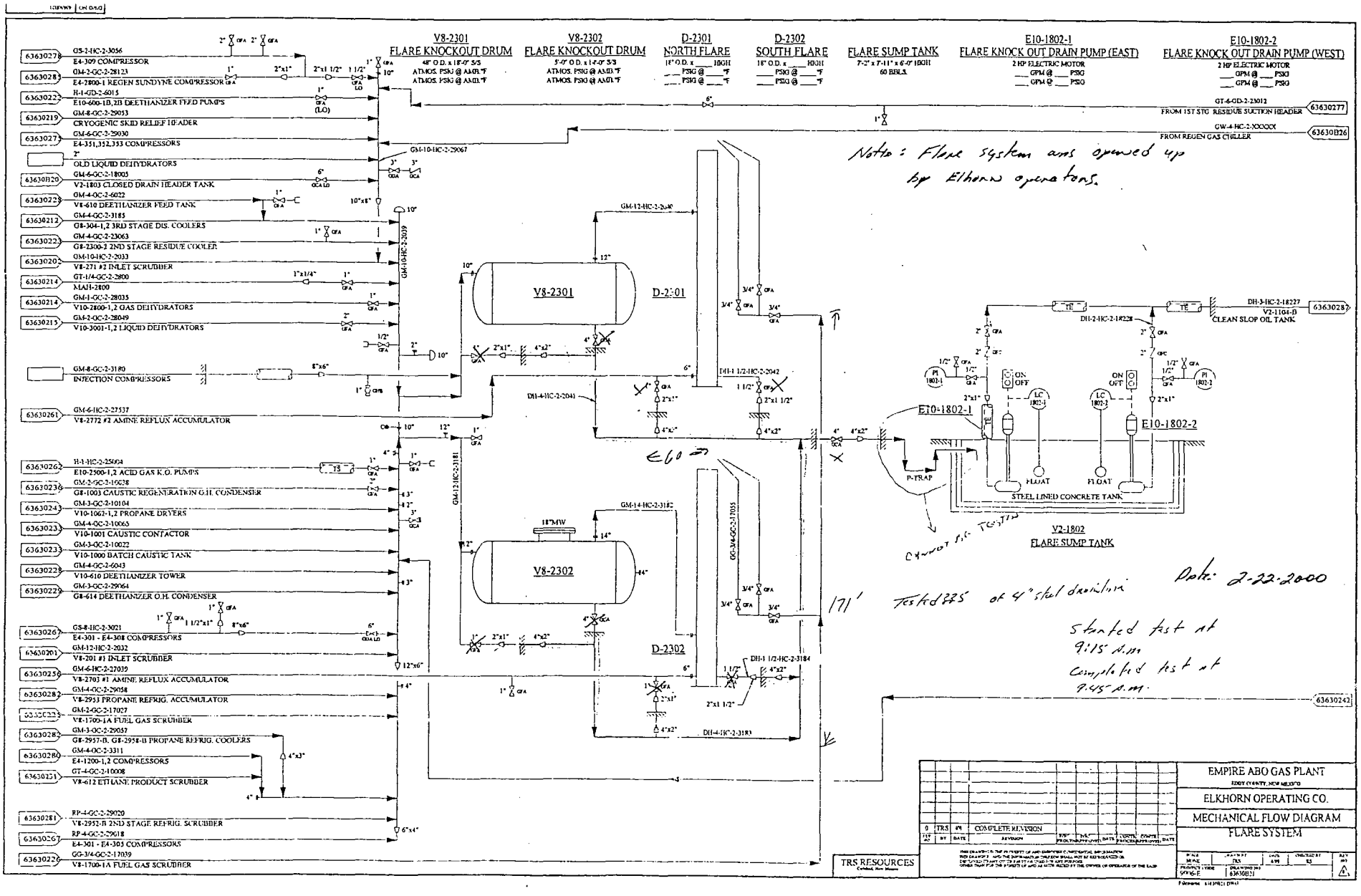
Test results were good

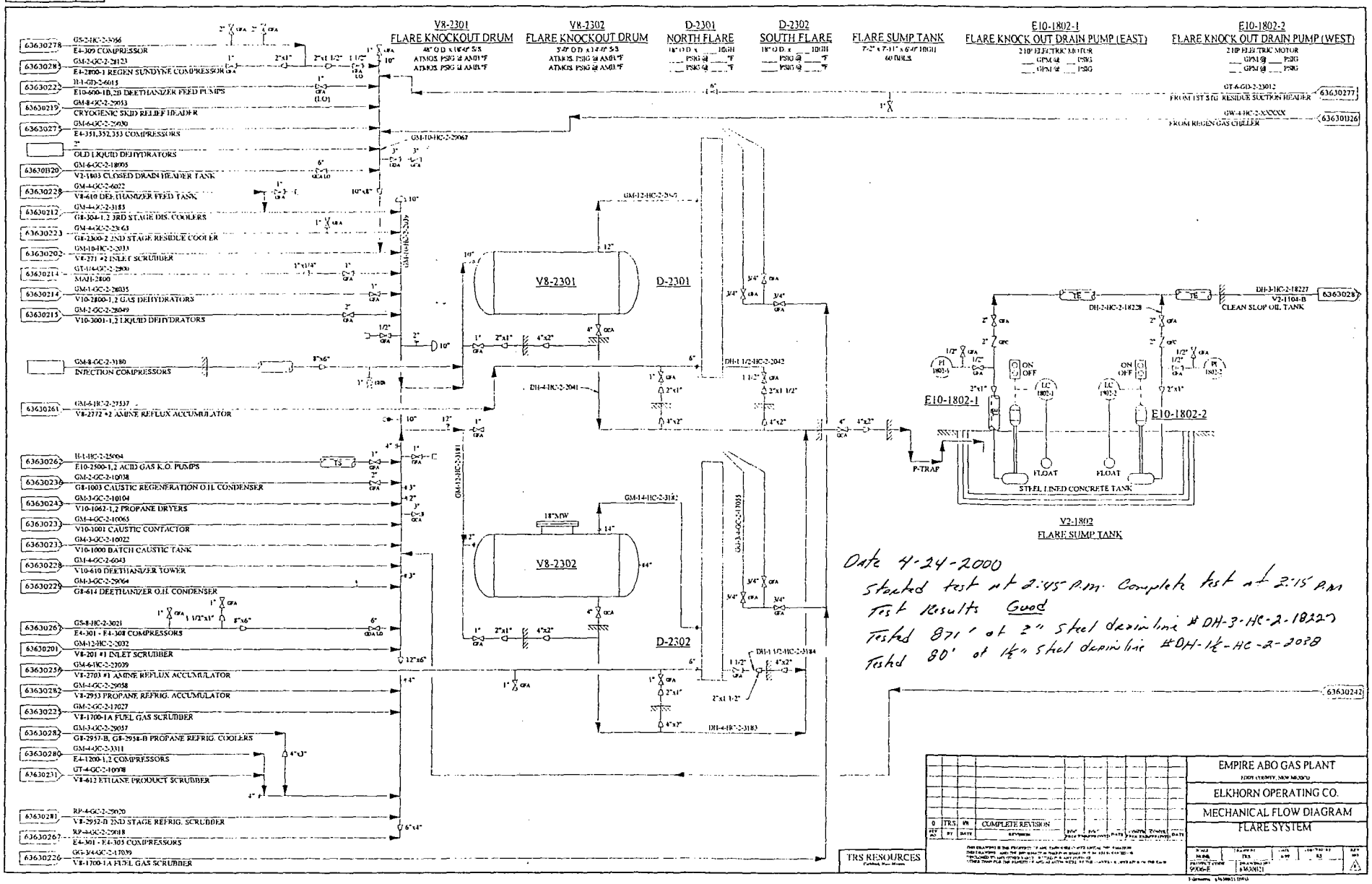

F-301-A
LUBE OIL FILTER
F-301-B
CUNO FILTER
G8-311
LUBE OIL COOLER
F-302-A
LUBE OIL FILTER
F-302-B
CUNO FILTER
G8-312
LUBE OIL COOLER
F-303-A
LUBE OIL FILTER
F-303-B
CUNO FILTER
G8-313
LUBE OIL COOLER
E4-301
E4-302
E4-303
AFTER COOLER
F-301-B
F-302-B
F-303-B
F-301-A
F-302-A
F-303-A
G8-311
G8-312
G8-313
TO ATMOS
COOLING WATER SUPPLY
COOLING WATER RETURN
E4-304-9 COMPRESSORS
COMPRESSOR BUILDING CELLAR
G8-1200-1,2 ETHANE PRODUCT COOLERS
EMPIRE ABO GAS PLANT
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
LUBE OIL SYSTEM
TRS RESOURCES

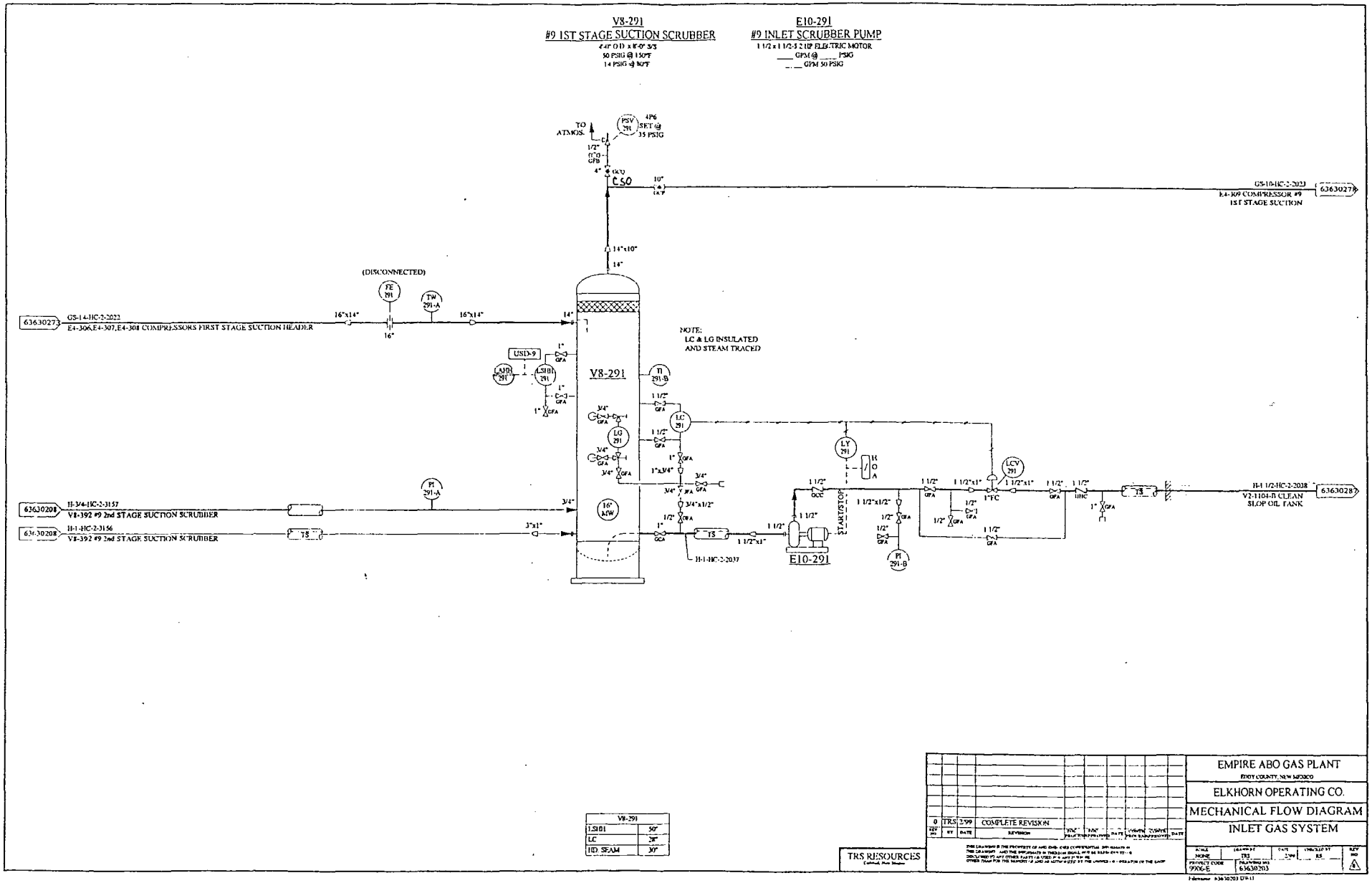

F-304
LUBE OIL FILTER
G8-314
LUBE OIL COOLER
F-305-A
LUBE OIL FILTER
F-305-B
CUNO FILTER
G8-315
LUBE OIL COOLER
F-306-A
LUBE OIL FILTER
F-306-B
LUBE OIL FILTER
G8-316
LUBE OIL COOLER
E4-304
E4-305
E4-306
F-304
F-305-A
F-305-B
F-306-A
F-306-B
G8-314
G8-315
G8-316
AFTER COOLER
SET @ 10 PSIG
SET @ 0 PSIG
SET @
LD-4-GC-2-19015
LD-4-GC-2-19018
LD-4-GC-2-19019
LD-4-GC-2-19017
LD-4-GC-2-19021
LD-4-GC-2-19022
LD-4-GC-2-19020
WC-4-FB-2-13107
COOLING WATER RETURN
WC-4-FB-2-13106
COOLING WATER SUPPLY
WC-4-FB-2-13111
COOLING WATER RETURN
WC-4-FB-2-13110
COOLING WATER SUPPLY
WW-4-FB-2-13528
WW-2-FB-2-13527
WW-4-FB-2-13508
GF-311, 312, 313 LUBE OIL COOLERS
WC-4-FB-2-13303
GF-300-6 JACKET WATER COOLER #6
WC-4-FB-2-13304
E10-300-6 JACKET WATER PUMP #6
SULLAIR COMPRESSORS
COMPRESSOR BUILDING CELLAR
EMPIRE ABO GAS PLANT
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
LUBE OIL SYSTEM
TRS RESOURCES
COMPLETE REVISION

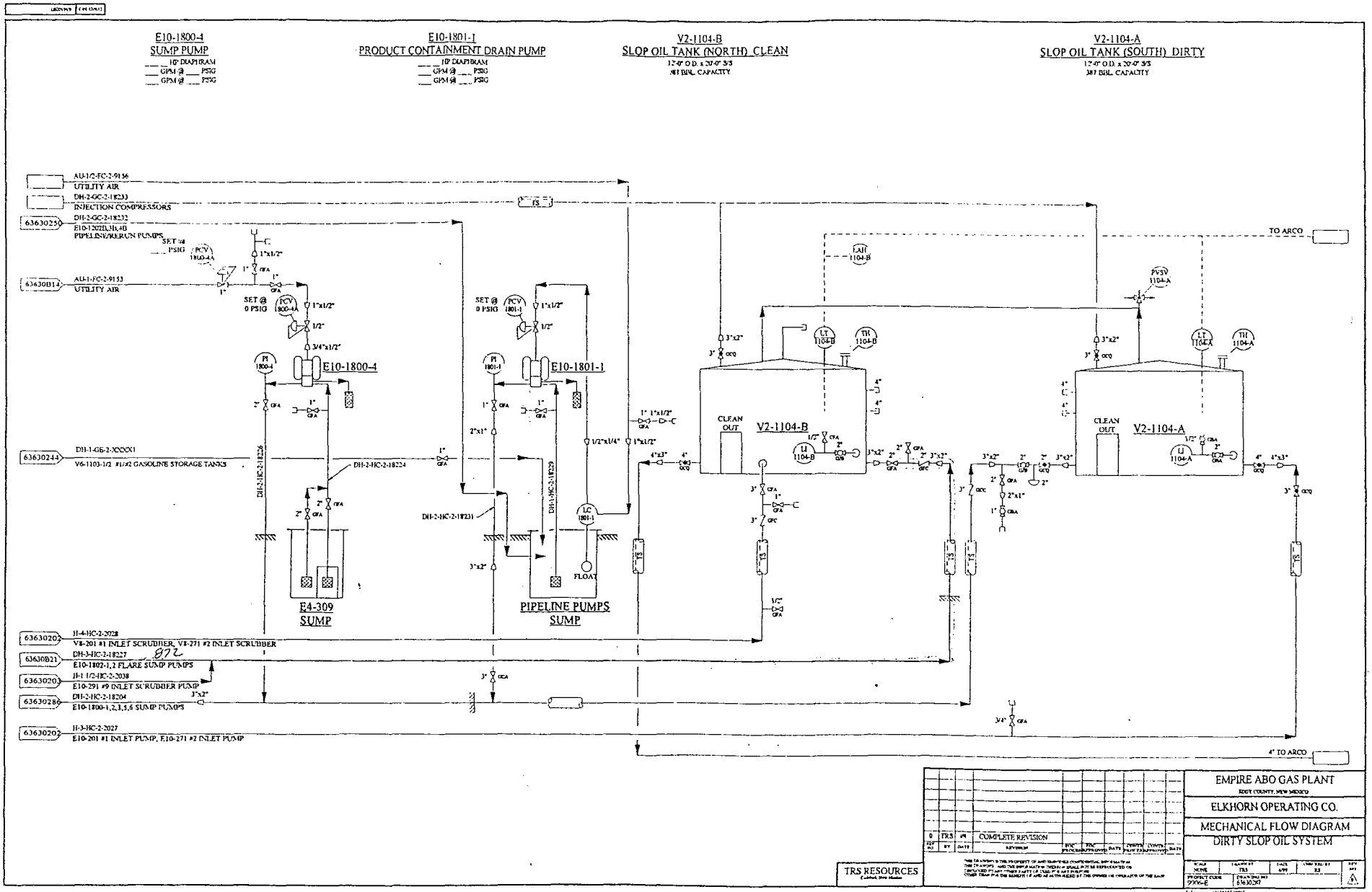

E4-930-4
#4 SULLAIR COMBUSTION AIR COMPRESSOR (SOUTHEAST)
___ 60 HP ELECTRIC MOTOR
___ CFM @ ___ PSIG
___ CFM @ ___ PSIG
V8-930-4
COMBUSTION AIR SCRUBBER/L.O. TANK
12 3/4" O.D. x 3'-0" S/S
175 PSIG @ 250/-20°F
___ PSIG @ ___ °F
G8-930-4
COMBUSTION AIR COOLER
AREA ___ SQ. FT.; DUTY ___ KBTU/HR
200 PSIG @ 250°F
___ PSIG @ ___/___ °F
1/2 HP
E4-930-4
V8-930-4
G8-930-4
INTAKE
MOISTURE SEPARATOR W/TRAP
FLUID FILTER
TO DRAIN
TO ATMOS
AIR COMPRESSOR SKID LIMITS
E4-930-5
#5 SULLAIR COMBUSTION AIR COMPRESSOR (SOUTHWEST)
___ 60 HP ELECTRIC MOTOR
___ CFM @ ___ PSIG
___ CFM @ ___ PSIG
V8-930-5
COMBUSTION AIR SCRUBBER/L.O. TANK
12 3/4" O.D. x 3'-0" S/S
175 PSIG @ 250/-20°F
___ PSIG @ ___°F
G8-930-5
COMBUSTION AIR COOLER
AREA ___ SQ. FT.; DUTY ___ KBTU/HR
200 PSIG @ 250°F
___ PSIG @ ___/___ °F
1/2 HP
E4-930-5
V8-930-5
G8-930-5
AI-6-FC-2-9041
E4-930-3 NORTHWEST SULLAIR
63630D22
DO-1-FC-2-9037
SULLAIR COMPRESSORS
63630D22
DO-1-FC-2-9038
COMPRESSOR BUILDING CELLAR
63630290
AI-6-FC-2-9040
E4-930-2 NORTH/MIDDLE SULLAIR
63630D22
COMPLETE REVISION
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
INSTRUMENT AIR
TRS RESOURCES

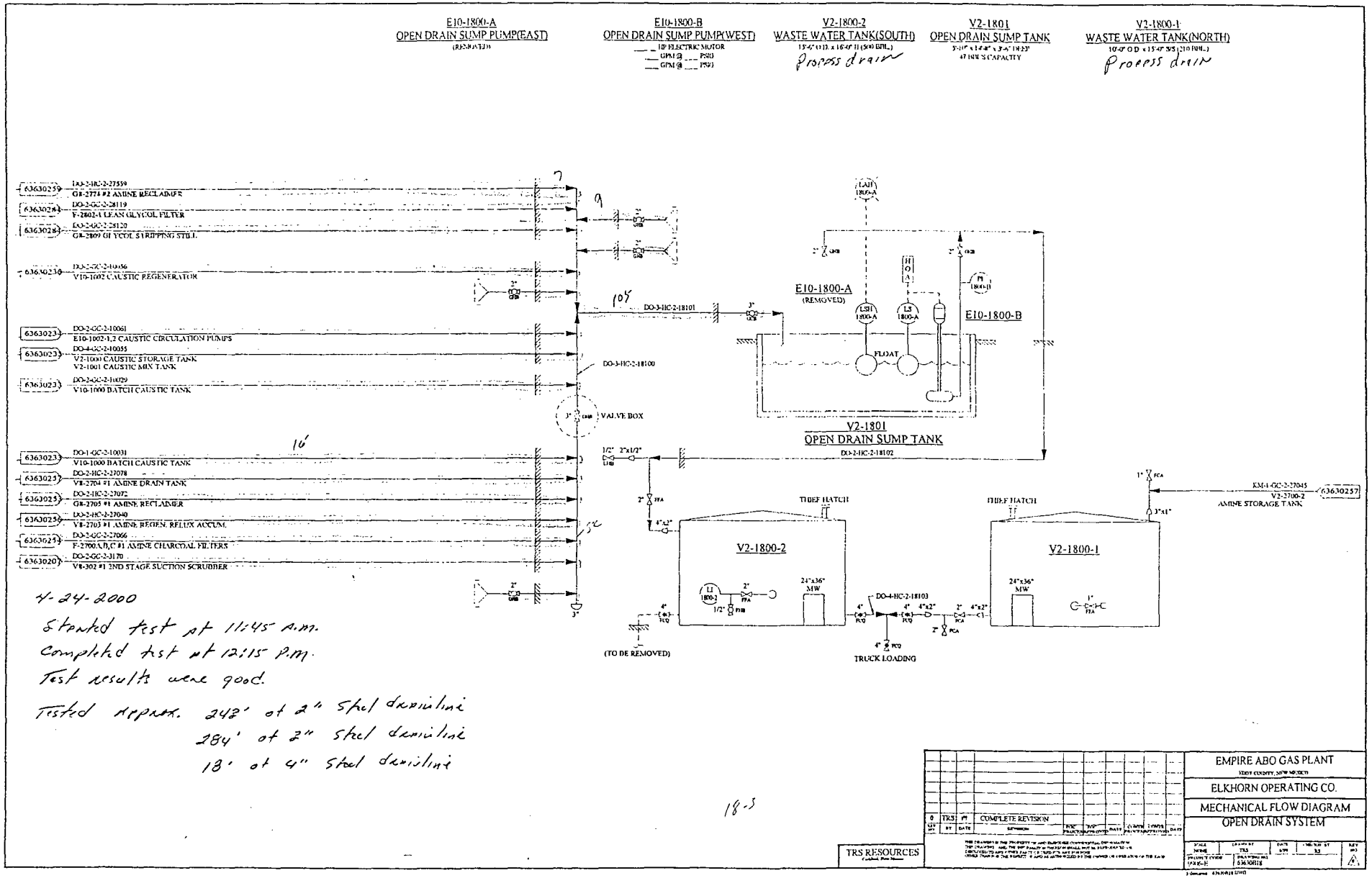

E4-930-1
#1 SULLAIR COMBUSTION AIR COMPRESSOR (NORTHEAST)
60 HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
V8-930-1
COMBUSTION AIR SCRUBBER/L.O. TANK
12 3/4" O.D. x 7'-0" S/S
175 PSIG @ 250°-20°F
___ PSIG @ ___°F
G8-930-1
COMBUSTION AIR COOLER
AREA ___ SQ. FT.; DUTY ___ MM BTU/HR
200 PSIG @ 250°F
___ PSIG @ ___/___°F
1/2 HP
E4-930-2
#2 SULLAIR COMBUSTION AIR COMPRESSOR (NORTH MIDDLE)
60 HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
V8-930-2
COMBUSTION AIR SCRUBBER/L.O. TANK
12 3/4" O.D. x 7'-0" S/S
175 PSIG @ 250°-20°F
___ PSIG @ ___°F
G8-930-2
COMBUSTION AIR COOLER
AREA ___ SQ. FT.; DUTY ___ MM BTU/HR
200 PSIG @ 250°F
___ PSIG @ ___/___°F
1/2 HP
E4-930-3
#3 SULLAIR COMBUSTION AIR COMPRESSOR (NORTHWEST)
60 HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
V8-930-3
COMBUSTION AIR SCRUBBER/L.O. TANK
12 3/4" O.D. x 7'-0" S/S
175 PSIG @ 250°-20°F
___ PSIG @ ___°F
G8-930-3
COMBUSTION AIR COOLER
AREA ___ SQ. FT.; DUTY ___ MM BTU/HR
200 PSIG @ 250°F
___ PSIG @ ___/___°F
1/2 HP
INTAKE
AIR COMPRESSOR SKID LIMITS
FLUID FILTER
TO DRAIN
TO ATMOS
MOISTURE SEPARATOR W/TRAP
E4-930-4 SOUTHEAST SULLAIR
COMPRESSOR BUILDING CELLAR
E4-930-5 SOUTHWEST SULLAIR
NO. 7 COMPRESSOR LEAN BURN SYSTEM
NO. 9 COMPRESSOR LEAN BURN SYSTEM
#8 COMPRESSOR LEAN BURN SYSTEM
CRYO COMPRESSOR BUILDING CELLAR
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
INSTRUMENT AIR
COMPLETE REVISION
TRS RESOURCES

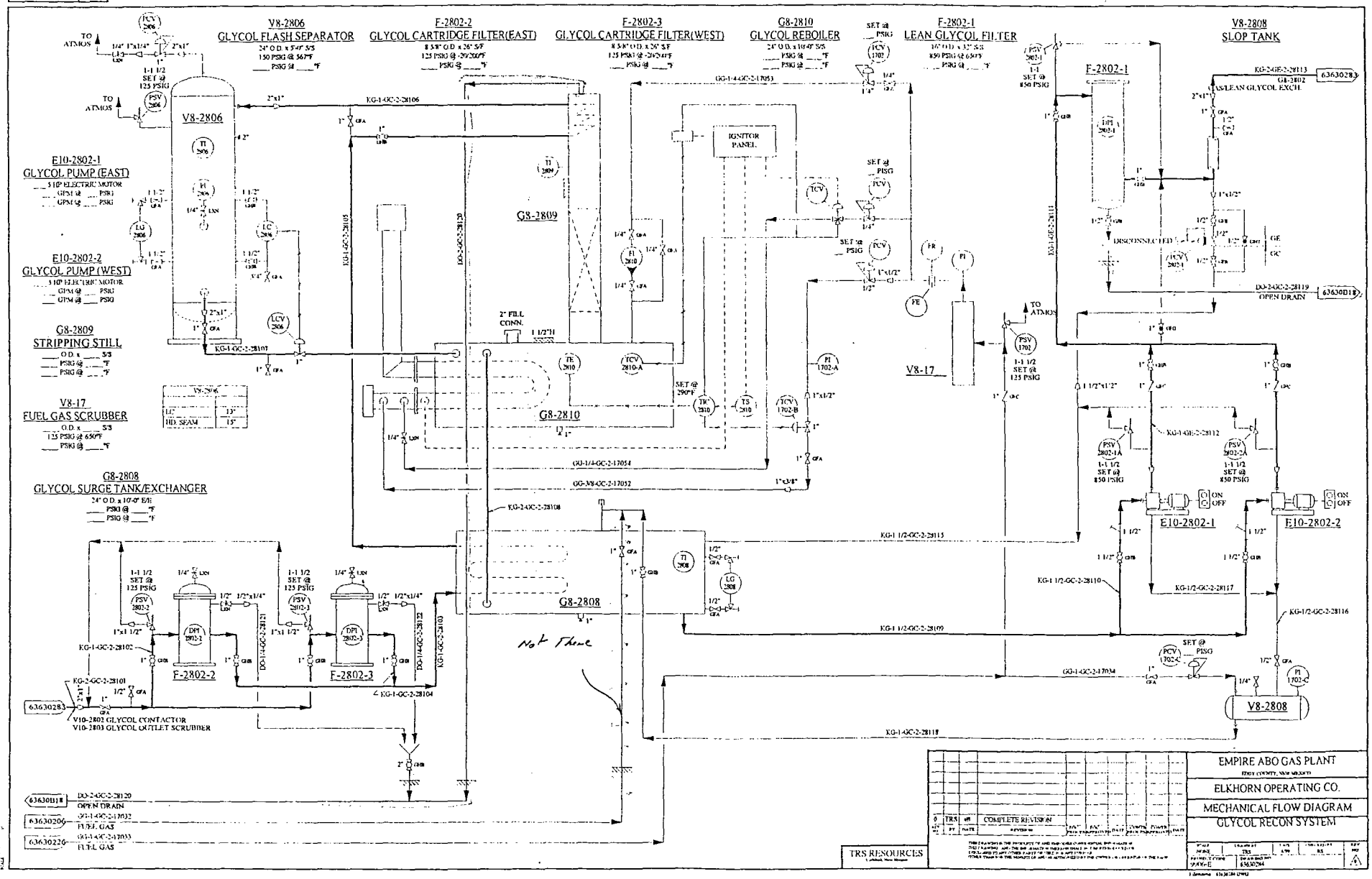

V8-2301
FLARE KNOCKOUT DRUM
V8-2302
FLARE KNOCKOUT DRUM
D-2301
NORTH FLARE
D-2302
SOUTH FLARE
FLARE SUMP TANK
E10-1802-1
FLARE KNOCK OUT DRAIN PUMP (EAST)
E10-1802-2
FLARE KNOCK OUT DRAIN PUMP (WEST)
Note: Flare system was opened up by Elkhorn operators.
Date: 2-22-2000
Started test at 9:15 a.m.
Completed test at 9:45 a.m.
171' Tested 285 of 4" steel drain line
STEEL LINED CONCRETE TANK
V2-1802
FLARE SUMP TANK
EMPIRE ABO GAS PLANT
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
FLARE SYSTEM
TRS RESOURCES

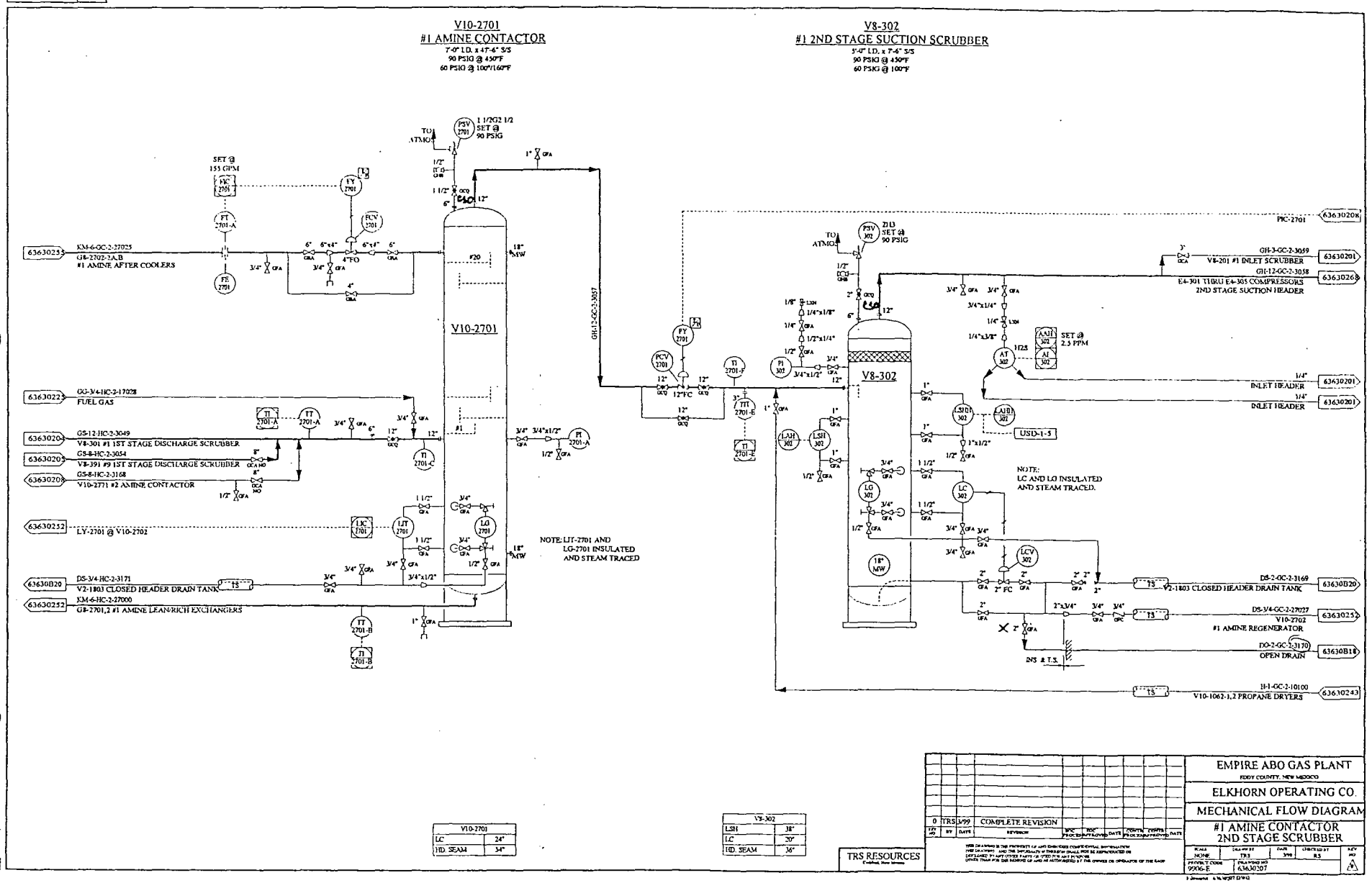

V8-2301
FLARE KNOCKOUT DRUM
V8-2302
FLARE KNOCKOUT DRUM
D-2301
NORTH FLARE
D-2302
SOUTH FLARE
FLARE SUMP TANK
E10-1802-1
FLARE KNOCK OUT DRAIN PUMP (EAST)
E10-1802-2
FLARE KNOCK OUT DRAIN PUMP (WEST)
63630278 GS-2-HC-2-3056 E4-309 COMPRESSOR
63630283 GM-2-GC-2-28123 E4-2800-3 REGEN SUNDYNE COMPRESSOR
63630222 H-1-GD-2-6015 E10-600-1B,2B DEETHANIZER FEED PUMPS
63630219 GM-8-GC-2-29053 CRYOGENIC SKID RELIEF HEADER
63630227 GM-6-GC-2-29030 E4-351,352,353 COMPRESSORS
OLD LIQUID DEHYDRATORS
63630120 GM-6-GC-2-18005 V2-1803 CLOSED DRAIN HEADER TANK
63630228 GM-4-GC-2-6022 V8-610 DEETHANIZER FEED TANK
63630212 GM-4-GC-2-3185 GE-304-1,2 3RD STAGE DIS. COOLERS
63630223 GM-4-GC-2-28163 GE-2300-2 2ND STAGE RESIDUE COOLER
63630202 GM-10-HC-2-2033 V8-271 #2 INLET SCRUBBER
63630214 GT-6-GC-2-2900 MAH-2800
63630214 GM-1-GC-2-28035 V10-2800-1,2 GAS DEHYDRATORS
63630215 GM-2-GC-2-28049 V10-3001-1,2 LIQUID DEHYDRATORS
GM-8-GC-2-3180 INJECTION COMPRESSORS
63630261 GM-6-HC-2-27537 V8-2772 #2 AMINE REFLUX ACCUMULATOR
63630226 H-1-HC-2-25004 E10-2500-1,2 ACID GAS K.O. PUMPS
63630233 GM-2-GC-2-10038 GE-1003 CAUSTIC REGENERATION O.H. CONDENSER
63630234 GM-3-GC-2-10104 V10-1062-1,2 PROPANE DRYERS
63630233 GM-4-GC-2-10065 V10-1001 CAUSTIC CONTACTOR
63630231 GM-3-GC-2-10022 V10-1000 BATCH CAUSTIC TANK
63630228 GM-4-GC-2-6043 V10-610 DEETHANIZER TOWER
63630229 GM-3-GC-2-29064 GE-614 DEETHANIZER O.H. CONDENSER
63630265 GS-8-HC-2-3021 E4-301 - E4-308 COMPRESSORS
63630201 GM-12-HC-2-2032 V8-201 #1 INLET SCRUBBER
63630259 GM-6-HC-2-23039 V8-2701 #1 AMINE REFLUX ACCUMULATOR
63630282 GM-4-GC-2-29058 V8-2933 PROPANE REFRIG. ACCUMULATOR
63630223 GM-2-GC-2-17027 VE-1700-1A FUEL GAS SCRUBBER
63630282 GM-3-GC-2-29057 GE-2957-B, GE-2958-B PROPANE REFRIG. COOLERS
63630280 GM-4-GC-2-3311 E4-1200-1,2 COMPRESSORS
63630231 GT-4-GC-2-10098 V8-612 ETHANE PRODUCT SCRUBBER
63630281 RP-4-GC-2-29020 V8-2952-B 2ND STAGE REFRIG. SCRUBBER
63630267 RP-4-GC-2-29018 E4-301 - E4-305 COMPRESSORS
63630226 GG-3/4-GC-2-17039 VE-1700-1A FUEL GAS SCRUBBER
GT-6-GD-2-23012 FROM 1ST STG. RESIDUE SUCTION HEADER 63630277
GM-4-HC-2-XXXXX FROM REGEN GAS CHILLER 63630026
GM-10-HC-2-29067
GM-12-HC-2-2967
GM-10-HC-2-3209
GM-12-HC-2-3181
GM-14-HC-2-3182
GM-3-GC-2-17035
DH-1 1/2-HC-2-2042
DH-4-HC-2-2041
DH-1 1/2-HC-2-3184
DH-4-HC-2-3183
V8-2301
D-2301
V8-2302
D-2302
E10-1802-1
E10-1802-2
DH-3-HC-2-18227 63630028
V2-1104-B CLEAN SLOP OIL TANK
P-TRAP
FLOAT
FLOAT
STEEL LINED CONCRETE TANK
V2-1802
FLARE SUMP TANK
63630242
Date 4-24-2000
Started test at 2:45 P.M. Complete test at 2:15 P.M
Test Results Good
Tested 871' of 2" steel drain line # DH-3-HC-2-18227
Tested 80' of 1½" steel drain line #DH-1½-HC-2-2028
EMPIRE ABO GAS PLANT
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
FLARE SYSTEM
TRS RESOURCES
COMPLETE REVISION
9906-F
63630021


V8-291
#9 1ST STAGE SUCTION SCRUBBER
E10-291
#9 INLET SCRUBBER PUMP
1 1/2 x 1 1/2-5 210' ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM 50 PSIG
TO ATMOS.
PSV 291
SET @ 35 PSIG
CSO
GS-10-HC-2-2023
E4-309 COMPRESSOR #9 1ST STAGE SUCTION
63630273
GS-14-HC-2-2022
E4-306,E4-307,E4-308 COMPRESSORS FIRST STAGE SUCTION HEADER
(DISCONNECTED)
FE 291
TW 291-A
NOTE:
LC & LG INSULATED AND STEAM TRACED
USID-9
ASH 291
LSHH 291
V8-291
TI 291-B
LC 291
LG 291
LY 291
H O A
LCV 291
PI 291-A
63630208
H-3/4-HC-2-3157
V8-392 #9 2nd STAGE SUCTION SCRUBBER
H-1-HC-2-3156
V8-392 #9 2nd STAGE SUCTION SCRUBBER
START/STOP
PI 291-B
E10-291
H-1 1/2-HC-2-2038
V2-1104-B CLEAN SLOP OIL TANK
H-1-HC-2-2037
V8-291
LSHH 50"
LC 28"
HD SEAM 30"
TRS RESOURCES
0 TRS 2/99 COMPLETE REVISION
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
INLET GAS SYSTEM
NONE
TRS
2/99
PROJECT CODE 9906-E
DRAWING NO. 63630203
REV 0


E10-1800-4
SUMP PUMP
___ 10" DIAPHRAM
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
E10-1801-1
PRODUCT CONTAINMENT DRAIN PUMP
___ 10" DIAPHRAM
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
V2-1104-B
SLOP OIL TANK (NORTH) CLEAN
12'-0" O.D. x 20'-0" S/S
387 BBL. CAPACITY
V2-1104-A
SLOP OIL TANK (SOUTH) DIRTY
12'-0" O.D. x 20'-0" S/S
387 BBL. CAPACITY
AU-1/2-FC-2-9156
UTILITY AIR
DH-2-GC-2-18233
INJECTION COMPRESSORS
63630250
DH-2-GC-2-18232
E10-1202B,3B,4B
PIPELINE/RERUN PUMPS
SET @ ___ PSIG
PCV 1800-4A
63630B11
AU-1-FC-2-9153
UTILITY AIR
SET @ 0 PSIG
PCV 1800-4
PCV 1801-1
E10-1800-4
E10-1801-1
PI 1800-4
PI 1801-1
LC 1801-1
FLOAT
63630244
DH-1-G6-2-XXXX1
V6-1103-1/2 #1/#2 GASOLINE STORAGE TANKS
DH-2-HC-2-18226
DH-2-HC-2-18224
DH-2-HC-2-18229
DH-2-HC-2-18231
E4-309
SUMP
PIPELINE PUMPS
SUMP
CLEAN OUT
V2-1104-B
V2-1104-A
LAH 1104-B
LT 1104-B
TH 1104-B
LI 1104-B
PVSV 1104-A
LT 1104-A
TH 1104-A
LI 1104-A
TO ARCO
4" TO ARCO
63630200
H-4-HC-2-2028
V8-201 #1 INLET SCRUBBER, V8-271 #2 INLET SCRUBBER
63630B21
DH-3-HC-2-18227
E10-1802-1,2 FLARE SUMP PUMPS
63630200
H-1 1/2-HC-2-2038
E10-291 #9 INLET SCRUBBER PUMP
63630280
DH-2-HC-2-18204
E10-1800-1,2,3,5,6 SUMP PUMPS
63630200
H-3-HC-2-2027
E10-201 #1 INLET PUMP, E10-271 #2 INLET PUMP
0 TRS COMPLETE REVISION
TRS RESOURCES
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
DIRTY SLOP OIL SYSTEM
SCALE NONE
DRAWN BY TRS
DATE 4/99
CHK'D BY RS
PROJECT CODE 2006-E
DRAWING NO. 636302S0
REV 0


E10-1800-A
OPEN DRAIN SUMP PUMP(EAST)
E10-1800-B
OPEN DRAIN SUMP PUMP(WEST)
10 HP ELECTRIC MOTOR
GPM @ PSIG
GPM @ PSIG
V2-1800-2
WASTE WATER TANK(SOUTH)
15'-6" O.D. x 16'-0" H (500 BBL.)
Process drain
V2-1801
OPEN DRAIN SUMP TANK
47 BBLS CAPACITY
V2-1800-1
WASTE WATER TANK(NORTH)
10'-0" O.D. x 15'-0" S/S (210 BBL.)
Process drain
6363023 DO-2-HC-2-27559 GR-2774 #2 AMINE RECLAIMER
6363023 DO-2-GC-2-28119 F-2802-A LEAN GLYCOL FILTER
6363023 DO-2-GC-2-28120 GR-2809 GLYCOL STRIPPING STILL
6363023 DO-2-GC-2-10056 V10-1002 CAUSTIC REGENERATOR
6363023 DO-2-GC-2-10061 E10-1002-1,2 CAUSTIC CIRCULATION PUMPS
6363023 DO-4-GC-2-10055 V2-1003 CAUSTIC STORAGE TANK V2-1001 CAUSTIC MIX TANK
6363023 DO-2-GC-2-10029 V10-1000 BATCH CAUSTIC TANK
6363023 DO-1-GC-2-10031 V10-1000 BATCH CAUSTIC TANK
6363023 DO-2-HC-2-27078 VR-2704 #1 AMINE DRAIN TANK
6363023 DO-2-HC-2-27072 GR-2705 #1 AMINE RECLAIMER
6363023 DO-2-HC-2-27040 VR-2703 #1 AMINE REGEN. RELUX ACCUM.
6363023 DO-2-GC-2-27066 F-2700,A,B,C #1 AMINE CHARCOAL FILTERS
6363020 DO-2-GC-2-3170 VR-302 #1 2ND STAGE SUCTION SCRUBBER
DO-3-HC-2-18101
DO-3-HC-2-18100
VALVE BOX
E10-1800-A
(REMOVED)
E10-1800-B
FLOAT
V2-1801
OPEN DRAIN SUMP TANK
DO-2-HC-2-18102
THIEF HATCH
V2-1800-2
24"x36" MW
THIEF HATCH
V2-1800-1
24"x36" MW
KM-1-GC-2-27045
V2-2700-2
AMINE STORAGE TANK
63630257
DO-4-HC-2-18103
(TO BE REMOVED)
TRUCK LOADING
4-24-2000
Started test at 11:45 A.M.
Completed test at 12:15 P.M.
Test results were good.
Tested approx. 242' of 2" Steel drainline
284' of 2" Steel drainline
18' of 4" Steel drainline
18-3
COMPLETE REVISION
TRS RESOURCES
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
OPEN DRAIN SYSTEM


V8-2806
GLYCOL FLASH SEPARATOR
F-2802-2
GLYCOL CARTRIDGE FILTER(EAST)
F-2802-3
GLYCOL CARTRIDGE FILTER(WEST)
G8-2810
GLYCOL REBOILER
F-2802-1
LEAN GLYCOL FILTER
V8-2808
SLOP TANK
E10-2802-1
GLYCOL PUMP (EAST)
E10-2802-2
GLYCOL PUMP (WEST)
G8-2809
STRIPPING STILL
V8-17
FUEL GAS SCRUBBER
G8-2808
GLYCOL SURGE TANK/EXCHANGER
IGNITOR PANEL
2" FILL CONN.
TO ATMOS
DISCONNECTED
OPEN DRAIN
Not There
V10-2802 GLYCOL CONTACTOR
V10-2803 GLYCOL OUTLET SCRUBBER
EMPIRE ABO GAS PLANT
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
GLYCOL RECON SYSTEM
TRS RESOURCES


V10-2701
#1 AMINE CONTACTOR
7'-0" I.D. x 47'-6" S/S
90 PSIG @ 450°F
60 PSIG @ 100°/160°F
V8-302
#1 2ND STAGE SUCTION SCRUBBER
5'-0" I.D. x 7'-6" S/S
90 PSIG @ 450°F
60 PSIG @ 100°F
V10-2701
V8-302
NOTE: LIT-2701 AND LG-2701 INSULATED AND STEAM TRACED
NOTE: LC AND LG INSULATED AND STEAM TRACED.
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
#1 AMINE CONTACTOR
2ND STAGE SCRUBBER
TRS RESOURCES
9906-E
63630207

G8-2701-1A	G8-2701-2A	G8-2702-B	E10-2702-D	V8-2703	E10-2702-1A	E10-2702-1B
#1 AMINE REFLUX COND. (EAST)	#1 AMINE REFLUX COND. (WEST)	#1 AMINE REFLUX AFTERCOOLER	#1 AMINE REFLUX AFTERCOOLER WATER CIRC. PUMP	#1 AMINE REFLUX ACCUM.	#1 AMINE REFLUX PUMP (EAST)	#1 AMINE REFLUX PUMP (WEST)
AREA 2452 SQ. FT.; DUTY 10.3 MMBTU/HR 50 PSIG @ 300°F ___ PSIG @ ___ / ___ °F	AREA 2452 SQ. FT.; DUTY 10.3 MMBTU/HR 50 PSIG @ 300°F ___ PSIG @ ___ / ___ °F	AREA 301 SQ. FT.; DUTY 0.473 MMBTU/HR SHELL: 50 PSIG @ 200°F/___ PSIG @ 60/60°F TUBE: 75 PSIG @ 200°F/___ PSIG @ ___ / ___ °F	1.25x1.5x3 210' ELECTRIC MOTOR ___ GPM @ ___ PSIG ___ GPM @ ___ PSIG	36' O.D. x 7'-6" S/S 50 PSIG @ 450°F 3 PSIG @ 60°F	1x6 1/2 3 HP ELECTRIC MOTOR 30 GPM @ ___ PSIG ___ GPM @ 55 PSIG	1x6 1/2 3 HP ELECTRIC MOTOR 30 GPM @ ___ PSIG ___ GPM @ 55 PSIG

63630252 GS-10-HC-2-27031 V10-2702 #1 AMINE REGENERATOR

TI 2702

GS-8-HC-2-27033

TIC 2701-2 SET @ 80°F

TCV 2701-1A

TCV 2701-2A

GS-8-HC-2-27032

G8-2701-1A G8-2701-2A

TE 2701-2

GS-8-HC-2-27035 GS-8-HC-2-27036

GS-8-HC-2-27034

E8-2701-1 E8-2701-2

XSHH 2701-1A XSHH 2701-2A

H O A FAST SLOW

STOP STOP

ON OFF

63630B05 WC-3-FB-2-13052 COOLING WATER RETURN

TI 2702-BA

G8-2702-B

TW 2702-BC TI 2702-BD

3/4-3/4 SET @ 75 PSIG PSV 2702-1 TO ATMOS

GS-6-HC-2-27037

63630B19 WW-2-FD-2-13520 V2-1800 EVAPORATION TANK

WC-3-FB-2-13051

63630B05 WC-3-FB-2-13050 COOLING WATER SUPPLY

ON OFF

E10-2702-B

SET @ 13 PSIG

PIC 2703 TCV 2703

PI 2703-B

GM-6-HC-2-27039 FLARE 63630121

GS-6-HC-2-27038 V8-2580 ACID GAS SCRUBBER 63630262

V8-2703

TI 2703-A TIT 2703-A

PI 2703A

LG 2703-A LIT 2703

SAMPLE CONTAINER

KM-3-HC-2-27042

KM-3-HC-2-27041

PI 2702-1A

KM-2-HC-2-27043 V10-2702 #1 AMINE REGENERATOR 63630252

FE 2702-1 (OUT OF SERVICE)

DA-2-HC-2-27054 V8-2704 #1 AMINE DRAIN TANK 63630257

KM-1-GC-2-27049 V2-2701 AMINE DAY TANK 63630257

E10-2702-1A

PI 2702-1B

KM-2-HC-2-27044

E10-2702-1B

DA-2-HC-2-27055 V8-2704 #1 AMINE DRAIN TANK 63630257

GM-1-HC-2-27073 FLARE 63630262

LIC 2703

LY-2703 63630252

DO-2-HC-2-27040 OPEN DRAIN 63630D18

V8-2703	
OT	30"
HEAD SEAM	24"

TRS RESOURCES

NO	BY	DATE	REVISION
0	TRS	3/99	COMPLETE REVISION

EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
#1 AMINE SYSTEM

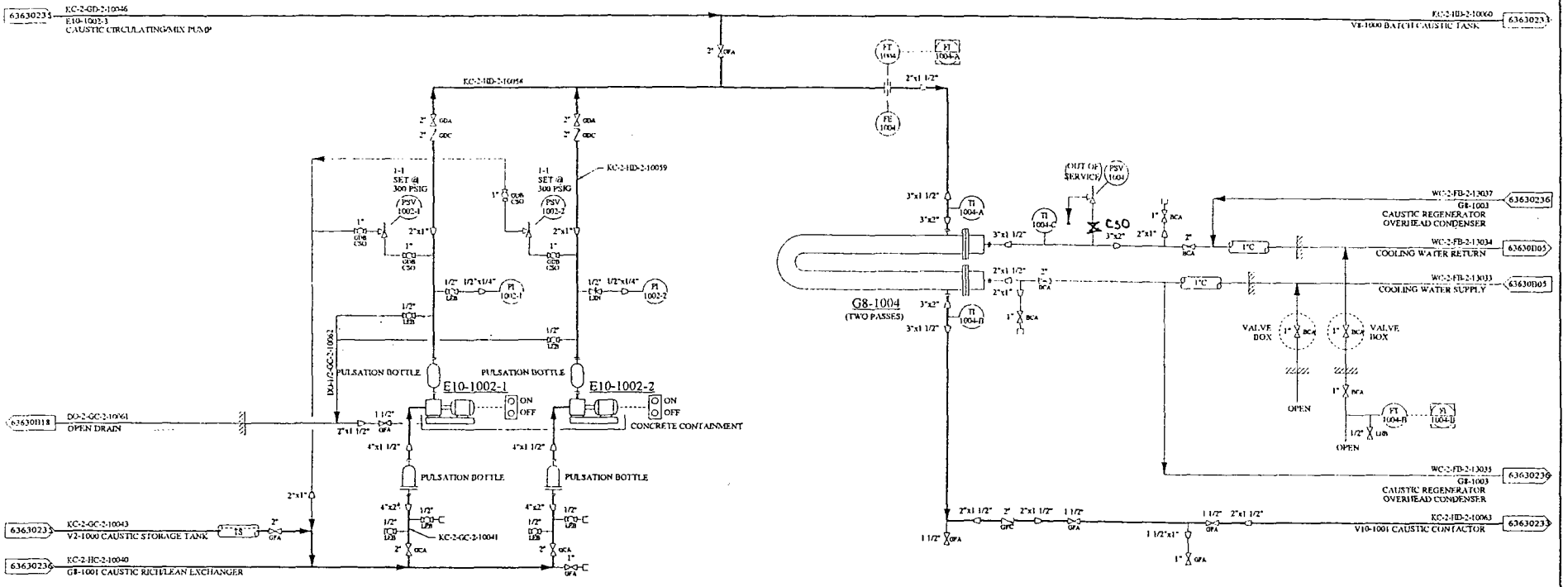
SCALE	DRAWN BY	DATE	CHECKED BY	REV NO
NONE	TRS	3/99	RS	0

PROJECT CODE 9XX6-E
DRAWING NO 63630256

E10-1002-1
CAUSTIC CIRCULATION PUMP (EAST)
1 1/4x1 1/2x1 1/2 2 HP ELECTRIC MOTOR
12 GPM @ 300 PSIG
___ GPM @ 250 PSIG

E10-1002-2
CAUSTIC CIRCULATION PUMP (WEST)
1 1/4x1 1/2x1 1/2 2 HP ELECTRIC MOTOR
12 GPM @ 300 PSIG
___ GPM @ 250 PSIG

G8-1004
LEAN CAUSTIC COOLER
AREA 203.8 SQ. FT. DUTY 0.168 MMBTU/HR
SHELL: 300 PSIG @ 650°F / 250 PSIG @ 120/118°F
TUBE: 500 PSIG @ 650°F / ___ PSIG @ ___°F



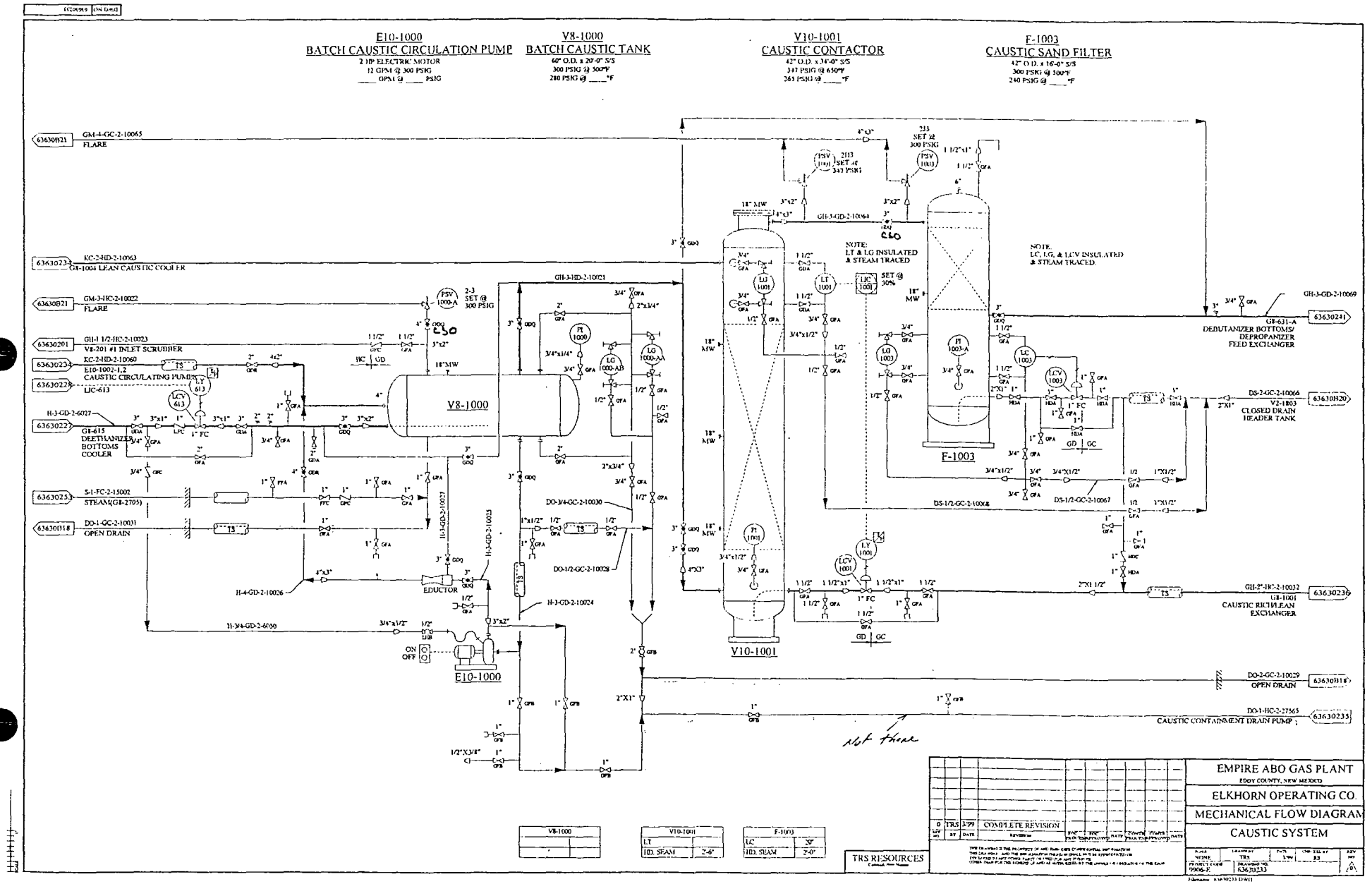
NO	BY	DATE	REVISION
0	TRS	3/99	COMPLETE REVISION

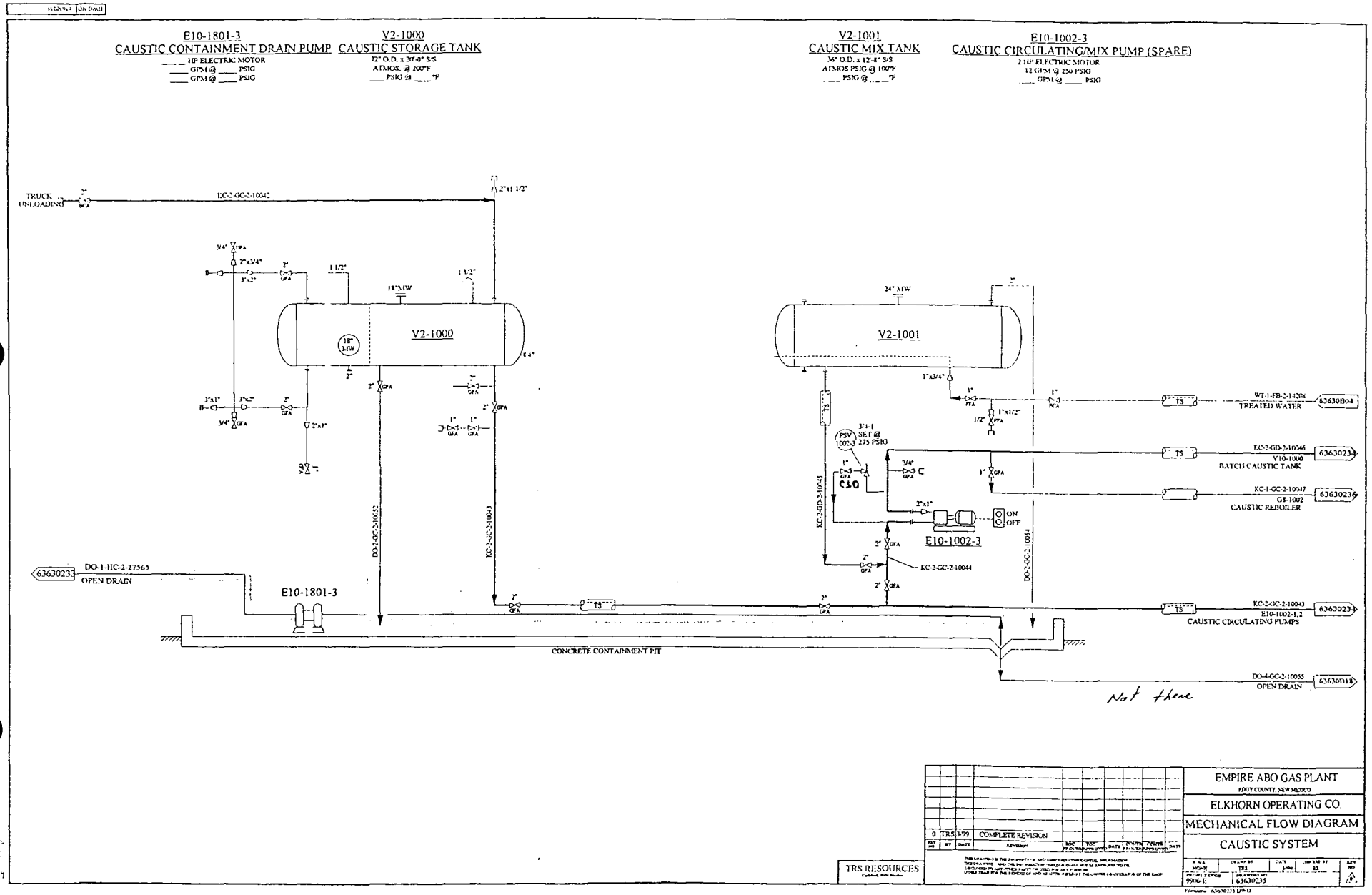
TRS RESOURCES

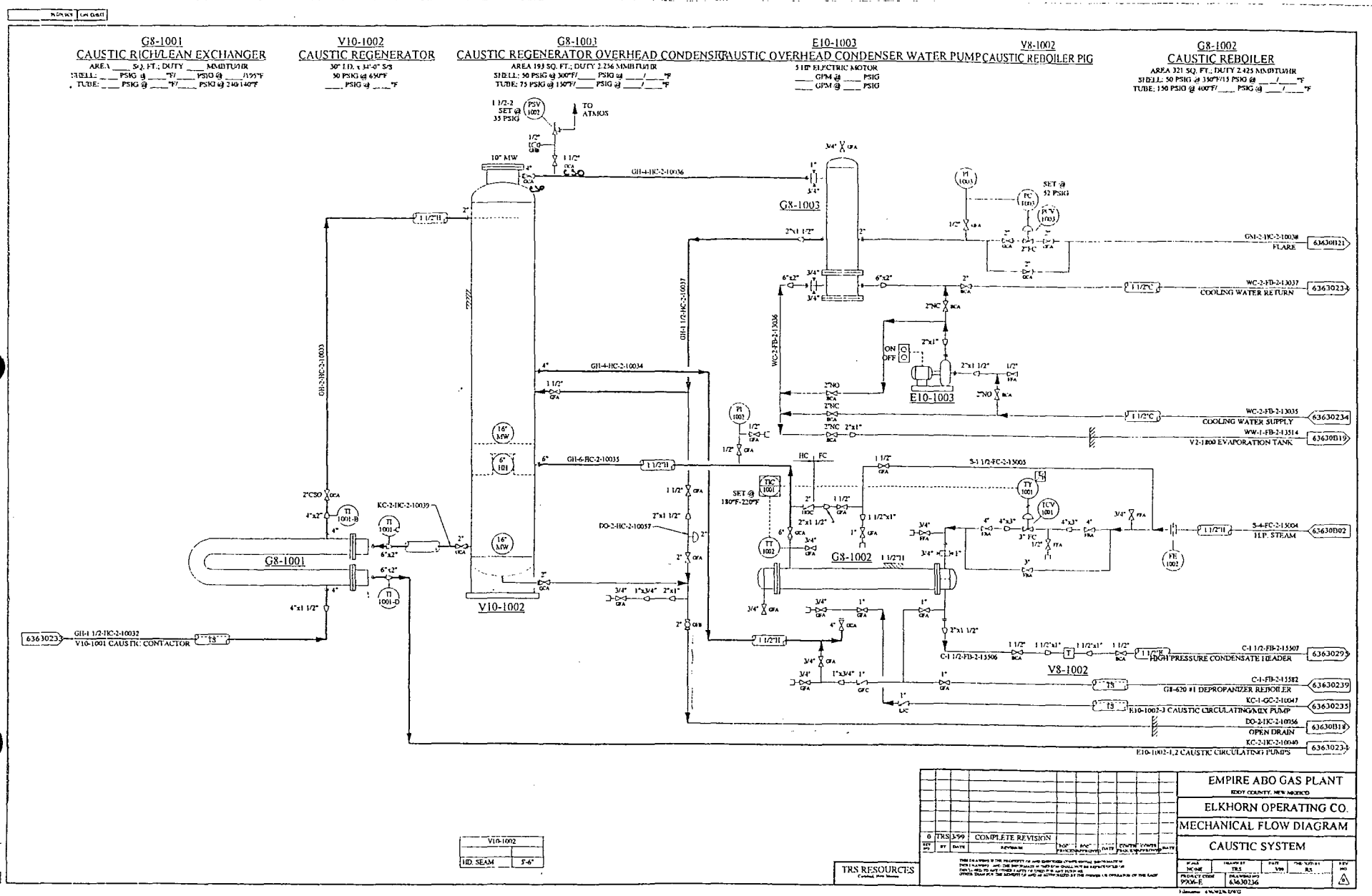
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
CAUSTIC SYSTEM

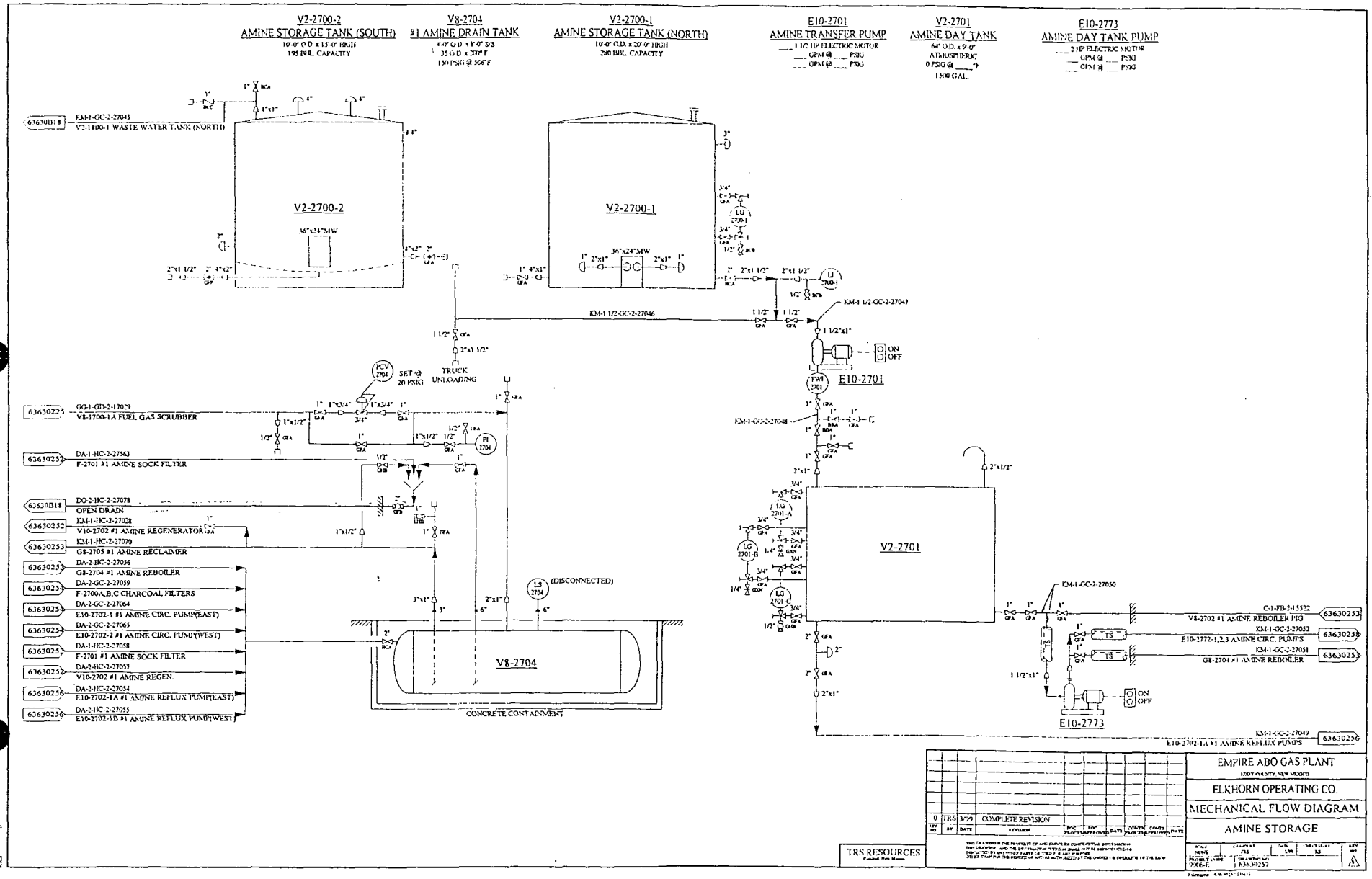
SCALE	DRAWN BY	DATE	CHECKED BY
NONE	TRS	3/99	RN

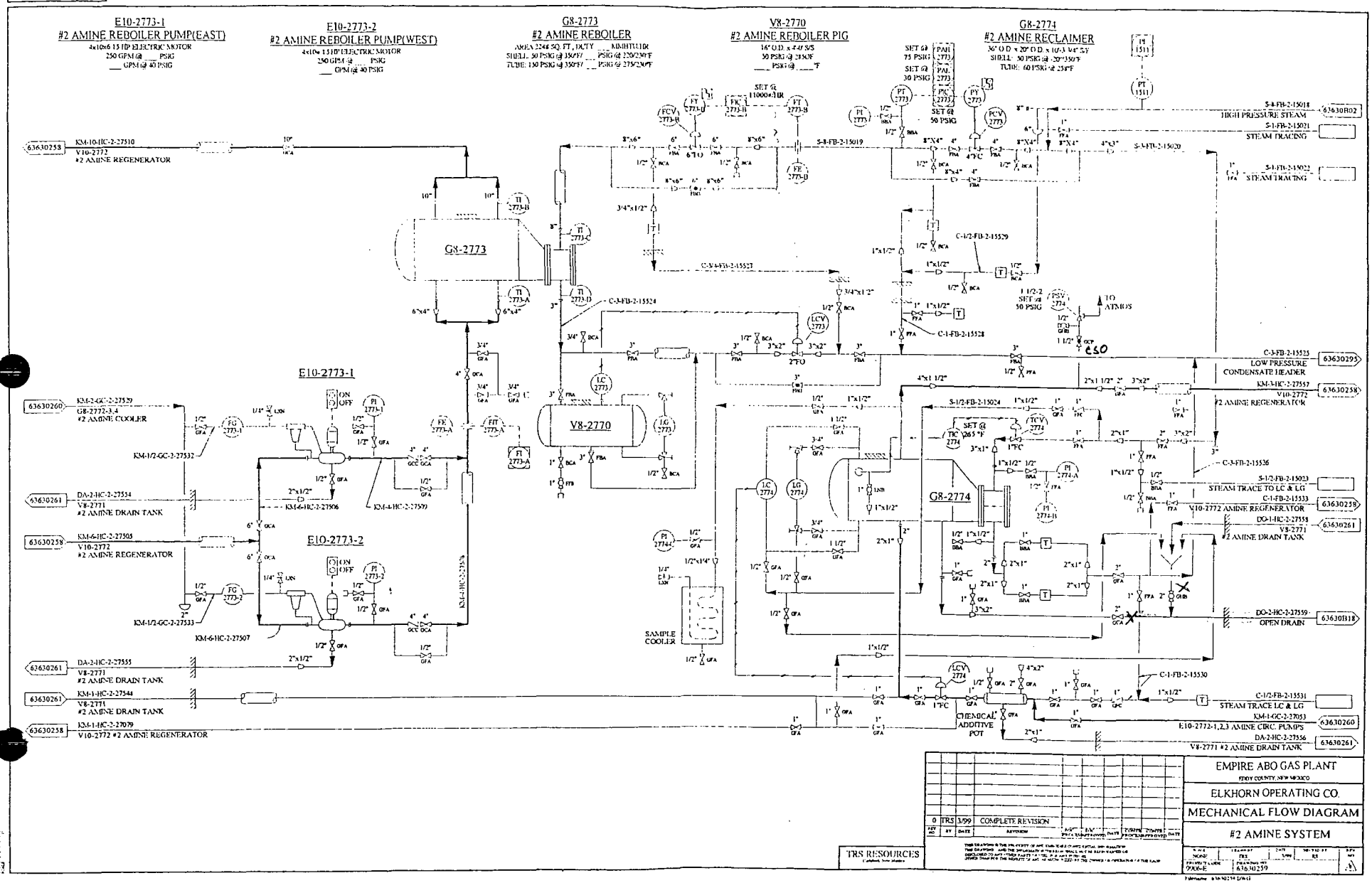
PROJECT CODE 9906-E
DRAWING NO A1430234
REV 0


E10-1000
BATCH CAUSTIC CIRCULATION PUMP
2 HP ELECTRIC MOTOR
12 GPM @ 300 PSIG
____ GPM @ ____ PSIG
V8-1000
BATCH CAUSTIC TANK
60" O.D. x 20'-0" S/S
300 PSIG @ 500°F
280 PSIG @ ____°F
V10-1001
CAUSTIC CONTACTOR
42" O.D. x 34'-0" S/S
347 PSIG @ 650°F
265 PSIG @ ____°F
F-1003
CAUSTIC SAND FILTER
42" O.D. x 16'-0" S/S
300 PSIG @ 500°F
240 PSIG @ ____°F
GM-4-GC-2-10065
FLARE
EC-2-HD-2-10063
GB-1004 LEAN CAUSTIC COOLER
GM-3-HC-2-10022
FLARE
GH-1 1/2-HC-2-10023
V8-201 #1 INLET SCRUBBER
EC-2-HD-2-10060
E10-1002-1,2
CAUSTIC CIRCULATING PUMPS
LIC-613
GB-615
DEETHANIZER
BOTTOMS
COOLER
S-1-FC-2-15002
STEAM(GB-2705)
DO-1-GC-2-10031
OPEN DRAIN
V8-1000
EDUCTOR
E10-1000
V10-1001
F-1003
NOTE:
LT & LG INSULATED
& STEAM TRACED
NOTE:
LC, LG, & LCV INSULATED
& STEAM TRACED
DEBUTANIZER BOTTOMS/
DEPROPANIZER
FEED EXCHANGER
GB-631-A
CLOSED DRAIN
HEADER TANK
V2-1803
GB-1001
CAUSTIC RICH/LEAN
EXCHANGER
DO-2-GC-2-10029
OPEN DRAIN
DO-1-HC-2-27563
CAUSTIC CONTAINMENT DRAIN PUMP
Not Here
TRS RESOURCES
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
CAUSTIC SYSTEM
COMPLETE REVISION
9906-F
636J0233


E10-1801-3
CAUSTIC CONTAINMENT DRAIN PUMP
___ HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
V2-1000
CAUSTIC STORAGE TANK
72" O.D. x 20'-0" S/S
ATMOS. @ 200°F
___ PSIG @ ___°F
V2-1001
CAUSTIC MIX TANK
36" O.D. x 12'-0" S/S
ATMOS PSIG @ 100°F
___ PSIG @ ___°F
E10-1002-3
CAUSTIC CIRCULATING/MIX PUMP (SPARE)
2 HP ELECTRIC MOTOR
12 GPM @ 250 PSIG
___ GPM @ ___ PSIG
TRUCK UNLOADING
EC-2-GC-2-10042
V2-1000
V2-1001
PSV 1002-3 SET @ 275 PSIG
E10-1002-3
E10-1801-3
63630233
DO-1-HC-2-27565
OPEN DRAIN
CONCRETE CONTAINMENT PIT
WT-1-FB-2-14208
TREATED WATER
63630B04
EC-2-GD-2-10046
V10-1000
BATCH CAUSTIC TANK
63630236
EC-1-GC-2-10047
G8-1002
CAUSTIC REBOILER
KC-2-GC-2-10043
E10-1002-1,2
CAUSTIC CIRCULATING PUMPS
63630236
DO-4-GC-2-10055
OPEN DRAIN
63630D18
Not there
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
CAUSTIC SYSTEM
TRS RESOURCES
0 TRS 3/99 COMPLETE REVISION
9906-E
63630233


G8-1001
CAUSTIC RICH/LEAN EXCHANGER
V10-1002
CAUSTIC REGENERATOR
G8-1003
CAUSTIC REGENERATOR OVERHEAD CONDENSER
E10-1003
CAUSTIC OVERHEAD CONDENSER WATER PUMP
V8-1002
CAUSTIC REBOILER PIG
G8-1002
CAUSTIC REBOILER
TO ATMOS
SET @ 52 PSIG
SET @ 180°F-220°F
FLARE
COOLING WATER RETURN
COOLING WATER SUPPLY
V2-1800 EVAPORATION TANK
H.P. STEAM
HIGH PRESSURE CONDENSATE HEADER
G8-620 #1 DEPROPANIZER REBOILER
E10-1002-3 CAUSTIC CIRCULATING/RX PUMP
OPEN DRAIN
E10-1002-1,2 CAUSTIC CIRCULATING PUMPS
V10-1001 CAUSTIC CONTACTOR
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
CAUSTIC SYSTEM
TRS RESOURCES
9906-E


V2-2700-2
AMINE STORAGE TANK (SOUTH)
10'-0" O.D. x 15'-0" HIGH
195 BBL CAPACITY
V8-2704
#1 AMINE DRAIN TANK
4'-0" O.D. x 8'-0" S/S
35.0 O.D. x 200° F
150 PSIG @ 366° F
V2-2700-1
AMINE STORAGE TANK (NORTH)
10'-0" O.D. x 20'-0" HIGH
280 BBL CAPACITY
E10-2701
AMINE TRANSFER PUMP
___ 1 1/2 HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
V2-2701
AMINE DAY TANK
64" O.D. x 9'-0"
ATMOSPHERIC
0 PSIG @ ____?
1500 GAL.
E10-2773
AMINE DAY TANK PUMP
___ 2 HP ELECTRIC MOTOR
___ GPM @ ___ PSIG
___ GPM @ ___ PSIG
63630118 KM-1-GC-2-27045 V2-1800-1 WASTE WATER TANK (NORTH)
V2-2700-2
V2-2700-1
KM-1 1/2-GC-2-27046
KM-1 1/2-GC-2-27047
TRUCK UNLOADING
PCV 2704
SET @ 20 PSIG
E10-2701
ON
OFF
63630225 GG-1-GD-2-17029 V8-1700-1A FUEL GAS SCRUBBER
PI 2704
KM-1-GC-2-27048
63630325 DA-1-HC-2-27563 F-2701 #1 AMINE SOCK FILTER
63630118 DO-2-HC-2-27078 OPEN DRAIN
63630252 KM-1-HC-2-27028 V10-2702 #1 AMINE REGENERATOR
63630253 KM-1-HC-2-27070 G8-2705 #1 AMINE RECLAIMER
63630325 DA-1-HC-2-27056 G8-2704 #1 AMINE REBOILER
63630325 DA-2-GC-2-27059 F-2700A,B,C CHARCOAL FILTERS
63630325 DA-2-GC-2-27064 E10-2702-1 #1 AMINE CIRC. PUMP(EAST)
63630325 DA-2-GC-2-27065 E10-2702-2 #1 AMINE CIRC. PUMP(WEST)
63630325 DA-1-HC-2-27058 F-2701 #1 AMINE SOCK FILTER
63630325 DA-2-HC-2-27057 V10-2702 #1 AMINE REGEN.
63630256 DA-2-HC-2-27054 E10-2702-1A #1 AMINE REFLUX PUMP(EAST)
63630256 DA-2-HC-2-27055 E10-2702-1B #1 AMINE REFLUX PUMP(WEST)
LS 2704
(DISCONNECTED)
V8-2704
CONCRETE CONTAINMENT
V2-2701
KM-1-GC-2-27050
C-1-FB-2-15522 V8-2702 #1 AMINE REBOILER PIG 63630253
KM-1-GC-2-27052 E10-2772-1,2,3 AMINE CIRC. PUMPS 63630258
KM-1-GC-2-27051 G8-2704 #1 AMINE REBOILER 63630325
E10-2773
KM-1-GC-2-27049 E10-2702-1A #1 AMINE REFLUX PUMPS 63630256
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
AMINE STORAGE
0 TRS 3-99 COMPLETE REVISION
TRS RESOURCES
Carlsbad, New Mexico
63630257


E10-2773-1
#2 AMINE REBOILER PUMP(EAST)
4x10x6 15 HP ELECTRIC MOTOR
250 GPM @ ___ PSIG
___ GPM @ 40 PSIG
E10-2773-2
#2 AMINE REBOILER PUMP(WEST)
4x10x6 15 HP ELECTRIC MOTOR
250 GPM @ ___ PSIG
___ GPM @ 40 PSIG
G8-2773
#2 AMINE REBOILER
AREA 2248 SQ. FT., DUTY ___ MMBTU/HR
SHELL: 50 PSIG @ 350°F ___ PSIG @ 220/230°F
TUBE: 150 PSIG @ 350°F ___ PSIG @ 275/230°F
V8-2770
#2 AMINE REBOILER PIG
16" O.D. x 4'-0" S/S
50 PSIG @ 230°F
___ PSIG @ ___ °F
G8-2774
#2 AMINE RECLAIMER
36" O.D. x 20'-0" O.D. x 10'-3 1/4" S/S
SHELL: 50 PSIG @ 350°F
TUBE: 60 PSIG @ 230°F
G8-2773
G8-2774
V8-2770
E10-2773-1
E10-2773-2
63630258
KM-10-HC-2-27510
V10-2772
#2 AMINE REGENERATOR
S-8-FB-2-15019
S-8-FB-2-15018
HIGH PRESSURE STEAM
63630802
S-1-FB-2-15021
STEAM TRACING
S-3-FB-2-15020
S-1-FB-2-15022
STEAM TRACING
C-1-1/2-FB-2-15529
C-3-FB-2-15527
C-3-FB-2-15524
C-1-FB-2-15528
TO ATMOS
C-3-FB-2-15525
LOW PRESSURE
CONDENSATE HEADER
63630295
KM-3-HC-2-27557
63630258
V10-2772
#2 AMINE REGENERATOR
63630260
KM-2-GC-2-27529
GE-2772-3,4
#2 AMINE COOLER
KM-1/2-GC-2-27532
KM-6-HC-2-27506
KM-4-HC-2-27579
S-1/2-FB-2-15024
S-1/2-FB-2-15023
STEAM TRACE TO LC & LG
C-1-FB-2-15533
63630258
V10-2772 AMINE REGENERATOR
DO-1-HC-2-27558
63630261
V8-2771
#2 AMINE DRAIN TANK
63630261
DA-2-HC-2-27554
V8-2771
#2 AMINE DRAIN TANK
63630258
KM-6-HC-2-27505
V10-2772
#2 AMINE REGENERATOR
KM-1/2-GC-2-27533
KM-6-HC-2-27507
KM-4-HC-2-27578
C-3-FB-2-15526
DO-2-HC-2-27559
OPEN DRAIN
63630318
SAMPLE COOLER
C-1-FB-2-15530
C-1/2-FB-2-15531
STEAM TRACE LC & LG
63630261
DA-2-HC-2-27555
V8-2771
#2 AMINE DRAIN TANK
63630261
KM-1-HC-2-27544
V8-2771
#2 AMINE DRAIN TANK
CHEMICAL ADDITIVE POT
KM-1-GC-2-27053
63630260
E10-2772-1,2,3 AMINE CIRC. PUMPS
63630258
KM-1-HC-2-27079
V10-2772 #2 AMINE REGENERATOR
DA-2-HC-2-27556
63630261
V8-2771 #2 AMINE DRAIN TANK
TRS RESOURCES
0 TRS 3/99 COMPLETE REVISION
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO
ELKHORN OPERATING CO.
MECHANICAL FLOW DIAGRAM
#2 AMINE SYSTEM
2906-E
63630259

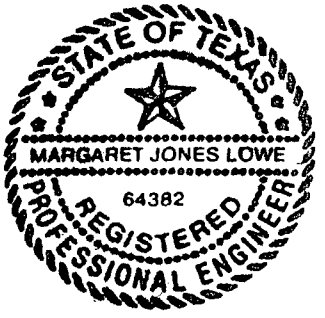
APPENDIX E

BP PERMIAN PERFORMANCE UNIT
BP America Production Company

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

EMPIRE ABO GASOLINE PLANT
EDDY COUNTY, NEW MEXICO

OPERATED BY
ELKHORN FIELD SERVICES



Approved by:

Margaret J. Lowe, PE
Sr. Environmental Engineer
Texas Registration 64382

19 June 2002
Date

Jack Bunce
Plant Manager

Myra Dria
SENM Asset Manager

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

INDEX

SECTION I - COMMITMENT OF MANPOWER

BP Permian Performance Unit (BP) and Elkhorn Field Services commit to complying with all aspects of this plan. Oil storage tanks will have adequate secondary containment to prevent a spill from reaching navigable water. Since it is not practical to install secondary containment for all equipment in the plant, BP and Elkhorn Field Services commit to provide the necessary personnel, equipment, and materials required to expeditiously control and remove any harmful quantity of oil discharged.

SECTION II - SPILL RESPONSE

A. INITIAL ACTION AT THE SITE OF A SPILL

The responsible Elkhorn Field Services employee at the scene of the operation who first learns about an oil spill or pollution shall take the following action:

1. Notify Appropriate Supervisor - Immediately contact supervisor, giving an assessment of the situation.

2. Alleviate danger - If any human life or property is in danger, take prompt action to alleviate such danger.

3. Contain spill - If the spill can be stopped or brought under control, take prompt action to do so. If possible, contain the spread of the spill using equipment available on-site.

4. Determine if spill reached "navigable water". "Navigable water" includes a variety of different sources, including lakes, creeks, and dry draws. A spill into navigable water is reportable if it is enough to create a sheen. Even if the draw is dry at the time of the spill, if oil gets into it, the spill is reportable to the National Response Center (NRC). If the spill did not get into "navigable water" respond according to procedure outlined in Attachment 1. If the spill did get into "navigable water", the Plant Manager or his designee will call the NRC and one of the following, beginning with the Plant Engineer:

1)	Dave Klenk		(281) 366-5107
	Plant Engineer	Cell	(281) 732-4569
2)	Environmental Engineer		(915) 688-5799
	Margaret Lowe	Cell	(915) 556-5322
4)	Environmental Team Lead		(281) 366-5790
	Bob Hill	Cell	(281) 384-5871
2)	SENM Asset Manager		(281) 366-2749
	Myra Dria	Cell	(713) 553-8729

Your supervisor will contact the Plant Manager and one of the BP HSE personnel and apprise them of the situation.

B. ACTIVATION OF SPCC PLAN:

After being notified, the Plant Manager or other responsible official shall promptly accomplish three actions:

1. **Notify Management** - He shall apprise his management of the situation as appropriate. The Environmental Engineer will coordinate with the Asset Manager if the spill enters waters of the U.S. or the National Response Center is otherwise notified.

2. **Notify Agencies** - If the spill reaches navigable water, verify that the National Response Center, the New Mexico Oil Conservation Division (OCD), the Bureau of Land Management (as necessary), and the Environmental Engineer have been notified. To notify Federal and State agencies, call the following numbers:

Federal Agencies:	1-800-424-8802	National Response Center (manned by Coast Guard)
	(505) 877-6544	Bureau of Land Management Carlsbad Resource Area
State Agencies	(505) 748-1283	NM Oil Conservation Division (24 Hour)

When a spill is outside the responsibility of the SPCC plan (i.e. it still does not reach navigable water) it may still need to be reported to a federal or local agency depending on area, amount, and type of spill. Attachment #1 in this plan lists those reporting requirements.

3. **Initiate Cleanup** - The Plant Manager is responsible for determining the degree and speed of containment and cleanup measures required as outlined in the Oil Spill Contingency Plan in C. below. Decisions as to how to clean up the spill are based on

   - Substance spilled
   - Size of spill
   - Sensitivity of location to people and environment
   - If spill entered water
   - Type of watercourse entered
   - Requirements of agency

4. **Do not talk to media** - During an oil or condensate spill situation, the following matters should not be discussed with anyone other than Elkhorn Field Services and BP Permian PU personnel unless prior clearances have been obtained from Asset Manager level:

   a. Cause, liability, legal consequences of the spill
   b. Estimates of damage to property or ecology
   c. Length and scope of cleanup operations
   d. Opinions concerning county, state, federal or other government agencies' response to the spill

C. OIL SPILL CONTINGENCY PLAN

1. The Plant Manager shall:

   a. Ensure the spill is contained or stabilized to the extent conditions allow.
   b. Ensure that the spill has been reported to the proper agencies.
   c. Initiate cleanup operations.
   d. Supervise and direct the cleanup operation subject to the approval of the Asset Manager and Environmental Engineer.
   e. Determine the needs of equipment and personnel involved in the cleanup operations.

f. Keep the SENM Asset Manager, or in his/her absence, the Environmental Engineer, fully informed of all events and developments.
g. Keep the Environmental Department informed of all events and developments and seek advice if necessary.

2. The facility's Plant Manager shall clean up the spill as follows:

a. Establish a plan of action for cleanup. This plan should be discussed with the Environmental Engineer and the responsible agency before implementing.
b. Procure bulldozers and/or backhoe to build additional containment such as dikes, dams, etc., to better contain the oil spill.
c. Procure vacuum trucks to reclaim the effluents spilled.
d. Restore the area of the spill, as nearly as possible, to the same condition as before the spill. Consider input from the Asset Manager, Environmental Engineer, landowner, the Oil Conservation Division and/or the Bureau of Land Management in determining the degree to which the spill is cleaned up and land reclaimed.
e. The Environmental Engineer will coordinate appropriate action if the spill reaches waters of the United States. In his/her absence, this will be done by HSE personnel or the SENM Asset Manager.
f. Record any reportable SPCC spill and maintain records in local files.
g. If the spill enters the waters of the U.S. and is greater than 1000 gallons, or if two reportable spills occur within 12 consecutive months, a report must be submitted to the EPA within 60 days. This report will contain the entire SPCC plan along with details of the spill event(s).

SECTION III - SPILL PREVENTION

A. FACILITY INFORMATION

This spill prevention, control and countermeasure plan is to be followed to prevent an occurrence of an oil spill. In the event an oil spill does occur, appropriate countermeasures will be taken at the Empire Abo Gasoline Plant, Eddy County, New Mexico.

The reporting system, facilities, type of material, previous oil or produced water spills, environmental characteristics, potential containment, and effects of an oil spill at these facilities are described.

Anyone who will be involved in this spill prevention, control and countermeasure plan will acquaint himself with this plan, governmental actions and pertinent statutes and regulations.

1. **Facility Location** - The Empire Abo Gasoline Plant is located in Township 18 South, Range 27 East, NE/4 SE/4 section 3 in Eddy County, New Mexico. The facility is a gas processing plant.

2. **Environment Of Area** - The surrounding area is native range land used for livestock grazing. The plant site is on BP Permian Performance Unit owned land. Surrounding land ownership is a combination of the United States Government and the State of New Mexico. Water drainage is into Scoggin Draw.

3. **Plant Office**
Elkhorn Field Services
PO Drawer 70
257 Empire Road
Artesia, NM 88211-0070
Phone: (505) 677-2161

BP Office
BP Permian PU
501 WestLake Park Blvd.
WestLake 1
Houston, TX 77079
Phone: (281) 366-2000

4. **Responsible Person** - Designated person accountable for oil or produced water spill prevention:

Jack Bunce
Plant Manager

5. **The Operating Equipment and System Involved** - Various gas processing equipment and hydrocarbon storage tanks are located in the plant. Tank design is of welded construction or bolted. Tank truck loading occurs at the facility loading rack areas.

6. **Potential Spills Prediction and Control** - Hydrocarbon storage locations are listed in the following table. The direction of flow from any of these sources would be to the southwest.

Source	Total Quantity (bbls)	Secondary Containment Capacity (bbls)
NGL Storage Area (C_4 & C_5 only)	4285	14000
Process Drain Storage Area		2100
1 Amine Tank	280	
1 Amine Tank	210	
1 Storage Tank (Slop)	210	
1 Storage Tank (Slop)	500	
Lube Oil Storage Area		550
2 Lube Oil Storage Tanks	644	
1 Gasoline Storage Tank	12	
1 Solvent Storage Tank	12	
1 Propane Fuel Storage Tank	24	
1 Diesel Tank	12.5	17.9
1 Ethyl Mercaptan Tank	15	16.3
Slop Oil Storage - 2 Tanks	800	550

7. **Secondary Containment** - The secondary containment for all tanks consists of unlined earthen dikes with sufficient clay content to contain spilled fluids. The attached plats show the secondary containment for the storage areas.

   In the NGL storage area only the butane (C_4) and the gasoline (C_5+) will not vaporize upon release (even in -10 °F temperature). The diked area is sized at a safety factor of 3.0 times the volume of the liquids within the vessels. In addition to this safety factor, the diked volume is also sized with excess to allow 24 hours of production.

   In the process storage area, the dikes are constructed to contain the volume of all tanks and the projected produced volume for 24 hours. In addition, the diked area has a safety factor of 25%.

   In the lube oil storage area, the dikes are sized for containment of the largest vessel and a safety factor of 70%.

   In the slop oil storage area, the dikes are sized for containment of the largest vessel and a safety factor of 37.5%.

   Although there is no storage at the loading rack, the potential exists for a spill. Natural gasoline and butane are the only products loaded at this facility that are heavy enough to allow for settling to the ground. An overflow line connects from the truck being loaded to the plant inlet line to prevent overfilling and spills.

9. **Facility Drainage** - Water drainage from Empire Abo Gas Plant is into Scoggin Draw and into the Pecos River located 4 miles to the southwest.

B. SPILL PREVENTION REQUIREMENTS

1. **Inspection and Records**
   a. The operator, by his normal work procedure and reports, inspects the storage area equipment daily for malfunctions. The routine surveillance of storage facilities each day ensures equipment is functioning properly.
   b. On an annual basis the Environmental Engineer and/or the Plant Manager will inspect the oil handling systems using checklist in Attachment #3.

2. **Personnel Training and Spill Prevention Procedures**
   a. Annually, personnel are instructed in the following:
      - Operation and maintenance of equipment to prevent a discharge.
      - Applicable pollution control laws, rules, and regulations.

      Training records are maintained at the facility.
   b. Scheduled spill prevention briefings for the operating personnel are conducted frequently enough to ensure adequate understanding of the SPCC plan.

3. **Facility Drainage**
   The drainage of oily fluid from the diked containment areas will be through the use of vacuum trucks and/or portable pumps with disposal at approved facilities or the fluid may be replaced in the production stream for reconditioning. Rainwater and storm water may be drained from the secondary containment IF there is no oil sheen. Attachment 4 will be used as documentation for disposition of fluid in secondary containment.

   The facility is contained on the southwest and southeast by a storm water control levee. This levee is in place to act as containment for storm water and as tertiary containment for oil, other hydrocarbon liquids, or chemicals. Oil will be collected if accumulations occur in this area as described above for diked containment areas.

   On the operator's routine rounds, the operator will look for signs of oil. If oil is observed, the Plant Manager will be notified and the product inside the firewall will be recovered by pumps and/or vacuum trucks and handled in approved methods (disposal or recycled). The test for oil will be a sheen that is visible to the eye. If no oil is observed a pump may be used to remove rainwater that has accumulated. Discharge will be to a portion of the plant where no erosion or sediment transport to water bodies will occur. Drain lines may be unlocked, and rainwater allowed to flow out of the dike if there is no sheen of oil observed. There must be personnel observing the discharge activities at all times. Records will be maintained at the facility of all drainage activities.

4. **Spill Prevention Instruction For Contractors** - Contractors will be sufficiently instructed on preventative measures they should employ while working at the facility. An authorized representative of Elkhorn Field Services or BP Permian PU will intervene if necessary while the contractor is working at the plant to prevent a spill event.

SECTION IV – ATTACHMENTS
SPCC PLAN ATTACHMENT #1

PROCEDURES FOR REPORTING NON-SPCC SPILLS AND UPSETS

1. PROCEDURES FOR REPORTING SPILLS AND UPSETS
Empire Abo Gasoline Plant

This is to be used to know what type of spills or upsets are "reportable" and the reporting procedures to follow, as required by Elkhorn Field Services, BP Permian PU and the agencies of jurisdiction for the gas plant. These reporting procedures are consistent with and should be used in conjunction with any facility comprehensive spill contingency plans. Both the New Mexico Oil Conservation Division and the Bureau of Land Management combine the volume of produced water and oil to determine reportable volume.

For spills that do not create a sheen on water or allow oil into a dry draw, the following procedures should be followed.

2. REPORTABLE SPILLS

Releases to be reported by the Plant Manager or delegated person:

a. OIL AND PRODUCED WATER

Spill Conditions		Required Reports				
Location	Amount (bbl)	NMOCD		BLM		NRC[1]
		Phone[2]	Write[3]	Phone	Write	Phone
Federal	<5	No	No	No	No	No
Federal	>5<10	No	Yes	No	No	No
Federal	>10<25	No	Yes	No	Yes	No
Federal	<25>100	Yes	Yes	No	Yes	No
Federal	>100	Yes	Yes	Yes	Yes	No
Fee, State	<5	No	No	No	No	No
Fee, State	>5<25	No	Yes	No	No	No
Fee, State	>25	Yes	Yes	No	No	No
In Water - BLM[4]	Any	Yes	Yes	Yes	Yes	Yes
In Water - State[4]	Any	Yes	Yes	Yes	Yes	Yes

Notes:
1 National Response Center (1-800-424-8802) for any spills in water
2 Phone - telephone call made within 24 hours of the spill
3 Write - written report as described below, within 10 days
4 If spilled in water or intermittent watercourse, see SPCC Plan reporting

Report to
- BP Management and Environmental Group
- New Mexico Oil Conservation Division
- If on BLM land, the BLM District Office
- If spill enters water or water course - National Response Center (1-800-424-8802).

Reporting Method:
- As required, phone in report within 24 hours
  See note on telephone reporting
- For all spills, written report within 10 days
- Use Release Notification and Corrective Action Form (C-141) to report to OCD
- Use BLM form NM 3162-1 to report to the BLM
- Use BP e-spillcard (g:\pbu\NO Leaks) Spill Reporting Form
  In report to Midland only include cost of cleanup

b. CHEMICAL SPILLS

Reportable Spill: Spills of caustics, acids, or chemicals endangering persons, wildlife, or property

Methanol	5000 lbs. or 16 bbls.	CERCLA

For other chemicals, contact the Environmental Engineer.

Reporting Method:

- Discuss any possible applicable spill with Asset Manager or Environmental Group before reporting further, unless people or wildlife is immediately endangered.
- Spills that could potentially harm the public or cause significant damage to the environment should be reported to the New Mexico Oil Conservation Division and the Bureau of Land Management (if applicable) district office.
- If communications with Asset Manager or Environmental Group confirm the existence of a "reportable quantity" spill, additional reports must be made to the National Response Center, the SERC, LEPC, and OCD.

MSDS sheets and other available resources should be used in obtaining data on chemicals used in your facility.

c. GASEOUS RELEASE

Reportable Release:

- On BLM land, any event releasing 500 MCF or more of gas (use BLM form NM 3162-1)
- Any event that releases more than 500 MCF requires immediate notification of the NMOCD district office
- Any event that releases more than 5000 MCF requires written notification of the NMOCD district office
- Any event that places life or property in danger requires NMOCD verbal and written report

Reporting Method:

- Discuss any possible applicable release with Asset Manager or Environmental Group before reporting, unless people or wildlife is immediately endangered.
- Releases that could potentially harm the public or cause significant damage to the environment should be reported to the New Mexico Oil Conservation Division and the Bureau of Land Management district office.

3. NOTES ON REPORTING

a. TELEPHONE REPORTS

- Reports should be made as soon as possible, at least within 24 hours. It is recommended to discuss spill with Asset Manager or Environmental Group before reporting spills.
- For telephone reports, use the BP e-spillcard (g:\pbu\NO Leaks) Report Form as a guide to indicate what information needs to be given.
- Document in facility records, all attempts to telephone reports to agencies successfully or unsuccessfully.
- Document spills of less than reportable amounts in facility files.

b. WRITTEN REPORTS

- Use the BP e-spillcard (g:\pbu\NO Leaks) Spill Report Forms for reporting all spills and releases.
- Use Release Notification and Corrective Action Form (C-141) to report to OCD.
- Use BLM form NM 3162-1 to report to the BLM
- Reports should be submitted within 10 days of spill.

c. ADDRESSES AND PHONE NUMBERS

- **BP Permian Performance Unit**

Production:	Dave Klenk	(281) 366-5107 (W)	(281) 732-4569 (Cell)
	Myra Dria	(281) 366-2749 (W)	(281) 553-8729 (Cell)
Environmental:	Margaret Lowe	(915) 688-5799 (W)	(915) 556-5322 (Cell)

- **For the State of New Mexico**

New Mexico Oil Conservation Division
District II
811 S. First Street
Artesia, NM 88210
(505) 748-1283

New Mexico Environment Department
Ground Water Quality Bureau
P.O. Box 1778
Santa Fe, NM 87502
(505) 827-2918

- **Bureau of Land Management**

BLM - Carlsbad Resource Area
P.O. Box 1778
Carlsbad, NM 87820
(505) 887-6544

BLM - New Mexico State Office
P.O. Box 1449
Santa Fe, NM 87504
(505) 438-7400

- **National Response Center:** 1-800-424-8802

- **For SARA and CERCLA reportable spills (chemical spills):**

a.) **SERC:**
Max Johnson, ERC Coordinator
Department of Public Safety
Title III Bureau
P.O. Box 1628
Santa Fe, NM 87405-1628
(505) 827-9224

b.) **Local Emergency Planning Committee**
Eddy County LEPC
Attn: Mr. Steve Massy
P.O. Box 1139
Carlsbad, NM 88221-1139
(505) 887-9511

c.) **Fire Department**

Artesia Fire Department
309 N. 7th
Artesia, NM 88210
(505) 746-2701

Loco Hills Volunteer Fire Department
P.O. Box 56
Loco Hills, NM 88255
(505) 677-3266

SPCC PLAN ATTACHMENT #2

STORAGE TANKS - INSPECTION FORMS

ANNUAL INSPECTION PROCEDURE:

At least once **annually**, the **Environmental Engineer and/or Plant Manager** in charge of the facility will visually inspect the facility for leaks and potential problems. This visual examination will review the condition of foundation and supports of tanks, possible corrosion of tank, overflow equalizing lines, thief hatches (vacuum protection), back pressure vent valves, drain valves and lines, fill and shipping lines, oil transfer facilities, alarm systems, and overall condition of complete installation and secondary containment.

Production Facility: _____ Reviewer: _____
Review Date: _____

Berms around Storage Tanks:

___ Can they hold the capacity of storage tanks?
___ Are they in good shape (No low spots in berm)?
___ Do they have proper drainage?
___ Is there any contaminated soil inside or outside berms?
___ Is rainwater inspected prior to drainage?
___ Are drains properly closed and sealed after water drainage?
___ Are adequate records kept after water drainage?
___ Are accumulations of oil in traps, drips, sumps, etc. properly removed?

Comments: _____
_____
_____

Storage Tanks:

___ Are tanks leaking anywhere (pinholes, manways, etc.)?
___ Are tanks free of rust?
___ Are they visually examined on a routine basis?
___ Are they fail-safe engineered to prevent spills?
___ Adequate capacity ___ Over flow equalizing lines
___ Vacuum protection ___ High level shut down

Comments: _____
_____
_____

General Comments: _____
_____
_____
_____

SPCC PLAN ATTACHMENT #3
ONSHORE FACILITY BULK STORAGE
TANKS DRAINAGE SYSTEM

Inspection Procedure:

The Plant Manager or his designee will conduct annual visual inspections of the diked areas and these will be documented. The operators will conduct daily inspections, and these will not be documented.

Record of drainage, bypassing, inspection and oil removal from secondary containment:

Date of Drainage	Date of Bypassing		Date of Inspection	Oil Removal	Supervisor's or Inspector's Signature
	Open	Closed			

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised March 17, 1999

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☐ Final Report

Name of Company	Contact
Address	Telephone No.
Facility Name	Facility Type

Surface Owner	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☐ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Describe Area Affected and Cleanup Action Taken.*

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name:	Approved by District Supervisor:	
Title:	Approval Date:	Expiration Date:
Date: Phone:	Conditions of Approval:	Attached ☐

* Attach Additional Sheets If Necessary

Form NM 3162-1
(July 1991)

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
New Mexico State Office

REPORT OF UNDESIRABLE EVENT

DATE OF OCCURRENCE/DISCOVERY: _____ TIME OF OCCURRENCE: _____

DATE REPORTED TO BLM: _____ TIME REPORTED: _____

BLM OFFICE REPORTED TO: (RESOURCE AREA/DISTRICT/OTHER): _____

LOCATION: (¼ ¼)___ SECTION ___ T. _____ R. _____ MERIDIAN _____

COUNTY: _____ STATE: _____ WELL NAME: _____

OPERATOR: COMPANY NAME _____ PHONE NO. _____
CONTACT PERSON'S NAME _____

SURFACE OWNER: _____ MINERAL OWNER: _____
(FEDERAL/INDIAN/FEE/STATE)

LEASE NO.: _____ RIGHT-OF-WAY NO.: _____

UNIT NAME / COMMUNITIZATION AGREEMENT No.: _____

TYPE OF EVENT, CIRCLE APPROPRIATE ITEM(S):

BLOWOUT, FIRE, FATALITY, INJURY, PROPERTY DAMAGE, OIL SPILL, SALTWATER SPILL, OIL AND SALTWATER SPILL, TOXIC FLUID SPILL, HAZARDOUS MATERIAL SPILL, UNCONTROLLED FLOW OF WELLBORE FLUIDS, OTHER (SPECIFY):

_____

CAUSE OF EVENT: _____
_____

HazMat Notified: (for spills) _____

Law Enforcement Notified: (for thefts) _____

CAUSE AND EXTENT OF PERSONAL INJURIES/CAUSE OF DEATH(S):
_____
Safety Officer Notified: _____

EFFECTS OF EVENT: _____
_____

ACTION TAKEN TO CONTROL EVENT: _____
_____

LENGTH OF TIME TO CONTROL BLOWOUT OR FIRE: _____

VOLUMES DISCHARGED: OIL _____ WATER _____ GAS _____

OTHER AGENCIES NOTIFIED: _____

ACTION TAKEN OR TO BE TAKEN TO PREVENT RECURRENCE: _____

_____

FINAL INVESTIGATION:
TEAM NAME(S) _____

_____

FIELD INSPECTION DATE _____

SUMMARY OF RESULTS OF INSPECTION _____

_____

_____

RESOURCE LOSS WAS (CIRCLE ITEM): AVOIDABLE UNAVOIDABLE

DATE OF MEMO NOTIFYING MINERALS MANAGEMENT SERVICE THAT LOSS WAS AVOIDABLE:

_____

DATE/TIME/PERSON NOTIFIED:
DISTRICT OFFICE _____

_____

STATE OFFICE _____

_____

WASHINGTON OFFICE _____

_____

SUMMARY OF RESULTS OF RECLAMATION/CORRECTIVE ACTION:

_____

_____

_____

_____

_____

REMARKS: _____

_____

_____

_____

_____

SIGNATURE OF AUTHORIZED OFFICER: _____

DATE: _____ TITLE: _____

SPCC PLAN ATTACHMENT #4
SPILL REPORTING FORMS

bp

Permian Business Unit - e-spillcard (v1.2e)

"NO Leaks" Recordable and Reportable Spill Card

Did the spill enter a creek bed, dry draw, or other waters of the U.S. ? ☐ YES ☐ NO

If the spill is primarily water, is there a trace or sheen of hydrocarbon (oil) on the water ? ☐ YES ☐ NO

If both are YES, additional State and/or Federal agency reports may be required. Consult Margaret Lowe (915-688-5799) with the Environmental Department.

Was this spill reported to an agency, i.e. State or/and Federal ? ☐ YES ☐ NO

Report Number(s): _____

Spill occurred in a "PROCESSING PLANT FACILITY": ☐ YES

Spill occurred in a "PROD. OPERATION FACILITY": ☐ YES

Asset Area: ☐ North ☐ South ☐ SENM

Date of Leak: _____

Lease/Well/Facility: _____

Approx.. Time of spill: _____

Reported to: _____

Report Date and Time: _____

Type of Leak (check all that apply):

		Leak Amount	Amount Recovered
☐ oil	☐ < 1 BBL	.0 BBL	.0 BBL
☐ water	☐ < 1 BBL	.0 BBL	.0 BBL
☐ chemical	☐ < 1 BBL	.0 BBL	.0 BBL

Chemical name: _____

TOTAL FLUID LOST (leaked - recovered): .0 BBL

☐ gas .0 MCF .0 lbs HC N/A

EQUIPMENT: ☐ Flow Line ☐ Injection Line ☐ Piping ☐ Pump ☐ Pressure vessel ☐ Stuffing box ☐ Tank ☐ Wellhead - Injection ☐ Wellhead - Production ☐ other description: _____

Material: ☐ Fiberglass ☐ Stainless ☐ Steel ☐ Poly ☐ PVC ☐ other description: _____

Corrosion Protection: ☐ none ☐ Corrosion Inhibition (i.e. chemical injection) ☐ CP (cathodic protection) type: _____

Cause of Leak: ☐ External Corrosion ☐ Equipment Failure ☐ Internal Corrosion ☐ Mechanical Damage ☐ Over Pressure ☐ other description: _____

Secondary Containment: ☐ NONE - total lost of fluid to ground ☐ Partially Contained ☐ Contained within catch basin ☐ Contained within LINED berm ☐ Contained within UNLINED berm ☐ other description: _____

Work Activity: ☐ Normal Operations ☐ Maintenance ☐ Intrusive (i.e. construction, ditching, etc.) ☐ Drilling/Workover

Safety: Did this leak result in a MI (Major Incident) or HIPO (High Potential Incident) ? ☐ no ☐ HIPO ☐ MI

Cost: Estimate cost to repair this leak. Include: labor, materials, and clean-up cost. $0.00

Brief description of spill and cause: _____

Cleanup actions: _____

Plans to prevent future spills: _____

NMED Air Emission of Reporting Requirements: HC gas release reportable? NO H2S release reportable? NO

TNRCC Air Emission of Reporting Requirements: HC gas release reportable? NO H2S release reportable? NO

Name of person submitting report: _____ Date: _____

Signature immediate supervisor: _____ Date: _____

Supervisor's name (please print): _____

NO Leaks Team Review: _____ Date: _____
(SENM, South, or North Asset Areas)

Routing (signed original): 1) Environmental Dept. - Margaret Lowe 2) Environmental Dept. - Jennifer Vasquez 3) Permian BU files

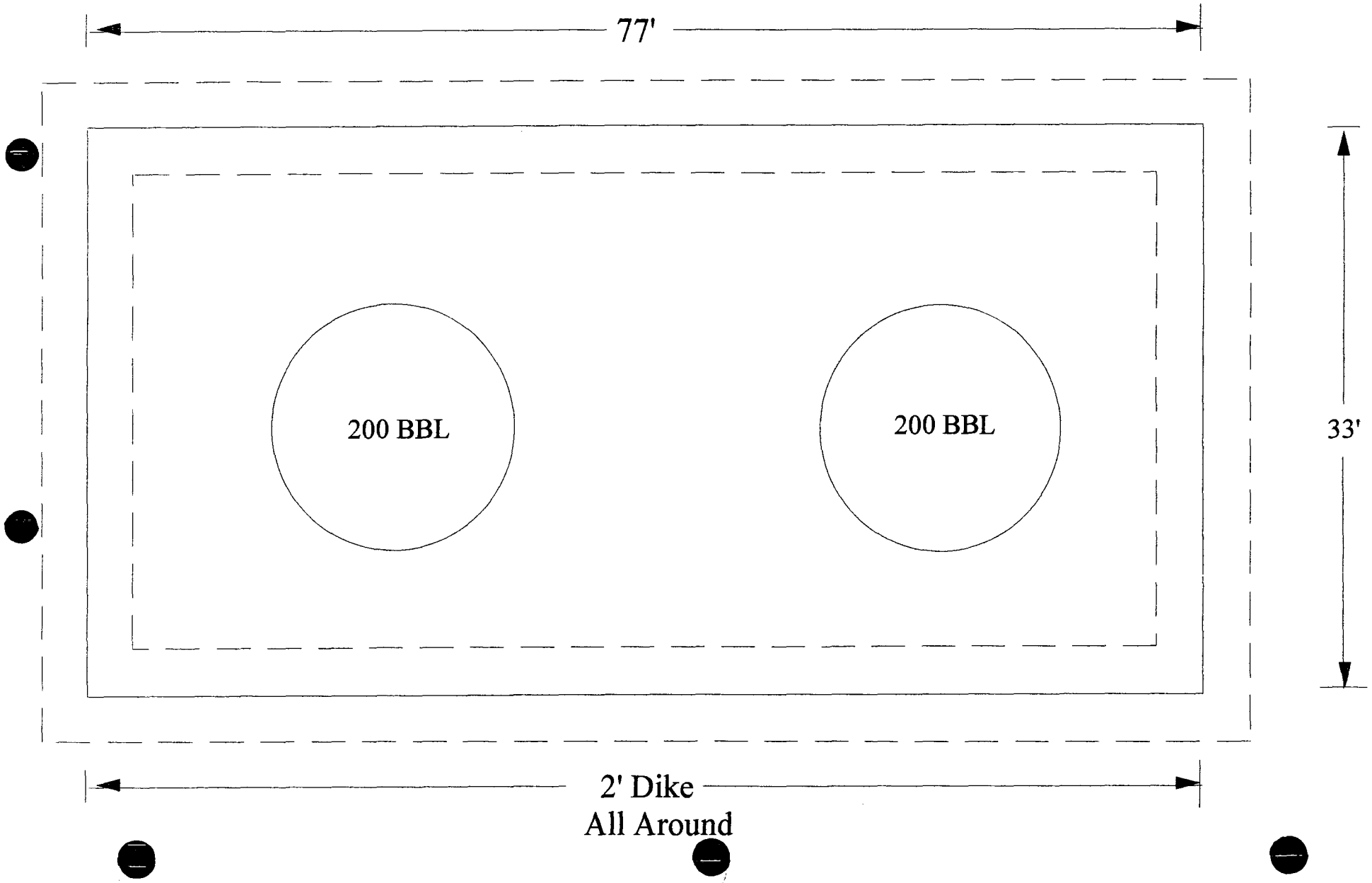
CC: Local File computer file: optional - store in "area" directory

"DO IT RIGHT, KEEP IT TIGHT"

Revised 6/19/2002

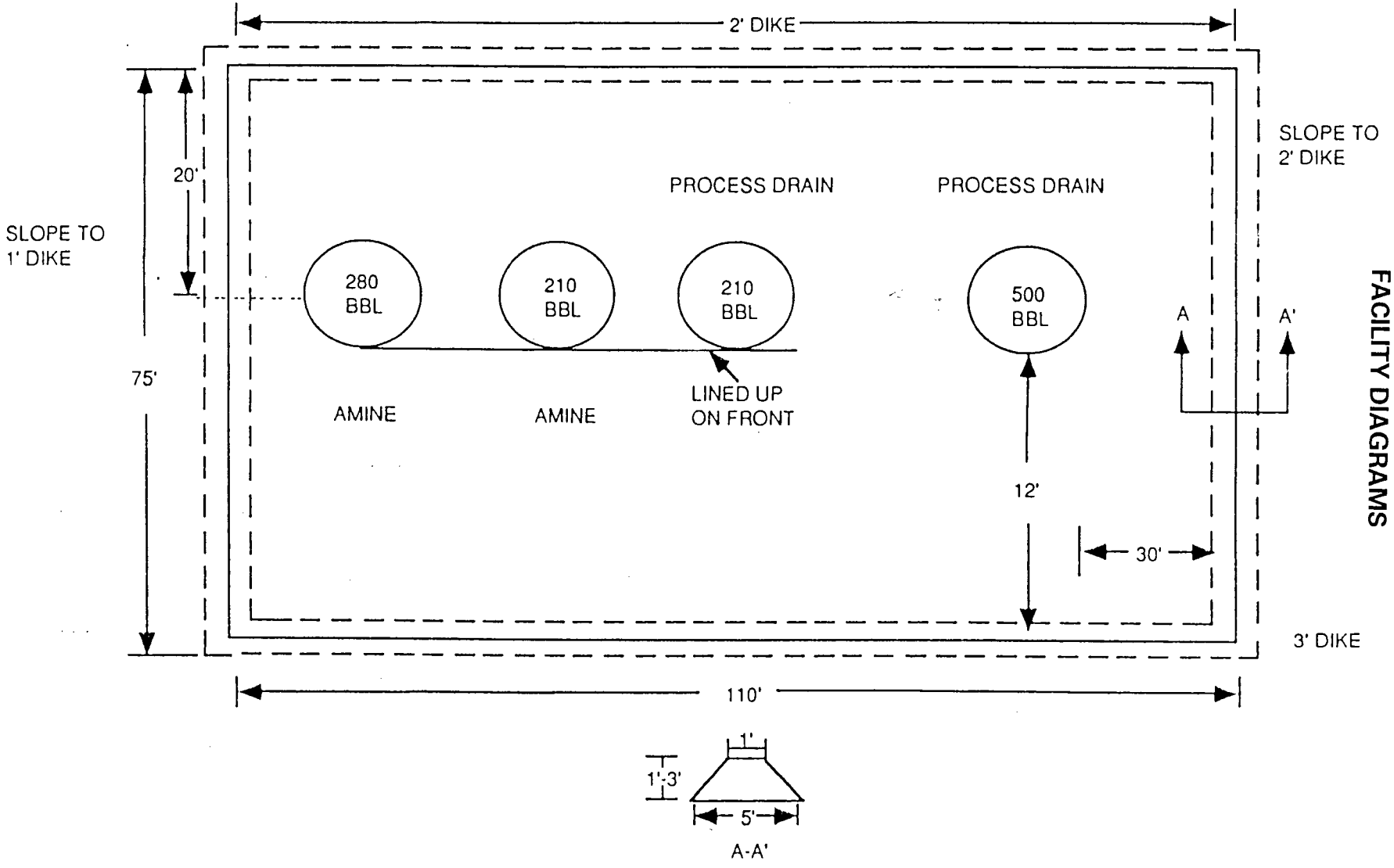
Slop Oil Tanks

EAGP



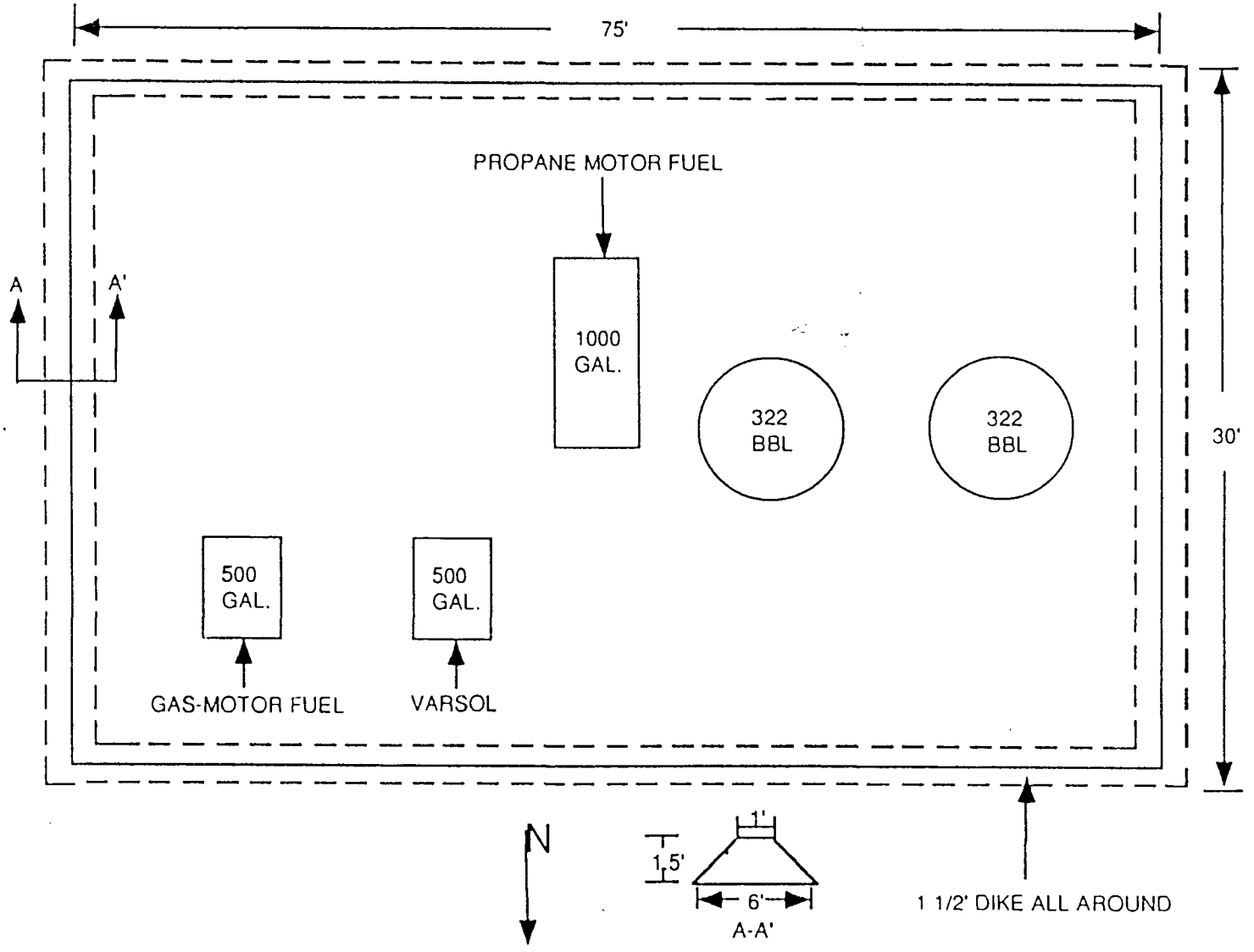
SPCC PLAN ATTACHMENT
FACILITY DIAGRAMS

PROCESS DRAIN STORAGE DIKING
EAGP

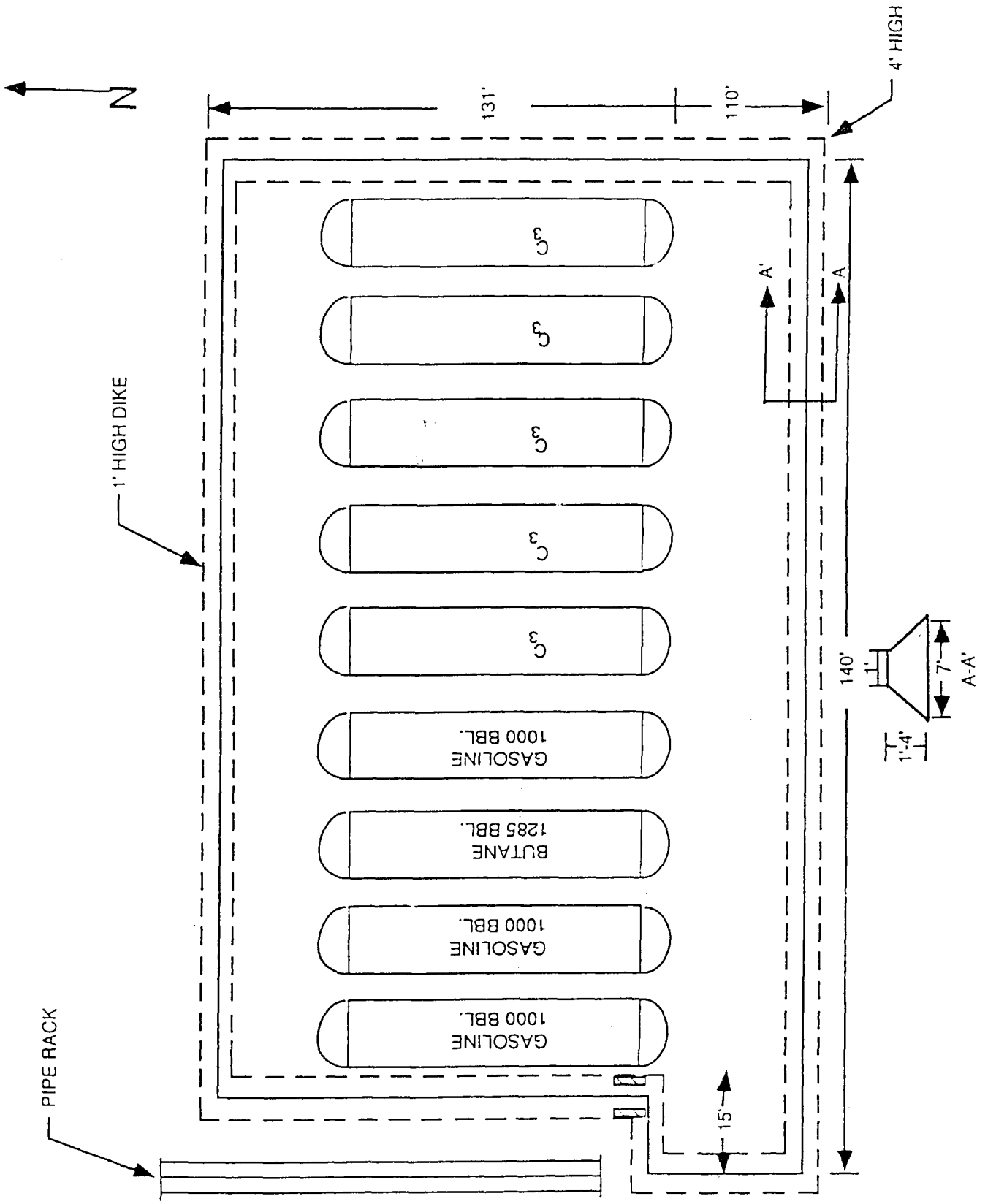


SPCC PLAN ATTACHMENT #5
FACILITY DIAGRAMS

LUBE OIL STORAGE - EAGP



NGL DIKE - EAGP



FACILITY DIAGRAMS (Cont.)

DWG NO D-63630-303

N

W-9+00 W-8+00 W-7+00 W-6+00 W-5+00 W-4+00 W-3+00 W-2+00 W-1+00 W-0+00 E-0+00

N-7+00 N-6+00 N-5+00 N-4+00 N-3+00 N-2+00 N-1+00 N-0+00

SUB. STA. NO.1 DWG. 636.30410
SUB. STA. NO.2 DWG. 636.30410
SUB. STA. NO.4 DWG. 636.30410
DISTRIBUTION CENTER NO.4 DWG. 636.30419
DISTRIBUTION CENTER NO. 1 AND NO. 2 DWG. 636.30433
PARKING
PP-1
OFFICE
PARKING
DRIVE GATE
LTG PNL "J"
FENCE
MECHANICAL ROOM DWG. 636.30418
SHOP
180'-0" WIDE ROAD
TICKET HOUSE
WAREHOUSE
WAREHOUSE
SULFUR PLANT NO. 3
SULFUR AREA SWRK "F" DWG. 636.30412
SULFUR PLANT NO. 1 (OUT OF SERVICE)
BOILER HOUSE
CHEMICAL & ENGINE STORAGE
COOLING TOWER SWRK "J" DWG. 636.30414
BOILER AREA STARTER RK "E" DWG. 636.30415
FIRE PROTECTION PUMP HOUSE SWRK DWG. 636.30420
STORAGE BLDG.
CONTROL BLDG.
PROCESS AREA SWRK "A" DWG. 636.30416
AUX. PROCESS AREA SWRK "B" DWG. 636.30417
ELEC. SHOP DWG. 636.30435
WEST PROCESS AREA SWRK "C" DWG. 636.30412
SWRK NO.7 "K" DWG. 636.30426
LW SWRK "L" DWG. 636.30431
EVAPORATION TANK
CONTROL ROOM POWER DWG. 636.30433
CRYO SHACK SWRK DWG. 636.30430
CONTROL RM. ESD SYS. DWG. 636.30434
COMP. BLDG. ATTIC-FAN SWRK "G" DWG. 636.30421
SUB. STA. NO.8 DWG. 636.30434
SUB. STA. NO.8 DWG. 636.30434
REGEN GAS FANS
PROCESS AREA SWRK NO.2 "H" DWG. 636.30422 DWG. 636.30423
STORAGE AREA SWRK "N" DWG. 636.30427
MAPCO SHED
MATCH LINE N-0+00'-0" SEE DWG. D-63630-303

REFERENCE DWGS

DWG. 636.30400	PRIMARY OVERHEAD ELECTRICAL DISTRIBUTION
DWG. 636.30401	480V. DISTRIBUTION CENTER NO.1
DWG. 636.30412	WEST PROCESS AREA SWITCHRACK "C"
DWG. 636.30413	SULFUR PLANT SWITCHRACK NO.3 "F"
DWG. 636.30414	COOLING TOWER SWITCHRACK "J"
DWG. 636.30415	BOILER AREA SWITCHRACK "E"
DWG. 636.30416	PROCESS AREA SWITCHRACK "A"
DWG. 636.30417	AUXILIARY PROCESS AREA SWITCHRACK "B"
DWG. 636.30418	OFFICE & SHOP SWITCHRACK
DWG. 636.30419	480V. DISTRIBUTION CENTER NO.2
DWG. 636.30420	FIRE PROTECTION SYSTEM SWITCHRACK
DWG. 636.30421	MAIN COMPRESSOR BLDG. ATTIC-FAN STARTER RACK "G"
DWG. 636.30422	(SOUTH) PROCESS AREA SWITCHRACK NO.3 "H"
DWG. 636.30423	(NORTH) PROCESS AREA SWITCHRACK NO.2 "H"
DWG. 636.30424	GAS COOLER AREA SWITCHRACK NO.5 "I"
DWG. 636.30425	480V. DISTRIBUTION CENTER NO.3
DWG. 636.30426	PROPANE REFRIGERANT AREA SWITCHRACK NO.7 "K"
DWG. 636.30427	STORAGE AREA SWITCHRACK "N"
DWG. 636.30428	GAS COOLER WOODFRAME SWITCHRACK NO.6 "M"
DWG. 636.30429	REGEN GAS BOOSTER COMPRESSOR SWITCHRACK "J"
DWG. 636.30430	CRYO SHACK MCC
DWG. 636.30431	JACKET WATER SYSTEM SWITCHRACK "L"
DWG. 636.30432	480V. DISTRIBUTION NO.4
DWG. 636.30433	ADMINISTRATION BLDG.
DWG. 636.30433	480V. DISTRIBUTION NO.5
DWG. 636.30433	CRYO CONTROL BLDG. POWER
DWG. 636.30434	480V. DISTRIBUTION NO.6
DWG. 636.30434	CRYO CONTROL BLDG. UPS & ESD SYS.
DWG. 636.30435	ELECTRICAL SHOP POWER DISTRIBUTION

NOTE: SEE DWG. 636.30305 FOR EQUIPMENT LEGEND.

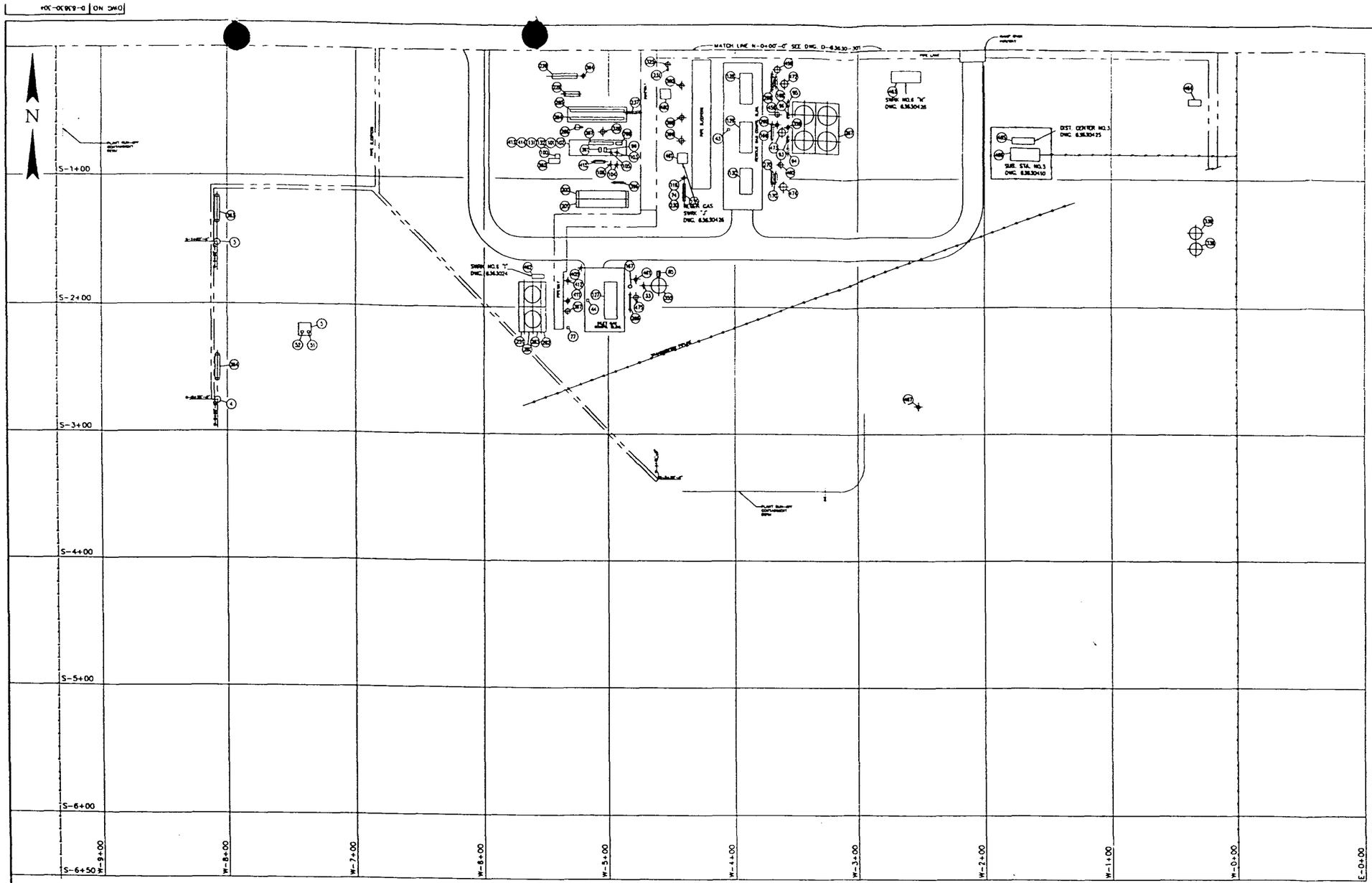
REV NO	BY	DATE	REVISION	AMOCO PROJECT	AMOCO APPROVED	DATE	CONTR PROJECT	CONTR APPROVED	DATE
2	M&H	5/5/93	AS-BUILT					JDL	
1	M&H	7/15/92	AS-BUILT					JDL	
0	LLC	2/28/92	AS-BUILT		GKC			GLC	
A	MTWC	10-18-91	ISSUED FOR APPROVAL		GKC			GLC	

EMPIRE ABO GAS PLANT
EDDY CO., NEW MEXICO
AMOCO PRODUCTION COMPANY
FACILITY PLOT PLAN
EQUIPMENT LOCATION PLAN
1 OF 2

SCALE	DRAWN BY	DATE	CHECKED BY	REV NO
1" = 40'-0"	MTWC	09-11-91	P.GONZALES	2
PROJECT CODE 6322	DRAWING NO. D-63630-303			

f:\engmtw\ 636303303.DWG

DWG NO D-636 30-304



NOTE: SEE DWG. 636303 05 FOR EQUIPMENT LEGEND

REV NO	BY	DATE	REVISION	AMOCO PROCESS APPROVAL	AMOCO APPROVAL	DATE	CONTR PROCESS APPROVAL	CONTR APPROVAL	DATE
2	MW	3/5/93	AS-BUILT			JDL			
1	MW	7/6/92	AS-BUILT			JDL			
0	DLL	2/28/92	AS-BUILT		GKC	GLC			
A	MTWC	10/11/91	ISSUED FOR APPROVAL		GKC	GLC			

EMPIRE ABO GASOLINE PLANT

EDDY CO., NEW MEXICO

AMOCO PRODUCTION COMPANY

FACILTY PLOT PLAN

EQUIPMENT LOCATION PLAN 2 OF 2

SCALE	DRAWN BY	DATE	CHECKED BY	REV NO
1" = 40'-0"	MTWC	09-12-91	D. GONZALES	4
PROJECT CODE 63221	DRAWING NO D-636 30-304			

filename: 636303 04 DWG

bp

BP America Production Company
501 WestLake Park Blvd. (77079)
Post Office Box 3092
Houston, Texas 77253-3092
USA

August 16, 2004

New Mexico Energy, Minerals and
Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Attention: Mr. W. Jack Ford

Discharge Plan GW-22 Renewal
Empire Abo Gas Plant
Eddy County, New Mexico

Enclosed are the original and one copy of the discharge plan permit renewal application required to renew the discharge plan for the Empire Abo Gas Plant. We have also included the plan on a CD for your convenience as well as a check in the amount of $100.00 for the renewal application filing fee.

Please contact Mike McKinley at (281) 366-3907 if any additional information is required.

Yours very truly,

Jeanne M. Johns
President
Natural Gas Liquids Business Unit

cc: NMOCD District II
1301 W. Grand Avenue
Artesia, New Mexico 88210

August 2004

Application for Discharge Plan Renewal

Empire Abo Gas Plant
Artesia, New Mexico

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104

Table of Contents

TABLES

APPENDICES

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Revised June 10, 2003

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES,GAS PLANTS, REFINERIES, COMPRESSOR, GEOTHERMAL FACILITES AND CRUDE OIL PUMP STATIONS

(Refer to the OCD Guidelines for assistance in completing the application)

☐ New ☒ Renewal ☐ Modification

1. Type:

The Empire Abo Gas Plant uses a cryogenic process to remove ethane, propanes, butanes, pentanes, and hexanes from natural gas and third party y-grade, both of which are delivered to the plant via pipelines. The gas is compressed, sweetened (to remove carbon dioxide and hydrogen sulfide), dehydrated, and then cooled to remove ethane and heavier hydrocarbons. The gas is sweetened using an amine system, dehydrated using mole sieves and cooled using a cryogenic process. Scrubbers, exchangers, separators, chillers, flash tanks, and compressors are used in the process. Design capacity of the plant is 56 MMscfd. Natural gas liquid and residue gas leave the plant by pipeline as products. Natural gas liquid and sulfur are trucked from the plant.

2. Operator:

The legally responsible parties:

BP America Production Company
Natural Gas Liquids Business Unit
Attention: Mike McKinley - Room 4.514
P.O. Box 3092
Houston, Texas 77253

Local Representative:
Dan Norman
BP America Production Company
Natural Gas Liquids Business Unit
PO Box 810
Hobbs, NM 88241
806-732-2745

Operator:
Elkhorn Operating Company
Empire Abo Gas Plant
Attn: Forest Noah
Artesia, New Mexico 88210
505 677 2161

3. Location:
The Empire Abo Gas Plant is in the NE/4/SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The center of the EAGP is 32° 46.6' North, 104° 15.6' West.

4. Name, telephone number and address of the landowner of the facility site.
BP America Production Company
Attention: Mike McKinley - Room 4.514
P.O. Box 3092
Houston, Texas 77253

5. Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility.

6. Attach a description of all materials stored or used at the facility.

7. Attach a description of present sources of effluent and waste solids. Average quality and daily volume of waste water must be included.

8. Attach a description of current liquid and solid waste collection/treatment/disposal procedures.

9. Attach a description of proposed modifications to existing collection/treatment/disposal systems.

10. Attach a routine inspection and maintenance plan to ensure permit compliance.

11. Attach a contingency plan for reporting and clean-up of spills or releases.

12. Attach geological/hydrological information for the facility. Depth to and quality of ground water must be included.

13. Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

14. CERTIFICATION I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Jeanne M. Johns Title: President, NA NGLs

Signature: Jeanne M. Johns Date: 8/16/04

E-mail Address: johnsjm@bp.com

Attachment 5: Facility Description

Appendix A contains a drawing of the EAGP. The process units shown on the site plan of Appendix A generates all of the wastewater and most of the solid waste at the EAGP. Wastewater, depending on its origin, drains to the Process Drain Tank, the evaporation pond or the North or South Slop Oil Tanks. The Process Drain Tank and the evaporation pond are on the west side of the Plant. The Slop Oil Tanks are on the southeast side of the Plant.

Attachment 6: Description of Materials Stored or Used at the Facility

Table 1 outlines the fluid storage locations at the facility, their capacity, and the types of fluids kept. See Appendix A for a map showing the locations of the pond and tanks.

Attachment 7: Description of Present Sources of Effluent and Waste Solids Generated at the Facility

There exist four sources of waste water produced at the EAGP. From blowdown and backwash, 200 to 400 barrels of water are created daily and sent to the evaporation pond. The chemical quality of this water is available in Appendix B.

From Plant processes, five to eight barrels per day of water is produced to the Process Drain Tank and ten to fifteen barrels per day are produced to the South (dirty) Slop Oil Tank. Much of this water is from blowdown operations and has a chemical quality similar to water sent to the evaporation pond.

Approximately 150 barrels per day of fluid is produced to the North (clean) Slop Oil Tank. This fluid contains produced water with entrained hydrocarbons and is sent to the BP M-13 tank battery. As such, this water is exempt.

Waste solids generated at the facility are listed in Table 2.

Attachment 8: Description of Current Liquid and Solid Waste Collection/ Treatment/ Disposal Procedures

The closed drain system collects process hydrocarbon fluids from drains and vents. Drawings 63830-207 and 63830-208 in Appendix C show the sources of effluent collected by this system. The collected liquids are transferred to the closed drain header tank. Gases released in the tank are vented to the flare system. The liquids are pumped to the north (clean) slop oil tank. These liquids are pumped to the BP M-13 tank battery (formerly ARCO). The hydrocarbons go to oil storage tanks and are products. Water separated from these natural gas liquids are sent to the BP injection wells, B48, B49, C48 and C50, or to the Walter Solt State Well No.1 or to an approved Class II disposal well.

The open drain system collects plant process waste liquids from blowdowns and drains in the caustic, amine, and coolant systems. Drawing 63630-203 (Figure 94-4) in Appendix C) shows the sources of this effluent. The collected liquids flow through below grade atmospheric lines to the open drain sump. These lines have been tested for mechanical integrity (See AGRA drain line testing report, Appendix D). The liquids are pumped from the open drain sump to the process drain tanks. At appropriate times, the contents of the tanks are trucked to Walter Solt State Well No.1, BP owned injection wells, or approved Class II disposal wells.

The amine drain system collects all waste amine from the two amine systems in underground sumps (Fig.94-5, Appendix C). These liquids are stored in the sumps until pressurized and sent back to the amine system or the open drain system and thence to the Walter Solt State Well No.1, BP owned injection wells, or approved Class II disposal wells. The underground lines in the amine systems have been tested for mechanical integrity (See Appendix D).

As shown in Figure 94-6 in Appendix C (Drawing 63630-201), the blowdown system collects blowdown from the five main boilers, the waste heat boiler and the sulfur plant's condenser. All of this effluent flows to the evaporation pond. Although not specifically shown in Figure 94-6, the sulfur plant condenser line drains into

the north end of the evaporation pond. Boiler blowdown water, backwash water from the reverse osmosis unit, and backwash water from process water coolers is sent to the east side of the evaporation pond. Cooling tower blowdown water is sent to the waste water tank. When necessary, this tank is allowed to overflow to the evaporation pond. All underground lines have been tested for mechanical integrity.

Excess water in the evaporation pond is pumped into the waste water tank immediately north of the evaporation pond. Water from the waste water tank is periodically pumped to BP injection wells or trucked to Walter Solt State Well No.1 or to another Class II disposal well.

The north slop oil system (clean) collects liquids from the closed drain header tank; #1, #2 and #9 inlet scrubbers; and the flare sump (Fig.94-7, Appendix C). The flare sump, in a concrete secondary containment, receives liquids from the flare knockout tanks. Separated hydrocarbons in the clean slop oil tank are products and sold. Water in the tank is exempt wastewater and is discharged to the BP disposal wells B48, B49, C48 and C50 or to Walter Solt State Well No.1 or to another Class II disposal well.

The south slop oil system (dirty) collects plant compressor pit fluids, synthetic oil from the starting air system, and oils from the containment at the product storage area, as shown in Figure 94-8 in Appendix C. For compressors E4-301 to 309 and E4-351 to 353, 30 inch steel sumps act as catchments for the packing case drains. The compressor pits act as catchments for any leaking fluids. Air diaphragm pumps move the contents of these catchments to the south slop oil tank. Water from this tank is trucked to the Walter Solt State Well No.1 or to another approved Class II disposal well. The oil is periodically trucked away by US Filter or a similar company.

The backwash system collects discharge fluids from the backwashing of water coolers and condensers (Figure 94-9, Appendix C). Water from the west side of the compressor building is drained into the evaporation pond. Water from the east side of the compressor building is drained into the compressor pits and then to the south slop oil tank. All underground lines have been tested for mechanical integrity (Appendix D).

Waste water from the office and the Cryo Room is disposed of through two septic tanks and leach fields located east and west of the respective buildings.

Produced sulfur is a product and is trucked away by various customers.

As discussed in Attachment 9, BP proposes to collect samples to accurately characterize the chemistry of certain waste streams to determine if alternate discharge strategies are appropriate.

In general, we know that the discharges to the closed drain system contain abundant dissolved-phase hydrocarbons and dissolved solids. Discharges to the open drain system contain dissolved solids and contaminants such as spent amine and caustic. Wastewater in both of the slop oil systems will contain dissolved hydrocarbons and dissolved solids. Because the appropriate disposal of wastewater in these systems is Class II disposal well injection, we have not created a chemical characterization.

The evaporation pond contains reeds, water plants and an active invertebrate community. Redwing blackbirds and water fowl use the pond. The pond was constructed by laying a synthetic plastic liner over steel sides with a sand bottom. There is no evidence that the pond leaks. Water levels are kept low in order to minimize the size of any accidental discharge.

MW-02, MW-2-07, MW-3-1, MW-09 and MW-2-14 are 200 feet or less from the north, east and south sides of the evaporation pond. We conclude from a comparison of water quality between water from the monitoring wells and water from the evaporation pond that leakage from the pond to ground water would improve ground water quality (See Appendix B).

Attachment 9: Description of Proposed Modifications to Solid Waste Collection/ Treatment/ Disposal Systems

BP plans to explore modifications to the effluent management system described herein. The purpose of such modifications is to minimize the volume of water that could be used beneficially but is now flowing to down hole disposal. We first plan to collect samples of various effluent streams. If, as we suspect, the quality of some

effluent streams permits beneficial use or meets WQCC ground water standards, we plan to use the water or discharge these waste streams to the ground surface.

Attachment 10: Routine Inspection and Maintenance Plan

Inspection and maintenance of the facility occurs on a daily basis (See SPCCP, Appendix E). Below ground and non-pressurized process and wastewater lines are tested every 5 years (See Drain Line Testing Report, Appendix D).

Groundwater Monitoring

All wastewater is stored in tanks with secondary containment or the lined evaporation pond. All wastewater is transported from the point of generation to the storage units via pipelines with documented mechanical integrity. Therefore, ground water monitoring is not necessary. Ground water monitoring will be addressed separately in the Stage I/II Abatement Plan.

Precipitation Runoff Control

The plant has levees around its southern and western sides to contain storm water runoff. These act as a tertiary containment for other spills at the plant. Any oil liquid that accumulates in this area is recovered with vacuum trucks and portable pumps. This is disposed at an approved offsite facility or added to the production stream.

Attachment 11: Contingency Plan for Reporting and Clean-up of Spills or Releases

The Spill Prevention, Control and Countermeasures Plan for The EAGP is contained in Appendix E.

Attachment 12: Geological and Hydrological Site Characteristics

We refer the reader to the forthcoming Stage I/II Abatement Plan for a detailed description of the environmental setting of the EAGP.

Attachment 13: Facility Closure Plan

All reasonable and necessary measures will be taken to prevent the exceedance of 20 NMAC 6.2.3103 quality standards should BP

choose to permanently close the facility. Closure measures will include removal or closure in place of all underground piping and equipment. All tanks will be emptied. No potentially toxic materials or effluents will remain on the site. All potential sources of toxic pollutants will be inspected. Should contaminated soil be discovered, any necessary reporting under NMOCD Rule 116 and 20 NMAC 6.2.1203 will be made and clean-up activities will commence. Post-closure maintenance and monitoring plans would not be necessary unless contamination is encountered.

TABLES

Table 1. Surface Fluid Storage

Type of Liquid	Stored Liquid	Type of Storage	Maximum Capacity	Location	Secondary Containment Type
Amine					
	Monoethanolamine	Tank	2 at 280 bbl.	East of Evap.Pond	Earthern berm
Acids					
	Sulphuric Acid	Tank	1000 gal.	East of cooling towers	Concrete berm
Caustics					
	Caustic	Tank	5000 gal.	South of #1 Propanizer	Concrete Berm
Oils					
	Lubrication Oils, misc.	Barrel	55 gal.ea.	East of #9 Inlet Gas Compressor Building	On grates w./concrete berm
	ISO 22	Tank	1000 gal.	East of Compressor Building	Concrete berm
	Rental Lube Oil	Tank	500 gal.	S.E. corner of plant	Fiberglass containment
	Chevron 541	Tank	2 at 322 bbls each	South of Shop	Earthern berm
Fuels					
	Diesel fuel	Tank	12.5 bbls	S.E. of Compressor Building	Fiberglass containment
	Gasoline	Tank	12 bbls	South of Shop	Fiberglass containment w./Earthern berm
	Propane	Tank	24 bbls	South of Shop	Earthern berm
Solvents					
	MR Solvent	Tank	12 bbls	South of Shop	Fiberglass containment w./Earthern Berm
	Safety Kleen	Vats		Comp. Bldg, Welding , Warehouse	
Soaps					
	Bio-degradable Industrial Detergent	Tank	500 gal.	East of Compressor Building	Concrete berm

Table 1. Surface Fluid Storage

Type of Liquid	Stored Liquid	Type of Storage	Maximum Capacity	Location	Secondary Containment Type
Others					
	Propylene Glycol (engine coolant)	Barrel	55 gal. each	East of #9 Inlet Gas Compressor Building	On grates w./concrete berm
	Ethyl Mercaptain	Tank	15 bbls	Loading Rack	Enclosed system, w./concrete berm
	Gasoline	Tank	2 at 1000 bbls each	East of Compressor Building	Earthern berm
	Butane	Tank	2 at 1280 bbls each	East of Compressor Building	Earthern berm
	Propane	Tank	5 at 1458, 1408, 1039, 1036, 1502 bbls.	East of Compressor Building	Earthern berm
	Methanol	Tank	1000 gal.	Cryo	Concrete berm
	Process Drains	Tank	500 and 210 bbls.	West side of Plant	Earthen berm

Table 2. Waste Solids Generated at the Facility

Description of Solid Waste	Disposal Facility
Used Amine, Oil, Regen Gas and Process Filters	U.S. Filter, an approved filter recycling facility
Construction Waste	Approved landfill
Refuse	City of Roswell Landfill

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

June 2, 2004

Mark Fesmire, P.E.
Director
Oil Conservation Division

Mr. Bob Manthei
BP America Production Company
P.O. Box 1089
Eunice, New Mexico 88231

RE: Discharge Permit GW-022 Renewal
Abo Empire Gas Processing Plant
Eddy County, New Mexico

Dear Mr. Manthei:

On December 13, 1999, the groundwater discharge permit renewal, GW-022, for the BP America Production Company Abo Empire Gas Processing Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico, was approved by the Director of the New Mexico Oil Conservation Division (OCD). This discharge permit renewal was required and submitted pursuant to Water Quality Control Commission (WQCC) regulations and was approved for a period of five years. **The approval will expire on December 13, 2004.**

If the facility continues to have potential or actual effluent or leachate discharges and wishes to continue operation, the discharge permit must be renewed. **Pursuant to Section 3106.F., if an application for renewal is submitted at least 120 days before the discharge permit expires, then the existing approved discharge permit for the same activity shall not expire until the application for renewal has been approved or disapproved.** The OCD is reviewing discharge permit submittals and renewals carefully and the review time can extend for several weeks to months. Please indicate whether BP America Production Company has made or intends to make, any changes in the system, and if so, please include these modifications in the application for renewal.

The discharge permit renewal application for the **Abo Empire Gas Processing Plant** is subject to WQCC Regulation 3114. Every billable facility submitting a discharge permit renewal will be assessed a filing fee of $100.00 plus a flat fee equal to $4,000.00 for gas processing plants. The $100.00 filing fee is to be submitted with the discharge permit renewal application and is nonrefundable.

Please make all checks payable to: **NMED-Water Quality Management** and addressed to the OCD Santa Fe Office. Please submit the original discharge permit renewal application and one copy to the OCD Santa Fe Office and one copy to the OCD Artesia District Office. **Note that the completed and signed application form must be submitted with your discharge permit renewal request.** (A complete copy of the regulations is available on OCD's website at **www.emnrd.state.nm.us/ocd/**).

If the Abo Empire Gas Processing Plant no longer has any actual or potential discharges and a discharge permit is not needed, please notify this office. If BP America Production Company has any questions, please do not hesitate to contact me at (505) 476-3489.

Sincerely,

W. Jack Ford, C.P.G.
Environmental Bureau
Oil Conservation Division

cc: OCD Artesia District Office

bp

BP America Production Company
600 N. Marienfeld
Suite 869
PO Box 1610
Midland, TX 79701

February 11, 2002

New Mexico Energy, Minerals and Natural Resources Dept.
Oil Conservation Division
1220 So. St. Francis Drive
Santa Fe, New Mexico 87505

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Receipt #7099 3400 0017 1731 6002

Re: **Asset Transfer**
ARCO Permian
Company Name Change to Discharge Plan

Facility Address:	Permit Number:
Empire/Abo Gas Plant P.O. Drawer 70 257 Empire Road Artesia, NM 88211-0070	GW - 22

Ladies and Gentlemen:

Following the various recent corporate mergers, BP America Inc. is in the process of reorganizing, consolidating and merging the upstream United States assets of its various wholly-owned subsidiaries, Amoco Production Company, BP Exploration & Production Inc., Atlantic Richfield Company, Vastar Resources, Inc. and Vastar Offshore, Inc. into two operating companies to align BP's legal structure with its business organization and to improve operating efficiencies (the "Reorganization"). By January 1, 2002, onshore assets and entities will be owned by Amoco Production Company (which will change its name to BP America Production Company) and offshore assets and entities will be owned by BP Exploration & Production Inc. We anticipate no substantive changes in either our operations or our business relationships as a result of this Reorganization.

Among the assets being transferred in connection with the Reorganization are the above-referenced Facility and associated permits. As of January 1, 2002, the Facility and permits will be owned by BP America Production Company. Please note that the address of the Facility remains the same and we anticipate that there will be no changes in operations or business relationships as a result of this Reorganization.

The federal tax ID number for BP America Production Company (formerly Amoco Production Company) remains the same (73-0466080).

We look forward to working with you in the same cooperative manner as we have in the past. If you have any questions or concerns, please call me at [915-688-5799].

Sincerely,

Margaret J. Lowe
Sr. Environmental Engineer

cc: F. Noah/EAGP
File 43A3d

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

K- Any of your people interested? Cobrum? Kirby? Murphy?

3/2/01 Peggy Lowe

BRT FYI

FEB 15 2001

RECEIVED

FEB 26 2001

CERTIFIED MAIL- RETURN RECEIPT REQUESTED

NM ENVIRONMENT DEPAR
OFFICE OF THE SECRETAR

Ms. Margaret J. Lowe
Sr. Environmental Engineer
ARCO Permian
600 N. Marienfeld
Post Office Box 1610
Midland, TX 79702

Dear Ms. Lowe:

On May 5, 2000, Atlantic Richfield Company Permian (ARCO Permian) applied to the Environmental Protection Agency (EPA) Region 6 Office for approval of a polychlorinated biphenyl (PCB) risk-based closure action at its Empire Abo Gasoline Plant (EAGP) near Artesia, New Mexico. This request was made pursuant to 40 CFR 761.61(c). A Public Notice for proposed approval was published in the Roswell Daily Record on November 10, 2000, which opened a 45-day comment period. We received no comments during the comment period which closed on December 25, 2000. This letter and enclosed conditions grant approval to ARCO Permian to close two PCB contaminated soil areas under the risk-based closure regulations.

Contamination from PCBs arose from their use in the 1960s in plant starting air compressor systems. Based upon information supplied by your company, there are three areas that require remediation at this facility. Area 1 (the location of the air compressor building) and Area 2 (the location of the volume bottle near Compressor 2) require a risk-based closure under 761.61(c) because residual PCB concentrations after loose soil excavation exceeded 25 parts per million (ppm). Area 3 (the location of the volume bottle near Compressor 3) is being closed under a separate action pursuant to 761.61(a) since residual PCB samples at this location after loose soil excavation were less than 25 parts per million. Risk-based closure approvals are required in areas where PCB concentrations exceed 25 ppm.

The loose PCB contaminated soils in closure areas designated "Area 1" and "Area 2" were removed down to solid caliche, or to the edge of plant equipment or building foundations. Excavated soils in the amount of 288,599 kg were disposed at the Waste Control Specialists PCB landfill near Andrews, Texas. The typical depths of excavation ranged from two and one-half to five feet below grade. Samples of caliche from Area 1 after excavation ranged from about 100 ppm PCBs to over 12,000 ppm. In Area 2, PCB concentrations after excavation ranged from less than 50 ppm PCBs to over 1880 ppm PCBs. ARCO proposes to cap these areas by placing a geosynthetic clay (bentonite) liner over the bottom and sides of the excavated areas, and then

filling the cells with natural soil. The capped areas will remain in-place until final plant closure at which time the two areas will be completely excavated and the material disposed off-site at an appropriate waste disposal facility.

As a result of our review of the application and a subsequent submittal dated June 2, 2000, EPA has determined that the closure of Areas 1 and Area 2 in accordance with the approved plan will not present an unreasonable risk to human health or the environment from PCBs. Factors that led EPA to this conclusion are discussed below.

1. Elimination of Direct Exposure: The PCB contaminated soil that was identified and designated "Area 1" and "Area 2" was removed and disposed at an approved PCB disposal facility. The only remaining contamination was in the caliche. These contaminated areas will, with this approval of the risk-based closure request, be lined with the geosynthetic/bentonite clay liner and capped which will eliminate any direct exposure pathway.

2. Evaporation Rate: The average pan evaporation rate for Artesia, New Mexico over the past ten years is 104 inches while average rainfall for this same time period was 11.9 inches according to the Agricultural Science Center at Artesia, New Mexico. The semi-arid conditions makes the potential for migration of PCBs through soil by incident precipitation remote even if the contaminated areas were not lined and capped.

3. Water Wells/Water Supplies: The New Mexico State Engineer's Roswell office records only two water wells within one mile of EAGP. These wells are not used for potable drinking water, and are apparently not operating at this time due to a lack of dwellings or windmills at the sites specified. Potable water for the EAGP site is through pipeline from wells in the Ogallala Aquifer 30 miles east of the plant. The potential for contamination of water well supplies from this action are therefore remote. There are no surface water bodies or tributaries within a one mile radius of this site.

4. Monitoring Wells: There are 27 monitoring wells at the plant site. The depth to water in these wells ranges from 7.35 to 82.15 feet below grade. Some of these wells have been sampled for PCBs. The samples collected and analyzed by ARCO showed no PCB arochlors detected in samples taken from ground water monitoring wells around the proposed sites for closure. Due to the hydrogeology of this area, groundwater monitoring will be required on a limited basis. Since there are only perched and unconnected groundwater zones below the site combined with the fact that the sites proposed for closure have been excavated of all loose soil down to caliche, groundwater monitoring will include sampling of up to ten or more wells once every three years during a period of ten years. If no PCBs are detected during that time period, EPA will re-evaluate whether any further sampling will be required.

ARCO Permian shall abide by the conditions of this approval. This approval shall become effective on the date of this letter. If you have questions, please contact Mr. James Sales, Engineer, Multimedia Planning and Permitting Division at (214) 665-6796.

Sincerely yours,

for Gregg A. Cooke
Regional Administrator

Enclosure

cc: Mr. Pete Maggiore
New Mexico Environment Department

ARCO PERMIAN

EMPIRE ABO GASOLINE PLANT
PCB SITE CLOSURE PURSUANT TO 40 CFR 761.61(c)

ARTESIA, NEW MEXICO

I. LOCATION OF FACILITY

The sites being remediated for closure under this approval are located ten miles east of Artesia, New Mexico in Eddy County at the ARCO Permian Empire Abo Gasoline Plant.

II. CLOSURE SITES AUTHORIZED

This approval authorizes the closure of the sites designated "Area 1" and "Area 2" pursuant to the risk-based closure provisions of 40 CFR 761.61(c). These sites are further designated in the application letters dated May 5, and June 2, 2000.

III. DISPOSAL FACILITY DESIGN AND CONSTRUCTION

A. General Design and Construction Requirements:

The closure of Area 1 and Area 2 shall be carried out in accordance with the procedures outlined in Attachment 3, "Bentomat St Liner Installation Procedure" to the application letter dated June 2, 2000.

B. Ground Water Monitoring Requirements:

1. In the third, sixth, and ninth calendar years after the year of this approval, ARCO will sample and analyze groundwater samples from the following monitoring wells: MW 2; MW 2-3: MW 2-16; MW 8; MW 2-13; MW 2-18; MW 2-12; and MW 9. ARCO will follow sampling and analytical methods required by EPA. The EPA may require samples from wells other than those listed in this paragraph if EPA so directs. If no PCBs are detected after the third round of sampling, EPA will re-evaluate whether any further samples will be required.

2. The EPA reserves the right to conduct or order further sampling in the future should EPA find reason to believe that this information is necessary for the protection of human health or the environment from PCBs.

IV. POST CLOSURE CARE

1. The Facility shall maintain the caps placed on Area 1 and Area 2 until such time as the Facility is dismantled. At that time, all remaining PCBs shall be excavated and disposed at an appropriate disposal facility for such wastes.

V. STANDARD APPROVAL CONDITIONS

A. Severability:

The conditions of this authorization are severable, and if any provision of this authorization, or any application of any provision, is held invalid, the remainder of this authorization shall not be affected thereby.

B. Duty to Comply:

The facility shall comply with all Federal, State, and local regulations, approvals, and permits.

C. Personnel Safety:

The facility personnel safety requirements and procedures for PCB handling, storage, transport, and disposal shall comply with OSHA requirements.

D. Duty to Mitigate:

The facility shall correct any adverse impact on the environment resulting from noncompliance with this approval.

E. Duty to Provide Information:

The facility shall furnish any relevant information which EPA may request to determine whether cause exists for modifying, revoking, reissuing, or terminating this approval, or to determine compliance with this approval. The facility shall also furnish, upon request, copies of records required to be kept under the TSCA PCB regulations.

F. Inspection and Entry:

The facility shall allow an authorized representative, upon presentation of credentials and other documents as may be required by law, to:

1. Enter the facility where PCBs are being handled, stored, treated, or disposed;

2. Have access to and copy, at reasonable times, any records that must be kept under the TSCA PCB regulations;

3. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations required under this approval or the TSCA PCB regulations; or,

4. Sample or monitor for the purpose of assuring that the facility is in compliance with the conditions of this approval or the TSCA PCB regulations.

G. Monitoring and Records:

The facility shall comply with all monitoring and record keeping requirements for PCB closure sites in accordance with 761.125(c)(5) for applicable portions of 761.61(a)(3), (a)(4), and (a)(5).

H. Deed Recording:

The Facility shall comply with the deed restriction requirements pursuant to 40 CFR 761.61(a)(8).

I. Effective Date:

These conditions shall become effective on the date of the approval letter. There is no expiration date for this approval.

END OF APPROVAL CONDITIONS

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

PAUL R. RITZMA
DEPUTY SECRETARY

February 12, 2001

Jim Sales
U.S. EPA Region VI
1445 Ross Avenue
Suite 1200
Dallas, Texas 75202

RE: PCB Remediation at Arco Empire Abo Gas Plant Near Artesia, New Mexico

Dear Mr. Sales:

This letter has been prepared at the request of Ms. Margaret Lowe of Arco. Ms. Lowe has informed the Ground Water Quality Bureau of the excavation of soils contaminated with PCBs adjacent to the main compressor building at the Empire Abo Gas Plant near Artesia, New Mexico. This work has been performed under the oversight of Region VI EPA. I understand from my conversations with Ms. Lowe and Mr. Jack Ford, of New Mexico's Oil Conservation Division (OCD) that the site has a variable depth to ground water and that ground water beneath the site is localized to that area. In addition, Mr. Ford has indicated to me that there is a network of monitoring wells in the area.

We understand that ARCO has excavated all of the soil that is practical at the present time without damaging the foundation of the adjacent building or without having to break up and remove caliche. Also, we understand that there are concentrations of PCBs remaining in some areas. ARCO will remediate the soils further when the Gas Plant eventually closes in the future, as required by EPA. Soil concentrations left in place do exceed the New Mexico risk based screening levels for PCBs for protection of ground water, which range from 3E-03 mg/kg for Aroclor 1016 to 2E+01 mg/kg for Aroclor 1260. Of course these screening levels are based upon a conservative ground water protection scenario and facilities may perform a Level 3 site-specific risk assessment to develop site clean-up levels. At the present time, ARCO is planning to cap the

remaining soils and periodically monitor ground water for PCBs as required by EPA and under OCD oversight.

The Ground Water Quality Bureau concurs with this method of handling the contamination. PCBs are generally not very mobile in the subsurface environment and the use of a cap will significantly reduce the likelihood of vadose zone transport. At the time of plant closure, ARCO will excavate and dispose of all remaining PCBs as required by EPA.

Sincerely,

Christine D. Bynum

Christine D. Bynum
Program Manager
Voluntary Remediation/Assessment and Abatement

CC: Jack Ford, Oil Conservation Division
Margaret Lowe, ARCO
Marcy Leavitt, Bureau Chief, Ground Water Quality Bureau

CERTIFICATE OF WASTE STATUS

NON-EXEMPT WASTE MATERIAL

ORIGINATING LOCATION: Empire Abo Injection Plant

SOURCE: Compressor Building Sumps

DISPOSAL LOCATION: SUNDANCE SERVICES INC.

As a condition of acceptance for disposal, I hereby certify that this waste is a non-exempt waste as defined by the Environmental Protection Agency's (EPA) July 1988 Regulatory Determination. To my knowledge, this waste will be analyzed pursuant to the provisions of 40 CFR, Part 261 to verify the nature as non-hazardous. I further certify that to my knowledge no "hazardous or listed waste" pursuant to the provisions of 40 CFR, Part 261, Subparts C and D, has been added or mixed with the waste so as to make the resultant mixture a "hazardous waste" pursuant to the provisions of 40 CFR, Section 261.3.

I, the undersigned as the agent for bp Permian concur with the status of the waste from the subject site.

Name: Margaret J Lowe

Title/Agency: Sr. Environmental Engineer

Address: PO Box 1610
Midland TX 79707

Signature: Margaret J Lowe

Date: 9/19/00

amec

September 29, 2000

AMEC Earth & Environmental
8519 Jefferson NE
Albuquerque, NM 87113

Attention: George Friend

Dear Mr. Friend:

RE: Analytical Results for Project 0-517-000116

Attached are the results for the samples submitted on September 21, 2000 from the above referenced project. For your reference, our project number associated with these samples is NM000542.

The samples were analyzed at the AMEC Environmental Chemistry Laboratory. The samples were also subcontracted to SVL Analytical, Inc. for metals analysis. The subcontracted results are included as Appendix A of this report. This report shall not be reproduced, except in its entirety, without written approval of the laboratory.

All analyses were conducted in accordance with applicable QA/QC guidelines. The results apply only to the samples submitted.

Please feel free to contact me if you have any questions regarding this report, or if I can be of any assistance in any other matter.

Respectfully submitted,

AMEC Earth & Environmental

Sean Gormley
Laboratory Manager

Post-it® Fax Note 7671	Date 10/2/00	# of pages ▶ 28
To George Friend	From Kim Davis	
Co./Dept.	Co.	
Phone #	Phone (503) 639-3400	
Fax #	Fax (503) 620-7892	

AMEC Earth & Environmental, Inc.
7477 SW Tech Center Drive
Portland, Oregon USA 97223
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Fax +1 (503) 620-7892

amec

Project: Empire ABO Plant
Project No.: 0-517-000116
Project Manager: George Friend
Sample Matrix: Soil

Service Request No.: NM000542
Report Date: 09/29/00
Report No.: 00054209
C.O.C. No.: 3472

Volatile Organic Compounds by GC/MSD
EPA Methods 8030B/8260B
mg/kg(ppm)

Sample Name:	North Tank	South Tank	S Side Compressor	Compressor Sump	Lab Blank	Reporting
Lab Code:	542-1	542-2	542-3	542-4	542-MB	Limit
Dichlorodifluoromethane	ND	ND	ND	ND	ND	0.1
Chloromethane	ND	ND	ND	ND	ND	0.1
Vinyl Chloride	ND	ND	ND	ND	ND	0.1
Bromomethane	ND	ND	ND	ND	ND	0.1
Chloroethane	ND	ND	ND	ND	ND	0.1
Trichlorofluoromethane	ND	ND	ND	ND	ND	0.1
1,1-Dichloroethene	ND	ND	ND	ND	ND	0.1
Acetone	ND	ND	ND	ND	ND	2.0
Carbon Disulfide	ND	ND	ND	ND	ND	0.1
Methylene Chloride	ND	ND	ND	ND	ND	0.5
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	0.1
MTBE	ND	ND	ND	ND	ND	0.1
1,1-Dichloroethane	ND	ND	ND	ND	ND	0.1
2,2-Dichloropropane	ND	ND	ND	ND	ND	0.1
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	0.1
2-Butanone(MEK)	ND	ND	ND	ND	ND	1.0
Bromochloromethane	ND	ND	ND	ND	ND	0.1
Chloroform	ND	ND	ND	ND	ND	0.5
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	0.1
Carbon Tetrachloride	ND	ND	ND	ND	ND	0.1
1,1-Dichloropropene	ND	ND	ND	ND	ND	0.1
Benzene	ND	0.082J	ND	ND	ND	0.1
1,2-Dichloroethane	ND	ND	ND	ND	ND	0.1
Trichloroethene	ND	ND	ND	ND	ND	0.1
1,2-Dichloropropane	ND	ND	ND	ND	ND	0.1
Dibromomethane	ND	ND	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	ND	ND	0.1
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	0.1
4-Methyl-2-Pentanone(MIBK)	ND	ND	ND	ND	ND	1.0
Toluene	ND	ND	ND	ND	ND	0.1
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	0.1
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	0.1
Tetrachloroethene	ND	ND	ND	ND	ND	0.1
2-Hexanone	ND	ND	ND	ND	ND	1.0
1,3-Dichloropropane	ND	ND	ND	ND	ND	0.1
Dibromochloromethane	ND	ND	ND	ND	ND	0.1
1,2-Dibromoethane	ND	ND	ND	ND	ND	0.1
Chlorobenzene	ND	ND	ND	ND	ND	0.1
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.1
Ethylbenzene	ND	1.5	ND	ND	ND	0.1
m,p-Xylene	ND	ND	ND	ND	ND	0.2
o-Xylene	ND	ND	ND	ND	ND	0.1
Styrene	ND	ND	ND	ND	ND	0.1

ND Not Detected
J - Estimated value because the analyte concentration is between the method reporting limit and the detection limit.

0003

amec

Project: Empire ABO Plant
Project No.: 0-517-000116
Project Manager: George Friend
Sample Matrix: Soil

Service Request No.: NM000542
Report Date: 09/29/00
Report No.: 00054209b
C.O.C. No.: 3472

Volatile Organic Compounds by GC/MSD
EPA Methods 5030B/8260B
mg/kg(ppm)

Sample Name:	North Tank	South Tank	S Side Compressor	Compressor Sump	Lab Blank	Reporting
Lab Code:	542-1	542-2	542-3	542-4	542-MB	Limit
Bromoform	ND	ND	ND	ND	ND	0.5
Isopropylbenzene	ND	1.1	ND	ND	ND	0.1
Bromobenzene	ND	ND	ND	ND	ND	0.1
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.1
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	0.1
n-Propylbenzene	ND	1.3	ND	ND	ND	0.1
2-Chlorotoluene	ND	ND	ND	ND	ND	0.1
4-Chlorotoluene	ND	ND	ND	ND	ND	0.1
1,3,5-Trimethylbenzene	ND	0.050J	ND	ND	ND	0.1
tert-Butylbenzene	ND	0.12	ND	ND	ND	0.1
1,2,4-Trimethylbenzene	ND	0.69	ND	ND	ND	0.1
sec-Butylbenzene	ND	1.4	ND	ND	ND	0.1
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	0.1
4-Isopropyltoluene	ND	0.56	ND	ND	ND	0.1
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	0.1
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	0.5
n-Butylbenzene	ND	0.27J	ND	ND	ND	0.5
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	2.5
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	2.5
Hexachlorobutadiene	ND	ND	ND	ND	ND	2.5
Naphthalene	ND	0.57J	ND	ND	ND	2.5
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	2.5
Sample Date:	09/20/00	09/20/00	09/20/00	09/20/00	09/21/00	
Extraction Date:	09/21/00	09/21/00	09/21/00	09/21/00	09/21/00	
Analysis Date:	09/28/00	09/28/00	09/28/00	09/29/00	09/26/00	
						Control Limits
Surrogate Recoveries:						
Dibromofluoromethane:	85%(a)	91%	96%	90%	100%	89%-115%
Toluene-d_8:	75%(a)	93%	91%	75%(a)	100%	89%-124%
4-Bromofluorobenzene:	80%(a)	108%	101%	83%(a)	103%	90%-127%

ND Not Detected
(a) Outside of AEE acceptance limits. Since the recovery is within USEPA method specified guidance limits, it is the opinion of the laboratory that usability of the data has not been adversely affected.

Signature of Chemist

QA/QC Review

amec

Project: Empire ABO Plant
Project No.: 0-517-000116
Project Manager: George Friend
Sample Matrix: Soil

Service Request No.: NM000542
Report Date: 09/26/00
Report No.: 00054203
C.O.C. No.: 3472

Semivolatile Organic Compounds by GC/MSD
EPA Methods 3545/8270C
mg/kg(ppm)
As Received Basis

Sample Name:	(a) North Tank	(a) South Tank	(a)(b) SSide Compressor	(a)(b) Compressor Sump	Lab Blank	Reporting
Lab Code:	542-1	542-2	542-3	542-4	542-MB	Limit
Pyridine	<2.6	<2.8	<2.4	<2.8	ND	0.80
N-Nitrosodimethylamine	<2.6	<2.8	<2.4	<2.8	ND	0.80
Aniline	<2.6	<2.8	<2.4	<2.8	ND	0.80
Phenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
Bis(2-chloroethyl) Ether	<1.1	<1.1	<1.0	<1.1	ND	0.33
2-Chlorophenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
1,3-Dichlorobenzene	<1.1	<1.1	<1.0	<1.1	ND	0.33
1,4-Dichlorobenzene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzyl Alcohol	<2.6	<2.8	<2.4	<2.8	ND	0.80
1,2-Dichlorobenzene	<1.1	<1.1	<1.0	<1.1	ND	0.33
2-Methylphenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
Bis(2-chloroisopropyl) Ether	<1.1	<1.1	<1.0	<1.1	ND	0.33
3- and 4- Methylphenol*	<1.1	<1.1	<1.0	<1.1	ND	0.33
N-Nitrosodi-n-propylamine	<1.1	<1.1	<1.0	<1.1	ND	0.33
Hexachloroethane	<1.1	<1.1	<1.0	<1.1	ND	0.33
Nitrobenzene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Isophorone	<1.1	<1.1	<1.0	<1.1	ND	0.33
2-Nitrophenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,4-Dimethylphenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
Bis(2-chloroethoxy) methane	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzoic Acid	<5.3	<5.7	<4.8	<5.6	ND	1.5
2,4-Dichlorophenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
1,2,4-Trichlorobenzene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Naphthalene	<1.1	<1.1	<1.0	<1.1	ND	0.33
4-Chloroaniline	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,6-Dichlorophenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
Hexachlorobutadiene	<1.1	<1.1	<1.0	<1.1	ND	0.33
4-Chloro-3-metnylphenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
2-Methylnaphthalene	<1.1	<1.1	<1.0	<1.1	ND	0.33
1-Methylnaphthalene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Hexachlorocyclopentadiene	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,4,6-Trichlorophenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,4,5-Trichlorophenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
2-Chloronaphthalene	<1.1	<1.1	<1.0	<1.1	ND	0.33
2-Nitroaniline	<1.1	<1.1	<1.0	<1.1	ND	0.33
Dimethyl Phthalate	<1.1	<1.1	<1.0	<1.1	ND	0.33
Acenaphthylene	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,6-Dinitrotoluene	<1.1	<1.1	<1.0	<1.1	ND	0.33
3-Nitroaniline	<1.1	<1.1	<1.0	<1.1	ND	0.33

ND Not Detected
* Quantified as 4-Methylphenol

amec

Project: Empire ABO Plant
Project No.: 0-517-000118
Project Manager: George Friend
Sample Matrix: Soil

Service Request No.: NM000542
Report Date: 09/26/00
Report No.: 00054203b
C.O.C. No.: 3472

Semivolatile Organic Compounds by GC/MSD
EPA Methods 3545/8270C
mg/kg(ppm)
Dry Weight Basis

Sample Name:	North Tank	South Tank	SSide Compressor	Compressor Sump	Lab Blank	Reporting
Lab Code:	542-1	542-2	542-3	542-4	542-MB	Limit
Acenaphthene	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,4-Dinitrophenol	<5.3	<5.7	<4.9	<5.5	ND	1.5
4-Nitrophenol	<2.6	<2.8	<2.4	<2.8	ND	0.80
Dibenzofuran	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,4-Dinitrotoluene	<1.1	<1.1	<1.0	<1.1	ND	0.33
2,3,4,6-Tetrachlorophenol	<1.1	<1.1	<1.0	<1.1	ND	0.33
Diethyl Phthalate	<1.1	<1.1	<1.0	<1.1	ND	0.33
Fluorene	<1.1	<1.1	<1.0	<1.1	ND	0.33
4-Chlorophenyl Phenyl Ether	<1.1	<1.1	<1.0	<1.1	ND	0.33
4-Nitroaniline	<1.1	<1.1	<1.0	<1.1	ND	0.33
Azobenzene	<1.1	<1.1	<1.0	<1.1	ND	0.33
2-Methyl-4,6-dinitrophenol	<2.6	<2.8	<2.4	<2.8	ND	0.80
N-Nitrosodiphenylamine	<1.1	<1.1	<1.0	<1.1	ND	0.33
4-Bromophenyl Phenyl Ether	<1.1	<1.1	<1.0	<1.1	ND	0.33
Hexachlorobenzene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Pentachlorophenol (PCP)	<2.6	<2.8	<2.4	<2.8	ND	0.80
Phenanthrene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Anthracene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Carbazole	<1.1	<1.1	<1.0	<1.1	ND	0.33
Di-n-butyl Phthalate	<1.1	<1.1	<1.0	<1.1	ND	0.33
Fluoranthene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzidine	<1.1	<1.1	<1.0	<1.1	ND	0.33
Pyrene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Butyl Benzyl Phthalate	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzo(a)anthracene	<1.1	<1.1	<1.0	<1.1	ND	0.33
3,3'-Dichlorobenzidine	<1.1	<1.1	<1.0	<1.1	ND	0.33
Chrysene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Bis(2-ethylhexyl) Phthalate	<1.1	<1.1	<1.0	<1.1	ND	0.33
Di-n-octyl Phthalate	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzo(b)fluoranthene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzo(k)fluoranthene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzo(a)pyrene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Indeno(1,2,3-c,d)pyrene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Dibenzo(a,h)anthracene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Benzo(g,h,i)perylene	<1.1	<1.1	<1.0	<1.1	ND	0.33
Sample Date:	09/20/00	09/20/00	09/20/00	09/20/00	09/22/00	
Extraction Date:	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	
Analysis Date:	09/25/00	09/25/00	09/25/00	09/25/00	09/25/00	

ND Not Detected

, ANALYTICAL, INC.
Environment Galen ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0991

REPORT OF ANALYTICAL RESULTS (TCLP)

LIENT : Agra Earth & Environmental
SVL JOB # : 95613
SVL SAMPLE # : 244358

LIENT SAMPLE ID: NORTH TANK
ample Collected: 9/20/00 11:30
ample Receipt : 9/22/00
ate of Report : 9/26/00

Sample Matrix: Solid Waste
Extraction : TCLP **
Extracted: 9/22/00

Determination	Result	Units	TCLP Reg. Limit	Method	Analysis Date
Corrosivity, pH	7.5			9045C	9/25/00
Ignitibility	>140	°F		1010	9/25/00
Reactivity	NO	YES/NO		SW846	9/25/00
Silver	<0.005	mg/L Ext	5.0	6010B	9/25/00
Arsenic	<0.02	mg/L Ext	5.0	6010B	9/25/00
Barium	0.972	mg/L Ext	100.0	6010B	9/25/00
Cadmium	<0.002	mg/L Ext	1.0	6010B	9/25/00
Chromium	<0.006	mg/L Ext	5.0	6010B	9/25/00
Mercury	<0.0002	mg/L Ext	0.2	7470	9/25/00
Lead	<0.005	mg/L Ext	5.0	6010B	9/25/00
Selenium	<0.02	mg/L Ext	1.0	6010B	9/25/00

** sample extracted according to EPA Method 1311 (TCLP).

eviewed By: Kirby Gray Date 9/26/00
9/26/00 15:08

C020

ANALYTICAL, INC.
Government Gulch ▪ P.O. Box 928 ▪ Kellogg, Idaho 83837-0928 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0691

REPORT OF ANALYTICAL RESULTS (TCLP)

LIENT : Agra Earth & Environmental
SVL JOB # : 95613
SVL SAMPLE # : 244360

LIENT SAMPLE ID: COMPRESSOR SUMP
ample Collected: 9/20/00 14:00
ample Receipt : 9/22/00
ate of Report : 9/26/00

Sample Matrix: Solid Waste
Extraction : TCLP **
Extracted: 9/22/00

Determination	Result	Units	TCLP Reg. Limit	Method	Analysis Date
Corrosivity, pH	6.7			9045C	9/25/00
Ignitibility	>140	°F		1010	9/25/00
Reactivity	NO	YES/NO		SW846	9/25/00
Silver	<0.005	mg/L Ext	5.0	6010B	9/25/00
Arsenic	<0.02	mg/L Ext	5.0	6010B	9/25/00
Barium	0.162	mg/L Ext	100.0	6010B	9/25/00
Cadmium	0.021	mg/L Ext	1.0	6010B	9/25/00
Chromium	<0.006	mg/L Ext	5.0	6010B	9/25/00
Mercury	<0.0002	mg/L Ext	0.2	7470	9/25/00
Lead	<0.005	mg/L Ext	5.0	6010B	9/25/00
Selenium	0.03	mg/L Ext	1.0	6010B	9/25/00

** Sample extracted according to EPA method 1311 (TCLP).

Reviewed By: Kathy Gray Date 9/26/00
9/26/00 13:08

ANALYTICAL, INC.
Lovewood Gulch • P.O. Box 929 • Kellogg, Idaho 83837-0929 • Phone: (208)784-1258 • Fax: (208)783-0881

REPORT OF ANALYTICAL RESULTS (TCLP)

CLIENT : Agra Earth & Environmental
SVL JOB # : 95613
SVL SAMPLE # : 244359

CLIENT SAMPLE ID: S.SIDE COMPRESSOR
Sample Collected: 9/20/00 13:50
Sample Receipt : 9/22/00
Date of Report : 9/26/00
Sample Matrix: Solid Waste
Extraction : TCLP **
Extracted: 9/22/00

Determination	Result	Units	TCLP Reg. Limit	Method	Analysis Date
Corrosivity, pH	7.8			9045C	9/25/00
Ignitibility	>140	°F		1010	9/25/00
Reactivity	NO	YES/NO		SW846	9/25/00
Silver	<0.005	mg/L Ext	5.0	6010B	9/25/00
Arsenic	<0.02	mg/L Ext	5.0	6010B	9/25/00
Barium	0.155	mg/L Ext	100.0	6010B	9/25/00
Cadmium	<0.002	mg/L Ext	1.0	6010B	9/25/00
Chromium	<0.006	mg/L Ext	5.0	6010B	9/25/00
Mercury	<0.0002	mg/L Ext	0.2	7470	9/25/00
Lead	<0.005	mg/L Ext	5.0	6010B	9/25/00
Selenium	0.03	mg/L Ext	1.0	6010B	9/25/00

** Sample extracted according to EPA method 1311 (TCLP).

Reviewed By: Bobby Bray Date 9/26/00
9/26/00 15:08

AGRA
ENGINEERING & ENVIRONMENTAL SERVICES
7477 SW Tech Center Drive
Portland, Oregon, U.S.A. 97223-8025
Tel (503)639-3400 Fax (503) 620-7892

3472

CHAIN OF CUSTODY

PROJECT: EMPIRE AND PLANT	PROJECT No: 0-517-000116
REPORT TO: GEORGE FRIEND	PHONE No: (505) 421-1801
PROJECT MANAGER: GEORGE FRIEND	PHONE No:
SAMPLER'S NAME (please print): GEORGE FRIEND	PHONE No:
SAMPLER'S SIGNATURE:	

ANALYSES REQUESTED (circle, check box or write preferred method in box)

SAMPLE ID	DATE	TIME	MATRIX	PRESERVATIVE	CONTAINERS No	CONTAINERS VOL	BTEX by EPA 602 / 8021	TPH-G	BTEX / TPH-G	TPH-HCID	TPH-D / TPH-D EXTENDED	TPH by EPA 8015 MODIFIED / 8015B	TPH-418.1 MODIFIED	TPH by EPA 418.1	GC/MS EPA 624 / EPA 8260 Volatiles	GC/MS EPA 625 / 8270 Semi-volatiles	VOCS EPA 601 / 602 or EPA 8021	PCBs EPA 608 / 8081 / 8082	LEAD EPA 6010 / EPA 7421 Total / Dissolved	TOTAL METALS	TCLP				
1 NORTH TANK	9-20	1180	GW	ICE	2	9 OZ						✓			✓	✓					✓	✓			
2 SOUTH TANK		1310			2							✓			✓	✓					✓	✓			
3 S. SIDE CLARIFIER		1060			2							✓			✓	✓					✓	✓			
4 CLARIFIER SUMP		1400			2							✓			✓	✓					✓	✓			
5																						!			
6																									
7																									
8																									
9																									
10																									

SAMPLE RECEIPT	LABORATORY	TURNAROUND TIME	QC Reporting Requirements (Addl charges may apply)	COMMENTS / INSTRUCTIONS
TOTAL # CONTAINERS: 1	SHIPPING ID / AIRBILL #:	☐ 8 HOUR	☐ LEVEL I	NEED RESULTS FOR SOUTH TANK. HSAP
CONDITION OF CONTAINERS:	CARRIER:	☐ 24 HOUR	☐ LEVEL II	
CONDITION OF SEALS:	DOT DESIGNATION:	☐ 1 WEEK	☐ LEVEL II with project specific Duplicate/Spikes	
		☐ 2 WEEK (standard)	☐ Level III (Full validation package)	
		☐ OTHER		

	RELINQUISHED BY / AFFILIATION	DATE	TIME		ACCEPTED BY / AFFILIATION	DATE	TIME
1		9-20-00	1100	1			
2				2			
3				3			

PAGE 1 OF 1

AGRA Earth & Environmental, Inc. (1/97)

June 2, 2000

Mr. Jim Sales
EPA Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202

RE: Empire Abo Gasoline Plant
PCB Soil Remediation Risk Based Closure under 40 CFR 761.61(c)

Dear Mr. Sales:

In ARCO Permian's May 5, 2000, letter, we requested approval for a risk-based closure of two PCB contaminated soil areas under 40 CFR 761.61(c). The contaminated areas are within the Empire Abo Gasoline Plant (EAGP), located approximately 10 miles east of Artesia, New Mexico in Eddy County. As requested during your May 26 site visit to the plant, I am providing the following additional information.

- Monitoring well information - There are 27 monitoring wells at the plant site. See Attachment 1 for map and additional information.
- The average pan evaporation rate for Artesia, NM over the last ten years is 104 inches. The average rainfall over the same time period is 11.9 inches. Attachment 2 has the pan evaporation and the rainfall information from the Agricultural Science Center at Artesia, NM.
- Drinking water wells within 1 mile of site - The New Mexico State Engineer's Roswell office had records for two water wells within one mile of EAGP.

RA 2996	NE SE NW	Section 2	T18S	R27E
RA 3917	SE NW NE	Section 10	T18S	R27E

  Based upon our field observations and the lack of dwellings or windmills on published maps, we believe these wells, if they still exist, provide water for oil field drilling operations and possibly livestock.
- Source of water for EAGP - Caprock Irrigation Company supplies water to the plant. The pipeline draws from wells in the Ogallala Aquifer about 30 miles east of the plant.
- PCB Remediation Waste volume and disposal site - We have shipped 288,599 kg (17 loads) of PCB-contaminated soil and remediation waste to the Waste Control Specialists Landfill, near Andrews, Texas. This landfill is a Texas Natural Resources Conservation Commission hazardous waste landfill, with EPA ID #TXD988088464 and state ID# 50358. There are two additional roll-off bins currently at the plant that will be shipped to the Andrews facility at the conclusion of the project.
- Installation procedure for Bentomat® ST liner - See Attachment 3.

If you have any questions, or need additional information, please contact me by telephone at (915) 688-5799 or by e-mail at mlowe@mail.arco.com

Sincerely,

Margaret J. Lowe

Margaret J. Lowe
Sr. Environmental Engineer

Attachment 1: Monitor Well Data
Attachment 2: Artesia Agricultural Science Center Data
Attachment 3: Bentomat® ST Liner Installation Procedure

cc: R. Anderson/NMOCD
G. Hierstein/Philip Services Corp.
R. McCollum/EAGP
File 43A2d1

ATTACHMENT 1

EMPIRE ABO GASOLINE PLANT

MONITOR WELL DATA

Fluid Levels in Monitor Wells

Empire Abo Gasoline Plant

		12/13-14/99	
Well	TOC Elev. Ft. ASL	Depth to Water (feet)	Corr. WL Elev. Ft. ASL
2	3548.50	33.92	3514.58
3	3555.70	74.10	3481.50
4	3551.30	52.45	3498.85
5	3543.90	64.10	3479.80
6*	3544.90	42.05	3504.85
7	3546.90	7.35	3539.55
8	3544.10	64.50	3479.60
9	3543.20	45.42	3497.54
2-2	3552.55	26.75	3525.80
2-3	3557.98	78.53	3479.45
2-4	3554.09	53.02	3501.07
2-5	3553.00	27.60	3525.40
2-6	3551.11	8.60	3541.71
2-7	3547.34	49.40	3497.94
2-9	3546.81	36.80	3508.37
2-10	3548.67	68.25	3476.40
2-11	3547.06	21.22	3525.44
2-12	3543.40	66.90	3475.38
2-13	3545.91	41.80	3503.93
2-14	3545.91	48.98	3496.80
2-15	3543.64	55.75	3486.93
2-16	3544.39	65.05	3479.34
2-18	3545.79	20.18	3525.61
3-1	3543.04	45.70	3497.34
3-2	3541.59	65.40	3474.83
3-3	3544.93	71.50	3473.43
3-4	3558.63	82.15	3476.48

* Data from 12/4/98

Note: When wells 1 and 2-1 were drilled, no fluids were encountered. The wells were plugged.

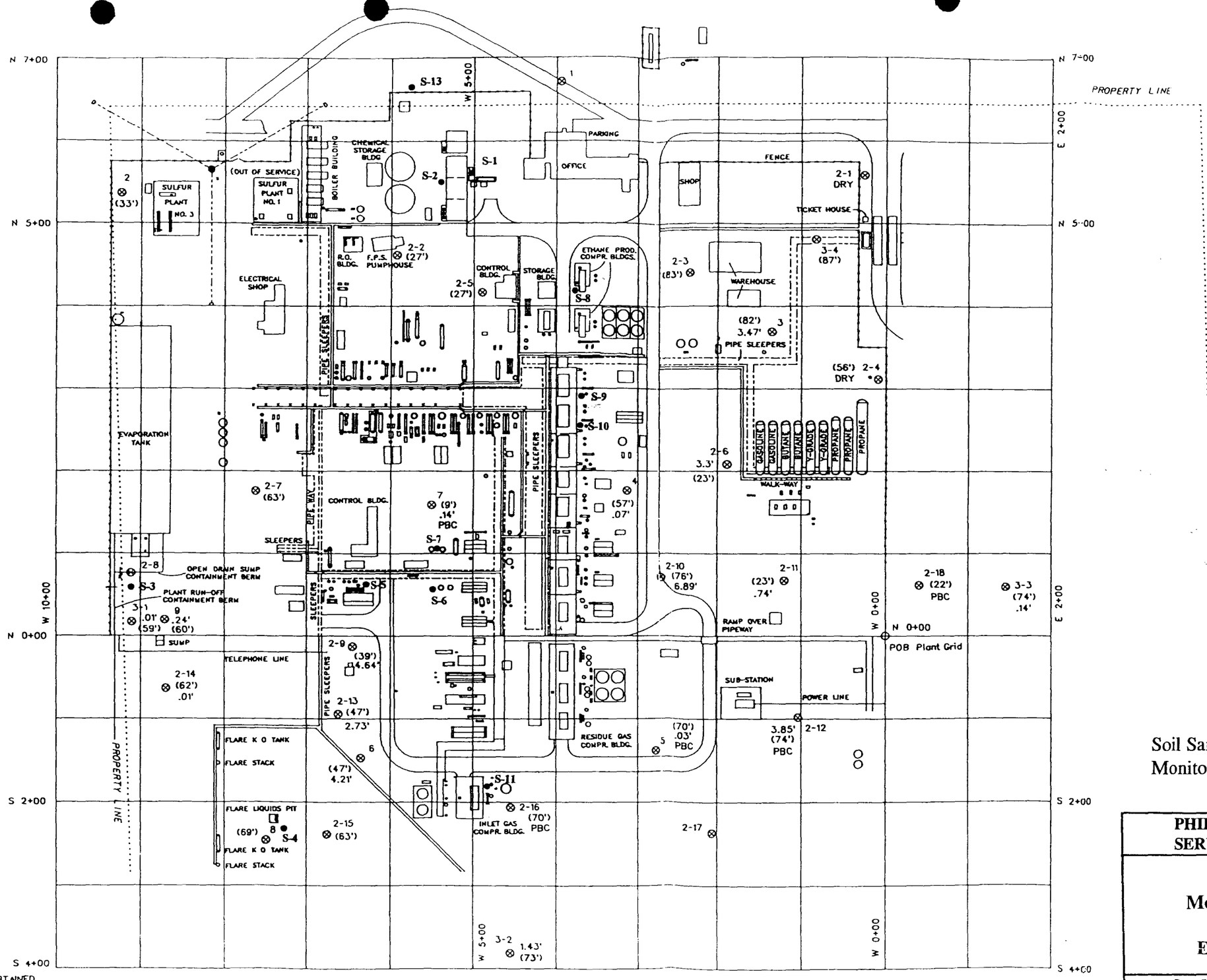


Figure 1

Soil Sample Location •
Monitoring Well Location ⊗

PHILIP ENVIRONMENTAL SERVICES CORPORATION

Soil Sample and Monitoring Well Locations

Empire Abo Gas Plant

Date: 7/18/1996	Scale: 1 in = 120 feet

NOTE: FACILITY PLOT PLAN OBTAINED
FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

Modified from AMOCO Production Company, 1994

ATTACHMENT 2

ARTESIA AGRICULTURAL SCIENCE CENTER DATA

Pan Evaporation (per inches)
Agricultural Science Center at Artesia, NM

Month	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
January	3.19	6.18	2.16	2.74	2.94	2.94	5.50	3.60	5.37	5.84	4.52
February	5.83	5.05	3.52	4.33	4.75	5.07	8.75	2.86	5.30	7.29	7.32
March	7.39	9.50	9.82	9.62	7.20	7.65	11.38	9.08	9.22	8.03	8.94
April	10.35	12.96	9.15	11.34	11.53	11.05	15.07	9.26	12.24	12.61	11.93
May	13.75	14.17	10.60	12.21	10.42	13.79	21.17	10.76	16.33	14.59	16.32
June	16.64	13.43	10.49	14.34	13.60	15.71	15.66	12.71	19.00	12.18	
July	11.11	9.41	11.96	11.84	13.07	12.82	11.94	13.82	13.91	12.59	
August	7.76	8.66	9.27	10.45	11.49	10.95	9.60	10.71	10.69	11.76	
September	6.66	5.51	8.83	9.08	8.76	8.09	7.40	8.55	9.94	8.83	
October	6.58	6.49	7.21	6.24	6.28	8.30	7.43	6.78	7.77	7.56	
November	4.98	7.84	6.50	3.68	4.41	5.40	4.71	3.69	4.56	4.98	
December	3.22	4.05	3.89	2.74	2.89	3.44	5.12	4.03	3.49	2.92	
Totals	97.46	103.25	93.40	98.61	97.34	105.21	123.73	95.85	117.82	109.18	49.03
Average	8.12	8.60	7.78	8.22	8.11	8.77	10.31	7.99	9.82	9.10	9.81

Rainfall Table

Aricultural Science Center at Artesia, NM, New Mexico State University

Month	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
					INCHES						
January	0.29	1.30	1.08	0.88	0.19	0.60	0.30	0.45	0.00	0.57	0.05
February	0.06	0.42	1.11	0.03	0.00	0.27	0.00	1.15	0.18	0.00	0.00
March	0.57	0.02	0.09	0.33	0.28	0.11	0.03	0.11	0.52	0.91	0.18
April	0.76	0.14	0.54	0.81	0.14	0.05	0.63	1.37	0.04	1.11	0.34
May	0.10	0.79	3.38	0.57	3.12	0.61	0.00	1.43	0.00	4.35	0.00
June	0.00	1.75	2.81	0.54	0.68	2.63	2.01	1.66	0.25	3.82	
July	2.25	3.26	0.99	1.23	0.31	0.94	1.34	0.60	1.01	2.17	
August	1.64	6.30	1.67	1.24	2.05	0.90	3.80	1.87	1.84	0.98	
September	1.78	3.96	1.32	0.12	0.28	2.17	1.54	2.37	0.44	0.63	
October	0.68	0.10	0.32	0.78	0.35	0.06	0.66	2.71	2.34	0.70	
November	0.81	0.83	0.40	0.41	0.86	0.00	0.38	0.30	0.09	0.00	
December	0.11	3.00	0.47	0.04	0.09	0.18	0.00	1.97	0.78	0.27	
Total	9.05	21.87	14.18	6.98	8.35	8.52	10.69	15.99	7.49	15.51	0.57
Average	0.75	1.82	1.18	0.58	0.70	0.71	0.89	1.33	0.62	1.29	0.11
Total (CM)	22.99	55.55	36.02	17.73	21.21	21.64	27.15	40.61	19.02	39.40	1.45
Average	1.92	4.63	3.00	1.48	1.77	1.80	2.26	3.38	1.59	3.28	0.29

ATTACHMENT 3

Bentomat® ST LINER INSTALLATION PROCEDURE

1 Introduction

1.1 This document provides procedures for the installation of CETCO's GCLs in a manner that maximizes safety, efficiency, and the physical integrity of the GCL.

1.2 These guidelines are based upon several years of experience at a variety of sites and should be generally applicable to any type of lining project using CETCO's GCLs. The user should contact CETCO if it is believed that conditions at a particular site warrant modifications to these guidelines.

1.3 The performance of the GCL is wholly dependent on the quality of its installation. It is the installer's responsibility to adhere to these guidelines, and to the project specifications and drawings, as closely as possible. It is the engineer's and owner's responsibility to provide construction quality assurance (CQA) for the installation, to ensure that the installation has been executed properly. This document covers only installation procedures.

2 Equipment Requirements

2.1 CETCO GCLs are delivered in rolls weighing 2,500-2,700 lbs. (1,2251 - 1,140 kg). It is necessary to support this weight using an appropriate core pipe as indicated in Table 1. For any installation, the core pipe must not deflect more than 3 inches (75 mm) as measured from end to midpoint when a full GCL roll is lifted.

Table 1. Core Pipe Requirements

Product	Nominal GCL Roll Size, W x L Ft. (m)	Typical GCL Roll Wt., lbs. (kg)	Interior Core Size, in. (mm)	Core Pipe Length x Diameter, ft. x in. (m x mm)	Minimum Core Pipe Strength
Bentomat CL, ST, DN	15 x 150 (4.6 x 45)	2,700 (1,225)	4 (100)	18 x 3 (5.5 x 75)	XXH
Claymax 200R, 600CL	13.8 x 125 (4.2 x 38)	2,500 (1,140)	4 (100)	16 x 3 (4.9 x75)	XXH

2.2 Lifting chains or straps appropriately rated, should be used in combination with a spreader bar made from an I-beam as shown in the cover illustration. The spreader bar ensures that the lifting chains or straps do not chafe against the ends of the GCL roll, allowing it to rotate freely during installation.

2.3 A front end-loader, backhoe, dozer, or other equipment can be utilized with the spreader bar and core bar. Alternatively, a forklift with a "stinger" attachment may be used for on-site handling and, in

certain cases installation. A forklift without a stinger attachment should not be used to lift or handle the GCL rolls. Stinger attachments specially fabricated to fit various forklift makes and models are available through CETCO.

2.4 When installing over certain geosynthetic materials, a 4-wheel, all-terrain vehicle (ATV) can be used to deploy the GCL from behind. An ATV can be driven directly on the GCL provided that no sudden stops, starts, or turns are made.

2.5 Additional equipment needed for installation of CETCO's GCLs includes:

- Utility knife and spare blades (for cutting the GCL).
- Granular bentonite or bentonite mastic (for overlapped seams of GCLs with needlepunched, non-woven geotextiles and for sealing around structures and details). Both are available from CETCO.
- Waterproof tarpaulins (for temporary cover on installed material as well as for stockpiled rolls).
- Optional chalk line marker to simplify bentonite placement at seams (when installing a GCL with needlepunched, non-woven geotextile components).
- Optional flat-bladed vise grips (for positioning the GCL panel by hand).

3 Subgrade Preparation

3.1 Subgrade surfaces consisting of granular soils or gravel may not be acceptable due to their large void fraction and puncture potential. In high head (greater than one foot) applications subgrade soils should possess a particle size distribution such that at least 80 percent of the soil is finer than a #60 sieve (0.250 mm).

3.2 When the GCL is placed over an earthen subgrade, the subgrade surface must be in accordance with the project specifications. Engineer's approval of the subgrade must be obtained prior to installation. The finished surface should be firm and unyielding, without abrupt elevation changes, voids, cracks, ice, or standing water.

3.3 The subgrade surface must be smooth and free of vegetation, sharp-edged rocks, stones, sticks, construction debris, and other foreign matter that could contact the GCL. The subgrade should be rolled with a smooth-drum compactor to remove any wheel ruts, footprints, or other abrupt grade changes. Furthermore, all protrusions extending more than 0.5 inch (12 mm) from the subgrade surface shall either be removed, crushed, or pushed into the surface with a smooth-drum compactor. The GCL may be installed on a frozen subgrade, but the subgrade soil in the unfrozen state should meet the above requirements.

4 Unloading

4.1 In most cases, CETCO GCLs are delivered on flatbed trucks. To unload the rolls from the flatbed, insert the core pipe through the roll. This may require removal of the core plug, which should be replaced after the roll is unloaded. Secure the lifting straps or chains to each end of the core pipe, and to the spreader bar mounted on the lifting equipment. Hoist the roll straight up; make sure its weight is evenly distributed so that it does not tilt or sway when lifted.

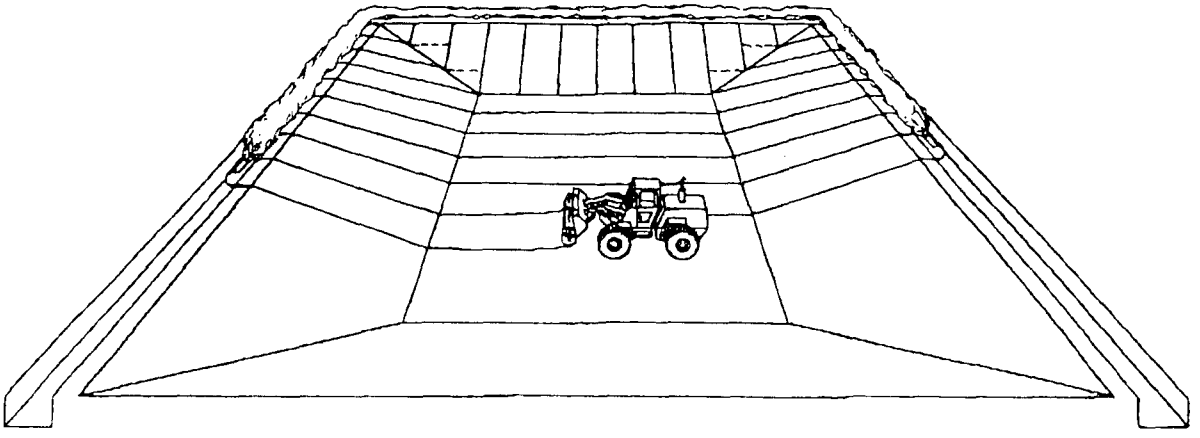
4.2 CETCO GCLs are also delivered in closed shipping containers. To remove the roll from the container, it is best to utilize a forklift mounted with a "stinger" attachment. Guide the stinger as far as possible through the core and lift the roll up and out of the container.

5 Installation

5.1 GCL rolls should be taken to the working area of the site in their original packaging. Prior to deployment, the packaging should be carefully removed without damaging the GCL. The orientation of the GCL (i.e., which side faces up) may be important if the GCL has two different geotextiles. Unless otherwise specified, however, the GCL should be installed such that the product name printed on one side of the GCL faces up.

5.2 Equipment which could damage the GCL should not be allowed to travel directly on it. Acceptable installation, therefore, may be accomplished such that the GCL is unrolled in front of the backwards-moving equipment (Figure 1). If the installation equipment causes rutting of the subgrade, the subgrade must be restored to its originally accepted condition before placement continues.

Figure 1. Typical Bentomat®/Claymax® installation strategy



5.3 GCL rolls should not be released on the slope and allowed to unroll freely by gravity.

5.4 Care must be taken to minimize the extent to which the GCL is dragged across the subgrade in order to avoid damage to the bottom surface of the GCL. A temporary geosynthetic subgrade covering commonly known as a slip sheet or rub sheet may be used to reduce friction damage during placement.

5.5 The GCL should be placed so that seams are parallel to the direction of the slope. End-of-roll seams should also be located at least 3 ft. (1 m) from the toe and crest of slopes steeper than 4H:1V.

5.6 All GCL panels should lie flat on the underlying surface, with no wrinkles or folds, especially at the exposed edges of the panels.

5.7 The GCL should not be installed in standing water or during rainy weather. Only as much GCL shall be deployed as can be covered at the end of the working day with soil, a geomembrane, or a temporary waterproof tarpaulin. The GCL shall not be left uncovered overnight. If the GCL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material. The project engineer and CQA inspector should be consulted for specific guidance if premature hydration occurs.

5.8 In hot weather conditions, Claymax must be covered with a soil layer within eight hours of deployment.

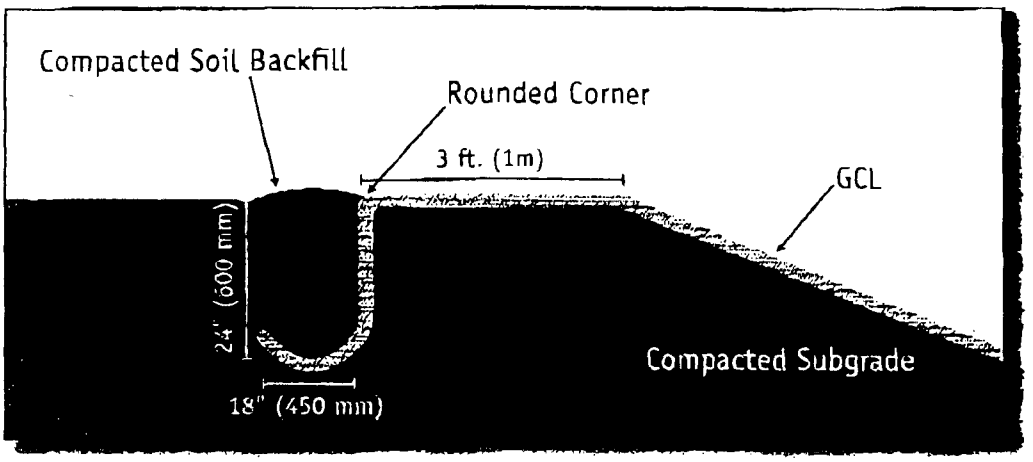
6 Anchorage

6.1 If required by the project drawings, the end of the GCL roll should be placed in an anchor trench at the top of a slope. The front edge of the trench should be rounded to eliminate any sharp corners that could cause excessive stress on the GCL. Loose soil should be removed or compacted into the floor of the trench.

6.2 Sufficient anchorage may alternately be obtained by extending the end of the GCL roll back from the crest of the slope. The length of this "runout" anchor is project-specific.

6.3 If a trench is used for anchoring the end of the GCL, soil backfill should be placed in the trench to provide resistance against pullout. The size and shape of the trench, as well as the appropriate backfill procedures, should be in accordance with the project drawings and specifications. Typical dimensions are shown in Figure 2.

Figure 2. Typical anchor trench design



6.4 The GCL should be placed in the anchor trench such that it covers the entire trench floor but does not extend up the rear trench wall.

7 Seaming

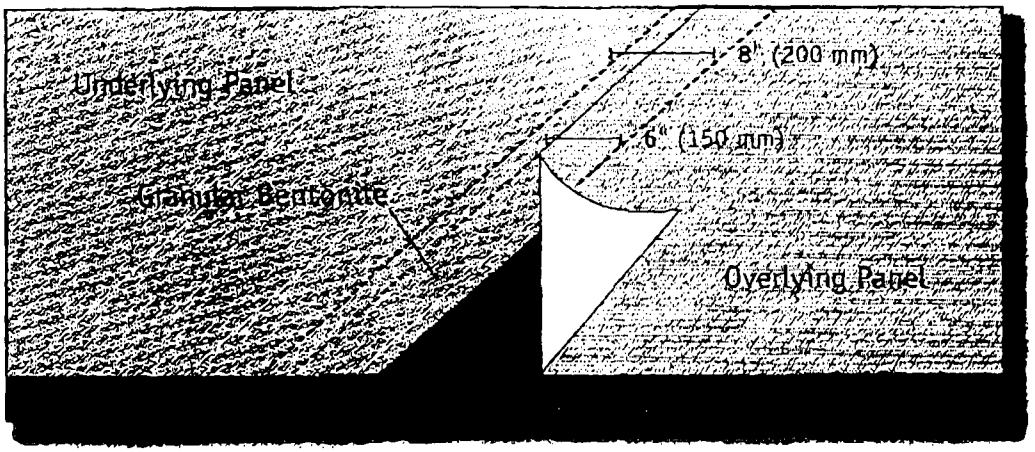
7.1 GCL seams are constructed by overlapping their adjacent edges. Care should be taken to ensure that the overlap zone is not contaminated with loose soil or other debris. Supplemental bentonite is required for CETCO Bentomat GCLs but not Claymax 200R or 600CL.

7.2 Unless otherwise specified, the minimum dimension of the longitudinal overlap should be 6 inches (150 mm). End-of-roll overlapped seams should be similarly constructed, but the minimum overlap should measure 24 inches (600 mm).

7.3 Seams at the ends of the panels should be constructed such that they are shingled in the direction of the grade to prevent the potential for runoff flow to enter the overlap zone. End panel overlap seams on slopes are permissible, provided adequate slope stability analysis has been conducted (i.e. the GCL is not expected to be in tension).

7.4 Bentonite-enhanced seams are constructed first by overlapping the adjacent panels as instructed above, exposing the underlying edge, and then applying a continuous bead or fillet of granular sodium bentonite (supplied with the GCL) along a zone defined by the edge of the underlying panel and the 6-inch (150 mm) line (Figure 3). The minimum application rate at which the bentonite is applied is one quarter pound per lineal foot (0.4 kg/m).

Figure 3. Bentonite-enhanced overlapped seam

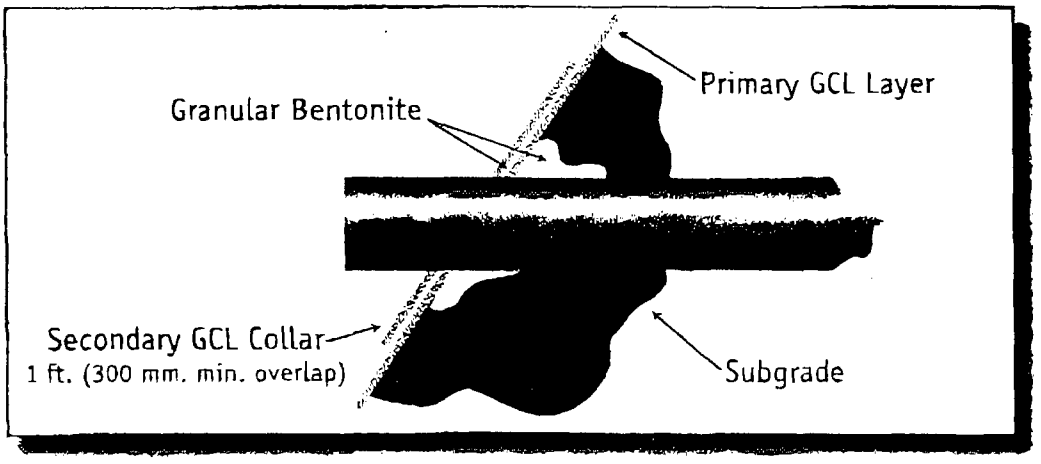


8 Sealing Around Penetrations and Structures

8.1 Cutting the GCL should be performed using a sharp utility knife. Frequent blade changes are recommended to avoid irregular tearing of the geotextile components of the GCL during the cutting process.

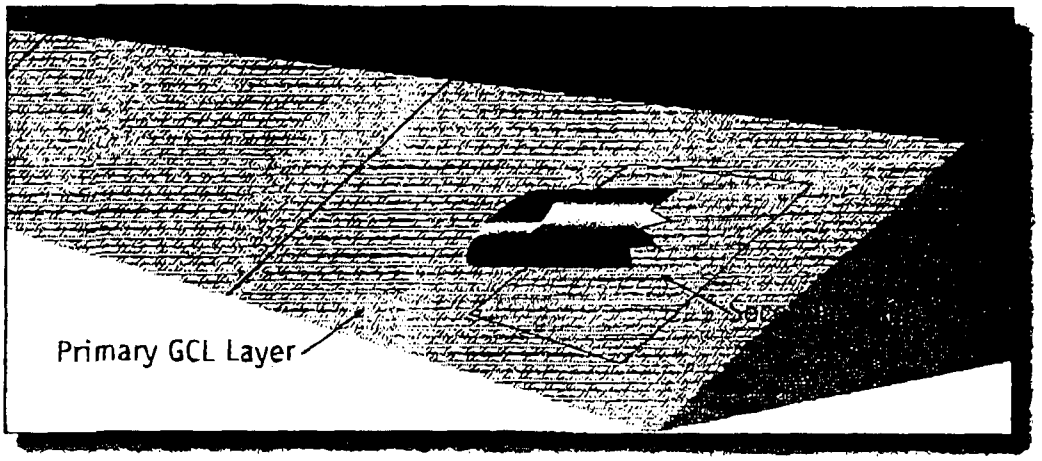
8.2 The GCL should be sealed around penetrations and structures embedded in the subgrade in accordance with Figures 4 through 6. Granular bentonite or a bentonite mastic shall be used liberally (approx. 2 lbs./ln ft. or 3 kg/m) to seal the GCL to these structures.

Figure 4a. Cross-section of a horizontal pipe penetration



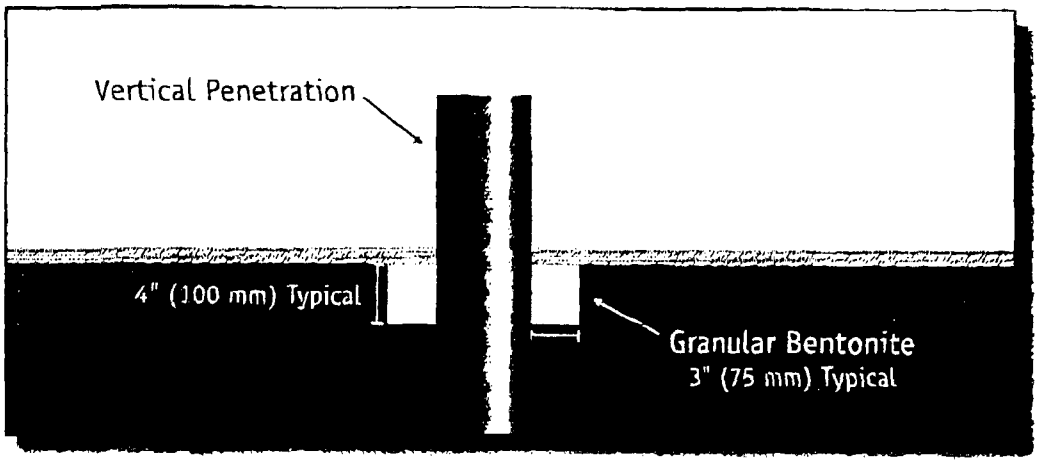
8.3 When the GCL is placed over an earthen subgrade, a "notch" should be excavated into the subgrade around the penetration (Figure 4a). The notch should then be backfilled with granular bentonite or bentonite mastic.

Figure 4b. Isometric view of a completed horizontal pipe penetration



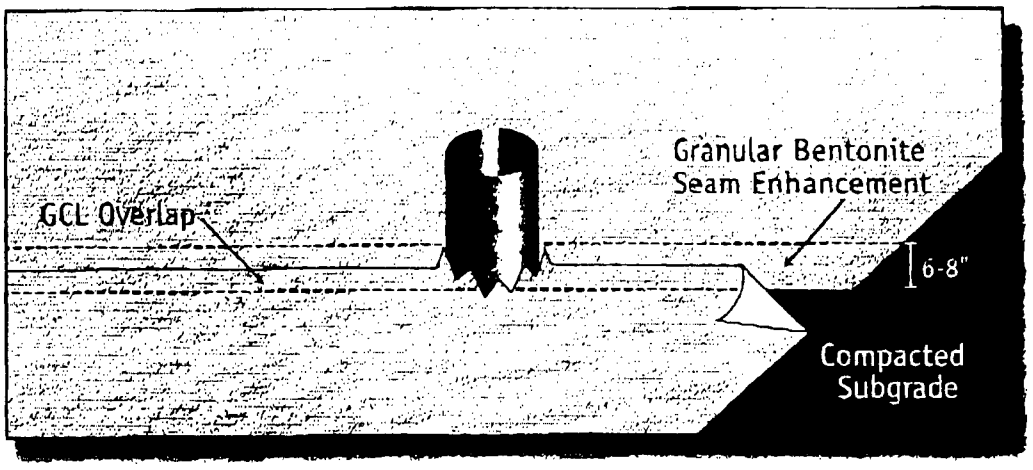
8.4 A secondary collar of GCL should be placed around the penetration as shown in Figure 4b. It is helpful to first trace an outline of the penetration on the GCL and then cut a "star" pattern in the collar to enhance the collar's fit to the penetration.

Figure 5a. Cross-section of a vertical penetration



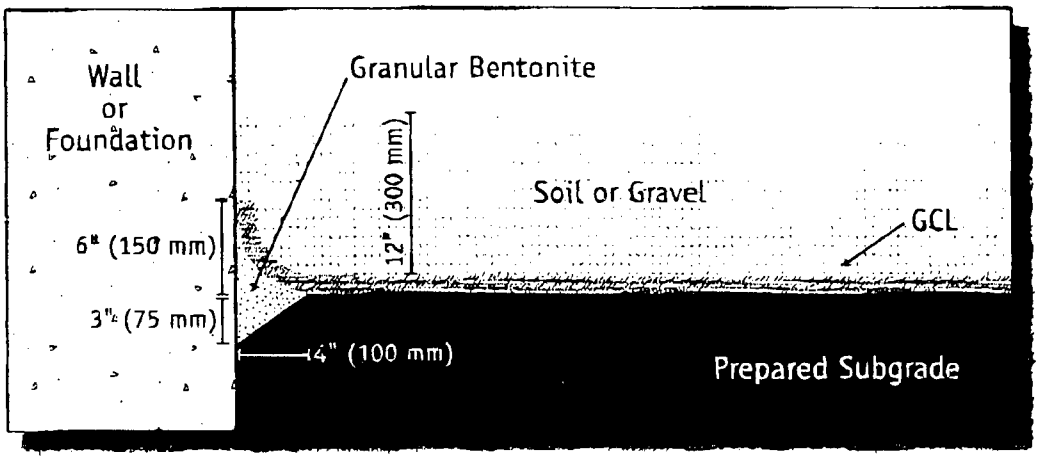
8.5 Vertical penetrations are prepared by notching into the subgrade as shown in Figure 5a. The penetration is completed with two separate pieces of GCL as shown in Figure 5b. A secondary collar is optional in this case.

Figure 5b. Isometric view of the completed vertical penetration



8.6 When the GCL is terminated at a structure or wall that is embedded into the subgrade, the sub grade should be notched as described in sections 8.3 and 8.5. The notch is filled with granula bentonite, and the GCL should be placed over the notch and up against the structure (Figure 6) The connection to the structure can be accomplished by placement of soil or stone backfill in thi area.

Figure 6. Cross-section of GCL seal against an embedded structure or wall

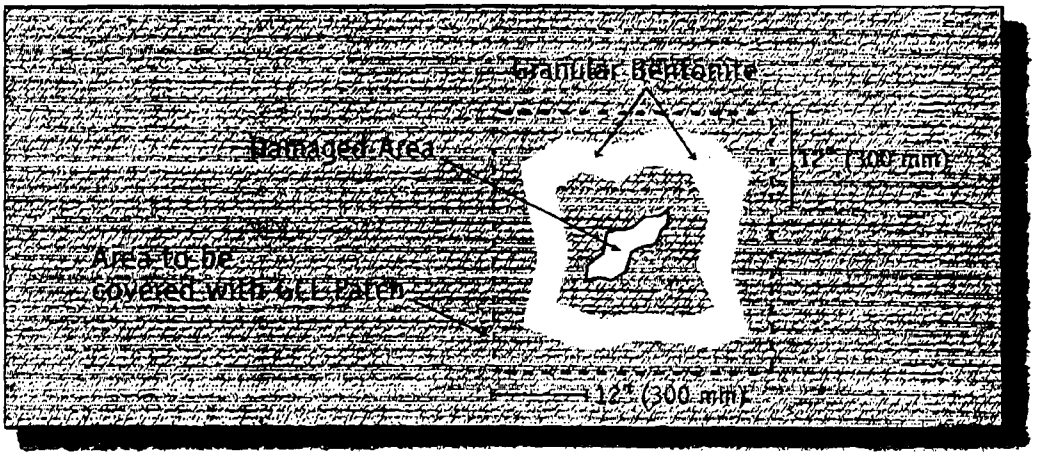


9 Damage Repair

9.1 If the GCL is damaged (torn, punctured, perforated, etc.) during installation, it may be possible i repair it by cutting a patch to fit over the damaged area (Figure 7). The patch should be obtain from a new GCL roll and should be cut to size such that a minimum overlap of 12 inches (300 mr

is achieved around all parts of the damaged area. Granular bentonite or bentonite mastic should be applied around the damaged area prior to placement of the patch. It may be necessary to use an adhesive such as wood glue to affix the patch in place so that it is not displaced during cover placement. Smaller patches also may be tucked under the damaged area to prevent patch movement.

Figure 7. Damage repair by patching



10 Cover Placement

10.1 Cover soils should be free of angular stones or other foreign matter that could damage the GCL. Cover soils should be approved by the Engineer with respect to particle size, uniformity, and chemical compatibility. Consult your CETCO representative if cover soils with high concentrations of calcium (e.g., limestone, dolomite) are present.

10.2 Recommended cover soils typically have a particle size distribution ranging between fines and 1 inch (25 mm).

10.3 Soil cover shall be placed over the GCL using construction equipment that minimizes stresses on the GCL. A minimum thickness of 1 foot (300 mm) of cover should be maintained between the equipment tires/tracks and the GCL at all times during the covering process. In frequently trafficked areas or roadways, a minimum thickness of 2 feet (600 mm) is required.

10.4 The final thickness of soil cover on the GCL varies with the application. A minimum cover layer must be at least 1 foot (300 mm) thick to provide confining stress to the GCL and prevent damage by equipment, erosion, etc.

10.5 Soil cover should be placed in a manner that prevents the soil from entering the GCL overlap zones. Soil cover should be pushed up slopes, not down slopes, to minimize tensile forces on the GCL.

10.6 When a textured geomembrane is installed over the GCL, a temporary geosynthetic covering known as a slip sheet or rub sheet should be used to minimize friction during placement and to allow the textured geomembrane to be more easily moved into its final position.

11 Hydration

11.1 In cases where the containment of non-aqueous liquids is required, it may be necessary to hydrate the covered GCL with water prior to use. Hydration is usually accomplished by natural rainfall and/or absorption of moisture from soil.

11.2 If manual hydration is necessary, water can be introduced by flooding the lined area or using a sprinkler system. Contact CETCO for specific procedures in these cases.

12 Shipping, Handling and Storage

12.1 All lot and roll numbers should be recorded and compared to the packing list. Each roll of GCL should also be visually inspected during unloading to determine if any packaging has been damaged. Damage, whether obvious or suspected, should be recorded and marked.

12.2 Major damage suspected to have occurred during transit should be reported immediately to the carrier and to CETCO. The nature of the damage should also be indicated on the bill of lading with the specific lot and roll numbers.

12.3 The party directly responsible for unloading the GCL should refer to this manual prior to shipment to ascertain the appropriateness of their unloading equipment and procedures. Unloading and on-site handling of the GCL should be supervised to ensure these goals are achieved. Roll dimensions and weights will vary with the dimensions of the product ordered.

12.4 Rolls should be stacked in a manner that prevents them from sliding or rolling from the stacks. This can be accomplished by frequent chocking of the bottom layer of rolls. Rolls should be stacked no higher than the height at which the spreader bar assembly can be safely handled by laborers (typically no higher than four). Rolls should never be stacked on end.

12.5 Rolls should be stored at the job site away from high-traffic areas but sufficiently close to the active work area to minimize handling. The designated storage area should be flat, dry and stable. Moisture protection of the GCL is provided by its packaging; however, an additional tarpaulin or plastic sheet is recommended.

ARCO Permian
600 North Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200

April 12, 2000

Mr. Jack Ford
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Empire Abo Gasoline Plant
Discharge Plan (GW-022)
Underground Drain Line Testing

Dear Mr. Ford:

This letter is to provide notice of the testing of all underground process/wastewater pipelines at the Empire Abo Gasoline Plant as required by Requirement 10 in our Discharge Plan. AGRA Environmental will perform the line testing. They are scheduled to arrive at the plant on Monday, April 17, 2000. Actual testing will not begin until later in the week since the first days will be spent getting set up to perform the testing. We will provide verbal notice to you the day before we start the testing. We anticipate the testing to take approximately two weeks to complete.

If you have any questions regarding the testing, please contact me at (915) 688-5799 or email me at mlowe@mail.arco.com.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc: R. McCollum/EAGP
G. Friend/AGRA Environmental
File 43A3d

Ford, Jack
From: Anderson, Roger
Sent: Friday, April 07, 2000 10:28 AM
To: 'Margaret Lowe'
Cc: Kieling, Martyne; Ford, Jack
Subject: RE: Empire Abo Gas Plant Cooling Tower Wastes

Your request is approved

/s/ Roger C. Anderson

From: Margaret Lowe[SMTP:MLOWE@mail.arco.com]
Sent: Friday, April 07, 2000 9:55 AM
To: Anderson, Roger
Subject: Empire Abo Gas Plant Cooling Tower Wastes

Roger, As we discussed yesterday, we are cleaning and repairing the cooling tower at the Empire Abo Gas Plant. Three years ago, we did similar work on the tower. We performed hazardous waste characterizations on the sand and scale from the basin and the wood from the tower when this work was done three years ago. Both of these wastes were non-hazardous wastes. There have been no process changes to our cooling tower operations so the waste characterizations remain valid.

We request permission to again spread the sand and scale in the south end of the plant. You approved this procedure in your July 27, 1997 letter.

We also request permission to send the fill and other debris from this work on the cooling tower to Lea Land Landfill as we did three years ago. This was approved in your March 5, 1998 letter.

If you have any questions, please call me at 915-688-5799 or respond to me by email.

Thank you very much for your prompt attention to this matter.

Margaret J. Lowe
Sr. Environmental Engineer
ARCO Permian

Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200

April 3, 2000

Mr. Jack Ford
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Empire Abo Gasoline Plant
Discharge Plan (GW-022)

Dear Mr. Ford:

Enclosed is the payment for the Empire Abo Gasoline Plant Discharge Plan Renewal Fee.

If you have any questions, please contact me at (915) 688-5799 or email me at mlowe@mail.arco.com.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc: R. McCollum/EAGP
File 43A3d

ACKNOWLEDGEMENT OF RECEIPT OF CHECK/CASH

I hereby acknowledge receipt of check No [redacted] dated 2/15/00,

or cash received on _____ in the amount of $ 1667.50

from ARCO Permian

for Empire Abo G.P. GW-022
(Facility Name) (DP No.)

Submitted by: _____ Date: 4/5/00

Submitted to ASD by: _____ Date: _____

Received in ASD by: _____ Date: _____

Filing Fee ___ New Facility ___ Renewal ✓

Modification ___ Other _____
(specify)

Organization Code 521.07 Applicable FY 2000

To be deposited in the Water Quality Management Fund.

Full Payment ✓ or Annual Increment ___

ARCO
ARCO Permian
ARCO Permian Payables
P.O. Box 1610
Midland, TX 79702

Citibank Delaware
A SUBSIDIARY OF CITICORP
ONE PENN'S WAY
NEW CASTLE, DE 19720

18002897

62-20
311

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND AND MICROPRINTING IN BORDER.

Pay ONE THOUSAND SIX HUNDRED SIXTY-SEVEN DOLLARS AND FIFTY CENTS [redacted]

To the order of:
NEW MEXICO OIL CONSERVATION DIVISION
2040 S PACHECO
SANTA FE NM 87505

02-15-00 Date

**********1,667.50* Amount

Void after 90 days

[redacted]

TD02

ARCO

ARÇO Permian

ARCO Permian Payables
P.O. Box 1610
Midland, TX 79702

Check/EFT#: [redacted]

Date: 02/15/00 Page 1 of 8002897

Pay Entity: 0701 Vendor #: N00071016006

DATE	INVOICE NUMBER	VOUCHER	SOURCE ID	GROSS	DISCOUNT/ADJUSTMENTS	NET
02/11/00	VR000211 EAGP DISCHARGE PLAN RENEWAL FEE	R246C 0200	PAK	1667.50		1667.50
			TOTAL	1667.50		1667.50

Questions regarding this remittance can be made by calling or writing:

915/688-5438 P.O. Box 1610, Attn. Disbursements, Midland, TX 79702

Detach check before depositing

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

February 7, 2000

CERTIFIED MAIL
RETURN RECEIPT NO. Z-142-564-967

Ms. Margaret J. Lowe
Environmental Engineer
ARCO Permian
P.O. Box 1610
Midland, Texas 79702

RE: Compressor Pits Soils
GW-022, Empire Abo Gas Plant
Eddy County, NM

Dear Ms. Lowe:

The New Mexico Oil Conservation Division (OCD) has received ARCO Permian's letter dated February 3, 2000 requesting that the OCD allow ARCO Permian to dispose of hydrocarbon impregnated soils from the injection plant compressor pits at the Sundance Services, Inc.'s Parabo facility. OCD **hereby approves of the disposal of the subject soils into the Parabo facility subject to the acceptance by Sundance Services, Inc.**

Note, that OCD approval does not relieve ARCO Permian of liability should ARCO Permian's operation's result in contamination of surface waters, ground waters or the environment.OCD approval does not relieve ARCO Permian from compliance with other federal, state, and local regulations/rules that may apply.

Sincerely,

Roger C. Anderson
Environmental Bureau Chief

RCA/wjf

cc: OCD Artesia District II

Facsimile Cover Sheet

To: Jack Ford
Company: New Mexico Oil Conservation Division
Phone: 505-827-7156
Fax: 505-827-8177

From: Margaret J. Lowe
Company: ARCO Permian
Phone: 915-688-5799
Fax: 915-688-5620

Date: February 3, 2000
Pages including this cover page: 14

Comments: Jack, We will go ahead and take the oily dirt from the injection plant compressor pits to Parabo.

I've attached the analysis that we performed on the oily dirt. Three samples were taken from various parts of the pits.

If there are any requirements for our fill material (e.g., soil vs. caliche), please include them in your approval letter.

Please call me if you have any questions. Thanks for your help.

Margaret

43A2a

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/23/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS PLANT -INJ. PLANT
Project Location: NOT GIVEN

Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: GP/AH

LAB NUMBER	SAMPLE ID	TCLP Cr (ppm)	TCLP Pb (ppm)
ANALYSIS DATE:		10/22/98	10/22/98
	EPA LIMITS	5	5
H3884-1	SP 1# (SUMP PIT)	<1	<1
H3884-3	COMP #1 (COMP PIT C-3)	<1	<1
H3884-4	COMP #2 (COMP PIT C-1)	<1	<1
Quality Control		5.042	5.333
True Value QC		5.000	5.000
% Accuracy		101	107
Relative Percent Difference		0.5	4.76
METHODS:	EPA 600/4-79-020	218.1	239.1

Chemist

10/23/98
Date

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PHONE (505) 393-2326 · 101 E. MARLAND · HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS PLANT -INJ. PLANT
Project Location: NOT GIVEN

Sampling Date: 10/14/98
Sample Type:OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: AH/GP

RCRA METALS

LAB NUMBER	SAMPLE ID	As ppm	Ag ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm
ANALYSIS DATE:		10/15/98	10/15/98	10/15/98	10/15/98	10/15/98	10/15/98	10/15/98	10/15/98
H3884-1	SP#1 (SUMP PIT	<0.01	12.4	43.7	10.8	20.8	102.9	<0.02	<0.1
H3884-3	COMP#1	0.053	0.6	<5	7.1	23.6	194.6	<0.02	<0.1
	(COMP PIT C-3)								
H3884-4	COMP#2	0.017	18.1	60.0	1.5	62.2	135.6	<0.02	<0.1
	(COMP PIT C-1)								
Quality Control		0.054	2.159	19.49	1.061	5.647	4.836	0.049	0.186
True Value QC		0.050	2.000	20.00	1.000	5.000	5.000	0.0500	0.200
% Recovery		108	108	97	106	112	97	99	93
Relative Percent Difference		1.3	0.96	1.98	4.22	3.19	1.17	4.7	3.39
METHODS: EPA 600/4-79-020		206.2	272.1	208.1	213.1	218.1	239.1	245.1	270.2
METHODS: SW-846		7060A	7760A	7080A	7130	7190	7420	7470A	7740

Cd 1.0
Cr 5.0
Pb 5.0

Chemist

10/16/98
Date

H3884-3.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS
Project Location: NOT GIVEN
Lab Number: H3884-2
Sample ID: SP #4A (SUMP PIT)

Analysis Date: 10/15/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

SEMIVOLATILES - 8270 (ppm)	Sample Result H3884-2	Method Blank	QC	% Recov.	True Value QC
1 n-Nitrosodimethylamine	<0.010	<0.010	0.044	88	0.050
2 2-Picoline	<0.010	<0.010	0.041	82	0.050
3 Methylmethanesulfonate	<0.010	<0.010	0.048	96	0.050
4 Ethylmethanesulfonate	<0.010	<0.010	0.046	92	0.050
5 Phenol	<0.010	<0.010	0.048	96	0.050
6 Aniline	<0.010	<0.010	0.058	116	0.050
7 bis (2-Chloroethyl) ether	<0.010	<0.010	0.043	86	0.050
8 2-Chlorophenol	<0.010	<0.010	0.051	102	0.050
9 1,4-Dichlorobenzene	<0.010	<0.010	0.050	100	0.050
10 1,3-Dichlorobenzene	<0.010	<0.010	0.051	102	0.050
11 Benzyl Alcohol	<0.010	<0.010	0.049	98	0.050
12 1,2-Dichlorobenzene	<0.010	<0.010	0.052	104	0.050
13 2-Methylphenol	<0.010	<0.010	0.052	104	0.050
14 bis (2-Chloroisopropyl) ether	<0.010	<0.010	0.045	90	0.050
15 Acetophenone	<0.010	<0.010	0.051	102	0.050
16 4-Methylphenol	<0.010	<0.010	0.050	100	0.050
17 n-Nitroso-di-n-propylamine	<0.010	<0.010	0.048	96	0.050
18 Hexachloroethane	<0.010	<0.010	0.044	88	0.050
19 Nitrobenzene	<0.010	<0.010	0.049	98	0.050
20 n-Nitrosopiperidine	<0.010	<0.010	0.049	98	0.050
21 Isophorone	<0.010	<0.010	0.047	94	0.050
22 2-Nitrophenol	<0.010	<0.010	0.049	98	0.050
23 2,4-Dimethylphenol	<0.010	<0.010	0.047	94	0.050
24 Benzoic acid	<0.010	<0.010	0.048	96	0.050
25 bis (2-Chloroethoxy) methane	<0.010	<0.010	0.049	98	0.050
26 2,4-Dichlorophenol	<0.010	<0.010	0.048	96	0.050
27 1,2,4-Trichlorobenzene	<0.010	<0.010	0.051	102	0.050
28 Naphthalene	<0.010	<0.010	0.049	98	0.050
29 4-Chloroaniline	<0.010	<0.010	0.054	108	0.050
30 2,6-Dichlorophenol	<0.010	<0.010	0.051	102	0.050
31 Hexachlorobutadiene	<0.010	<0.010	0.049	98	0.050
32 n-Nitroso-di-n-butylamine	<0.010	<0.010	0.052	104	0.050
33 4-Chloro-3-methylphenol	<0.010	<0.010	0.050	100	0.050
34 2-Methylnaphthalene	<0.010	<0.010	0.052	104	0.050
35 1,2,4,5-Tetrachlorobenzene	<0.010	<0.010	0.057	114	0.050
36 Hexachlorocyclopentadiene	<0.010	<0.010	0.050	100	0.050
37 2,4,6-Trichlorophenol	<0.010	<0.010	0.043	86	0.050

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date:10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS
Project Location: NOT GIVEN
Lab Number: H3884-2
Sample ID: SP #4A (SUMP PIT)

Analysis Date: 10/14/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

VOLATILES - 8260 (ppm)		Sample Result H3884-2	Method Blank	QC	%Recov.	True Value QC
1	Dichlorodifluoromethane	<0.010	<0.010	0.085	85	0.100
2	Chloromethane	<0.010	<0.010	0.091	91	0.100
3	Vinyl chloride	<0.010	<0.010	0.096	96	0.100
4	Bromomethane	<0.010	<0.010	0.095	95	0.100
5	Chloroethane	<0.010	<0.010	0.097	97	0.100
6	Iodomethane	<0.010	<0.010	0.102	102	0.100
7	1,1-Dichloroethene	<0.010	<0.010	0.095	95	0.100
8	Trichlorofluoromethane	<0.010	<0.010	0.095	95	0.100
9	Carbon Disulfide	<0.010	<0.010	0.103	103	0.100
10	Methylene chloride*	0.330	0.063	0.095	95	0.100
11	trans-1,2-Dichloroethene	<0.010	<0.010	0.097	97	0.100
12	1,1-Dichloroethane	<0.010	<0.010	0.093	93	0.100
13	2-Butanone	1.61	<0.500	0.082	82	0.100
14	cis-1,2-Dichloroethene	<0.010	<0.010	0.095	95	0.100
15	2,2-Dichloropropane	<0.010	<0.010	0.090	90	0.100
16	Chloroform	<0.010	<0.010	0.092	92	0.100
17	Bromochloromethane	<0.010	<0.010	0.097	97	0.100
18	1,1,1-Trichloroethane	<0.010	<0.010	0.093	93	0.100
19	1,2-Dichloroethane	<0.010	<0.010	0.094	94	0.100
20	1,1-Dichloropropene	<0.010	<0.010	0.097	97	0.100
21	Benzene	<0.010	<0.010	0.092	92	0.100
22	Carbon tetrachloride	<0.010	<0.010	0.096	96	0.100
23	Trichloroethene	<0.010	<0.010	0.114	114	0.100
24	Dibromomethane	<0.010	<0.010	0.090	90	0.100
25	Bromodichloromethane	<0.010	<0.010	0.080	80	0.100
26	(2-Chloroethoxy)ethene	<0.010	<0.010	0.086	86	0.100
27	trans-1,3-Dichloropropene	<0.010	<0.010	0.088	88	0.100
28	4-methyl-2-pentanone	<0.500	<0.500	0.111	111	0.100
29	1,2-Dichloropropane	<0.010	<0.010	0.089	89	0.100
30	cis-1,3-Dichloropropene	<0.010	<0.010	0.089	89	0.100
31	Toluene	<0.010	<0.010	0.088	88	0.100

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ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS
Project Location: NOT GIVEN
Lab Number: H3884-2
Sample ID: SP #4A (SUMP PIT)

Analysis Date: 10/15/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

SEMIVOLATILES - 8270 (ppm)	Sample Result H3884-2	Method Blank	QC	% Recov.	True Value QC
38 2,4,5-Trichlorophenol	<0.010	<0.010	0.043	86	0.050
39 2-Chloronaphthalene	<0.010	<0.010	0.043	86	0.050
40 2-Nitroaniline	<0.010	<0.010	0.041	82	0.050
41 Acenaphthalene	<0.010	<0.010	0.046	92	0.050
42 Dimethylphthalate	<0.010	<0.010	0.046	92	0.050
43 2,6-Dinitrotoluene	<0.010	<0.010	0.050	100	0.050
44 3-Nitroaniline	<0.010	<0.010	0.057	114	0.050
45 Acenaphthene	<0.010	<0.010	0.048	96	0.050
46 2,4-Dinitrophenol	<0.010	<0.010	0.046	92	0.050
47 Dibenzofuran	<0.010	<0.010	0.049	98	0.050
48 Pentachlorobenzene	<0.010	<0.010	0.049	98	0.050
49 4-Nitrophenol	<0.010	<0.010	0.047	94	0.050
50 1-Naphthylamine	<0.010	<0.010	0.044	88	0.050
51 2,4-Dinitrotoluene	<0.010	<0.010	0.051	102	0.050
52 2-Naphthylamine	<0.010	<0.010	0.052	104	0.050
53 2,3,4,6-Tetrachlorophenol	<0.010	<0.010	0.048	96	0.050
54 Fluorene	<0.010	<0.010	0.053	106	0.050
55 4-Chlorophenyl-phenylether	<0.010	<0.010	0.050	100	0.050
56 Diethylphthalate	<0.010	<0.010	0.048	96	0.050
57 4-Nitroaniline	<0.010	<0.010	0.054	108	0.050
58 4,6-Dinitro-2-methylphenol	<0.010	<0.010	0.052	104	0.050
59 Diphenylamine	<0.010	<0.010	0.051	102	0.050
60 n-Nitrosodiphenylamine	<0.010	<0.010	0.051	102	0.050
61 4-Bromophenyl-phenylether	<0.010	<0.010	0.051	102	0.050
62 Phenacetin	<0.010	<0.010	0.046	92	0.050
63 Hexachlorobenzene	<0.010	<0.010	0.051	102	0.050
64 4-Aminobiphenyl	<0.010	<0.010	0.059	118	0.050
65 Pentachlorophenol	<0.010	<0.010	0.051	102	0.050
66 Pentachloronitrobenzene	<0.010	<0.010	0.051	102	0.050
67 Pronamide	<0.010	<0.010	0.041	82	0.050
68 Phenanthrene	<0.010	<0.010	0.050	100	0.050
69 Anthracene	<0.010	<0.010	0.044	88	0.050
70 Di-n-butylphthalate	<0.010	<0.010	0.043	86	0.050
71 Fluoranthene	<0.010	<0.010	0.048	96	0.050
72 Benzidine	<0.010	<0.010	0.011	22	0.050
73 Pyrene	<0.010	<0.010	0.060	120	0.050
74 p-(Dimethylamino)azobenzene	<0.010	<0.010	0.059	118	0.050

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ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS
Project Location: NOT GIVEN
Lab Number: H3884-2
Sample ID: SP #4A (SUMP PIT)

Analysis Date: 10/15/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

SEMIVOLATILES - 8270 (ppm)	Sample Result H3884-2	Method Blank	QC	% Recov.	True Value QC
75 Butylbenzylphthalate	<0.010	<0.010	0.056	112	0.050
76 Benzo[a]anthracene	<0.010	<0.010	0.055	110	0.050
77 3,3'-Dichlorobenzidine	<0.010	<0.010	0.047	94	0.050
78 Chrysene	<0.010	<0.010	0.046	92	0.050
79 bis (2-Ethylhexyl) phthalate	<0.010	<0.010	0.041	82	0.050
80 Di-n-octylphthalate	<0.010	<0.010	0.058	116	0.050
81 Benzo [b] fluoranthene	<0.010	<0.010	0.054	108	0.050
82 Benzo [k] fluoranthene	<0.010	<0.010	0.058	116	0.050
83 7,12-Dimethylbenz (a) anthracene	<0.010	<0.010	0.115	230	0.050
84 Benzo [e] pyrene	<0.010	<0.010	0.050	100	0.050
85 3- Methylcholanthrene	<0.010	<0.010	0.050	100	0.050
86 Dibenzo (a,j) acridine	<0.010	<0.010	0.050	100	0.050
87 Indeno [1,2,3-cd] pyrene	<0.010	<0.010	0.044	88	0.050
88 Dibenz [a,h] anthracene	<0.010	<0.010	0.048	96	0.050
89 Benzo [g,h,i] perylene	<0.010	<0.010	0.048	96	0.050

	% Recovery
90 2-Fluorophenol	108
91 Phenol-d5	97
92 Nitrobenzene-d5	105
93 2-Fluorobiphenyl	99
94 2,4,6-Tribromophenol	105
95 Terphenyl-d14	108

METHODS: EPA SW 846-8270

NOTE: The following compounds were also tenatively identified: 2,6-Di-t-butyl-4-methyl,-4-methoxy, and -4-ethylphenol.

Burgess J. A. Cooke, Ph. D.

10/16/98
Date

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ARCO PERMIAN
ATTN: MARGARET LOWE
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FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date:10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS
Project Location: NOT GIVEN
Lab Number: H3884-2
Sample ID: SP #4A (SUMP PIT)

Analysis Date: 10/14/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

VOLATILES - 8260 (ppm)		Sample Result H3884-2	Method Blank	QC	%Recov.	True Value QC
32	1,1,2-Trichloroethane	<0.010	<0.010	0.089	89	0.100
33	1,3-Dichloropropane	<0.010	<0.010	0.091	91	0.100
34	2-Hexanone	<0.500	<0.500	0.108	108	0.100
35	Dibromochloromethane	<0.010	<0.010	0.082	82	0.100
36	1,2-Dibromoethane	<0.010	<0.010	0.093	93	0.100
37	Tetrachloroethene	<0.010	<0.010	0.095	95	0.100
38	Chlorobenzene	<0.010	<0.010	0.082	82	0.100
39	1,1,1,2-Tetrachloroethane	<0.010	<0.010	0.090	90	0.100
40	Ethylbenzene	<0.010	<0.010	0.087	87	0.100
41	m, p - Xylene	<0.020	<0.020	0.174	87	0.200
42	Bromoform	<0.010	<0.010	0.080	80	0.100
43	Styrene	<0.010	<0.010	0.091	91	0.100
44	o-Xylene	<0.010	<0.010	0.091	91	0.100
45	1,1,2,2-Tetrachloroethane	<0.010	<0.010	0.092	92	0.100
46	1,2,3-Trichloropropane	<0.010	<0.010	0.093	93	0.100
47	Isopropylbenzene	<0.010	<0.010	0.096	96	0.100
48	Bromobenzene	<0.010	<0.010	0.089	89	0.100
49	2-Chlorotoluene	<0.010	<0.010	0.086	86	0.100
50	n-propylbenzene	<0.010	<0.010	0.103	103	0.100
51	4-Chlorotoluene	<0.010	<0.010	0.092	92	0.100
52	1,3,5-Trimethylbenzene	<0.010	<0.010	0.098	98	0.100
53	tert-Butylbenzene	<0.010	<0.010	0.103	103	0.100
54	1,2,4-Trimethylbenzene	<0.010	<0.010	0.099	99	0.100
55	1,3-Dichlorobenzene	<0.010	<0.010	0.089	89	0.100
56	sec-Butylbenzene	<0.010	<0.010	0.096	96	0.100
57	1,4 Dichlorobenzene*	0.051	0.027	0.088	88	0.100
58	4-Isopropyltoluene	<0.010	<0.010	0.099	99	0.100
59	1,2-Dichlorobenzene	<0.010	<0.010	0.089	89	0.100
60	n-Butylbenzene	<0.010	<0.010	0.088	88	0.100
61	1,2-dibromo-3-chloropropane	<0.010	<0.010	0.091	91	0.100
62	1,2,3-Trichlorobenzene	<0.010	<0.010	0.116	116	0.100

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ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS
Project Location: NOT GIVEN
Lab Number: H3884-2
Sample ID: SP #4A (SUMP PIT)

Analysis Date: 10/14/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

VOLATILES - 8260 (ppm)		Sample Result H3884-2	Method Blank	QC	%Recov.	True Value QC
63	Hexachlorobutadiene	<0.010	<0.010	0.102	102	0.100
64	Naphthalene	0.052	<0.010	0.094	94	0.100
65	1,2,4-Trichlorobenzene	<0.010	<0.010	0.110	110	0.100

		% Recovery
66	Dibromofluoromethane	100
67	Toluene-D8	104
68	4-Bromofluorobenzene	95

METHODS: EPA SW-846-8260.
*Target detected in both sample and method blank.

Burgess J.A. Cooke, PH. D.

10/16/98
Date

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ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS PLANT -INJ. PLANT
Project Location: NOT GIVEN

Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

LAB NO.	SAMPLE ID	TPH (mg/kg)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE:		10/15/98	10/14/98	10/14/98	10/14/98	10/14/98
H3884-1	SP-#1 (SUMP PIT)	151000	<0.020	<0.020	<0.020	<0.060
H3884-3	COMP#1	160000	<0.020	<0.020	<0.020	<0.060
	(COMP PIT C-3)					
H3884-4	COMP #2	245000	<0.020	<0.020	<0.020	<0.060
	(COMP PIT C-1)					
Quality Control		3401	0.097	0.091	0.091	0.277
True Value QC		3000	0.100	0.100	0.100	0.300
% Recovery		113	97.2	91.0	90.8	92.4
Relative Percent Difference		2.0	1.7	0.1	1.8	1.1

METHODS: TRPHC - EPA 600/7-79-020, 418.1; BTEX - EPA SW846-8020, 8260
NOTE: BTEX results for H3884-1 taken from 8260 analysis of H3884-2.

Chemist

10/16/98
Date

H3884-1.XLS

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ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS PLANT- INJ. PLANT
Project Location: NOT GIVEN
Sample ID: COMP#1 (COMP PIT C-3)
Lab Number: H3884-3

Analysis Date: 10/15/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

AROCLORS (PCB's) ppm	Sample Result	Method Blank	True Value QC	QC	%IA
PCB 1016	<50	<50	NR	NR	NR
PCB 1221	<50	<50	NR	NR	NR
PCB 1232	<50	<50	NR	NR	NR
PCB 1242	<50	<50	0.045	0.050	90
PCB 1248	<50	<50	NR	NR	NR
PCB 1254	<50	<50	0.047	0.050	94
PCB 1260	<50	<50	0.045	0.050	90

	% Recovery
Nitrobenzene-d5	112
2-Fluorobiphenyl	MI(147)
Terphenyl-d14	84

METHOD: SW-846 3580, 8270
MI = Matrix Interference

Chemist

10/16/98
Date

H3884-3.XLS

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ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS PLANT- INJ. PLANT
Project Location: NOT GIVEN
Sample ID: SP #1 (SUMP PIT)
Lab Number: H3884-1

Analysis Date: 10/15/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

AROCLORS (PCB's) ppm	Sample Result	Method Blank	True Value QC	QC	%IA
PCB 1016	<50	<50	NR	NR	NR
PCB 1221	<50	<50	NR	NR	NR
PCB 1232	<50	<50	NR	NR	NR
PCB 1242	<50	<50	0.045	0.050	90
PCB 1248	<50	<50	NR	NR	NR
PCB 1254	<50	<50	0.047	0.050	94
PCB 1260	<50	<50	0.045	0.050	90

	% Recovery
Nitrobenzene-d5	109
2-Fluorobiphenyl	MI(121)
Terphenyl-d14	87

METHOD: SW-846 3580, 8270
MI = Matrix Interference

Chemist

10/16/98
Date

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ANALYTICAL RESULTS FOR
ARCO PERMIAN
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: (915) 688-5620

Receiving Date: 10/14/98
Reporting Date: 10/16/98
Project Number: NOT GIVEN
Project Name: EMPIRE ABO GAS PLANT- INJ. PLANT
Project Location: NOT GIVEN
Sample ID: COMP#2 (COMP PIT C-1)
Lab Number: H3884-4

Analysis Date: 10/15/98
Sampling Date: 10/14/98
Sample Type: OIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC

AROCLORS (PCB's) ppm	Sample Result	Method Blank	True Value QC	QC	%IA
PCB 1016	<50	<50	NR	NR	NR
PCB 1221	<50	<50	NR	NR	NR
PCB 1232	<50	<50	NR	NR	NR
PCB 1242	<50	<50	0.045	0.050	90
PCB 1248	<50	<50	NR	NR	NR
PCB 1254	<50	<50	0.047	0.050	94
PCB 1260	<50	<50	0.045	0.050	90

	% Recovery
Nitrobenzene-d5	104
2-Fluorobiphenyl	MI(123)
Terphenyl-d14	84

METHOD: SW-846 3580, 8270
MI = Matrix Interference

Chemist

10/16/98
Date

H3884-4 XLS

CARDINAL LABORATORIES, INC.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

Page____ of____

Company Name:	Apache Permian	BILL TO	
Project Manager:	Margaret Lowe	P.O. #:	
Address:	PO Box 1610	Company:	
City:	Midland State: TX Zip: 79702	Attn:	
Phone #:	915-688-5799 Fax #: 915-688-5620	Address:	
Project #:	Project Owner:	City:	
Project Name:	Empire Abo Gas Plant - Inj. Plant	State: Zip:	
Project Location:		Phone #:	
Sampler Name:		Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D. #	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING DATE	SAMPLING TIME	ANALYSIS REQUEST: TPH	BTEX	metals	PCBs	Volatiles	Semi-volatiles						
H3884-1	SP#1 (Sump Pit)												10/14/98	10:30 Am	✓	✓	✓	✓								
1	SP#2 (Sump Pit)												10/14/98	10:40 Am	✓	✓	✓	✓								
—	SP#3 (Sump Pit)												10/14/98	10:50 Am	✓	✓	✓	✓								
H3884-2	SP#4A (Sump Pit)												10/14/98	10:55 Am					✓	✓						
†	SP#4B (Sump Pit)												10/14/98	10:55 Am					✓	✓						
H3884-3	Comp#1 (Comp pit C-3)												10/14/98	11:00 Am	✓	✓	✓	✓								
H3884-4	Comp#2 (Comp pit C-1)												10/14/98	11:20 Am	✓	✓	✓	✓								

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collection, including attorney's fees.

Sampler Relinquished:	Date: 10/14/98	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 7:10PM	Margaret Lowe	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date: 10/14/98	Received By: (Lab Staff)	REMARKS:
	Time: 3:30P		
Delivered By: (Circle One)	Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No	CHECKED BY: (Initials)	
Sampler - UPS - Bus - Other:			

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

Z 274 520 549 OCD

US Postal Service FORD
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	M. Lowe
Street & Number	ARCO
Post Office, State, & ZIP Code	Midland
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	GW-022

PS Form 3800, April 1995

November 22, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-274-520-549

Ms. Margaret J. Lowe
Environmental Engineer
ARCO Permian
P.O. Box 1610
Midland, TX 79702

RE: Plant Wastes Disposal
GW-022, Empire Abo Gas Plant
Eddy County, NM

Dear Ms. Lowe:

The New Mexico Oil Conservation Division (OCD) has received ARCO Permian's letter dated November 10, 1999 requesting that the OCD allow ARCO Permian to dispose of various cleaning wastes into the Lee Land, Inc. landfill. The OCD **hereby approves of the disposal of these various non-hazardous (based on the verbal certification by ARCO Permian) exempt wastes at the ARCO Permian Empire Abo plant facility into the Lee Land, Inc. landfill, provided that the material is acceptable to Lee Land, Inc. and is liquid free prior to disposal.**

Note, that OCD approval does not relieve ARCO Permian of liability should ARCO Permian's operation's result in contamination of surface waters, ground waters or the environment.OCD approval does not relieve ARCO Permian from compliance with other federal, state, and local regulations/rules that may apply.

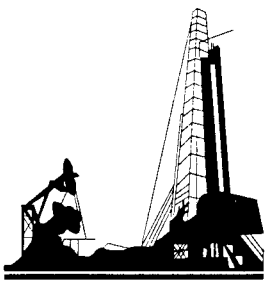
Sincerely,

W. Jack Ford
Environmental Bureau

cc: OCD Artesia District Office

OIL CONSERVATION DIVISION

2040 South Pacheco
Santa Fe, NM 87505
(505) 827-7133
Fax: (505) 827-8177



(PLEASE DELIVER THIS FAX)

To: Ms. Margaret Lowe

From: Jack FORD

Date: Nov. 22, 1999

Number of Pages (Includes Cover Sheet) 2

Message: FYI

If you have any trouble receiving this, please call:
(505) 827-7133

Facsimile Cover Sheet

To: Roger Anderson
Company: New Mexico Oil Conservation Division
Phone: 505-827-7152
Fax: 505-827-8177

From: Margaret J. Lowe
Company: ARCO Permian
Phone: 915-688-5799
Fax: 915-688-5620

Date: November 21, 1999
Pages including this cover page: 2

Comments: Roger, In case you didn't get this letter when we faxed it Tuesday, I thought I would fax it again. I would appreciate it if you would page me (1-800-738-9633) so we can talk about these wastes. Thank you for your help.

Margaret

505-677-5152 - @ Plant

ARCO Permian
600 N Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200

November 10, 1999

Mr. Roger Anderson
New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Empire Abo Gasoline Plant, Discharge Plan GW-033
Eddy County, New Mexico

Dear Mr. Anderson:

ARCO Permian requests permission to dispose of various plant wastes at Lea Land, Inc. landfill, Permit No. SWM-131401, located in Lea County, New Mexico. All wastes were generated in various processes in the plant. Wastes and approximate volumes are tabulated below.

WASTE	QUANTITY
Sulfur Recovery Unit Catalyst	30,000 lbs.
Amine system charcoal	1 yd^3
Dehydrator treater beads	60 yd^3
Scale from bottom of cooling tower	1 yd^3
Pall rings from caustic system	6 yd^3
Muffle furnace refractory	1 yd^3
Water softener beads	6 yd^3
Kaiser 45 beads	6 yd^3

I have talked with Ken Slaughter at Lea Land, Inc. and he said they could accept these materials with your permission. We plan to load and transport the waste materials Monday, November 22.

We would appreciate your prompt response. If you have any questions, please contact me by telephone at (915) 688-5799 or by email at mlowe@mail.arco.com.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc: R. McCollum/EAGP
File 43A2c

ARCO Permian
600 N Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200

November 8, 1999

Mr. Jack Ford
New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Empire Abo Injection Plant
Eddy County, New Mexico

Dear Mr. Ford:

The Empire Abo Injection Plant was separately owned and operated from the Empire Abo Gasoline Plant (EAGP). Because the injection plant was no longer in service when ARCO Permian bought EAGP, it was not included in the revision of the EAGP Discharge Plan.

ARCO Permian has removed the compressors from the old injection plant. We are currently getting bids for final removal of debris and oily dirt from the pits. We anticipate completing this work in early December. ARCO requests permission to roadspread the oily dirt (approximately 10 cubic yards) on lease roads in the Empire Abo Unit area surrounding the plant. The oily dirt will be mixed with non-contaminated soil to less than 5% TPH to prevent storm water contamination.

ARCO also requests permission to leave the injection plant concrete foundations in place and backfill the sumps to grade. Some pieces of concrete that were removed during the demolition project will also be used as backfill in the sumps.

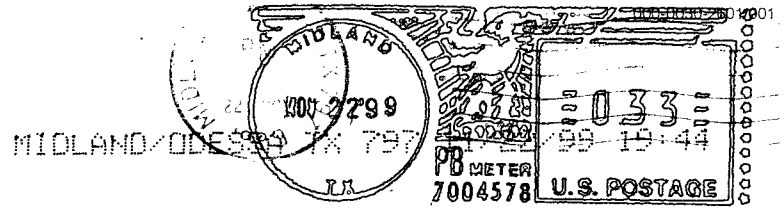
We would appreciate your prompt response. If you have any questions, please contact me by telephone at (915) 688-5799 or by email at mlowe@mail.arco.com.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc: L. Henson/EUN
File 43A2f

ARCO Permian
600 N. Marienfeld
Midland TX 79701
P.O. Box 1610
Midland TX 79702



Mr. Jack Ford
New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, NM 87505

87505-5472 57

P.01

TRANSACTION REPORT

DEC-14-99 TUE 12:25 PM

DATE	START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#
DEC-14	12:23 PM	ARTESIA	40″	1	SEND	OK	

The Santa Fe New Mexican

Since 1849. We Read You.

SEP 15 1999

NM OIL CONSERVATION DIVISION
ATTN: LUPE SHERMAN
2040 S. PACHECO ST.
SANTA FE, NM 87505

AD NUMBER: 107401 ACCOUNT: 56689
LEGAL NO: 66050 P.O.#: 00199000278
191 LINES 1 time(s) at $ 84.10
AFFIDAVITS: 5.25
TAX: 5.58
TOTAL: 94.93

AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO
COUNTY OF SANTA FE
I, B Perner being first duly sworn declare and say that I am Legal Advertising Representative of THE SANTA FE NEW MEXICAN, a daily newspaper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a Newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication #66050 a copy of which is hereto attached was published in said newspaper 1 day(s) between 09/13/1999 and 09/13/1999 and that the notice was published in the newspaper proper and not in any supplement; the first publication being on the 13 day of September, 1999 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/ Betsy Perner
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 13 day of September A.D., 1999

Notary B Mathie

Commission Expires 9-13-2001

OFFICIAL SEAL
B MATHIE
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires

NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application(s) have been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-022) - ARCO Permian, Margaret Lowe, (915) 688-5200, 600 North Marienfeld, Midland, Texas 79701, has submitted a discharge plan renewal application for the ARCO Empire Abo Gasoline Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The Empire Abo Gas Plant was previously operated by Amoco. ARCO Permian purchased the plant and is now responsible for all operations. Approximately 15,000 gallons per day (1.4 acre-feet per month) of waste water with a total dissolved solids concentration of 3,000 mg/l will be collected and stored in an above ground open top steel tank prior to transport to an OCD approved offsite disposal facility. Ground water most likely to be affected in the event of an accidental discharge is at a depth of approximately 20 feet with a total dissolved solids concentration ranging from 4,000 to 5,000 mg/l. ARCO Permian will continue to discharge all other effluents consistent with the existing discharge plan. The discharge plan addresses how spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application(s) may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan application(s), the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan(s) based on information available. If a public hearing is held, the Director will approve or disapprove the proposed plan(s) based on the information in the discharge plan application(s) and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 24th day of August, 1999.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
LORI WROTENBERY, Director

Legal #66050
Pub. September 13, 1999

Artesia Daily Press

P.O. Box 190, Artesia, NM 88211-0190
Phone: (505) 746-3524
Fax: (505) 746-8795

INVOICE

Invoice Date:	09/08/99
Invoice Number:	1049094
Customer Number:	10005610

Oil Conservation Division
2040 South Pacheco St.
Santa Fe NM 87505

DATE	TYPE	DOC NO	REF NUMBER	DESCRIPTION	# OF INS	DEPTH	RATE	AMOUNT
09/08/99	INV	1049094	A/R:1049094 Ord:10579849	**LEGAL NOTICE NOTICE OF PUBLICA** Artesia Daily Press Legal Section, LEGAL NOTICE				
				9/8/99	1	14.75	51.92	51.92
				State Sales Tax	1	14.75	3.21	3.21
				This is your First Notice! Thank You!				
							TOTAL	55.13

I hereby certify that this is a true and correct statement to the best of my knowledge.

Barbara Boone
Bookkeeper

Please detach and return this portion with payment. To ensure proper credit to your account, please write your customer number on your check. If you have any questions about your account, please contact Accounts Receivable at (505) 746-3524.	Invoice Date 09/08/99	Invoice Number 1049094
	Customer Number 10005610	
Retail Advertising Legal 16708	**PLEASE PAY:**	**55.13**

ARTESIA DAILY PRESS
Attn: Accounts Receivable
P.O. Box 190
Artesia, NM 88211-0190

Oil Conservation Division
2040 South Pacheco St.
Santa Fe NM 87505

Affidavit of Publication

NO. 16708

STATE OF NEW MEXICO

County of Eddy:

Gary Scott being duly sworn,says: That he is the **Publisher** of The Artesia Daily Press, a daily newspaper of general circulation, published in English at Artesia, said county and county and state, and that the here to attached

Legal Notice

was published in a regular and entire issue of the said Artesia Daily Press,a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for

1 consecutive weeks/days on the same day as follows:

First Publication September 8 1999

Second Publication

Third Publication

Fourth Publication

Gary Scott

Subscribed and sworn to before me this

9th day of September 1999

Barbara Ann Bruns

Notary Public, Eddy County, New Mexico

My Commission expires September 23,1999

LEGAL NOTICE
NOTICE OF PUBLICATION

Copy of Publication:

STATE OF NEW MEXICO
ENERGY, MINERALS AND
NATURAL RESOURCES
DEPARTMENT
OIL CONSERVATION
DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application(s) have been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

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Any interested person m further information fro Conservation Division submit written commen Director of the Oil Con Division at the addre above. The discharge pl cations(s) may be viewe above address between 8 and 4:00 p.m., Monday Friday. Prior to ruling on posed discharge plan tion(s), the Director of Conservation Division sh at least thirty (30) days date of publication of thi during which comments submitted and a public

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NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

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If no public hearing is held, the Director will approve or disapprove the proposed plan(s) based on information available. If a public hearing is held, the Director will approve or disapprove the proposed plan(s) based on the information in the discharge plan application(s) and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 24th day of August, 1999.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

SEAL

for LORI WROTENBERY, Director

P-106 625 341

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

OCD/Jack Ford/GW-022

Sent to Artesia Daily Press	
Street and No. P.O. Box 190	
P.O., State and ZIP Artesia, NM 88211	
Postage	$ .33
Certified Fee	.40
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	1.35
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$ 2.95
Postmark or Date	

PS Form 3800, June 1985

SANTA FE NM 87502 AUG 31 1999

SANTA FE NM 87502 AUG 3 1999

ARCO Permian
600 N Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200

August 17, 1999

Mr. Jack Ford
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Empire Abo Gasoline Plant
Discharge Plan (GW-022)

Dear Mr. Ford:

ARCO Permian is pleased to submit this Discharge Plan Renewal Application for the above referenced site.

Operations at the plant remain as presented in the Notice of Intent to Discharge submitted in January 1998 and in the follow-up information submitted in March 1998. The Empire Abo Gasoline Plant will continue to operate as specified in the existing Discharge Plan.

As stated in our annual report, ARCO Permian does not plan to construct and operate the irrigation project as proposed and approved by the OCD. If economics and operational parameters change such that the irrigation project becomes feasible, ARCO Permian will notify you before start of construction.

If you have any questions regarding this application, please contact me at (915) 688-5799 or email me at mlowe@mail.arco.com.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc (with enclosures):
R. McCollum/EAGP
File

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

Revised March 17, 1999

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES, GAS PLANTS. REFINERIES, COMPRESSOR, AND CRUDE OIL PUMP STATIONS

(Refer to the OCD Guidelines for assistance in completing the application)

☐ New ☐ Renewal ☐ Modification

1. Type: Empire Abo Gasoline Plant

2. Operator: Elkhorn Operating Company, Empire Abo Gas Plant, PO Box 70, Artesia, NM 88211-0070
   Legally responsible party:
   Address: ARCO Permian, PO Box 1610, Midland, TX 79702-1010

   Contact Person: Margaret J. Lowe Phone: 915-688-5799

3. Location: NE /4 SE /4 Section 3 Township 18S Range 27E
   Submit large scale topographic map showing exact location.

NO CHANGES HAVE BEEN MADE SINCE THE NOTICE OF INTENT TO DISCHARGE WAS SUBMITTED JANUARY 6, 1998 WITH FOLLOWUP INFORMATION SUBMITTED MARCH 1998.

4. Attach the name, telephone number and address of the landowner of the facility site. **No changes from existing discharge plan.**
5. Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility. **No changes from existing discharge plan.**
6. Attach a description of all materials stored or used at the facility. **No changes from existing discharge plan.**
7. Attach a description of present sources of effluent and waste solids. Average quality and daily volume of wastewater must be included. **No changes from existing discharge plan.**
8. Attach a description of current liquid and solid waste collection/treatment/disposal procedures. **No changes from existing discharge plan.**
9. Attach a description of proposed modifications to existing collection/treatment/disposal systems. **No changes from existing discharge plan.**
10. Attach a routine inspection and maintenance plan to ensure permit compliance. **No changes from existing discharge plan.**
11. Attach a contingency plan for reporting and clean-up of spills or releases. **No changes from existing discharge plan.**
12. Attach geological/hydrological information for the facility. Depth to and quality of ground water must be included. **No changes from existing discharge plan.**
13. Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders. **No changes from existing discharge plan.**

14. CERTIFICATION

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Margaret J. Lowe Title: Environmental Engineer

Signature: Margaret J. Lowe Date: 8/17/99

ACKNOWLEDGEMENT OF RECEIPT OF CHECK/CASH

I hereby acknowledge receipt of check No. [redacted] dated 6-28-99,

or cash received on _____ in the amount of $ _____

from ARCO Permian

for Abo Empire Gas Plant (Facility Name) GW-022 (OP No.)

Submitted by: _____ Date: 8-24-99

Submitted to ASD by: _____ Date: _____

Received in ASD by: _____ Date: _____

Filing Fee ✓ New Facility ___ Renewal ✓

Modification ___ Other _____ (specify)

Organization Code 521.07 Applicable FY 99

To be deposited in the Water Quality Management Fund.

Full Payment ✓ or Annual Increment ___

ARCO

ARCO Permian

ARCO Permian Payables
P.O. Box 1610
Midland, TX 79702

Citibank Delaware
A SUBSIDIARY OF CITICORP
ONE PENN'S WAY
NEW CASTLE, DE 19720

62-20
311

18002293

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND AND MICROPRINTING IN BORDER.

Pay FIFTY DOLLARS AND NO CENTS

To the order of:

NMED WATER QUALITY MANAGEMENT FUND
OIL CONSERVATION DIVISION
2040 SOUTH PACHECO ST
SANTA FE NM 87505

Date 06-28-99

Amount **********50.00*

Void after 90 days

Terry S Dallas

TD02

[redacted]

ARCO

ARCO Permian

ARCO Permian Payables
P.O. Box 1610
Midland, TX 79702

Check/EFT# [redacted]

Date 06/28/99

Page 1800293

Pay Entity: 0701

Vendor # 0000008037200

DATE	INVOICE NUMBER	VOUCHER	SOURCE ID	GROSS	DISCOUNT/ADJUSTMENTS	NET
06/25/99	VR990625 EMPIRE ABO GAS PLANT DISCHARGE PLAN GW-022 RENEWAL	R399C 0699	PAK	50.00		50.00
			TOTAL	50.00		50.00

Questions regarding this remittance can be made by calling or writing:

915/688-5438 P.O. Box 1610, Attn. Disbursements, Midland, TX 79702

Detach check before depositing

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

June 10, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-357-870-108

Ms. Margaret J. Lowe
ARCO Permian
P.O. Box 1610
Midland, Texas 79702

RE: Discharge Plan GW-022 Renewal
Abo Empire Gas Processing Plant
Eddy County, New Mexico

Dear Mr. Lowe:

On December 13, 1994, the groundwater discharge plan renewal, GW-022, for the ARCO Permian Abo Empire Gas Processing Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico, was approved by the Director of the New Mexico Oil Conservation Division (OCD). This discharge plan renewal was required and submitted pursuant to Water Quality Control Commission (WQCC) regulations and was approved for a period of five years. **The approval will expire on December 13, 1999.**

If the facility continues to have potential or actual effluent or leachate discharges and wishes to continue operation, the discharge plan must be renewed. **Pursuant to Section 3106.F., if an application for renewal is submitted at least 120 days before the discharge plan expires, then the existing approved discharge plan for the same activity shall not expire until the application for renewal has been approved or disapproved.** The OCD is reviewing discharge plan submittals and renewals carefully and the review time can extend for several weeks to months. Please indicate whether ARCO Permian has made or intends to make, any changes in the system, and if so, please include these modifications in the application for renewal.

The discharge plan renewal application for the **Abo Empire Gas Processing Plant** is subject to WQCC Regulation 3114. Every billable facility submitting a discharge plan renewal will be assessed a fee equal to the filing fee of $50.00 plus a flat fee equal to one-half of the original flat fee for gas plants. The $50.00 filing fee is to be submitted with the discharge plan renewal application and is nonrefundable.

Please make all checks payable to: **NMED-Water Quality Management** and addressed to the OCD Santa Fe Office. Please submit the original discharge plan renewal application and one copy to the OCD Santa Fe Office and one copy to the OCD Artesia District Office. **Note that the completed and signed application form must be submitted with your discharge plan renewal request.** (Copies of the WQCC regulations and discharge plan application form and guidelines are enclosed to aid you in preparing the renewal application. A complete copy of the regulations is also available on OCD's website at **www.emnrd.state.nm.us/ocd/**).

If the Abo Empire Gas Processing Plant no longer has any actual or potential discharges and a discharge plan is not needed, please notify this office. If ARCO Permian has any questions, please do not hesitate to contact me at (505) 827-7156.

Sincerely,

W. Jack Ford, C.P.G.
Environmental Bureau
Oil Conservation Division

enclosed: Discharge Plan Application form

cc: OCD Artesia District Office

Z 357 870 108

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Margaret Lowe	
Street & Number ARCO	
Post Office, State, & ZIP Code Midland	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date GW-022	

PS Form **3800**, April 1995

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

June 1, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-357-870-105

Ms. Margaret J. Lowe
Environmental Engineer
ARCO Permian
P.O. Box 1610
Midland, TX 79702

RE: Charcoal Waste Spreading
GW-022, Empire Abo Gas Plant
Eddy County, NM

Dear Ms. Lowe:

The New Mexico Oil Conservation Division (OCD) has received ARCO Permian's letter dated May 26, 1999 requesting that the OCD allow ARCO Permian to spread charcoal cleaning filter waste onsite. The OCD **hereby approves of the spreading of approximately 100 cubic feet of this non-hazardous charcoal filter waste at the ARCO Permian Empire Abo plant facility within the facility fence, provided that the material is liquid free prior to surface spreading.** This is a modification to the discharge plan (GW-022) waste stream and will be incorporated as part of the discharge plan. No further requests for disposal of this waste will be required unless changes in disposal procedures are to be adopted. Such changes will require approval prior to any changes being adopted.

Note, that OCD approval does not relieve ARCO Permian of liability should ARCO Permian's operation's result in contamination of surface waters, ground waters or the environment. OCD approval does not relieve ARCO Permian from compliance with other federal, state, and local regulations/rules that may apply.

Sincerely,

W. Jack Ford, C.P.G.
OCD Environmental Bureau

cc: OCD Artesia District II

Z 357 870 105

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (See reverse)

Sent to	M. Lowe
Street & Number	ARCO
Post Office, State, & ZIP Code	Midland
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	GW-022 Disposal

PS Form 3800, April 1995

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

May 14, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z-357-870-087

Ms. Margaret Lowe
ARCO Permian
P.O. Box 1610
Midland, Texas 79702

RE: Discharge Plan Fees GW-022
ARCO Empire Abo Natural Gas Processing Plant
Eddy County, New Mexico

Dear Mr. Christian:

On August 4, 1998, ARCO Permian, received, via certified mail, an approval dated July 31, 1998 from the New Mexico Oil Conservation Division (OCD) for a major modification of discharge plan GW-022. Each major modification to a discharge plan has a filing fee and a flat fee as described in WQCC Section 3114.B.c.3. The OCD has not as of this date (May 14, 1999) received the required flat fee amount of $1667.50. The last check (Number 1717000175) submitted by ARCO Permian, in the amount of $50.00, was dated March 16, 1998 for the filing fee required for major modifications of the discharge plan. The total flat fee amount remaining is $1667.50 of the original $1667.50 flat fee for discharge plan GW-022 modification.

ARCO Permian will submit the remaining $1,667.50 flat fee in full immediately upon receipt of this notice in order to be in compliance with Water Quality Control Commission Regulation 3114.B.6, or the OCD may initiate enforcement actions which may include fines and/or an order to cease all operations at the facility. Please make all checks payable to: **NMED-Water Quality Management** and addressed to the OCD Santa Fe Office.

If you have any questions regarding this matter, please contact me at (505)-827-7152 or Mr. W. Jack Ford at (505) 827-7156.

Sincerely,

Roger Anderson
Environmental Bureau Chief

RCA/wjf

xc: Artesia OCD district office

PS Form **3800**, April 1995

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (*See reverse*)

Z 357 870 087

Sent to Margaret Lowe
Street & Number ARCO
Post Office, State, & ZIP Code Midland
Postage $
Certified Fee
Special Delivery Fee
Restricted Delivery Fee
Return Receipt Showing to Whom & Date Delivered
Return Receipt Showing to Whom, Date, & Addressee's Address
TOTAL Postage & Fees $
Postmark or Date GW-022

Affidavit of Publication

State of New Mexico,
County of Eddy, ss.

Amy McKay,
being first duly sworn, on oath says:

That she is Business Manager of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the state wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

May 26, 19 98
, 19
, 19
, 19
, 19
, 19

That the cost of publication is $ 65.20, and that payment thereof has been made and will be assessed as court costs.

Amy McKay

Subscribed and sworn to before me this 29th day of May, 1998

Donna Crump

My commission expires 8/1/98
Notary Public

May 26, 1

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND
NATURAL RESOURCES
DEPARTMENT
OIL CONSERVATION
DIVISION

No 18419

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application(s) have been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-022) - ARCO Permian, Margaret Lowe, (915) 688-5200, 600 North Marienfeld, Midland, Texas 79701, has submitted a major discharge plan modification application for the ARCO Empire Abo Gasoline Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The Empire Abo Gas Plant was previously operated by Amoco. ARCO Permian recently purchased the plant and is now responsible for all operations. Approximately 15,000 gallons per day (1.4 acre-feet per month) of waste water with a total dissolved solids concentration of 3,000 mg/l will be collected and stored in an above ground open top steel tank prior to transport via pipeline to a land application area. Maximum application rate will not exceed 42,000 gallons per day (3.8 acre-feet per month) during any peak discharge period. The land application site, encompassing approximately 22 acres, is located in the NW/4 of Section 21, Township 18 South, Range 27 East, NMPM. Waste water used for application purposes will be derived from boiler blowdown, cooling tower blowdown and water softener backwash. Ground water most likely to be affected in the event of an accidental discharge is at a depth of approximately 20 feet with a total dissolved solids concentration ranging from 4,000 to 5,000 mg/l. ARCO Permian will continue to discharge all other effluents consistent with the existing discharge plan. The discharge plan addresses how spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application(s) may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan application(s), the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan(s) based on the information available. If a public hearing is held, the Director will approve or disapprove the proposed plan(s) based on the information in the discharge plan application(s) and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 14th day of May, 1998.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

Roger C. Anderson

for LORI WROTENBERY,
Director

NM State Energy, Mineral

505-827-7131

CARLSBAD CURRENT-ARGUS

620 South Main • P.O. Box 1629
Carlsbad, New Mexico 88220
(505) 887-5501

CLASSIFIED ADVERTISING INVOICE

START DATE	05/26/98	STOP DATE	05/26/98
NO. INSERTIONS	1	NO. LINES	146
CLASSIFICATION	100	AD NO.	247765

AMOUNT DUE	IF PAID AFTER	
$ 65.20	05/26/98	$

YOUR AD READ:

MAY261998NOTICE

Thank You

First Notice

RETURN POSTAGE GUARANTEED

NM State Energy, Miner
Oil Conservation Divi
2040 South Pacheco St
Santa Fe
NM 87505

PLEASE RETURN WITH YOUR REMITTANCE

ADNUM: 247765
STOP DAY:05/26 100
05/26/98 65.20

No.

ARCO Permian
600 N Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200

JUN – 1

May 26, 1998

Mr. Jack Ford
New Mexico Oil Conservation Division
2048 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Empire Abo Gasoline Plant
Eddy County, New Mexico

Dear Mr. Ford:

We plan to replace the charcoal filters in the Empire Abo Gas Plant (EAGP) amine system. The system will be removed from service, drained of amine and then filled with steam condensate. The condensate will be heated to remove the hydrocarbons from the charcoal. The hydrocarbon/condensate stream will be routed to the closed drain system for disposal as approved in the EAGP discharge plan. This cleaning process will be repeated several times to remove as much amine and hydrocarbon from the charcoal as possible. After final removal of the condensate, the charcoal will be removed from the system and new charcoal will be installed.

We request permission to dispose of approximately 100 cubic feet of charcoal by landspreading within the plant boundary. The charcoal will be spread to minimize surface runoff. ARCO Permian owns the plant surface land.

We would appreciate your prompt response. If you have any questions, please contact me at (915) 688-5799 or Robert Livingston at (505) 677-5101.

Sincerely,

Margaret Lowe

Margaret J. Lowe
Environmental Engineer

cc: R. McCollum/EAGP
R. Livingston/EAGP
File

The Santa Fe New Mexican
Since 1849. We Read You.

NM OCD
ATTN: SALLY MARTINEZ
2040 S. PACHECO
SANTA FE, NM 87505

AD NUMBER: 26549 ACCOUNT: 56689
LEGAL NO: 63547 P.O.#: 98199000257
211 LINES 1 time(s) at $ 84.40
AFFIDAVITS: 5.25
TAX: 5.60
TOTAL: 95.25

AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO
COUNTY OF SANTA FE
I, B Reiner being first duly sworn declare and say that I am Legal Advertising Representative of THE SANTE FE NEW MEXICAN, a daily newspaper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a Newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication #63547 a copy of which is hereto attached was published in said newspaper 1 day(s) between 05/22/1998 and 05/22/1998 and that the notice was published in the newspaper proper and not in any supplement; the first publication being on the 22 day of May, 1998 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/ Betsy Reiner
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 21 day of May A.D., 1998

Notary B. Mathie

Commission Expires 3-13-2001

OFFICIAL SEAL
B. MATHIE
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 3-13-2001

NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application(s) have been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-022) - ARCO Permian, Margaret Love, (915) 688-5200, 600 North Marienfeld, Midland, Texas 79701, has submitted a major discharge plan modification application for the ARCO Empire Abo Gasoline Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The Empire Abo Gas Plant was previously operated by Amoco. ARCO Permian recently purchased the plant and is now responsible for all operations. Approximately 15,000 gallons per day (1.4 acre-feet per month) of waste water with a total dissolved solids concentration of 3,000 mg/l will be collected and stored in an above ground open top steel tank prior to transport via pipeline to a land application area. Maximum application rate will not exceed 42,000 gallons per day (3.8 acre-feet per month) during any peak discharge period. The land application site, encompassing approximately 22 acres, is located in the NW/4 of Section 21, Township 18 South, Range 27 East, NMPM. Waste water used for application purposes will be derived from boiler blowdown, cooling tower blowdown and water softener backwash. Ground water most likely to be affected in the event of an accidental discharge is at a depth of approximately 20 feet with a total dissolved solids concentration ranging from 4,000 to 5,000 mg/l. ARCO Permian will continue to discharge all other effluents consistent with the existing discharge plan. The discharge plan addresses how spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application(s) may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan application(s), the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan(s) based on information available. If a public hearing is held, the Director will approve or disapprove the proposed plan(s) based on information in the discharge plan application(s) and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 14th day of May 1998.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
LORI WROTENBERY, Director

Legal #63547
Pub. May 22, 1998

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

May 19, 1998

Carlsbad Current Argus
Attention: Advertising Manager
Post Office Box 1629
Carlsbad, New Mexico 88221

Re: Notice of Publication

P 269 262 732

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (See reverse)

Sent to	Carlsbad Current Argus
Street & Number	
Post Office, State, & ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	5/20

PS Form 3800, April 1995

Dear Sir/Madam:

Please publish the attached notice one time immediately on receipt of this request. Please proofread carefully, as any error in a land description or in a key word or phrase can invalidate the entire notice.

Immediately upon completion of publication, please send the following to this office:

1. ***Publisher's affidavit in duplicate.***
2. ***Statement of cost (also in duplicate).***
3. ***Certified invoices for prompt payment.***

We should have these immediately after publication in order that the legal notice will be available for the hearing which it advertises, and also so that there will be no delay in your receiving payment.

Please publish the notice no later than May 26, 1998.

Sincerely,

Sally Martinez

Sally Martinez
Administrative Secretary

Attachment

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

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If no public hearing is held, the Director will approve or disapprove the proposed plan(s) based on information available. If a public hearing is held, the Director will approve or disapprove the proposed plan(s) based on the information in the discharge plan application(s) and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 14th day of May, 1998.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

S E A L

for LORI WROTENBERY, Director

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

May 19, 1998

The New Mexican
***Attention:** Betsy Perner*
202 East Marcy
Santa Fe, New Mexico 87501

Re: Notice of Publication
PO # 98-199-00257

Dear Ms. Perner:

Please publish the attached notice one time immediately on receipt of this request. Please proofread carefully, as any error in a land description or in a key word or phrase can invalidate the entire notice.

Immediately upon completion of publication, please send the following to this office:

1. ***Publisher's affidavit.***
2. ***Invoices for prompt payment.***

We should have these immediately after publication in order that the legal notice will be available for the hearing which it advertises, and also so that there will be no delay in your receiving payment.

Please publish the notice no later than Friday, May 22, 1998.

Sincerely,

Sally Martinez

Sally Martinez
Administrative Secretary

Attachment

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application(s) have been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-022) - ARCO Permian, Margaret Lowe, (915) 688-5200, 600 North Marienfeld, Midland, Texas 79701, has submitted a major discharge plan modification application for the ARCO Empire Abo Gasoline Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The Empire Abo Gas Plant was previously operated by Amoco. ARCO Permian recently purchased the plant and is now responsible for all operations. Approximately 15,000 gallons per day (1.4 acre-feet per month) of waste water with a total dissolved solids concentration of 3,000 mg/l will be collected and stored in an above ground open top steel tank prior to transport via pipeline to a land application area. Maximum application rate will not exceed 42,000 gallons per day (3.8 acre-feet per month) during any peak discharge period. The land application site, encompassing approximately 22 acres, is located in the NW/4 of Section 21, Township 18 South, Range 27 East, NMPM. Waste water used for application purposes will be derived from boiler blowdown, cooling tower blowdown and water softener backwash. Ground water most likely to be affected in the event of an accidental discharge is at a depth of approximately 20 feet with a total dissolved solids concentration ranging from 4,000 to 5,000 mg/l. ARCO Permian will continue to discharge all other effluents consistent with the existing discharge plan. The discharge plan addresses how spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application(s) may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan application(s), the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan(s) based on information available. If a public hearing is held, the Director will approve or disapprove the proposed plan(s) based on the information in the discharge plan application(s) and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 14th day of May, 1998.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

S E A L

for LORI WROTENBERY, Director

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 14th day of May, 1998.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

Roger C. Anderson

SEAL

for LORI WROTENBERY, Director

The Santa Fe New Mexican
Since 1849. We Read You.

NM OIL CONSERVATION DIVISION

AD NUMBER: 17937 ACCOUNT: 56689

LEGAL NO: 63256 P.O. #: 98-199-000257

175 LINES ONCE at $ 70.00

Affidavits: 5.25

Tax: 4.70

Total: $ 79.95

AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO
COUNTY OF SANTA FE

I, BETSY PERNER being first duly sworn declare and say that I am Legal Advertising Representative of THE SANTA FE NEW MEXICAN, a daily news paper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a Newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication # 63246 a copy of which is hereto attached was published in said newspaper once each WEEK for ONE consecutive week(s) and that the notice was published in the newspaper proper and not in any supplement; the first publication being on the 30 day of MARCH 1998 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/ Betsy Perner
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 30 day of MARCH A.D., 1998

Notary B Mathie
Commission Expires 3-13-2001

OFFICIAL SEAL
B. MATHIE
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 3-13-2001

NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

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(GW-022) - ARCO Permian, Margaret Lowe, (915) 688-5200, P.O. box 1610, Midland, Texas 79702, has submitted a major discharge plan modification application for the ARCO Empire Abe Gasoline Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. Approximately 17,500 gallons per day of waste water with a total dissolved solids concentration ranging from 3,000-4,000 mg/l will be collected and stored in an above ground open top steel tank prior to transport via pipeline to a land application area, encompassing approximately 22 acres, located in the NW/4 of Section 21, Township 18 South, Range 27 East, NMPM. Ground water most likely to be affected in the event of an accidental discharge is at a depth of approximately 50 feet with a total dissolved solids concentration of approximately 3,000 mg/l. The discharge plan addresses how spills, leaks, and other accidental discharges to the surface will be managed.

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If no public hearing is held, the Director will approve or disapprove the plan(s) based on information available. If a public hearing is held, the Director will approve the plan(s) based on the information in the discharge plan application(s) and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23rd day of March 1998.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
LORI WROTENBERY,
Director

Legal #63246
Pub. March 30, 1998

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application(s) have been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-022) - ARCO Permian, Margaret Lowe, (915) 688-5200, P. O. Box 1610, Midland, Texas 79702, has submitted a major discharge plan modification application for the ARCO Empire Abo Gasoline Plant located in the NE/4 SE/4 of Section 3, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. Approximately 17,500 gallons per day of waste water with a total dissolved solids concentration ranging from 3,000-4,000 mg/l will be collected and stored in an above ground open top steel tank prior to transport via pipeline to a land application area, encompassing approximately 22 acres, located in the NW/4 of Section 21, Township 18 South, Range 27 East, NMPM. Ground water most likely to be affected in the event of an accidental discharge is at a depth of approximately 50 feet with a total dissolved solids concentration of approximately 3,000 mg/l. The discharge plan addresses how spills, leaks, and other accidental discharges to the surface will be managed.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application(s) may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan application(s), the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan(s) based on information available. If a public hearing is held, the Director will approve or disapprove the proposed plan(s) based on the information in the discharge plan application(s) and information submitted at the hearing.

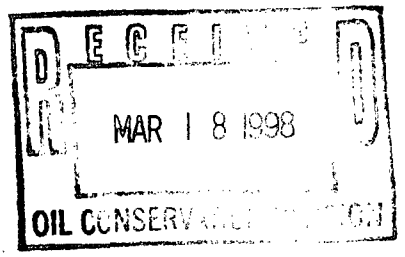
GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 23th day of March, 1998.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

SEAL

for LORI WROTENBERY, Director

ARCO Permian
600 N Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200



March 17, 1998

Mr. Jack Ford
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: ARCO Empire Abo Gasoline Plant Discharge Plan

Dear Mr. Ford:

Thank you for meeting with us in January to discuss our recent submission: *Environmental Site Assessment and Notice of Intent to Discharge* for the Empire Abo Gasoline Plant (January, 1998). In our meeting, you informed us that the Director of the NMOCD has determined that a discharge plan is required for the facility. This letter amends our previous submission to create a complete discharge plan for the facility.

We agree that a discharge plan is required under WQCC regulations for the land application site. However, we believe the evidence presented in our January, 1988 report clearly shows that activities within the plant boundaries will not impact ground water at a place of reasonable present or future use. Nevertheless, we commit to removal of phase separated hydrocarbon (PSH) at the plant site. The PSH removal program discussed in this letter is a voluntary action and is commensurate with the risks posed by PSH beneath the site. We understand that these voluntary PSH recovery actions are governed by the discharge plan process.

When the Empire Abo plant is closed or shut-down and discharge of wastewater is no longer required, we will allow this discharge permit to lapse. At this same time, we will also cease our voluntary PSH recovery program. We are confident that the data presented in our January, 1998 submission combined with future data collected at the site over the course of the next few years will fully support our decision to cease PSH recovery upon plant shut-down or closure. In the meantime, you will find our proposed program meets the requirements of the WQCC regulations and is fully consistent with the environmental setting and risk profile of the plant.

This submittal presents the 1997 annual ground water sampling event for the plant. The wells were measured and sampled on December 18, 1997. The sampling results are summarized in Table 6.

We also attach a proposed schedule for construction of the land application site. If you require any additional information for the public notice or for approval of our land application proposal, please call me immediately. We would like to maintain our schedule to permit planting in the early spring.

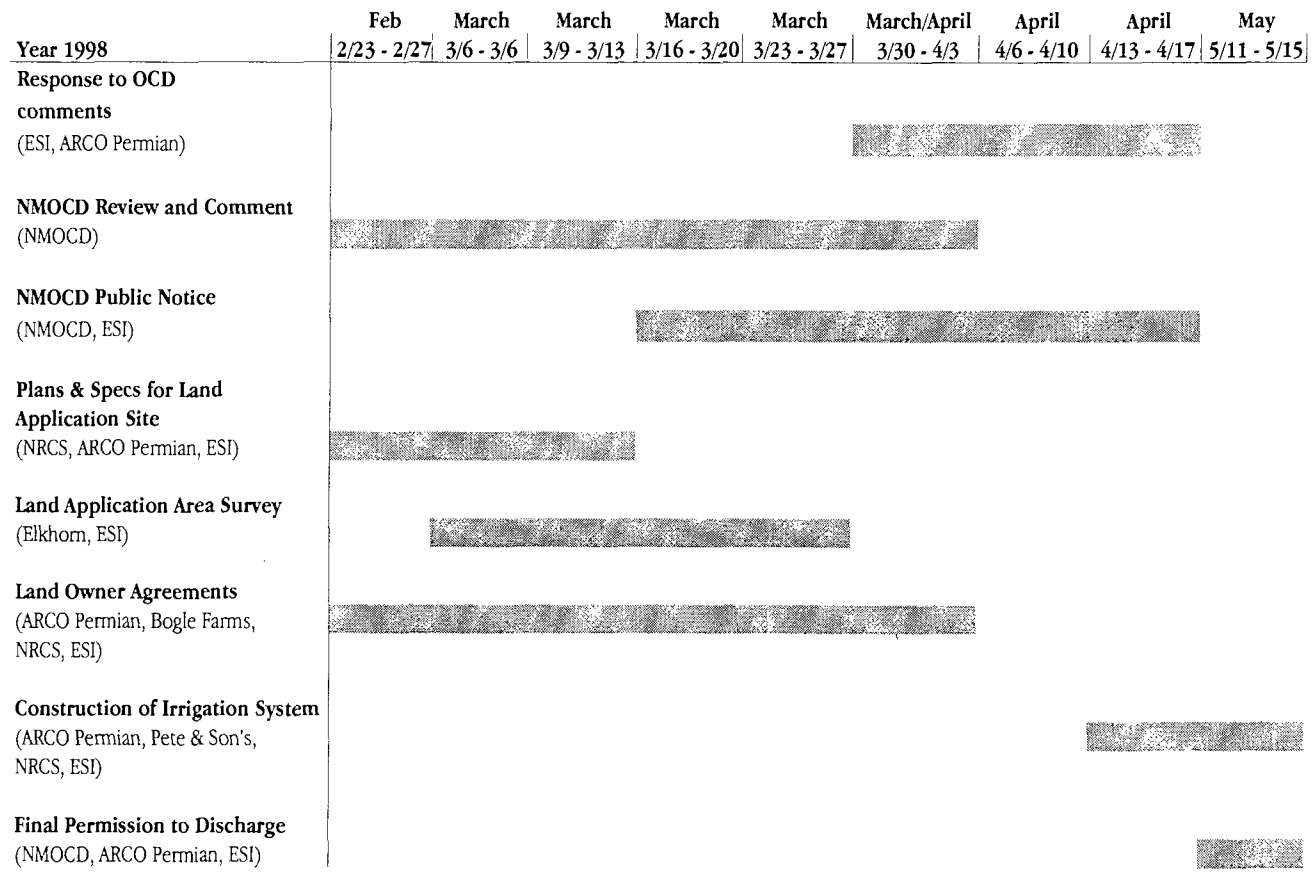
Sincerely,

Margaret Lowe
Environmental Engineer

ML:cv
xc: (w/enclosures)
Bogle Farms Ltd.
Elkhorn Operating Company
OCD Artesia Office
Environmental Services, Inc.
U.S. Department of Agriculture

ARCO Permian—Empire Abo Gasoline Plant Discharge Plan

Project Timeline



ARCO Permian

ARCO Permian Payables
P.O. Box 1610
Midland, TX 79702

Check/EFT#: [redacted]

Date: 03/16/

Page 1 of 2

Pay Entity: 0701

Vendor #: N00008037200

DATE	INVOICE NUMBER	VOUCHER	SOURCE ID	GROSS	DISCOUNT/ADJUSTMENTS	NET
03/16/98	VR980316 EMPIRE ABO GAS PLANT DISCHARGE PLAN	R404C 0398	PAK	50.00		50.00
			TOTAL	50.00		50.00

RECEIVED
NOV 1 3 1997
Environmental Bureau
Oil Conservation Division

Questions regarding this remittance can be made by calling or writing:

915/688-5438 P.O. Box 1610, Attn. Disbursements, Midland, TX 79702

Detach check before depositing

ARCO Permian

ARCO Permian Payables
P.O. Box 1610
Midland, TX 79702

73-426
839

Permian Accounts Payable
The First National Bank of Chicago-0710
Chicago, Illinois
Payable Through Republic Bank
Shelbyville, Kentucky

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND AND MICROPRINTING IN BORDER.

Pay [redacted]

FIFTY DOLLARS AND NO CENTS

To the order of:

NMED WATER QUALITY MANAGEMENT FUND
2040 SOUTH PACHECO ST
SANTA FE NM 87505

Date 03-16-98

Amount **********50.00*

Void after 90 days

Range S. Davis
GD014

[redacted]

Modification of Ground Water Discharge Plan GW-22

EMPIRE ABO GASOLINE PLANT

prepared for

ARCO Permian, A Unit of Atlantic Richfield
600 North Marienfeld
Midland, TX 79702

March 1998

4665 INDIAN SCHOOL NE
SUITE 106
ALBUQUERQUE
NEW MEXICO
87110

Table of Contents

Monitoring and Reporting Plan

Ground Water Monitoring Requirements

Table 1 presents our proposed monitoring plan for ground water wells at the plant site. We propose to recover phase separated hydrocarbons (PSH) in any well which contains more than 0.5 feet of PSH. Most wells have shown no change in the character of ground water over the past five years of monitoring. The data of the past five years also clearly shows where PSH exits. Continued monitoring of the entire monitoring network will continue to define what is already well established. We recommend that only seven monitoring wells remain operational for sampling at the site. Monitor wells 2, 8, 2-8, 2-14, 2-15, 3-2 and 3-3 create an effective network to detect movement of hydrocarbons from the plant site.

A one time grab sample of PSH from wells 3, 9, 2-9, 2-10, 2-15 and 3-2 will be tested for the following

- API gravity
- Vapor pressure

The purpose of this one time event is to define the source of PSH. The possibility exists that much of the observed PSH originated from nearby crude pipelines, not the Empire Abo Gasoline Plant. These data may assist in determining the origin of the PSH.

On an annual basis, any of the wells (2, 8, 2-8, 2-14, 2-15, 3-2 and 3-3) that do not exhibit PSH will be tested for the following

- Total dissolved solids
- BTEX
- Depth to water

On an annual basis we will also measure depth to water, depth to PSH and total depth in all monitor wells.

ARCO Permian will submit annual reports in January of each year which will include sample results and annual volume of PSH removal amounts.

Ground water monitoring at the land application site is discussed in a later section.

Table 1 outlines the modifications to the monitoring program we are proposing. Proposed annual monitoring is highlighted in bold type. Please note an initial semi-annual sampling program is proposed for wells MW-2 and MW-8.

Table 1-1
Proposed Modifications to Ground Water Monitoring Program

Well #	Proposed Modification	Rationale
1-	Ensure proper PSH Recovery	Previous reports indicate well is abandoned
2-	**Two additional semi-annual monitoring events, then annual**	1996 results are significantly different from previous analyses. Well is at northwest edge of property *
3-	Ensure proper PSH Recovery	Center of property, consistently showing PSH
4-	Ensure proper PSH Recovery	Center of property, consistently showing PSH and/or high BTEX concentration
5-	Ensure proper PSH Recovery	Center of property, consistently showing PSH
6-	Ensure proper PSH Recovery	Center of property, consistently showing PSH
7-	Ensure proper PSH Recovery	Center of property, consistently showing PSH and/or high BTEX concentration
8-	**Two additional semi-annual monitoring events, then annual**	1996 results are significantly different from previous analyses, well is on west edge of property
9-	Ensure proper PSH Recovery	Consistently shows PSH. MW-2, MW 2-14 and MW-8 can effectively monitor western property line
2-1	Ensure proper PSH Recovery	Previous reports indicate well is abandoned
2-2	Ensure proper PSH Recovery	Data demonstrate BTEX below WQCCR standards
2-3	Ensure proper PSH Recovery	1996 results are significantly different from previous analyses, well is on central portion of property
2-4	Ensure proper PSH Recovery	Center of property, consistently shows high BTEX
2-5	Ensure proper PSH Recovery	Data demonstrate BTEX below WQCCR standards
2-6	Ensure proper PSH Recovery	Center of property, consistently showing PSH
2-7	Ensure proper PSH Recovery	Consistently shows PSH. MW-2, MW 2-14 and MW-8 can effectively monitor western property line
2-8	**Annual monitoring**	Located on Western property line
2-9	Ensure proper PSH Recovery	Center of property, consistently showing PSH
2-10	Ensure proper PSH Recovery	Center of property, consistently showing PSH
2-11	Ensure proper PSH Recovery	Center of property, consistently showing PSH
2-12	Ensure proper PSH Recovery	Center of property, consistently showing PSH
2-13	Ensure proper PSH Recovery	Center of property, consistently showing PSH
2-14	**Annual monitoring**	Located on western edge of property
2-15	**Annual monitoring**	Center of property, consistently showing PSH
2-16	Ensure proper PSH Recovery	Center of property, consistently showing PSH and/or high BTEX concentration
2-17	Ensure proper PSH Recovery	Previous reports indicate well is abandoned
2-18	Ensure proper PSH Recovery	Center of property, consistently showing PSH and/or high BTEX concentration
3-1	Ensure proper PSH Recovery	Consistently shows PSH. MW-2, MW 2-14 and MW-8 can effectively monitor western property line
3-2	**Annual monitoring**	Located on southern edge of process area
3-3	**Annual monitoring**	Located on eastern edge of property
3-4	Ensure proper PSH Recovery	Consistently shows high BTEX concentration

* Recent results are presented in Table 4-6

Land Application Design Requirements

ARCO Permian proposes to discharge water from the evaporation pond to the proposed land application site. Plant waste water in the evaporation pond is derived from the cooling tower, reverse osmosis unit, boilers and other minor nonhydrocarbon waste streams. The land application site is owned by Bogle Farms, Ltd.

The proposed land application site is approximately 3.75 miles from the plant. The design of the irrigation system minimizes infiltration and maximizes surface area irrigation. If any infiltration occurs at the proposed land application site, the water will be rich in oxygen and nutrients thereby benefiting the ground water. Because the TDS of the underlying ground water is 4000-5000 mg/L, infiltrated water from the irrigation system (3120 mg/L TDS) will improve the overall ground water quality of the area.

Land Application Site Monitoring Requirements

ARCO Permian will monitor the land application as follows

- One time—grab sample was taken on June 5, 1997 from the evaporation pond for analysis of all applicable WQCC standards. The results are in appendix 3 of the original application.
- One time—collect a grab sample of the evaporation pond sediments for analysis of sodium, calcium, chloride, sulfate, nitrates and total metals.
- Semi-annually—collect a grab sample from the evaporation pond. Parameters for alkalinity, barium, boron, fluoride, magnesium, nitrate, pH, total hardness and total phosphorus will be analyzed. The Department of Agriculture is most concerned about conductivity, sodium, calcium, chloride, sulfate concentrations and TDS. These analyses will be included in each sampling event.
- Monthly—test conductivity of the evaporation pond.
- Monthly—monitor the volume of applied water (after irrigation begins).

In the event any petroleum hydrocarbons are released to the land application site from the plant, we will report the incident and modify the monitoring schedule as appropriate.

ARCO Permian will submit annual reports in January of each year which will include sample results and application volume amounts.

Land Application Design

2

ARCO Permian proposes to discharge water from the evaporation pond to the proposed land application site. Plant waste water in the evaporation pond is derived from the cooling tower, reverse osmosis unit, boilers and other minor nonhydrocarbon waste streams. The land application site is owned by Bogle Farms, Ltd. ARCO Permian obtained guidance for the design of the land application system from the United States Department of Agriculture, Natural Resources Conservation Service, which suggested the following

- Use approximately 20 acres.
- Apply no more than 1.5 acre feet per year of discharge water to native vegetation.
- Irrigate between 6:00 pm and 6:00 am from March through October, due to chloride concentrations.
- Irrigate between 8:00 am and 8:00 pm from November through February, due to freezing temperatures.
- Apply at least 4 inches of discharge water per irrigation event.
- Land application area should have at least a depth of 30 inches of silt loam soils.
- Plant *Alkali Sacaton* as the native grass and apply one pound of seed per acre.
- Initially fence the area to allow the grass to grow, then allow grazing in heavy, short periods for weed control.
- Install an irrigation control system to make efficient use of discharge water, see table 2-2.

The proposed irrigated land area is located in Eddy County, New Mexico, T18S, R27E, Section 21:

- 8 acres, SW/4, SE/4, NW/4
- 2 acres, NW/4, SE/4, SE/4, NW/4
- 3 acres, NE/4, SE/4, NW/4
- 10 acres, N/2, NW/4, SW/4

Table 2 summarizes the design requirements for the proposed irrigated land area.

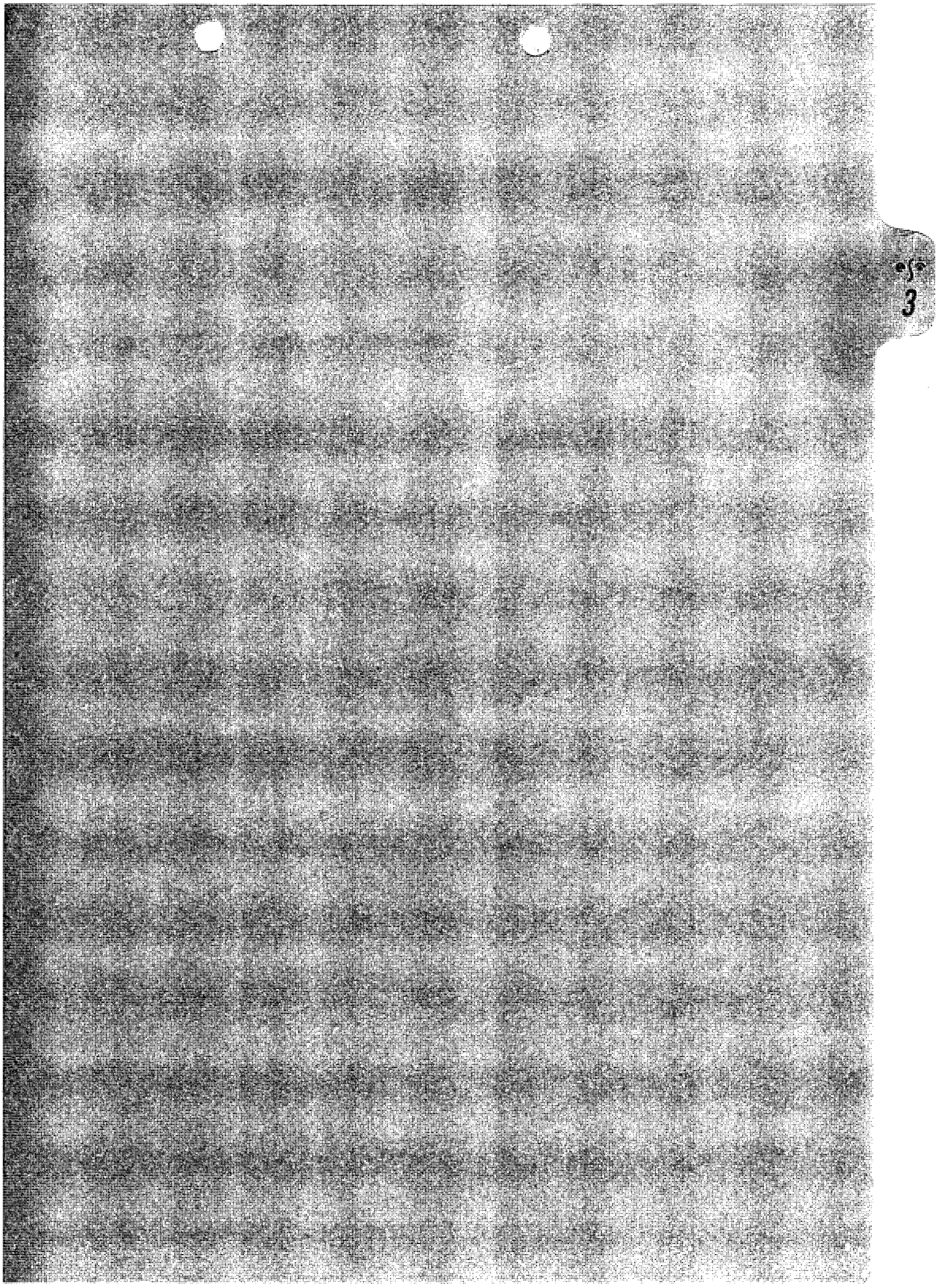
Table 2-2
Design Requirements

Static Pressure	
Beginning of irrigated land	82.3 lbs/190 ft
End of irrigated land	93 lbs/215 ft

Estimated Pipeline Length	**Property Owner**
560 ft	Private
3,168 ft	Federal
11,880 ft	State
4,192 ft	Private

Sprinkler Design	
Rainbird 104/105 23°	Covers 300 ft diameter
0.690 inch	Nozzle size
136 gal/min	Application rate
19,800 ft	Maximum length of pipeline
10 bhp	Booster pump at plant

Include an auto on/off float or electric switch in pond to control amount of water discharged. Also, include an auto shut off if a leak is detected.



PSH Recovery Plan

As indicated in our previous submission, we do not believe PSH recovery is warranted at the site. The previous submission clearly demonstrated that the observed PSH will not enter Scoggin Draw. The PSH will not enter any nearby water wells. Also, the PSH may not be a result of gas plant activities and, therefore, would not be the responsibility of ARCO.

Table 3 presents data from a January 1998 bailing test at MW 2-9. Clearly, PSH does not readily flow into these recovery wells. The existing pumping system at the site is ineffective for PSH recovery. This system pumps significantly more water than PSH.

Nevertheless, as a voluntary action, ARCO will implement a PSH recovery program that is commensurate with the documented lack of exposure pathways and is consistent with PSH movement to wells.

We propose to install an oil absorbent well sock in all wells exhibiting more than 0.5 feet of PSH. Wells showing more than 1 foot of PSH shall be checked quarterly and the passive skimmer and entrained PSH removed on an quarterly basis. Wells showing less than 1 foot of PSH but more than 5 inches shall be checked semi-annually and the skimmer and PSH will be removed on a semi-annual basis.

Measurable PSH were present in 12 of the monitor wells. The most recent sampling event in December 1997 measured product thickness ranges from 0.01 to 4.30 feet thick as shown in table 4.

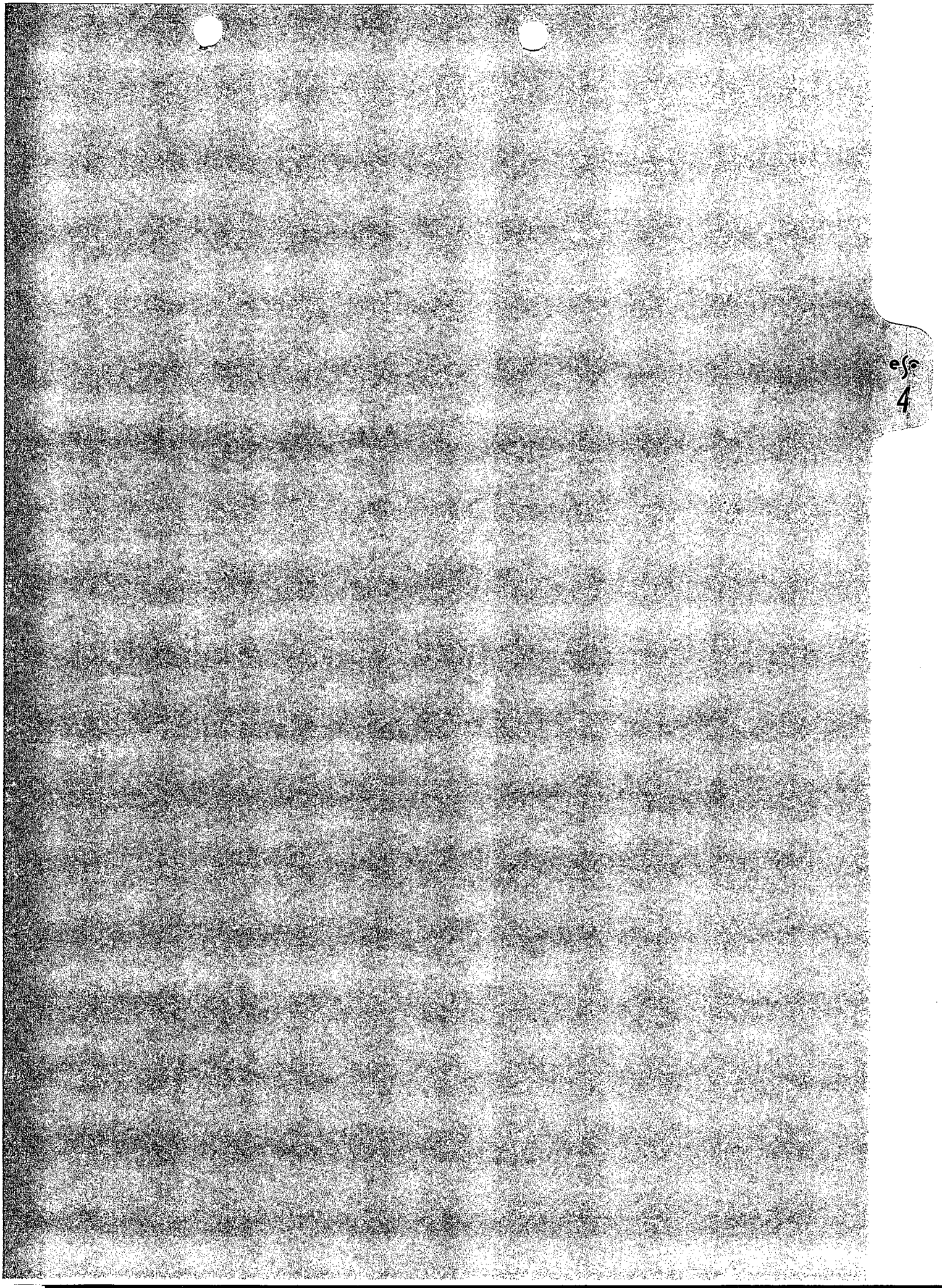
ARCO Permian will submit annual reports in January of each year which will include annual volume of PSH removal amounts.

Table 3-3
PSH Bailing Test

Date	Time	PSH Thickness (inches)	Comments
January 27, 1998	16:14:28	27.50	Before PSH removal
	16:15:28	0.500	After PSH removal
	16:16:55	0.750	
	16:18:15	1.000	
	16:21:38	1.375	
	16:23:25	1.000	
	16:24:24	1.125	
	16:25:45	1.750	
	16:26:45	2.250	
	16:27:45	3.000	
	16:28:46	1.375	
	16:29:53	3.500	
	16:31:00	2.250	
	16:32:12	1.875	
	16:33:34	1.125	
	16:34:46	2.125	
	16:28:46	1.375	
	16:35:40	1.000	
	16:36:35	0.875	
	19:00:00	1.000	
January 28, 1998	07:42:0	5.750	
	17:33:20	3.250	
	17:35:40	1.875	

Table 3-4
Phase Separated Hydrocarbon Thickness
12/18/97

Monitor Well	Product Thickness (feet)
3	2.60
5	0.26
6	5.60
9	0.43
2-6	0.41
2-9	3.78
2-10	4.77
2-11	0.44
2-12	0.49
2-13	0.06
2-15	2.60
3-2	1.38



Natural Attenuation of Dissolved Phase

We do not believe that restoration of ground water at the plant site is warranted. We also maintain that New Mexico Water Quality Control Commission regulations do not apply to this private water created by the plant site. The activities at the plant created the observed ground water. The lining of the evaporation pond, repair of pipe leaks and other environmental protection measures implemented during the past 10 to 20 years have decreased the flux of water from the plant to the subsurface. Over time the ground water beneath the site will dissipate as a result of these process changes. Over time the observed hydrocarbons will volatilize or biodegrade. The addition of water to the subsurface via on site leach fields will only speed natural biodegradation of petroleum hydrocarbons. We believe that the subsurface data clearly show that the ground water beneath the plant site will improve.

Nevertheless, as a voluntary action, ARCO proposes natural attenuation as an effective mechanism to ensure that the plant complies with the standards set forth in the WQCC regulations. Table 5 shows the dissolved oxygen content of selected wells and presents analytical data on micronutrients. In our opinion, sufficient oxygen and other electron acceptors are present to facilitate natural remediation through metabolism of petroleum hydrocarbons by indigenous microorganisms.

We see that several ground water wells which are adjacent to observed PSH meet WQCC ground water standards. Monitor well 8, for example, indicates benzene at < 1 ppb. Yet this well is only 90 feet from Well 2-15—a well with 1 foot of PSH. The screen for monitor well 8 is slightly below the potentiometric surface, possibly explaining why PSH is not observed in this well. Monitor well 8 is also down gradient from PSH in several other wells. The fact that monitor well 8 meets WQCC standards despite proximity to petroleum hydrocarbons suggests active natural bioremediation at the plant site. This well and others also show a decline in hydrocarbon concentration from 1996 to 1997. This could be a result of natural attenuation. Our proposed semi-annual sampling event of monitor wells 2 and 8 may confirm this conclusion.

Table 6 summarizes the most recent sampling event in December 1997. Samples were analyzed for BTEX and TDS. We believe the high TDS concentrations for monitor well 2-2 and 2-5 is a result of the water softener leak which would be high in cations and anions. The leak was repaired in the late 1980's or early 1990's.

We conclude that such natural restoration is an effective method to ensure compliance with the mandates set forth in the WQCC regulations.

Table 4-5
1998 Dissolved Oxygen and Micronutrients Results

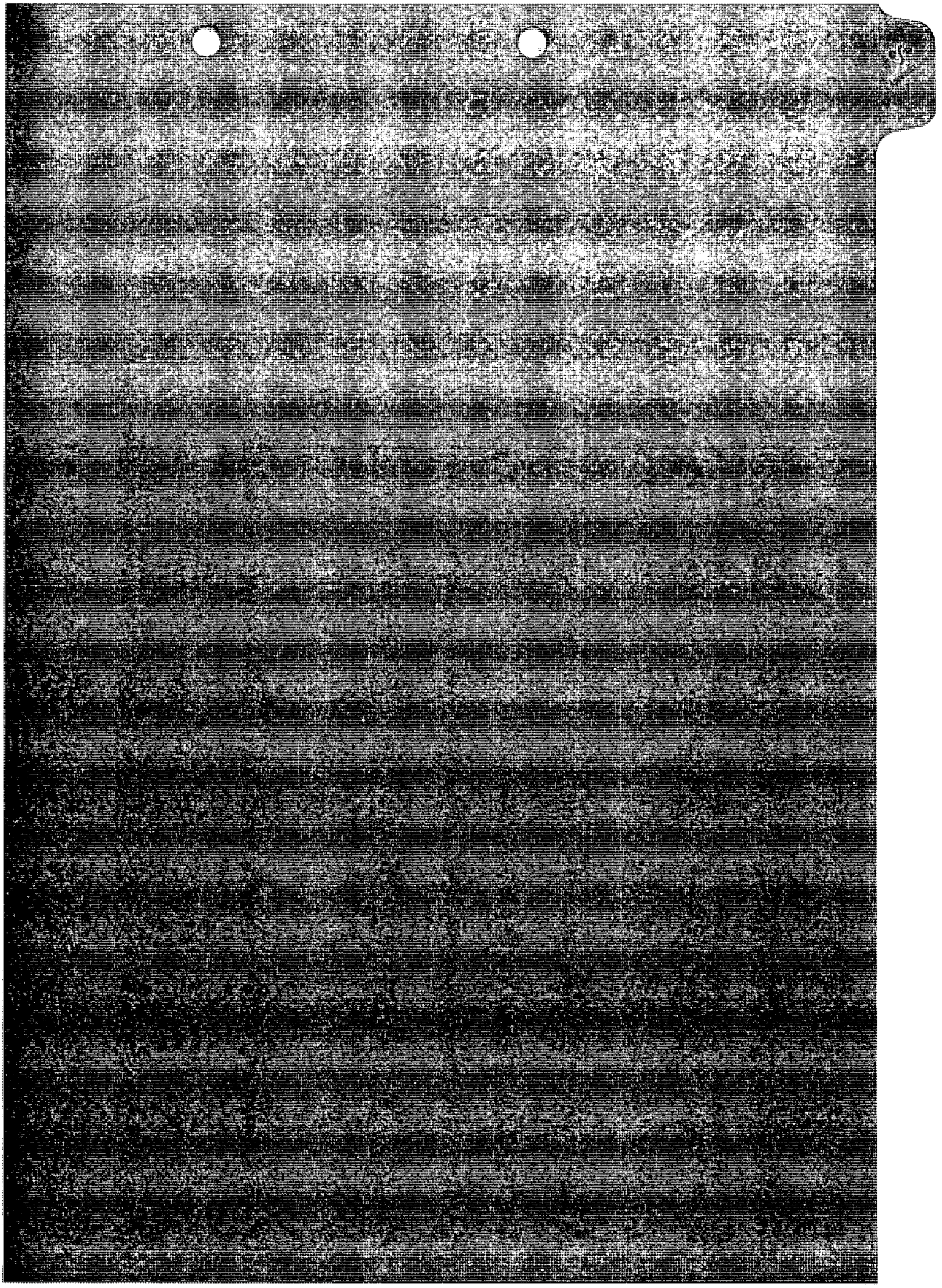
Sample Number	Sample Date	Units	Hydro carbon Degraders	Total Hetrotrophs	Amm-onia	o-Phos-phate	Nitrate	Sulfate	pH	DO
MW 2	January 1998	cfu/mL mg/L	1500	4800	0.4	0.5	3.2	99	7	7.9
MW 2-16	January 1998	cfu/mL mg/L	3800	400000	9.3	0.4	ND	105	7	8.1

ND = Not Detected
DO = Dissolved Oxygen

Table 4-6
1996, 1997 and 1998 Ground Water Sampling Results

Sample Number	Sample Date	Units	Benzene	Toluene	Ethylbenzene	Xylene	TDS mg/L
MW 2	July 1996	mg/L	0.198	0.283	0.235	0.461	
	December 1997	mg/L	<0.001	<0.001	<0.001	<0.001	3100
MW 8	July 1996	mg/L	0.728	0.554	0.970	2.340	
	December 1997	mg/L	<0.001	<0.001	<0.001	<0.001	3370
MW 2-2	July 1996	mg/L	<0.01	<0.01	<0.01	<0.01	
	December 1997	mg/L	0.001	<0.001	<0.001	<0.001	555000
MW 2-3	July 1996	mg/L	0.229	0.163	0.150	0.306	
	December 1997	mg/L	<0.001	<0.001	<0.001	<0.001	3180
MW 2-4	July 1996	mg/L	1.79	0.360	0.230	0.37	
	December 1997	mg/L	0.21	<0.005 *	0.0091	<0.005 *	
MW 2-5	July 1996	mg/L	<0.01	<0.01	<0.01	<0.01	
	December 1997	mg/L	0.0011	<0.001	<0.001	<0.001	567000
MW 2-16	July 1996	mg/L	0.080	0.106	0.134	0.330	
	December 1997	mg/L	0.004	<0.001	<0.001	<0.001	3540
	January 1998	mg/L	0.005	0.011	0.007	0.003	
MW 3-4	July 1996	mg/L	0.157	0.109	0.117	0.221	
	December 1997	mg/L	<0.001	<0.001	<0.001	<0.001	3120

*<0.005 = 5 times dilution factor



CytoCulture
ENVIRONMENTAL
BIOTECHNOLOGY
CytoCulture International, Inc. 1986

February 12, 1998

Client: Environmental Services, Inc.
Contact: Melinda Hunt
Client Code: Lab-ESI

Project Description: Empire ABO gas plant
Fax: 505-266-7738

SAMPLES: Two water samples in 500 ml bottles were received on 1/30/98. The samples were stored at 4°C until assayed.

Hydrocarbon-Degrading and Total Heterotrophic Bacteria Enumeration Assays

ANALYSIS REQUEST: Bacterial enumeration for total petroleum hydrocarbon-degraders (broad range petroleum hydrocarbons: diesel/gasoline, and waste oil) and total heterotrophs.

CARBON SOURCE: Petroleum hydrocarbons were added as the sole carbon and energy sources for the growth of hydrocarbon-degrading aerobic bacteria on agar plates. Gasoline (Chevron Reg.) was added to the lids to provide petroleum hydrocarbon vapors. Diesel (Chevron #2) and motor oil were blended in a 50:50 ratio and dissolved into the agar to provide additional aliphatic hydrocarbons in the growth matrix. Heterotrophic bacteria plates were prepared with Difco Total Plate Count Agar providing a wide range of amino acid and carbohydrate carbon sources.

PROTOCOLS:

Hydrocarbon Degraders: Sterile agar plates (100 x 15 mm) were prepared with minimal salts medium at pH 6.8 with 1.5% noble agar, without any other carbon sources or nutrients added. A 200 µl aliquot of pasteurized gasoline was added to absorbent paper in the plate lids to provide the vapor source of light fraction hydrocarbons. Plates were inoculated with 1.0 ml of sample or a log dilution of each water sample. Triplicate plates were inoculated with sample log dilutions of 10^{0}, 10^{-1}, and 10^{-2}. The hydrocarbon plates were poured on 2/4/98 and counted after 7 days on 2/11/98. The plate count data are reported as colony forming units (**cfu**) per milliliter (**ml**) of sample. Each bacteria population value represents a statistical average of the plate count data obtained with inoculations for two of the three log dilutions tested.

***Heterotrophs*:** Sterile agar plates (100 x 15 mm) were prepared with minimal salts medium and 2.35% plate count agar at pH 6.8 without other carbon sources or nutrients added. Plates were inoculated with 1.0 ml of water sample, or a log dilution of the sample, in triplicate at sample dilutions of 10^{-1}, 10^{-2}, and 10^{-3}. The heterotroph plates were poured on 2/4/98 and counted after 7 days on 2/11/98. The plate count data are reported as colony forming units (**cfu**) per milliliter (**ml**) for each water sample. Each enumeration value represents a statistical average of two of the three log dilutions inoculated in plates.

Vox 510·233·0102 Fax 510·233·3777 Email: Cyto@CytoCulture.com
249 Tewksbury Avenue Point Richmond California 94801·3829 USA

Hydrocarbon-Degrading and Heterotrophic Bacteria Enumeration Results

CLIENT SAMPLE NUMBER	SAMPLE DATE	HYDROCARBON DEGRADERS (cfu/ml)	TOTAL HETEROTROPHS (CFU/ML)
MW-2	1/27/98	1.5×10^3	4.8×10^3
ABO 2-16	1/28/98	3.8×10^3	4.0×10^5

NUTRIENT ASSAYS

ANALYSIS REQUEST: Nutrient assays for nitrogen as ammonia and phosphorus as ortho-phosphate, nitrogen as nitrate, and total sulfate.

PROTOCOL: Spectrophotometric assays were performed to determine the concentrations of ammonia-nitrogen, ortho-phosphate, nitrate-nitrogen, and sulfate. The assays follow EPA manual colorimetric protocols using precalibrated reagents and a Gilford 240 spectrophotometer. All assays conform to California CLP and Standard Water & Wastewater Methods.

Client Sample	Sample Date	Ammonia N (mg/L)	o-Phosphate (mg/L)	Nitrate N (mg/L)	Sulfate (mg/L)
MW-2	1/27/98	0.4	0.5	3.2	99
ABO 2-16	1/28/98	9.3	0.4	ND	105

0.1 mg/L represents the lowest detection level for ammonia, o-phosphate and nitrate assays. ND = Not Detected

Note: Low levels of ammonia nitrogen and nitrate nitrogen would inhibit the growth of hydrocarbon-degrading bacteria in groundwater containing high concentrations of dissolved phase petroleum hydrocarbons. Nitrate can provide nitrogen and alternative electron acceptor source in low oxygen environments. O-phosphate levels are also marginal. The higher concentrations of sulfate could serve as alternate electron acceptors to support biodegradation activity in low oxygen environments. Groundwater can be enhanced with nutrient supplements. Contact CytoCulture for technical assistance regarding site bioremediation strategies and protocols.

Dissolved Oxygen and pH

ANALYSIS REQUEST: Analysis for dissolved oxygen and pH for water samples.

PROTOCOL: The pH levels of the water samples were measured with a Corning digital pH meter and reported as the mean of triplicate values. The dissolved oxygen levels of the water samples were measured with a YSI analog DO meter and reported as the mean of duplicate values. All assays conform to California CLP and Standard Water & Wastewater analytical method specifications. pH and DO were measured on 2/3/98.

Client Sample	Sample Date	pH	DO (mg/L)
MW-2	1/27/98	7.15	7.9
ABO 2-16	1/28/98	7.60	8.1

The high dissolved oxygen levels could be an artifact of sampling or indicate adequate oxygenation exists to support the biodegradation activity. The pH levels, particularly in sample ABO 2-16, are slightly above optimal levels for the growth of hydrocarbon-degrading bacteria typically found in contaminated groundwater.

Bacterial enumerations, nutrient assays, pH and DO measurements were performed by Dr. Sean P. Bushart. CytoCulture is available on a consulting basis to assist in the interpretation of these data and their application to field remediation protocols.

Sean P. Bushart, Ph.D.
Laboratory Services

Randall von Wedel, Ph.D.
Principal, Director of Research

c:\Cytolab\Lab Report\lab-ESI\2/12/98

ASSAIGAI ANALYTICAL LABORATORIES, INC.
7300 Jefferson, N.E. • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259
3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820

ENVIRONMENTAL SERVICES, INC.
attn: ROBIN DELAPP
4665 INDIAN SCHOOL NE STE
ALBQ., NM. 87110

* explanation of codes	
B	Analyte detected in Method Blank
E	Result is estimated
M	See explanatory memo

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: **ENVIRONMENTAL SERVICES, INC.**
Project: **9712191 EMPIRE ABO ARCO**

Wm. P. Biava

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: **E. ABO 2-16** Sample Matrix: **WATER GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			EPA 160 series						
12/18/97	9712191-01A	WTDS-436	Total Dissolved Solids	3540	mg / L	10		MT.1997.514 - 4	12/23/97
			SW846-8020 Volatiles						
12/18/97	9712191-01B	X97482	Benzene	4.5	ug / L	1		XG.1997.392 - 8	12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1		XG.1997.392 - 8	
		X97482	o-Xylene	< 1.0	ug / L	1		XG.1997.392 - 8	
		X97482	p/m Xylenes	7.2	ug / L	2		XG.1997.392 - 8	
		X97482	Toluene	< 1.0	ug / L	1		XG.1997.392 - 8	

Client Sample ID: **E ABO 2-5** Sample Matrix: **WATER GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			EPA 160 series						
12/18/97	9712191-02A	WTDS-438	Total Dissolved Solids	567,000	mg / L	10	E	MT.1997.544 - 4	12/30/97
			EPA-200 series AA-FL						
12/18/97	9712191-02B	M97930	Calcium	717	mg / L	1		MW.1998.18 - 14	01/06/98
		M97930	Iron	< 0.05	mg / L	0.05		MW.1998.8 - 12	01/05/98
		M97930	Magnesium	122	mg / L	1		MW.1998.19 - 14	01/06/98
		M97930	Potassium	9.1	mg / L	1		MW.1998.17 - 15	
		M97930	Sodium	24200	mg / L	1		MW.1998.9 - 12	01/05/98
			EPA-300.0 anions						
12/18/97	9712191-02B	W97556	Bromide	< 25.0	mg / L	0.5		MW.1998.5 - 22	12/26/97
		W97556	Chloride	14000	mg / L	0.5		MW.1998.5 - 11	
		W97556	Fluoride	< 25.0	mg / L	0.5		MW.1998.5 - 22	
		W97556	Nitrate, Nitrogen	< 10.0	mg N/ L	0.2	E	MW.1998.5 - 22	
		W97556	Nitrite, Nitrogen	11.0	mg N/ L	0.2	E	MW.1998.5 - 22	
		W97556	Phosphate	< 20.0	mg P/ L	0.4	E	MW.1998.5 - 22	
		W97556	Sulfate	234000	mg / L	0.5		MW.1998.5 - 24	

Certificate of Analysis

Client: **ENVIRONMENTAL SERVICES, INC.**

Project: **9712191 EMPIRE ABO ARCO**

			SW846-8020 Volatiles							
12/18/97	9712191-02C	X97494	Benzene	1.1	ug / L	1		XG.1997.394 - 4	12/30/97
		X97494	Ethylbenzene	< 1.0	ug / L	1		XG.1997.394 - 4	
		X97494	o-Xylene	< 1.0	ug / L	1		XG.1997.394 - 4	
		X97494	p/m Xylenes	< 2.0	ug / L	2		XG.1997.394 - 4	
		X97494	Toluene	< 1.0	ug / L	1		XG.1997.394 - 4	

Client Sample ID: **E ABO 3-4** Sample Matrix: **WATER_GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			EPA-160 series						
12/18/97	9712191-03A	WTDS-436	Total Dissolved Solids	3120	mg / L	10		MT.1997.514 - 5	12/23/97
			EPA-200 series AA-FL						
12/18/97	9712191-03B	M97930	Calcium	733	mg / L	1		MW.1998.18 - 15	01/06/98
		M97930	Iron	< 0.05	mg / L	0.05		MW.1998.8 - 13	01/05/98
		M97930	Magnesium	123	mg / L	1		MW.1998.19 - 15	01/06/98
		M97930	Potassium	4.2	mg / L	1		MW.1998.17 - 16	
		M97930	Sodium	85.4	mg / L	1		MW.1998.9 - 13	01/05/98
			EPA-300.0 anions						
12/18/97	9712191-03B	W97556	Bromide	< 0.5	mg / L	0.5		MW.1998.5 - 7	12/26/97
		W97556	Chloride	126	mg / L	0.5		MW.1998.5 - 9	
		W97556	Fluoride	0.6	mg / L	0.5		MW.1998.5 - 7	
		W97556	Nitrate, Nitrogen	0.5	mg N/ L	0.2	E	MW.1998.5 - 7	
		W97556	Nitrite, Nitrogen	< 0.2	mg N/ L	0.2	E	MW.1998.5 - 7	
		W97556	Phosphate	< 0.4	mg P/ L	0.4	E	MW.1998.5 - 7	
		W97556	Sulfate	1800	mg / L	0.5		MW.1998.5 - 9	
			SW846-8020 Volatiles						
12/18/97	9712191-03C	X97482	Benzene	< 1.0	ug / L	1		XG.1997.392 - 9	12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1		XG.1997.392 - 9	
		X97482	o-Xylene	< 1.0	ug / L	1		XG.1997.392 - 9	
		X97482	p/m Xylenes	< 2.0	ug / L	2		XG.1997.392 - 9	
		X97482	Toluene	< 1.0	ug / L	1		XG.1997.392 - 9	

Client Sample ID: **E ABO 2-4** Sample Matrix: **WATER_GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			SW846-8020 Volatiles						
12/18/97	9712191-04A	X97482	Benzene	210	ug / L	1		XG.1997.392 - 10	12/29/97
		X97482	Ethylbenzene	9.1	ug / L	1		XG.1997.392 - 14	12/30/97
		X97482	o-Xylene	< 5.0	ug / L	1		XG.1997.392 - 14	
		X97482	p/m Xylenes	< 10	ug / L	2		XG.1997.392 - 14	
		X97482	Toluene	< 5.0	ug / L	1		XG.1997.392 - 14	

Client Sample ID: **E ABO #8** Sample Matrix: **WATER_GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			EPA-160 series						
12/18/97	9712191-05A	WTDS-436	Total Dissolved Solids	3370	mg / L	10		MT.1997.514 - 6	12/23/97
			EPA-200 series AA-FL						
12/18/97	9712191-05B	M97930	Calcium	622	mg / L	1		MW.1998.18 - 16	01/06/98

12/18/97	9712191-05B	M97930	Iron	< 0.05	mg / L	0.05		MW.1998.8 - 14	01/05/98
		M97930	Magnesium	107	mg / L	1		MW.1998.19 - 16	01/06/98
		M97930	Potassium	4.4	mg / L	1		MW.1998.17 - 17	
		M97930	Sodium	300	mg / L	1		MW.1998.9 - 14	01/05/98
			EPA-300.0 anions						
12/18/97	9712191-05B	W97556	Bromide	< 0.5	mg / L	0.5		MW.1998.5 - 8	12/26/97
		W97556	Chloride	224	mg / L	0.5		MW.1998.5 - 10	
		W97556	Fluoride	< 0.5	mg / L	0.5		MW.1998.5 - 8	
		W97556	Nitrate, Nitrogen	< 0.2	mg N/ L	0.2	E	MW.1998.5 - 8	
		W97556	Nitrite, Nitrogen	< 0.2	mg N/ L	0.2	E	MW.1998.5 - 8	
		W97556	Phosphate	< 0.4	mg P/ L	0.4	E	MW.1998.5 - 8	
		W97556	Sulfate	1540	mg / L	0.5		MW.1998.5 - 10	
			SW846-8020 Volatiles						
12/18/97	9712191-05C	X97482	Benzene	< 1.0	ug / L	1		XG.1997.392 - 11	12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1		XG.1997.392 - 11	
		X97482	o-Xylene	< 1.0	ug / L	1		XG.1997.392 - 11	
		X97482	p/m Xylenes	< 2.0	ug / L	2		XG.1997.392 - 11	
		X97482	Toluene	< 1.0	ug / L	1		XG.1997.392 - 11	

Client Sample ID: **E ABO 2-3** Sample Matrix: **WATER_GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			EPA-160 series						
12/18/97	9712191-06A	WTDS-436	Total Dissolved Solids	3180	mg / L	10		MT.1997.514 - 7	12/23/97
			SW846-8020 Volatiles						
12/18/97	9712191-06B	X97482	Benzene	< 1.0	ug / L	1		XG.1997.392 - 12	12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1		XG.1997.392 - 12	
		X97482	o-Xylene	< 1.0	ug / L	1		XG.1997.392 - 12	
		X97482	p/m Xylenes	< 2.0	ug / L	2		XG.1997.392 - 12	
		X97482	Toluene	< 1.0	ug / L	1		XG.1997.392 - 12	

Client Sample ID: **E ABO #2** Sample Matrix: **WATER_GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			EPA-160 series						
12/18/97	9712191-07A	WTDS-436	Total Dissolved Solids	3100	mg / L	10		MT.1997.514 - 8	12/23/97
			SW846-8020 Volatiles						
12/18/97	9712191-07B	X97482	Benzene	< 1.0	ug / L	1		XG.1997.392 - 13	12/29/97
		X97482	Ethylbenzene	< 1.0	ug / L	1		XG.1997.392 - 13	
		X97482	o-Xylene	< 1.0	ug / L	1		XG.1997.392 - 13	
		X97482	p/m Xylenes	< 2.0	ug / L	2		XG.1997.392 - 13	
		X97482	Toluene	< 1.0	ug / L	1		XG.1997.392 - 13	

Client Sample ID: **E ABO 2-2** Sample Matrix: **WATER_GRAB**

Collect	Fraction	QC Group	Analyte	Result	Units	Limit	*	Run Group - #	Run Date
			EPA-160 series						
12/18/97	9712191-08A	WTDS-438	Total Dissolved Solids	555,000	mg / L	10	E	MT.1997.544 - 6	12/30/97
			SW846-8020 Volatiles						
12/18/97	9712191-08B	X97494	Benzene	1.0	ug / L	1		XG.1997.394 - 5	12/30/97

Certificate of Analysis

Client: **ENVIRONMENTAL SERVICES, INC.**

Project: **9712191 EMPIRE ABO ARCO**

12/18/97	9712191-08B	X97494	Ethylbenzene	< 1.0	ug / L	1		XG.1997.394 - 5	12/30/97
		X97494	o-Xylene	< 1.0	ug / L	1		XG.1997.394 - 5	
		X97494	p/m Xylenes	< 2.0	ug / L	2		XG.1997.394 - 5	
		X97494	Toluene	< 1.0	ug / L	1		XG.1997.394 - 5	

ASSAIGAI ANALYTICAL LABORATORIES, INC.
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3332 Wedgewood, E-5 • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820

* explanation of codes	
B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

ENVIRONMENTAL SERVICES, INC.
attn: ROBIN DELAPP
4665 INDIAN SCHOOL NE STE 106
ALBQ., NM. 87110

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: ENVIRONMENTAL SERVICES, INC.
Project: 9801251 ARCO PERMIAN

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: ***MW2-16 9801281801*** Sample Matrix: ***WATER*** Sample Collected: ***01/28/98 18:01:00***

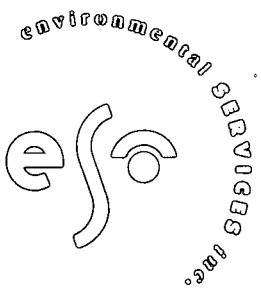
Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			SW846-8020 Volatiles							
9801251-01A	X9873	71-43-2	Benzene	4.9	ug / L	1	1		XG.1998.100-4	02/10/98
	X9873	100-41-4	Ethylbenzene	7.0	ug / L	1	1		XG.1998.100-4	
	X9873	95-47-6	o-Xylene	3.4	ug / L	1	1		XG.1998.100-4	
	X9873		p/m Xylenes	11	ug / L	1	2		XG.1998.100-4	
	X9873	108-88-3	Toluene	11	ug / L	1	1		XG.1998.100-4	

*** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ***

	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well
	2-15	8	6	2-13	2-9	7	2-14	9	3-1	2-7	2	2-2
Controller For Wells					2-9, 2-15, 6, & 2-13.			9 & 3-1.				
Product Depth	62.88	0.00	40.15	43.00	35.25	0.00	0.00	59.21	0.00	0.00	0.00	0.00
Water Depth	65.48	68.75	45.75	43.06	39.03	8.27	61.98	59.64	60.16	0.00	33.86	26.88
Well Depth	73.56	82.05	53.37	49.20	42.23	26.40	76.25	73.54	72.80	60.75	37.52	48.62
Cable Type	Shielded	Shielded	Shielded	Shielded	Shielded	NONE	NONE	Shielded	NONE		Shielded	Shielded
Pump Type	2SK2	Grundfos 2"	2SK2	2SK2	2SK2	Gladiator (Side Fill).	Gladiator (Top Fill).	2SK2	2SK2	NONE.	Grundfos 2"	Grundfos 2"
Liquid Disposal	Slop Oil Tank	Portable Trailer	Slop Oil Tank	Slop Oil Tank	Slop Oil Tank	Open Drain System.	Slop Oil Tank	Slop Oil Tank	Slop Oil Tank		Portable Trailer	Portable Trailer
Well Location	East of the flare sump pumps.	South of the flare sump pumps.	North-west of the #9 cooler gas fans.	South-west of the fire hose drying rack.	South of the #2 amine overhead cooler fans.	North of the Bulk Gas Dehydrators	North-west of the flares.	North-west of the flares.	North-west of the flares.	South-east of the process drain tanks.	West of the sulfur storage tank.	South-east of the fire pump building.
Air Supply Shut Off	Pipe rack north-east of the flare sump pumps.	Electric. **(Also has piping for pneumatic operation).**	Pipe rack south of the monitor well.	Pipe rack west of the monitor well.	Pipe rack west of the monitor well.	North-east corner of the #1 amine cooler fan.	North-west of the North flare drain drum.	North-west of the North flare drain drum.	North-west of the North flare drain drum.	NONE.	Electric.	Electric.
Comment	Pump O.K. and in service.	Electric (Not Tested). Also has piping for pneumatic operation.	Pump O.K. and in service.	Pump O.K. and in service.	Pump O.K. and in service.	Pump O.K. and in service.	Pump O.K. and in service.	Pump O.K. and in service.	Pump O.K. and in service.	Does not have a pump or piping for pneumatic operation.	Electric (Not Tested).	Electric (Not Tested).

	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Monitor Well
	3-3	2-18	2-4	2-11	2-6	3	4	2-10	5	2-12	3-2	2-16
Controller For Wells				2-11 & 3-3.	2-6 & 3.		4	2-10			3-2	
Product Depth	0.00	0.00	0.00	21.99	21.81	77.42	0.00	68.98	69.08	69.75	69.72	0.00
Water Depth	73.46	22.71	52.69	22.43	22.22	77.02	56.84	73.75	69.34	70.24	71.10	69.39
Well Depth	82.21	38.35	58.80	23.32	23.97	91.46	60.60	77.50	92.50	82.96	102.00	82.51
Cable Type	Shielded	None	None	Shielded	Shielded	Shielded	Shielded	Shielded	Shielded	Galvanized	Shielded	Shielded
Pump Type	2SK2	Gladiator (Top Fill).	Grundfos 2"	2SK2	2SK2	2SK2	2SK2	2SK2	Gladiator (Top Fill).	Gladiator (Top Fill).	2SK2	Gladiator (Top Fill).
Liquid Disposal	Slop Oil Tank	Slop Oil Tank	Portable Trailer	Slop Oil Tank	Slop Oil Tank	Slop Oil Tank	Slop Oil Tank From 1,2,3 Comp.	Slop Oil Tank From 6,7,8 Comp.	Slop Oil Tank	Slop Oil Tank	Slop Oil Tank	Slop Oil Tank
Well Location	South-east of the Y-Grade skid.	South-west of the Y-Grade skid.	North-east of #9 propane storage tank.	South of the tank farm earthen contain-ment.	West of the #1 gasoline storage tank.	South-east of the paint/ insulation building.	East of #4 jacket water cooler fan.	East of #7 jacket water cooler fans.	South-east of the cryo compressor jacket water cooler fans.	North-west of the slop oil tanks.	North-east of the welding shop.	South-east of #9 J.W. Tank.
Air Supply Shut Off	South of the tank farm next to the collection line.	South of the tank farm next to the collection line.	Electric.	South of the tank farm next to the collection line.	Pipe rack west of the #1 gasoline tank.	Pipe rack east of the E.P. Filter.	South-west of the #5 jacket water pump.	Line in on the Instrument Air Scrubber.	South-west corner of the cryo compressor jacket water	Pipe rack north-east of the slop oil tanks.	Pipe rack south of the #9 jacket water cooler fans.	South of the #9 inlet scrubber.
Comment	Pump O.K. and in service.	Does not pump and needs repair.	Electric (Not Tested).	Pump O.K. but the well was dry.	Pump O.K. but the well was dry.	Pump O.K. Well is >40' and may need an additional check valve	Pump O.K. and in service.	Pump questionable. Well is >40' and may need an additional check valve	Pump O.K. and in service.	Pump O.K. and in service.	Pump O.K. and in service.	Pump O.K. and in service.

	Monitor Well 2-3	Monitor Well 3-4	Monitor Well 2-5
Controller For Wells			
Product Depth	0.00	0.00	0.00
Water Depth	82.11	84.69	27.50
Well Depth	106.50	112.44	52.96
Cable Type			Shielded.
Pump Type	NONE.	NONE.	Grundfos 2"
Liquid Disposal			Portable Trailer
Well Location	South-west of the maintenance shop.	North-east of the maintenance shop.	West of the old process control building.
Air Supply Shut Off	NONE.	NONE.	Electric.
Comment	Does not have a pump or piping for pneumatic operation.	Does not have a pump or piping for pneumatic operation.	Electric (Not Tested).



4009 INDIAN SCHOOL NE
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NEW MEXICO
87110

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

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PS Form 3800, April 1995

March 5, 1998

CERTIFIED MAIL
RETURN RECEIPT NO. Z-357-869-939

Ms. Margaret J. Lowe
Environmental Engineer
ARCO Permian
P.O. Box 1610
Midland, TX 79702

RE: Cooling Tower Cleaning Waste
GW-022, Empire Abo Gas Plant
Eddy County, NM

Dear Ms. Lowe:

The New Mexico Oil Conservation Division (OCD) has received ARCO Permian's letter dated February 16, 1998 requesting that the OCD allow ARCO Permian to dispose of cooling tower solid waste materials at the Lea Land, Inc. Landfill facility. The OCD **hereby approves of the disposal of these non-hazardous wood and plastic materials (based on the TCLP that was submitted) at the Lea Land, Inc. Landfill facility.**

Note, that OCD approval does not relieve ARCO Permian of liability should ARCO Permian's operation's result in contamination of surface waters, ground waters or the environment. OCD approval does not relieve ARCO Permian from compliance with other federal, state, and local regulations/rules that may apply.

Sincerely,

Roger C. Anderson
Environmental Bureau Chief

RCA/wjf

cc: OCD Artesia District II

February 16, 1998

Mr. Roger Anderson
New Mexico Oil Conservation Division
2048 South Pacheco
Santa Fe, New Mexico 87505

Re: Empire Abo Gasoline Plant
Eddy County, New Mexico

Dear Mr. Anderson:

We performed maintenance on the Empire Abo Gas Plant cooling tower last year and would like to dispose of the wood and plastic fill that were cleaned out of the tower. Based on user knowledge, the only hazardous waste characterization testing that we had performed was TCLP for chromium. The use of chromium in the cooling tower was discontinued by Amoco in the 1970s. The TCLP results are attached. Because of the nature of a cooling tower, there should be no volatiles or semi-volatiles in the wood. In addition, we did not test for pesticides and the remaining metals because there is no source for these contaminants at the gas plant.

We request permission to dispose of approximately 15 cubic yards of wood and plastic fill from the Empire Abo Gasoline Plant cooling tower at the Lea Land, Inc. Landfill, Permit No. SWN-131401 located in Lea County, New Mexico. I have discussed this particular waste with them, and they have stated that they can take it with your approval.

We would appreciate your prompt response. If you have any questions, please contact me at (915) 688-5799.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc: R. McCollum/EAGP
SaraLyn Hall/Lea Land
File

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ARCO
ATTN: MARGARET LOWE
P.O. BOX 1610
MIDLAND, TX 79702
FAX TO: 915-688-5620

Receiving Date: 05/02/97
Reporting Date: 05/20/97
Project Number: NOT GIVEN
Project Name: COOLING TOWER
Project Location: EMPIRE ABO

Sampling Date: 05/01/97
Sample Type: SOLID
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: GP

TCLP METALS

LAB NUMBER	SAMPLE ID	As ppm	Ag ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm
ANALYSIS DATE:		05/09/97	05/08/97	05/08/97	05/08/97	05/08/97	05/08/97	05/20/97	05/09/97
EPA LIMITS:		5	5	100	1	5	5	0.2	1
H2938-1A	SCALE	<1	<1	<5	<0.1	<1	<1	<0.02	<0.1
H2938-1B	SCALE & BOARD	<1	<1	<5	<0.1	<1	<1	<0.02	<0.1
Quality Control		0.1098	0.930	4.930	1.032	1.060	2.040	0.0105	0.0980
True Value QC		0.1000	1.000	5.000	1.000	1.000	2.000	0.0100	0.1000
% Recovery		110	93	98	103	106	102	105	98
Relative Standard Deviation		7.4	0.1	1.3	1.5	3.9	1.8	0.9	4.9
METHODS: EPA 1311, 600/4-91/0		206.2	272.1	208.1	213.1	218.1	239.1	245.1	270.2

Chemist

5/20/97
Date

January 6, 1998

Mr. Roger Anderson
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Empire Abo Gasoline Plant

Dear Mr. Anderson:

ARCO Permian is pleased to submit this Environmental Site Assessment and Notice of Intent to Discharge for the above referenced site. You will note that the document meets all the criteria for submission as a discharge plan. We believe the site data demonstrate that a discharge plan is not required for this facility. The data show that natural groundwater does not exist beneath the plant site and that the water beneath the plant site is an isolated "mound" of groundwater caused by discharges from plant operations over the years.

This notice of intent presents our plan for land application for certain discharge streams. The US Department of Agriculture has recommended the planting of alkali sacoton. Alkali sacoton is a salt tolerant grass that should grow well under the proposed conditions. It also is a good source of protein for the cattle that graze in this area. ARCO proposes to plant a cover crop in the spring to allow the irrigated area to be developed and will plant the sacoton during the recommended planting time of August through September.

The proposed irrigation sites are owned either by the State of New Mexico or are deeded to Bogle Farms, Ltd. The state land surface is leased by Bogle Farms. ARCO Permian and Bogle Farms have applied to the State Land Office for permission to irrigate the area outlined in the notice of intent.

We appreciate your review of our notice of intent to discharge. Upon your concurrence that a discharge plan is not required for this site, we will allow the existing discharge plan for the site to expire. Amoco Production Company formerly owned the site and submitted the previously approved discharge plan.

We will be contacting you to determine if the proposed meeting date of January 22, 1998, at the Empire Abo Gasoline Plant will work with your schedule. As discussed in my letter of December 11, 1997, we would like to meet with you to discuss the existing groundwater recovery system and the proposed irrigation system.

If you have any questions, please contact me at (915) 688-5799.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc (with enclosures):
Bogle Farms, Ltd.
NM State Land Office
Elkhorn Operating Company
US Department of Agriculture
Environmental Services, Inc.
File

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

July 21, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-638

Ms. Margaret J. Lowe
Environmental Engineer
ARCO Permian
P.O. Box 1610
Midland, TX 79702

RE: Cooling Tower Cleaning Waste
GW-022, Empire Abo Gas Plant
Eddy County, NM

Dear Ms. Lowe:

The New Mexico Oil Conservation Division (OCD) has received ARCO Permian's letter dated July 14, 1997 requesting that the OCD allow ARCO Permian to spread cooling tower cleaning waste onsite. The OCD **hereby approves of the spreading of this non-hazardous sludge (based on the TCLP that was submitted) at the ARCO Permian Empire Abo plant facility within the facility fence, provided that the material is liquid free prior to surface spreading.**

Note, that OCD approval does not relieve ARCO Permian of liability should ARCO Permian's operation's result in contamination of surface waters, ground waters or the environment.OCD approval does not relieve ARCO Permian from compliance with other federal, state, and local regulations/rules that may apply.

Sincerely,

Roger C. Anderson
Environmental Bureau Chief

RCA/pws

c: OCD Artesia District II

P 326 936 638

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (See reverse)

Sent to	Arco Permian - Ms. Lowe
Street & Number	Empire Abo GW-
Post Office, State, & ZIP Code	Cooling Tower-waste App.
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, April 1995

April 12, 2000

Mr. Jack Ford
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Empire Abo Gasoline Plant
Discharge Plan (GW-022)

Dear Mr. Ford:

ARCO Permian is pleased to submit the accepted Attachment to the Discharge Plan Renewal GW-022 for the Empire Abo Gasoline Plant.

As we discussed, the requirement for impermeable pad and curb type containment (requirement number 7) does not apply to the product tanks (propane, butane, Y grade gasoline).

Requirement number 10 requires testing of all underground process/ wastewater pipelines by December 31, 1999. In our conversation on March 1, 2000, we discussed our scheduling difficulties and agreed that the required underground piping would be tested no later than May 31, 2000. We will notify you at least 72 days in advance of the testing as required.

Spill/release reporting will be reported in accordance with OCD Rule 116 and WQCC 1203 to the OCD Artesia District Office (requirement number 13).

If you have any questions regarding this application, please contact me at (915) 688-5799 or email me at mlowe@mail.arco.com.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc: R. McCollum/EAGP
File 43A3d

ATTACHMENT TO THE DISCHARGE PLAN RENEWAL GW-022
ARCO PERMIAN
EMPIRE ABO GAS PLANT
DISCHARGE PLAN APPROVAL CONDITIONS
(December 13, 1999)

1. Payment of Discharge Plan Fees: The $50.00 filing fee has been received by the OCD. There is a required flat fee equal to one-half of the original flat fee for natural gas plants. The renewal flat fee required for this facility is $1,667.50 which may be paid in a single payment due at the time of approval, or in equal annual installments over the duration of the discharge plan, with the first payment due upon receipt of this approval.

2. ARCO Permian Commitments: ARCO Permian will abide by all commitments submitted in the discharge plan renewal application dated August 17, 1999 and these conditions for approval.

3. Waste Disposal: All wastes will be disposed of at an OCD approved facility. Only oilfield exempt wastes shall be disposed of down Class II injection wells. Non-exempt oilfield wastes that are non-hazardous may be disposed of at an OCD approved facility upon proper waste characterization per 40 CFR Part 261.

4. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums will be stored on their sides with the bungs in and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets will also be stored on an impermeable pad and curb type containment.

5. Process Areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.

6. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new tanks or existing tanks that undergo a major modification, as determined by the Division, must be placed within an impermeable bermed enclosure.

7. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.

8. Labeling: All tanks, drums and containers will be clearly labeled to identify their contents and other emergency notification information.

9. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least 72 hours prior to all testing.

10. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity no later than December 31, 1999 and every 5 years, from tested date, thereafter. The permittee may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to all testing.

11. Class V Wells: No Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be closed unless it can be demonstrated that groundwater will not be impacted in the reasonably foreseeable future. Leach fields and other wastewater disposal systems at OCD regulated facilities which inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.

12. Housekeeping: All systems designed for spill collection/prevention will be inspected weekly and after each storm event to ensure proper operation and to prevent overtopping or system failure. A record of inspections will be retained on site for a period of five years.

13. Spill Reporting: All spills/releases will be reported pursuant to OCD Rule 116 and WQCC 1203 to the OCD ~~Aztec~~ Artesia District Office.

14. Transfer of Discharge Plan: The OCD will be notified prior to any transfer of ownership, control, or possession of a facility with an approved discharge plan. A written commitment to comply with the terms and conditions of the previously approved discharge plan must be submitted by the purchaser and approved by the OCD prior to transfer.

15. Closure: The OCD will be notified when operations of the Empire Abo Gas Plant are discontinued for a period in excess of six months. Prior to closure of the Empire Abo Gas Plant a closure plan will be submitted for approval by the Director. Closure and waste disposal will be in accordance with the statutes, rules and regulations in effect at the time of closure.

16. Certification: ARCO Permian, by the officer whose signature appears below, accepts this permit and agrees to comply with all terms and conditions contained herein. ARCO Permian further acknowledges that these conditions and requirements of this permit may be changed administratively by the Division for good cause shown as necessary to protect fresh water, human health and the environment.

Accepted:

ARCO PERMIAN

by Thalia R Hobbs
Title
SENM Asset Manager

ARCO Permian
600 N Marienfeld
Midland TX 79701
Post Office Box 1610
Midland TX 79702
Telephone 915 688 5200

JUL - 1

June 24, 1999

Mr. Jack Ford
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Empire Abo Gasoline Plant

Dear Mr. Ford:

ARCO Permian is pleased to submit this annual report for the above referenced site. The annual groundwater monitoring results are included with this submission.

At this point, ARCO Permian does not plan to construct and operate the irrigation project as proposed and approved by the OCD. If economics and operational parameters change such that the irrigation project becomes feasible, ARCO Permian will notify you before start of construction.

If you have any questions, please contact me at (915) 688-5799.

Sincerely,

Margaret J. Lowe
Environmental Engineer

cc (with enclosures):
R. McCollum/EAGP
File

Environmental Services, Inc.

Memo

To: Margaret Lowe

From: Randall T. Hicks

CC: Salley Cudney

Date: April 6, 1999

Re: Empire Abo Gasoline Plant 1998 Annual Report

Groundwater and Separate Phase Hydrocarbon Elevations

Table 1 presents the results of the elevation survey conducted in December 1998. We included the results from the 1996 field campaign conducted by others as well as the December 1997 field program of ESI. We will e-mail the excel spreadsheet to Jack Ford upon your authorization to permit a more detailed analysis of the results by NMOCD.

If one evaluates the 1998 data in Table 1, the same uniform pattern emerges as described in the discharge plan renewal. A groundwater "mound" exists beneath the facility. Most of the wells show little change in fluid elevation since 1996 (see Table 2). Several measurements are noteworthy. In 1998, water levels rose more than 2 feet as compared to 1997, 1996 in:

MW 3, MW 6, MW-2-6 (1996 only)

In 1998, water levels dropped more than 2 feet as compared to 1997,1996 in:

MW-4 (1996 only), MW 8, MW 9, MW 2-10 (1997 only), MW 2-12, MW 2-13, MW 2-14, MW 2-15, MW 2-16 (1996 only), MW 3-1, MW 3-2 (1996 only),

With respect to separate phase hydrocarbon thickness (SPH), we observe minor changes. Wells that exhibited more than 1 foot of SPH in 1996 and 1997 continue to show more than 1 foot of SPH in 1998. Several wells did show changes in SPH

thickness (see Table 2). In 1998, SPH thickness increased by more than 1 foot as compared to 1997 and 1996 in:

MW 3, MW 6, MW 2-6 (1997 only), MW 2-10,

SPH thickness decreased by more than 1 foot as compared to 1997 and 1996 in:

MW 9, MW 2-12, MW 2-14, MW 2-15 (1997 only), MW 3-2 (1996 only)

Groundwater Chemistry

Table 3 presents the groundwater chemistry data. The discharge plan requires sampling and analysis of the following wells provided that separate phase hydrocarbon (SPH) is not evident in the well:

MW 2, MW 8, MW 2-8, MW 2-14, MW 2-15, MW3-2 and MW 3-3

In December 1998, three of these wells exhibited SPH: MW 2-14, MW 2-15 and MW 3-2. We did not sample these three wells. MW 2-8 is on facility maps, but does not exist on the ground. We obtained a sample from MW 3-1 as a replacement for MW 2-8.

Historic chemical analyses exist for MW 2, MW 8 and MW 3-1 Benzene concentration in all wells has decreased by several orders of magnitude since 1996.

Drive Point Installation

Near the proposed land application site, along Scoggins Draw, R.T. Hicks Consultants, Ltd. (under contract to ESI) installed two drive point wells. The purpose of these drive point wells is to monitor groundwater quality immediately down gradient from the proposed land application site. Mr. Jack Ford of NMOCD assisted in selecting the location for these monitoring points.

Both wells penetrate the unconsolidated alluvium near Scoggins Draw. The hand auger used to bore each hole for the drive point reached refusal at 8 feet below land surface. LA-MW 1, near the central portion of the proposed land application site, encountered groundwater in the boring at a depth of 4 feet. After installation of the well point and filter pack, the drive point was dry. We anticipate that the well will be capable of sampling after equilibration with groundwater.

LA-MW 2, installed south and west of the land application site did not encounter groundwater. This well may require a deeper boring in order to be useful for sampling. During construction of the land application site, we recommend installation of a deeper drive point at this location. A backhoe may be employed rather than a hand auger for a deeper well installation. However, groundwater may exist only in

the unconsolidated alluvium and not in the underlying mudstone/evaporite. Groundwater may not exist near LA-MW 2.

Well construction details are presented below. All measurements are in feet.

	Sec. T. R.	FNL	FWL	T D from TOC	Stick-up	Screen Interval	Lithologic Description
LA MW-1	21 T18S R27E	2500	2200	14.5	6	11-14	Buff to white sandy clay, saturated at 4 feet refusal at 8 feet
LA MW-2	21 T18S R27E	2750	1500	14.8	6.5	11-14	Buff to white sandy clay, refusal at 8.3 feet

Proposed 1999 Activities

The discharge plan requires a sampling event in June. If construction of the land application site is complete, we will also sample the two drive point monitoring wells along Scoggins Draw in June. At present, we understand that all wastewater discharge from the evaporation ponds flows directly into the Arco injection system identified in the Discharge Plan. Arco will construct the land application system only if the existing injection well system can no longer accept the discharge from the evaporation pond. We will sample the drive point monitor wells after Arco constructs the land application site and if Arco anticipates land application of evaporation pond fluid.

We plan the annual sampling program for late September 1999.

Table 1: Fluid Levels in Monitor Wells, Empire Abo Gasoline Plant

		12/4/98				12/18/97		11/18/96	
Well	TOC Elev. Ft. ASL	Depth to SPH (feet)	Depth to Water (feet)	SPH Thickness (feet)	Corr. WL Elev. Ft. ASL	SPH Thickness (feet)	Corr. WL Elev. Ft. ASL	SPH Thickness (feet)	Corr. WL Elev. Ft. ASL
2	3548.5	x	33.9	0	3514.6	0	3514.64	0	3514.88
3	3555.7	77	77.11	0.11	3478.502	2.92	3476.344	5.33	3473.836
4	3551.3	x	60.69	0	3490.61	0	#VALUE!	0	3494.46
5	3543.9	x	71.31	0	3472.59	0.26	3474.352	0.6	3473.63
6	3544.9	x	46.38	0	3498.52	5.6	3494.67	6.22	3494.414
7	3546.9	x	9.14	0	3537.76	0	3538.63	0	3538.12
8	3544.1	x	70.81	0	3473.29	0	3475.35	0	3476.05
9	3543.2	62.12	63.92	1.8	3477.84	0.43	3483.216	0.48	3483.796
2-2	3552.55	x	26.85	0	3525.7	0	3525.67	0	3525.63
2-3	3557.98	x	83.51	0	3474.47	0	3475.87	0	3475.66
2-4	3554.09	x	53.11	0	3500.98	0	3501.4	0	3501.57
2-5	3553	x	29.42	0	3523.58	0	3525.5	0	3525.5
2-6	3551.11	18.22	18.26	0.04	3532.818	1.07	3533.734	0.41	3528.562
2-7	3547.34	x	x	0	#VALUE!	0	#VALUE!	0	#VALUE!
2-9	3546.81	35.9	39	3.1	3505.33	3.78	3504.756	3.45	3505.3
2-10	3548.67	73	75.92	2.92	3470.414	4.3	3472.58	4.77	3471.104
2-11	3547.06	x	23.36	0	3523.7	0.44	3524.278	0	3523.85
2-12	3543.4	65.9	73.61	7.71	3463.622	0.49	3472.768	0	3470.44
2-13	3545.91	45.6	45.7	0.1	3500.13	0.06	3502.802	0.01	3503.422
2-14	3545.91	64.8	66.54	1.74	3477.978	0	3483.93	0	3484.57
2-15	3543.64	65.42	69.1	3.68	3471.596	2.6	3476.08	2.74	3476.008
2-16	3544.39	x	71.15	0	3473.24	0	3475	0	3475.25
2-18	3545.79	x	22.12	0	3523.67	0	3524.84	0	3523.08
3-1	3543.04	x	63	0	3480.04	0	3482.88	0.01	3484.572
3-2	3541.59	71.1	75.25	4.15	3463.02	4.79	3463.258	1.38	3469.386
3-3	3544.93	x	74.49	0	3470.44	0	3471.84	0	3471.47
3-4	3558.63	x	86.15	0	3472.48	0	3473.94	0	3473.54

VALUE indicates that the well was dry or non-existent

Table 2:Changes in Fluid Levels, Empire Abo Gasoline Plant

Well	Corrected Water Level Change 97 to 98	Corrected Water Level Change 96 to 98	SPH Thickness Change 97 to 98	SPH Thickness Change 96 to 98
2	-0.04	-0.28	0	0
3	2.158	4.666	2.81	5.22
4	#VALUE!	-3.85	0	0
5	-1.762	-1.04	0.26	0.6
6	3.85	4.106	5.6	6.22
7	-0.87	-0.36	0	0
8	-2.06	-2.76	0	0
9	-5.376	-5.956	-1.37	-1.32
2-2	0.03	0.07	0	0
2-3	-1.4	-1.19	0	0
2-4	-0.42	-0.59	0	0
2-5	-1.92	-1.92	0	0
2-6	-0.916	4.256	1.03	0.37
2-7	#VALUE!	#VALUE!	0	0
2-9	0.574	0.03	0.68	0.35
2-10	-2.166	-0.69	1.38	1.85
2-11	-0.578	-0.15	0.44	0
2-12	-9.146	-6.818	-7.22	-7.71
2-13	-2.672	-3.292	-0.04	-0.09
2-14	-5.952	-6.592	-1.74	-1.74
2-15	-4.484	-4.412	-1.08	-0.94
2-16	-1.76	-2.01	0	0
2-18	-1.17	0.59	0	0
3-1	-2.84	-4.532	0	0.01
3-2	-0.238	-6.366	0.64	-2.77
3-3	-1.4	-1.03	0	0
3-4	-1.46	-1.06	0	0

#VALUE indicates that the well was dry or non-existent
Measurements in feet

Table 3: Analytical Results, Empire Abo Gasoline Plant

Sample Number	Sample Date	Units	Benzene	Toluene	Ethylbenzene	Xylene O + P/M	TDS mg/L
MW 2	Jul-96	mg/L	0.198	0.283	0.235	0.461	
	Dec-97	mg/L	<0.001	<0.001	<0.001	<0.001	3100
	Dec-98	mg/L	0.027	0.0071	0.0057	2.2 + 8.4E-3	2850
MW 8	Jul-96	mg/L	0.728	0.554	0.97	2.34	
	Dec-97	mg/L	<0.001	<0.001	<0.001	<0.001	3370
	Dec-98	mg/L	0.0012	0.0011	0.0012	nd + 2.1E-3**	3480
MW 2-14	Jul-96	mg/L	0.039	0.046	0.103	0.222	
	Dec-98		SPH	SPH	SPH	SPH	SPH
MW 2-15	Jul-96		SPH	SPH	SPH	SPH	SPH
	Dec-98		SPH	SPH	SPH	SPH	SPH
MW 2-16	Jul-96	mg/L	0.08	0.106	0.134	0.33	
	Dec-97	mg/L	0.0045	<0.001	<0.001	<0.001	3540
	Jan-98	mg/L	0.0049	0.011	0.007	0.0034	
MW 3-1*	Jul-96	mg/L	0.252	0.075	0.122	0.29	
	Dec-98	mg/L	0.097	0.0026	0.0038	1.7 + 5.2E-3**	4150
MW 3-2	Dec-97		SPH	SPH	SPH	SPH	SPH
	Dec-98		SPH	SPH	SPH	SPH	SPH
MW-3-3	Jul-96		SPH	SPH	SPH	SPH	SPH
	Dec-98	mg/L	4.6	nd	nd	nd	2590

* Replaces MW 2-8

** Ortho and Para/Meta Xylene reported separately

environmental SERVICES INC.

March 25, 1998

Mr. Jack Ford
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: ARCO Permian, Empire Abo Gasoline Plant Discharge Plan

Dear Mr. Ford:

Per your request Environmental Services, Inc. (ESI), is providing a map with the new location of the proposed land application site. This map does not locate the fresh water pond in the area, but ARCO Permian is in the process of having a survey done that will include the location of the fresh water pond. ESI will send in the survey map once it is complete.

If you require any additional information for approval of our land application proposal, please call me immediately. We would like to maintain our schedule to permit planting in the early spring.

Sincerely,

Melinda G. Hunt

cc (with enclosures):
Margaret Lowe, ARCO Permian
Randy McCollum, Elkhorn Operating Company
Lewis Derrick, Bogle Farms Ltd.
Don Alam, U.S. Department of Agriculture
OCD Artesia Office

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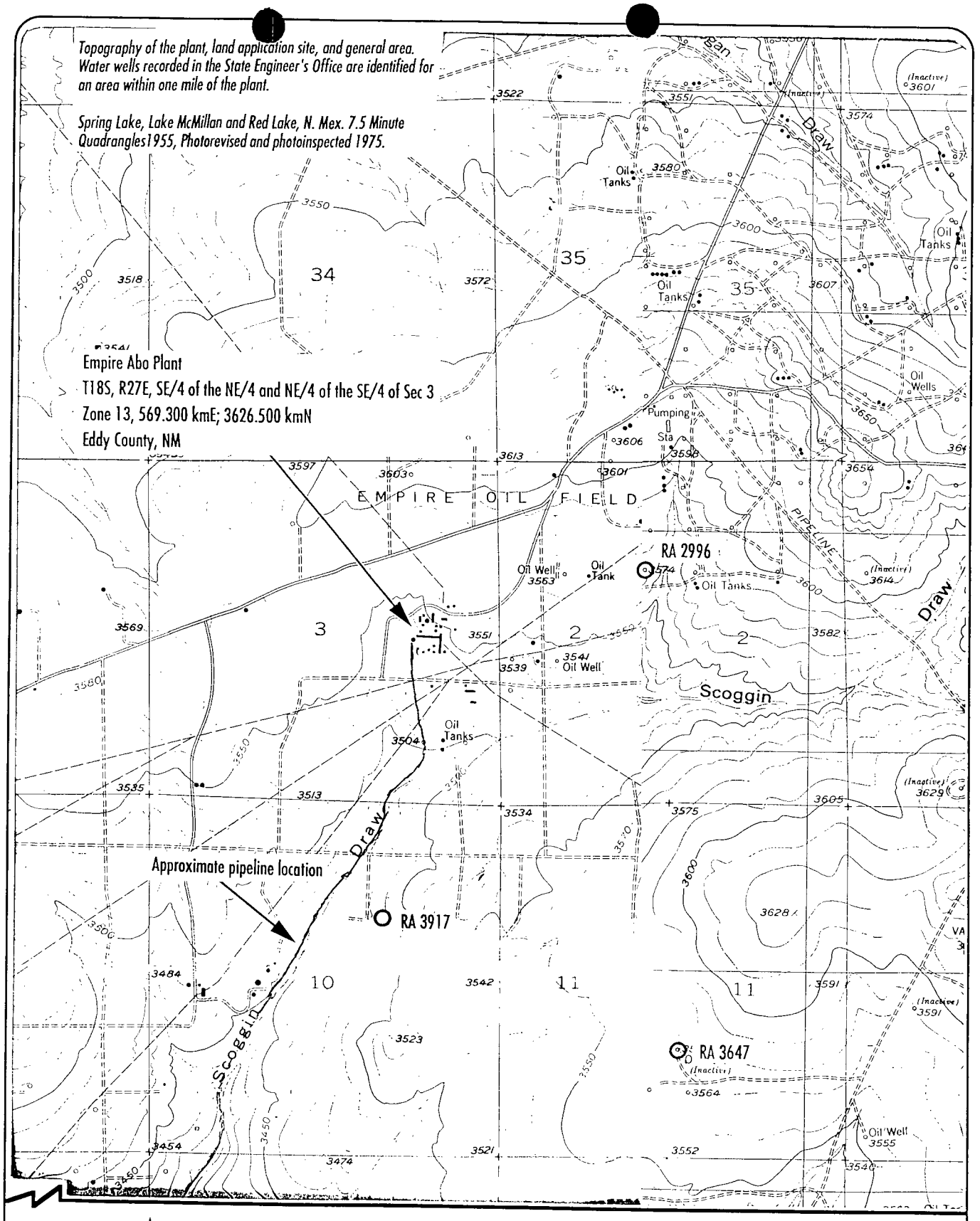
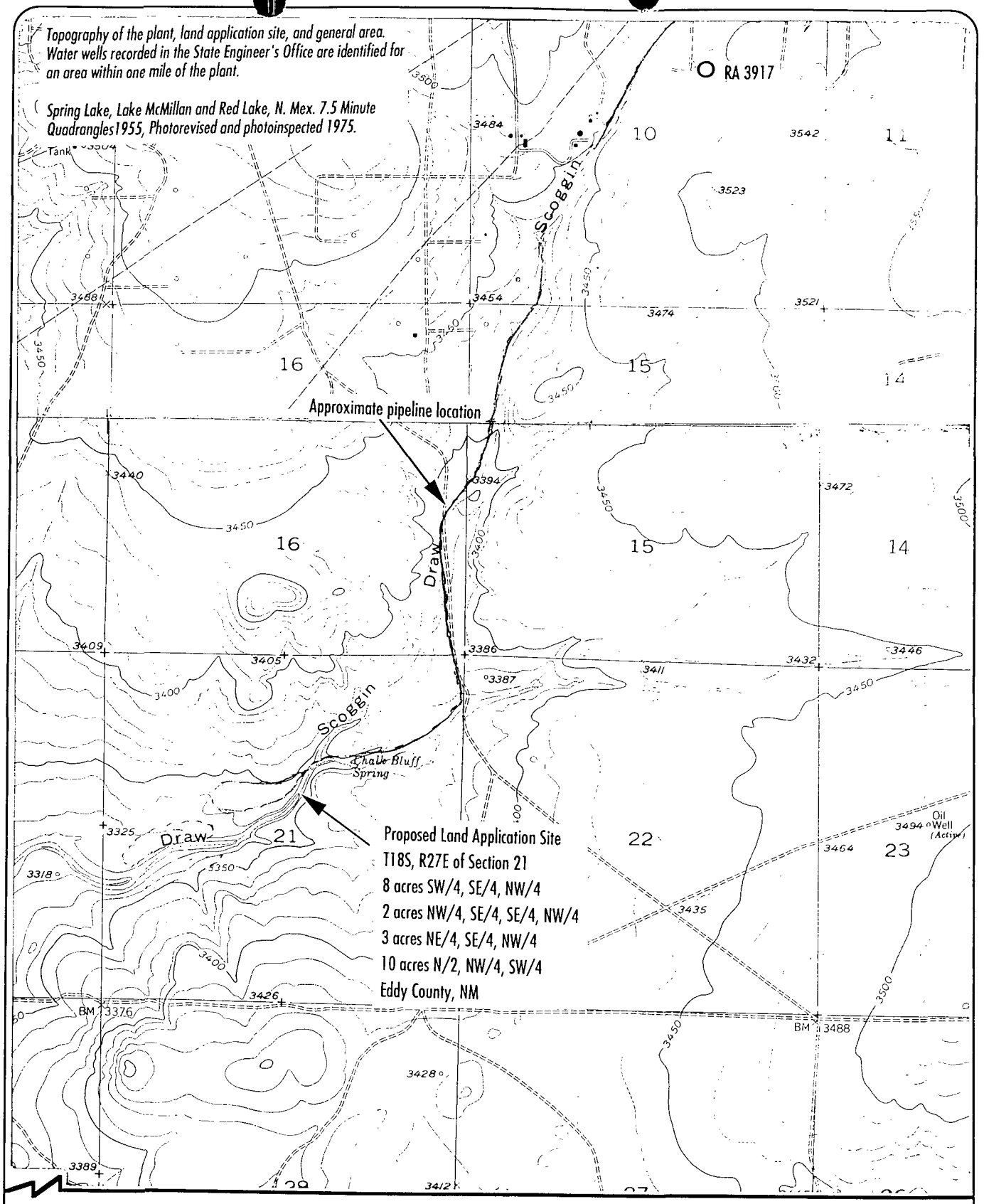
87110
PHO 505 266 6611
FAX 505 266 7738



Scale: 1 in = 2000 ft
1:24,000

Figure 1a
Location of Facility



Scale: 1 in = 2000 ft
1:24,000

Figure 1b
Location of Facility