Louisiana Solid Waste Permit Application
Mandatory Modification Document
Wet Gas Scrubber Settling Ponds

ExxonMobil
Refining & Supply

ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

Facility No. GD-033-0596
Permit No. P-0274
Agency Interest No. 2638

July 2005 Volume 1 of 2

Project No. 0028411

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PUBLIC NOTICE
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY (LDEQ)
EXXONMOBIL REFINING AND SUPPLY COMPANY, WET GAS SCRUBBER SETTLING PONDS
TECHNICALLY COMPLETE SOLID WASTE MANDATORY MODIFICATION/PERMIT RENEWAL APPLICATION

The LDEQ, Office of Environmental Services, has determined that the solid waste mandatory modification/permit renewal for ExxonMobil Refining & Supply Company, P.O. Box 551, Baton Rouge, LA 70821 for the Wet Gas Scrubber Settling Ponds is technically complete and acceptable for public review. **The facility is located at 4045 Scenic Highway, Baton Rouge, East Baton Rouge Parish.**

ExxonMobil Refining & Supply Company requested to renew and modify the Type I-Industrial Solid Waste Permit for its Wet Gas Scrubber Settling Ponds that is a surface impoundment designed to hold an accumulation of liquid waste and/or sludge, to comply with the mandatory modification required by LAC 33:VII.315.G. This plan is called the Mandatory Modification Document and is essentially a revision of the facility's solid waste permit application. The solid waste rules required all facilities with existing or pending solid waste permits to submit a plan to upgrade in accordance with the new requirements by February 1, 1994.

Written comments, written requests for a public hearing or written requests for notification of the final decision regarding this permit action may be submitted to Ms. Soumaya Ghosn at LDEQ, Public Participation Group, P.O. Box 4313, Baton Rouge, LA 70821-4313. **Written comments and/or written requests must be received by 12:30 p.m., Wednesday, April 18, 2007.** Written comments will be considered prior to a final permit decision.

If LDEQ finds a significant degree of public interest, a public hearing will be held. LDEQ will send notification of the final permit decision to the applicant and to each person who has submitted written comments or a written request for notification of the final decision.

The technically complete permit mandatory modification/renewal document is available for review at the LDEQ Public Records Center, Room 127, 602 North 5th Street, Baton Rouge, LA. Viewing hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday (except holidays). **The available information can also be accessed electronically on the Electronic Document Management System (EDMS) on the DEQ public website at www.deq.louisiana.gov.**

Additional copies may be reviewed at the East Baton Rouge Parish Library, Delmont Gardens Branch, 3351 Lorraine Street, Baton Rouge, LA 70805 and at the Office of the Baton Rouge Mayor-President, 222 Saint Louis Street, 3rd Floor, Baton Rouge, LA 70802.

Inquiries or requests for additional information regarding this permit action should be directed to Enjoli' Muse, LDEQ, Waste Permits Division, P.O. Box 4313, Baton Rouge, LA 70821-4313, phone (225) 219-0968.

Persons wishing to be included on the LDEQ permit public notice mailing list or for other public participation related questions should contact the Public Participation Group in writing at LDEQ, P.O. Box 4313, Baton Rouge, LA 70821-4313, by email at maillistrequest@ldeq.org or contact the LDEQ Customer Service Center at (225) 219-LDEQ (219-5337).

Permit public notices including electronic access to general information from the technically complete solid waste permit application can be viewed at the LDEQ permits public notice webpage at www.deq.state.la.us/news/PubNotice/ and general information related to the public participation in permitting activities can be viewed at www.deq.louisiana.gov/portal/tabid/2198/Default.aspx.

Alternatively, individuals may elect to receive the permit public notices via email by subscribing to the LDEQ permits public notice List Server at http://www.state.la.us/ldbc/listservpage/ldeq_pn_listserv.htm.

All correspondence should specify AI Number 2638, Permit Number P-0274, and Activity Number PER20020002.

Scheduled Publication Date: March 14, 2007

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08/11/06

Tracker 11/21/06

ExxonMobil
Refining and Supply Company
P. O. Box 551
Baton Rouge, LA 70821-0551

COPY

W. D. Fellows
Environmental Manager

LDEQ

6 NOV 13

ExxonMobil
Refining & Supply

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WATER & WASTE PERMITS DIVISION
SOLID & HAZARDOUS WASTE SECTION

original to TOSW
copy to SWG/Tounsel
Aug

November 10, 2006

HAND DELIVERED

Mr. Bijan Sharafkhani, P.E.
Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
Waste Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

RE: Louisiana Solid Waste Permit Mandatory Modification Document/Permit Renewal
Wet Gas Scrubber Settling Ponds
ExxonMobil Refining & Supply Company
Facility No. GD-033-0596
Solid Waste Permit No. P-0274
Agency Interest Number 2638
Activity Number PER20020001
Baton Rouge Refinery
Baton Rouge, East Baton Rouge Parish, Louisiana

Dear Mr. Sharafkhani:

Per your October 17, 2006 letter, (received October 18, 2006) please find the attached six copies of ExxonMobil's Louisiana Solid Waste Mandatory Modification Document (MMD) for the Wet Gas Scrubber Settling Ponds.

Please contact Ron Dunham at (225) 977-4860 if you have any questions in regard to this submittal.

Sincerely,

WD Fellows

RECEIVED
NOV 13 2006
LDEQ

DEPARTMENT OF ENVIRONMENTAL QUALITY

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

MAR 06 2007

CERTIFIED MAIL 7003 2260 0005 9326 9228

Mr. William D. Fellows, Environmental Manager
ExxonMobil Refining and Supply
P.O. Box 551
Baton Rouge, LA 70821

Re: Notice of Technical Completeness
Exxon Refining and Supply Company
Wet Gas Scrubber Settling Pond
Mandatory Modification/ Permit Renewal
AI #2638/ GD-033-0596/ P-0274/ PER20020002
East Baton Rouge Parish

Dear Mr. Fellows:

The Waste Permits Division is in receipt of the final copies of your submittal dated February 16, 2007. After review of this submittal, it has been determined that your permit renewal is technically complete and ready for public review.

The Environmental Assistance Division will distribute copies of your application for public review and public notices in the appropriate newspapers in accordance with LAC 33:VII.513.F.3. Please contact Ms. Soumaya Ghosn at (225) 219-3276 for the date of publication and the dates for the comment period. At the conclusion of the comment period, the Waste Permits Division will consider all comments and a decision will be made regarding your application.

Please reference Agency Interest Number (AI-2638), Site Identification Number (GD-033-0596), Permit Number (P-0274), and Permit Activity Number (PER20020002) on all future correspondence pertaining to this facility. If you have any questions concerning this matter, please contact Ms. Enjoli' Muse of the Solid Waste Permits Section at (225) 219-0968.

Sincerely,

Bijan Sharafkhani, P.E.
Administrator
Waste Permits Divison

em

c: Capital Regional Office

ENVIRONMENTAL **SERVICES**
: PO BOX 4313, BATON ROUGE, LA 70821-4313
P:225-219-3181 F:225-219-3309
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ExxonMobil
Refining and Supply Company
P. O. Box 551
Baton Rouge, LA 70821-0551

W. D. Fellows
Environmental Manager

ExxonMobil
Refining & Supply

September 21, 2005

Beth Scardina
Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

Re: Wet Gas Scrubber Settling Ponds
Updated Permit Application
AI# 2638 / GD-033-0596 / P-0274

Dear Ms. Scardina:

As requested by the LDEQ, please find five (5) copies of our updated permit application for the Wet Gas Scrubber Ponds. Should you have any questions in regard to this submittal, please contact Ron Dunham at 225-977-4860.

WD Fellows

RSD:1/environ2/rsd/wgs1
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NOV 13 2006
LDEQ

ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

Louisiana Solid Waste Permit Application
Mandatory Modification Document
Wet Gas Scrubber Settling Ponds

Facility No. GD-033-0596
Permit No. P-0274
Agency Interest No. 2638

July 2005

Project No. 0028411

Mickey W. Alston, P.G.
Partner-In-Charge

David B. Hebert, P.G.

Jennifer G. Arnold

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana
(225) 292-3001

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I	*CONTINGENCY PLAN AND EMERGENCY PROCEDURES*
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LOUISIANA SOLID WASTE PERMIT APPLICATION
MANDATORY MODIFICATION DOCUMENT
WET GAS SCRUBBER SETTLING PONDS
FACILITY NO. GD-033-0596
PERMIT NO. P-0274
AGENCY INTEREST NO. 2638

ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

INTRODUCTION

Background

On January 16, 1986, Exxon Company, U.S.A. filed Solid Waste Notification Forms for surface impoundments at the Baton Rouge Refinery (the Solid Waste Notification Form is contained in Appendix G). Exxon Company, U.S.A. is now the ExxonMobil Refining & Supply Company. These surface impoundments are critical components of the wastewater and storm water treatment facilities at the site and are operated under Louisiana Department of Environmental Quality (LDEQ) water discharge permits.

On February 24, 1986, ExxonMobil was issued an order to submit a permit application addressing Sections 6.4.2 and 6.4.3 of the Louisiana Solid Waste Rule and Regulations (LSWRR) subsequently recodified within the Louisiana Administrative Code (LAC) as LAC 33:VII Chapters 11 and 13. The permit application was submitted on August 18, 1986.

On March 14, 1988, ExxonMobil received an Administrative Order (dated March 10, 1988) to respond to the Louisiana Department of Environmental Quality (LDEQ) administrative comments on the Solid Waste Permit Application. In addition to general revisions and clarifications, the permit application was amended to include Rain Basin 2. These revisions were submitted to the LDEQ on May 14, 1988.

On October 2, 1989, ExxonMobil was issued Order-to-Close OC-0135 and OC-0136 for the Dirty Water Detention Basin and the Wet Gas Scrubber Aeration Pond, respectively. The permit application was revised to delete reference to these two impoundments.

On May 16, 1991, LDEQ amended the February 24, 1986, Order to Upgrade to include only the Rain Basin 2 and the two Wet Gas Scrubber Settling Ponds. The BIOX Basins and Rain Basin 1 became hazardous as a result of promulgation of the new TCLP test.

The permit application was revised to delete reference to the BIOX Basins and Rain Basin 1. Rain Basin 2 is addressed in a separate document. The permit for the Wet Gas Scrubber Settling Ponds was issued by LDEQ on March 13, 1992. A copy of this correspondence is included in Attachment A to this Introduction.

Revisions to the solid waste rules were promulgated by the LDEQ on February 20, 1993. The rules were recodified within Title 33, Chapter VII of the Louisiana Administrative Code. The revisions reduced the number of chapters from nineteen to eleven, and all chapter references mentioned in the old rules have changed. The new regulations significantly expanded the compliance requirements for solid waste processing and disposal facilities. They required all facilities in Louisiana to recodify and resubmit their solid waste permits by February 1, 1994.

These regulations developed new waste stream types and separated solid waste facilities by classification as Type I, I-A, II, and III facilities. Per LAC 33:VII.315.G., the solid waste rules required all facilities with existing or pending solid waste permits to submit a plan to upgrade in accordance with the new requirements by February 1, 1994. This plan is called the Mandatory Modification Document (MMD), and is essentially a revision of a facility's solid waste permit application. The rules also established new permitting, closure and exemption requirements and expanded the existing and operation standards for solid waste disposal and processing facilities. The facility covered by this permit is classified as a Type I disposal facility.

This MMD fulfills the requirements of the May 5, 1993 LDEQ memo and is written for the following facility:

- Wet Gas Scrubber Settling Ponds

Permit Organization

In order to facilitate evaluation, this MMD is organized in accordance with the numbering system presented in LAC 33:VII Chapter 5. A cross-reference table with the past format for the permit application is attached as Table 1. The application is divided as follows:

LAC 33:VII.519.	Application Form (Part I)
LAC 33:VII.521.	Application Form (Part II)
LAC 33:VII.523.	Application Form (Part III)
APPENDICES	

On May 5, 1993, the LDEQ sent a memorandum to all solid waste permit applicants and holders. This memorandum describes the preferred format and content of the MMD. A copy of the memorandum is provided as Attachment B.

Lists of Modifications

The May 5, 1993 LDEQ memo required that three lists of modifications addressed in the MMD be included at the front of the MMD. The modifications addressed in this MMD are:

- **Mandatory Modifications:** The impoundments are not required to be physically modified as a result of the 1993 revised solid waste rules. Additions to the text to address new information requirements are noted in the attached cross-reference table (Table 1). Changes to the detection monitoring program to bring the program into compliance with the new rules, including the proposed statistical program, are addressed in Section 521.F.5.e. of the MMD.

- **Previously Approved Modifications:** There have been no modifications approved by the LDEQ during the lifetime of this permit.

- **Voluntary Modifications:** There are no voluntary modifications proposed in this MMD.

TABLE 1

CROSS REFERENCE TABLE

LOUISIANA SOLID WASTE FACILITY PERMIT APPLICATION FOR TYPE I FACILITIES

1993 REVISED RULES		1992 PREVIOUS RULES
519.	Part I: Permit Application Form	1107.B.
A-S.	Application Form	1107.B.1a.-p.
M.	Letter from LRRDA on Statewide Plan Conformance	1107.B.1.m.
N.	Letter from Parish Concerning Zoning	1107.B.1.n.
Q.	Proof of Publication	1107.A.3.d.
R.	Proof of Legal Authority for Signatory to Sign	1107.B.1.p.
521.	Part II: Supplementary Information, All Processing, and Disposal Facilities	1107.C.
A.	Location Characteristics	New
	1.a. Area Master Plan	1107.C.1.
	1.b. Letter on Traffic Impact (Not Required)	New
	1.c. Existing Land Use	New
	1.d. Aerial Photograph	New
	1.e. Environmental Characteristics	1107.C.2.e.
	1.e.i. List	1107.C.2.e.i.
	1.e.ii. Letters	New
	1.e.iii. Mitigation	1107.C.2.e.ii.
	1.f. Wetlands Demonstration (Not Required)	New
	1.g. Demographic Information	New
	2.a. Wells	1107.C.2.b.ii.
	2.b. Faults	New
	2.c. Utilities	New
B.	Facility Characteristics	1107.C.2.
	1.a. Elements of Disposal System	1107.C.2.a.i.
	1.b. Perimeter Barriers, Security, and Signs	1107.C.2.a.ii.
	1.c. Buffer Zones	1107.C.2.a.ix.
	1.d. Fire Protection and Medical Care	1107.C.2.a.iv.
	1.e. Landscaping	New
	1.f. Receiving and Monitoring Income Wastes	1107.C.2.a.iii.
	1.g. NPDES Discharge Points	1107.C.2.c.ii. and 1107.C.3.c.vii(a)(v)LFR
	1.h. Other Features	1107.C.2.a.x.
	2.a. Areas for Isolating Borrow Wastes	1107.C.2.a.v.
	2.b. Location of Leachate Containment, Treatment and Removal (CTR) Systems	1107.C.2.a.vi.
C.	Facility Surface Hydrology	1107.C.2.c.
	1.a. Method to Prevent Runon	1107.C.2.c.i.
	1.b. Description of Runon/Runoff Collection System	1107.C.2.c.ii.
	1.c. Maximum 24hr/25yr Storm Event	1107.C.2.c.iii.
	1.d. Location of Aquifer Recharge Areas	1107.C.2.b.iii.
	1.e. Flood Plain Impacts	New
D.	Facility Geology	1107.C.2.d.
	1.a. Isometric Profile and Cross Sections	1107.C.2.d.i.
	1.b. Logs of Soil Borings and Abandonment Descriptions	1107.C.2.d.ii and 1107.C.3.c.vi(b).SI or 1107.C.3.c.ii.(b).LFL
	1.c. Results of Tests for Classifying Soils	1107.C.2.d.iii. and 1107.C.3.c.vii.(a).(ii).LFR
	1.d. Geologic Cross Section to 200 ft.	New
	1.e. Faults Mapped on Facility	New
	1.f. Potential Seismic Impact	New
	1.g. Unstable Area Design	New
	2. Type III Facility Geology (Not Applicable)	New

NOTE: SI = Surface Impoundments
LFL = Landfill
LFR = Landfarm

TABLE 1 (Cont'd)

CROSS REFERENCE TABLE

LOUISIANA SOLID WASTE FACILITY PERMIT APPLICATION FOR TYPE I FACILITIES

1993 REVISED RULES		1992 PREVIOUS RULES
E.	Facility Subsurface Hydrology	1107.C.2.b.
	1.a. Ground Water Delineation to 30 ft.	1107.C.2.b.i., and 1107.C.3.c.vii.(a).(iii).LFR
	1.b. Ground Water Delineation to 200 ft.	1107.C.2.b.iv.
	2. Type II, Landfarm Subsurface Hydrology (Not Applicable)	New
F.	Facility Plans and Specifications	1107.C.3.
	1. Plans, Specifications, and Operations Must be Prepared Under Supervision and Certified by an Engineer	1107.C.3.b.
	2.a. Detailed Contour Drawings with Boring Locations	1107.C.3.a.
	2.b. Drawings of Slopes and Levee Construction	New
	2.c. Type of Material and Source for Levees	New
	3.a. Landfill Daily Fill Cover Dimensions	New
	3.b. Landfill Type of Cover Material and Its Source	1107.C.3.c.ii.(d).LFL
	4.a. Cross Sections of Facility	1107.C.3.c.ii.(a).LFL or 1107.C.3.c.vi.(a).SI
	4.b. Description of Liner System	1107.C.3.c.ii.(c).LFL or 1107.C.3.c.vi.(c).SI
	4.c. Description of Leachate CTR System	1107.C.3.c.ii.(f).LFL
	5.a. Three Wells or Piezometers	1107.C.3.c.ii.(g).LFL or 1107.C.3.c.vi.(d).SI
	5.b. Monitoring Well Details	1107.C.3.c.ii.(g).LFL or 1107.C.3.c.vi.(d).SI
	5.c. Sampling and Analysis Plan	1107.C.6.a. and b.
	5.d. Data from Existing Wells	1107.C.6.c.
	5.e. Detection Monitoring Plan	New
	5.f. Method for Plugging and Abandonment	New
	6. Gas Collection and Treatment System	New
G.	Facility Administrative Procedures	1107.C.4.a.
	1.a. Recordkeeping	1107.C.4.a.i.
	1.b. Minimum Personnel Required to Operate Facility	1107.C.4.a.ii.
	1.c. Maximum Days of Operation per Week	1107.C.4.a.iii.
	2. Type II, Operator Certification (Not Applicable)	New
H.	Facility Operational Plans	1107.C.4.b.
	1.a. Types, Quantities and Sources of Waste	1107.C.4.b.i.
	1.b. Waste Handling Procedures	1107.C.4.b.ii.
	1.c. Minimum Equipment to be Furnished at the Facility	1107.C.3.c.ii.(e)LFL.
	1.d. Plan to Segregate Wastes	1107.C.4.b.iii.
	1.e. Procedures for Breakdowns, Abnormal Conditions	1107.C.4.b.iv.
	1.f. Contingency Procedures	1107.C.4.b.v. and 1107.C.4.a.v.
	1.g. Procedures for Controlling Vectors, Dust, Litter and Odors	1107.C.4.b.viii. and 1107.C.2.a.viii.
	2.a. Comprehensive Facility Operational Plan	New
	2.b. Salvaging Procedures and Control	1107.C.4.b.vi.
	2.c. Scavenging Control	1107.C.4.b.vii.

NOTE: SI = Surface Impoundments
LFL = Landfill
LFR = Landfarm

TABLE 1 (Cont'd)

CROSS REFERENCE TABLE

LOUISIANA SOLID WASTE FACILITY PERMIT APPLICATION FOR TYPE I FACILITIES

	1993 REVISED RULES	1992 PREVIOUS RULES
	3. Operational Plans for Landfarms	1107.C.3.c.vii.LFR
	3.a. Mandatory Submittal Items	1107.C.3.c.vii.(a).LFR
	3.b. Submittal Items for Food-chain Cropland	1107.C.3.c.vii.(b).LFR
	3.c. Submittal Items for Non-food-chain Landfarms	1107.C.3.c.vii.(c).LFR
	4. Operational Plans for Type I-A and II-A Incinerator Waste-Handling Facilities (Not Applicable)	1107.C.3.c.i.
	5. Operational Plans for Type I-A and II-A Refuse-Derived Fuel Facilities and Type III Separation and Composting Facilities (Not Applicable)	1107.C.3.c.iii.
	6. Description of Marketing Produces and Control for Facilities in Item 5., above (Not Applicable)	New
	7. Operational Plans for Facilities With Potential to Produce Gases. (Not applicable)	New
I.	Implementation Plan	1107.C.5.
	1.a. Construction Schedule	1107.C.5.a.
	1.b. Details on any Phased Implementation	1107.C.5.b.
	2. Plans for Closing or Upgrading Existing Operating Areas	New
J.	Facility Closure	1107.C.7.
	1.a. Date of Final Closure of the Facility	1107.C.7.b.
	1.b. Method and Steps Necessary for Closing the Facility	1107.C.7.c.
	1.c. Estimated Cost of Closure	1107.C.9.d.i.
	2.a. Description of Final Cover	New
	2.b. Largest Surface Area Requiring Final Cover	New
	2.c. Estimate of Maximum Inventory of Solid Waste	New
	2.d. Closure Schedule	1107.C.7.a.
	3.a. Sequence of Final Closure by Unit	New
	3.b. Drawing with Final Contours of Facility	New
	3.c. Copy of Document to be Filed with Parish	1107.C.7.d.
K.	Facility Post Closure	1107.C.8.
	1.a. Long-Term Use of Facility	1107.C.8.a.
	1.b. Cost of Conducting Post Closure	1107.C.9.d.i.
	2.a. Method for Calculating Post-Closure Activities	1107.C.6.d.
	2.b. Method of Monitoring System Abandonment	1107.C.8.d.
	2.c. Measures Planned to Ensure Public Safety	1107.C.8.b.
	2.d. Use of Facility During Post-Closure	1107.C.8.c.
L.	Financial Responsibility	1107.C.9.
	1. Owner Name and Address	1107.C.9.a.
	2. Permittee Annual Report	1107.C.9.b.
	3. Evidence of Liability Coverage	1107.C.9.c.
	4. Evidence of a Financial Assurance Mechanism	1107.C.9.d.ii.
M.	Special Requirements	1107.C.10.
523.	Part III: Additional Supplementary Information	IT Decision Questions

NOTE: SI = Surface Impoundments
LFL = Landfill
LFR = Landfarm

LAC 33:VII.709/LAC 33:VII.521 Cross Reference Table

ExxonMobil addressed and incorporated the applicable regulations in LAC 33:VII.709 within the September 2005 application responses. The application's organization is in accordance with the regulations requesting a Section 521 regulatory sequence "to facilitate evaluation." To provide for an easier permit review process, ExxonMobil has also provided a table of cross-references to demonstrate that the September 2005 application submittal satisfies the applicable requirements contained in LAC 33:VII.709.

LAC 33:VII.521 Supplementary Information, All Processing and Disposal Facilities	LAC 33:VII.709 Standards Governing All Solid Waste Disposal Facilities (Type I And II)
LAC 33:VII.521.A - Location Characteristics	LAC 33:VII.709.A - Location Characteristics
LAC 33:VII.521.A.1.a	LAC 33:VII.709.A.1
LAC 33:VII.521.A.1.b	LAC 33:VII.709.A.2
LAC 33:VII.521.A.1.e	LAC 33:VII.709.A.3
LAC 33:VII.521.A.1.f	LAC 33:VII.709.A.4
LAC 33:VII.521.A.2.b	LAC 33:VII.709.A.5
LAC 33:VII.519.N	LAC 33:VII.709.A.6
LAC 33:VII.521.B – Facility Characteristics	LAC 33:VII.709.B - Facility Characteristics
LAC 33:VII.521.B.1a-b	LAC 33:VII.709.B.1
LAC 33:VII.521.B.1b	LAC 33:VII.709.B.1.a
LAC 33:VII.521.B.1b	LAC 33:VII.709.B.1.b
LAC 33:VII.521.B.1b	LAC 33:VII.709.B.1.c
Not Applicable – This facility does not receive off-site waste	LAC 33:VII.709.B.1.d
LAC 33:VII.521.B.1c	LAC 33:VII.709.B.2
LAC 33:VII.521.B.1c	LAC 33:VII.709.B.2.a
LAC 33:VII.521.B.1c	LAC 33:VII.709.B.2.b
LAC 33:VII.521.B.1d	LAC 33:VII.709.B.3
LAC 33:VII.521.B.1e	Not Applicable - The facility is located within the boundaries of a plant
LAC 33:VII.521.B.1f	LAC 33:VII.709.B.5
LAC 33:VII.521.B.1f	LAC 33:VII.709.B.5.a
LAC 33:VII.521.B.1f	LAC 33:VII.709.B.5.b
LAC 33:VII.521.B.1g	LAC 33:VII.709.B.6
LAC 33:VII.521.C - D - Facility Geology	LAC 33:VII.709.C - Facility Geology
LAC 33:VII.521.C.1.a-b, LAC 33:VII.521.D.1.c	LAC 33:VII.709.C.1.a
Not Applicable – This is an existing facility	LAC 33:VII.709.C.1.b
LAC 33:VII.521.C.1.d, e, LAC 33:VII.521.D.1-2	LAC 33:VII.709.C.1.c
LAC 33:VII.521.D.1.e-f	LAC 33:VII.709.C.2
LAC 33:VII.521.D.1.g	LAC 33:VII.709.C.3
LAC 33:VII.521.I - Implementation Plans	LAC 33:VII.709.D - Implementation Plans
LAC 33:VII.521.I	LAC 33:VII.709.D.1
LAC 33:VII.521.I	LAC 33:VII.709.D.2
LAC 33:VII.521.E.1, LAC 33:VII.521.F.5	LAC 33:VII.709.E.1.a

LAC 33:VII.521.E.1.a.iv, LAC 33:VII.521.F.5.e	LAC 33:VII.709.E.1.a.i
LAC 33:VII.521.E.1.a.iii, LAC 33:VII.521.F.5.c	LAC 33:VII.709.E.1.a.ii
Not Applicable – No well construction activities	LAC 33:VII.709.E.1.c
Not Applicable – No well construction activities	LAC 33:VII.709.E.1.d
LAC 33:VII.521.F.5.f	LAC 33:VII.709.E.1.e
LAC 33:VII.521.F.5.c – d	LAC 33:VII.709.E.1.f
LAC 33:VII.521.F.5.c – d, Appendix N	LAC 33:VII.709.E.2
LAC 33:VII.521.F.5.c – d, Appendix N	LAC 33:VII.709.E.3
LAC 33:VII.521.F.5.c – d, Appendix N	LAC 33:VII.709.E.3.g
Not Applicable - This facility is a Type I, Industrial Surface Impoundment	LAC 33:VII.709.E.4
Not Applicable- This facility is a Type I, Industrial Surface Impoundment	LAC 33:VII.709.E.5
Not Applicable - This facility is a Type I, Industrial Surface Impoundment	LAC 33:VII.709.E.6
Not Applicable- This facility is a Type I, Industrial Surface Impoundment	LAC 33:VII.709.E.7
Not Applicable - A statistically significant increase over background concentrations has not been detected	LAC 33:VII.709.E.8
Not Applicable – No on-going remedial activities, this facility is a Type I, Industrial Surface Impoundment	LAC 33:VII.709.E.9
Not Applicable - This facility is a Type I, Industrial Surface Impoundment	LAC 33:VII.709.E.10

LDEQ Permit Acceptance Correspondence

Attachment A

July 2005

Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

State of Louisiana

Department of Environmental Quality

Edwin W. Edwards
Governor

Kai David Midboe
Secretary

STANDARD PERMIT

Site Number: GD-033-0596 Standard Permit Number: P-0274

Pursuant to the Louisiana Environmental Quality Act (La. R.S. 30:2001 et seq; "the Act") as amended, and the Louisiana Administrative Code, Title 33, Part VII, a Standard Permit is issued to:

Exxon Company, U.S.A.
(hereinafter referred to as the "Permittee")
Post Office Box 551
Baton Rouge, Louisiana 70821-0551

Limitations and conditions applicable to this Standard Permit:

1. This Standard Permit applies only to the West Gas Scrubber Settling Ponds (hereinafter referred to as the "Facility"), located at 4045 Scenic Highway, Baton Rouge, Louisiana, Township 6 South, Range 1 West, in East Baton Rouge Parish.

2. Upon completion of construction of all upgrading measures outlined in the implementation plan and after implementation of new activities required by the Standard Permit, certification by a qualified professional must be given to the Secretary of the Department of Environmental quality, that the Facility, as it exits, is consistent with the representations made in the permit application accepted by the Solid Waste Division and all conditions of the Standard Permit.

3. The Permittee shall notify the Division prior to commencement of operation of new features constructed as part of the upgrading of the Facility so that an inspection can be made in accordance with LAC 33:VII.1111.A.

4. The operation of the Facility is subject to all applicable rules and regulations and orders of the Solid Waste Division now and hereafter in effect.

5. The operation of the Facility shall be in accordance with the representations made in the permit application accepted by the Solid Waste Division and all conditions of this Standard Permit.

6. The estimated date of final closure of the Facility as provided in LAC 33:VII.1107.C.7.b of the permit application is to be used for the purpose of projecting the Facility's potential capacity. This Standard Permit expires _____

March 13, 2002, by which time the Permittee shall submit a current permit application for the facility or it shall be closed in accordance with the closure plan outlined in the permit application.

7. No modification to a site, facility, process or disposal method or operation may be effected without prior approval of the Secretary in accordance with LAC 33:VII.1105.G.

8. Failure to operate the Facility in accordance with the Act, the Louisiana Administrative Code, Title 33, Part VII, or this Standard Permit shall constitute a violation which will subject the Permittee to the possible imposition of civil penalties in accordance with LAC 33:VII, Chapter 15 and Section 2025 of the Act; and to the possible suspension or revocation of the Standard Permit in accordance with LAC 33:VII.1105.N.

Kai David Midboe

KAI DAVID MIDBOE, Secretary
Department of Environmental Quality

3/13/92
Date of Issuance

ExxonMobil
Refining and Supply Company
P.O. Box 551
Baton Rouge, Louisiana 70821-0551

W. D. Fellows
Environmental Coordinator
Baton Rouge Refinery

ExxonMobil
Refining & Supply

April 5, 2001

Ms. Yolunda Righteous
Office of Environmental Services – Permits Section
Louisiana Department of Environmental Quality
Post Office Box 82135
Baton Rouge, Louisiana 70884-2135

RE: Permit Renewal Application - Facility No. GD-033-0596
Rain Basin-2 – Permit No. P-0273
Wet Gas Scrubber Settling Ponds – Permit No. P-0274

Dear Ms. Righteous:

The ExxonMobil Baton Rouge Refinery maintains two solid waste permitted units. The permits for each of the units referenced above will expire on March 13, 2002. In 1994, Mandatory Modification Documents (MMDs) were submitted to the Louisiana Department of Environmental Quality (LDEQ) Solid Waste Division for each of the units as required by LAC 33:VII.315.G.3. However, we have not received comments from the LDEQ on the aforementioned submittals. Therefore, we request that the MMDs now serve as our permit renewal applications for the two permitted units.

At the time of the MMD submittals, we included the required $500 permit review fee per MMD. Therefore, pending your approval that the MMDs will serve as our permit renewal, we also request a variance from LAC 33:VII.525.A. Upon receipt of written approval from LDEQ regarding this request, we will adhere to the public notice requirements in LAC 33:VII.513.A.

Should you have any questions in regard to this matter, please contact Mr. Ron Dunham at (225) 977-4860.

W D Fellows

RSD/SW1
Certified Mail # 7000 1670 0012 9723 6553

ExxonMobil
Refining & Supply Company
P.O. Box 551
Baton Rouge, Louisiana 70821-0551

W. D. Fellows
Environmental Coordinator

ExxonMobil
Refining & Supply

December 4, 2001

Mr.Michael Vince, Administrator
Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
P.O. Box 82135
Baton Rouge, La. 70884-2135

Re: Permit Renewal Application - Facility No. GD-033-0596
Rain Basin 2 - Permit No. P-0273
Wet Gas Scrubber Settling Ponds - Permit No. P-0274

Dear Mr. Vince:

On April 5, 2001, we wrote a letter (enclosed) to Ms. Yolunda Righteous in reference to the above units and that the permits were expiring on March 13, 2002. Since then we have also spoken to Mr. Lenny Young and Mr. Brett LeBlanc in reference to the letter.

The issue is that in 1994, Mandatory Modification Documents (MMDs) were submitted to LDEQ for each of these units. However, we never received comments from LDEQ and requested in April that the MMDs serve as our renewal applications. It was then and it remains our understanding that this approach has been accepted by LDEQ in the past.

Therefore, we are again writing to request your written concurrence with our April 5th request. Should you have any questions in regard to this matter, please contact Ron Dunham at (225) 977-4860.

W D Fellows

RSD/SW2
Certified Mail # 7000 1670 0012 9723 7833

State of Louisiana

Department of Environmental Quality

M.J. "MIKE" FOSTER, JR.
GOVERNOR

March 1, 2002

J. DALE GIVENS
SECRETARY

CERTIFIED MAIL 7099 3400 0007 7056 1831
RETURN RECEIPT REQUESTED

Mr. W.D. Fellows
ExxonMobil Refining & Supply
P.O. Box 551
Baton Rouge, Louisiana 70821

RE: ExxonMobil Baton Rouge Refinery (AI# 2638)
Permit Renewal Application – Facility No. GD-033-0596
Rain Basin-2 – Permit No. P-0273
Wet Gas Scrubber Settling Ponds – Permit No. P-0274

Dear Mr. Fellows:

The Louisiana Department of Environmental Quality-Permits Division (LDEQ-PD) is in receipt of the referenced correspondence dated April 5, 2001, pertaining to these two solid waste permitted units.

The Mandatory Modification Documents (MMDs) may serve as a permit renewal application upon request by the facility and approval by LDEQ. Additionally, the request to have the MMD serve as the renewal application must also be accompanied by the required $2,500 permit application review fee. Therefore, LDEQ's approval that the MMDs serve as ExxonMobil's renewal permit applications is contingent upon the receipt of the application review fee specified in LAC 33:VII.525.A. Upon the LDEQ's receipt of the required fee, the MMDs will be delegated to serve as the permit renewal applications.

Should you have any questions concerning this matter, please contact Ms. Annie Vashishta or Mr. Lenny Young, Permits Division at (225) 765-2784.

Sincerely,

Linda Korn Levy
Assistant Secretary

cc: Ron Dunham, ExxonMobil

ENVIRONMENTAL GROUP
W.D. FELLOWS

MEM	MAR - 5 2002	Handle
File		Comment
Copy	RAC WJE KMH	See Me
Update		Info
Circulate	TSH DHL	DESTROY

ExxonMobil
Refining and Supply Company
P. O. Box 551
Baton Rouge, LA 70821-0551

W. D. Fellows
Environmental Manager

ExxonMobil
Refining & Supply

March 8, 2002

Linda Korn Levy, Assistant Secretary
Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
P.O. Box 82135
Baton Rouge, La. 70884-2135

Re: ExxonMobil Baton Rouge Refinery (AI# 2638)
Permit Renewal Application - Facility No. GD-033-0596
Rain Basin-2 - Permit No. P-0273
Wet Gas Scrubber Settling Ponds - Permit No. P-0274

Dear Ms. Korn Levy:

We are in receipt of your letter of March 1, 2002, and have attached two $2,500.00 permit renewal application review fee checks to this letter as requested. It is our understanding that the MMDs will now serve as the permit renewal applications for the two above referenced solid waste units.

We appreciate your assistance in this matter and should you have any questions please call Ron Dunham at (225) 977-4860.

W D Fellows

RSD:sw302
Certified Mail # 7000 1670 0012 9723 8151

DEPARTMENT OF ENVIRONMENTAL QUALITY

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

MAR 07 2006

CERTIFIED MAIL 7004 1160 0000 3793 7082

William D. Fellows, Environmental Manager
P.O. Box 551
Baton Rouge, LA 70821

Re: Notice of Deficiencies #1
Exxon Refining & Supply Company
Wet Gas Scrubber Settling Ponds
AI #2638/GD-033-0596/P-0274
East Baton Rouge (PER20020002)

Dear Mr. Fellows:

The Water and Waste Permits Division has performed the technical review of your permit application submitted on September 21, 2005. The submittal has been determined to be deficient and not in compliance with LAC 33:VII. The deficiencies are outlined below:

Permit Writer Review

519.N	Please provide a zoning affidavit.
520	Please provide a history of compliance.
521.A.1.e.i	Provide the required response.
521.A.2.c	Please address LAC 33:VII.307.A.1, 307.B & 307.C.1 for an exemption in a separate submittal.
521.B.1.b	Please address 717.B.1.b.
521.D.1.c	Please, provide a detailed report of the results of the test.
521.E.1.b.i-iii	Please provide the required information.
521.G.1.a	Please address 713.C.1.b.iii.k.
521.G.1.b	List the minimum personnel by job description necessary to achieve the operational requirements of the facility.
521.H.1.c	Please address.

ENVIRONMENTAL SERVICES
: PO BOX 4313, BATON ROUGE, LA 70821-4313
P:225-219-3181 F:225-219-3309
WWW.DEQ.LOUISIANA.GOV

521.H.4-7	If a section does not apply, the applicant must state that it does not apply and explain why.
521.L.3	Please state that you will obtain and maintain liability insurance as required in 727.A.1.
521.L.4	Please state that you will obtain and maintain financial assurance as required in 727.A.2 for closure and post-closure care.

Engineering Review

521.A.1.e.ii	This section does apply, please address.
521.B.1.a	Distinguish the property lines on Figure B-3.
521.B.1.c	Provide supporting documentation supporting the waiver of the buffer zone.
521.B.1.f	The Operational Plan included in Appendix H does not provide the additional information required by this regulation. Provide a response.
521.C.1.a	Address this regulation as it applies to the Wet Gas Scrubber Settling Ponds.
521.C.1.b	Please provide an explanation why the ponds do not experience runoff/run-on.
521.C.1.e	Please note, 713.A.6 does not apply. Provide the 100-year flood and levee elevations.
521.H.2.a	Appendix H does not include any of the information required by this regulation. Provide a more detailed response while addressing all of the standards in 713.D.
Appendix J	Table J-2: Update the costs associated with testing to reflect the number of samples to be analyzed and the methods to be run.

Geology Review

709	Each of these regulations must be addressed individually prior to approval of the Mandatory Modification Document.

521.F.5.c The parameter list associated with this section must be justified. Further information is needed prior to elimination or inclusion of organic parameter analyses in this section.

521.F.5.e Justification must be provided for the well spacing associated with these ponds. There are three monitor wells that currently monitor groundwater quality at the ponds. Also, the statistical analysis mentioned in this section must provide detail on how the program will be implemented; i.e., when will a statistical exceedance be indicated and how will these statistics be used to indicate an exceedance. Analytical results must be statistically compared between upgradient and downgradient wells until such time that the Department is satisfied that the downgradient wells have not been impacted. At that time, the wells can be statistically compared to themselves in the future.

Your response to these deficiencies shall be sent to this office within thirty (30) days of receipt of this letter. Additionally, five (5) copies of your response, including appendices, shall be provided. Failure to respond to these deficiencies as described as well as failure or refusal to comply with this notice may result in a permit denial and appropriate enforcement actions may be taken under the applicable regulatory and statutory provisions.

Please reference your Agency Interest Number (AI 2638), Facility Identification Number (GD-033-0596), Permit Number (P-0274) and Permit Activity Number (PER20020002) on all future correspondence. If you have any questions concerning this matter, please contact Mr. Timothy Smith of the Solid and Hazardous Waste Permits Section at (225) 219-0029, Jason Meyers, Environmental Technology, Engineering Group 4 at (225) 219-3459 or Carey Dicharry, Environmental Technology, Geology Group 3 at (225) 219-3410.

Sincerely,

Lenny M. Young

Lenny Young
Administrator
Water and Waste Permits Division

ts

c: Capital Regional Office
Jason Meyers, OEA, ETD
Carey Dicharry, OEA, ETD

ExxonMobil
Refining and Supply Company
Environmental Remediation
4045 Scenic Highway
Baton Rouge, Louisiana 70805-4894

April 07, 2006

ExxonMobil
Refining & Supply

Mr. Michael Vince
Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

RE: Notice of Deficiencies
Solid Waste Mandatory Modification Document/Permit Renewal Application
Wet Gas Scrubber Settling Ponds
ExxonMobil Refining & Supply Company
Facility No. GD-033-0596
Solid Waste Permit No. P-0274
Agency Interest Number 2638
Activity Number PER20020002
Baton Rouge Refinery
Baton Rouge, East Baton Rouge Parish, Louisiana

Dear Mr. Vince:

This letter is in response to the Notice of Deficiencies (NODs) provided to ExxonMobil on March 07, 2006 from the Permits Division. ExxonMobil is submitting the appropriate information to satisfy the applicable requirements in the Solid Waste Mandatory Modification Document/Permit Renewal Application submitted in September 2005.

The NOD submission includes comment responses and replacement pages to be inserted into the permit renewal application. Additionally, some LDEQ requests were already addressed within the recent application submission.

ExxonMobil is hopeful that the responses to the department's comments will provide for an easier permit review process by the LDEQ.

Please contact Ron Dunham at (225) 977-4860 if you have any questions in regard to this submittal.

Very Truly Yours,

Dave Fellows

Enclosure
JGA:mhs

0046988/2708BRltr.DOC

Notice of Deficiencies Responses
Updated Louisiana Solid Waste Permit Mandatory Modification Document
Wet Gas Scrubber Settling Ponds
ExxonMobil Refining & Supply Company
Facility No. GD-033-0596
Solid Waste Permit No. P-0274
Agency Interest No. 2638
Activity No. PER20020002
Baton Rouge Refinery
Baton Rouge, East Baton Rouge Parish, Louisiana

Permit Writer Review

LDEQ Comment:

519.N *Please provide a zoning affidavit.*

ExxonMobil's Response:

Although ExxonMobil has included "other documentation stating that the proposed use does not violate existing land-use requirements" in accordance with LAC 33:VII.519.N, ExxonMobil is including zoning documentation from the Geographic Information System (GIS) Baton Rouge Government Website. The GIS Property Details are presented in Attachment 1 of this correspondence and classify the existing land use as "Industrial".

LDEQ Comment:

520 *Please provide a history of compliance.*

ExxonMobil's Response:

ExxonMobil has complied with the requirement of LAC 33:I.1701, and the Permit Qualifications and Requirements-Form 1701 was provided in Appendix O of the September 2005 submittal.

LDEQ Comment:

521.A.1.e.i *Provide the required response.*

ExxonMobil's Response:

As stated in the application, and acknowledged by the appropriate state agencies in the Attachment to Section A titled Threatened or Endangered Species Correspondence, there are no known historic sites, recreation areas, archeological sites, designated wildlife-management areas, swamps and marshes, wetlands, habitats for endangered species, or sensitive ecological areas within 1,000 feet of the facility perimeter or as otherwise appropriate.

LDEQ Comment:

521.A.2.c *Please address LAC 33:V1L307.A.1, 307.B & 307.C.1 for an exemption in a separate submittal.*

ExxonMobil's Response:

An Exemption request from this requirement was submitted to the agency in March 2006. A copy of the Exemption request is included as Attachment 2 of this response document. However, pursuant to a phone conversation with Timothy Smith of LDEQ, ExxonMobil has elected to use the confidentiality provision which will cover all of the solid waste and hazardous waste permits.

LDEQ Comment:

521.B.1.b *Please address 717.B.1.b.*

ExxonMobil's Response:

As displayed in Figure B-3 and discussed in the application, the ExxonMobil Facility is enclosed by a perimeter fence. Docks and gates are continuously monitored, manned or locked, and detailed security procedures are regulated under the Facility's Security Plan. ExxonMobil has a duty to protect public safety by preventing public disclosure of such sensitive security information (49 CFR 1520.5(b)) and does not feel that including additional information is protective of public safety. As with LAC 33:VII.521.A.2.c, ExxonMobil is requesting confidentiality associated with this information.

LDEQ Comment:

521. D.1 .c *Please, provide a detailed report of the results of the test.*

ExxonMobil's Response:

A summary of test results reported by Etco Engineers (1971) was presented in the application and further detailed in the data presented in Tables D-1 to D-4 that follow the summary discussion.

LDEQ Comment:

521. E.1.b.i-iii *Please provide the required information.*

ExxonMobil's Response:

As stated in the application, there are no additional recognized usable aquifers which have their upper surfaces within 200 feet of the ground surface.

LDEQ Comment:

521.G.1.a *Please address 713.C.1.b.iii.k.*

ExxonMobil's Response:

As stated in the application, records will be maintained during the life of the facility and will be kept on file for at least three years after closure, pursuant to LAC 33:VII.713.C.1.b.iii. As also stated, certified field notes for construction and installations, and quality assurance/quality control records will be maintained at the Baton Rouge Refinery and these records will be made available to LDEQ officials during facility inspections. ExxonMobil has revised the text to specifically identify quality assurance/quality control records to include leak detection assurance procedures (See Attachment 4, LAC 33:VII.521 Part II replacement page G-1). Since the facility does not have a liner or cover system, "demonstrating that liners ... and cover systems are constructed or installed in accordance with appropriate assurance procedures" is not applicable.

LDEQ Comment:

521.G.1 .b *List the minimum personnel by job description necessary to achieve the operational requirements of the facility.*

ExxonMobil's Response:

As stated in the application, a full description of key personnel by general job classification was included on pages 1 and 2 of the Training Plan located in Appendix F.

LDEQ Comment:

521.H.1.c *Please address.*

ExxonMobil's Response:

As described in the application, the Wet Gas Scrubber Settling Ponds (WGSSP) are settling basins that do not rely on any utilities or power for operation. Therefore, there is no "equipment to be furnished at the facility" and this section is not applicable.

LDEQ Comment:

521.H.4-7 *If a section does not apply, the applicant must state that it does not apply and explain why.*

ExxonMobil's Response:

Please see replacement page H-8 presented in Attachment 4, LAC 33:VII.521 Part II replacement pages. These sections do not apply to this Type I facility, and this facility does not receive waste with a potential to produce gases.

LDEQ Comment:

521.L.3 *Please state that you will obtain and maintain liability insurance as required in 727.A.1.*

ExxonMobil's Response:

As provided in Appendix L, titled Financial Assurance Documentation, ExxonMobil has submitted documents displaying compliance with LAC 33:VII.727 Financial Assurance. ExxonMobil has demonstrated through the financial test specified in LAC 33:VII.727.A.1 that it meets the liability coverage and will continue to do so.

LDEQ Comment:

521.L.4 *Please state that you will obtain and maintain financial assurance as required in 727.A.2 for closure and post-closure care.*

ExxonMobil's Response:

As provided in Appendix L, ExxonMobil has submitted documents directly displaying compliance with LAC 33:VII.727 Financial Assurance. ExxonMobil has demonstrated through the financial test specified in LAC 33:VII.727.A.2 that it meets the financial assurance for closure and post-closure care and will continue to do so.

Engineering Review

LDEQ Comment:

521. A.1.e.ii *If this section does apply, please address.*

ExxonMobil's Response:

As stated in the application, and acknowledged by the appropriate state agencies in the Attachment to Section A titled Threatened or Endangered Species Correspondence, there are no known historic sites, recreation areas, archeological sites, designated wildlife-management areas, swamps and marshes, wetlands, habitats for endangered species, or sensitive ecological areas within 1,000 feet of the facility perimeter or as otherwise appropriate.

LDEQ Comment:

521.B.1.a *Distinguish the property lines on Figure B-3.*

ExxonMobil's Response:

Figure B-3 is included to distinguish facility perimeter enclosures and refinery security. Figures A-1, A-2 and A-4 clearly identify facility property lines. A single figure displaying "elements of the process or disposal systems employed, including, as applicable, property lines, original contours (shown at not greater than five-foot intervals), buildings, units of the facility, drainage, ditches and roads;" for the entire Refinery would be illegible at the scale necessary. Please view Figures A-1, A-2, A-4, B-1, B-2, and Appendix B for the requested information.

LDEQ Comment:

521.B.1.c *Provide supporting documentation supporting the waiver of the buffer zone.*

ExxonMobil's Response:

As stated in the application (and the 1994 submittal) the Wet Gas Scrubber Settling Ponds have a buffer zone of less than 50 feet on the east (Illinois Central Railroad) and south (Honeywell International). Previous guidance from the LDEQ stated that an affidavit from adjacent landowners waiving the requirement of less than a 200 foot buffer zone is not required for *existing permitted facilities*. This facility pre-dates LAC 33:VII.709.B.2.a which requires "permission, in the form of a notarized affidavit, of the adjoining landowner and occupants." Again, this is an existing facility whose location has not changed since previous application submittals.

LDEQ Comment:

521.B.1.f *The Operational Plan included in Appendix H does not provide the additional information required by this regulation. Provide a response.*

ExxonMobil's Response:

As stated in the September 2005 submittal application, the ExxonMobil Baton Rouge Refinery does not accept any waste from outside the facility.

LDEQ Comment:

521.C.1.a *Address this regulation as it applies to the Wet Gas Scrubber Settling Ponds.*

ExxonMobil's Response:

As stated in the application, the Wet Gas Scrubber Settling Ponds do not experience surface drainage. As clarified on replacement page C-1 (Attachment 4), by design, surface impoundments are designed to hold an accumulation of liquid waste and/or sludge and overtopping can not occur. Discharge waters flow to a concrete overflow sump and are then pumped to the wastewater treatment plant under an approved NPDES permit.

LDEQ Comment:

521.C.1.b *Please provide an explanation why the ponds do not experience runoff/run-on.*

ExxonMobil's Response:

As clarified on replacement page C-1 (Attachment 4), by design, surface impoundments are designed to hold an accumulation of liquid waste and/or sludge and therefore do not experience runoff/run-on. Discharge waters flow to a concrete overflow sump and are then pumped to the wastewater treatment plant under an approved NPDES permit.

LDEQ Comment:

521.C.1.e *Please note, 713.A.6 does not apply. Provide the 100-year flood and levee elevations.*

ExxonMobil's Response:

According to the Federal Emergency Management Agency (FEMA) flood insurance rate map (application Figure A-3), the site is located in the batture area adjacent to the Mississippi River, and is within the 100-year flood plain. The 100-year flood stage for the Mississippi River in the vicinity of the ExxonMobil refinery is 46.1 feet MSL (the highest recorded flood level of the river was 43.5 feet MSL in 1983). The area which includes the site was previously filled by ExxonMobil to prevent flooding (generally referred to as the Shallow Fill Zone). Current ground surface elevations are approximately 50 feet MSL. Therefore, the site is above the expected Mississippi River flood elevation. (ExxonMobil has provided this additional information on replacement page C-3 in Attachment 4.)

LDEQ Comment:

521.H.2.a *Appendix H does not include any of the information required by this regulation. Provide a more detailed response while addressing all of the standards in 713.D.*

ExxonMobil's Response:

ExxonMobil has addressed all applicable requirements in 713.D within the application submittal text. Appendix H has been revised to summarize the applicable rationale already provided and provides further rationale on the non-applicable requirements. An Appendix H replacement page is included with this correspondence in Attachment 4.

LDEQ Comment:

Appendix J *Table J-2: Update the costs associated with testing to reflect the number of samples to be analyzed and the methods to be run.*

ExxonMobil's Response:

ExxonMobil has revised the cost associated with testing samples to reflect the maximum of 24 samples (Attachment 4, Appendix J replacement pages). As stated in Appendix J on page 5 of the application, samples will be analyzed in accordance with EPA SW-846 methods.

Geology Review

LDEQ Comment:

709 *Each of these regulations must be addressed individually prior to approval of the Mandatory Modification Document.*

ExxonMobil's Response:

ExxonMobil addressed and incorporated the applicable regulations in LAC 33:VII.709 within the September 2005 application responses. The application's organization is in accordance with the regulations requesting a Section 521 regulatory sequence "to facilitate evaluation." To provide for an easier permit review process, ExxonMobil has also provided a table of cross-references to demonstrate that the September 2005 application submittal satisfies the applicable requirements contained in LAC 33:VII.709 (see Attachment 3 of this document).

LDEQ Comment:

521.F.5.c *The parameter list associated with this section must be justified. Further information is needed prior to elimination or inclusion of organic parameter analyses in this section.*

ExxonMobil's Response:

The parameter list was generated in the WGSSP original application based upon sludge sample data and knowledge of the waste material. Since that time, additional sampling data, as presented in Attachment 2 of Appendix H, combined with annual ground water monitoring results from the existing wells, have indicated the parameter list is appropriate. ExxonMobil has provided semi-annual groundwater monitoring reports to the LDEQ since original permit issuance. (ExxonMobil has included this additional information on replacement page F-4, Attachment 4.)

LDEQ Comment:

521.F.5.e *Justification must be provided for the well spacing associated with these ponds. There are three monitor wells that currently monitor groundwater quality at the ponds. Also, the statistical analysis mentioned in this section must provide detail on how the program will be implemented; i.e., when will a statistical exceedance be indicated and how will these statistics be used to indicate an exceedance. Analytical results must be statistically compared between upgradient and downgradient wells until such time that the Department is satisfied that the downgradient wells have not been impacted. At that time, the wells can be statistically compared to themselves in the future.*

ExxonMobil's Response:

Well spacing has not changed from the existing 1994 MMD submittal and designations of upgradient and downgradient wells are consistent with available potentiometric surface data.

ExxonMobil has revised Section 5 of Appendix N to include statistical evaluations of upgradient and downgradient analytical data utilizing the ANOVA test with a post hoc test to differentiate individual wells (see Attachment 4, Appendix N replacement page 12). The method described is used to show that exceedances of the Permit concentration limits for some metals are representative of background concentrations by showing that upgradient and downgradient analytical data concentrations are not statistically different; therefore, these results are not indicative of a release from the Permit unit. A revised response is included on replacement page F-7.

GIS Property Details
Attachment 1

Incorporated into final submittal.

WGSSPs Exemption Request

Attachment 2

ExxonMobil
Refining and Supply Company
P. O. Box 551
Baton Rouge, LA 70821-0551

W. D. ...ows
Environmental Manager

ExxonMobil
Refining & Supply

March 13, 2006

Mr. Michael Vince
Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

CERTIFIED MAIL #7003 1680 0005 3869 9229

RE: Louisiana Solid Waste Permit Mandatory Modification Document Exemption
Wet Gas Scrubber Settling Ponds
ExxonMobil Refining & Supply Company
Facility No. GD-033-0596
Solid Waste Permit No. P-0274
Agency Interest Number 2638
Baton Rouge Refinery
Baton Rouge, East Baton Rouge Parish, Louisiana

Dear Mr. Vince:

The updated Wet Gas Scrubber Settling Ponds Louisiana Solid Waste Permit Mandatory Modification Document (MMD) was submitted in July 2004 and was prepared in accordance with the Louisiana Solid Waste Regulations promulgated December 31, 2003 and with the Louisiana Department of Environmental Quality (LDEQ) letter dated May 5, 1993.

ExxonMobil Refining & Supply Company (ExxonMobil) has identified specific citations within the Solid Waste Regulations that have little to no impact on the permitted operational activity but potentially compromises the safety and security of the facility's critical infrastructure as defined in 33 CFR 105.260(b). ExxonMobil is hereby requesting an exemption from regulatory citation LAC 33:VII.521.A.2(c):

2. ***the following information regarding wells, faults, and utilities is required for all Type I and II facilities:***
   c. ***Utilities. Scale map showing the location of all pipelines, power lines, and right-of-ways within the site.***

The Baton Rouge Refinery Wet Gas Scrubber Settling Ponds (WGSSP) facility is a rain water surface impoundment that does not rely on any utilities or power for operation. Permitting action on this facility (pursuant to LAC 33:VII.307.B) does not pose significant adverse impacts on public health, safety, welfare, or the environment, and compliance with LAC 33:VII.521.A.2(c) imposes an "unreasonable safety burden" on ExxonMobil.

Not only is the requested information critical infrastructure, it is an element regulated under the Facility's Security Plan and 33 CFR 105.305(d)(2). Thus, ExxonMobil has a duty to protect public safety by preventing public disclosure of sensitive security information as directed by 49 CFR 1520.5(b). However, this information will be made available for inspection by the appropriate government agencies upon request.

ExxonMobil is hopeful that this request will not impede the MMD permit review process by the LDEQ. A copy of the public notice for the exemption request (per *LAC 33:VII.307.C.1*) is included as Attachment 1 to this correspondence.

Please contact Wayne Abshire (225) 977- 4860 if you have any questions in regard to this exemption request.

Very Truly Yours,

Dave Fellows

Enclosure

JGA:kaw

Public Notice

Public Notification of Exemption Request
ExxonMobil Refining & Supply Company
EPA ID Number LAD 062 662 887
Baton Rouge,
East Baton Rouge Parish, Louisiana

The ExxonMobil Refining & Supply Company (ExxonMobil) has requested an exemption from specific citations within the Solid Waste Regulations requesting utility scale maps showing the location of all pipelines, power lines, and right-of-ways within the site. This notice satisfies the requirement of the LAC 33:VII.307.C.1 for solid waste permit renewal applications P-0273 and P-0274.

Please contact Richard Cotton (225) 977-8337 if you have any questions in regard to this exemption request.

72611 feb 24 1t

LAC 33:VII.709 Cross-Reference Table

Attachment 3

Incorporated into final submittal.

Application Replacement Pages
Attachment 4

Incorporated into final submittal.

DEPARTMENT OF ENVIRONMENTAL QUALITY

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

JUN 29 2006

William D. Fellows, Environmental Manager
ExxonMobil Refining and Supply
P.O. Box 551
Baton Rouge, LA 70821

Re: Exemption Request
Wet Gas Scrubber Settling Pond
Exxon Refining & Supply Company
AI #2638/GD-033-0596/P-0274/ PER20060004
East Baton Rouge

RECEIVED
JUL 07 2006
By

Dear Mr. Fellows:

We have reviewed your request for an exemption from the regulatory citation LAC 33:VII.521.A.2.c which requires you to provide a Utilities Scale Map. The Department recognizes this facility as an existing facility as defined by the Solid Waste Regulations. The compliance record of the facility indicates that in the past the facility has operated in accordance with its permit conditions.

The proposed operation of the facility as reflected by the permit application indicates your intent to continue operation of the facility in a manner protective of human health and the environment. In consideration of the foregoing facts, an exemption is hereby granted to the regulatory citation LAC 33:VII.521.A.2.c as allowed by these regulations.

Please reference Agency Interest (AI 2638), Site Identification Number (GD-033-0596), Permit Number (P-0274) and Permit Activity Number (PER20060004) on all future correspondence pertaining to this permit activity. If you have any questions concerning this matter, please contact Mr. Timothy Smith of the Waste Permits Division at (225) 219-0029.

Sincerely,

Chuck Carr Brown, Ph.D.
Assistant Secretary

ts

c: ERM

ENVIRONMENTAL **SERVICES**
: PO BOX 4313, BATON ROUGE, LA 70821-4313
P:225-219-3181 F:225-219-3309
WWW.DEQ.LOUISIANA.GOV

DEPARTMENT OF ENVIRONMENTAL QUALITY

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

JUL 25 2006

CERTIFIED MAIL 7004 1160 0000 3793 9666

William D. Fellows, Environmental Manager
ExxonMobil Refining and Supply
P.O. Box 551
Baton Rouge, LA 70821

Re: Notice of Deficiencies #2
Exxon Refining & Supply Company
Wet Gas Scrubber Settling Pond
AI #2638/GD-033-0596/P-0274/ PER20020002
East Baton Rouge

Dear Mr. Fellows:

The Waste Permits Division has performed the technical review of your response to NODs submitted on April 7, 2006. The submittal has been determined to be deficient and not in compliance with LAC 33:VII. The deficiencies are outlined below:

Engineering Review

521.B.1.f	The original response to this section states to "Refer to the Facilities Operation Plan (Appendix H) for additional information." Appendix H does not include any information regarding the devices or methods to determine, record, and monitor incoming waste. Furthermore, the regulation is applicable to all facilities, not just facilities that receive waste from outside sources.
521.H.2.a	Please address 713.D.2.g, h and 713.D.3.b.
Appendix J	Table J-2: Update the costs associated with testing to reflect the analysis to be run (TPH, sulfides, phenol, etc.)

Your response to these deficiencies shall be sent to this office within thirty (30) days of receipt of this letter. Additionally, five (5) copies of your response, including appendices, shall be provided. Failure to respond to these deficiencies as described as well as failure or refusal to comply with this notice may result in a permit denial.

ENVIRONMENTAL **SERVICES**
: PO BOX 4313, BATON ROUGE, LA 70821-4313
P:225-219-3181 F:225-219-3309
WWW.DEQ.LOUISIANA.GOV

Please reference your Agency Interest Number (AI 2638), Facility Identification Number (GD-033-0596), Permit Number (P-0274) and Permit Activity Number (PER20020002) on all future correspondence. If you have any questions concerning this matter, please contact Mr. Jason Meyers, Engineering Group 4 at (225) 219-3459.

Sincerely,

Bijan Sharafkhani, P.E.
Administrator
Waste Permits Division

ts

c: Capital Regional Office
Jason Meyers, OEA,
ERM

ExxonMobil
Refining and Supply Company
P. O. Box 551
Baton Rouge, LA 70821-0551

W. D. Fellows
Environmental Manager

LDEQ RECEIPT

6 AUG 15 P1 :2

ExxonMobil
Refining & Supply

August 15, 2006

HAND DELIVERED

Mr. Bijan Sharafkhani
Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
Waste Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

RE: Notice of Deficiencies #2
Solid Waste Mandatory Modification Document/Permit Renewal Application
Wet Gas Scrubber Settling Ponds
ExxonMobil Refining & Supply Company
Facility No. GD-033-0596
Solid Waste Permit No. P-0274
Agency Interest Number 2638
Activity Number PER20020002
Baton Rouge Refinery
Baton Rouge, East Baton Rouge Parish, Louisiana

Dear Mr. Sharafkhani:

ExxonMobil submitted in September 2005 a Solid Waste Mandatory Modification Document/Permit Renewal Application. Please find attached our response to the Notice of Deficiencies (NODs) provided to ExxonMobil on July 25, 2006 from the Waste Permits Division. The NOD submission includes comment responses and replacement pages to be inserted into the permit renewal application.

Please contact Ron Dunham at (225) 977-4860 if you have any questions in regard to this submittal.

Sincerely,

W D Fellows

Enclosure
JGA:kw

Notice of Deficiencies Responses
Updated Louisiana Solid Waste Permit Mandatory Modification Document
Wet Gas Scrubber Settling Ponds
ExxonMobil Refining & Supply Company
Facility No. GD-033-0596
Solid Waste Permit No. P-0274
Agency Interest No. 2638
Activity No. PER20020002
Baton Rouge Refinery
Baton Rouge, East Baton Rouge Parish, Louisiana

Engineering Review

LDEQ Comment:

521.B.1.f *The original response to this section states to "Refer to the Facilities Operation Plan (Appendix H) for additional information." Appendix H does not include any information regarding the devices or methods to determine, record, and monitor incoming waste. Furthermore, the regulation is applicable to all facilities, not just facilities that receive waste from outside sources.*

ExxonMobil's Response:

ExxonMobil has revised page B-5, to clarify that impoundment wastes consist of solids, which settle out of the Wet Gas Scrubber wastewater. These wastes are produced by known processes and have been extensively characterized over years of impoundment operations. Sediments are sampled and/or characterized prior to removal and liquid discharge is processed under an approved NPDES permit. Sampling results are maintained by ExxonMobil. For information purposes, representative results from a recent sampling event were included with Appendix H. In addition to the above periodic sampling, engineering knowledge is utilized to determine and record incoming waste by monitoring of exiting wastes and management of impoundment water levels (Replacement Page B-5).

LDEQ Comment:

521.H.2.a *Please address 713.D.2.g, h and 713.D.3.b*

ExxonMobil's Response:

ExxonMobil has revised page H-4 and Appendix H to clarify that facility inspections are conducted in-part to ensure that impoundment design capacity remains unchanged (Replacement Pages). Also as stated in the application, this facility is not protected by levees and therefore LAC 33:VII.713.D.2.h is not applicable.

As previously stated in Appendix H of the application, the impoundment is protected against overtopping by overfilling, wave action, or action of storms by the facility's option to operate both ponds during abnormal conditions and inclement weather. Furthermore as previously stated, facilities are examined daily and after major storms (defined as >2.0" from midnight to midnight) for early detection and prevention of such occurrences.

LDEQ Comment:

Appendix J *Table J-2: Update the costs associated with testing to reflect the analysis to be run (TPH, sulfides, phenol, etc.)*

ExxonMobil's Response:

Table J-2 was updated to include current analytical costing estimates (Appendix J Replacement Pages).

LAC 33:VII.521 Part II
Replacement Pages

Incorporated into final submittal.

Appendix H
Replacement Page

Incorporated into final submittal.

Appendix J
Replacement Pages

Incorporated into final submittal.

LDEQ Modifications Letter

Attachment B

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

State of Louisiana

Department of Environmental Quality

Edwin W. Edwards
Governor

May 5, 1993

Kai David Midboe
Secretary

To: Solid and Industrial Waste Permit Applicants and Permit Holders

From: Thomas H. Patterson
Program Manager
Permit Section

The new Solid Waste Regulations, which became effective on February 20, 1993, require permit holders and applicants to submit additional information to the department for review.

In an effort to reduce the amount of time needed to process these modifications, the Solid Waste Division requests that all mandatory modifications of permit applications submitted in response to LAC 33:VII.315 be prepared as follows:

1. Please incorporate all mandatory modifications or additions made in response to LAC 33:VII.315. into a new document (permit application). This document should incorporate all previous text, previously approved modifications, modifications pending review, new mandatory modifications, and new voluntary modifications.

2. Underline all mandatory modifications and additions submitted in response to LAC 33:VII.315. to distinguish additions from original text.

3. Please number the new document according to the Solid Waste Regulations promulgated February 20, 1993 as amended.

4. Identify all drawings and photographs using the regulation or exhibit number referenced in the amended text.

5. Please provide a list of all modifications and additions made in response to LAC 33:VII.315. Any previously approved modification which satisfies a mandatory modification requirement should also be included on this list.

6. All previously approved modifications shall be incorporated into the rewrite but not otherwise highlighted. Please supply a list of all previously approved modifications and deletions in addition to the list required in Item #5.

7. Please provide a list of all new non-mandatory/voluntary modifications which are submitted for the first time in this document. This list should be separate from lists required in Item 5 & 6.

OFFICE OF SOLID AND HAZARDOUS WASTE SOLID WASTE DIVISION P.O. BOX 82178 BATON ROUGE, LOUISIANA 70884-2178

TELEPHONE (504) 765-0249 FAX (504) 765-0299

Type II Facilities will be issued an Order to allow these facilities to implement those items required by LAC 33:VII.315.G prior to any mandatory modification deadline. The required items include considerations for airports, restriction of public access, hazardous waste exclusion, discharges to surface water, unstable areas, 100-year floodplains, run-on/run-off control, daily cover, open burning, methane monitoring and vector control. Permit modifications to propose and include site specific plans for these items may follow in accordance with the mandatory modification schedule for Type II facilities.

Please note that all mandatory modifications must be accompanied by a fee of $500, according to LAC 33:VII.525. This fee does not include voluntary modifications.

Voluntary modifications and mandatory modifications may be submitted together with a fee of $1,000 according to LAC 33:VII.525.C.

For the convenience of both permit applicant and the department, any future modifications will be managed by replacing applicable pages.

Should you require any additional information regarding this matter, please contact your DEQ facility manager or myself at (504)765-0257 at your convenience.

THP:wl

Solid Waste Permit Application Form

Part I

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

LAC 33:VII.519
SOLID WASTE STANDARD PERMIT APPLICATION - PART I

(The form shall be completed in accordance with the instructions found in LAC 33:VII.513.A.1)

A. Applicant (Permit Holder): ExxonMobil Refining & Supply Company (a division of ExxonMobil Corporation) Wet Gas Scrubber Settling Ponds

B. Facility Name: ExxonMobil, Baton Rouge Refinery

C. Facility Location/Description: 4045 Scenic Highway Baton Rouge, Louisiana 70805

D. Location: Sections 44 Township 6 South Range 1 West of St. Helena Meridian

Parish: East Baton Rouge

Coordinates: Latitude Degrees 30 Minutes 28 Seconds 30 North

Longitude Degrees 91 Minutes 11 Seconds 45 West

E. Mailing Address: P.O. Box 551, Baton Rouge, LA 70821

F. Contact: William D. Fellows

G. Telephone: (225) 977-8430

H. Type and Purpose of Operation: (check each applicable line)

Type I	Industrial Landfill	___
	Industrial Surface Impoundment	X
	Industrial Landfarm	___
Type I-A	Industrial Incinerator Waste Handling Facility	___
	Industrial Shredder/Compactor/Baler	___
	Industrial Transfer Station	___
Type II	Sanitary Landfill	___
	Residential/Commercial Surface Impoundment	___
	Residential Commercial Landfarm	___
Type II-A	Residential/Commercial Incinerator Waste Handling Facility	___
	Residential/Commercial Shredder/ Compact/Baler	___
	Residential/Commercial Transfer Station	___
	Residential/Commercial Refuse-derived Fuel	___
Type III	Construction/Demolition-debris Landfill	___
	Woodwaste Landfill	___
	Compost Facility	___
	Resource Recovery/Recycling Facility	___

Other

Describe: _____

_____

I. Site Status: Owned _X_ Leased ___ Lease Term ___ Years

(Note: If leased, provide copy of lease agreement)

J. Operations Status: Existing _X_ Proposed __

K. Total Acres _Approx. 0.5_ Processing Acres _____ Disposal Acres _Approx. 0.5_

L. Environmental Permits: (List)

A. Permit Type	B. Permit Number	C. Description
NPDES (402)	LA0005584	
N	LAR050000	
N	LA0005568	
N	LAR05N342	
N	LAR200000	
E	P-0273	Solid Waste
E	P-0274	Solid Waste
E	P-0325	Solid Waste
Air	2275-V1	Pipestills
Air	2234-V1	Cokers
Air	2385-V1	CAT Complex
Air	2589-V1	Light Ends
Air	2447-VO	HHLA
Air	2176-V1	Clean Gasoline
Air	PSD-LA-667(M-1)	Clean Gasoline
Air	2300 (M-1)	Sulfur Unit
Air	234 (M-2)	Lubes extraction
Air	2296-V1	Light Oils
Air	2363-VO	WCLA
Air	(M-2)	Sludge Drier
Air	3120-00056-V1	ATF
Air	2815-VO	Tank Cleaning Pump
Air	2047-VO	MVR(Docks)
Air	2261-VO	Reforming (Feed Prep, PHLA-2)
Air	2341-VO	Specialties
Air	2795-VO	Refinery Tank Farm

M. Conformity with regional plans. Attach letter from the Louisiana Resource Recovery and Development Authority (LRRDA) stating that the facility is an acceptable part of the state-wide program.

See Attachment A.

(Note: In accordance with R.S. 30:2307.B, LRRDA authority does not apply to solid waste disposal activity occurring entirely within the boundaries of a plant, industry, or business which generates such solid waste).

N. Zoned: Yes X No _____ Zoning Requested _____

Zone Classification: Industrial

Note: If zoned, include zoning affidavit and/or other documentation stating that the proposed use does not violate existing land-use requirements.

O. Types, Quantities, and Sources of Waste:

	Processing		Disposal	
	On-Site	Off-Site	On-Site	Off-Site
Residential	N/A	N/A	N/A	N/A
Industrial			2.9 (tons/week)	
Commercial				
Other	N/A	N/A	N/A	N/A

P. Service Area: NA

List of Parishes: NA

Statewide NA Unlimited NA

Q. Proof of Operator's Public Notice: Attach proof of publication of the notice regarding the permit application submittal as required by LAC 33:VII.513.A.
See Attachment B.

R. Certification: I have personally examined and am familiar with the information submitted in the attached document, and I hereby certify under penalty of law that this information is true, accurate, and complete to the best of my knowledge. I am aware that there are significant penalties for submitting false information, including the possibility of fine and/or imprisonment.

Signature W D Fellows

Date Sept 21, 2005

Typed Name and Title William D. Fellows/Refinery Contact

S. Any additional information required by the administrative authority.
(Note: Attach proof of the legal authority of the signee to sign for the applicant).
See Attachment C.

Louisiana Resource Recovery and Development Authority Documentation

Attachment A

July 2005

Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

State of Louisiana

OPERATIONS SUPPORT DEPART
CD
TAK
File
MAY 23 1986
WRB FRH MWK PMM SMF
JPH RAC JRL MAC ERP

EDWIN W. EDWARDS
GOVERNOR
B. JIM PORTER
SECRETARY

DEPARTMENT OF NATURAL RESOURCES

MICHAEL J. BOURGEO
DEPUTY SECRETARY

May 22, 1985

L. Kronenberger
Exxon Company, U.S.A.
P. O. Box 551
Baton Rouge, LA 70821

RE: Solid Waste Permit Applications
Wastewater Treatment Impoundments
East Baton Rouge Parish, Louisiana

Dear Mr. Kronenberger:

The Louisiana Resource Recovery and Development Authority (LRRDA) is investigating the feasibility of constructing regional waste facilities in several locations in the state as an environmentally acceptable means of solving the state's solid waste disposal problem.

At present time, the Louisiana Resource Recovery and Development Authority has no plans for the development of a waste-to-energy facility in the E. Baton Rouge Parish area. Therefore, if the Wastewater Treatment Impoundments referenced above meets state and federal regulations, the facility is acceptable to LRRDA.

Sincerely,

V H Tompkins

V. H. Tompkins
Acting Program Administrator

VHT/lr

Property Details for: 4045 SCENIC HWY

Property Information | **Parcel ID:710270264**

Address:	4045 SCENIC HWY		Lot Number:		UND
Business Name:	EXXON CHEMICAL				
Planning District:	7	Sub Area:	1	Lot & Block:	27
Subdivision:		Filing:		Block Number:	
Zoning:	M2 Yard Requirements	DOTD Number:	179		
Existing Land Use:	Industrial	Horizon Land Use:	Industrial		
NAICS Code:	324110	Flood Zone:	X		

Census Information

Census Tract:	30.02
Census Block:	1

Jurisdiction Information

City Limits:	No	Zip Code:	70802
Council District:	10	Police District:	1E-2
Voting District:	1-17	Fire District:	
LA House of Representative:		Enterprise Zone:	Yes
		Industrial Area:	1

Print Close

Public Notice

Attachment B

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

CAPITAL CITY PRESS

Publisher of
THE ADVOCATE

PROOF OF PUBLICATION

The hereto attached notice was published in THE ADVOCATE, a daily newspaper of general circulation published in Baton Rouge, Louisiana, and the official Journal of the State of Louisiana, the City of Baton Rouge, and the Parish of East Baton Rouge, in the following issues:

02/08/07

Susan A. Bush, Public Notices Clerk

Sworn and subscribed before me by the person whose signature appears above:

February 8, 2007

Pegeen Singley, Notary Public, #66565
My Commission Expires: Indefinite
Baton Rouge, Louisiana

Public Notice
Of
Intent to Submit Permit Application
ExxonMobil Refining & Supply Company
Agency Interest No. 2638
Facility Identification No. GD-033-0596
Permit Activity No. PER20020002
4045 Scenic Highway, Baton Rouge
East Baton Rouge Parish, Louisiana

Notice is hereby given that ExxonMobil Baton Rouge Refinery intends to submit to the Department of Environmental Quality, Office of Environmental Services, Water and Waste Permits Division, an application for a permit to operate the Wet Gas Scrubber Settling Ponds (WGSSP) surface impoundments in East Baton Rouge Parish, Range- West of St. Helena Meridian, Township- 6 South, Section- 44, which is located along the east bank of the Mississippi River in northwestern Baton Rouge, Louisiana.

Comments concerning the facility may be filed with the secretary of the Louisiana Department of Environmental Quality at the following address:

Louisiana Department of Environmental Quality
Office of Environmental Services
Water and Waste Permits Division
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

3558231-feb 8-1t

ERM - METAIRIE 3558231
ANGIE JONES
3838 N CAUSEWAY BLVD STE 2725
METAIRIE LA 70002-3663

Proof of Legal Authority

Attachment C

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

#132

INCUMBENT POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS:

THAT EXXON MOBIL CORPORATION, a New Jersey corporation having an office in Fairfax, Virginia, acting by and through J. S. Simon, as Vice President of Exxon Mobil Corporation, does hereby nominate, constitute and appoint the incumbent of the following positions:

Operations Support Senior Advisor, ExxonMobil Refining & Supply Company (a division of Exxon Mobil Corporation)

Refinery Manager, ExxonMobil Refining & Supply Company (a division of Exxon Mobil Corporation)

Global Refining Technical Senior Advisor, ExxonMobil Refining & Supply Company (a division of Exxon Mobil Corporation)

as Agent and Attorney-in-Fact of Exxon Mobil Corporation for purposes of executing and delivering all instruments as more particularly described below, and does hereby grant, delegate and invest each said incumbent with power and authority to execute and deliver for, in the name and on behalf of Exxon Mobil Corporation, and in connection with the business and affairs of Exxon Mobil Corporation, which may be required or appropriate in the conduct of the business, operations and affairs of the Exxon Mobil Corporation, including, without limitation except as herein provided, instruments pledging the credit of Exxon Mobil Corporation, bonds of indemnity, other indemnities, guaranties, affidavits, permits, licenses, applications for permits or licenses, other governmental documents, bids, collective bargaining agreements, other contracts, deeds of conveyance, encumbrances, leases, releases, discharges of mortgages or deeds of trust, assignments, transfers of leasehold estates and/or other interests in real and/or personal property, and any other instruments or documents EXCEPT the following:

1) any mortgage, assignment, conveyance or release of real property or equipment valued at more than Five Hundred Thousand Dollars ($500,000) by any taxing authority; or

2) any instrument authorizing, permitting or evidencing the borrowing of money from any person or entity; or

3) any instrument authorizing or permitting the issuance of corporate bonds of indebtedness (secured or unsecured), or capital shares of Exxon Mobil Corporation, or effecting any change in the capital structure of Exxon Mobil Corporation; or

4) any instrument delegating the power and authority conferred herein to execute and deliver instruments.

The incumbent of said position may exercise the power and authority herein granted, delegated and invested, in any particular and appropriate transaction or matter, as an Attorney-in-Fact of Exxon Mobil Corporation. Any action taken as authorized under this Incumbent Power of Attorney shall be an act of Exxon Mobil Corporation and be binding upon it.

Certificates of incumbency and evidencing authority relating to particular transactions or matters may be issued by the Secretary or any Assistant Secretary of Exxon Mobil Corporation and may be relied upon by third parties dealing with Exxon Mobil Corporation. Such Certificates shall certify that, on the dates set out therein, the individual named therein was an incumbent of said position; that the execution and delivery by such person of particular instruments or documents was authorized by this Incumbent Power of Attorney; and that this Incumbent Power of Attorney was in effect at the time of such execution and delivery.

This Incumbent Power of Attorney is effective immediately and shall expire on October 31, 2006.

APPROVED AND EXECUTED this 31 day of October, 2003.

EXXON MOBIL CORPORATION

By: J S Simon
J. S. Simon
President ExxonMobil Refining & Supply Company
Vice President of Exxon Mobil Corporation

ATTEST:

H. S. Thomassen
Assistant Secretary

United States of America
Commonwealth of Virginia
County of Fairfax

The foregoing instrument was acknowledged before me this 31st day of October, 2003, by J. S. Simon, President of ExxonMobil Refining & Supply Company, a division of Exxon Mobil Corporation and Vice President of Exxon Mobil Corporation, a New Jersey corporation, on behalf of said Corporation.

Susan A Diaz
Notary Public

My Commission Expires: 8/31/2006

Solid Waste Permit Application

Part II

July 2005

Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

LOUISIANA SOLID WASTE PERMIT APPLICATION
MANDATORY MODIFICATION DOCUMENT
WET GAS SCRUBBER SETTLING PONDS

PART II

ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

INTRODUCTION

Background

ExxonMobil Refining & Supply Company (a division of Exxon Mobil Corporation) has prepared this solid waste permit mandatory modification document (MMD) for the Wet Gas Scrubber Settling Ponds operated at ExxonMobil's Refinery, located in Baton Rouge, Louisiana. This application has been prepared in conformance with the Louisiana Solid Waste Regulations promulgated December 31, 2003 and with the Louisiana Department of Environmental Quality (LDEQ) letter dated May 5, 1993 to all Louisiana Solid Waste Permit Applicants and Permit Holders. All chapters included in the Louisiana Solid Waste Regulations have been reviewed for applicability during the preparation of this document. All applicable chapters have been addressed and all non-applicable chapters are listed as such (Attachment A).

Pursuant to LAC 33:VII.519, this application includes a completed Part I Form. Pursuant to LAC 33:VII.521, this application contains a completed Part II formatted to conform with the numbering system used in Section 521 of the Solid Waste Regulations to facilitate evaluation. Pursuant to LAC 33:VII.523, this application contains a completed Part III. Each response in Parts II and III is preceded by its corresponding regulatory passage in boldface to further improve ease of evaluation.

Environmental Regulatory Codes-
List of Applicable Chapters

Attachment A

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

Ch.1 General Provisions and Definitions

ExxonMobil Response:
ExxonMobil will comply with all general provisions listed under Chapter 1 Regulations.

Ch.3 Scope and Mandatory Provisions of the Program

ExxonMobil Response:
ExxonMobil will comply with all general provisions listed under Chapter 3 Regulations.

Ch.5 Solid Waste Management System

ExxonMobil Response:
ExxonMobil will comply with all general provisions listed under Chapter 5 Regulations. ExxonMobil will also comply with all applicable sections listed under Chapter 5. The applicable sections addressed by this document are:

517 Permit Modifications
519 Part I: Permit Application Form
520 Compliance Information
521 Part II: Supplementary Information,
All Processing and Disposal Facilities
523 Part III: Additional Supplementary Information
525 Standard Permit Application Fee Review

Ch.7 Solid Waste Standards

ExxonMobil Response:
ExxonMobil will comply with all general provisions listed under Chapter 7 Regulations. ExxonMobil will also comply with all applicable sections listed under Chapter 7. The sections addressed by this document are:

709 Standards Governing All Solid Waste Disposal Facilities
(Type I and II)
713 Standards Governing Surface Impoundments
727 Financial Assurance

Ch.9 Enforcement

ExxonMobil Response:
ExxonMobil will comply with all general provisions listed under Chapter 9 Regulations.

Ch.11 Beneficial-Use Facilities

ExxonMobil Response:
The regulations listed under Chapter 11 are not applicable to the ExxonMobil Wet Gas Scrubber Settling Ponds.

Ch. 13 Statewide Beautification

ExxonMobil Response:
The regulations listed under Chapter 13 are not applicable to the ExxonMobil Wet Gas Scrubber Settling Ponds.

Ch.30 Appendices

ExxonMobil Response:
ExxonMobil will comply with all general provisions listed under Chapter 30 Regulations.

Ch.103 Recycling and Waste Reduction Rules

ExxonMobil Response:
The regulations listed under Chapter 103 are not applicable to the ExxonMobil Wet Gas Scrubber Settling Ponds.

Ch.104 Credit for Recycling Equipment

ExxonMobil Response:
The regulations listed under Chapter 104 are not applicable to the ExxonMobil Wet Gas Scrubber Settling Ponds.

Ch.105 Waste Tires

ExxonMobil Response:
The regulations listed under Chapter 105 are not applicable to the ExxonMobil Wet Gas Scrubber Settling Ponds.

Ch.111 Appendices

ExxonMobil Response:
The regulations listed under Chapter 111 are not applicable to the ExxonMobil Wet Gas Scrubber Settling Ponds.

LAC 33:VII.521
PART II: SUPPLEMENTARY INFORMATION,
ALL PROCESSING AND DISPOSAL FACILITIES

A. LOCATION CHARACTERISTICS

Standards pertaining to location characteristics are contained in LAC 33:VII.709.A (Type I and II facilities), LAC 33:VII.717.A (Type I-A and II-A facilities), and LAC 33.719.A (Type III facilities).

1. **The following information on location characteristics is required for all facilities:**

   a. **Area Master Plans – a location map showing the facility, road network, major drainage systems, drainage-flow patterns, location of closest population center(s), location of the public-use airport(s) used by turbojet aircraft or piston-type aircraft, proof of notification of affected airport and Federal Aviation Administration as provided in LAC 33:VII.709.A.2, location of the 100-year flood plain, and other pertinent information. The scale of the maps and drawings must be legible, and engineering drawings are required.**

   The Baton Rouge Refinery of ExxonMobil Refining & Supply Company, a division of ExxonMobil Corporation, is located approximately 232 miles above the Head of Passes of the Mississippi River. The refinery is situated in the industrial complex approximately 2-1/2 miles north of the Interstate 10 Mississippi River Bridge and north of the city of Baton Rouge.

   The USGS topographic map for the West Baton Rouge Quadrangle, provided as Figure A-1, shows the facility, road network, surrounding land use, drainage flow patterns and location of the closest population centers. The refinery is bounded by industrial properties on the north, commercial property on the east, residential and industrial properties on the south and the Mississippi River on the west. Drainage-flow patterns, indicated by the surface contours on Figure A-1, are west to the Mississippi River. Facility stormwater is managed by the facility's sewer system.

   Portions of the USGS topographic map for the West Baton Rouge and the Scotlandville Quadrangles are provided as Figure A-2 showing the location of the closest public-use airport. The public-use airport is Ryan Airport, located approximately four miles to the northeast. A proof of notification of the affected airport is not provided because the facility is not located within 10,000 feet of the airport runways used by turbojet aircraft or within 5,000 feet of airport runways used by piston-type aircraft.

   The location of the 100-year flood plain is provided on Figure A-3. The facility is located within the 100-year flood plain.

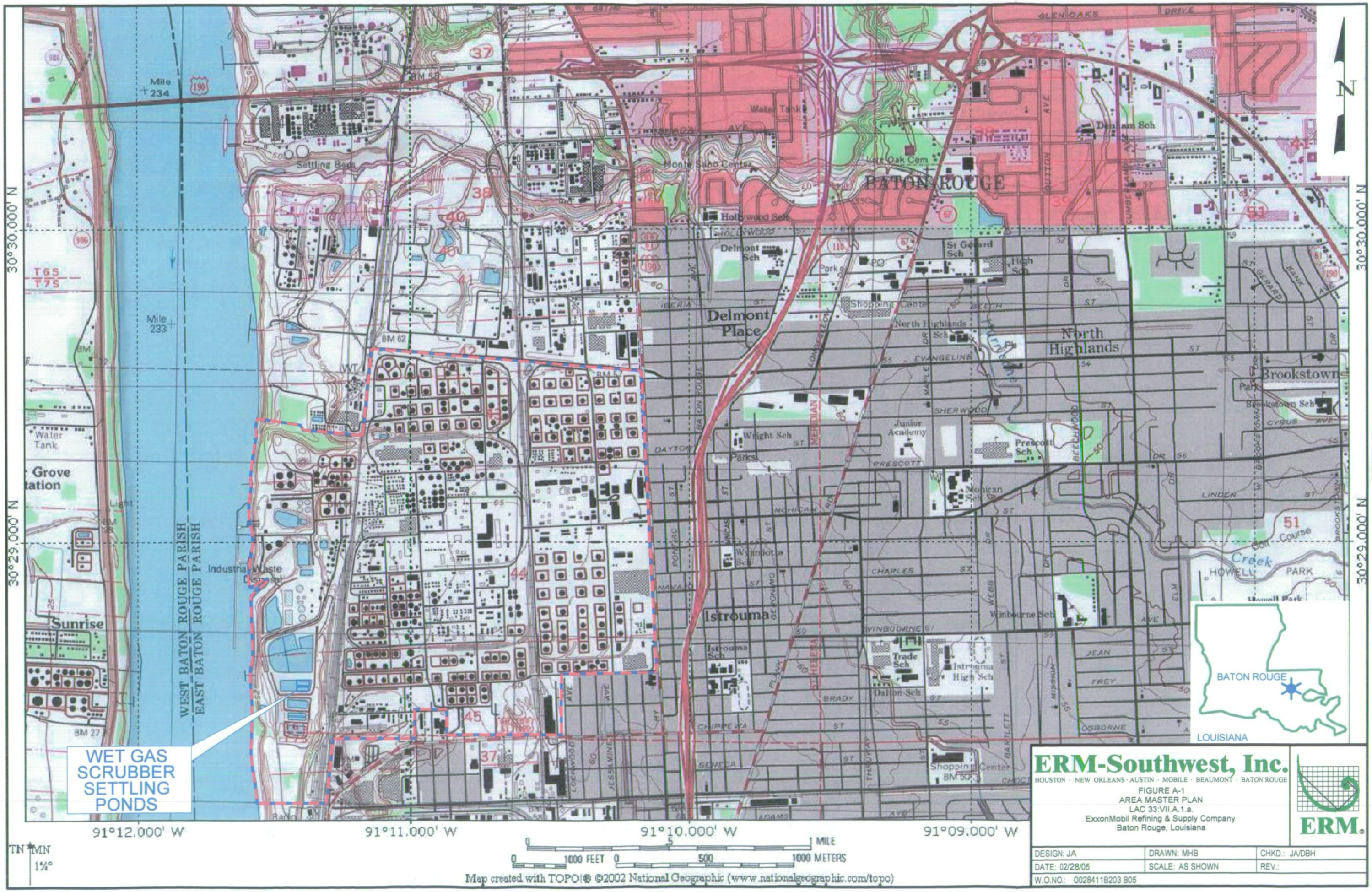

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FIGURE A-1
AREA MASTER PLAN
LAC 33:VII.A.1.a.
ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

ERM®

DESIGN: JA	DRAWN: MHB	CHKD.: JA/DBH
DATE: 02/28/05	SCALE: AS SHOWN	REV.:
W.O.NO.: 0028411B203 B05		

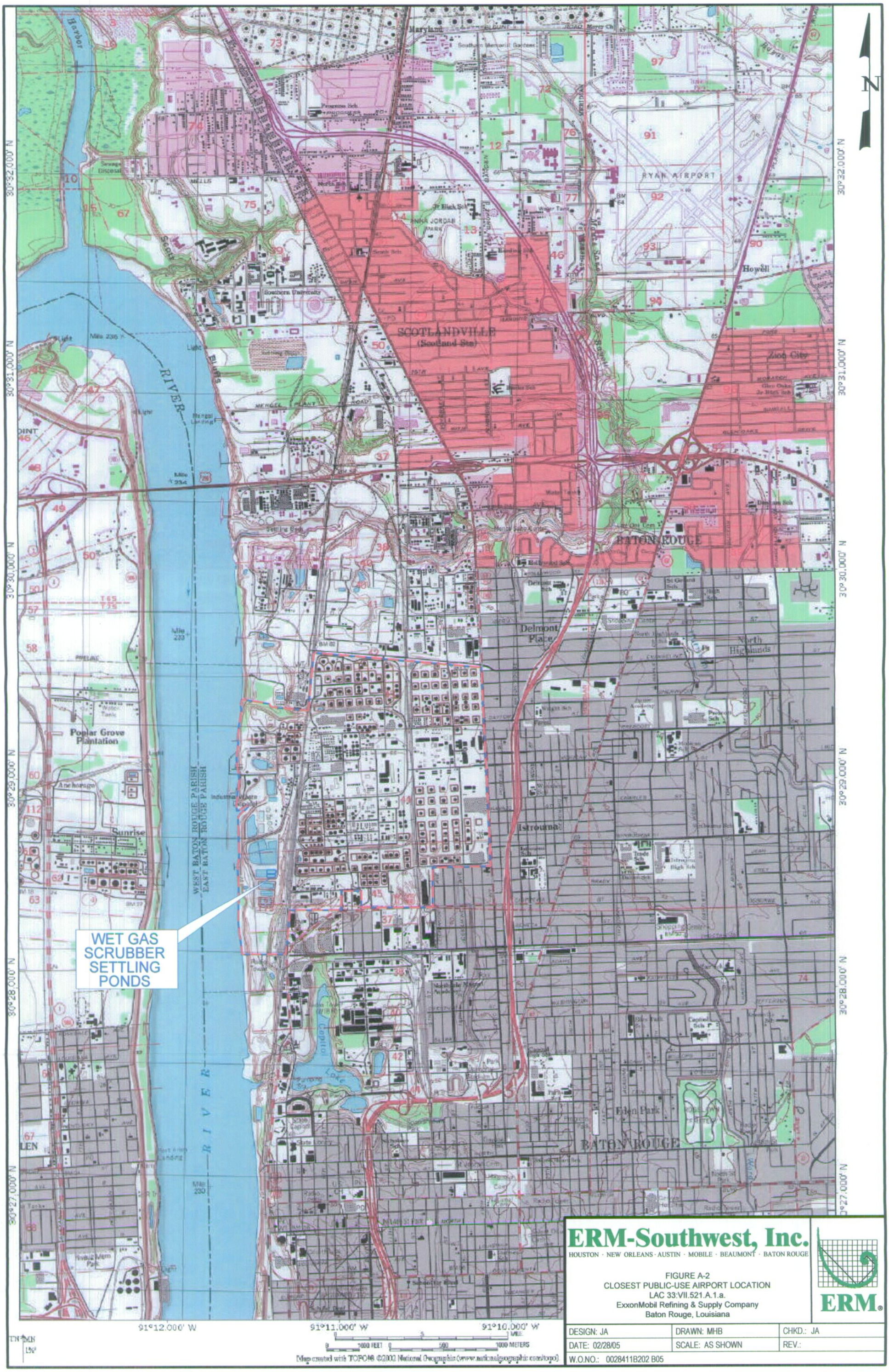

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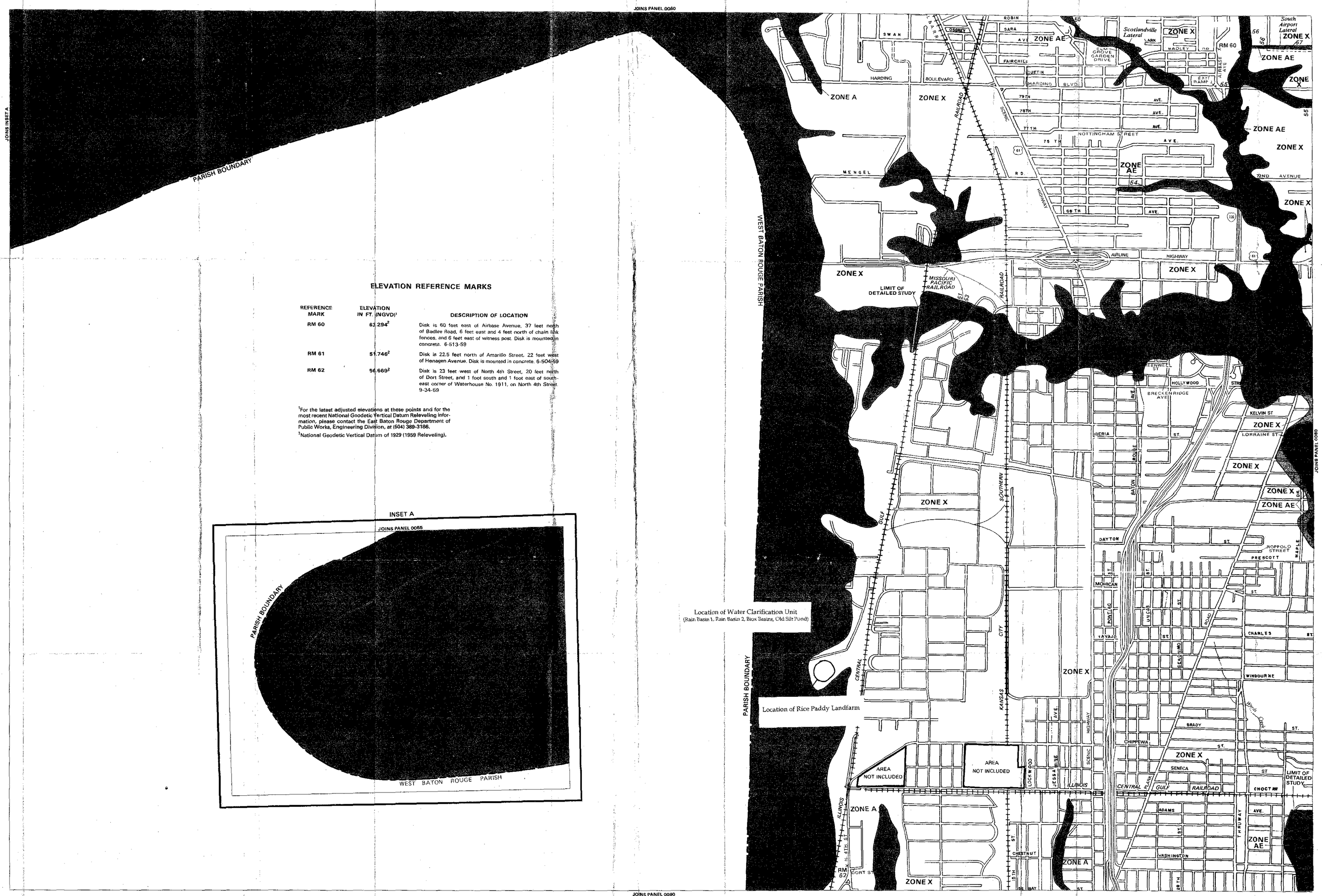
FIGURE A-2
CLOSEST PUBLIC-USE AIRPORT LOCATION
LAC 33:VII.521.A.1.a.
ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

ERM®

DESIGN: JA	DRAWN: MHB	CHKD.: JA
DATE: 02/28/05	SCALE: AS SHOWN	REV.:
W.O.NO.: 0028411B202 B05		

A B C D E F G H J



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 60	62.294[2]	Disk is 60 feet east of Airbase Avenue, 37 feet north of Badley Road, 6 feet east and 4 feet north of chain link fences, and 6 feet east of witness post. Disk is mounted in concrete. 6-513-59
RM 61	51.746[2]	Disk is 22.5 feet north of Amarillo Street, 22 feet west of Hanagen Avenue. Disk is mounted in concrete. 6-506-59
RM 62	56.669[2]	Disk is 23 feet west of North 4th Street, 20 feet north of Dort Street, and 1 foot south and 1 foot east of southeast corner of Waterhouse No. 1911, on North 4th Street. 9-34-59

[1]For the latest adjusted elevations at these points and for the most recent National Geodetic Vertical Datum Releveling information, please contact the East Baton Rouge Department of Public Works, Engineering Division, at (504) 389-3186.

[2]National Geodetic Vertical Datum of 1929 (1959 Releveling).

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** No base flood elevations determined.
- **ZONE AE** Base flood elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain.
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

D — D Cross Section Line

EL 987 — Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7x — Elevation Reference Mark

•M1.5 — River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels, see separately printed Map Index.

MAP REPOSITORY
Flood Office Engineering Department, 4th Floor, Municipal Building, North Street, Baton Rouge, Louisiana 70801 (Maps available for reference only, not for distribution).

INITIAL IDENTIFICATION:
NOVEMBER 22, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:

NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 2, 1979

FLOOD INSURANCE RATE MAP REVISIONS:
JULY 6, 1982
NOVEMBER 15, 1985
MAY 17, 1993: to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to change zone designations, to update map format, to add roads and road names, to incorporate previously issued letters of map revision, and to incorporate previously issued letters of map amendment.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
1200 0 1200 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIGURE 6-1

FIRM
FLOOD INSURANCE RATE MAP

EAST BATON ROUGE PARISH, LOUISIANA
(BATON ROUGE AND VICINITY)

PANEL 75 OF 125
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
220058 0075 D

MAP REVISED:
MAY 17, 1993

b. **A letter from appropriate agency or agencies regarding those facilities receiving wastes generated off-site, stating that the facility will not have a significant adverse impact on the traffic flow of area roadways and that the construction, maintenance, or proposed upgrading of such roads is adequate to withstand the weight of the vehicles.**

This section is not applicable because the facility does not receive wastes generated off-site.

c. **Existing Land Use - a description of the total existing land use within three miles of the facility (by approximate percentage) including, but not limited to:**

i. **residential;**

Approximately 53% of the total land use within three miles of the ExxonMobil, Baton Rouge, Solid Waste facility is currently residential.

ii. **health-care facilities and schools;**

Less than 5% of the total existing land use within three miles of the ExxonMobil, Baton Rouge, Solid Waste facility is currently devoted to health-care facilities and schools.

iii. **agricultural;**

Less than 5% of the total existing land use within three miles of the ExxonMobil, Baton Rouge, Solid Waste facility is currently devoted to agricultural use.

iv. **industrial and manufacturing;**

Approximately 10% of the total existing land use within three miles of the ExxonMobil, Baton Rouge, Solid Waste facility is currently devoted to industrial and manufacturing use.

v. **other commercial;**

Approximately 5% of the total land use within three miles of the ExxonMobil, Baton Rouge, Solid Waste facility is currently devoted to other commercial activities.

vi. **recreational; and**

Approximately 11% of the total existing land use within three miles of the ExxonMobil, Baton Rouge, Solid Waste facility is currently devoted to recreational use. This is largely a result of the Mississippi River being categorized as recreational.

vii. **undeveloped.**

Approximately 11% of the total existing land use within three miles of the ExxonMobil, Baton Rouge, Solid Waste facility is currently undeveloped land.

Existing land use within a three-mile radius of the site has been estimated based on available maps, published information, and through general knowledge of the area.

d. **Aerial Photographs - a current aerial photograph, representative of the current land use, of a one-mile radius surrounding the facility. The aerial photograph shall be of sufficient scale to depict all pertinent features. (The administrative authority may waive the requirement for an aerial photograph for Type III facilities.)**

An aerial photograph representing the current land use within a one-mile radius surrounding the facility is provided as Figure A-4.

e. **Environmental Characteristics - the following information on environmental characteristics:**

i. **a list of all known historic sites, recreation areas, archaeologic sites, designated wildlife-management areas, swamps and marshes, wetlands, habitats for endangered species, sensitive ecological areas within 1,000 feet of facility perimeter or as otherwise appropriate;**

There are no known historical, archaeological (as registered by the Louisiana Department of Culture, Recreation and Tourism) or recreational areas on or within 1,000 feet of the facility. No designated wildlife areas have been established in the vicinity of the facility, and there is no apparent unique habitat for listed endangered species. No natural swamps or marshes occur within the facility or immediately adjacent to it. The batture area along the Mississippi can be periodically flooded but does not support significant populations of marsh plant species in the refinery vicinity.

The land occupied by the solid waste facility and the refinery have been in use for over 30 years. Because of this, the natural vegetation and topography of the land has been permanently altered. Surrounding properties are occupied by other industrial concerns.

N

LEGEND

- PROPERTY BOUNDARY
- ONE MILE RADIUS (CENTER OF PROPERTY)
- ONE MILE RADIUS (CENTER OF 200 FT RADIUS, WET GAS SCRUBBER SETTLING PONDS)
- TWO HUNDRED FOOT RADIUS (CENTER OF WET GAS SCRUBBER SETTLING PONDS)
- ONE MILE PROPERTY BOUNDARY OFFSET (APPROXIMATE)
- ONE MILE RADIUS (PROPERTY BOUNDARY OFFSET, APPROXIMATE)

0 2000 4000
SCALE FEET

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SITE PROPERTY MAP WITH ONE-MILE RADIUS
WET GAS SCRUBBER SETTLING PONDS
LOUISIANA SOLID WASTE PERMIT MMD
ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

ERM

DESIGN: JA	DRAWN: LMc	CHKD.:
DATE: 07/11/05	SCALE: AS SHOWN	REV.:

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The area 1,000 feet west of the facility includes the Mississippi River (to approximately mid-channel). Industrial complexes have been in operation along the river for many years. The river is not considered to be a unique or sensitive biological habitat.

ii. **documentation from the appropriate state and federal agencies substantiating the historic sites, recreation areas, archaeologic sites, designated wildlife-management areas, wetlands, habitats for endangered species, and other sensitive ecological areas within 1,000 feet of the facility; and**

Not applicable. See LAC 33:VII.521.A.1.e.i. Supporting documentation is located in the Attachments of this section.

iii. **A description of the measures planned to protect the areas listed from the adverse impact of operation at the facility;**

Not applicable. See LAC 33:VII.521.A.1.e.i.

f. **A Wetlands Demonstration, if applicable, as provided in LAC 33:VII.709.A.4.**

Not applicable for existing facilities.

g. **Demographic Information - the estimated population density within a three-mile radius of the facility boundary, based on latest census figures.**

The average population density within a three-mile radius of the ExxonMobil Refinery solid waste facilities is 2,568 persons per square mile. The information is based on data obtained from the Census 2000 Redistricting Data (Public Law 94-171) Summary File.

2. **The following information regarding wells, faults and utilities is required for Type I and II facilities:**

a. **Wells. Map showing the locations of all known or recorded shot holes and seismic lines, private water wells, oil and/or gas wells, operating or abandoned, within the facility and within 2,000 feet of the facility perimeter and the locations of all public water systems, industrial water wells, and irrigations wells within one-mile of the facility. A plan shall be provided to prevent adverse effects on the environment from the wells and shot holes located on the facility.**

Water well data were gathered via the computerized retrieval system employed by the Louisiana Department of Transportation and Development (LDOTD) Water Resources Section in Baton Rouge. Each well identified was plotted, on USGS 7-1/2 minute quadrangle maps. The resulting map is provided as Figure A-5. A listing of registered wells within two miles of the facility is provided in Appendix M.

According to a search of the Louisiana Department of Natural Resources (DNR) files, no oil and/or gas wells or shot holes are located in the vicinity of the impoundment or within 2,000 feet of the facility perimeter.

Water levels are observed and recorded by the USGS in selected wells, which are assumed to be representative of the aquifer in general. This information is presented in Figure A-6. Hydrographs illustrate the hydraulic connection of the Mississippi River and the Recent Alluvium and the Shallow Pleistocene aquifers.

b. Faults

i. scaled map showing the locations of all recorded faults within the facility and within one mile of the perimeter of the facility; and

No recorded faults lie within one mile of the facility perimeter. Diagrams of seismic activity in Louisiana and the U.S. are presented in Appendix A.

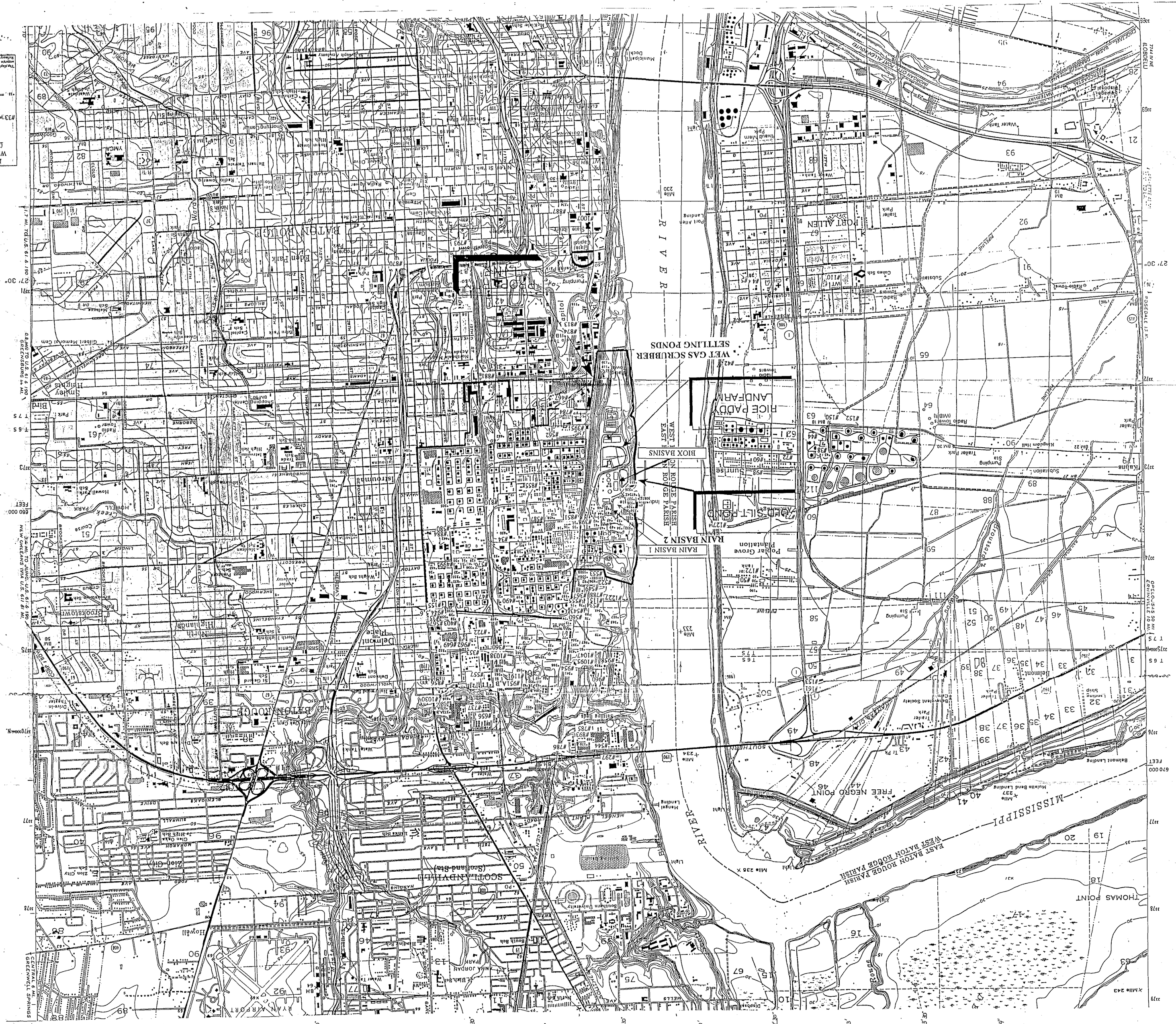
ii. demonstration, if applicable, of alternative fault setback distance as provided in LAC 33:VII.709.A.5.

Not applicable. No recorded faults within 200 feet of the facility perimeter have shown evidence of displacement in Holocene time.

c. Utilities. Scale map showing the location of all pipelines, power lines, and right-of-ways within the site.

The ExxonMobil Refining & Supply Company request an exemption to including these maps in the MMD permit application. These maps provide critical infrastructure information that would be made available to the general public. Access to this information must be limited in the interest of security for the complex. This type of information can cause much more harm in the hands of people with bad intentions than it can help in the permitting process for a settling basin that does not rely on any utilities or power for its operation.

However, this information will be made available for inspection by any government agency upon request.


Map of Water Withdrawal Wells
(2 Mile Radius)
#33 = Active water well (U.S.G.S. numbered)
= Abandoned water well (USGS #)
The depicted well locations may be an approximate source of the Baton Rouge Water District's supply.
RIVER
MISSISSIPPI
WEST BATON ROUGE PARISH
EAST BATON ROUGE PARISH
THOMAS POINT
FREE NEGRO POINT
Mulatto Bend Landing
Belmont Landing
Mengel Landing
Port Allen Landing
PORT ALLEN
BATON ROUGE
SCOTLANDVILLE
(Scotland Bluff)
Zion City
Southern University
Howell Park
Delmont Place
Delmont Heights
Highland
Smiley Heights
Edgehill
Eden Park
Capitol
Capitol Park
Capitol Lake
Gilbert Memorial Cem
Tiger Stadium
Municipal Dock
Water Tank
Radio Towers
Pumping Sta
Trailer Park
Kingdom Hall
Substation
Kelling
Poplar Grove Plantation
RAIN BASIN 1
RAIN BASIN 2
BIOX BASINS
WET GAS SCRUBBER SETTLING PONDS
RICE PADDY LANDFARM
SILT POND
EAST BATON ROUGE PARISH
WEST BATON ROUGE PARISH
Mile 238
Mile 234
Mile 233
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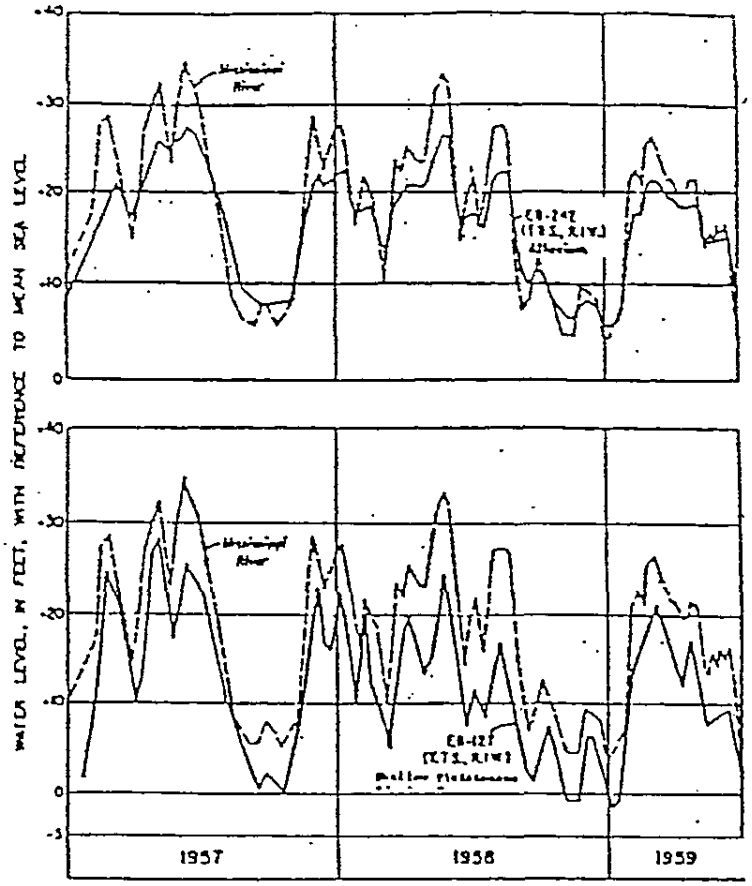
Mile 12
Mile 11
Mile 10
Mile 9
Mile 8
Mile 7
Mile 6
Mile 5
Mile 4
Mile 3
Mile 2
Mile 1
Mile 0
-30° 29'
-30° 29' 30"
-30° 30'
-30° 30' 30"
-30° 31'
-30° 31' 30"
-30° 27'
-30° 27' 30"
-30° 28'
-30° 28' 30"
670 000
680 000
FEET
T 6 S
T 7 S
T 7 N
T 6 N
NEW ORLEANS 34 MI. TO JUNC. U.S. 61 & 190
GREENSBURG 44 MI.
BAMETO U.S. 61 & 190
GREENWELL SPRINGS
OPELOUSAS 50 MI.
ERWINVILLE 10 MI.
POSEDALE 17 MI.
TO U.S. 61 & 190



(Ref.2)

Hydrographs of water levels in the Mississippi River, Recent and Pleistocene alluvium in the Baton Rouge area.

Supplementary Information-Part II
A-4)a

Sand	Well	1978-79 water levels (feet below land surface)
"Shallow Pleistocene"	EB-127	14.66- 46.46
"800-foot"	EB-128	79.15-102.67
"1,000-foot" (not measured--comparable to "800-foot")		
"1,200-foot"	WBR-5	97.64-107.67
"1,500-foot"	EB-168	124.37-147.27
"1,700-foot" (not measured--comparable to "2,000-foot")		
"2,000-foot"	EB-367	326.81-345.34
	EB-90	266.10-280.80
"2,400-foot"	EB-806B	198.22-204.04
"2,800-foot"	EB-944	46.22- 50.80

(Ref.3)

Supplementary Information-Part II
A-4)b)iii

SOURCE: DAMES & MOORE; HYDROGEOLOGICAL STUDIES
HAZARDOUS WASTE MANAGEMENT FACILITIES; FEBRUARY 1980

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ERM

DATE 12/93 | W.O.NO. 14-134

FIGURE A-6
REPRESENATIVE WATER LEVELS
BATON ROUGE AQUIFERS
LAC33:VII.521.A.2.a.
EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

Threatened or Endangered Species Correspondence

Attachments

July 2005

Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

ERM-Southwest, Inc.

3501 N. Causeway Blvd.
Suite 200
Metairie, Louisiana 70002-3663
(504) 831-6700
(504) 831-6742 (Fax)

March 17, 1999

Mr. Ron Dunham
Exxon Company, U.S.A.
4045 Scenic Highway
Baton Rouge, Louisiana 70805

ERM

RE: Threatened or Endangered Species W.O. # 14-334
Mile Marker 232

Ron:

Per your request, Environmental Resources Management (ERM) obtained information relative to the presence of threatened or endangered species within mile marker 232 of the Mississippi River. ERM received documentation from the State of Louisiana Department of Wildlife & Fisheries that there are no rare, threatened, or endangered species or critical habitats within this area. A copy of the letter from the Department of Wildlife & Fisheries is included as Attachment 1 to this correspondence. As you requested, the aforementioned work was performed under Exxon Authorization Number 34.

If you have any questions or comments, please contact me at (504) 831-6700.

Sincerely,

Environmental Resources Management

Barrett A. Cieutat

Barrett A. Cieutat, P.G.

BAC:dsd

Attachment

14-334\Dun_M17.Doc

16300 Katy Freeway
Suite 300
Houston, Texas 77094-1611
(281) 579-8999
(281) 579-8988 (Fax)

7700 Chevy Chase Drive
Suite 110
Austin, TX 78752
(512) 459-4700
(512) 459-4711 (Fax)

3204 Long Prairie Road
Suite C
Flower Mound, TX 75028-2718
(972) 355-2100
(972) 355-7204 (Fax)

2615 Calder, Suite 260
Beaumont, Texas 77702
(409) 833-7755
(409) 727-5454
(409) 833-7799 (Fax)

A member of the Environmental Resources Management Group

State of Louisiana

James H. Jenkins, Jr.
Secretary

Department of Wildlife & Fisheries
Post Office Box 98000
Baton Rouge, LA 70898-9000
(225) 765-2800

M.J. "Mike" Foster, Jr.
Governor

March 11, 1999

Mr. Frederick Moreton
ERM-Southwest, Inc.
3501 N. Causeway Blvd., Suite 200
Metairie, LA 70002-3663

RE: Mississippi River Mile Marker 232

Dear Mr. Moreton:

Personnel of the Habitat Section of the Fur and Refuge Division have reviewed the preliminary data for the captioned project. In reviewing our database, no rare, threatened, or endangered species or critical habitats were found within the area of the captioned project that lies in Louisiana. No state or federal parks, wildlife refuges, scenic streams, or wildlife management areas are known at the specified site within Louisiana's boundaries.

The Louisiana Natural Heritage Program has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. Heritage reports summarize the existing information known at the time of the request regarding the location in question. They should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The Louisiana Natural Heritage Program requires that this office be acknowledged in all reports as the source of all data provided here.

Sincerely,

Gary Lester, Coordinator
Natural Heritage Program

GL:rwg
enclosure: Invoice # 99031102

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

RECEIVED
DEC 08 2004
By

December 6, 2004

Ms. Jennifer Arnold
Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816

Dear Ms. Arnold:

Please reference your November 29, 2004, facsimile requesting our review of an existing industrial facility located at 4045 Scenic Highway in Baton Rouge, East Baton Rouge Parish, Louisiana. You requested our review of that facility, including adjoining areas within a 1,000-foot radius of that facility, pursuant to presence of threatened and endangered species and/or other resources of concern. The U.S. Fish and Wildlife Service (Service) has reviewed the information you provided, and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The project site is located adjacent to the Mississippi River, which is known to be occupied by the pallid sturgeon (*Scaphirhynchus albus*). The pallid sturgeon, Federally listed as an endangered species, is also found in the Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex) and is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana. Habitat loss through river channelization and dams have adversely affected this species throughout its range. Should the proposed project directly or indirectly affect the pallid sturgeon or its habitat, further consultation with this office will be necessary.

We appreciate the opportunity to provide comments in the planning stages of this proposed project. If you need further assistance, please contact Angela Culpepper (337/291-3137) of this office.

Sincerely,

Russell C. Watson
Supervisor
Louisiana Field Office

cc: LDWF, Natural Heritage Program, Baton Rouge, LA

B. FACILITY CHARACTERISTICS

Standards concerning facility characteristics are contained in LAC 33:VII.709.B (Type I and II facilities), LAC 33.VII.717.B (Type I-A and II-A facilities), and LAC 33:VII.719.B (Type III facilities). A facility plan, including drawings and a narrative, describing the information required below must be provided.

1. **The following information is required for all facilities:**

   a. **elements of the process or disposal system employed, including, as applicable, property lines, original contours (shown at not greater than five-foot intervals), buildings, units of the facility, drainage, ditches and roads;**

   The Baton Rouge Refinery is a thoroughly integrated complex with a maximum crude run capacity of 535,000 barrels per calendar day. Major processes include distillation, catalytic cracking, hydrocracking, reforming, coking, alkylation, polymerization, dewaxing, deasphalting, hydrofining, treating and blending. Approximately 500 petroleum products and grades of products are made ranging from propane to residual fuels, asphalt and coke. Figure B-1 is a simplified flow plan showing the relationship of the units in the overall refining process.

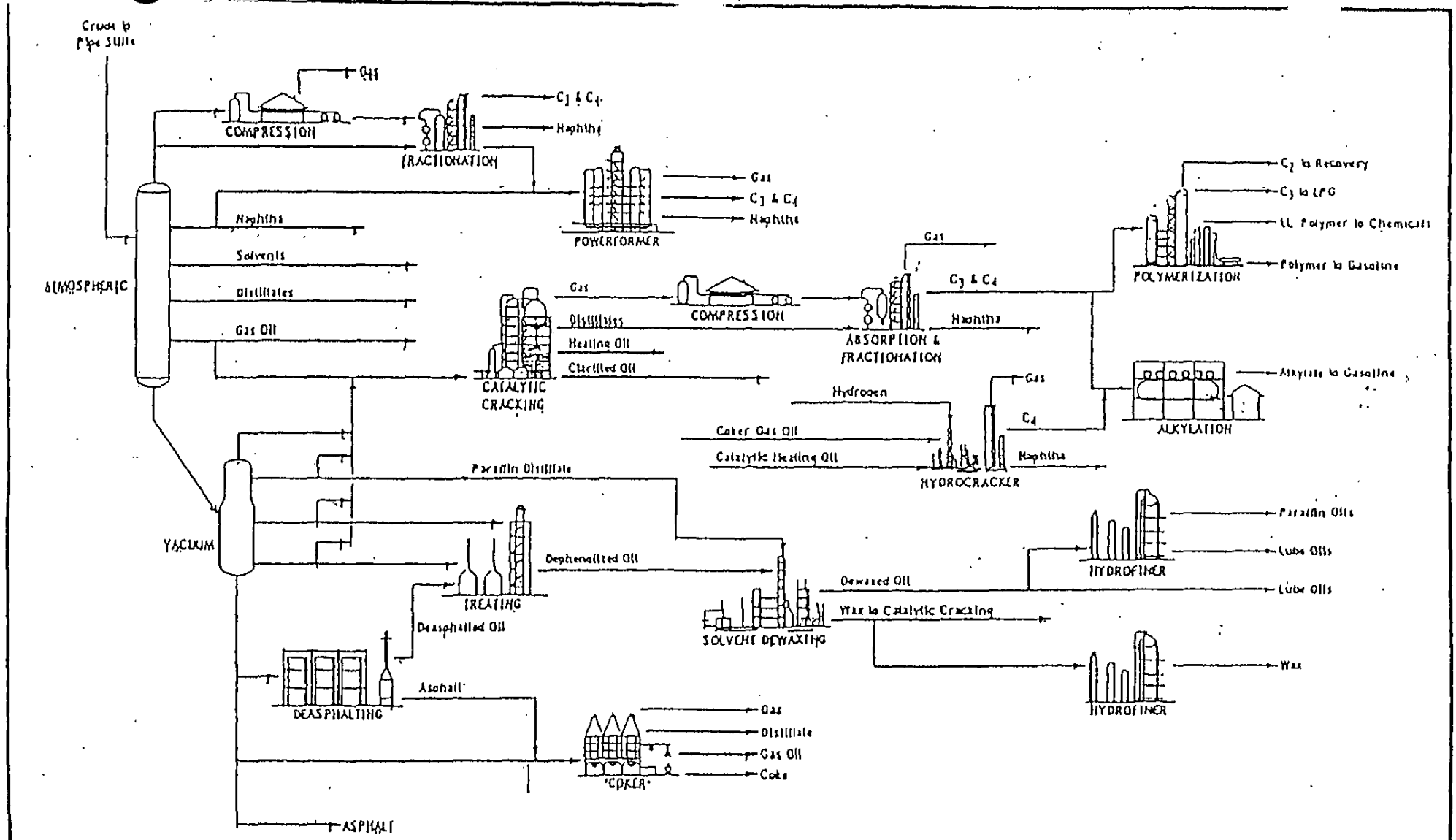
   The refinery includes 30 major process units, loading facilities, docks, river water clarifiers, office buildings, laboratories and extensive tank storage. In addition, ExxonMobil Chemical Company has four process units located within the refinery. Environmental control facilities include a 10,000 gpm wastewater treatment plant, sulfur recovery and tail gas clean-up unit, a benzene stripper, wastewater containment tankage, sour water strippers, marine vapor recovery, and a catalytic cracking regenerator flue gas scrubber.

   The Wet Gas Scrubber Settling Ponds are located within the boundaries of the Water Clarification Unit. Illinois Central Railroad and Honeywell International own property adjacent to the Wet Gas Scrubber Settling Ponds.

   A plot plan of the refinery showing property lines, buildings, facilities, excavations, drainage, and roads is provided as Figure B-2. Plan and sectional views including contours for the surface impoundment, along with dimensions and other design information, are provided in Appendix B.

   b. **the perimeter barrier and other control measures;**

   A perimeter fence encloses the entire facility as shown in Figure B-3. Docks are manned 24 hours a day and it is a Dock requirement to stop and question persons who are not identified as refinery or marine personnel. The riverbank north of the Docks is covered with trees and thick natural growth, which make it generally inaccessible from the river.



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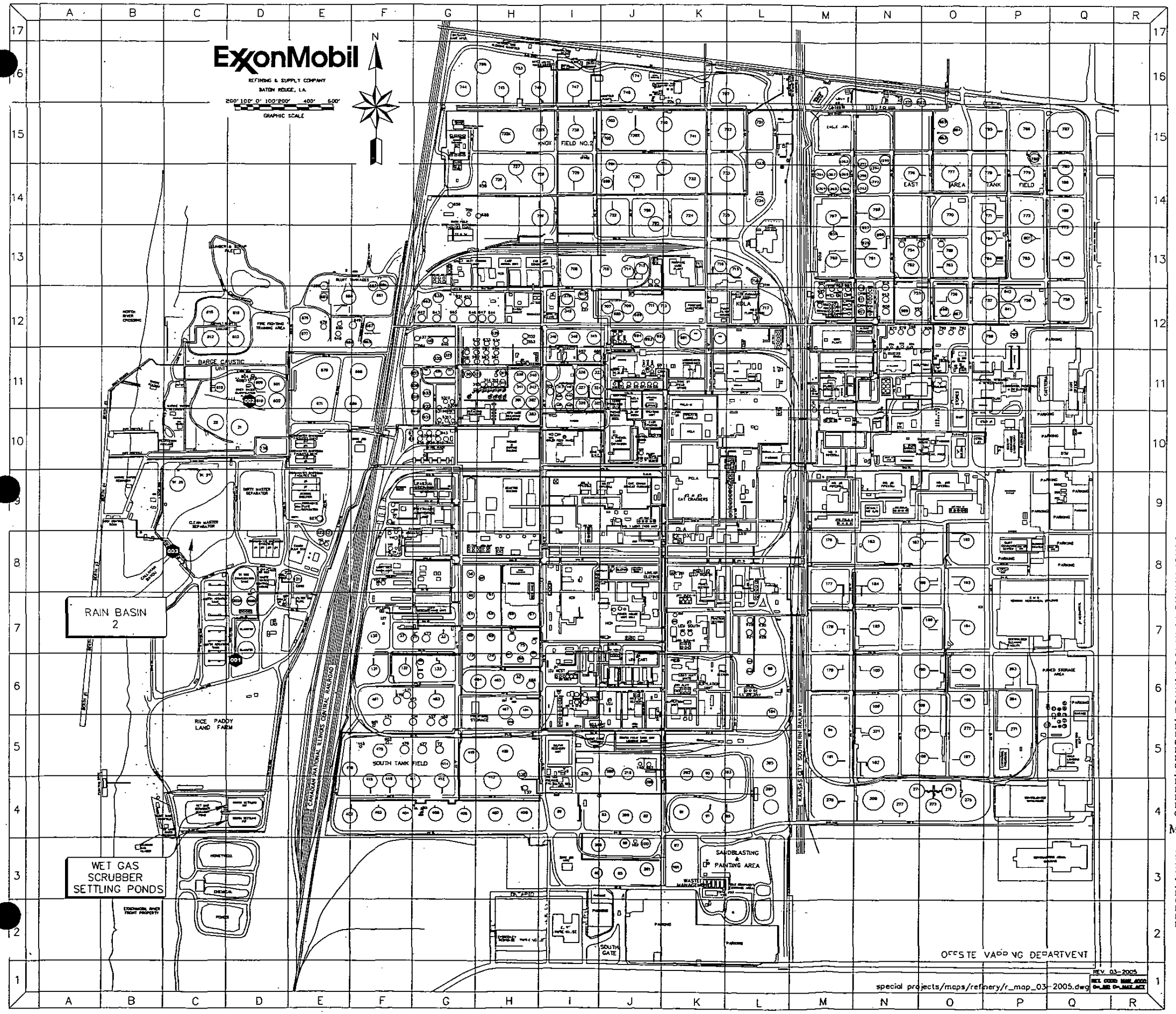
DATE 12/93 | W.O.NO. 14-134

FIGURE B-1

REFINERY FLOW PLAN
LAC33:VII.521.B.1.a.

EXXON COMPANY, U.S.A. REFINERY
BATON ROUGE, LOUISIANA



LEGEND

UNITS

K8	ALKYLATION UNITS
I16	ANALYZER BUILDING
C8	AROMATICS
C11	BARGE CAUSTIC UNIT
C12	BLUFF TANKAGE
I10	BOILER FEEDWATER PLANT
L13	BULK STATION #1
E8	BULK STATION #2
G15	BULK STATION #3 & #4
P7	CENTRAL MECHANICAL BUILDING
K9	CAT CRACKING UNITS
K16	CATALYST PLANT
H13	COKER (EAST,WEST,&FAR EAST)
C10	DIRTY WATER DETENSION BASIN
B9	DOCKS
O14	EAST AREA TANK FIELD (NORTH)
O7	EAST AREA TANK FIELD (SOUTH)
C4	EAST BANK MANIFOLD
D8	EULA
D12	FIRE FIGHTING TRAINING AREA
P5	FIRE STATION
K8	GLA 2X & 3X
K10	HCLA
J7	HCN
K11	HHLA UNIT
I7	ICN
L12	KDLA
I15	KNOX FIELD
P11	LABS (ER&DL)
P11	LABS (PPL)
K11	LELA UNIT
I5	LIGHT ENDS LOADING RACK
J9	LIGHT ENDS UNIT #1
L9	LIGHT ENDS UNIT #2
K7	LIGHT ENDS UNIT #3
J6	LIGHT ENDS UNIT #4
J6	LIGHT ENDS UNIT #5
G7	LIGHT OILS FINISHING UNIT
J8	LINEAR OLEFINS
H10	LUBE BLENDING BUILDING
C10	LUBE RACK
D13	LUMBER SCRAP PILE
J6	LRLA
K11	LWLA
Q10	MAIN GATE
Q11	MAIN OFFICE
B9/C10	MARINE VAPOR RECOVERY (MVR)
Q7	#1 MECHANICAL
Q10	MEDICAL
F9	NAPTHA GATE
O16	NORTH GATE
N16	NOVA/EAGLE LION
H8	OSCC BUILDING
M12	OXO PLANT
H10	PACKAGING & SHIPPING BLDG.
G9	PARTIAL OXIDATION UNIT
P10	PDC #1
J9	PDC #2
J7	PDC #4
L11	PDC #5
C11	PDC #6
H11	PDC #7
K10	PDC #8
L11	PDC #10
E8	PDC #12
I7	PDC #14
G9	PHTHALIC ANHYDRIDE UNIT
I9	PIPESTILL #1
J9	PIPESTILL #2
M10	PIPESTILL #7
M9	PIPESTILL #8
N9	PIPESTILL #9
O9	PIPESTILL #10
C10	PLANTATION PIPE LINE
I6	POLY
J7	POWERFORMER #1
H8	POWERFORMER #2
K12	PROPANE LUBE PLANT
G6	PROPANE STORAGE
P10	QUALITY ASSISTANCE LAB (QAL)
J9	REFINERY MIXING MANIFOLD (RMM)
K8	RGCU
H9	RHLA
C11	RIVER WATER CLARIFICATION PLANT
L11	ROCC
L3	SANDBLAST & PAINTING AREA
Q10	SECURITY
J2	SOUTH GATE
F5	SOUTH TANK FIELD
K11	SPEC. MAINTENANCE
I5	SULFUR RECOVERY UNITS
K3	WASTE MANAGEMENT
C4	WET GAS SCRUBBER AREATION POND

MAINTENANCE WORK CENTER

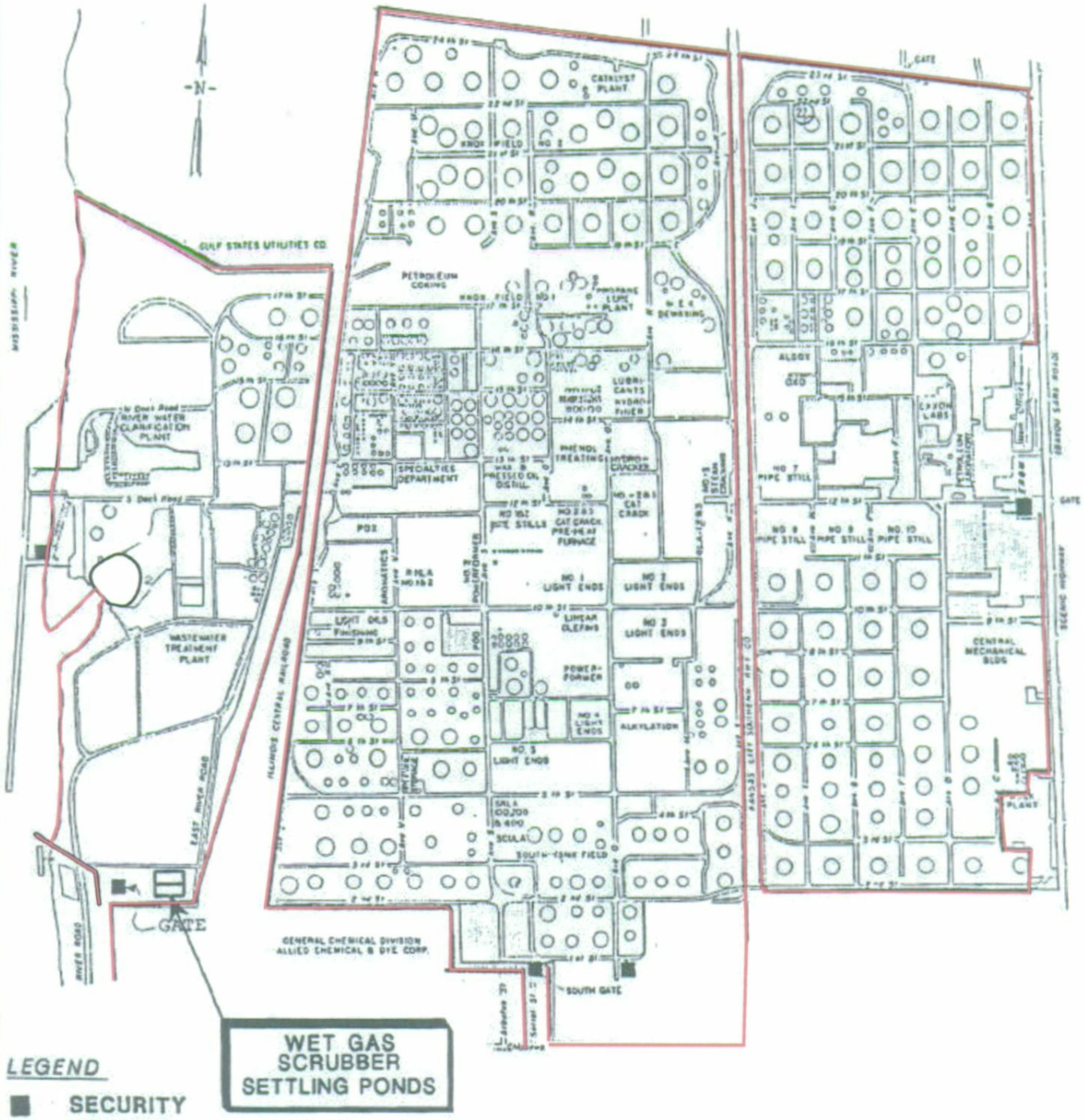
I10	ZONE #11 CRACKING/REFORMER
I12	ZONE #14 COKER
N10	ZONE #14 PIPE STILLS
J11	ZONE #15 SPECIALTIES
J5	ZONE #23 LIGHT ENDS
F10	ZONE #25 ENVIRO./UTILITIES
Q8	ZONE #27 ELECTRICAL DISTRIBUTION
P8	ZONE #42 MOTORIZED
I3	ZONE #51 OIL MOVEMENT
K3	ZONE #53 CONSTRUCTION

TANKS

* WASTE WATER TREATMENT TANKS

D10	21	O7	194	H5	420	H14	659	P12	798
C10	22	O8	195	G11	434	E12	660	H18	799
I10	23	O8	196	G12	437	F12	661	J12	800
C9	24	O5	197	H12	428	G12	662	D8	801*
C9	26	Q14	198	J11	440	G12	663	P13	801
G11	27	Q14	199	I11	441	F12	665	D8	802*
H8	32	K16	201	I11	442	E12	666	D8	803*
G7	33	D7	202A	I11	443	F12	667	J12	803
G7	37	D7	202B	F5	445	F11	668	D8	804*
F8	43	D8	203	I11	448	F11	669	D8	805*
F10	46	J16	219	I11	449	E12	678	D7	806*
F10	47	J16	221	H5	456	E12	677	J12	806
G11	49	K16	224	G5	457	E12	678	D7	807*
G11	50	I12	237	F5	459	E12	679	D7	808*
G8	56	I6	249	G5	460	E12	681	D7	809*
H8	57	I16	258	F6	461	F13	683	D7	810*
G7	60	I16	259	H6	462	F13	684	I12	812
H7	61	J3	261	G6	463	J12	685	L13	838
G7	64	P6	263	H6	464	I11	687	P12	841
H7	65	P6	264	H6	465	I11	688	P12	842
H7	66	I3	268	H6	467	K11	689	M13	859
H7	67	P5	271	H6	468	K11	690	O16	862
G7	68	O5	272	H7	469	K11	691	O15	863
H7	69	O4	273	F6	470	J12	692	O15	864
H7	70	N4	274	F6	471	J12	693	O15	865
G7	71	O4	275	F5	472	J12	694	N13	867
G5	72	O4	276	F6	473	J12	695	F8	901
G6	73	N4	277	F5	474	O12	696	P5	901*
H6	74	M4	278	F5	475	J14	698	F5	902
H7	75	L4	279	F5	476	J12	699	G6	905
G4	76	J5	280	G5	477	G14	700	N13	906
I3	80	J5	281	E8	522	J14	701	N12	907
K4	81	K5	282	E8	523	J15	702	N12	908
J4	82	L5	283	E9	527	J15	703	N12	909
J4	83	L4	284	J10	529	J15	704	N12	910
L4	85	K7	296	J11	530	J12	707	N12	911
I4	86	F8	297	J11	531X	I13	708	N12	912
K5	90	J4	298	J11	532	J12	709	N12	913
K4	91	N4	300	J11	533	J13	710	N12	914
G4	93	H11	302	J11	534	J12	711	N12	915
M5	94	H11	303	D8	543	J13	712	N12	916
G4	95	H11	304	D8	544	K12	713	G6	919
K3	97	H11	305	E9	545	J13	714	O12	921
L6	98	H11	306	E8	546	L13	715	N12	924
J3	99	H11	307	I12	555	K13	716	N12	925
J3	100	H11	308	J11	560	L12	717	N13	926
D8	101*	H11	309	J11	561	L13	718	O12	928
K3	101	H11	310	J11	562	H14	720	O12	929
D8	102*	H11	311	J11	567	J14	722	O12	930
J3	102	H11	312	J11	568	K14	724	K7	945
D8	103*	I11	313	J11	569	L14	725	L6	946
D8	104*	H11	314	G12	584	H14	726	J5	947
L6	104	H11	315	H11	586	H14	727	L6	948
N6	105	G11	322	H11	587	H14	728	M12	952
N6	106	I11	323	G11	591	I14	729	M12	953
O6	108	I11	324	G11	592	J14	730	M12	954
O5	109	I11	325	H11	593	K14	731	M12	955
H8	111	I11	326	H11	594	K14	732	M12	956
J10	119	I11	327	G11	595	K14	733	M12	957
F7	127	I11	328	H11	596	L14	734	N12	958
J10	129	I11	329	H11	597	H15	735X	N12	959
F7	130	G11	332	H11	598	H15	737X	N12	960
F6	131	J12	334	G11	600	I15	738	N12	961
F6	132	H11	339	D11	601	J15	739X	M12	962
G8	133	H11	340	D8	602*	K15	740	M12	963
H6	134	H11	341	D11	602	K15	741	M12	965
D10	135	H11	342	E8	603*	L15	742	M12	966
H4	137	I12	345	D11	604	L14	743	M12	967
H5	138	I12	346	D11	607	G16	744	M12	968
J5	140	I12	348	D11	608	H16	745	M12	971
F8	141	I12	349	D11	609	H16	746	N12	972
F8	142	J11	354	D11	610	J16	748	N12	973
F8	143	J4	369	C12	612	P15	750	N12	974
F8	144	I5	370	D12	613	L15	751	N12	975
F8	145	N5	371	C12	615	H16	753	N12	976
F8	146	O5	372	D12	616	N13	754	N12	977
F8	147	J11	373	C11	619	N12	755	N12	978
F8	148	I12	376	H11	620	O12	756	N12	979
J11	150	H11	381	G10	621	P12	757	N12	980
F9	152	H11	382	H11	622	P12	758	M12	951
F9	153	H10	383	H11	624	Q12	759	N12	982
F9	154	L5	395	G10	626	M13	760	M12	984
F9	155	K7	396	G10	627	N13	761	N12	985
K7	162	H6	397	G10	628	N13	762	M12	986
H16	167	H6	398	G10	629	O13	763	M12	987
H16	168	H6	399	G10	630	P13	764	M12	988
I16	169	J8	400	G12	632	P13	765	N12	989
I16	170	J8	401	H12	633	Q13	766	N12	991
I16	171	E4	402	H12	634	M14	767	E8	1211
I16	172	F4	403	G12	635	O14	770	E13	1300
I16	173	F4	404	G12	639	P14	771	N14	1343
J16	174	G4	405	G12	640	P14	772	M15	1363
M8	176	G4	406	G12	642	Q13	773	M14	1364
M8	177	H4	407	G12	643	N14	774X	M14	1365
M7	178	H4	408	G12	646	N14	776	M14	1366
M6	179	G4	409	H12	647	O14	777	M14	1367
M5	181	F5	410	E12	648	P14	778	M14	1368
N5	182	G4	411	F12	649	P14	779	M14	1369
N8	183	G4	412	E12	650	Q14	780	N16	1370
N8	184	H4	412	G12	651	P13	784	N14	1393
N7	185	G5	414	G12	652	P15	785	N14	1394
N8	187	F4	415	H14	655	P15	786	N15	1395
O8	188	F4	416	G14	656	Q15	787	N15	1397
O7	189	G5	419			O12	788	N14	1398
O6	190					O13	789	J17	1651
O5	192					O12	790	G11	5309
O5	193					O12	791	G11	5310
						O12	792	G11	5311
						P12	793	G10	5312
						J14	795	G10	5313
						J14	796	G10	5314
						K16	797		

FIGURE B-2
EXXON BATON ROUGE REFINERY
PLOT PLAN
LAC33:VII.521.B.1.a.



WET GAS SCRUBBER SETTLING PONDS

LEGEND

■ SECURITY OFFICES

FENCES
HEIGHT:7-8 ft.
CONSTRUCTION:Chain-link steel with top 1 ft. barbed wire.

REVISED DECEMBER 4,1992

ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

DESIGN: JA	DRAWN: MHB	CHKD.: JA
DATE: 12/93	SCALE: AS SHOWN	REV.: 07/08/05
W.O.NO.: 0028411A205 G05		

FIGURE B-3
BATON ROUGE REFINERY - SECURITY
LAC33:VII.521.B.1.b.

ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

ERM

The perimeter fence is seven to eight feet tall and is constructed of two-inch diameter chain-link steel posts and woven wire fabric. The top foot of the fence is comprised of strands of barbed wire or razor wire. Gate entry points are either equipped with secure locking devices or controlled by refinery security personnel on a 24-hour basis. Gate houses are provided for the guards and are equipped with electronically regulated barriers to permit controlled ingress and egress. Floodlighting of the entrances to the facilities is furnished to insure safety and security at night.

c. **a buffer zone;**

The solid waste facilities are separated from adjacent property by space and natural and artificial barriers as indicated on Figure B-2 Area Master Plan. The 200-foot buffer zone is depicted in Figure A-4 and B-2. As also shown on Figure B-2, roads circumscribe the waste management area. The natural and artificial barriers that constitute the buffer zone do not store, process, or dispose of solid waste.

The Wet Gas Scrubber Settling Ponds have a buffer zone of less than 50 feet on the east (Illinois Central Railroad) and south (Honeywell International). Pursuant to LAC 33:VII.709.B.2.a and coupled with guidance from the LDEQ, an affidavit from adjacent landowners waiving the requirement of less than a 200 foot buffer zone is not required for existing permitted facilities.

d. **fire-protection measures;**

The fire protection capabilities at the ExxonMobil Baton Rouge Refinery consist of the Primary Emergency Team, Volunteer Fire Squad and fire fighting equipment and supplies. A description of the fire water system, mobile equipment and foam system is provided in Appendix C. The location of the Refinery Fire Station and access routes to the solid waste facilities are shown in Figure B-4.

e. **landscaping and other beautification efforts;**

Not applicable. The facility is within the boundaries of an industrial plant.

f. **devices or methods to determine, record, and monitor incoming waste;**

The ExxonMobil Baton Rouge Refinery does not accept any waste from outside the plant. Any waste accumulated is generated from on-site refinery operations. Impoundment wastes consist of solids, which settle out of the Wet Gas Scrubber wastewater in the surface impoundments. Sediments are characterized prior to removal and liquid discharge is processed under an approved NPDES permit. Sampling results are maintained by ExxonMobil. For additional information, refer to the Facilities Operation Plan (Appendix H). In addition to the above periodic sampling, engineering knowledge is utilized to determine and record incoming waste by monitoring of exiting wastes and management of impoundment water levels.

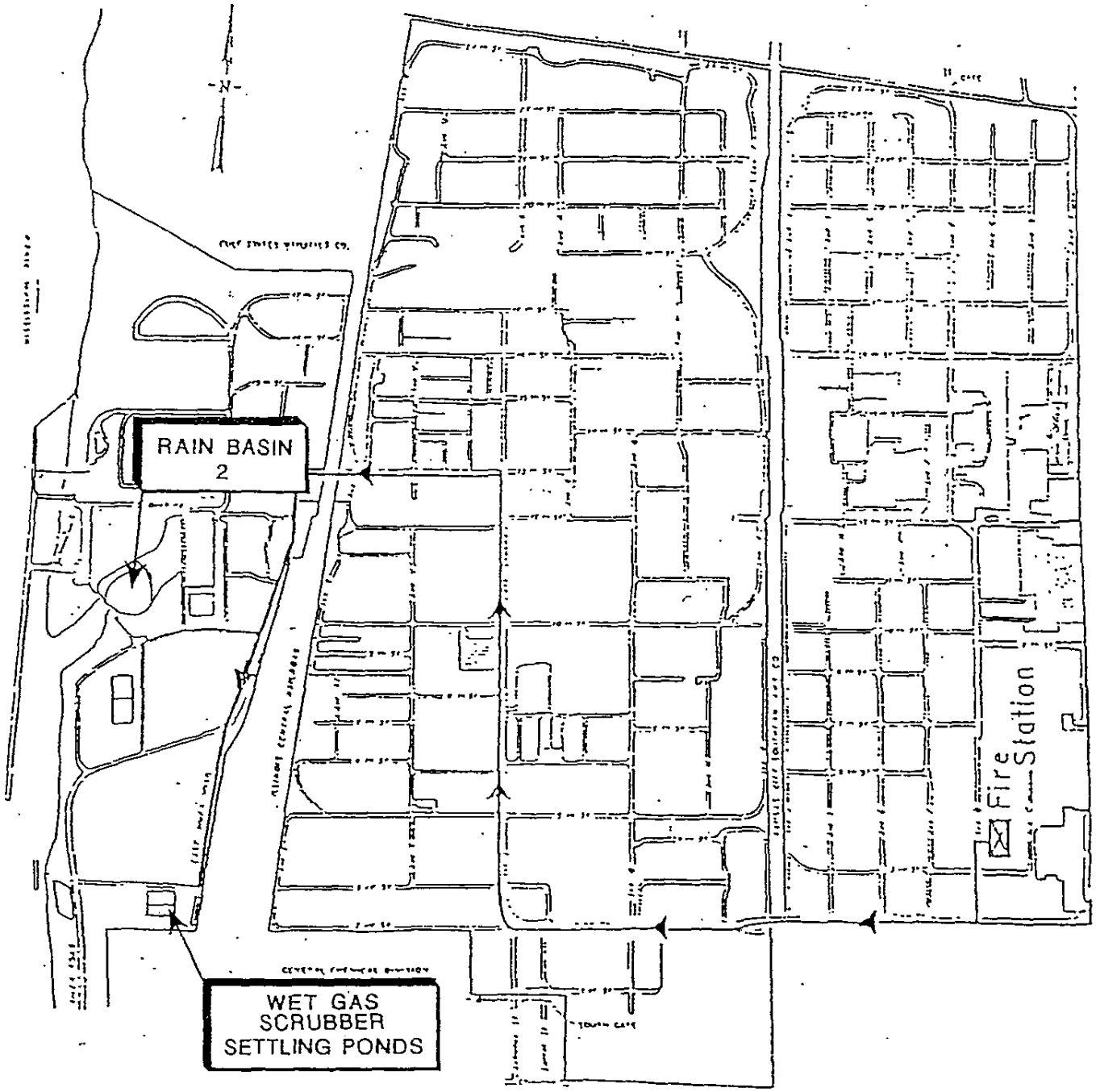


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FIGURE B-4

LOCATION OF REFINERY
FIRE STATION AND ACCESS ROUTES
LAC33:VII.521:B.1.d.
EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

g. **NPDES discharge points (existing and proposed); and**

Figure B-5 is a schematic diagram of the wastewater treatment system at the Baton Rouge Refinery. There are currently three outfalls permitted under NPDES Permit No. LA 0005584. Process waters and contaminated storm water that have been treated in the wastewater treatment system are discharged to the Mississippi River through Outfall 001.

Outfall 002 is the discharge point for clarified river water, and uncontaminated storm water is discharged through Outfall 003. These three outfalls are shown on Figure B-2.

h. **other features, as appropriate**

There are no other appropriate features.

2. **The following information is required for Type I and II facilities:**

a. **areas for isolating nonputrescible waste or incinerator ash, and borrow areas; and**

Not applicable. These ponds are existing surface impoundments, as illustrated in Figure B-2.

b. **location of leachate collection/treatment/removal system**

The Wet Gas Scrubber Settling Ponds do not have leachate collection or treatment facilities.

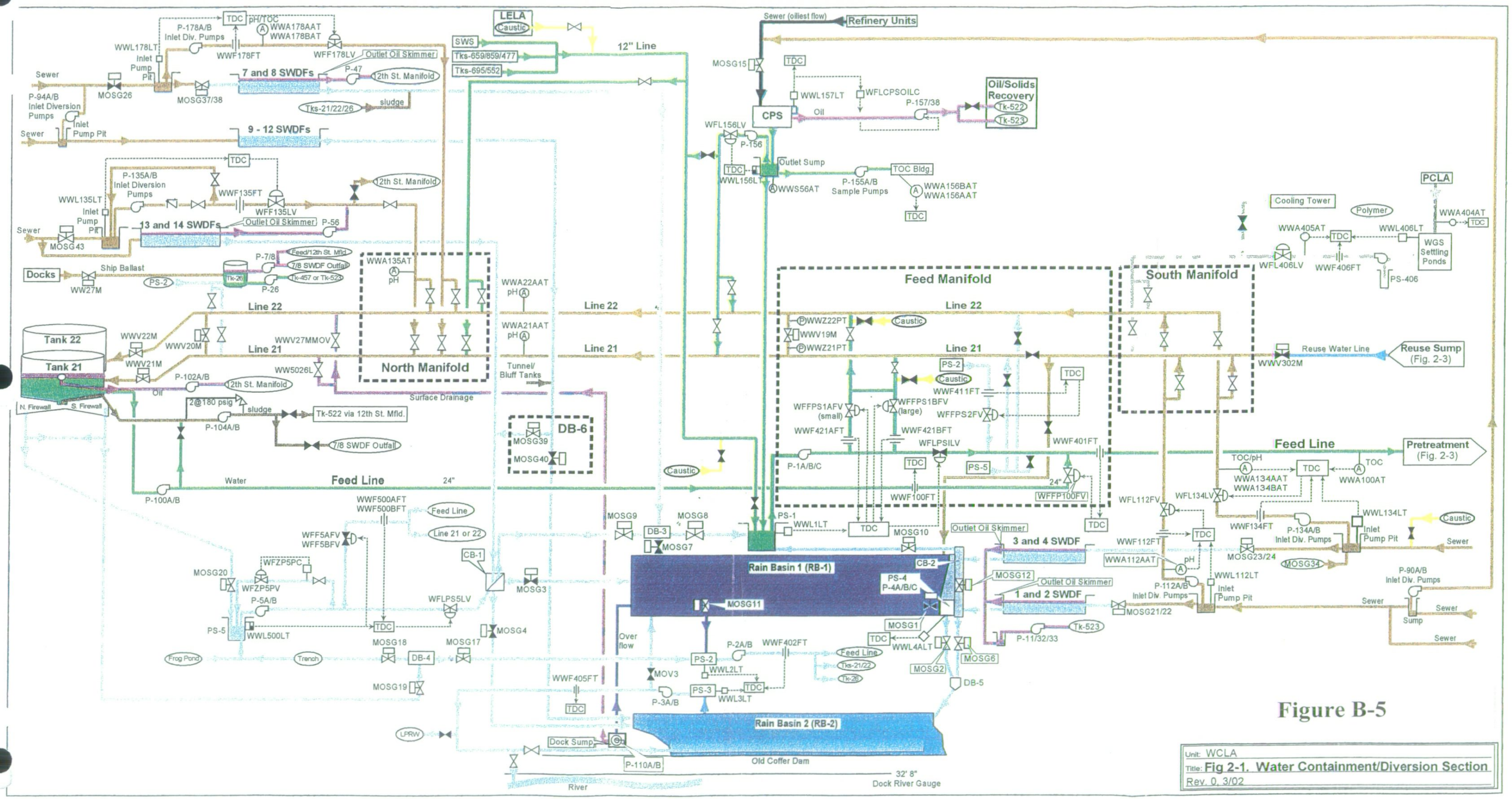


Figure B-5

Unit: WCLA
Title: Fig 2-1. Water Containment/Diversion Section
Rev. 0, 3/02

C. *FACILITY SURFACE HYDROLOGY*

Standards governing facility surface hydrology are contained in LAC 33:VII.717.A (Type I and II landfills), LAC 33:VII.713.A (Type I and II surface impoundments), LAC 33:VII.715.A (Type I and II landfarms), LAC 33:VII.717.C. (Type I-A and II-A facilities), and LAC 33:VII.719.C (Type III facilities).

1. **The following information regarding surface hydrology is required for all facilities:**

   a. **a description of the method to be used to prevent surface drainage through the operating areas of the facility;**

      Surface drainage at the Baton Rouge Refinery is controlled through an underground sewer network, which moves storm water through a series of Storm Water Diversion Facilities (SWDF) to the Refinery's Wastewater Treatment Plant for treatment and discharge. A system of catch basins throughout the plant intercept surface runoff before it moves through the operating areas. The Wet Gas Scrubber Settling Ponds do not experience any surface drainage. Furthermore, by design, surface impoundments are designed to hold an accumulation of liquid waste and/or sludge and overtopping can not occur. Discharge waters flow to a concrete overflow sump and are then pumped to the wastewater treatment plant under an approved NPDES permit.

   b. **a description of the facility runoff/run-on collection system;**

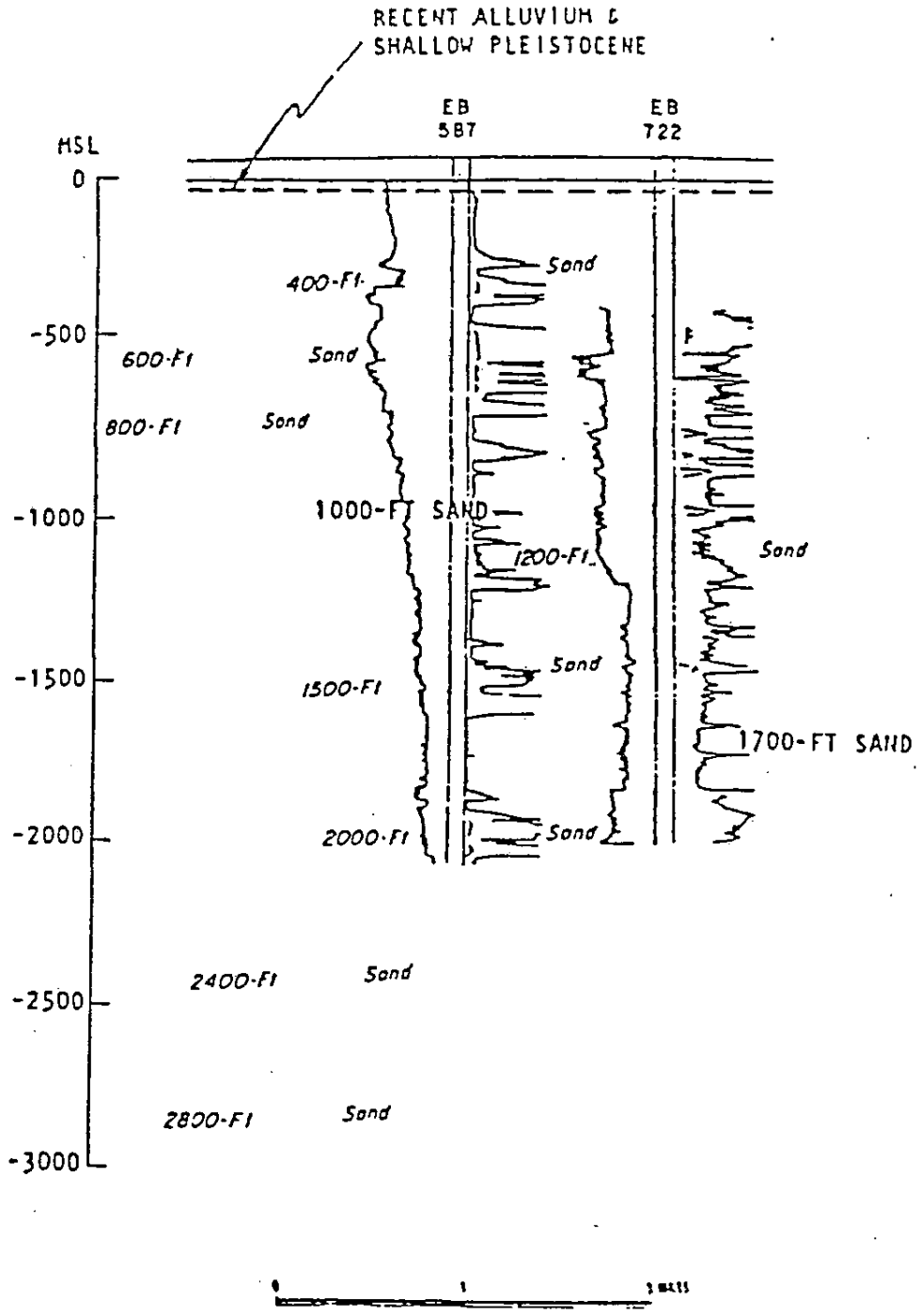
      The Wet Gas Scrubber Settling Ponds do not experience runoff/run-on. By design, surface impoundments are designed to hold an accumulation of liquid waste and/or sludge and therefore do not experience runoff/run-on. Discharge waters flow to a concrete overflow sump and are then pumped to the wastewater treatment plant under an approved NPDES permit.

   c. **the maximum rainfall from a 24-hour/25-year storm event;**

      The maximum rainfall in 24 hours was 12.08 inches recorded in April 1967 (Hydrogeological Studies Report in Baton Rouge Refinery by Dames & Moore, 1980). The maximum rainfall for a 25-year storm event is 8.8 inches ("Rainfall Frequency/Magnitude Atlas for South-Central United States" by Faires, Kiem and Muller).

   d. **the location of aquifer recharge areas in the site or within 1,000 feet of the site perimeter, along with a description of the measures planned to protect those areas from the adverse impact of operations at the facility; and**

      The major portion of all fresh ground water produced in the Baton Rouge area is derived from 12 aquifers ranging in age from Pleistocene to Miocene. These aquifers are named by the depths of occurrence and are shown in Figure C-1. The aquifers are discontinuous and of variable thickness. The individual sands may be absent at a particular location. Freshwater has been produced from a maximum depth of 3,100 feet below sea level from the "2,800-foot" sand.



SOURCE: DAMES & MOORE; HYDROGEOLOGICAL STUDIES
HAZARDOUS WASTE MANAGEMENT FACILITIES
BATON ROUGE REFINERY; FEBRUARY 1980

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FIGURE C-1

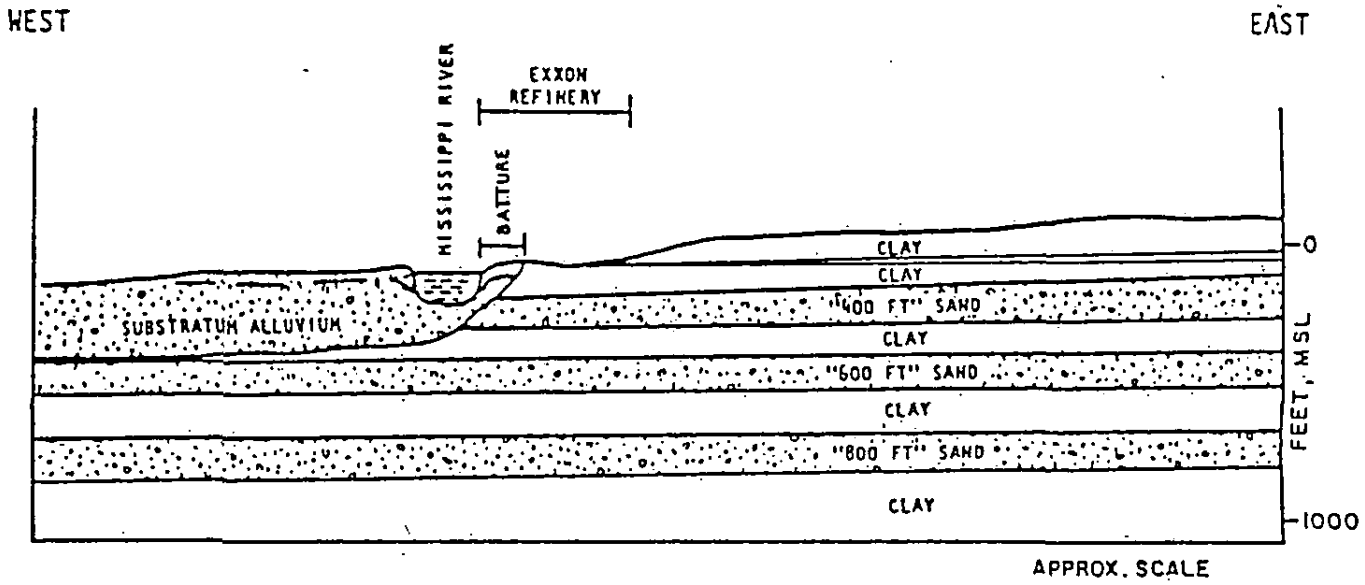
AQUIFERS-BATON ROUGE AREA
(VICINITY OF EXXON REFINERY)
LAC33:VII.521.C.1.d.
EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

The relationship between the various aquifers present beneath the refinery site is shown in Figure C-2. A major buried channel exists beneath, and to the west of, the Mississippi River. This broad valley has been filled with recent alluvium and forms the present land surface over which the Mississippi River flows. The connection between this alluvial material and the "400-foot" sand and upper unit is readily apparent. The subsurface valley also intersects the "600-foot" sand west of the section.

The "400-foot" and "600-foot" aquifers in the Baton Rouge area are considered to be the subsurface equivalent of Pleistocene terrace deposits exposed at land surface in northern East and West Feliciana Parishes (Morgan 1963). Recharge areas for the deeper aquifers (i.e., the "1,700-foot" and "2,000-foot" aquifers) are believed to be north of the Louisiana/ Mississippi boundary.

e. **if the facility is located in a flood plain, a plan to ensure that the facility does not restrict the flow of the 100-year base flood or significantly reduce the temporary water-storage capacity of the flood plain, and documentation indicating that the design of the facility is such that the flooding does not affect the integrity of the facility or result in the washout of solid waste.**

According to the Federal Emergency Management Agency (FEMA) flood insurance rate map (Figure A-3), the site is located in the batture area adjacent to the Mississippi River and is within the 100-year flood plain. The 100-year flood stage for the Mississippi River in the vicinity of the ExxonMobil refinery is 46.1 feet MSL (the highest recorded flood level of the river was 43.5 feet MSL in 1983). The area which includes the site was previously filled by ExxonMobil to prevent flooding (generally referred to as the Shallow Fill Zone). Current ground surface elevations are approximately 50 feet MSL. Therefore, the site is above the expected Mississippi River flood elevation.



NOTE: HYDRAULIC CONNECTION BETWEEN SUBSTRATUM ALLUVIUM AND 400 FT SAND. ALSO POSSIBLE CONNECTION WITH 600 FT SAND FURTHER WEST. FLOW DIRECTION DEPENDENT ON RELATIVE PIEZOMETRIC LEVELS.

SOURCE: DAMES & MOORE; HYDROGEOLOGICAL STUDIES HAZARDOUS WASTE MANAGEMENT FACILITIES BATON ROUGE REFINERY; FEBRUARY 1980

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FIGURE C-2
RELATIONSHIP BETWEEN AQUIFERS BENEATH THE BATON ROUGE REFINERY
LAC33:VII.521.C.1.d.
EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

D. *FACILITY GEOLOGY*

Standards governing facility geology are contained in LAC 33:VII.709.C (Type I and II facilities), LAC 33:VII.717.D (Type I-A and II-A facilities), and LAC 33:VII.719.D (Type III facilities).

1. **The following information regarding geology is required for Type I and II facilities:**

   a. **isometric profile and cross-section of soils, by type, thickness, and permeability;**

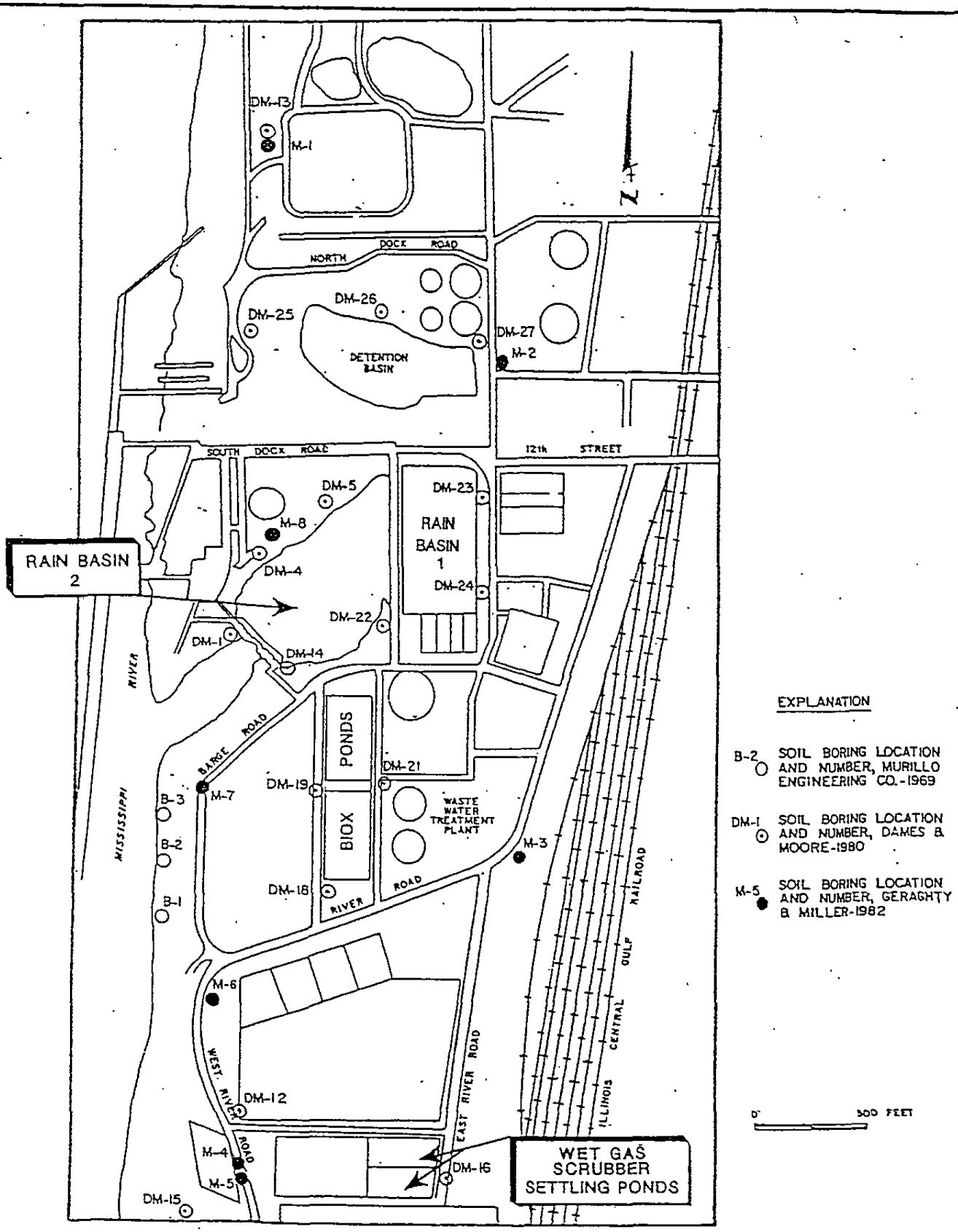
   Since these facilities are existing, isometric profiles of soil to a depth of 20 feet below the lowest excavation do not exist. Soil profiles have, however, been taken in the general area of the facility.

   The soil-boring information collected at the site indicates that two contrasting hydrogeologic environments within the shallow subsurface soils exist in the ExxonMobil waste-treatment area: (1) the relatively impermeable clays of Pleistocene age; and (2) the recent alluvial deposits (often referred to as Batture deposits) of the Mississippi River, consisting of less compact clays, silts and some sands (Geraghty & Miller Draft Report: Assessment of Ground Water Quality and Installation of Monitor Well Network at the Waste Treatment Area, Baton Rouge Refinery, August 1983).

   - Pleistocene Clays

     The Pleistocene sediments are primarily compacted clays (CH) with isolated zones of silty and sandy clays (CH or CL). Thin silt and silty sand lenses (ML or SM) are present in the Pleistocene clay, but they are generally of limited areal extent. The vertical permeability of this unit is very low; compact clays commonly have permeability's of $1x10^{-8}$ centimeters per second (cm/sec) or less. The Pleistocene clays represent an aquiclude that is at least 140 ft thick (Geraghty & Miller Draft Report: Assessment of Ground Water Quality and Installation of Monitor Well Network at the Water Treatment Area, Baton Rouge Refinery, August 1983).

     A considerable thickness of Pleistocene clays was logged in the eastern part of the study area, in borings M-2 and M-3 by Geraghty & Miller in 1982. The locations of these soil borings are shown in Figure D-1. Boring M-2 encountered the Pleistocene from approximately 23 to 115 ft below land surface. Boring M-3 encountered the hard Pleistocene clays at depths of 16 to 128 ft below land surface. The boring penetrated primarily stiff clays with a silt lens from 38 to 47 ft below land surface. Both borings failed to reach any deep sands and terminated in very hard clay. The borings were abandoned at their total depth by plugging the borehole from bottom to ground surface with cement grout.



SOURCE: GERAGHTY & MILLER; ASSESSMENT OF GROUND WATER QUALITY AND INSTALLATION OF MONITOR WELL NETWORK AT THE WASTE TREATMENT AREA BATON ROUGE REFINERY, AUGUST 1983.

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FIGURE D-1
SOIL BORING LOCATIONS
LAC33:VII.521.D.1.a.

EXXON COMPANY U.S.A.
BATON ROUGE, LOUISIANA

DATE	12/93	W.O.NO.	14-134

- Alluvial Sediments

  Most of the waste-treatment area is situated on loosely consolidated flood-plain deposits consisting primarily of unconsolidated clays (usually CH or OH) with some lenses of silt (MC) and sand (SM).

  These sediments were deposited in the incised erosional channel of the pre-historic Mississippi River and are therefore much younger than the Pleistocene sediments. Detailed boring information, as shown on six generalized cross-sections, A-A', B-B', C-C', D-D', E-E' and F-F' (Figures D-2 through D-7), indicate that the upper surface of the waste treatment area is covered with 5 to more than 30 feet of rubble and fill materials. The fill consists of materials that have been deposited throughout the refinery's history. The materials originated from the Mississippi River and the refinery site and may be characteristically similar to materials stored in the solid waste facilities. The natural soil below the fill is generally clay of low permeability about 10 to 30 feet thick. It is underlain by 10 to 60 feet of loosely consolidated, tan and gray silty clay and clayey silts, imbedded with relatively thin lenses of clays, silt, and sand of limited lateral extent. Near the river, the silt/clay unit is underlain by very permeable sand and gravel, more than 30 feet thick. The total thickness of the alluvial deposits beneath the site is estimated to be between 200 and 250 feet.

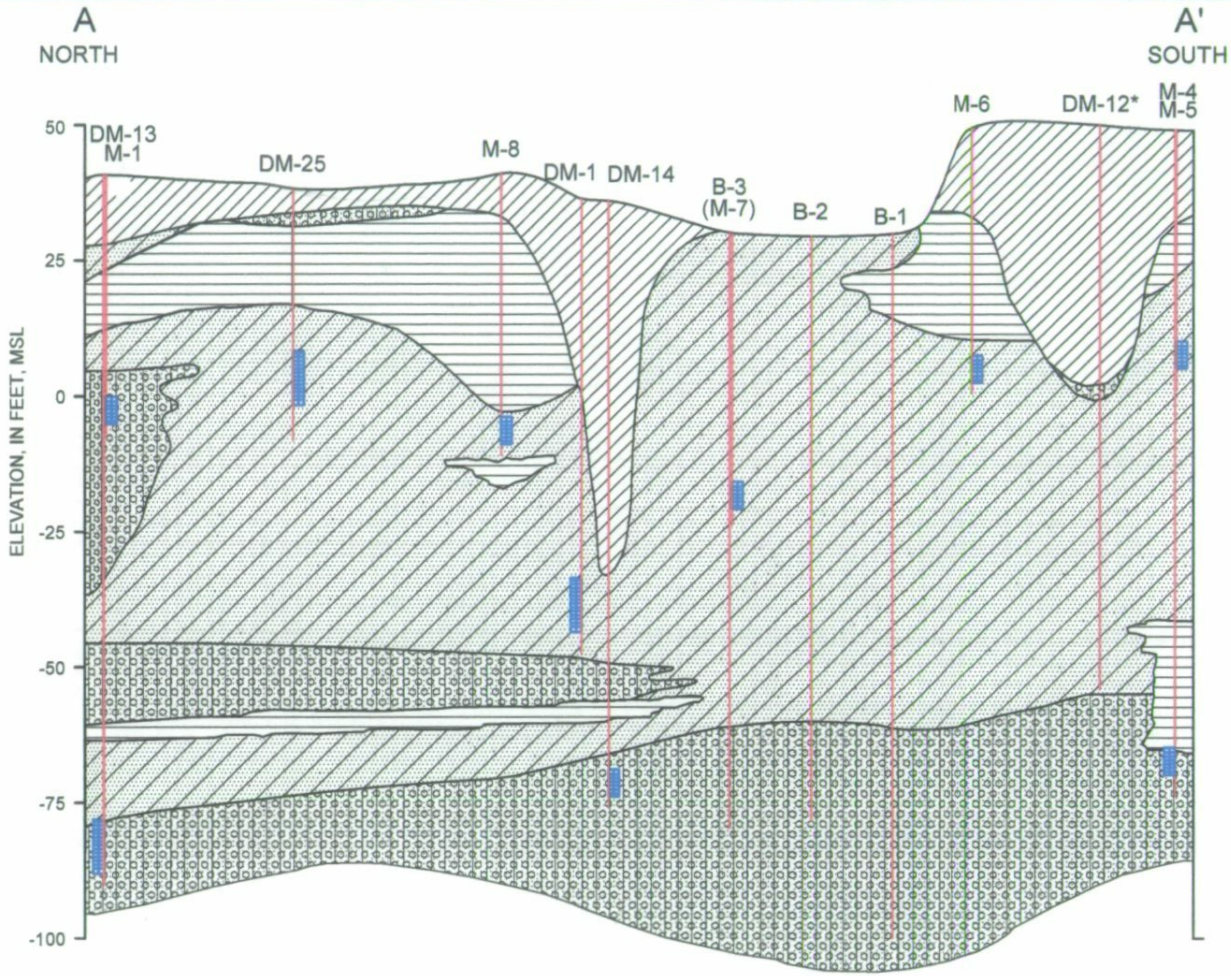
  One cross section depicting the geology at the Wet Gas Scrubber Settling Ponds i.e., F-F' has been revised to show monitor well-screen depth intervals. In addition, the depth profile of the Wet Gas Scrubber Settling Ponds has been added. Revised geological cross section F-F' is attached as figure D-7.

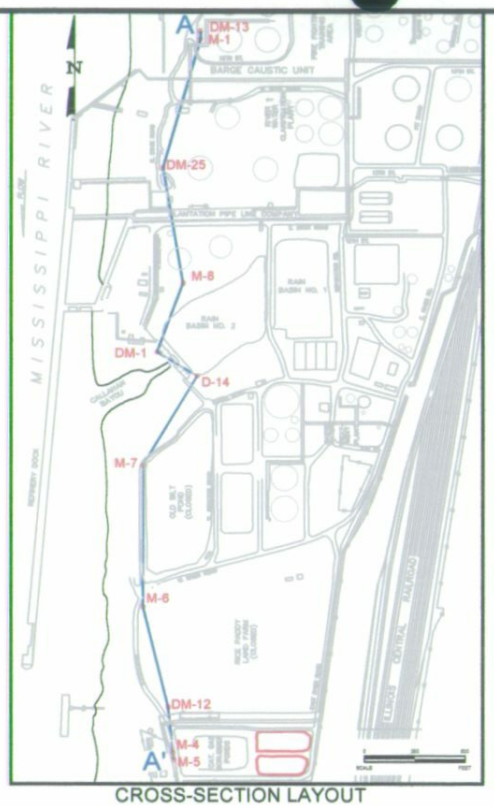
b. logs of all known soil borings taken on the facility and a description of the methods used to seal abandoned soil borings;

Over the past twenty years, the geology and hydrogeology in this part of the Baton Rouge Refinery have been extensively characterized. Copies of the boring logs for the facility have been included in Appendix D of this document.

Several of the wells have been plugged and abandoned (P & A). The P & A reports for these wells have also been provided in Appendix D.

In general, the Refinery will provide for sealing of the vertical migration path resulting from exploratory boring and/or monitoring programs.





CROSS-SECTION LAYOUT

EXPLANATION

- CLAY
- SILTY CLAY, CLAYEY SILT
- SILT, SAND, GRAVEL
- FILL
- WELL SCREEN INTERVAL

NOTE: * WELL CONSTRUCTION DETAILS NOT AVAILABLE FOR DM-12.

CROSS-SECTION SOURCE: GERAGHTY & MILLER; *ASSESSMENT OF GROUND WATER QUALITY AND INSTALLATION OF MONITOR WELL NETWORK AT THE WASTE TREATMENT AREA, BATON ROUGE REFINERY*; AUGUST 1983.

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FIGURE D-2
GEOLOGIC CROSS-SECTION A-A'
LAC33:VII.521.D.1.a.
EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

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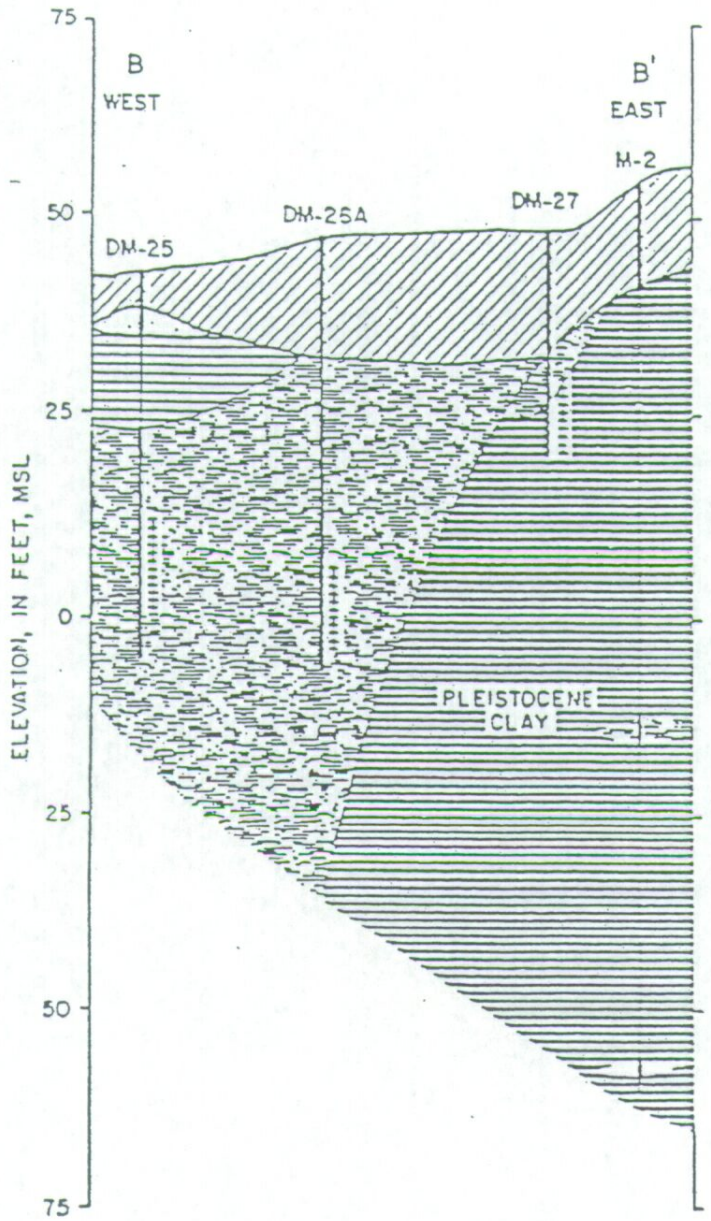

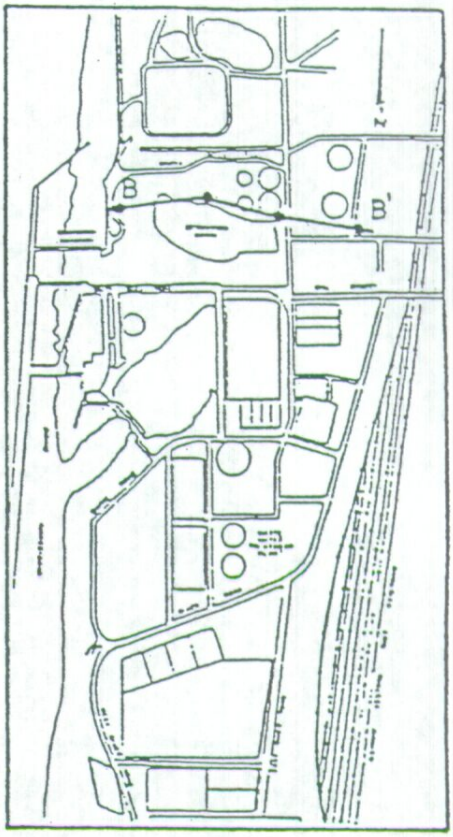

EXPLANATION

- CLAY
- SILTY CLAY, CLAYEY SILT
- SILT, SAND, GRAVEL
- FILL

0 500 FEET

SOURCE: GERAGHTY & MILLER; ASSESSMENT OF GROUND WATER QUALITY AND INSTALLATION OF MONITOR WELL NETWORK AT THE WASTE TREATMENT AREA BATON ROUGE REFINERY; AUGUST 1983

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FIGURE D-3
GEOLOGIC SECTION B-B´
LAC33:VII.521.D.1.a.
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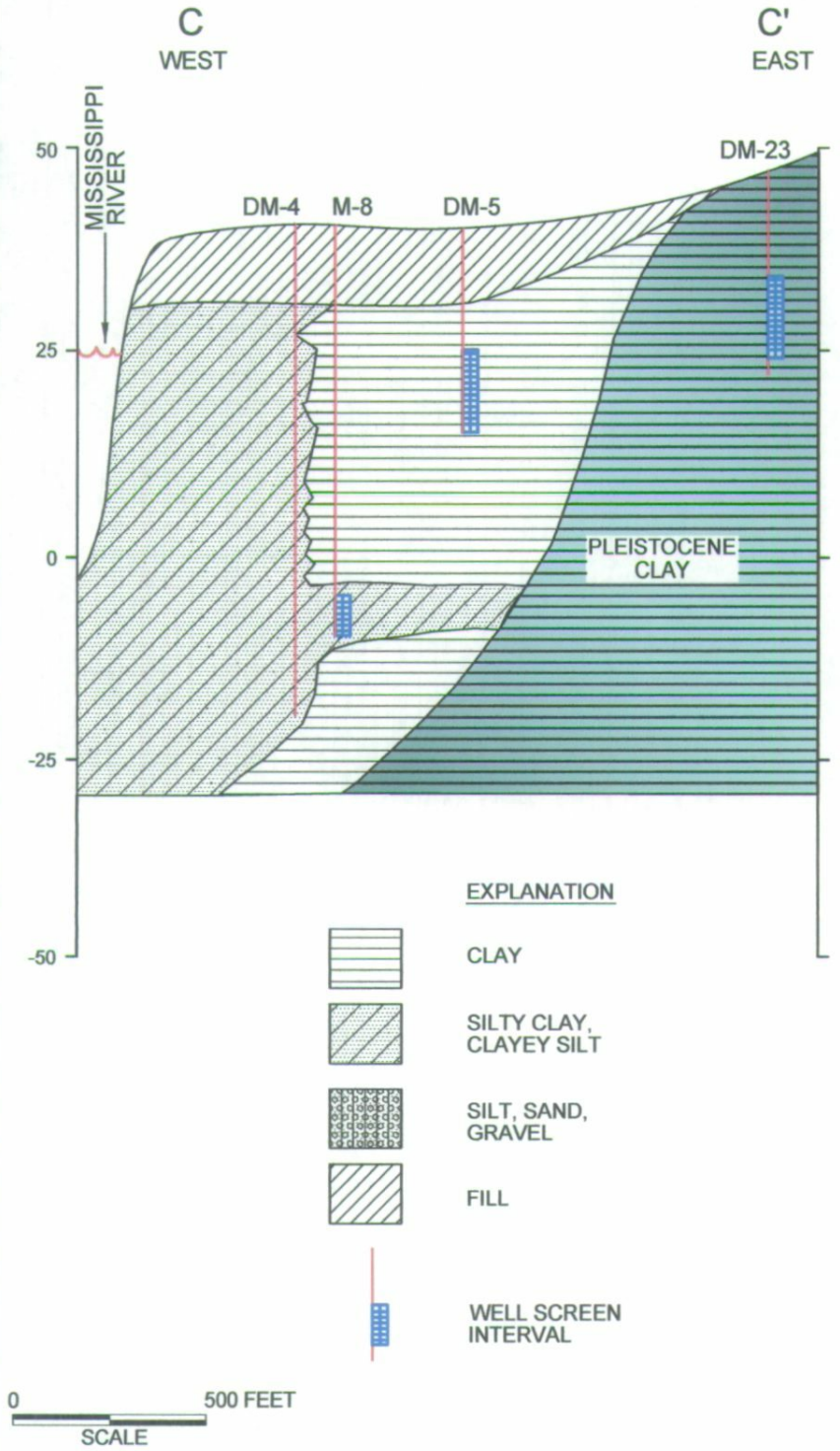
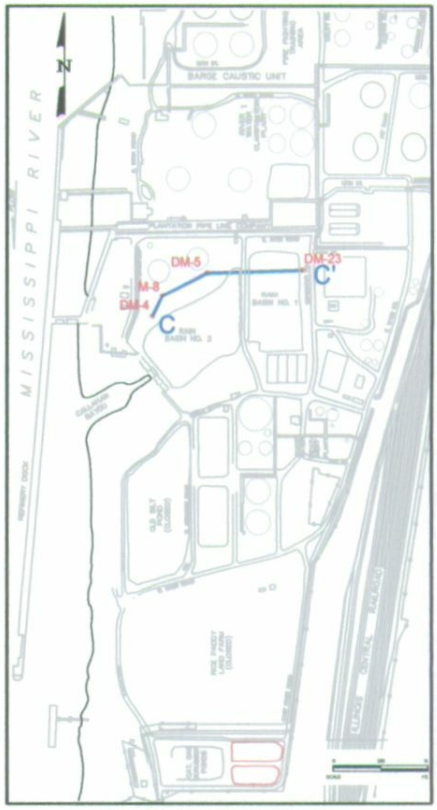
BATON ROUGE, LOUISIANA





CROSS-SECTION LAYOUT

CROSS-SECTION SOURCE: GERAGHTY & MILLER; *ASSESSMENT OF GROUND WATER QUALITY AND INSTALLATION OF MONITOR WELL NETWORK AT THE WASTE TREATMENT AREA, BATON ROUGE REFINERY*; AUGUST 1983.

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FIGURE D-4
GEOLIGIC CROSS-SECTION C-C'
LAC33:VII.521.D.1.a.
Exxon Company, U.S.A.
Baton Rouge, Louisiana

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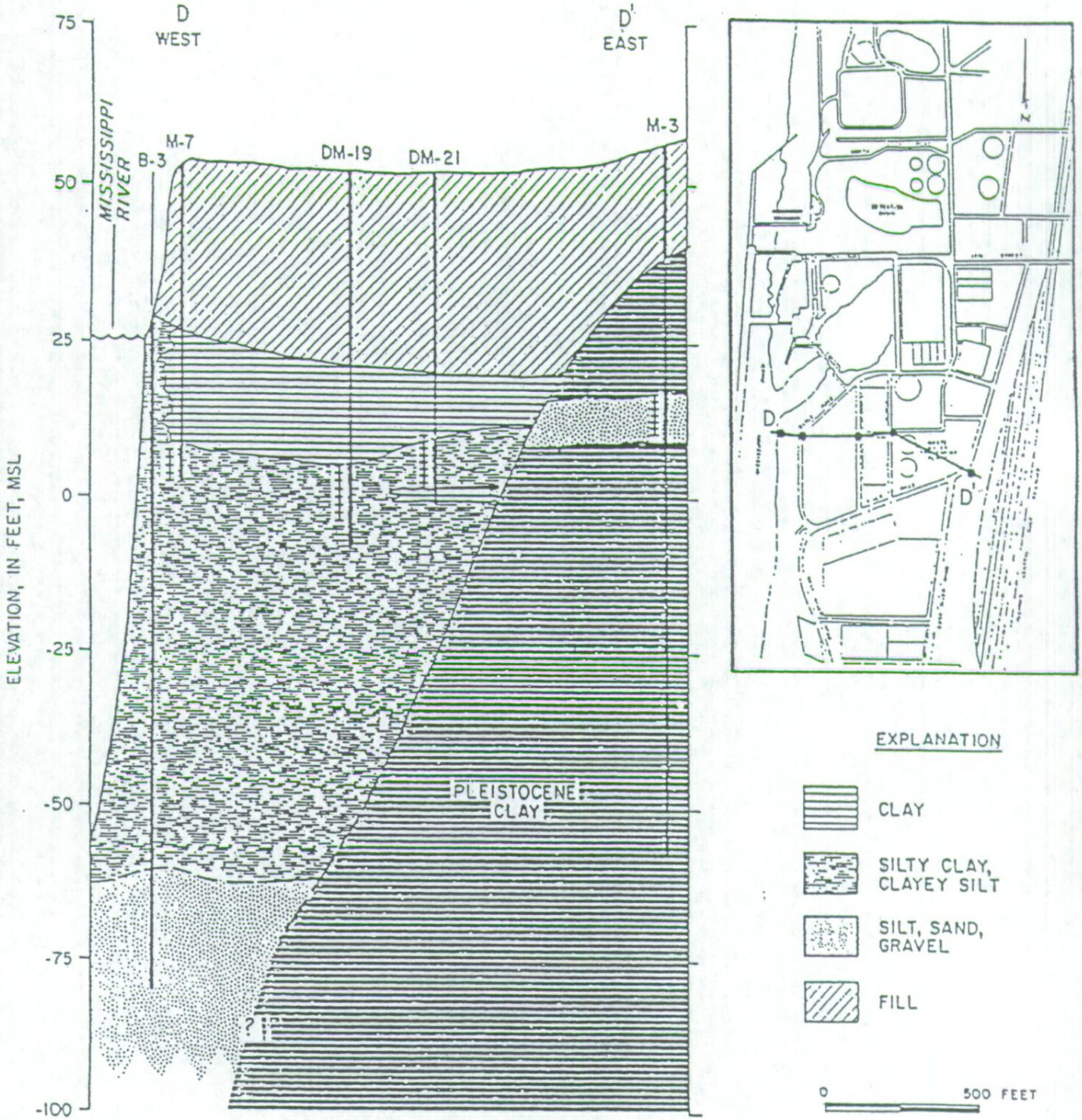

SOURCE: GERAGHTY & MILLER; ASSESSMENT OF GROUND WATER QUALITY AND INSTALLATION OF MONITOR WELL NETWORK AT THE WASTE TREATMENT AREA, BATON ROUGE REFINERY; AUGUST 1983

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FIGURE D-5

GEOLOGIC CROSS-SECTION D-D'
LAC33:VII.521.D.1.a.

EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

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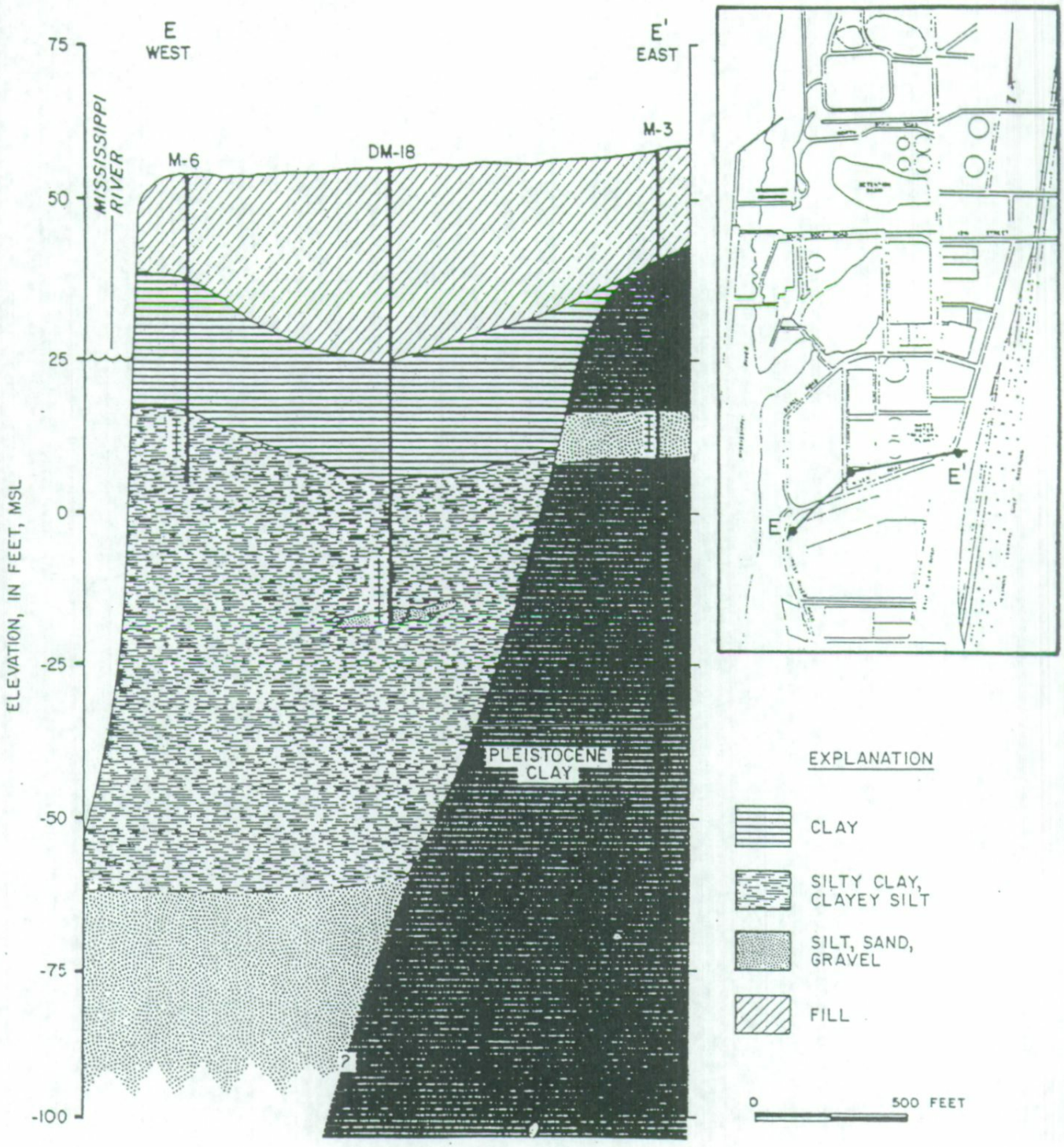

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FIGURE D-6

GEOLOGIC CROSS-SECTION E-E'
LAC33:VII.521.D.1.a.
EXXON COMPANY, U. S. A.
BATON ROUGE, LOUISIANA

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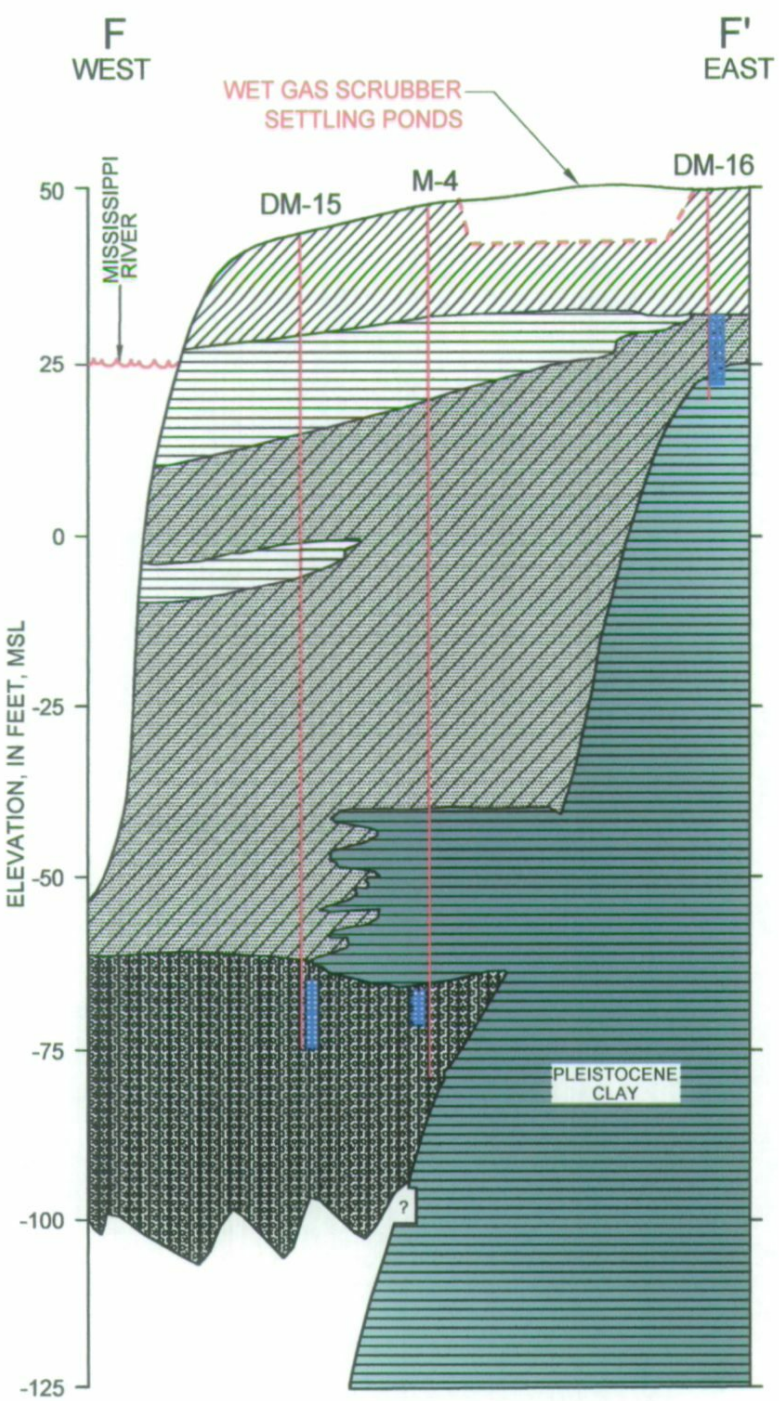

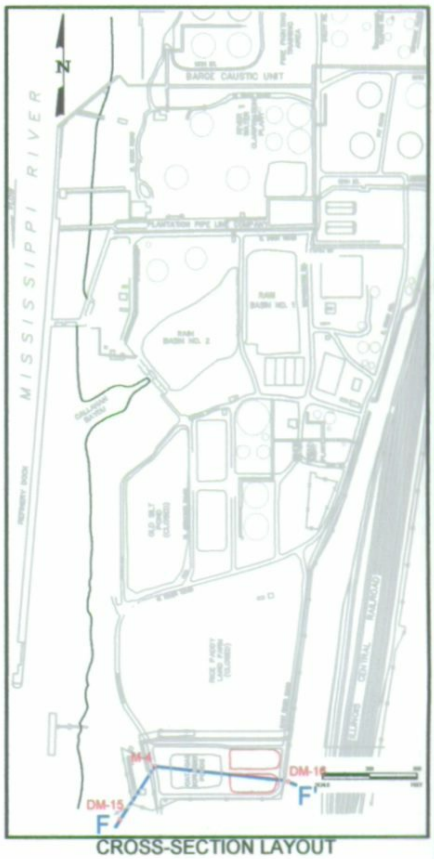

CROSS-SECTION LAYOUT

EXPLANATION

- CLAY
- SILTY CLAY, CLAYEY SILT
- SILT, SAND, GRAVEL
- FILL
- WELL SCREEN INTERVAL
- WET GAS SCRUBBER SETTLING PONDS, APPROXIMATE DEPTH PROFILE*

0 — 500 FEET
HORIZONTAL SCALE

NOTE: * DEPTH INFORMATION FROM PLAN VIEW AND CROSS-SECTION WET GAS SCRUBBER AERIATION AND SETTLING PONDS, DRAWING NO. 4, DATED 01/94, ERM-SOUTHWEST, INC.

CROSS-SECTION SOURCE: GERAGHTY & MILLER; *ASSESSMENT OF GROUND WATER QUALITY AND INSTALLATION OF MONITOR WELL NETWORK AT THE WASTE TREATMENT AREA, BATON ROUGE REFINERY* ; AUGUST 1983.

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FIGURE D-7
GEOLIGIC CROSS-SECTION F-F'
LAC33:VII.521.D.1.a.
Exxon Company, U.S.A.
Baton Rouge, Louisiana

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Additional borings made for evaluating the site will be completely filled from bottom to top with cement. The hole will be left open only as necessary to obtain core samples, water samples, and establish the initial water level. If subsequent samples or water level readings are to be taken, the hole will be completed as a well with suitable casing and sealing of the annulus between the hole and the casing.

c. **results of tests for classifying soils (moisture contents, Atterberg limits, gradation, etc.), measuring soil strength, and determining the coefficients of permeability, and other applicable geotechnical tests;**

Unified Soil Classification System (USCS) symbols for soil samples are provided with the logs in Appendix D. The typical stratigraphy is described in Section LAC 33:VII.521.D.1.a above. Definitions of the USCS designations are given in Appendix D.

The properties of the soils in this area have not been studied in detail for this report. However, the characteristics of the Pleistocene clays which were encountered by Etco Engineers (1971) in their investigation of a northerly parcel of land within the refinery are believed to be representative. This material is stiff to very stiff with shear strength generally in excess of 3 tons per square foot (tsf). The liquid limit was found to be between 35 and 82, and the plasticity index between 17 and 60, indicating a low permeability. Field permeability and some geotechnical testing results for some of the soil borings described in Appendix D are provided in Tables D-1through D-4. The Pleistocene clay can be characterized by desiccation planes (slickensides), which may modify its properties when considering the performance of the material in situ. These planes could provide a pathway for the migration of contaminants (if they were numerous and interconnected) but the rate of movement would be extremely low (similar to clay without slickensides) (Excerpt from Dames and Moore, Addendum to Report Hydrogeologic Studies, Hazardous Waste Management Facilities Baton Rouge Refinery, April 17, 1980).

d. **geologic cross-section from available published information depicting the stratigraphy to a depth of at least 200 feet below the ground surface;**

Detailed cross-sections to depths of approximately 200 feet are presented as Figures D-2 through D-7. A generalized cross-section depicting the stratigraphy beneath the site (to a depth of >1000 feet) is provided as Figure C-2.

Table D-1

Field Permeability Test Results

Well No.	Soil Type	Permeability (cm/sec)
DM-1	Silt & Clay	8.64×10^{-5}
DM-4	Silt	4.98×10^{-6}
DM-5	Clay, Silt &Sand	3.81×10^{-6}
DM-6	Silt & Clay	1.83×10^{-5}
DM-7	Silt & Clay	8.42×10^{-6}
DM-8	Silt & Clay	4.12×10^{-4}
DM-9	Silt & Clay	2.25×10^{-5}
DM-10	Sand	4.30×10^{-3}
DM-11	Sand & Clay	2.70×10^{-4}
DM-12	Sand & Silt	4.82×10^{-3}

Table D-2
In Situ Permeability of Soil Borings*
Exxon Baton Rouge

Well #	Depth (ft.)	L (cm)	t (sec)	H_0 (cm)	H_I (cm)	I_n (H_0/H_1)	K (cm/sec)
MW-A	5	15.24	1800	228.6	226.8	7.9x10-3	6.7x10-5
	10	15.24	1080	381.0	375.2	1.5x10-2	2.1x10-4
	15	15.24	360	533.4	466.3	1.3x10-1	5.5x10-3
	20	15.24	900	685.8	657.5	4.2x10-2	7.1x10-4
MW-D	5	Test not valid for this interval.					
	10	15.24	900	502.9	501.7	2.4x10-3	4.1x10-5
MW-E	5	15.24	1080	350.5	343.5	2.0x10-2	2.8x10-4
	10	15.24	900	502.9	483.1	4.0x10-2	6.8x10-4
MW-G	5	15.24	900	350.5	347.5	8.6x10-3	1.5x10-4
	10	15.24	600	502.9	460.3	8.9x10-2	2.3x10-3

Notes:

L (cm) length of soil sample measured in centimeters
t (sec) elapsed time between H_0 and H_I measured in seconds
H_0 (cm) initial head on the soil sample measured in centimeters
H_I (cm) final head on the soil sample measured in centimeters
I_n (H_0/H_I) natural log of the normalized head difference
K (cm/sec) hydraulic conductivity of soil sample measured in centimeter per second

* *See Appendix D - Attachment 1 for Method of Calcualation*

Table D-3

In Situ Permeability of Screened Intervals*

Well No.	Hydraulic Conductivity K (cm/sec)
MW-A	$2.5x10^{-5}$
MW-B	Insufficient water to perform test
MW-C	$3.4x10^{-5}$
MW-D	Insufficient water to perform test
MW-E	$1.3x10^{-4}$
MW-F	$1x10^{-4}$
MW-G	$2.5x10^{-4}$
MW-H	$4x10^{-5}$

* Calculations and methods presented in Appendix D

TABLE D-4

Deuel and Zahray Laboratories, Inc.

P.O. Box 3006
College Station, TX 77841

Telephor
(409) 693-3

July 23, 1986

ERM Southwest, Inc.

Soil Samples Submitted 06/30/86

Sample ID	% Moisture, as Received	Bulk Density, g/cm^3
MW A	18.6	1.79
MW B	31.2	1.68
MW C	44.8	1.75
MW D	29.3	1.72
MW E	28.7	1.65
MW F	41.7	1.68
MW G	23.0	1.61
MW H	20.2	1.76

Sample ID	-Particle Size Distribution- % Sand	% Silt	% Clay	Hydraulic Conductivity cm/hour
MW A	≤1	74.7	25.3	0.112
MW B	≤1	43.0	56.4	0.013
MW C	≤1	33.6	66.4	0.003
MW D	12.0	60.2	27.8	0.107
MW E	≤1	48.3	49.9	0.053
MW F	5.0	71.9	23.1	0.006
MW G	18.9	63.5	17.6	insf*
MW H	14.2	64.8	21.0	0.040

Sample ID	Liquid Limit, %	Plastic Limits, %
MW A	28.1	16.7
MW B	64.9	18.8
MW C	68.6	30.0
MW D	35.9	15.6
MW E	30.7	17.6
MW F	59.6	24.3
MW G	28.6	17.9
MW H	29.1	19.6

*Insufficient Sample

Robert K. Zahray
Laboratory Manager

e. **for faults mapped as existing through the facility, verification of their presence by geophysical mapping or stratigraphic correlation of boring logs. If the plane of the fault is verified within the facility's boundaries, a discussion of measures that will be taken to mitigate adverse effects on the facility and the environment;**

No known faults have been mapped as existing through the facility.

f. **for a facility located in a seismic impact zone, a report with calculations demonstrating that the facility will be designed and operated so that it can withstand the stresses caused by the maximum ground motion, as provided in LAC 33:VII.709.C.2; and**

The facility is not located in a seismic impact zone, as shown in Appendix A. The facility is located in "Zone 1". The maximum acceleration from earthquake activity for this seismic zone is 0.1 grams or 3.22 feet per second squared.

g. **for a facility located in an unstable area, a demonstration of facility design as provided in LAC 33:VII.709.C.3.**

The facility is not known to be located in an unstable area. As discussed in the above response, Zone 1 represents an area of very low impact from earthquake activity, and is not considered an unstable area.

2. **The following information regarding geology is required by Type III woodwaste, and construction/demolition-debris facilities:**

a. **General description of the soils provided by a qualified professional (a geotechnical engineer, soil scientist, or geologist) along with a description of the method used to determine soil characteristics; and**

Not applicable. This facility is not a Type III woodwaste or construction/ demolition-debris facility.

b. **Logs of all known soil borings taken on the facility and a description of the methods used to seal abandoned soil borings.**

Not applicable. This facility is not a Type III woodwaste or construction/ demolition-debris facility.

E. FACILITY SUBSURFACE HYDROLOGY

Standards governing facility subsurface hydrology are contained in LAC 33:VII.715.A (Type I and II landfarms).

1. **The following information on subsurface hydrology is required for all Type I facilities and Type II landfills and surface impoundments:**

   a. **delineation of the following information for the water table and all permeable zones from the ground surface to a depth of at least 30 feet below the base of excavation:**

      i. **areal extent beneath the facility;**

      The uppermost water bearing zone capable of bearing other than trace amounts of water at the site is the clayey to sandy silt first encountered within alluvial sediments at elevation approximately 10 to 25 feet (MSL). This zone pinches out in an easterly direction beneath the Wet Gas Scrubber Settling Ponds, as shown in Figure D-7.

      ii. **thickness and depth of the permeable zones and fluctuations;**

      The upper surface of the waste-treatment area is covered with 5 to more than 30 feet of rubble and fill materials. The fill consists of dredged materials that have been deposited throughout the refinery's history. The materials originated from the Mississippi River and the refinery site and may be characteristically similar to materials stored in the solid waste facilities. The natural soil below the fill is generally clay of low permeability about 10 to 30 feet thick. It is underlain by 10 to 60 feet of loosely consolidated, tan and gray silty clay and clayey silts, interbedded with relatively thin lenses of clays, silt, and sand of limited lateral extent. Near the river the silt/clay unit is underlain by very permeable sand and gravel more than 30 feet thick. The total thickness of the alluvial deposits beneath the site is estimated to be 200 to 250 feet.

      iii. **direction(s) and rate(s) of groundwater flow based on information obtained from piezometers and shown on potentiometric maps; and**

      Potentiometric figures (Appendix E) show the direction of ground water flow is generally to the west, toward the Mississippi River. Hydraulic gradient ranges from 0.01 to 0.02 foot per foot (ft/ft). Using an average hydraulic gradient of 0.015 ft/ft, an average hydraulic conductivity for the monitored zone of 1×10^{-5} cm/sec, and an assumed effective porosity of 15 %, the average ground water flow velocity was calculated to be 0.003 ft/day. A reversal of flow direction could occur near the western perimeter during prolonged periods of high river stage.

Copies of semiannual potentiometric surface maps and ground water monitoring data summary tables (2000 through 2004) have been included in Appendix E of this document.

iv. **any change in groundwater flow direction anticipated to result from any facility activities.**

No change in ground water flow direction is anticipated as a result of facility activities.

Radial flow does not appear to be applicable. See potentiometric surface maps and ground water monitoring data summary tables referenced under the previous comment/response to 521.E.1.a.iii and included in Appendix E.

b. **delineation of the following, from all available information, for all recognized aquifers which have their upper surfaces within 200 feet of the ground surface:**

i. **areal extent;**

ii. **thickness and depth to the upper surface;**

iii. **any interconnection of aquifers; and**

iv. **direction(s) and rate(s) of groundwater flow shown on potentiometric maps.**

With the exception of the uppermost water-bearing zone described in Section E.1.a and the sandy alluvium directly beneath this zone, no other aquifers are recognized within 200 feet of ground surface. Boring logs indicate that the sandy alluvium consists of sand with gravel, and is first encountered at depths ranging from 100 to 120 feet below land surface. The zone appears to be continuous in a north- south direction beneath the Water Clarification Unit area, but pinches out to the east as shown in cross sections D-5 through D-7. A 1989 report prepared by the USGS in cooperation with the LDOTD (Water Resources Technical Report No. 48) indicated that a confining layer approximately 50 feet in thickness exists between the alluvial aquifer and the "400-foot" sand beneath the site. It is assumed that ground water flow direction in the sandy portion of the alluvium would be similar to flow direction in the uppermost alluvial deposits.

2. **The following information on subsurface hydrology is required for Type II landfarms. Delineation of the following information for the water table and all permeable zones from the ground surface to a depth of at least 30 feet below the zone of incorporation:**

   a. **Aerial extent beneath the facility**

      Not applicable. The facility is not a Type II landfarm.

   b. **thickness and depth of the permeable zones and fluctuations;**

      Not applicable. The facility is not a Type II landfarm.

   c. **direction(s) and rate(s) of the groundwater flow based on information obtained from piezometers and shown on potentiometric maps; and**

      Not applicable. The facility is not a Type II landfarm.

   d. **any change in groundwater flow direction anticipated to result from any facilities activities.**

      Not applicable. The facility is not a Type II landfarm.

F. *FACILITY PLANS AND SPECIFICATIONS*

Standards governing facility plans and specifications are contained in LAC 33:VII.711.B (Type I and II landfills), LAC 33:VII.713.B (Type I and II surface impoundments), LAC 33:VII.715.B (Type I and II landfarms), LAC 33:VII.717.E (Type I-A and II-A facilities), LAC 33:VII.721.A (Type III construction and demolition debris and woodwaste landfills), LAC 33:VII.723.A (Type III composting facilities), and LAC 33:VII.725.A (Type III separation facilities). Standards for groundwater monitoring are contained in LAC 33:VII.709.E (Type I and II facilities).

1. Certification

The person who prepared the permit application must provide the following certification:

***"I certify under penalty of law that I have personally examined and I am familiar* with the information submitted in this permit application and that the facility as described in this permit application meets the requirements of the Solid Waste Rules and Regulations. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment."**

At the time these impoundments were designed and built, these regulations were not in effect. They were, however, built using good engineering practices. The solid waste impoundments are currently being maintained to comply with the cited regulations.

Martin West, P.E.
ERM-Southwest, Inc.
Professional Engineer No. 25988

STATE OF LOUISIANA
MARTIN L. WEST
REG. No. 25988
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

This Application was prepared by ERM-Southwest, Inc., an environmental engineering consulting firm registered in the State of Louisiana.

2. **The following information on plans and specifications is required for Type I and II facilities:**

   a. **a detailed plan-view drawing(s) showing original contours, proposed elevations of the base of units prior to installation of the liner system, and boring locations;**

      The Wet Gas Scrubber Settling Ponds were designed by engineers and architects in the State of Louisiana. Information has been extracted from the original drawings for the illustrative purposes of this permit application. Engineering drawings of the Wet Gas Scrubber Settling Ponds are provided as Drawing No. 4 in Appendix B. This drawing includes dimensions, elevations and other appropriate design information.

      This permit application was prepared by ERM- Southwest, an environmental engineering consulting firm registered in the State of Louisiana.

   b. **detailed drawings of slopes, levees, and other pertinent features; and**

      A cross-section of the facility is provided on Drawing No. 4 in Appendix B. This facility is not protected by levees. Natural barriers and facility elevation protect against the 100-year flood.

   c. **the type of material and its source for levee construction. Calculations shall be submitted demonstrating that an adequate volume of material is available for the required levee construction.**

      Not applicable. The permitted facility is existing.

3. **The following information on plans and specifications is required for Type I, II and III landfills:**

   a. **Approximate dimensions of daily fill and cover; and**

      This information is not applicable since the facility is a surface impoundment.

   b. **the type of cover material and its source for daily, interim, and final cover. Calculations shall be submitted demonstrating that an adequate volume of material is available for daily, interim and final cover.**

      This information is not applicable since the facility is a surface impoundment.

4. **The following information on plans and specifications for the prevention of groundwater contamination must be submitted for Type I and II facilities:**

a. **representative cross-sections and geologic cross-sections showing original and final grades, approximate dimensions of daily fill and cover, drainage, the water table, groundwater conditions, the location and type of liner, and other pertinent information;**

A typical cross-section showing original and final grades and other pertinent information including dimensions and water table evaluations at the impoundment is provided as Drawing No. 4 in Appendix B.

Surface drainage is discussed in Section LAC 33:VII.521.C of this permit application. A description of the ground water condition at the site is presented in Section LAC 33:VII.521.E and geological cross-sections are provided in Section LAC 33:VII.521.D.

b. **a description of the liner system, which shall include: calculations of anticipated leachate volumes, rationale for particular designs of such systems, and drawings; and**

The Wet Gas Scrubber Settling Ponds were constructed in a manner to prevent contamination of ground water (see Drawing No. 4 in Appendix B). The facility contains a liner as stated below:

Facility	Liner	Estimated Permeability
Wet Gas Scrubber Settling Ponds	Natural Clays and Silty Clays	$<10^{-6}$ cm/sec

Logs of soil borings taken from the area around the impoundments may be found in Appendix D. A narrative description of the soils may be found in LAC 33:VII.521D, Facility Geology.

Boring logs in the vicinity of the Wet Gas Scrubber Settling Ponds, are shown in Appendix D, and indicate that the impoundments are underlain by 5 to 20 feet of clay and approximately 30 feet of silty clays. These natural clays protect the uppermost aquifer from potential contamination.

c. **a description of the leachate collection and removal system, which shall include calculations of anticipated leachate volumes, rationale for particular designs of such systems, and drawings.**

This requirement is not applicable per LAC 33:VII.713.B.3.a.

5. **The following information on plans and specifications for groundwater monitoring must be provided for Type I and II facilities:**

   a. **a minimum of three piezometers or monitoring wells in the same zone must be provided in order to determine groundwater flow direction;**

      Three monitoring wells have been installed to monitor the uppermost water-bearing zone in the vicinity of the WGSSPs. Monitoring wells M-5 and S-3 are downgradient of the WGSSPs. Monitoring well DMS-1 is upgradient of the impoundments. A review of potentiometric maps constructed using these and other facility wells indicates that ground water flow direction is west, toward the Mississippi River.

   b. **for groundwater monitoring wells, cross-sections illustrating construction of wells, a scaled map indicating well locations and the relevant point of compliance, and pertinent data on each well, presented in tabular form, including drilled depth, the depth to which the well is cased, screen interval, slot size, elevations of the top and bottom of the screen, casing size, type of grout, ground surface elevations, etc.;**

      Well construction diagrams for wells DMS-1, S-3 and M-5 are provided in Appendix-D. A monitoring well location map is provided as Figure F-1. Table F-1 provides pertinent data for each well, including drilled depth to which the well is cased, screen interval, slot size, elevations of the top and bottom of the screen, casing size and type of grout. Boring logs for each well are provided in Appendix D.

   c. **a groundwater monitoring program including a sampling and analysis plan that includes consistent sampling and analysis procedures that ensure that monitoring results provide reliable indications of groundwater quality;**

      A revised Ground Water Monitoring Plan is provided in Appendix N. The parameter list was generated in the WGSSP original application, and is based upon sludge sample data and knowledge of the waste material. Since that time, additional sampling data as presented in Attachment 2 of Appendix H, combined with annual ground water monitoring results from the existing wells, have not indicated the need to change the parameter list. ExxonMobil has provided semi-annual groundwater monitoring reports to the LDEQ since original permit issuance.

   d. **for an existing facility, all data on samples taken from monitoring wells in place at the time of the permit application must be included. (If this data exists in the Solid Waste Division records, the administrative authority may allow references to the data in the permit application.) For an existing facility with no wells, groundwater data shall be submitted within 90 days after the installation of monitoring wells. For a new facility, groundwater data (one sampling event) shall be submitted before waste is accepted;**

      Ground water monitoring data is submitted to LDEQ Ground Water Protection on a semi-annual basis.

Table F-1

Monitoring Well Information

Wet Gas Scrubber Settling Ponds

Exxon Company, U.S.A. Refinery

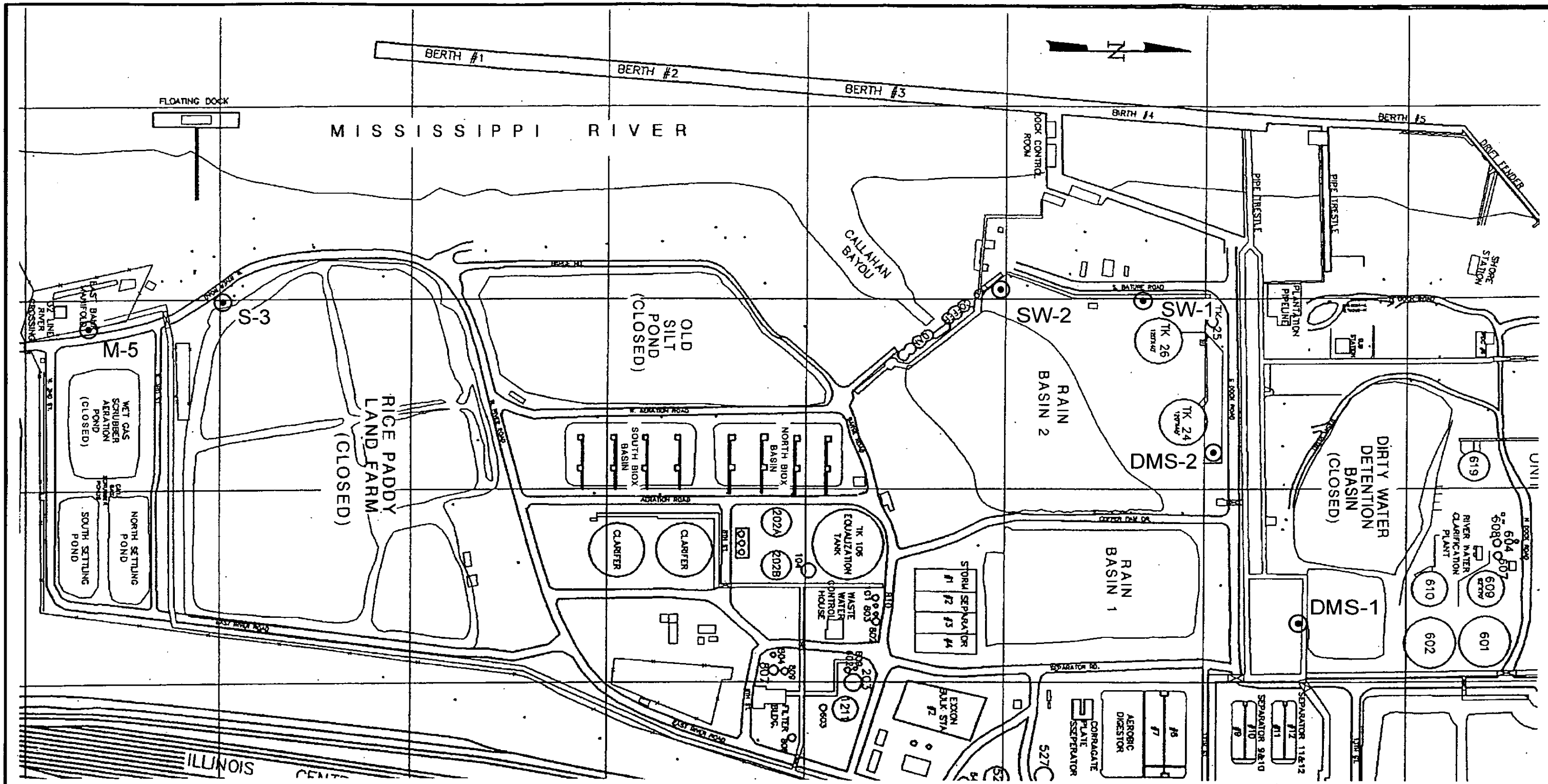
Baton Rouge, Louisiana

Parameters/Well Numbers	DMS-1	S-3	M-5
Up of Downgradient:	Up	Down	Down
Unit Monitored:	WGSSPs	WGSSPs	WGSSPs
Well Construction:	2" Stainless Steel	4" PVC	2" Stainless Steel
Sampling Equipment:	Dedicated Pump	Dedicated Pump	Dedicated Pump
Top of Casing Elevation (feet amsl):	48.51	55.08	50.18
Well Depth (feet below grade):	57.5	60	48
Screened Interval (from ___ feet	-1.49	-2.42	4.68
to ___ feet amsl):	-11.49	-7.42	-0.32
Screen Slot Size (inches):	0.01	0.01	Unknown
Grout Type:	Cement/Bentonite	Cement/Bentonite	Cement
Latitude:	30°29'02"	30°28'35"	30°28'31"
Longitude:	91°11'22"	91°11'31"	91°11'30"

Notes:

WGSSPs: Wet Gas Scrubber Settling Ponds

amsl: above mean sea level



ERM-Southwest, Inc.

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

FIGURE F-1
SOLID WASTE MONITORING WELL LOCATIONS
LAC33:VII.521.F.5.b.
EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

ERM.

DESIGN: JA	DRAWN: MHB	CHKD.: JA
DATE: 07/08/05	SCALE: AS SHOWN	REV.:
W.O.NO.: 0028411B215 G05		

e. **a plan for detecting, reporting, and verifying changes in groundwater; and**

The ground water monitoring network will be sampled semi-annually (once baseline data is collected) according to the methods described previously in this section. Well spacing has not changed from the existing 1994 MMD submittal and designations of upgradient and downgradient wells are consistent with available potentiometric surface data. A written report of the analytical results with an interpretation of the data and chain of custody documentation will be submitted to the Administrative Authority semi-annually.

In accordance with the procedures in LAC 33:VII.709.E.3.e, the statistical test chosen for the ExxonMobil monitoring program will initially include tolerance limits and nonparametric analysis of variance (ANOVA). If the percentage of nondetects is greater than 15% for any parameter, it is likely that an ANOVA test will be used. The ANOVA test compares the means of different groups of observations (*i.e.* upgradient versus downgradient wells for this purpose) to determine whether there are any significant differences between the two groups. The ANOVA test will be done in conjunction with a post hoc test to compare each compliance well with the upgradient wells to identify statistical difference within individual wells. All decisions on applicable statistical methods will follow the *Guidance Document on the Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities-Interim Final Guidance* (EPA/530/SW-89/026), and *A Ground Water Information Tracking System with Statistical Analysis Capability GRITS/STAT* (EPA/625/11-91/002) in determining the most appropriate statistical method for each parameter's dataset.

The method for handling results reported as not detected (ND) for a particular parameter will depend on the distribution of the background data. If all of the results for a particular parameter are reported as ND, then any sample which exceeds the American Chemical Society's limit of quantitation (LOQ) at the 99% confidence level for that parameter would be considered to exceed background. If only part of the background data are reported as ND, then a value equal to one-half the method detection limit will be substituted when calculating the sample mean and standard deviation.

If subsequent statistical analysis of groundwater data indicates that the selected statistical method is not appropriate, ExxonMobil will use another method identified in LAC 33:VII.709.E.2.e.

ExxonMobil has revised Section 5 of Appendix N to include statistical evaluations of upgradient and downgradient analytical data utilizing the ANOVA test with a post hoc test to differentiate individual wells. The method described is used to show that exceedances of the Permit concentration limits for some metals are representative of background concentrations by showing that upgradient and downgradient analytical data concentrations are not statistically different; therefore, these results are not indicative of a release from the Permit unit.

f. **the method for plugging and abandonment of groundwater monitoring systems.**

Groundwater well plugging and abandonment methods will be performed in accordance with the *Water Wells Rules and Regulations, State of Louisiana (LAC 70:XIII)*, as adopted by the Louisiana Department of Transportation and Development, Water Resource Section, at such time as wells are proposed for abandonment. In addition, the methods of abandonment are discussed as follows:

Boreholes will be plugged by tremie-pumping cement bentonite grout from the bottom of the hole up. When wells are proposed for abandonment, the casing and other components of the well including the screen, grout, bentonite seal, filter pack, concrete slab, protective casing, guard posts, and soil in contact with the grout, will be pulled or drilled out, if practical. The borehole will then be grouted in the manner described above. Otherwise, cement bentonite grout will be injected under pressure into the casing and forced through the well screen. Sufficient grout will be added to completely fill the casing to within approximately two feet of the ground surface. The casing will be cut off to the ground surface and the remaining borehole space will be grouted to the ground surface the following day, allowing for settlement of grout placed the preceding day.

A document from a qualified professional stating the casing removal was attempted but could not be completed without detrimental effects to the environment will accompany well abandonment reporting forms. The surface features of the well will be dismantled and disposed of in an environmentally sound manner. Attempts to restore the surface to its original conditions will be made and a notification of the plugging and abandonment will be sent to the LDEQ Solid Waste Division and LDOTD.

6. **The facility plans and specifications for Type I and II landfills and surface impoundments (surface impoundments with on-site closure and a potential to produce gases) must provide a gas collection and treatment or removal system.**

Not applicable.

G. *FACILITY ADMINISTRATIVE PROCEDURES*

Standards governing facility administrative procedures are contained in LAC 33:VII.711.C (Type I and II landfills), LAC 33:VII.713.C (Type I and II surface impoundments), LAC 33:VII.715.C (Type I and II landfarms), LAC 33:VII.717.F (Type I-A and II-A facilities), LAC 33:VII.721.B (Type III construction and demolition debris and woodwaste landfills), LAC 33: VII.723.B (Type III composting facilities), and LAC 33:VII.725.B (Type III separation facilities).

1. **The following information on administrative procedures is required for all facilities:**

   a. **recordkeeping system; types of records to be kept; and the use of records by management to control operations;**

   Records will be maintained during the life of the facility and will be kept on file for at least three years after closure pursuant to LAC 33:VII.713.C.1.b.iii. The following records will be maintained at the Baton Rouge Refinery and these records will be made available for LDEQ officials during facility inspections:

   1. Copies of the current Louisiana Solid Waste Rules and Regulations;
   2. The permit;
   3. The permit application;
   4. Permit modifications;
   5. Certified field notes for construction and installations;
   6. Operator training programs, certifications, and certificates;
   7. Daily log in which Wet Gas Scrubber Settling Pond notations will be made;
   8. Quality assurance/quality control records (including leak-detection assurance procedures) ;
   9. Inspections by the permit holder or operator;
   10. Monitoring, testing, or analytical data;
   11. Any other applicable or required data deemed necessary by the administration authority;
   12. Records on ground water sampling results;
   13. Post-closure monitoring reports, if required; and
   14. Copies of all documents received from or submitted to the LDEQ Solid Waste Division.

   The above records will be used by ExxonMobil to account for waste volumes generated, ground water quality, and maintenance on the solid waste facilities. Each of the above items will be used to monitor the operation of the solid waste facilities.

   An Annual Solid Waste Report which includes discussions on the Wet Gas Scrubber Settling Ponds (WGSSP) is provided each year in June. The Annual

Report contains all required information in LAC 33:VII.713.C.1.a.i. The reporting period for facility is from July 1 through June 30 and the report is submitted to the administrative authority before August 1 of each reporting year. The annual report for the WGSSP is provided on a separate annual-reporting form and references the WGSSP's seven digit industrial waste number (0596-037).

b. **an estimate of the minimum personnel, listed by general job classification, required to operate a facility; and**

The same refinery personnel operate the solid and hazardous waste management facilities. The training plan developed for the management of hazardous waste is also applicable to solid waste management and is presented in Appendix F. A list of key personnel by general job classification may be found on pages 1 and 2 of the training plan.

c. **maximum days of operation per week and per facility operating day (maximum hours of operation within a 24-hour period).**

The ExxonMobil Baton Rouge Refinery is operated 24-hours a day, 7 days a week.

2. **Administrative procedures for Type II facilities shall include the number of facility operators certified by the Louisiana Solid Waste Operator Certification and Training Program (R.S. 37:3151 et seq.).**

Not Applicable. The permitted facility is classified as Type 1.

H. FACILITY OPERATIONAL PLANS

Standards governing facility operational plans are contained in LAC 33: VII.711.D (Type I and II landfills), LAC 33:VII.713.D (Type I and II surface impoundments), LAC 33:VII.715.D (Type I and II landfarms), LAC 33:VII.717.G (Type I-A and II-A facilities), LAC 33:VII.721.C (Type III construction and demolition debris and woodwaste landfills), LAC 33:VII.723.C (Type III composting facilities), and LAC 33:VII.725.C (Type III separation facilities).

1. **The following information on operational plans is required for all facilities:**

   a. **types of waste (including chemical, physical, and biological characteristics of industrial wastes generated on-site), maximum quantities of wastes per year, and sources of waste to be processed or disposed of at the facility;**

   The chemical and physical characteristics of the wastes entering the facilities as well as quantities of waste are provided in Appendix G, Solid Waste Notification Forms. Offsite wastes are not accepted for disposal at the refinery.

   The Facility Operation Plan, Appendix H, includes analytical data from recent sampling of the settling ponds. Attachments of Appendix H include a Letter of No Objection submitted in March of 2004 requesting to include cobalt as an additional groundwater sampling parameter.

   b. **waste-handling procedures from entry to final disposition, which could include shipment of recovered materials to a user;**

   During normal operations of the WGSSPs, catalyst will accumulate on the bottoms of the surface impoundments. When removal becomes necessary, the catalyst may be recycled at an approved reuse facility such as a cement plant, sent offsite for disposal, or revised onsite per an approval beneficial use permit.

   Figure B-5 provides a schematic diagram of the wastewater treatment system at the Baton Rouge Refinery. As indicated, storm water is diverted into the 24 million gallon Rain Basin-1 during periods of high rainfall. The process sewers are fed to the wastewater treatment facilities throughout the rain. During this time, any contaminants present in the storm water systems are flushed out of the sewers and removed in the storm water diversion facilities or contained in the Rain Basin-1. After this first flush, the water is essentially all clean storm water runoff. When as much rainfall as possible has been contained in the Rain Basin-1, the storm water flow is diverted to the Rain Basin-2. When the Rain Basin-2 becomes full, it overflows into the River at NPDES Outfall 003. After the rain, the contaminated rainfall runoff from the Rain Basin-1 is fed through underground pipes to the biological treatment system and discharged through Outfall 001.

The wet gas scrubber is utilized to reduce particulate emissions from the catalytic cracking unit. Effluent from the scrubber is routed to one of the two settling ponds via a piping system. After a retention period for settling and equalization, the effluent is combined with other wastewater treatment plant process waters permitted under NPDES Outfall 001. All sampling protocols and testing frequencies are compliant with current NPDES permit regulations.

Wastewaters received into these facilities are via flow through piping systems and in an emergency to underground sewers which preclude the introduction of any other waste types. The refinery has quality assurance/quality control measures in place to ensure that only non-hazardous wastes are placed in these facilities.

c. **minimum equipment to be furnished at the facility;**

Not applicable. This facility is a surface impoundment.

d. **plan to segregate wastes, if applicable;**

Since these wastes are compatible, no plans have been developed to segregate them.

e. **procedures planned in case of breakdowns, inclement weather, and other abnormal conditions (including detailed plans for wet-weather access and operations);**

A description of the flow and water diversion to the Wastewater Treatment Plant-Offsite is contained in Appendix H. The plan describes the option to operate both ponds during abnormal conditions and inclement weather with discharge pumped to the treatment plant.

All machinery involved in plant operation including the wastewater treatment system is periodically inspected and maintained to prevent breakdowns and insure the containment of wastes. In the event of an emergency situation, normal operations of the surface impoundments will be shut down and wastewater discharges stopped during clean-up operations.

Operations at the plant continue as usual during most types of inclement weather. Severe weather conditions, such as in hurricanes or other violent storms, may result in the operational shutdown or slowdown of the plant, depending on the location and severity of such weather and the likelihood of direct impact on the plant. Decisions to shutdown or idle the plant in inclement weather are made by facility management.

f. **procedures, equipment, and contingency plans for protecting employees and the general public from accidents, fires, explosions, etc., and provisions for emergency care should an accident occur (including proximity to a hospital, fire and emergency services, and training programs); and**

Procedures for fire protection and emergencies are contained in Appendix C (Fire Fighting Equipment and Supplies) and Appendix I (Contingency plan and Emergency Procedures).

ExxonMobil has an Emergency Plans Manual to deal with most types of emergencies and accidents. In addition, a Contingency Plan specific to the waste treatment area was developed to address the requirements of the Louisiana Hazardous Waste Regulations and is also applicable to the solid waste facilities. A copy of this plan is provided in Appendix I.

The local fire and police departments as well as both area hospitals (i.e. Baton Rouge General Medical Center and Our Lady of the Lake Regional Medical Center) will be supplied with a copy of the contingency plan upon approval of the permit. These centers have also been provided information concerning the wastes handled and the overall refinery process. The personnel training manual may be found in Appendix F. Primary emergency care is provided onsite by trained company personnel. Ambulances are maintained onsite for quick transport to the nearest hospital, located approximately five miles from the Refinery. The Refinery has its own fire department located within the refinery. ExxonMobil is also a member of the Baton Rouge Area Mutual Aid System (BRAMAS).

g. **provisions for controlling vectors, dust, litter, and odors.**

Since the WGSSPs are surface impoundments, which handle non-putrescible wastes, provisions for litter control or vector control are not applicable. The physical nature of the solid waste contained in the WGSSPs is such that the waste will not become airborne trash. The refinery does, however, have a policy dealing with general plant housekeeping.

2. **The following information on operational plans is required for Type I and Type II facilities:**

   a. **a comprehensive operational plan describing the total operation, including (but not limited to) inspection of incoming waste to ensure that only permitted wastes are accepted (Type II landfills must provide a plan for random inspection of incoming waste loads to ensure that hazardous wastes or regulated PCB wastes are not disposed of in the facility.); traffic control; support facilities; equipment operation; personnel involvement; and day-to-day activities. A quality-assurance/quality-control (QA/QC) plan shall be provided for facilities receiving industrial waste; domestic-sewage sludge; incinerator ash; friable asbestos; nonhazardous petroleum-contaminated media; and debris generated from underground storage tanks [UST], corrective action, or other special wastes as determined by the administrative authority. The QA/QC plan shall include (but shall not be limited to) the necessary methodologies; analytical personnel; preacceptance and delivery restrictions; and appropriate responsibilities of the generator, transporter, processor, and disposer. The QA/QC plan shall ensure that only permitted, nonhazardous wastes are accepted;**

      A Facilities Operational Plan is provided as Appendix H. Control measures ensure that only non-hazardous wastes are introduced to these facilities. The impoundments are operated as a component of the facility wastewater and storm water management systems under an approved NPDES permit. Influent to the Wet Gas Scrubber Settling Ponds is piped in a flow-through manner precluding the introduction of any uncontrolled waste streams, thus no hazardous waste is managed by the facility. Operation of the facility is supervised by the water clarification unit operator. The operator periodically inspects and documents the operation of the impoundment. Since flows are limited to a known waste stream, which is contained and controlled, annual TCLP testing of wastewaters is not required. Additionally, no open burning operations are conducted within the Wet Gas Scrubber Settling Ponds.

      The facilities are examined daily and after storms (>2.0" from midnight to midnight) to protect against and detect evidence of deterioration of the banks, overtopping, malfunction or improper operation, and to ensure design capacity of the impoundment remains unchanged. In addition, formal solid waste inspections are performed weekly and are documented on the attached form provided as Figure H-1. If an inspection reveals a leak in the impoundment and it is then confirmed by on-site environmental professionals, the Solid Waste Division will be notified as required by the solid waste regulations.

   b. **salvaging procedures and control, if applicable; and**

      Not applicable. Materials are not salvaged from the solid waste facilities.

Water Clarification Unit Inspection Report

Inspection Type:	Weekly		*Post Storm		Date:	
Note: Units are required to be inspected during turnarounds and downtimes.					Time:	

*Post storm inspections required when rainfall exceeds 2" in a 24-hour period. In the event of a post storm inspection, answer only the (*) questions.

[illegible]		Yes	No (explain below)
Operational Status (Are they in service?)	North		
	South		
Can changes in liquid level be explained?	North		
	South		
*Is there a minimum of 2' of freeboard?	North		
	South		
Area free of leaks around the impoundments, in the adjoining ditch, or west of the river crossing manifold along the batture?			
*Dikes and surrounding soils free of any severe erosion or deterioration?			
Are roadways unobstructed?			
*Are pumps and associated operating equipment in working order?			
Are all steam, water or hydrocarbon lines in immediate area free of leaks?			

***Explain any checks in the "No" column and what corrective action was taken:**

[illegible]	*What is the level?	
	Yes	No (explain below)
Can changes in level be explained?		
*Are the sides of the coffer dam free of leaks or erosion?		
*Are pumps and associated operating equipment in working order?		
*Is there a minimum of 7' 5" of freeboard? (7.5" of freeboard exists unless river backs up into the impoundment)		
Are all steam, water or hydrocarbon lines in immediate area free of leaks?		

***Explain any checks in the "No" column and what corrective action was taken:**

Print Name:

Signature:

Date:

c. **scavenging control.**

Not applicable. Materials are not scavenged for the solid waste facilities.

3. **The following information on operational plans is required for Type I and Type II landfarms:**

Not applicable. The facility is a surface impoundment.

a. **items to be submitted regardless of land use:**

i. **A detailed analysis of waste, including (but not limited to) pH, phosphorous, nitrogen, potassium, sodium, calcium, magnesium, sodium-adsorption ratio, and total metals (as listed in LAC 33.VII.715.D.3.b);**

Not applicable. This facility is a surface impoundment.

ii. **soil classification, cation-exchange capacity, organic matter, content in soil, soil pH, nitrogen, phosphorous, metals (as listed in LAC 33:VII.715.D.3.b), salts, sodium, calcium, magnesium, sodium-adsorption ration, and PCB concentrations of the treatment zone;**

iii. **annual application rate (dry tons per acre) and weekly hydraulic loading (inches per acre); and**

Not applicable. This facility is a surface impoundment.

iv. **an evaluation of the potential for nitrogen to enter the groundwater.**

Not applicable. This facility is a surface impoundment.

b. **items to be submitted in order for landfarms to be used for flood-chain cropland:**

i. **a description of the pathogen-reduction method for septage, domestic sewage sludges, and other sludges subject to pathogen production;**

Not applicable. This facility is a surface impoundment.

ii. **crops to be grown and the dates for planting;**

Not applicable. This facility is a surface impoundment.

iii. **PCB concentrations.**

Not applicable. This facility is a surface impoundment.

iv. **Annual application rates of cadmium and PCB's and**

Not applicable. This facility is a surface impoundment.

v. **Cumulative applications of cadmium and PCB's**

Not applicable. This facility is a surface impoundment.

c. **items to be submitted for landfarms to be used for nonfood-chain purposes:**

Not applicable. This facility is a surface impoundment.

i. **description of the pathogen-reduction method in septage, domestic sewage sludges, and other sludges subject to pathogen production; and**

Not applicable. This facility is a surface impoundment.

ii. **description of control of public and livestock access.**

Not applicable. This facility is a surface impoundment.

4. **The following information on operational plans is required for Type I-A and II-A incinerator waste-handling facilities and refuse-derived energy facilities:**

   a. **a description of the method used to handle process waters and other water discharges which are subject to NPDES permit and state water discharge permit requirements and regulations; and**

      Not Applicable. This facility is a Type I, Industrial Surface Impoundment.

   b. **a plan for the disposal and periodic testing of ash (all ash and residue must be disposed of in a permitted facility).**

      Not Applicable. This facility is a Type I, Industrial Surface Impoundment.

5. **The following information on operational plans is required for Type I-A and II-A refuse-derived fuel facilities and Type III separation and composting facilities:**

   a. **a description of the testing to be performed on the fuel or compost; and**

   b. **a description of the uses for and the types of fuel/compost to be produced.**

      Not Applicable. This facility is a Type I, Industrial Surface Impoundment.

6. **The operational plans for Type I-A and II-A refuse-derived fuel facilities and Type III separation and composting facilities must include a description of marketing procedures and control.**

   Not Applicable. This facility is a Type I, Industrial Surface Impoundment.

7. **The operational plans for Type I and II facilities receiving waste with a potential to produce gases must include a comprehensive air monitoring plan.**

   Not Applicable. This facility is a Type I, Industrial Surface Impoundment that does not receive waste with a potential to produce gases.

I. IMPLEMENTATION PLAN

Standards governing implementation plans are contained in LAC 33:VII.709.D (Type I and II facilities), LAC 33:VII.717.H (Type I-A and II-A facilities), and LAC 33:VII.719.E (Type III facilities).

1. **The implementation plans for all facilities must include the following:**

   a. **a construction schedule for existing facilities, which shall include beginning, and ending time frames and time frames for the installation of all major features such as monitoring wells and liners. (Time-frames must be specified in days, with day one being the date of standard permit issuance); and**

      Not applicable. No new construction is planned at this time.

   b. **details on phased implementation if any proposed facility is to be constructed in phases.**

      Not applicable. See LAC 33:VII.521.I.1.a above.

2. **The implementation plans for Type I and II facilities must include a plan for closing and upgrading existing operating areas if the application is for expansion of a facility or construction of a replacement facility.**

   Not applicable. This application is not for an expansion of a facility or construction of a replacement facility.

J. FACILITY CLOSURE

Standards governing facility closure are contained in LAC 33:VII.711.E (Type I and II landfills), LAC 33:VII.713.E (Type I and II surface impoundments), LAC 33:VII.715.E (Type I and II landfarms), LAC 33:VII.717.I (Type I-A and II-A facilities), LAC 33:VII.721.D (construction and demolition debris and woodwaste landfills), LAC 33:VII.723.D (Type III composting facilities), and LAC 33:VII.725.D (Type III separation facilities).

1. **The closure plan for all facilities must include the following:**

   a. **the date of final closure;**

      The estimated date of final closure is the year 2024.

   b. **the method to be used and steps necessary for closing the facility; and**

      The methodology to close the facility is contained in Section 1.3 of Appendix J. Current operations do not include a runoff-diversion system therefore, LAC 33:VII.713.E.2.b is not applicable.

   c. **the estimated cost of closure of the facility, based on the cost of hiring a third party to close the facility at the point in the facility's operating life when the extent and manner of its operation would make closure the most expensive.**

      Closure costs for the Wet Gas Scrubber Ponds are provided in Table 2 of Appendix J. Since all solid waste will be removed from the surface impoundments at closure, post-closure care is not required.

2. **The closure plan for Type I and II landfills and surface impoundments must include:**

   a. **a description of the final cover and the methods and procedures used to install the cover;**

      A final cover will not be installed because ExxonMobil intends to remove all sludge and contaminated soils and achieve clean closure.

   b. **an estimate of the largest area of the facility ever requiring a final cover at any time during the active life;**

      Not applicable. See LAC 33:VII.J.2.a

   c. **an estimate of the maximum inventory of solid waste ever on-site over the active life of the facility; and**

      An estimate of the maximum inventory of solid waste ever on-site over the active life of the facility is provided in Table 1 of Appendix J.

d. **a schedule for completing all activities necessary for closure.**

A schedule of closure for the facilities is provided in Section 1.4 of Appendix J.

3. **The closure plan for all Type I and II facilities and Type III woodwaste and construction/demolition debris facilities shall include the following:**

a. **the sequence of final closure of each unit of the facility, as applicable:**

The methodology to close the facilities is contained in Section 1.3 of Appendix J.

b. **a drawing showing final contours of the facility; and**

Final contours of the facility will be approximately the same as the existing contours shown on Figure 3 of Appendix B.

c. **a copy of the document that will be filed upon closure of the facility with the official parish record keeper indicating the location and use of the property for solid waste disposal, unless the closure specified a clean closure.**

A copy of the applicable closure documents, if required, will be filed with the East Baton Rouge Parish Records keeper upon closure of the facility.

K. *FACILITY POST-CLOSURE*

Standards governing post-closure requirements are contained in LAC 33:VII.711.F (Type I and II landfills), LAC 33: VII.713.F (Type I and II surface impoundments), LAC 33:VII.715.F (Type I and II landfarms), and LAC 33:VII.721.E (Type III construction and demolition debris and woodwaste landfills).

1. **The post-closure plan for all facilities must include the following:**

   a. **specification of the long-term use of the facility after closure, as anticipated; and**

      Long-term use of the site after clean closure is anticipated to be in accordance with the industrial setting of the refinery.

   b. **the cost of conducting post closure of the facility, based on the estimated cost of hiring a third-party to conduct post-closure activities in accordance with the closure plan.**

      Since all solid waste will be removed from the surface impoundments at closure, post-closure care will not be required.

2. **The post-closure plan for Type I and II facilities must include the following:**

   a. **the method for conducting post-closure activities, including a description of the monitoring and maintenance activities and the frequency at which they will be performed;**

      At closure, it is anticipated that all solid waste will be removed from the impoundments. No monitoring procedures are required in accordance with LAC 33:VII.713.E.3.b.

   b. **the method for abandonment of monitoring systems, leachate collection systems, gas-collection systems, etc.;**

      In the event that groundwater monitoring wells must be abandoned, they will be plugged using the most up-to date techniques. Current practices for well abandonment are found in the response to LAC 33;VII.709.F.5.f. Prior to abandonment of any monitoring well, approval, will be obtained form the Administrative Authority.

c. measures planned to ensure public safety, including access control and gas control; and

Perimeter barriers will be maintained after closure to assure public safety and access control. Since it is planned to remove all waste from the facilities, the risk to public safety is minimal. Gas controls are not applicable, since all wastes are non-putrescible.

d. a description of the planned uses of the facility during the post-closure period.

At this time, it is anticipated that ExxonMobil will continue as owner of the site after closure. Should this status change ExxonMobil will notify the Secretary if the LDEQ in accordance with these regulations.

L. *FINANCIAL RESPONSIBILITY*

Standards governing financial responsibility are contained in LAC 33:VII.727. A section documenting financial responsibility according to LAC 33:VII.727 which contains the following information, must be included for all facilities:

1. **the name and address of the person who currently owns the land and the name and address of the person who will own the land if the standard permit is granted (if different from the permit holder, provide a copy of the lease or document which evidences the permit holder's authority to occupy the property); or**

   The Baton Rouge Refinery is wholly owned by the ExxonMobil Corporation, U.S.A., whose stock is widely held and publicly traded.

2. **the name of the agency or other public body that is requesting the standard permit; or, if the agency is a public corporation, its published annual report; or, if otherwise, the names of the principal owners, stockholders, general partners, or officers;**

   The most recent published annual report for ExxonMobil Corporation is provided as Appendix K.

3. **evidence of liability coverage, including:**

   a. **personal injury, employees, and the public (coverage, carriers, and any exclusions or limitations);**

      Documentation of financial assurance for the liability coverage, closure and post-closure care of the refinery's solid waste facilities is provided in Appendix L.

   b. **property damage (coverage and carrier);**

      See 33:VII.521.L.3.a.

   c. **environmental risks; and**

      See 33:VII.521.L.3.a.

4. **evidence of a financial assurance mechanism for closure and/or post-closure care and corrective action for known releases when needed.**

   Documentation of financial assurance for the reliability coverage, closure and post-closure care of the refinery's solid waste facilities is provided in Appendix L.

M. SPECIAL REQUIREMENTS

The administrative authority may require additional information for special processes or systems and for supplementary environmental analysis.

No other additional information has been requested at this time.

Additional Supplemental Information

Part III

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

LAC 33:VII.523PART III: ADDITIONAL SUPPLEMENTARY INFORMATION

The following supplementary information is requested for all solid waste processing and disposal facilities. All responses and exhibits must be identified in the following sequence to facilitate the evaluation:

A. a discussion demonstrating that the potential and real adverse environmental effects of the facility have been avoided to the maximum extent possible;

In developing ExxonMobil's Baton Rouge Refinery, care and consideration was and is given to the preservation and protection of surrounding swamps, marshes, floodplains, estuaries, wildlife hatcheries, habitats of endangered species and historical sites. However, there are no known historical or archeological areas (as registered by the Louisiana Department of Culture, Recreation and Tourism) within 1,000 feet of the waste disposal sites (See attachments located in Part II Section A). No designated wildlife areas have been established in the vicinity of the sites, and there is no apparent unique habitat for listed endangered species. No natural swamps or marshes occur within or immediately adjacent to the site. The battture area along the Mississippi can be periodically flooded but does not support significant populations of marsh plant species in the refinery vicinity.

ExxonMobil has taken measures specifically designed to protect the environment and monitor any effects the refinery has on the environment. A ground water monitoring plan, as described in Section 521.F.5 of this application, has been implemented to detect any possible contamination at the earliest point. Process waters and contaminated storm waters are treated at the water clarification unit prior to discharge through NPDES outfalls (Appendix H contains a description of the wastewater treatment procedures). Wastewater streams containing volatile hydrocarbons are segregated and treated in a covered corrugated plat separator to minimize air emissions. A wastewater benzene removal program is in place to comply with benzene waste operations National Emission & Standard for Hazardous Air Pollutants. The refinery also has an air-monitoring program in place.

ExxonMobil has a contingency and emergency procedure plan to address and minimize any hazards to the environment from fire, explosions, or any release of wastes to the air, soil, or surface waters. The plan is presented in Appendix I of the permit application.

B. a cost-benefit analysis demonstrating that the social and economic benefits of the facility outweigh the environmental-impact costs;

Cost analysis of the alternative treatment, storage and disposal techniques demonstrate that the social and economic benefits of the present waste management facilities exceed the environmental impacts.

Specifically, ExxonMobil has considered the possibility of replacing the surface impoundments with tanks. However, tanks and associated equipment to manage this stream would not only be costly to build, but there is no available real estate to place the required tanks. Maintenance time and costs would also increase. In addition, the impoundments have proven reliable and effective.

In assessing the social and economic benefits, ExxonMobil has taken into consideration the effects that any alternatives would have on employees, the revenue supplied to surrounding areas, and the company's bottom line profit. It is ExxonMobil's intent to reduce to the maximum extent possible any environmental impacts to the air, land, or water within the refinery and the surrounding area.

C. a discussion and description of possible alternative sites that would offer more protection to the environment without unduly curtailing non-environmental benefits; and

ExxonMobil has considered the technical and economic feasibility of selected alternatives for treating, storing and disposing of refinery solid wastes. It is felt that the surface impoundments provide adequate environmental protection while remaining economically feasible. Storage tanks to replace the impoundments would be costly in terms of both land and money, <u>and an engineering alternative would be logistically very difficult, if at all possible</u>.

D. a discussion of possible alternative sites that would offer more protection to the environment without unduly curtailing non-environmental benefits; and

The solid waste facilities have been in existence since the early 1970s and it is felt that the current location of the facilities are situated so as to provide adequate protection to the environment. The site is not located in a seismic area. The solid waste management facilities are located more than 1,000 feet from any environmentally sensitive areas (i.e., swamps, marshes, estuaries, wildlife hatcheries, habitants of endangered species and historical sites). Plant site facilities are separated and shielded from adjoining non-compatible land uses by a buffer zone of approximately 200 feet of space or more surrounding the site (Figure A-4).

E. a discussion and description of the mitigating measures, which would offer more protection to the environment than the facility, as proposed, without unduly curtailing non-environmental benefits.

As previously stated, ExxonMobil's waste management facilities are existing and have been designed and operated to minimize hazards to human health and the environment. In addition, the current ground water monitoring system has been located as to intercept any potential contamination at the earliest practical occurrence. Personnel training and contingency plans have been developed to address emergency situations. As discussed in Section 523.A above, physical barriers aid in protecting the environment.

Seismic Maps

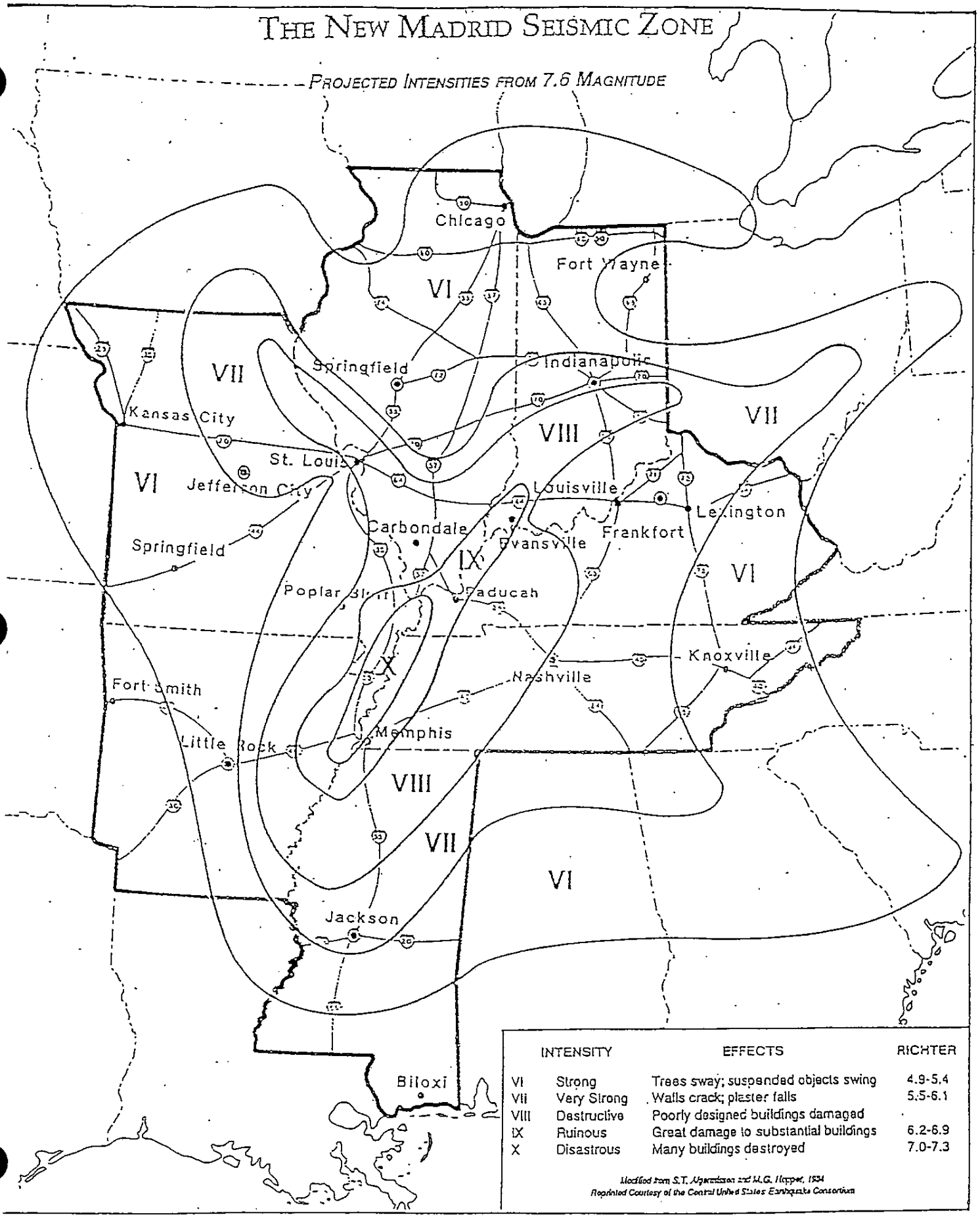
Appendix A

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

THE NEW MADRID SEISMIC ZONE

PROJECTED INTENSITIES FROM 7.6 MAGNITUDE

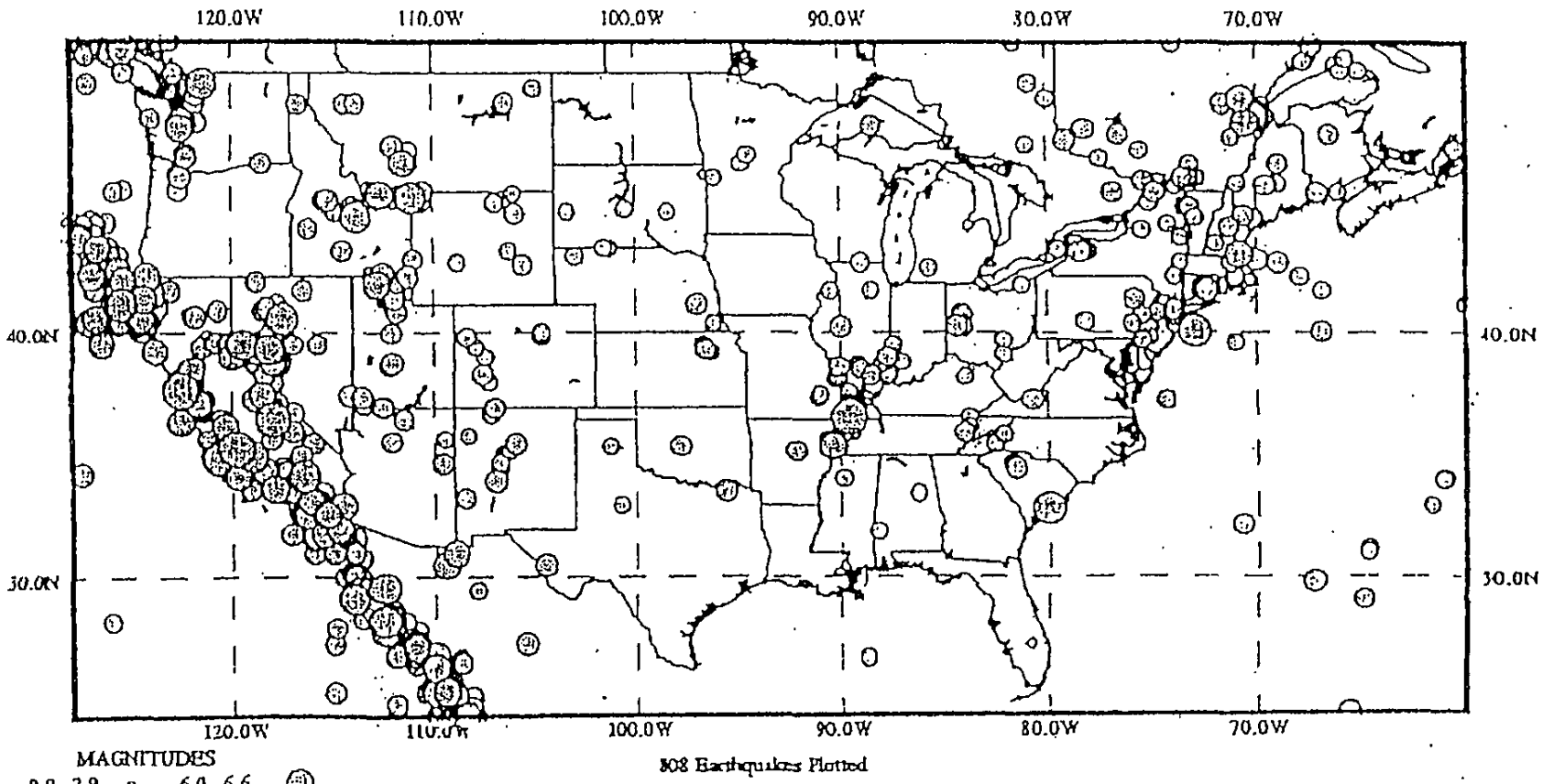


INTENSITY		EFFECTS	RICHTER
VI	Strong	Trees sway; suspended objects swing	4.9-5.4
VII	Very Strong	Walls crack; plaster falls	5.5-6.1
VIII	Destructive	Poorly designed buildings damaged	
IX	Ruinous	Great damage to substantial buildings	6.2-6.9
X	Disastrous	Many buildings destroyed	7.0-7.3

Modified from S.T. Algermissen and M.G. Hopper, 1984
Reprinted Courtesy of the Central United States Earthquake Consortium

CENTRAL UNITED STATES EARTHQUAKE CONSORTIUM
2630 Holmes Road, East

SEISMICITY OF THE UNITED STATES 1500 TO MAY 1993 BY EARTHQUAKE MAGNITUDE

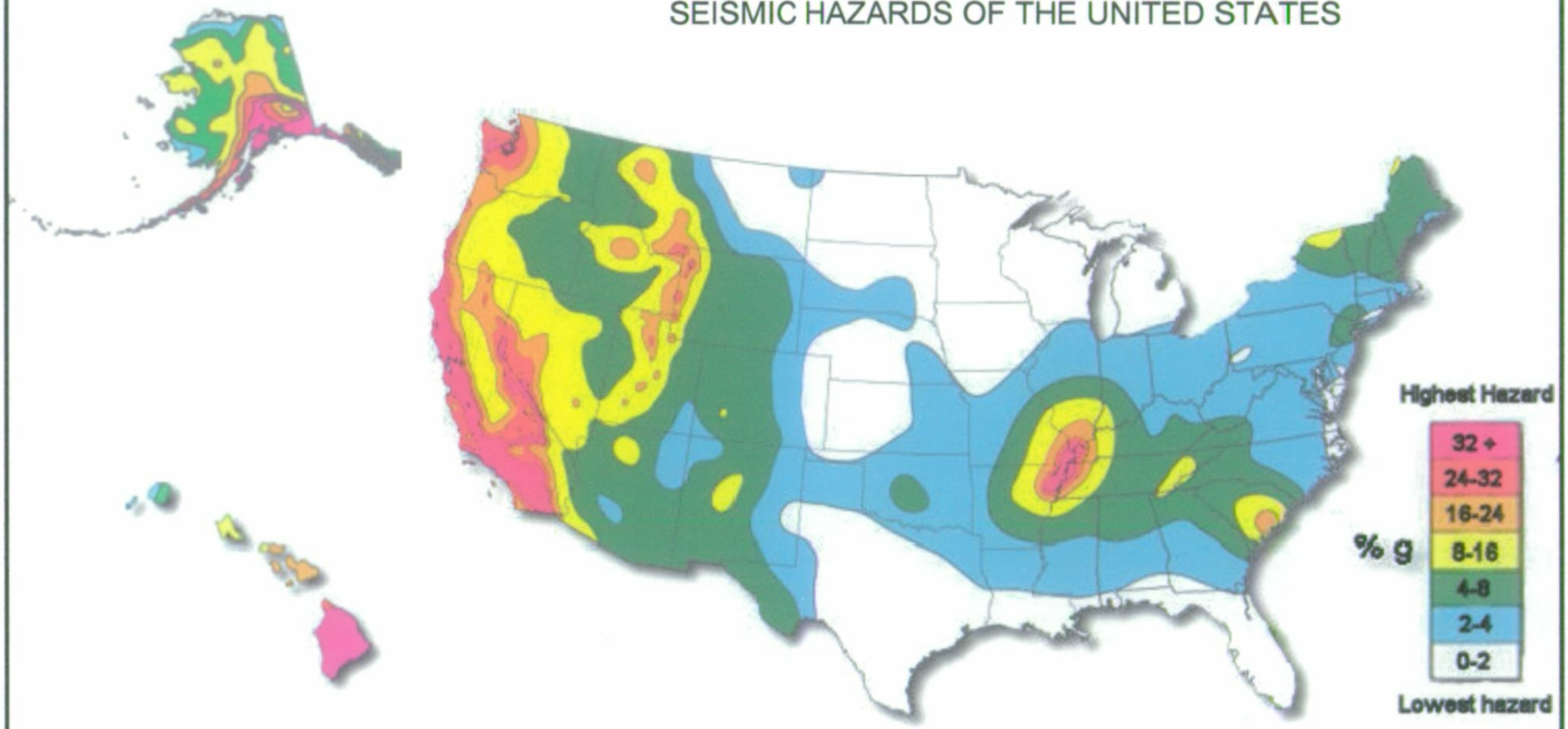


MAGNITUDES

0.0 - 2.9	o	6.0 - 6.6	
3.0 - 4.4	O	6.7 - 7.4	
4.5 - 5.1		7.5 - 8.1	
5.2 - 5.9		>8.1	

NATIONAL GEOPHYSICAL DATA CENTER / NOAA BOULDER, CO, 80303

SEISMIC HAZARDS OF THE UNITED STATES



ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

DESIGN: SF	DRAWN: MHB/LAH	CHKD.: SF
DATE: 3-24-05	SCALE: N/A	REV.:
W.O.NO.: C:\0028411B209.dwg, 3/24/2005 4:01:03 PM		

SEISMIC HAZARD OF THE UNITED STATES

ERM

Surface Impoundments Drawings

Appendix B

July 2005
Project No. 0028411

Environmental Resources Management
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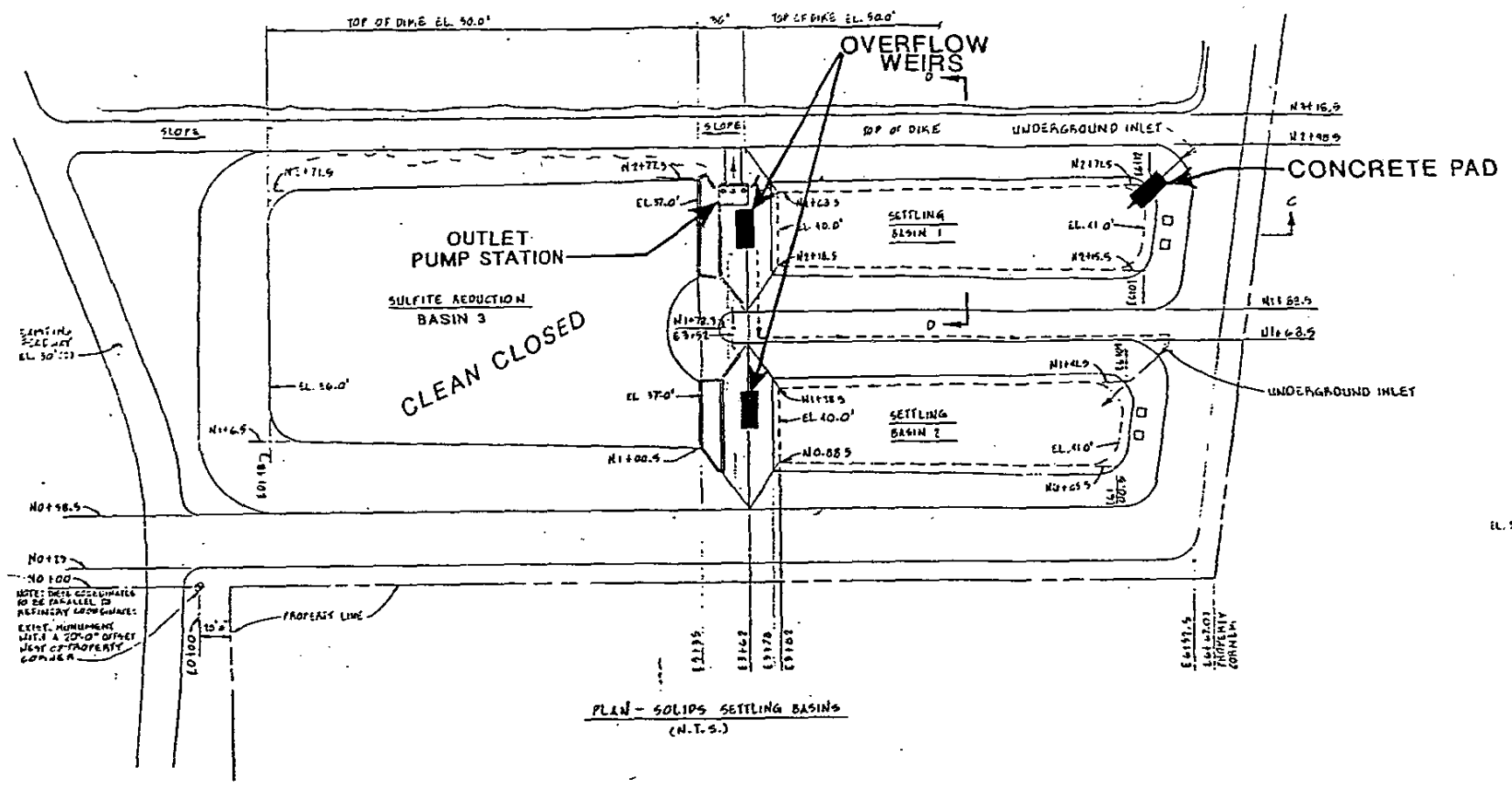
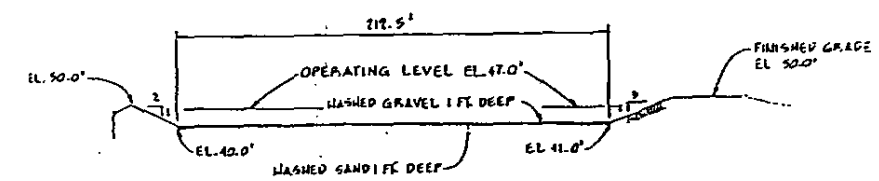


PLAN - SOLIDS SETTLING BASINS
(N.T.S.)



SECTION "CC"
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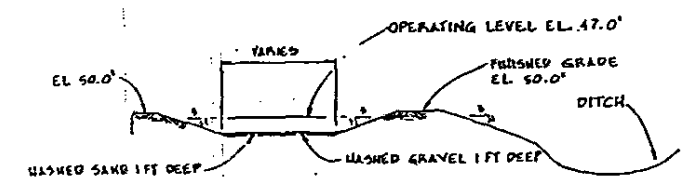
(TYP. FOR 2)



SECTION "DD"
SCALE: 1"=40'
(TYP FOR 2)

NOTES:

1. OUTLET FLOW IS ON LEVEL CONTROL.
2. MISSISSIPPI RIVER HIGH WATER LEVEL IS 49.0' MSL.
3. SURFACE DRAINAGE IS CARRIED AWAY FROM THE IMPOUNDMENTS VIA DITCHES, AS SHOWN IN SECTION D-D, WHICH ALSO HANDLE DRAINAGE FROM ILLINOIS CENTRAL RAILROAD & ALLIED CHEMICAL PROPERTIES.

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DRAWING NO. 4

PLAN VIEW AND CROSS-SECTION
WET GAS SCRUBBER AERATION
AND SETTLING PONDS

EXXON COMPANY, U.S.A. REFINERY
BATON ROUGE, LOUISIANA

DESIGN:	CHECKED:	DATE: 01/94	SHEET NO.
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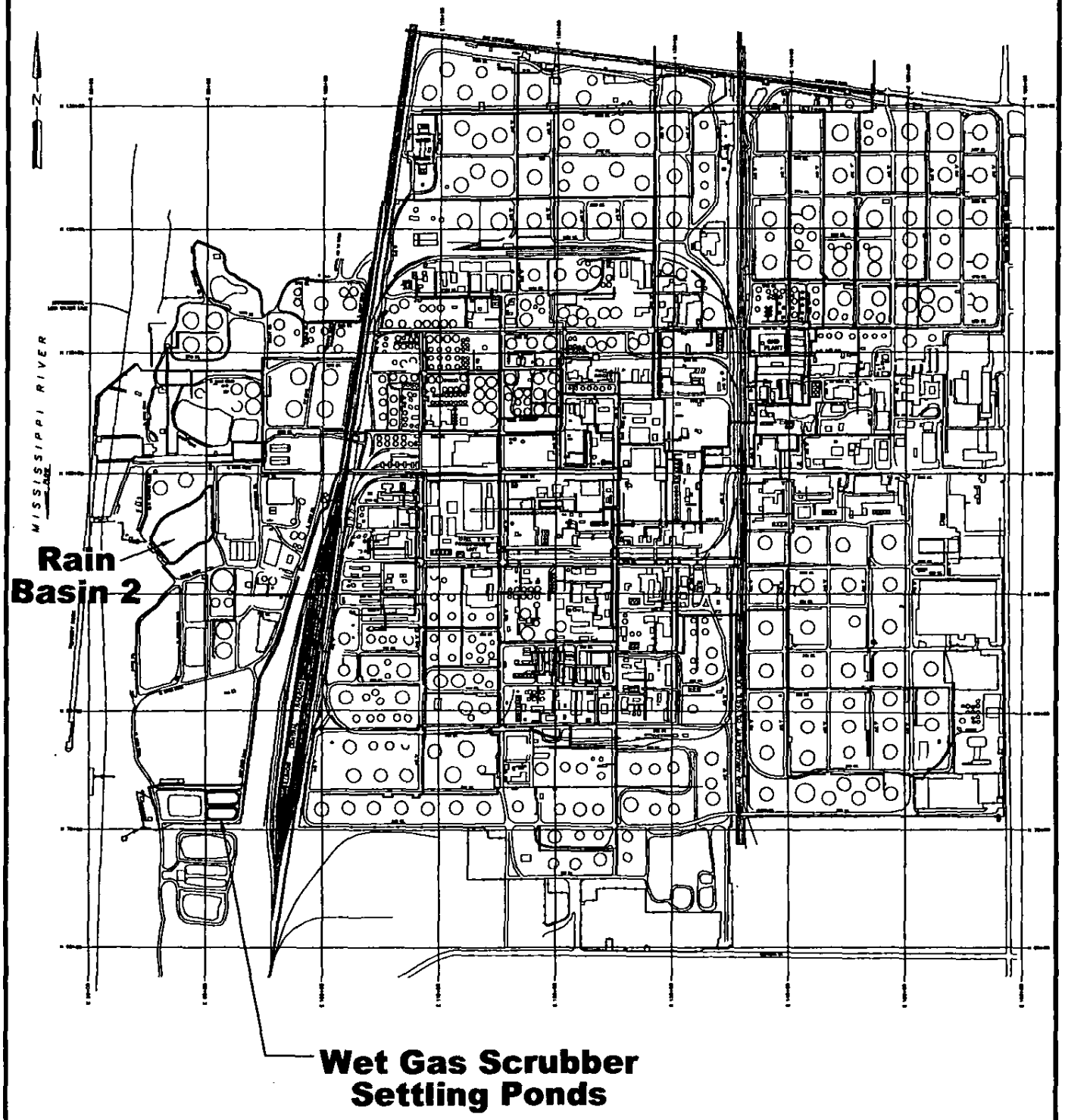

BASEMAP SOURCE: ExxonMobil Map System S001, AGS#S001AA Revision, 07/28/93.

ERM-Southwest, Inc.

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DESIGN: JA	DRAWN: MHB	CHKD.: JA
DATE: 03/24/05	SCALE: AS SHOWN	REV.:
W.O.NO.: 0024811A210 C05		

FIGURE 1
FACILITY MAP

ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana
(Agency Interest Number 2638)

ERM

Fire Fighting Equipment and Supplies

Appendix C

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

As required by LAC33: VII.521.B.1.d., the fire-protection measures for a facility are to be included within a Louisiana Solid Waste Permit Mandatory Modification Document. Appendix C is included to satisfy this requirement by describing the fire water system, mobile equipment and foam systems within the ExxonMobil facility. Appendix C was assembled from ExxonMobil's current Emergency Plans Manual. Due to the fluid nature of emergency manuals, the information provided within Appendix C is subject to periodic updates. ExxonMobil believes that these updates would not significantly impact the operations of the Wet Gas Scrubber Settling Ponds. Therefore, ExxonMobil is requesting that LDEQ not require a solid waste permit modification in the event of an internal Emergency Plans Manual update. Should an internal update significantly impact the operations of the Wet Gas Scrubber Settling Ponds, the need for a modification would be evaluated and supplemental documentation will be provided as necessary.

Chapter 6: Fire Fighting

SECTION **PAGE NO.**

6.1 General Information 1
Pre-Planning 1
Fire Assessment 1
Fire Control 1
Fire Extinguishment 2
Foams for Vapor Suppression 3
6.2 Specific Procedures 5
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Fire Water Systems 16
Mobile Equipment 20
Deluge Systems 23
Fixed Foam Systems 23
Foam Inventory and Outside Sources 25
Louisiana Emergency Resource Supply Network ("Hired Gun Gang") 26
Miscellaneous Equipment 27

6.1 General Information

Overcome Fear! This is the number one rule in effectively fighting fires. Actions born of panic often add to the seriousness of the emergency. Everyone has an inborn fear of fire, but a frightened person cannot act intelligently. Rather, he is likely to become panic-stricken and harm himself and others.

Respect the Power of Fire. A wholesome respect for the power of fire develops fire prevention thinking and leads to aggressive, but safe attack on fires.

Develop Self Confidence. A famous philosopher once said, "*The application of knowledge is power*". With increased knowledge of fire protection comes increased confidence in one's ability to prevent fires and attack them effectively.

Effective fire fighting involves pre-planning, fire assessment, fire control, and fire extinguishment, as described below.

Pre-Planning

Pre-planning is an effective tool to be used as much as possible. It allows the emergency responders to have the required knowledge to devise a plan of action for general hazards. Pre-planning also brings to light any unusual concerns that would take non-routine action to control, as well as further equipment and/or training needs for emergency personnel.

Fire Assessment

Assessing the emergency allows decisions that affect placement of equipment or manpower to be made safely and with full utilization prior to commitment. Table 6-1 on page 3 provides information on fire classification and extinguishing agents that should be used.

Fire Control

Preventing the fire from spreading often determines the success of extinguishing efforts. Prevention of fire spread includes protection of tanks, other structures, and pipelines that are affected either by direct flame impingement or by radiant heat. The following measures should be considered for prevention of fire spread:

- Proper placement of cooling streams using adequate water coverage with minimum water waste

- Maintaining adequate drainage of the fire area to ensure against floating, blazing oil into unfired areas. This may also provide a means of fuel removal and consequent product salvage.
- Construction of temporary drains, ditches, and dikes especially when a boil-over becomes imminent.
- Blanketing unfired pools of oil in fire-exposed areas with foam

Fire Extinguishment

Successful fire extinguishment results from the systematic application of planned procedures. There are three main steps to extinguishing a fire:

Eliminate Fuel Supply

This is accomplished by operational procedures such as depressurizing a system, blowing down a complete section, pumping out tanks, closing pipeline blocks, rerouting flow, etc. Eliminating the fuel supply is a certain method to extinguish a fire since a fire cannot exist without fuel. This is most effective on process unit fires.

The extinguishment of a fire without eliminating the fuel supply may allow a vapor cloud to form and drift until another source of ignition is found.

Eliminate Heat

Heat causes oil to vaporize, which then becomes fuel for the fire. Water is the most effective agent for eliminating heat. The finer the water spray, the greater the surface of the water that is presented for heat absorption.

Water applied in the form of spray or fog to the flame area reduces radiant heat, which produces additional oil vapor. It cools involved structures and equipment below the ignition point of oil vapors.

Prevent Air from Combining with Fuel

In most cases, this is a difficult procedure and must be accomplished by diluting the air with inert gas to reduce the oxygen content or by blanketing the fuel supply with a gas-tight barrier. Carbon dioxide and dry powder chemicals or wet steam are effective only if the entire fire area can be covered to smother the fire. Steam introduced into a system from which fuel is flowing also has a smothering effect.

Foam provides a barrier between fuel and air only if an unbroken blanket of foam is built up.

Table 6-1 identifies the three fire classes and groups them according to the fuel involved. It also provides extinguishing agents for each class.

Table 6-1
FIRE CLASSIFICATION AND EXTINGUISHING AGENTS

FIRE CLASS		FIRE TYPE	EXTINGUISHING AGENTS/ACTIONS
A		Solid combustible materials (wood, paper, fabric, etc.)	• Quench with water
B	B-2	Two-dimensional fires or single plane fires (spills) of flammable liquids and vapors such as petroleum products	• Starve • Smother • Quench • Use water, fog, or foam on large fires
	B-3	Three-dimensional fires (complicated by pressure, falling stream, or free vapor), of flammable liquids and vapors such as petroleum products	• Starve • Use Hydro Chem technology (a water, foam, and dry chemical powder mixture)
C		Electrical circuits and equipment	• De-energize circuits and equipment. • Use a non-conducting extinguishing agent (Halon and carbon dioxide are preferred, but dry powder may also be used) • Smother and quench only after the circuit has been de-energized. • Do not use water or foam on live circuits.

Foams for Vapor Suppression

Firefighting foam is a common means of controlling the release of vapors from spills of hazardous materials. Foam is applied to unignited spills of flammable or

combustible liquids to prevent ignition. In this application, ignition is prevented by suppressing the rate of vapor release from the liquid, thereby preventing the accumulation of sufficient vapor to form a flammable mixture.

Firefighting foams are used on spills of materials that present hazards other than flammability. Aqueous foams are used to mitigate the emission of vapors from spills of hazardous materials. Conventional firefighting foams are used on most chemicals that exist as liquids at room temperatures. Special foams are required for hazardous materials which are highly acidic or highly alkaline, or which have boiling points below 20°C. Some hazardous materials, which are highly water-reactive, cannot be successful blanketed with aqueous foam of any type.

6.2 Specific Procedures

This section provides procedures specific to fighting fires on tanks and process units. Tank fires may be fully involved fires, rim or seal fires on floating-roof tanks, fires on the top or bottom of a sphere, tank truck fires, railroad tank car fires, or fires on barges or tankers. Process unit fires include electrical machinery fires, pump and compressor fires, trench and pit fires, furnace header and split tube fires, sewer fires, and spill fires on tower structures or on ground levels. Specific procedures are provided below for each type of tank and process fire.

Tank Fires

Use the following general guidelines for handling tank fires. Procedures for specific types of tank fires are provided under their respective sections.

1. Extinguish fires surrounding the tank before attempting to extinguish fire within the tank.
2. Conduct all necessary work within the firewall area during the early part of the fire so that as the fire progresses, extinguishment procedures can be carried on from a safer distance.
3. Fight fire from upwind, as it will be difficult to extinguish a fire on one tank that is being heated by an up-wind fire.
1. Cool tanks that are exposed to the heat of an adjacent fire by means of water curtains applied to the roof and shell to prevent excessive vaporization and lessen the danger of fire spread.

CAUTION:

All crude oils, fuel oil, and asphalt when burning, develop a "heat wave" that travels downward at a rate of from 15 to 50 inches per hour. Temperature of the oil in this heat wave may reach 500° to 600°F. When this heat wave reaches the bottom water or if sufficient water is entrained in the bottom oil, a violent boilover may result. Burning oil first erupts and then falls, spreading beyond the firewalls of the tank. The column of flame will be 300 to 400 feet in diameter at the base, spreading wider as it rises 1,000 feet or more. The beginning of a boilover is indicated usually by both an increase in height and in brightness of the flames immediately prior to the actual eruption of boiling oil. A boilover is a violent eruption, whereas, a slop-over results from expansion or frothing of the heated liquid.

5. Test the tank shell with a water stream to determine the downward progress of the heat wave.

6. If extinguishment has failed by the time the heat wave has reached a point 5 feet above a known bottom water level, evacuate all personnel immediately from the area.

CAUTION:

Successive boilovers often occur in burning tanks.

7. Be on guard against successive boilovers from a burning tank.

Fully Involved Tank Fires

Fully involved tank fires occur when the tank structure and its entire surface becomes fully involved in fire. This can occur with any type of tank design. A cone roof tank may have its roof completely displaced, which makes application of foam/water streams easy to achieve. However, when fighting fires, special problems may arise that must be overcome, such as:

- A roof may be partly displaced or the roof/shell seam may be split, making foam application difficult
- A floating roof may sink partially, trapping burning oil under and behind it making foam rundown to the entire surface area difficult

The fire fighting team must adapt to these situations and adjust their tactics accordingly. When responding to a fully involved, large diameter tank fire, perform the following:

1. Establish a defensive posture upon arriving at the scene until an adequate supply of water, pumping capacity, foam concentrate, large volume nozzles, supply hose, and manpower has arrived.
2. Identify and procure the necessary resources to initiate fire-fighting activities.

NOTE: Each tank, depending on diameter, has a minimum application rate of foam/water solution needed to extinguish the fire. To begin fire fighting activities with less than the minimum application rate would be a waste of time and resources.

3. Determine diameter and surface area of tank.
4. Use the table below to determine minimum application rate. These are minimum rates based on 65 minutes to achieve extinguishment. If at all

possible, use greater rates to "overwhelm" the fire and accomplish quicker extinguishment.

TANK DIAMETER (ft.)	APPLICATION RATE (gpm/ft^2)
< 150	0.16
151 – 200	0.18
201 – 250	0.20
250 – 259	0.22
> 300	0.25

5. Extinguish any ground fires.
6. Protect surrounding tanks and equipment from radiant heat exposures using water sprays and water curtains.
7. Begin fire-fighting activities upon arrival of all fire fighting equipment and personnel.
8. The incident command must ensure that adequate manpower is onsite, and crews are rotated routinely to assure proper rest for the firefighters.

Rim or Seal Fire

Rim or seal fires usually occur on open top floating-roof tanks, where a portion or all of the seal area between the tank roof and the tank shell is burning.

When responding to a rim or seal fire, perform the following:

CAUTION:

Excessive water and foam on tank roofs can sink the roof and cause additional complications.

1. Check roof drain before applying water and foam to tank roofs.
2. Fight rim fires with foam set to the correct percent and applied to the inside of the foam dam.

CAUTION:

6. If extinguishment has failed by the time the heat wave has reached a point 5 feet above a known bottom water level, evacuate all personnel immediately from the area.

> **CAUTION:**
>
> Successive boilovers often occur in burning tanks.

7. Be on guard against successive boilovers from a burning tank.

Fully Involved Tank Fires

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2. Identify and procure the necessary resources to initiate fire-fighting activities.

> **NOTE:** Each tank, depending on diameter, has a minimum application rate of foam/water solution needed to extinguish the fire. To begin fire fighting activities with less than the minimum application rate would be a waste of time and resources.

3. Determine diameter and surface area of tank.
4. Use the table below to determine minimum application rate. These are minimum rates based on 65 minutes to achieve extinguishment. If at all

possible, use greater rates to "overwhelm" the fire and accomplish quicker extinguishment.

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201 – 250	0.20
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5. Extinguish any ground fires.
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8. The incident command must ensure that adequate manpower is onsite, and crews are rotated routinely to assure proper rest for the firefighters.

Rim or Seal Fire

Rim or seal fires usually occur on open top floating-roof tanks, where a portion or all of the seal area between the tank roof and the tank shell is burning.

When responding to a rim or seal fire, perform the following:

CAUTION:

Excessive water and foam on tank roofs can sink the roof and cause additional complications.

1. Check roof drain before applying water and foam to tank roofs.
2. Fight rim fires with foam set to the correct percent and applied to the inside of the foam dam.

CAUTION:

Blistering of paint on the tank shell can indicate excessive heat and the need for cooling water.

3. If paint blistering occurs or the tank shell is becoming hot, apply cooling water to the outside of the shell.
4. Avoid directing heavy streams of water into the flammable material at the roof edge as this may splash the burning product onto the roof and increase the fire.
5. If the roof becomes submerged in burning oil, apply foam by means of portable foam nozzles.

Sphere Top Fire

Fires associated with spheres should be extinguished by fuel elimination only. When responding to a fire located at the top of a sphere, the following procedures should be followed.

1. Stop movement of product to the sphere.
2. Open cooling water spray to the top valve assembly and to the top of the sphere so the run-off will cover the shell.
3. Apply cooling streams to adjacent threatened equipment.
4. Pump out the sphere contents to unaffected storage at a rate that will not pull a vacuum within the sphere.
5. Refill the sphere with water to float all remaining flammable material to the point of leakage when product pump-out has reached the limit as determined by available storage space, pump operations, etc.
6. Exercise caution to avoid forcing flammable liquid under pressure through the leak.
7. If sufficient space exists above the leak, water can be employed to float the flammable liquid above the leak.

NOTE: Performing this procedure properly allows the flames to be extinguished when water covers the leak.

8. Continue pumping until water appears in the flare liquid drum indicating that the flammable material has been eliminated.

9. Continue cooling streams after flame is extinguished until all danger of reignition from hot steel has been eliminated.

Sphere Bottom Fire

Fires associated with spheres should be extinguished by fuel elimination only. When responding to a fire located at the bottom of a sphere, perform the following:

1. Stop movement of product to or from the sphere.
2. Open cooling water sprays to the sphere so run-off will cover the shell.
3. Apply cooling water streams to the supporting structure and to the bottom piping assembly.
4. Apply cooling streams to adjacent threatened equipment.
5. Pump water to the sphere to float the flammable material above the leak. This will extinguish the flames if the water-pumping rate exceeds the rate of leakage.

CAUTION:

If a flare is flooded with hydrocarbon liquid, there could be a carryover from the flare system resulting in the possibility of ground or equipment fires.

6. Avoid flooding the flare with hydrocarbon when pumping water into sphere.
7. Gas free the sphere according to normal operational plans.
8. Water spray can be used to disperse vapors.
9. Continue cooling streams after flame is extinguished until all danger of reignition from hot steel has been eliminated.

Tank Truck Fires

The greatest concern of tank truck fires is the cargo. Tank truck fires with light ends cargo (ethylene, propylene, etc.) should only be extinguished by eliminating the fuel source. When responding to a tank truck fire with light ends cargo, perform the following:

1. Stop all pumping operations.
2. Close block valves in lines to tanks.

3. Apply cooling water spray to blanket the truck tanks completely.
4. Protect adjacent equipment with cooling water streams.
5. Shut off the supply of fuel to extinguish the flames, if control valves on the tank truck are operable.
6. If this is not practical, permit light ends to burn out under controlled conditions.
7. Extinguish liquids fire with dry powder or foam.
8. Continue cooling streams after flame is extinguished until all danger of reignition from hot steel has been eliminated.

Railroad Tank Car Fires

Products Other than LPG. When responding to a railroad tank car fire with products other than LPG, the following procedures should be followed.

1. Stop all loading and unloading operations at the racks.
2. Remove the spouts and close the domes of all unaffected cars.
3. Apply cooling water spray from hose lines to the tank of the burning car and adjacent cars.

CAUTION:

Directing water streams into the dome of the burning car could increase the intensity of the fire by:

- Splashing flammable material
- Floating flammable material out of the tank
- Causing the liquid to froth and slop or boil over.

4. Avoid directing water streams into the dome of the burning car.
5. Remove unaffected tank cars from the fire area, if possible.
6. Use dry powder or water to extinguish the fire.

LPG. Railroad tank fires with LPG products should be extinguished by fuel elimination only. When responding to a railroad tank car fire with LPG products (such as propylene, butadiene, etc.), perform the following:

1. Stop all loading and unloading operations at unaffected spots.

2. Close the valve in the loading and unloading lines of all unaffected cars.
3. Apply cooling water spray from hose lines to the burning car and adjacent cars.
4. Remove unaffected tank cars from the fire area, if possible.
5. Work under high pressure fog protection when attempting to close valves on burning railroad car containing LPG products.
6. If controls on the car are operable, close valves to stop the flow of vapor.

Barge and Tanker Fires

Perform the following when dealing with cargo fires on barges and tankers:

1. Stop all transfer of products.
2. Apply cooling water streams to deck and sides of vessel.
3. Work under high pressure water fog protection when attempting to close cover plates.
4. Extinguish fires at hatches by closing cover plates.
5. Extinguish fires at vents or manifolds with high pressure water-fog or dry powder extinguisher.
6. If tank seams have been opened by explosion, apply foam through the opening.
7. Protect dock facilities with the installed water spray system, the fire monitor system, and additional hose streams, if necessary.

Process Unit Fires

Process unit fires are extinguished principally by fuel removal. This is accomplished by using operational changes to reduce pressure, introducing steam to systems, and blowing down sections or the entire unit involved. Procedures specific to several types of fires that can occur in a process unit are provided in this section.

The following steps provide general procedures for handling process unit fires. The area and intensity of a fire will indicate the proper method of extinguishment.

1. Use dry powder chemical or steam to combat small fires.

CAUTION:

The use of water may cause flanges and joints to leak, thereby adding to the fire. Adjusting the water stream to spray will lessen this danger.

2. Use water in the form of spray since it is most effective on large area or intense fires that threaten damage to supporting structures and adjacent equipment.
3. Use foam only where it can blanket the burning fuel.

Electrical Machinery Fires

1. Do not use water or foam on electrical fires.
2. Operators: If possible, switch to spare machine.
3. If this is not possible, adjust or discontinue operations until equipment is operable.
4. De-energize the circuit, if possible.
5. Apply Halon, carbon dioxide, or dry powder to extinguish the fire.

Pump and Compressor Fires

1. Operators: If possible, switch to spare machine.
2. If this is not possible, adjust operations to take the affected machine out of service and isolate it.
3. If possible, drain or depressurize the lines from a remote location.
4. Apply steam or dry powder from portable extinguisher to the leak.
5. If portable extinguishers are inadequate:
   - 5.1 Blanket the fire area with water spray from hose lines and fog nozzles.
   - 5.2 Direct jets of high pressure water spray into the source of fuel until the operators have succeeded in stopping the flow of fuel.
6. Apply foam to trenches in which burning oil may accumulate, beginning at and covering the sewer drain to prevent fire entering the sewers.
7. Avoid working above sewer drains or near fire traps.
8. Maintain adequate draining of fire area.

Trench and Pit Fires

1. Locate and stop the source of leakage into the trench or pit.
2. Apply dry powder to the fire area.
3. If this is not successful, apply foam, covering the sewer drain first, if possible.
4. Apply high pressure water spray to prevent damage to adjacent equipment.
5. Avoid overflowing trenches or pits with water as this may cause spread of the fire.
6. Avoid working above drain or near fire traps.

Furnace Header

A header box fire is sometimes the result of abrupt change in process temperature. Use the following steps to respond to a furnace header fire.

1. Put steam in header box.
2. Make adjustments to return to normal temperatures.
3. If these changes do not stop the leakage and fire, follow the steps below for split furnace tube.

Split Furnace Tube

1. Take the furnace out of service either by bypassing the furnace or shutting down the unit.
2. Depressurize the furnace rapidly so that steam can be cut into the tubes to extinguish the fire.
3. Protect structural steel members that are in the flame by applying water spray from hose lines and fog nozzles.
4. Do not use foam or dry powder in the firebox as they are ineffective on this type of fire and will result only in waste.

Sewer Fires

CAUTION:

In most cases, a sewer fire occurs following a sewer explosion.

1. If there is a sewer fire and no explosion has occurred:

1.1 Be prepared for an explosion while fighting the fire.

1.2 Ensure no one is standing is working on or near the sewer outlets.

2. If a sewer explosion occurs, direct steam or water fog at sewer outlets in all gaseous areas.
3. Apply foam at each manhole from which flame is emerging.
4. Direct water streams into involved trenches to maintain flow toward the fire area. If there is oil on the water in the trenches, use foam.

Spill Fires - Tower Structures

1. Immediately determine the source of leakage or spill. Stop it, if possible.
2. If it is a continuous leak that cannot be stopped, remove the involved equipment from service, depressurize, and steam, if necessary.
3. Protect surrounding structures with water spray from hose lines equipped with fog nozzles maintaining the water flow until the operators control the flow of fuel.
4. Blanket small fires with steam or dry powder.
5. Avoid scattering burning material when applying steam or dry powder.
6. Blanket large fire areas with water spray from monitors or hose lines equipped with fog nozzles to protect supporting structures.
7. Maintain water flow until the operators control the flow of fuel.
8. If quantities of oil are flushed to lower levels and continued to burn in pools, apply foam.
9. Maintain adequate drainage of the fire area.
10. Avoid working above sewer drains or near firetraps.

Spill Fires - Ground Level

1. Immediately determine the source of leakage or spill. Stop it, if possible.
2. If it is a continuous leak that cannot be stopped, remove the involved equipment from service, depressurize, and steam, if necessary.
3. Protect surrounding structures with water from the hose lines equipped with fog nozzles maintaining the water flow until the operators control the flow of fuel.
4. Blanket small fire areas with dry powder.

5. Avoid scattering burning material when applying dry powder.
6. In case of a large spill, direct high pressure water fog into the source of leakage.
7. Apply foam to extinguish fires in oil pools or trenches.
8. Maintain adequate drainage of the fire area.
9. Avoid working above sewer drains or near firetraps.

Laboratory Fires

This type of fire requires different combating procedures because of glassware and special types of apparatus and equipment involved. Laboratory supplies include many chemicals that may emit toxic vapors when exposed to fire.

1. Do not enter a smoke-filled area without respiratory protection. Use self-contained breathing apparatus.
2. Use Halon or carbon dioxide portable extinguishers on small fires.
3. Use wheeled units or 17# Halon units for combating fires larger than the bench top size.
4. In case of large spills of flammable material, whether ignited or not, evacuate personnel from the building and cut off the fuel, air, gas, and electrical service to the building.
5. Cut off any other outside sources of fuel.
6. Use water fog or water spray only on fires that threaten to damage the building structure.

6.3 Equipment/Resources

The Refinery is equipped with an extensive inventory of fire fighting equipment and resources described in greater detail below, including the Refinery fire water system, various pieces of mobile equipment, and fixed foam systems:

Fire Water Systems

This section describes the Refinery Fire Water System as well as the system at Anchorage Tank Farm. Maryland Tank Farm has been demolished with the exception of five tanks. The tanks have been cleaned of product and no fire-fighting equipment is needed.

Refinery Fire water System

The Refinery Fire Water System is composed of a cast iron, plastic and steel pipe network. Fire hydrants and sprinkler systems connected to this system are located throughout the refinery. River water for the fire system is supplied from the Low Pressure River Water System (LPRW) controlled and operated by EULA. This system pumps water from the Mississippi River and holds approximately 35 pounds per square inch (psi) of pressure. Six fire water pumps take suction from LPRW and, together with P-12 that takes suction from WCLA final effluent, boost the pressure to 90-125 psi of pressure and discharge into the fire water system. Table 6-2 describes the fire water pumps.

The Refinery and Chemical Plant fire water systems are connected by two 10-inch fire water lines. These lines are normally blocked but can be opened to supply fire water from either plant to the other when needed. The Refinery fire water system can also be connected to Formosa chemicals and Albemarle Corporation if needed during an emergency.

Clarified river water (CRW) is available to use as fire water during Refinery emergencies or other special circumstances. For example, in an emergency where the Refinery loses electricity, the clarified river water system can supply water to the fire water system. At the River Water Clarification Plant (RWCP), P-6002 diesel-driven water pump can supply clarified water to the fire water system. P-5 and P-8 fire water pumps are equipped with clarified river water lines connected to the suction of P-6002. Switching suction valves from LPRW to CRW allows P-5 and P-8 to take suction directly from the CRW system. The other pumps listed in the table below can also be connected to P-6002.

Table 6-2

FIRE WATER PUMPS

PUMP	GPM	HP	TYPE	LOCATION	OPERATION
P-4	3,000	350	T	Ave. K & 10th St.	• Can be started and stopped by EULA controller through TDC-3000 either at EULA or at OSCC • On pressure control; automatically starts when Refinery fire water pressure drops below 100 psi.

P-5	4,000	480	D	Ave. S & 10th St. (east of PHLA-2)	• Can be started by EULA controller through TDC-3000 either at EULA or at OSCC. • Can only be shut down manually at the pump • Has pressure letdown set at 125 psi to relieve excess pressure on the fire water system
P-7*	3,000	450	T	Dock (Sprinkler)	• Remote start/stop from Dock Office • Can discharge into the fire water system or supply water to the Dock sprinkler system
P-8	3,000	300	M	Ave. N & 15th St.	• Can be started and stopped by the EULA controller through TDC-3000 at EULA or at OSCC • Has pressure letdown set at 125 psi to relieve excess pressure on the fire water system
P-9	3,500	460	D	Ave. M & 5th St. (east of Alky)	• Can be started by EULA controller through TDC-3000 either at EULA or at OSCC. • Can only be shut down manually at the pump • Has pressure letdown set at 125 psi to relieve excess pressure on the fire water system
P-10	3,000	350	T	17th St. (south of Cokers)	• Can be started and stopped by the EULA controller through TDC 3000 at EULA or at OSCC
P-11	3,000	300	M	Ave. H & 13th St. (NE of 7-PSLA)	• Can be started and stopped by the EULA controller through TDC-3000 at EULA or at OSCC • Has pressure letdown set to operate at 125 psi that relieves excess pressure on the fire water system
P-12	5,000	600	M	EULA	• Can be started and stopped by the EULA controller through TDC-3000 at EULA or at OSCC

* P-7 is owned and operated by Docks.

PUMP	GPM	HP	TYPE	LOCATION	OPERATION
P-6002	16,000		D	RWCP	• During a total power failure, pumps water from 601 and 602 Tanks (total capacity 80,000 bbls) into fire water system at 140 psi. • Clarified water can be cut into Fire Water System at 7 tie-ins listed below; block valves must be operated manually. 1. Utility Road and South Dock Road 2. 16th Street and Avenue U

					3. To suction of P-5 4. 10th Street and Avenue O 5. 16th Street and Avenue N 6. 16th Street and Avenue J 7. 10th Street and Avenue J

Anchorage Tank Farm (ATF) Fire Water System

The Fire Water System at ATF is described in the table below.

Table 6-3
ANCHORAGE TANK FARM FIRE WATER SYSTEM

NAME	DESCRIPTION	CAPACITY	COMMENTS
Tank 1544	Fire Water Tank	Combined capacity of 1521 and 1544 Tanks is 70,000 bbls	Primary source of fire water at ATF

NAME	DESCRIPTION	CAPACITY	COMMENTS
		At 3,000-4,000 gpm rate, combined capacity will last approximately 16 hrs.	Located in the SW portion of ATF Filled with well water from P-10 or P-9 (backup)
Tank 1521	Fire Water Tank	Combined capacity of 1521 and 1544 Tanks is 70,000 bbls At 3,000-4,000 gpm rate, combined capacity will last approximately 16 hrs	Secondary source of fire water at ATF Located in the NE portion of ATF Filled from 1544 Tank with pump P-11
P-9	Well Pump		Backup for filling 1544 Tank
P-10	Well Pump		Fills 1544 Tank with well water
P-11	Pump	Vertical multi-stage centrifugal electric motor-driven pump Pump rate is 1500 gpm	Primary fire water pump Located on south side of 1544 Tank Supplies water from 1544 Tank to the fire water closed loop system in the tank field Pumps water from 1544 Tank into 1521 Tank
P-22	Pump	Horizontal diesel-driven centrifugal pump Pump rate is 2500 gpm	Located on north side of 1521 Tank

NOTES:

- A manifold is provided north of 1521 Tank for the use of a pumper truck. The pumper truck can take suction from 1521 Tank and discharge back into the ATF Fire water System.
- Emergency makeup fire water can be pumped from the Refinery to ATF via the No. 4 crude system by installing a water connection at the Anchorage manifold at North Dock Road and Batture Road. The No. 4 crude line would first be displaced into a storage tank west of 1521 Tank. An 8" spool at 1521 Tank manifold could then be turned and 1521 Tank backfilled with water from the Refinery.
- Additional fire water supply is available via a tie-in to the fire water systems at PAL, ACT, and the Enterprise facility.

Mobile Equipment

Mobile Equipment includes pumper trucks, foam tankers, water tankers, a rescue truck, an ambulance, and a fireboat as described below. All units use 3M-AFFF-ATC Light Water Foam.

Pumpers

All the fire trucks described below are equipped with a stock of nozzles, tools, hoses, safety equipment, and miscellaneous fittings and supplies.

#54 Fire Truck. The #54 truck is an E One 1994 model, 450 HP Turbo Automatic, 3000-gpm from draft, 1000-gallon foam concentrate, single-stage 8FG water pump, equipped with:

- Three 5" storz discharges
- Six 2½" NPSH threads
- Two preconnected 1½" hoses in cross lays
- Hot shot foam system that serves all discharges
- Dry chemical through turret

#36 and #53 Fire Trucks. The #36 and #53 trucks are 1988 Chubb National Foam pumpers, Detroit turbo-charged diesel with automatic transmission. Pump capacity from draft is 2,000 gpm. Both trucks are equipped with a servo-command foam proportioning system. Foam capacity is 1,000 gallons of concentrate.

#47 Ladder Truck. The #47 Truck is a 1982 E One Detroit turbo-charged assisted diesel with automatic transmission. Total pump capacity from draft is 2,000 gpm. The truck has a hydraulic pump that runs off the transmission to run the outriggers and for the boom (ladder) operation. A balanced foam pressure proportioning system is powered by a PTO (power take off) from the transmission to provide foam mixture. The truck holds approximately 900 gallons of foam concentrate in a stainless steel tank of which approximately 850 gallons is usable under normal operation. The boom (ladder) on this truck can reach a height of 110 feet above ground level and swivel 360 degrees. An anti-electrocution platform is provided on the operator's side of the truck. This truck is approximately 39' 3" long, 10' 8" high, and 9' 6" wide.

#76 Fire Truck. The #76 Truck is a 1978 Ford diesel with automatic transmission. It has a 1,500-gpm Hale water pump and a National foam-balanced pressure proportioning system with a 1,000-gallon foam concentrate tank.

Foam Tankers - #45 and #75 Tank Trucks

The #45 and #75 Tank Trucks are 1979/1980 GMC diesel with automatic transmission and hold 3,000 gallons of foam concentrate. They are located at the Central Fire Station. All fittings required to transfer foam are on the truck.

Water Tanker - # 63 Truck

The #63 Truck is a 1990 GMC 2½ ton truck capable of towing "Big Red" 6,000-gpm diesel pump. The truck has a 300 gpm pump with a 600-gallon water tank and a 25-gallon foam tank. The truck is equipped with a preconnect 1½ inch hand line 200 feet long that can be used for water or foam delivery. The truck is also equipped with a 6,000-gpm nozzle mounted on the deck. This nozzle would be supplied from the "Big Red" diesel pump or foam pumpers and would be used mainly in tank fire fighting.

The #63 is the only truck that is equipped with a water tank, therefore it is the first response to any vehicle fire call where water supply may be limited, such as in parking areas, as well as for grass fire calls where having a mobile fire truck is desirable.

Rescue Truck

The Refinery maintains a specialized rescue truck for use by the Volunteer Rescue Squad. The rescue truck is a 1999 International and is housed in the Fire Station. The rescue truck has the equipment necessary to perform all possible high angle, heavy rescues that might be encountered.

Ambulance

The Plant ambulance is a 1996 Freightliner. It is driven by the Security Traffic Officer and maintained by the Fire Station. The ambulance is capable of transporting three stretcher cases. It is housed behind the Medical Department in the Refinery. Some of the major components are:

- Oxygen Resuscitator
- Rolling Litter
- Spine Board
- First Aid Kit
- Leg Splints
- Oxygen Bank
- Automatic External Defibrillator (AED)

The ambulance operability is checked daily by Emergency Medical Response Team representatives and the results are recorded with all concerns promptly

addressed. The Emergency Medical Response Team is responsible for maintaining the medical supplies on the ambulance and checking supplies after each run.

Fire Boat: SeaRiver BAYOU STATE

The SeaRiver BAYOU STATE is assigned to Baton Rouge as part of ExxonMobil Shipping Company's Gulf Coast Branch inland waterways fleet. It is used as a ship berthing tug and in primary fire response for the ExxonMobil Docks. The BAYOU STATE is available for other harbor emergencies through the Mutual Aid organization.

The SeaRiver BAYOU STATE is the only fully equipped fireboat in the Baton Rouge area. Its fire fighting system includes a combination water and foam system with a 1,500 gallon-per-minute pump, a 2,000-gallon foam concentrate storage tank with one fixed variable and two portable variable stream fire monitors. The fixed nozzle is capable of a 250-foot reach when used alone.

The 2,000 gallons of foam concentrate last 50 minutes at a 1,500-gpm application rate at 3 percent foam solution. Resupply of foam concentrate is done with the nurse trucks (3,000 gallons each) and 305-gallon totes or 55-gallon drums. ExxonMobil has a contract with Williams Fire and Hazard Control that allows immediate delivery of foam if needed.

The SeaRiver BAYOU STATE may be called to assist in an emergency by USCG, Port Authority, State Police, Mutual Aid, or vessels in distress via Marine radio channels. Normally, calls for assistance would come in through the Mutual Aid System to the Refinery OEC.

The BAYOU STATE Captain notifies the Port Captain of all calls and coordinates all emergency activities with the Refinery Superintendent. If the emergency is a Mutual Aid or ExxonMobil Dock fire situation, the Refinery Superintendent requests that OEC call the 801 or 811 volunteer fire fighters to assist the BAYOU STATE crew in the fire fighting effort.

The Refinery Superintendent makes the decision to hold departure until the volunteers have boarded or to have them brought aboard via a launch.

In a fire situation at the ExxonMobil Docks, the Refinery Superintendent is the overall coordinator in consultation with the affected ship's Captain or First Mate aboard. The BAYOU STATE Captain, crew, and volunteers follow fire fighting

directions via emergency frequency radio, with the BAYOU STATE Captain making decisions on safety of the vessel and crew.

Deluge Systems

Several areas in the Refinery are equipped with deluge systems for fire suppression. These include:

- Water deluge systems in areas such as loading racks, docks and storage areas. EMPR barrel storage area deluge system can be operated as water only or water and foam.
- Foam deluge systems (KDLA)

Fixed Foam Systems

Anchorage Tank Farm (ATF)

ATF large diameter crude tanks 1501, 1502, 1503, 1504, 1505, 1506, and 1525 are all external floating roof tanks. 1501, 1502, 1503, 1504, 1505 and 1506 tanks range between 240 - 290 feet in diameter. 1525 tank is 166 feet in diameter. These tanks are equipped with fixed foam systems to be used in the event of a seal fire. Each system consists of a 400-gallon foam bladder drum that supplies foam/water solution into a sprinkler system for each tank. The system uses freeze-protected foam.

The seal area of each tank is equipped with a foam dam that holds the foam over the seal area. Each drum has connections for our mobile fire equipment, enabling us to take suction and discharge foam from our pumpers into the sprinkler system in the event we deplete the 400-gallon supply in the fixed system. 1501, 1504, and 1505 tanks have separate foam drums for each tank. 1502 and 1503 tanks share a drum, as do 1506 and 1525 tanks. These systems are manual systems requiring ATF operators or fire squad members to manually open two valves.

Docks

The Docks Fixed Foam System provides a 15-minute supply of freeze-protected foam to the Docks System which includes elevated monitors in each berth along with the foam piping originating with the foam truck manifold located on South Dock Road just south of Plantation Pipeline Company Control Room and terminating at Nos. 1 through 5 berths. Another foam truck manifold is located south of the south clarifier at WCLA which supplies foam to the Docks via No. 1

berth. Each berth mentioned has two (2) risers off the main foam line, and elevated monitors to cover the ship's manifold at any river stage.

A foam truck is connected to a fire water supply and discharges foam into the foam manifold via 2½" hose connections.

Fire hoses are connected to the foam line risers in Nos. 1, 2, 3, 4, or 5 berths for the application of foam.

Pre-connected 55-gallon foam drums are stationed along the Dock Approach Road, at Shore Station adjacent to the Plantation Pipeline office, and at the Knoxfield Analyzer House.

KDLA

KDLA Unit foam system consists of four systems. The Second Floor Filter Room Foam Lines consist of foam piping originating at ground level south of KDLA battery limits, on the east side of the Satellite Building, east of the corner of 16th street and Avenue N, and terminating in the filter room on the 2nd floor. The D-800 system consists of piping which can deliver foam or fire water to the following areas, numbered from west to east:

1. P-500's, P-401's, P-426's, P-7, P-207, P-402's
2. P-501A/B
3. G-12, G-17, P-202's, West End
4. G-112, G-113
5. Filters #7 though #14
6. Filters #1 through #6

Two additional systems are:

- Portable Foam Eductor Nozzles consisting of three 55-gallon drums attached to fire monitors
- 60-gallon Foam Generator consisting of four fixed 60-gallon integrated foam systems with nozzles

Sales Station

The Baton Rouge Sales Station has a fixed foam system at its gasoline truck loading facilities on Scenic Highway. This fixed foam system consists of the following:

- Three electronic fire detectors on each of the five loading stations for a total of 15 sensors. When a detector is activated, foam is delivered to all stations via the foam piping.
- A 500-gallon foam storage tank, located in a building just north of loading stations. The foam storage tank is kept full of 3M-AFFF Light Water Foam concentrate.
- High pressure fire water supply
- Foam proportioner
- Foam piping from proportioner and storage tank to loading stations. Foam is applied via this piping to the ground level as well as overhead and is delivered to all stations when activated.
- Automatic valves which deliver fire water and foam-to-foam proportioner, and deliver foam to loading stations after receiving signal from electronic sensors.
- The Electronic Control Panel Board is located in the foam storage drum building. It receives signals from electronic sensors on loading stations, and delivers signals to automatic valves. This panel can be used to monitor or test foam system.

Foam Inventory and Outside Sources

Foam for all types of fires is stored onsite at the Refinery in the locations described in the table on the following page.

LOCATION	TANK CAPACITY (gallons)
Truck 54 (Pumper)	1,000
Truck 36 (Pumper)	1,000
Truck 53 (Pumper)	1,000
Truck 45 (Tanker)	3,000
Truck 47 (Ladder)	900
Foam Tanks at Fire Station	7,000
Truck 76 (Pumper)	1,000

Truck 75 (Tanker)	3,000
Stores	10,000

Williams Fire and Hazard Control has access to a much larger supply (minimum 10,000 gallons) of foam from Decatur, Alabama and Houston, Texas with a 5-6 hour delivery. In case of a major fire, foam is available from:

Williams Fire and Hazard Control: 24 hour numbers

(281) 999-0276
(409) 727-2347

Louisiana Emergency Resource Supply Network ("Hired Gun Gang")

The Louisiana Emergency Supply Network, also known as the "Hired Gun Gang", is a mutual aid group made up of representatives from south Louisiana area petrochemical companies. Each member company has agreed to send aid to other members in the event of a major incident.

In emergencies such as large diameter tank fires, where the need for extreme pumping rates, relay water supply, and large volumes of fire fighting foams are needed, additional pumps, hoses, foam, nozzles, and other equipment are available through this network. In the event of a large-scale incident in our complex, this network is activated to supplement supplies and equipment that may be limited.

Williams Fire and Hazard Control, a member company, is the administrator of the group. The Hired Gun Gang can be called 24 hours a day by using the numbers listed above for Williams Fire and Hazard Control.

Miscellaneous Equipment

Listed below are various other pieces of fire fighting equipment located at the Refinery Fire Station or the Fire Training Grounds.

- "Big Red" 6,000-gpm portable diesel pump (trailer-mounted)
- Ten portable monitors (trailer-mounted)
- Two exhaust fans (gas-powered)

- One chlorine repair kit ("B Kit") for emergency repairs to chlorine cylinders
- One breathing air trailer with 9 breathing air cylinders for refilling Scott Air Paks
- One CO_2 response trailer with six 75 pound CO_2 cylinders for electrical fires
- One dry chemical trailer with 1,300 pounds of Purple K powder
- One 6,000-gpm trailer-mounted "Top Gun" nozzle
- One 2,000-gpm trailer-transported "Hired Gun" nozzle
- Two skid-mounted dry powder units
- 1,000 pounds Purple K dry powder

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Boring Logs, Well Construction Diagrams and Report to Plug and Abandon Monitoring Wells

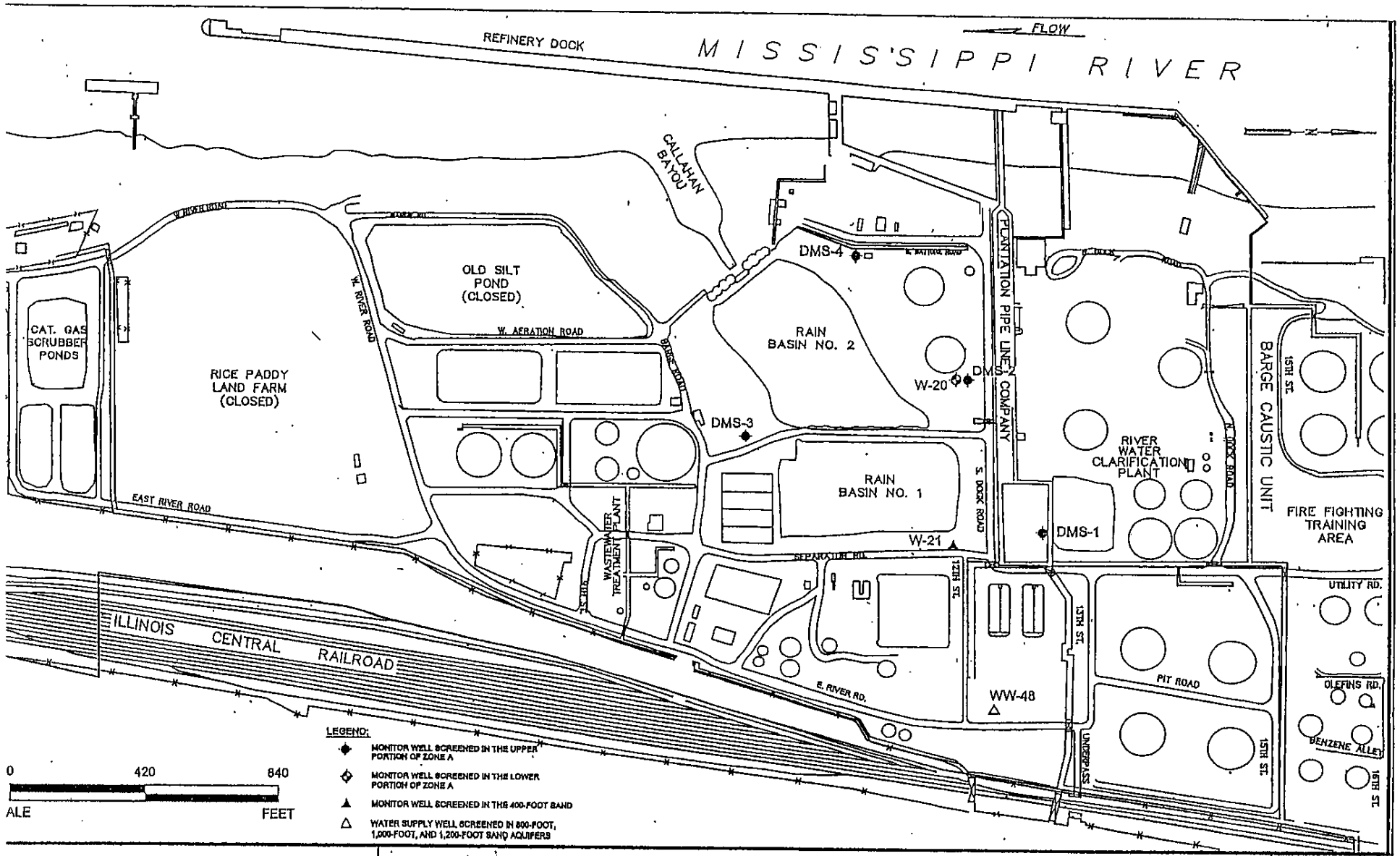
Appendix D

July 2005
Project No. 0028411

Environmental Resources Management
3029 South Sherwood Forest Boulevard, Suite 300
Baton Rouge, Louisiana 70816
(225) 292-3001

LEGEND

GW	WELL GRADED GRAVELS OR GRAVEL-SAND MI LITTLE OR NO FINES.
GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES.
GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.
SW	WELL GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
SM	SILTY SANDS, SAND-SILT MIXTURES.
SC	CLAYEY SANDS, SAND-CLAY MIXTURES.
SC-H	SAME AS ABOVE WITH HIGH LIQUID LIMIT.
ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY.
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.
OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY.
MH	INORGANIC SILTS MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.
PT	PEAT AND OTHER HIGHLY ORGANIC SOILS.
	SANDSTONE
	NO SAMPLE OR RECOVERY.



ERM-Southwest, Inc.

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

DESIGN: FDG	DRAWN: MMH	CHKD.: FDG
DATE: 02/06/03	SCALE: AS SHOWN	REV.:
JOB NO.: 014723A216 B03		

FIGURE 1-2
WELL LOCATION MAP

ExxonMobil Refining & Supply Company
Baton Rouge, Louisiana

ERM

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-1

PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP

DATE STARTED: 9-15-91 DATE COMPLETED: 9-19-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 25 FT. DEPTH 25 FT.

TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

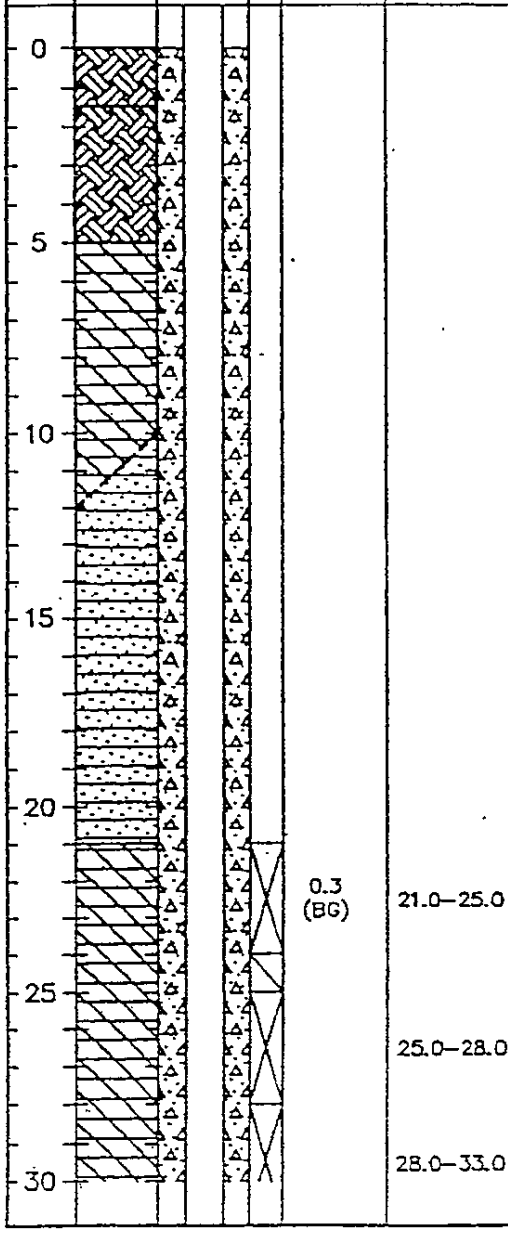
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.

CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 45 FT. SUMP LENGTH 2.5 FT.

BORING DIAMETER: 8.25 IN. BORING TD: 55 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY

DRILLING METHOD: MR-0-23 / HSA-23-55 LOG BY: B. BRAY / B.B. BROOM



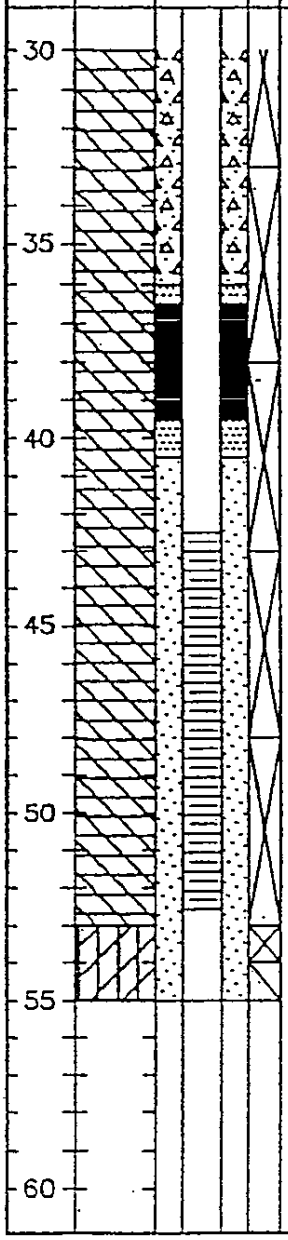
SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
	0.0–1.5	FILL: LIMESTONE GRAVEL, COMPACTED.
	1.5.0–5.0	FILL: RUBBLE (BRICK AND CONCRETE) WITH BROWN AND GRAY SILTY CLAY.
	5.0–10.0	SILTY CLAY: GRAY WITH SAND, BLACK PARTICLES AND ORGANICS, STRONG CHEMICAL ODOR. (LOG FROM CUTTINGS).
	10.0–21.0	GRADES TO. SILTY SAND: GRAY WITH BLACK STAINING, STRONG CHEMICAL ODOR. (LOG FROM CUTTINGS).
21.0–25.0 25.0–28.0 28.0–33.0	21.0–53.0	SILTY CLAY: YELLOW BROWN MOTTLED WITH LIGHT GRAY, FIRM, DENSE.

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-1
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP
DATE STARTED: 9-15-91 DATE COMPLETED: 9-19-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 25 FT. DEPTH 25 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 45 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 55 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-23 / HSA-23-55 LOG BY: B. BRAY / B.B. BROOM



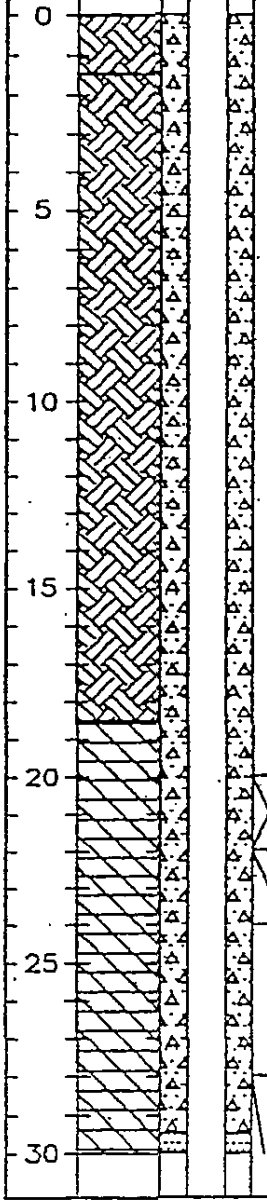
PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
	28.0–33.0		FRACTURE IN SILTY CLAY AT 32.0 FT.
	33.0–38.0		
	38.0–43.0		
	43.0–48.0		FRACTURE IN SILTY CLAY AT 42.5 FT.
	48.0–53.0		FRACTURE IN SILTY CLAY FROM 48–53 FT. ABUNDANT NODULES (CARBONATE) FROM 48–51 FT.
	53.0–55.0	53.0–55.0	CLAYEY SILT: LIGHT GRAY, SOME MOTTLING, WITH LIGHT YELLOW.
			BORING TERMINATED AT 55 FT. ON 9-19-91.

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-2
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP
DATE STARTED: 9-19-91 DATE COMPLETED: 9-21-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 21 FT. DEPTH 21 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 35.5 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 48 FT. STICKUP: 3.0 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-21 / HSA-21-48 LOG BY: B. BRAY / B.B. BROOM



DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
0						0-1.5	FILL: GRAVEL WITH LIGHT BROWN, SAND, SILT AND CLAY, COMPACTED.
5						1.5-18.5	FILL: GRAVEL, RUBBLE (BRICK, CONCRETE, TERRACOTTA PIPE) WITH BLACK STAINING AND STRONG CHEMICAL ODOR (LOG FROM CUTTINGS). LOST CIRCULATION IN FILL MATERIAL, STRONG CHEMICAL ODOR.
10							
15							
20				0.0	20.0-24.0		
25						18.5-38.0	SILTY CLAY: GRAY, FIRM, DENSE, NO CHEMICAL ODOR.
					28.0-33.0		(LOG FROM CUTTINGS).
30							

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-2

PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP

DATE STARTED: 9-19-91 DATE COMPLETED: 9-21-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 21 FT. DEPTH 21 FT.

TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.

CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 35.5 FT. SUMP LENGTH 2.5 FT.

BORING DIAMETER: 8.25 IN. BORING TD: 48 FT. STICKUP: 3.0 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY

DRILLING METHOD: MR-0-21 / HSA-21-48 LOG BY: B. BRAY / B.B. BROOM

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
30					28.0-33.0		
35					33.0-38.0		(LOG FROM CUTTINGS).
					38.0-40.0		
40					40.0-43.0	38.0-43.0	CLAYEY SILT/CLAYEY SAND: GRAY, SILT TO VERY FINE GRAINED SAND, SOFT.
45						43.0-48.0	SAND: GRAY, FINE TO MEDIUM GRAINED, WELL SORTED, SOME CLAY.
							BORING TERMINATED AT 48 FT. ON 9-21-91.
50							
55							
60							

ERM-SOUTHWEST, INC.

FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-3

PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP

DATE STARTED: 9-17-91 DATE COMPLETED: 9-20-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 36 FT. DEPTH 36 FT.

TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.

CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 45 FT. SUMP LENGTH 2.5 FT.

BORING DIAMETER: 8.25 IN. BORING TD: 63 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY

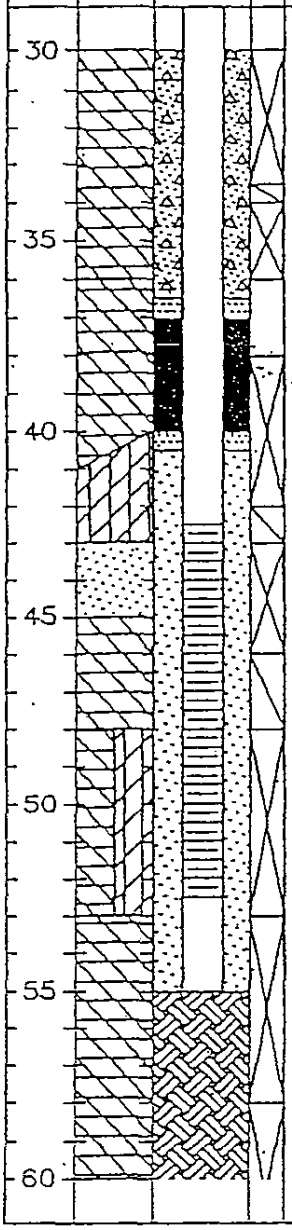
DRILLING METHOD: MR-0-36 / HSA-38-55 LOG BY: B. BRAY / B.B. BROOM

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
0						0-1.5	FILL: GRAVEL AND SAND, COMPACTED.
						1.5-3.5	CLAY: LIGHT BROWN AND GRAY WITH SHELLS, SOME BLACK STAINING, VERY STIFF.
5						3.5-19.0	SILTY CLAY/CLAYEY SILT: GRAY WITH WOOD FRAGMENTS, VERY STRONG CHEMICAL ODOR.
10							
15							
20						19.0-21.5	ORGANICS: LOGS AND ROOTS WITH SOME GRAY CLAY.
25						21.5-36.0	SILTY CLAY: GRAY, STIFF, STRONG CHEMICAL ODOR.
30							

WORK ORDER NO.: 14-83 BORING NO.: DMS-3
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP
DATE STARTED: 9-17-91 DATE COMPLETED: 9-20-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 36 FT. DEPTH 36 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 45 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 63 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-36 / HSA-36-55 LOG BY: B. BRAY / B.B. BROOM



SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
30.0-34.0		
34.0-36.0		
	36.0-40.0	SILTY CLAY: GRAY, TRACE SILT, DENSE, VERY STIFF. NO ODOR. GRADES TO:
38.0-43.0	40.0-43.0	CLAYEY SILT: GRAY, TRACE VERY FINE GRAINED SAND, MOIST TO WET, FIRM, MEDIUM DENSE.
	43.0-45.0	SAND: GRAY, VERY FINE TO FINE GRAINED, SOFT, SATURATED.
43.0-48.0	45.0-48.0	CLAYEY SILT: GRAY, MOIST, FIRM, MEDIUM DENSE.
48.0-53.0	48.0-53.0	SILTY CLAY/CLAYEY SILT: GRAY, MOIST, FIRM, MEDIUM DENSE, ORGANICS AT 51-52 FEET.
53.0-58.0	53.0-63.0	SILTY CLAY: GRAY, MOIST, FIRM MEDIUM DENSE, DECREASING MOISTURE.
58.0-63.0		

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-3
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP
DATE STARTED: 9-17-91 DATE COMPLETED: 9-20-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 38 FT. DEPTH 38 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 45 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 63 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-38 / HSA-38-55 LOG BY: B. BRAY / B.B. BROOM

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
60					58.0-63.0		
65							BORING TERMINATED AT 63 FT. ON 9-20-91.

ERM-SOUTHWEST, INC.

FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-4

PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP

DATE STARTED: 9-18-91 DATE COMPLETED: 9-21-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 44 FT. DEPTH 44 FT.

TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.

CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 55 FT. SUMP LENGTH 2.5 FT.

BORING DIAMETER: 8.25 IN. BORING TD: 65 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY

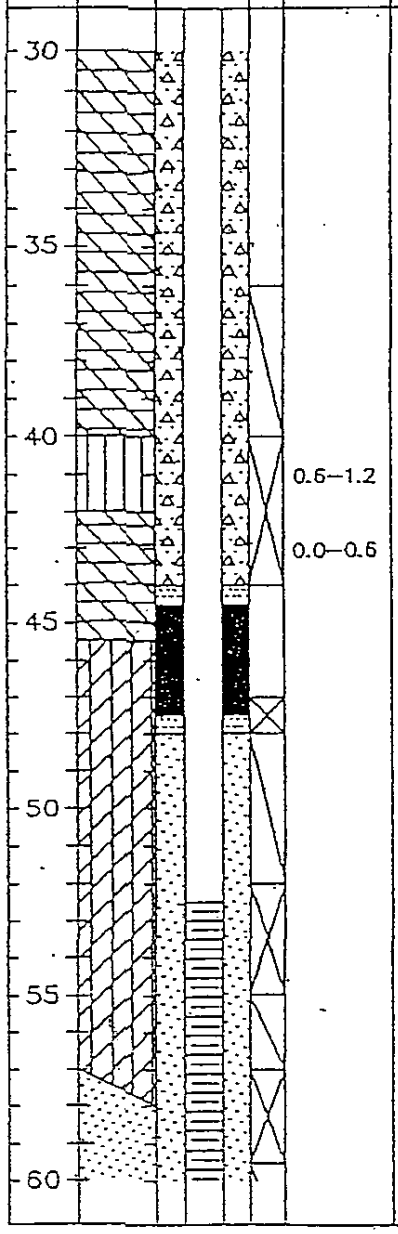
DRILLING METHOD: MR-0-44 / HSA-44-65 LOG BY: B. BRAY / B.B. BROOM

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
0						0-1.5	FILL: GRAVEL, BRICK, LIGHT BROWN SAND AND CLAY.
5						1.5-18.0	FILL: SHELL, PEA GRAVEL, SAND AND CLAY MIXED WITH SOME WOOD. NO ODOR. (LOG FROM CUTTINGS). GRADES TO: LIGHT BROWN AND GRAY SILTY CLAY FILL MATERIAL WITH LOOSE SHELL AND GRAVEL. (LOG FROM CUTTINGS).
10							
15							
20						18.0-40.0	SILTY CLAY: GRAY, MEDIUM STIFF, STRONG CHEMICAL ODOR. (LOG FROM CUTTINGS). TRACE WOOD FRAGMENTS. STRONG CHEMICAL ODOR. (LOG FROM CUTTINGS).
25							
30							

WORK ORDER NO.: 14-83 BORING NO.: DMS-4
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP
DATE STARTED: 9-18-91 DATE COMPLETED: 9-21-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 44 FT. DEPTH 44 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 55 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 65 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-44 / HSA-44-65 LOG BY: B. BRAY / B.B. BROOM



SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
36.0-40.0		BLACK STAINED VERY SOFT SILTY CLAY (NO RECOVERY, LOG FROM CUTTINGS ON SAMPLER).
	40.0-42.0	SILT: GRAY, SOME CLAY COHESIVE, NO VISIBLE STAINING.
	42.0-45.5	SILTY CLAY: GRAY, MEDIUM STIFF, STRONG CHEMICAL ODOR.
45.5-57.5	45.5-57.5	CLAYEY SILT: DARK GRAY, SOFT, CHEMICAL ODOR WITH BLACK STAINING. NO CHEMICAL ODOR AND NO VISIBLE SOIL STAINING. GRADES TO
52.0-57.0		
57.0-62.0	57.5-65.0	SAND: GRAY VERY FINE TO FINE GRAINED SAND, MODERATELY WELL SORTED, SOFT, SATURATED.

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: DMS-4

PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: WWTP

DATE STARTED: 9-18-91 DATE COMPLETED: 9-21-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 44 FT. DEPTH 44 FT.

TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.

CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 55 FT. SUMP LENGTH 2.5 FT.

BORING DIAMETER: 8.25 IN. BORING TD: 65 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY

DRILLING METHOD: MR-0-44 / HSA-44-65 LOG BY: B. BRAY / B.B. BROOM

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
60					57.0-62.0		
65							BORING TERMINATED AT 65 FT. ON 9-21-91.
70							

ERM-SOUTHWEST, INC.

FIELD BORING LOG

WORK ORDER NO.: 14-97 BORING NO.: SW-1

PROJECT: SOLID WASTE MONITORING SYSTEM OWNER: EXXON, CO., USA LOCATION: WWTP

DATE STARTED: 6-22-92 DATE COMPLETED: 6-23-92

SURFACE CASING: TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE .01 IN.

CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 80 FT. SUMP LENGTH 2.5 FT.

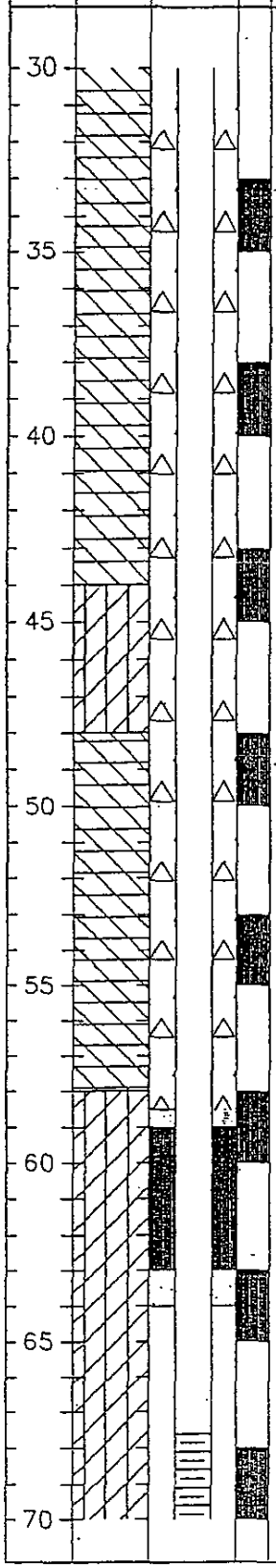
BORING DIAMETER: 8.25 IN. BORING TD: 80 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: FUGRO GEOSCIENCE DRILLER: J. KEY

DRILLING METHOD: HOLLOW STEM AUGER LOG BY: G. GABALDON

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
0							
					2.0	0.0-8.0	FILL: SILTY CLAY, BROWN, MOIST, STIFF, SOME FINE SAND, IRON STAINING, ODOR, ROOTS, WOOD FRAGMENTS.
					1.5		
5							
					1.4	8.0-13.0	SILTY CLAY: GRAY, MOIST, STIFF, WOOD FRAGMENTS.
10							
					1.5	13.0-18.0	CLAYEY SILT: GRAY, MOIST, STIFF, WOOD FRAGMENTS, ROOTS, ORGANIC RICH LENSES, SOME FINE SAND.
15							
					1.0	18.0-44.0	SILTY CLAY: GRAY, SOME BROWN MOTTLING NEAR TOP, MOIST, STIFF TO VERY STIFF, WOOD FRAGMENTS, SOME FINE SAND.
20							
					0.5		
25							
					2.1		
30							

WORK ORDER NO.: 14-97 DATE: 6-23-92 BORING NO.: SW-1



DEPTH(FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
30							
					2.1		AS ABOVE, SATURATED 33.0-33.5 FEET.
35							
					2.0		
40							
					2.0		
45						44.0-48.0	CLAYEY SILT: GRAY, MOIST, STIFF TO VERY STIFF, WOOD FRAGMENTS, SOME FINE SAND.
					2.0		
50							SILTY CLAY: GRAY, MOIST, STIFF TO VERY STIFF, SOME SATURATED, INTERBEDDED SILTY CLAY, SOME FINE SAND, WOOD FRAGMENTS.
						48.0-58.0	
					2.0		AS ABOVE
55							
					2.0		
60							
					1.6	58.0-73.0	SILTY CLAY/CLAYEY SILT: GRAY, MOIST, STIFF, WOOD FRAGMENTS, SOME FINE SAND.
65							
					1.6		
70							

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-97 DATE: 6-23-92 BORING NO.: SW-1

DEPTH(FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
70							
					2.0	73.0–79.0	SANDY SILT/SILTY SAND: GRAY, SATURATED, STIFF, INCREASING CLAY TO BASE.
75							
					1.9	79.0–80.0	CLAYEY SILT: GRAY, MOIST, STIFF, SOME FINE SAND.
80							BORING TERMINATED AT 80.0 FEET.
85							
90							
95							
100							
105							
110							

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-97 BORING NO.: SW-2

PROJECT: SOLID WASTE MONITORING SYSTEM OWNER: EXXON, CO., USA LOCATION: WWTP

DATE STARTED: 6-15-92 DATE COMPLETED: 6-16-92

SURFACE CASING: TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____

SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE .01 IN.

CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 50 FT. SUMP LENGTH 2.5 FT.

BORING DIAMETER: 8.25 IN. BORING TD: 60 FT. STICKUP: 3 FT.

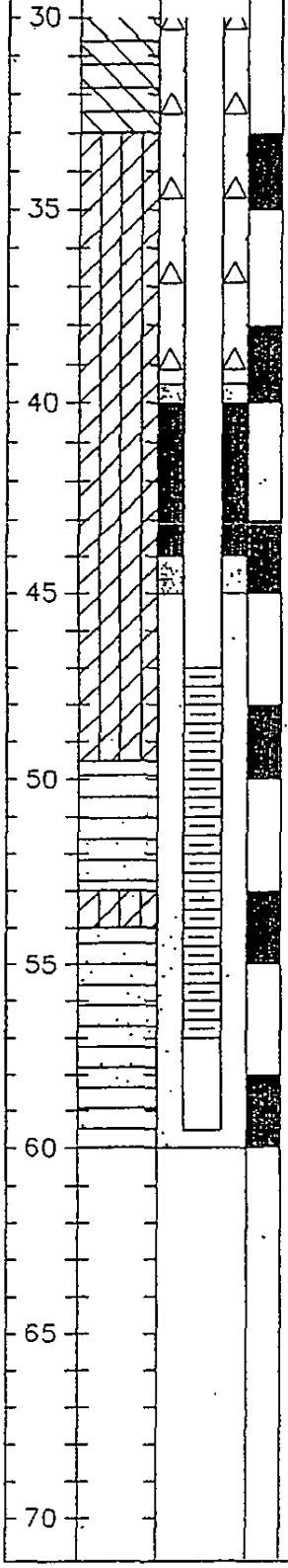
DRILLING COMPANY: FUGRO GEOSCIENCE DRILLER: J. KEY

DRILLING METHOD: HOLLOW STEM AUGER LOG BY: G. GABALDON

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
0							
					1.0	0.0–13.0	FILL: SILTY CLAY, BROWN, MOIST, STIFF TO VERY STIFF, SHELL FRAGMENTS, IRON STAINING, SOME BLACK STAINING, ODOR, RUBBLE, SOME FINE SAND.
					1.0		
5							
					0.7		
10							
					1.8	13.0–23.0	SILTY CLAY: GRAY, MOIST, STIFF, SOME FINE SAND, SLIGHT ODOR.
15							
					2.2		AS ABOVE, SOME IRON STAINING, WOOD FRAGMENTS, NO ODOR.
20							
					0.2	23.0–28.0	SILTY SAND/SANDY SILT: GRAY, VERY MOIST, LOOSE TO MEDIUM DENSE, VERY FINE TO FINE, SAND MODERATELY WELL SORTED.
25							
					2.0	28.0–33.0	SILTY CLAY: GRAY, MOIST, STIFF TO VERY STIFF, INCREASING CLAY WITH DEPTH, SOME BLACK STAINING.
30							

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-97 DATE: 6-15-92 BORING NO.: SW-2



DEPTH(FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
					1.9	33.0-49.5	CLAYEY SILT: GRAY, MOIST, STIFF, SOME FINE SAND.
					2.0		AS ABOVE, ROOTLETS.
					2.1		
					2.1		
						49.5-53.0	SILTY SAND: GRAY, SATURATED, MEDIUM DENSE, VERY FINE TO FINE.
						53.0-54.0	CLAYEY SILT: GRAY, MOIST, FIRM, SOME ROOTS.
					2.0	54.0-60.0	SILTY SAND: GRAY, SATURATED, MEDIUM DENSE, SOME ROOTS, VERY FINE TO FINE.
					1.6		
							BORING TERMINATED AT 60.0 FEET.

ERM-Southwest, Inc. FIELD BORING LOG

WORK ORDER NO.: 14-154 BORING NO.: W-20
PROJECT: RB-1 GW MON. OWNER: EXXON COMPANY, U.S.A. LOCATION: NORTH OF RB-2
DATE STARTED: 6-13-94 DATE COMPLETED: 7-8-94

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 28 FT. DEPTH 28 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE STAINLESS STEEL DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE STAINLESS STEEL DIAMETER 2 IN. LENGTH 93 FT. SUMP LENGTH 2 FT.
BORING DIAMETER: 14/8.25 IN. BORING TD: 30/125 FT. STICKUP: 3 FT.

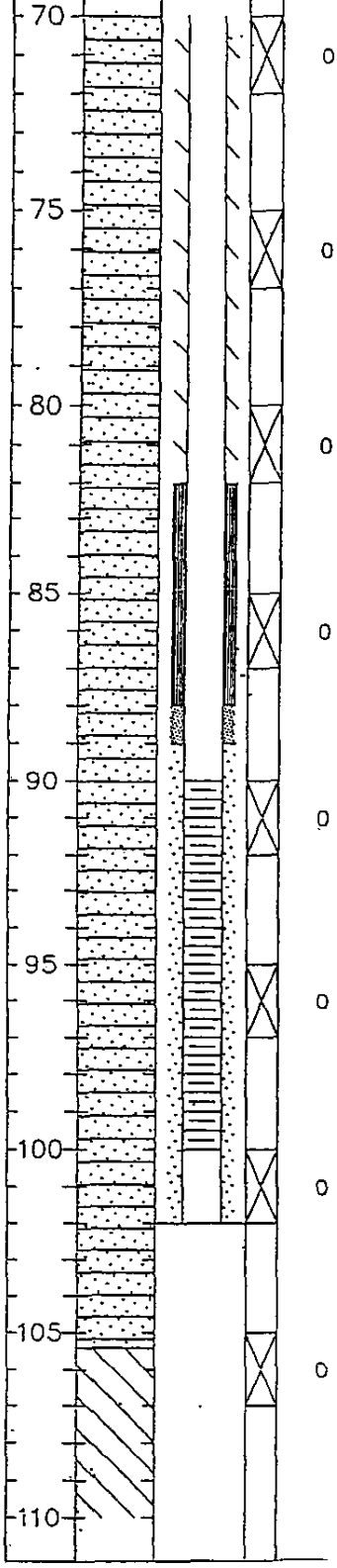
DRILLING COMPANY: FUGRO GEOSCIENCES DRILLER: J. GUNTER / D. FENDLEY
DRILLING METHOD: HOLLOW STEM AUGER/MUD ROTARY LOG BY: D. UPTHEGROVE

DEPTH(FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INT. (FEET) RECOVERY (FEET/FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
0							
				12.0	1.5/2		FILL: SILTY AND SANDY CLAY, GREEN-GRAY, BROWN AND BLACK, MOIST, FRIABLE, GRAVEL, HYDROCARBON (HC) ODOR.
5						0.0-17.7	
				15.2	0.8/2		AS ABOVE STIFF, W/ BLACK STAINING AND OILY POCKETS.
10							
15				73.5	0.8/2		AS ABOVE, SATURATED, RUNNY FROM 16.0-17.7 FEET, THEN
				11.1	1.7/2		CLAY (NATIVE): GREEN-GRAY, SATURATED, MEDIUM STIFF, LARGE WOOD FRAGMENTS, HC ODOR DECREASING WITH DEPTH.
20				1.1	1.8/2		AS ABOVE, LESS ODOR.
						17.7-40.0	
25				0	1.4/2		SILTY CLAY: GREEN-GRAY, SATURATED, STIFF, NO ODOR, INCREASING SILT W/ DEPTH.
30							

WORK ORDER NO.: 14-154 DATE: 6/13-7/8/94 BORING NO.: W-20

DEPTH(FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INT. (FEET) RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
30							
35				0	0.8/2		AS ABOVE, WITH SOME VERY FINE GRAINED SAND, ROOTS.
40				0	2.0/2		SILTY SAND: GRAY, SATURATED, LOOSE, VERY FINE GRAINED, SMALL ROOTS, TRACE CLAY.
45				0	1.8/2		AS ABOVE.
50				0	0.8/2		AS ABOVE.
55				0	2.0/2	40.0–105.4	0.8' SILTY AND SANDY CLAY: GRAY, SATURATED, SOFT, ROOTS, THEN 1.2' SILTY SAND: GRAY, SATURATED, VERY FINE GRAINED, LOOSE, ROOTS, SOME CLAY.
60				0	1.8/2		0.8' SILTY CLAY: GRAY, SATURATED, MEDIUM STIFF, ROOTS, THEN SILTY SAND: GRAY, SATURATED, VERY FINE GRAINED, LOOSE.
65				0	2.0/2		SILTY CLAY/CLAYEY SILT WITH SANDY ZONES: GRAY, SATURATED, SOFT, SMALL ROOTS.
70							

WORK ORDER NO.: 14-154 DATE: 6/13-7/8/94 BORING NO.: W-20



DEPTH (FEET)	PID/FID (PPM)	SAMPLE INT. (FEET) RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
70	0	1.8/2		SILTY SAND: GRAY, SATURATED, VERY FINE GRAINED, LOOSE, ROOTS AND WOOD FRAGMENTS, SOME CLAY.
75	0	1.6/2		0.6' SILTY AND SANDY CLAY: GRAY, SATURATED, MEDIUM STIFF, THEN WOOD: PURPLE AND TAN, SATURATED.
80	0	1.6/2		SILTY SAND: GRAY, SATURATED, VERY FINE GRAINED, LOOSE, WITH SOME CLAY.
85	0	1.5/2		SILTY AND SANDY CLAY: GRAY, SATURATED, MEDIUM STIFF.
90	0	0.6/2		SILTY SAND: GRAY, SATURATED, VERY FINE GRAINED, MEDIUM DENSE.
95	0	1.8/2		0.8' AS ABOVE WITH WOOD FRAGMENTS, THEN SILTY CLAY: GRAY, SATURATED, STIFF, TRACE SAND.
100	0	2.0/2		AS ABOVE WITH WOOD FRAGMENTS.
105	0	1.8/2	105.4-127.0	0.4' AS ABOVE, THEN 1.4' CLAY: LIGHT GRAY AND TAN MOTTLED, MOIST, VERY STIFF→ PLEISTOCENE.
110				

WORK ORDER NO.: 14-154 DATE: 6/13-7/8/94 BORING NO.: W-20

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INT. (FEET) RECOVERY (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
110				0	2.0/2		AS ABOVE, MOSTLY GRAY, SLIGHTLY SILTY.
115				0	2.0/2		1.8' GRAY SILTY SAND (SLOP FROM ABOVE), THEN 0.2' SILTY CLAY: TAN, MOIST, HARD.
120							
125				0	2.0/2		SILTY CLAY: GRAY GREEN, MOIST, HARD, SOME ORANGE Fe STAINING.
							TD AT 127 FEET.
130							
135							
140							
145							
150							

ERM-Southwest, Inc.

Drilling Log

Project GROUND WATER ASSESSMENT Owner EXXON

Location BATON ROUGE, LA. W. O. Number 14-39

Well Number DM-18A Total Depth 85' Borehole Diameter Variable (20", 12", 6")

Top of Casing Elevation 57.74' Water Level: Initial * 24-hrs. 22.4'

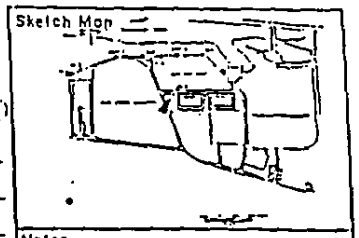
Screen: Dia. 2" Length 10'/2.5' SUMP Slot Size 0.01"

Casing: Dia. 2" Length 70' Type 304 SS

Drilling Company LAYNE Drilling Method ROTARY & HOLLOW STEM AUGER

Driller J.D. ANTHONY Log By D.E. WEIDEMANN Date Drilled 4-23-87

Sketch Map



Notes
14" CASING SET TO 33'
8" CASING SET TO 65'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	Description/Soil Classification (Color, Texture, Structures)
0					0-1	0-5	Fill: Silty clay, brown, dry, some oily stains (from cuttings).
5					5-7	5-10	Fill: sandy, dark brown to grey, wet to saturated, odor.
10					10-12	10-15	Sandy silt: dark grey, few small gravel pieces, odor, probable fill material.
15					15-17	15-25	Sand: dark grey to blackish green medium to coarse, quartz-rich, occasional shell pieces, odor, becoming dark grey, very wet and unconsolidated at 20', probable fill material.
20					20-22		
25					25-27	25-27	Clay: dark grey to green, soft.
					27-29	27-30	Clayey silt: dark grey to black, becomes olive grey at 28.5', fine sand lenses and sand stringers, trace of mica flakes, damp to dry, odor throughout.
30					30-32	30-35	Silty clay: dark grey to black, mica flakes, soft and wet near top, becomes drier but still soft near base, odor present to approximately 33', becomes dark greenish grey with silt lenses from 32-34'.
					32-34		
35					35-37	35-40	Clay: medium grey, soft, slight odor.
40							

* INITIAL WATER LEVEL MEASUREMENTS NOT COLLECTED SINCE GROUTING TECHNIQUES WOULD RENDER DATA INVALID

ERM-Southwest, Inc.

Drilling Log

Project GROUND WATER ASSESSMENT Owner EXXON

Location BATON ROUGE, LA. W. O. Number 14-39

Well Number DM-18A Total Depth 85' Borehole Diameter Variable (20", 12", 6")

Top of Casing Elevation 57.74' Water Level: Initial * 24-hrs. 22.4'

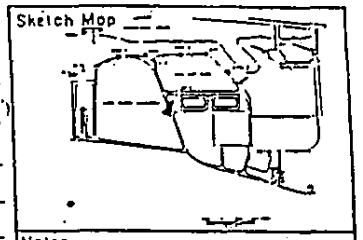
Screen: Dia. 2" Length 10'/2.5' SUMP Slot Size 0.01"

Casing: Dia. 2" Length 70' Type 304 SS

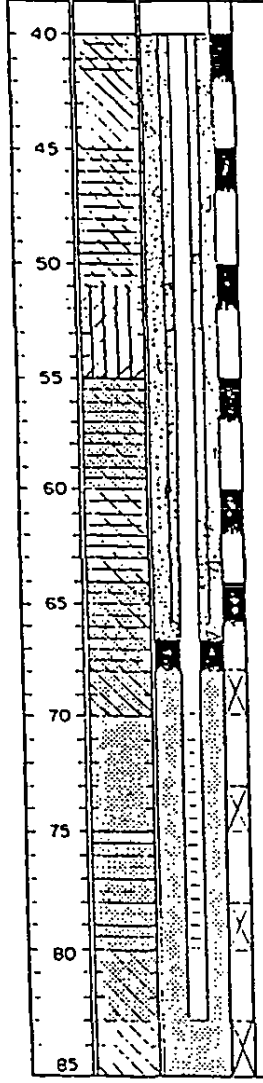
Drilling Company LAYNE Drilling Method ROTARY & HOLLOW STEM AUGER

Driller J.D. ANTHONY Log By D.E. WEIDEMANN Date Drilled 4-23-87

Sketch Map



Notes
14" CASING SET TO 33'
8" CASING SET TO 66'



Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structures)
40-42	40-41.5	Silty clay: grey, soft, large root or limb within, also a few rootlets, odor.
	41.5-45	Clay: grey, stiffer, slight odor.
45-47	45-50	Silty clay: medium grey with clayey silt lenses, soft somewhat stiffer at base, occasional wood pieces and rootlets, slight odor.
50-52	50-51	Silty clay: as above, soft, plastic, very slight to no odor.
	51-55	Clayey silt: grey, soft, no odor, has lense of very fine silty sand at top, large wood branch or root at base.
55-57	55-60	Silty sandy clay: grey, few wood pieces, fine sand, with sandy clay lense from 56.0-56.7', no odor throughout.
60-62	60-64	Silty clay: grey, trace very fine sand and rare mica flakes, occasional siltier lenses, at base have softer, silty clay with no sand, no odor throughout.
64-66	64-68	Silty sandy clay: grey, soft, lense of sandy clay from 64.9-65.5', no odor throughout.
68-70	68-70	Sandy clay: grey, soft, very fine sand, no odor.
	70-75	Sand: very sandy zone present: sediment washed out during flushing of borehole.
73-75		
	75-78	Silty sand: description based on cuttings flushed out during drilling.
78-80	78-83	Interbedded layers of silty sand and sandy clay: clay lenses present: fine grained, saturated, no odor.
83-85	83-85	Clay: grey with sandy clay and lenses of clayey sandy silt, clay is drier, stiffer than above.

ERM-Southwest, Inc.

Drilling Log

Project GROUND WATER ASSESSMENT Owner EXXON

Location BATON ROUGE, LA. W. O. Number 14-39

Well Number ERM-1 Total Depth 59' Borehole Diameter Variable (2", 6")

Top of Casing Elevation 56.34' Water Level: Initial * * 24-hrs. 24.85'

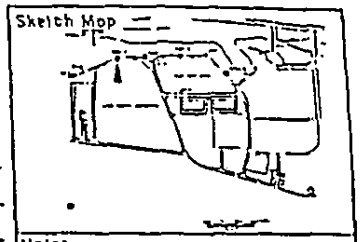
Screen: Dia. 2" Length 10'/2.5' SUMP Slot Size 0.01"

Casing: Dia. 2" Length 42' Type 304 SS

Drilling Company LAYNE Drilling Method HOLLOW STEM AUGER

Driller J.D. ANTHONY Log By D.E. WEIDEMANN Date Drilled 4-24-87

Sketch Map



Notes

8" CASING SET TO 32'

Depth (Feet)	Graphic Log	Well Construction	Sample Type	Cohesive Strength (Tons/Sq. Ft.)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structures)
0					*	0-22	Fill: 0-1' :brown, loamy. 1-6' :black, clayey, odor, becoming softer, with brick pieces from 3-6'. 6-8' :brown silty clay, dry. 8-11' :black silty clay, few pebbles, shell fragments from 8-9'; then abundant rubble (brick pieces, asphalt, road gravel) from 9-11'. 11-15' :black silty clay, dry, firm, with odor. 15-16.5' :dark grey to olive green silty clay, few rootlets, brick pieces, slight odor. 16.5-22' :black silty clay, old electrical wires within, odor.
5							
10							
15							
20						22-27	Silty sandy clay: medium to dark grey, soft, moist, slight odor.
25						27-35	Silty clay: medium to dark grey, drier, stiffer than above, with iron nodules, staining and occasional silty or sandy lenses which are moist to wet, no odor.
30					30-32		
					33-35		
35						35-42	Clay: grey, soft, no odor.
40							

* ALL SAMPLES LOGGED FROM AUGER CUTTINGS UNLESS OTHERWISE NOTED.

** INITIAL WATER LEVEL MEASUREMENTS NOT COLLECTED SINCE GROUTING TECHNIQUES WOULD HAVE RENDERED DATA INVALID.

ERM-Southwest, Inc.

Drilling Log

Project GROUND WATER ASSESSMENT Owner EXXON

Location BATON ROUGE, LA. W. O. Number 14-39

Well Number ERM-1 Total Depth 59' Borehole Diameter Variable (12", 6")

Top of Casing Elevation 56.34' Water Level: Initial * * 24-hrs. 24.85'

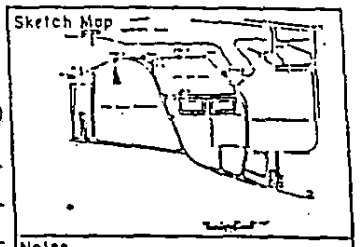
Screen: Dia. 2" Length 10'/2.5' SUMP Slot Size 0.01"

Casing: Dia. 2" Length 42' Type 304 SS

Drilling Company LAYNE Drilling Method HOLLOW STEM AUGER

Driller J.D. ANTHONY Log By D.E. WEIDEMANN Date Drilled 4-24-87

Sketch Map



Notes

8" CASING SET TO 32'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	Description/Soil Classification (Color, Texture, Structures)
40					*	42-49	Sandy clay: grey, soft, very wet, no odor, sand noted on augers above this zone and throughout this interval. Discrete sand/silt lenses may be present.
45							
						49-54	Clayey silt: grey, with silty clay and trace fine sand.
50							
						54-59	Silty clay: grey, drier than above.
55							
59							

ERM-SOUTHWEST, INC. FIELD BORING LOG

WORK ORDER NO.: 14-83 BORING NO.: BB-1
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: BIOX BASIN
DATE STARTED: 9-12-91 DATE COMPLETED: 9-20-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 50 FT. DEPTH 50 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 60 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 70 FT. STICKUP: 2.5 FT.

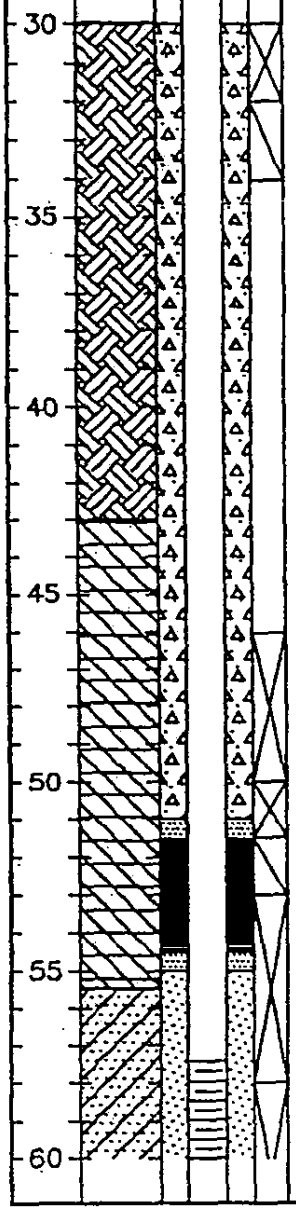
DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-48 / HSA-48-70 LOG BY: B. BRAY / B.B. BROOM

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING); CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
0						0.0-1.0	FILL: SHELL WITH GRAY AND BROWN SILTY CLAY.
						1.0-5.0	FILL: BROWN SILTY CLAY WITH PEBBLES.
5				83	5.0-9.0	5.0-43.0	FILL: BLACK SILTY CLAY WITH GRAVEL AND DEBRIS, VERY DENSE, SATURATED, STRONG CHEMICAL ODOR.
10				59	10.0-14.0		
				118			
15				115.8	15.0-19.0		
				99.6			GRADES TO:
20				132.6	20.0-24.0		BLACK SILTY CLAY INTERBEDDED WITH CLAYEY SAND AND PEA GRAVEL. STRONG CHEMICAL ODOR.
				154.1			
25				134.1	25.0-29.0		INCREASING SAND CONTENT WITH DEPTH. STRONG CHEMICAL ODOR.
				118.9			
30							

WORK ORDER NO.: 14-83 BORING NO.: BB-1
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: BIOX BASIN
DATE STARTED: 9-12-91 DATE COMPLETED: 9-20-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 50 FT. DEPTH 50 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 60 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 70 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-48 / HSA-48-70 LOG BY: B. BRAY / B.B. BROOM



DEPTH (FEET)	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
30	155.1	30.0-34.0		BLACK MEDIUM SAND INTERLAYERED WITH SILTY CLAY.
35				
40				BLACK SILT AND SAND WITH WOOD AND PEA GRAVEL (LOG FROM CUTTINGS).
45	0.0	46.0-50.0		
	0.0		43.0-55.5	SILTY CLAY: GRAY, TRACE SILT, DENSE, PLASTIC, NO CHEMICAL ODOR.
50	–	50.0-53.0		
55	–	53.0-58.0		
60				

WORK ORDER NO.: 14-83 BORING NO.: BB-1
PROJECT INTER. STAT. M.W. OWNER: EXXON REFINERY LOCATION: BIOX BASIN
DATE STARTED: 9-12-91 DATE COMPLETED: 9-20-91

SURFACE CASING: TYPE CARBON STEEL DIAMETER 10 IN. LENGTH 50 FT. DEPTH 50 FT.
TYPE _____ DIAMETER _____ LENGTH _____ DEPTH _____
SCREEN: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 10 FT. SLOT SIZE 0.01 IN.
CASING: TYPE 304 S.S. DIAMETER 2 IN. LENGTH 60 FT. SUMP LENGTH 2.5 FT.
BORING DIAMETER: 8.25 IN. BORING TD: 70 FT. STICKUP: 2.5 FT.

DRILLING COMPANY: LAYNE ENV. / FUGRO GEO. DRILLER: D. SHOWS / J. KEY
DRILLING METHOD: MR-0-48 / HSA-48-70 LOG BY: B. BRAY / B.B. BROOM

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	PID/FID (PPM)	SAMPLE INTERVAL (FEET)	DESCRIPTION INTERVAL (FEET)	DESCRIPTION/SOIL CLASSIFICATION SEQUENCE: TEXTURE (LITHOLOGY), TEXTURE MODIFIER, COLOR MOISTURE CONTENT, PLASTICITY (FINES), UNIFORMITY (LAYERING), CONSISTENCY (DENSITY, FIRMNESS), STRUCTURE (SLICKENSIDES, FRACTURES), OTHER (ROOTS, ORGANICS, SHELLS, NODULES, ODORS, ETC.), POCKET PENETROMETER READING, SAMPLES TAKEN.
60				–	58.0–63.0	55.5–70.0	SAND: GRAY, VERY FINE TO FINE GRAINED, MODERATELY WELL SORTED, TRACE SILT CLAY, FIRM TRACE CLAY LENSES.
65				–	63.0–68.0		INCREASING CLAY CONTENT.
70							BORING TERMINATED AT 70 FT. ON 9-20-91.

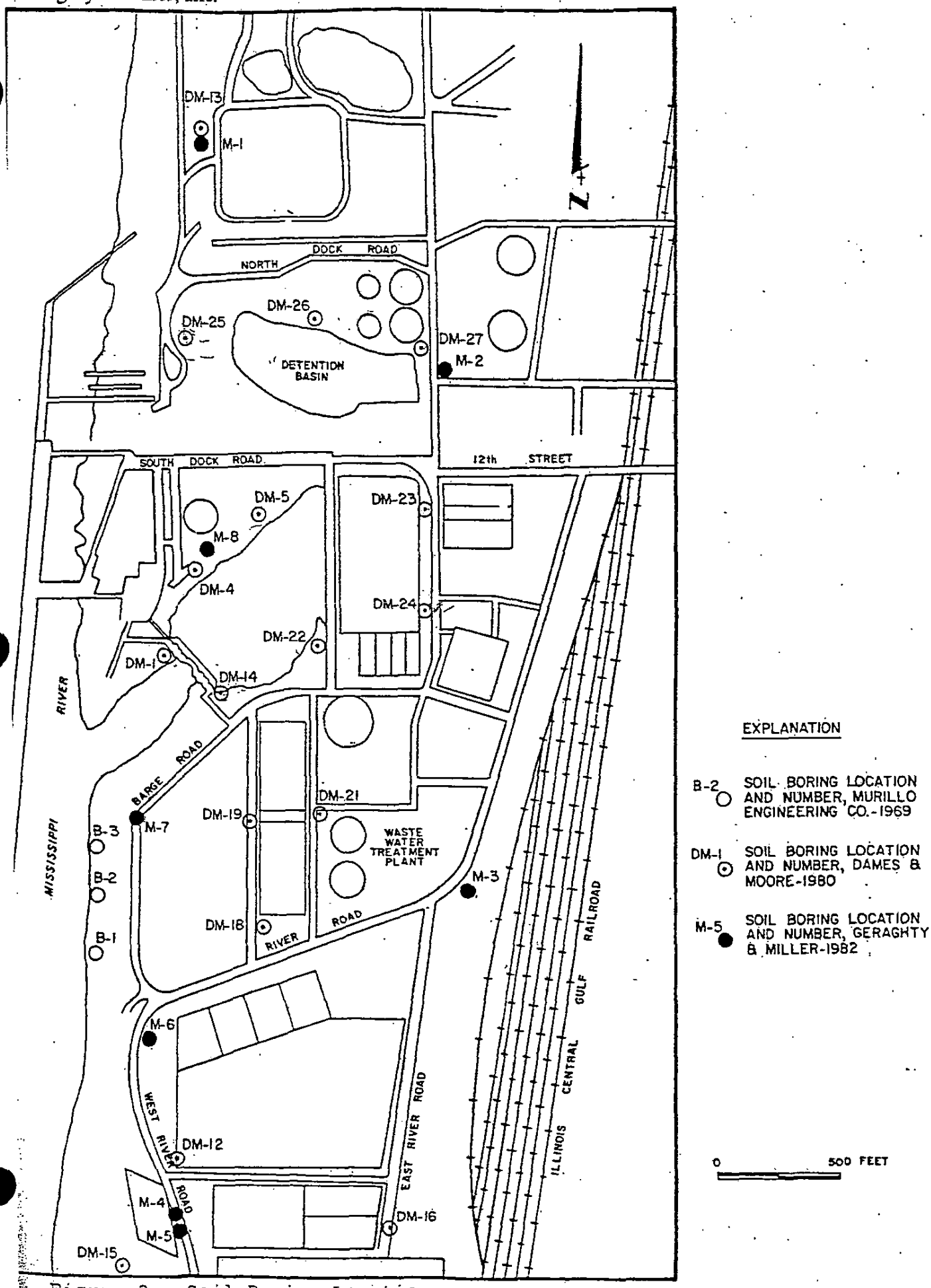


Figure 3. Soil-Boring Locations.

LITHOLOGIC LOG OF BOREHOLE M-1

Description	Depth (ft)	Thickness (ft)
Rubble, fill.....	0 - 16	16
Clay, gray, soft.....	16 - 36	20
Silt, sandy, clayey, gray, soft.....	36 - 47	11
Clay, silty, gray, medium.....	47 - 48	1
Total Depth:	48 feet	

LITHOLOGIC LOG OF BOREHOLE M-2

Description	Depth (ft)	Thickness (ft)
Clayey fill material, tan, soft.....	0 - 12	12
Clay, gray and tan, soft.....	12 - 18	6
Rubble and clay, gray, stiff.....	20 - 23	3
Clay, gray-tan, stiff.....	23 - 56	33
Clay, reddish-gray, with silt lenses, stiff, dry.....	56 - 60	4
Clay, gray to red-brown, hard, with black organics.....	60 - 69	9
Clay, silty, sandy, gray to white, hard, dry.....	69 - 70	1
Clay, reddish brown-gray, very stiff, with silt seams at 78-81 ft, organics...	70 - 84	14
Clay, brown-gray, stiff, with ferruginous nodules.....	84 - 113	14
Sand, coarse, reddish-brown, very dry.....	113 - 114½	1½
Clay, gray to brown, stiff.....	114½ - 115	½
Total Depth:	115 feet	

LITHOLOGIC LOG OF BOREHOLE M-3

Description	Depth (ft)	Thickness (ft)
Rubble	0 - 16	16
Clay, tan, plastic	16 - 23	7
Clay, gray-tan, plastic	23 - 38	15
Silt, gray-tan	38 - 42	4
Silt, sandy with clay lenses, brown	42 - 47	5
Clay, tan-brown, medium	47 - 58	11
Clay, stiff, red-brown, with black organics	58 - 74	16
Clay, stiff, gray-tan	74 - 100	26
Clay, green-gray, some plasticity	100 - 138	38
Total Depth:	138 feet	

LITHOLOGIC LOG OF BOREHOLE M-4/M-5

Description	Depth (ft)	Thickness (ft)
Rubble and clay	0 - 16	16
Clay, gray, medium, stiff	16 - 30	14
Clay, silty, gray	30 - 42	12
Silt with some clay lenses, gray, soft	42 - 52	10
Not sampled	52 - 86	34
Clay, silty, gray, soft	86 - 88	2
Clay, gray-tan, stiff, with silt lenses	88 - 114	26
Wood (a log)	114 - 115	1
Sand and gravel, medium to coarse, gray, brown, black	115 - 123	8
Clay, gray, plastic	123 - 125	2
Total Depth:	125 feet	

LITHOLOGIC LOG OF BOREHOLE M-6

Description	Depth (ft)	Thickness (ft)
Rubble, silts and clay.....	0 - 16	16
Clay, blackish, with chemical odor.....	16 - 18	2
Clay, gray-brown, with black streaks, faint chemical odor.....	18 - 34	16
Clay, gray-brown, soft.....	34 - 37	3
Silt, clayey, silty clay, gray, soft.....	37 - 47	10
Silt, clayey, gray, soft.....	47 - 48	1
Total Depth:	48 feet	

LITHOLOGIC LOG OF BOREHOLE M-7

Description	Depth (ft)	Thickness (ft)
Rubble, silt and clay.....	0 - 25	25
Clay, gray, stiff (Note: Chemical odor at 36 ft).....	25 - 44	19
Silt, clayey, gray, medium.....	44 - 50	6
Total Depth:	50 feet	

LITHOLOGIC LOG OF BOREHOLE M-8

Description	Depth (ft)	Thickness (ft)
Rubble and clay.....	0 - 10	10
Clay, silty, gray, with some wood chips...	10 - 40	30
Clay, silty, gray, soft.....	40 - 44	4
Silt, clayey, gray, non-cohesive.....	44 - 46	2
Silt, sandy, clayey, gray.....	46 - 48	2
Clay, stiff, with silt lenses.....	48 - 52	4
Total Depth:	52 feet	

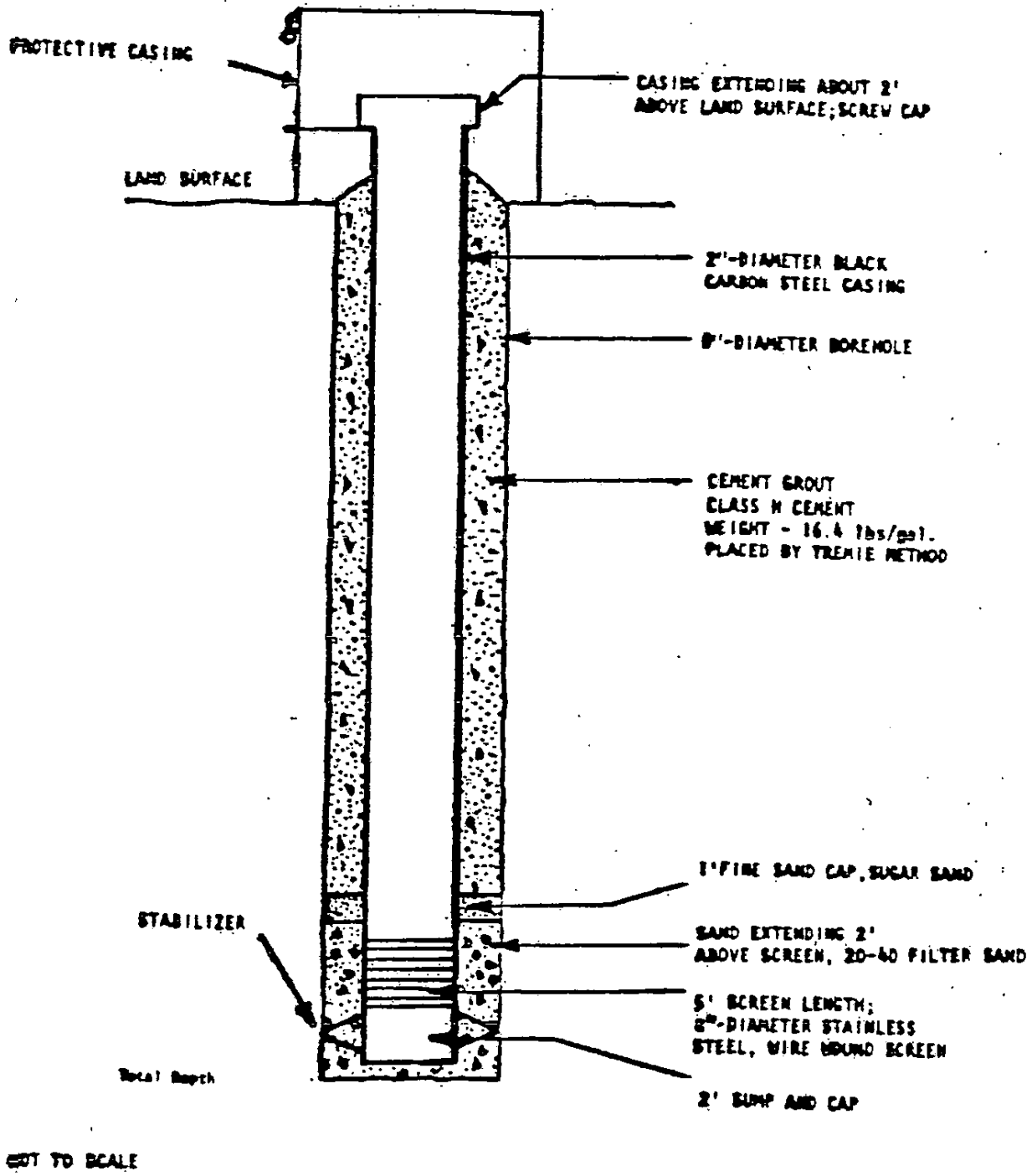


Figure B-2. TYPICAL WELL CONSTRUCTION DIAGRAM

TABLE B-1

CONSTRUCTION DETAILS OF MONITOR WELLS
EXXON REFINERY, BATON ROUGE, LOUISIANA

Well Number	Date Drilled	Depth Drilled Below Grace (ft)	Borehole Diameter (in)	Screen Setting (ft)	Elevations (ft-msl)[1]
M-1	3/82	48	8	41 - 46	43.6
M-3	2/82	49	8	42 - 47	58.0
M-4	2/82	123	6½	114 - 119	50.4
M-5	2/82	48	6½	41 - 46	50.2
M-6	3/82	49	6½	42 - 47	55.2
M-7	2/82	54	8	46 - 51	54.6
M-8	2/82	52	8	45 - 50	43.9
DM-13	1/80	131	6	119 - 129	44.8
DM-14	1/80	112	6	105 - 110	37.6
DM-23	1/80	25	6	13 - 23	49.2
DM-24	1/80	30	6	18.5 - 28.5	48.9
DM-25	1/80	46½	6	30 - 40	40.7
DM-26	1/80	52	6	40 - 50	45.9
DM-27	1/80	29	6	17 - 27	50.0

[1]msl = mean sea level.

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NAME EXXON PROJECT NUMBER 846162-01
FIELD ENG./GEO. CSH APPROX. ELEV.
COORDINATES DRILLING METHODS ROTARY-AUGER

PAGE 1 OF 2
BORING NO. S-3
DATE 6/25/84

CASING INFORMATION		GROUNDWATER LEVEL DATA			
SIZE	DEPTH	ACTUAL TIME	DEPTH	ACTUAL TIME	DEPTH
10"	30'				
4"	60'				

DEPTH	CASING BLOWS PER 30 CM.	BLOWS ON SAMPLER PER 15 CM.	SAMPLER RECOVERY	SAMPLE NO. AND TYPE	SOIL PROFILE	U.S.C.S. SYMBOL	DESCRIPTION	REMARKS
0								START TIME 8:15 AM
5			100%	ST-1		ML-CL	BLACK AND BROWN CLAYEY SILT, SOME RUBBLE, WITH OILY SLUDGE	LUNCH 12:00 - 1:00 PM CLEAN PUMP 1:15 - 2:15 PM DRILLER WENT TO SHOP (GDC) FOR SLEAGE HAMMER 2:15 - 2:30
10			100%	ST-2		ML-CL	BLACK AND BROWN CLAYEY SILT, SOME RUBBLE, WITH OILY SLUDGE	
15			100%	ST-3		ML-CL	BLACK AND BROWN CLAYEY SILT, WITH OILY SLUDGE	
20			100%	ST-4		CL	BROWN AND GRAY STIFF CLAY WITH OILY SLUDGE, SOME WOOD, RUBBLE, ETC.	
25			100%	ST-5		CL	BROWN AND GRAY STIFF CLAY WITH OILY SLUDGE	HARD LAYER AT 24' (GYPSUM?)
30			100%	ST-6		CL	BROWN AND GRAY STIFF CLAY WITH RUBBLE	10:30 AM REAMED HOLE DOWN TO 30' WITH 16" BIT. SET 10" CASING AND GROUTED TO SURFACE. 3:00 - 5:00 PM LEFT SITE AT 5:30 PM 6/25/84
35			0%	ST-7		CL	NO SAMPLE RECOVERY PROBABLY SOFT CLAY.	
40		5-5-5	10%	SS-1		SM	BROWN CLAYEY SANDY SILT	
45			60%	ST-8		ML	BROWN AND GRAY CLAYEY SILT	

NOTES:

D'APPOLONIA

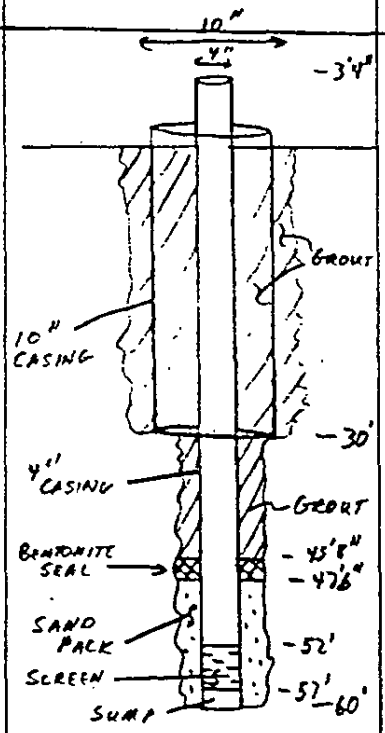
VISUAL CLASSIFICATION OF SOILS

PROJECT NAME Exxon PROJECT NUMBER 846162-01
FIELD ENG./GEO. CSH APPROX. ELEV.
COORDINATES DRILLING METHODS Rotary-Auger

PAGE 2 OF 2
BORING NO. S-3
DATE 6/26/84

CASING INFORMATION		GROUNDWATER LEVEL DATA			
SIZE	DEPTH	ACTUAL TIME	DEPTH	ACTUAL TIME	DEPTH
10"	30'				
4"	60'				

DEPTH	CASING BLOWS PER 30 CM.	BLOWS ON SAMPLER PER 15 CM.	SAMPLER RECOVERY	SAMPLE NO. AND TYPE	SOIL PROFILE	U.S.C.S. SYMBOL	DESCRIPTION	REMARKS
45								
50			40%	ST-9		CL	GRAY AND BROWN SILTY CLAY	
55			80%	ST-10		ML	GRAY AND BROWN CLAYEY SILT	
60			50%	ST-11		ML	GRAY CLAYEY SILT	STOP TIME 4:00 PM



LEFT SIT AT 5:30 PM 6/26/84

NOTES: WELL GROUTED (COMPLETED) 10:00AM 6/27/84 DRILLERS LEFT SITE AT 10:15 AM 6/27/84

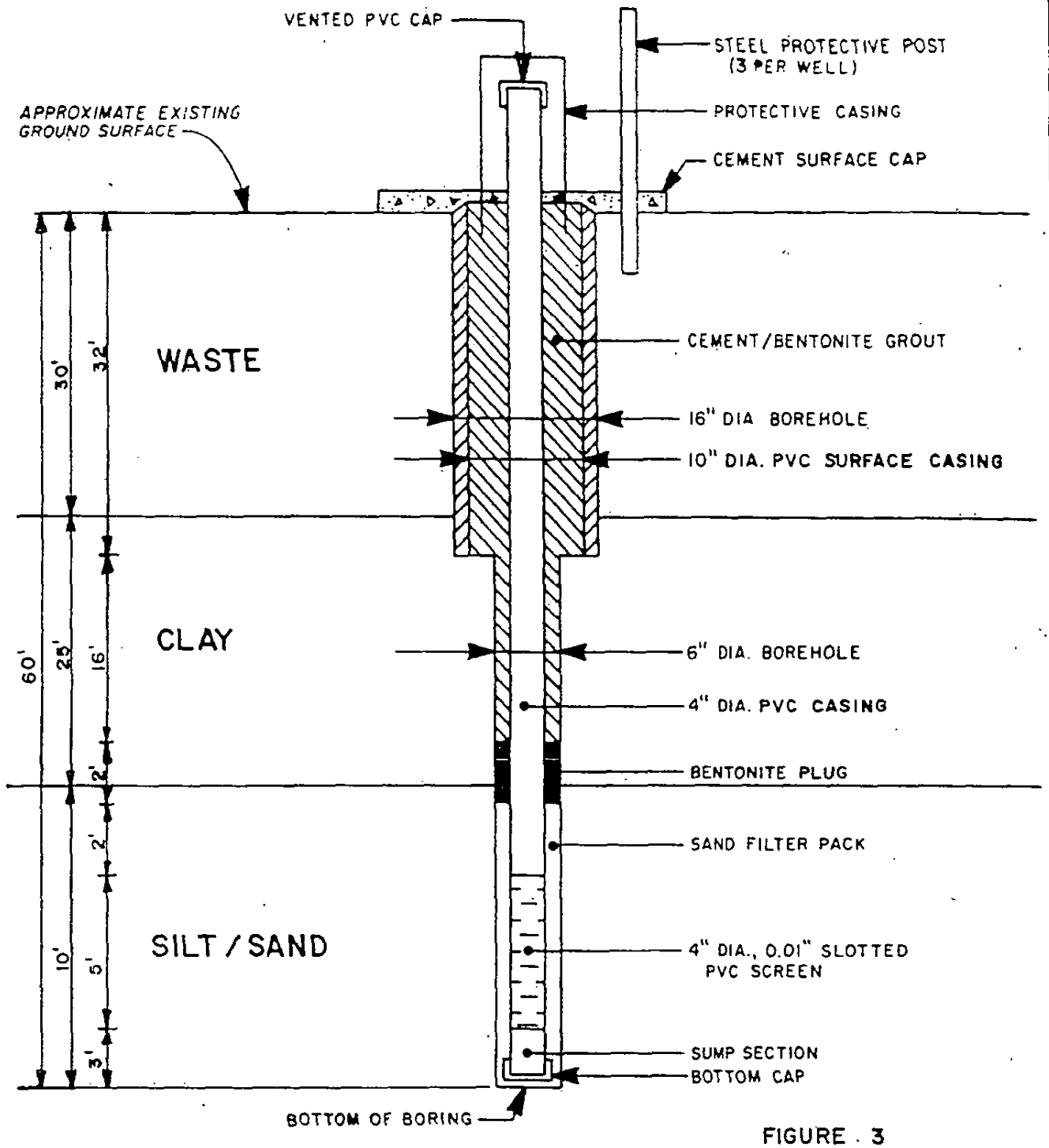


FIGURE 3

S-3 WELL
COMPLETION DETAILS

PREPARED FOR
EXXON USA
BATON ROUGE REFINERY
BATON ROUGE, LOUISIANA

NOTE:
S-1 AND S-2 WERE PLUGGED AND ABANDONED.

D'APPOLONIA

D'APPOLONIA

2 2 120

VISUAL CLASSIFICATION OF SOILS

PROJECT NAME EXXON PROJECT NUMBER 846162-01
FIELD ENG./GEO. CSH APPROX. ELEV.
COORDINATES DRILLING METHODS ROTARY-AUGER

PAGE 1 OF 3
BORING NO. S-4
DATE 6/26/84

CASING INFORMATION		GROUNDWATER LEVEL DATA			
SIZE	DEPTH	ACTUAL TIME	DEPTH	ACTUAL TIME	DEPTH

Vacuum Truck here from 9:0[illegible]

DEPTH	CASING BLOWS PER 30 CM.	BLOWS ON SAMPLER PER 15 CM.	SAMPLER RECOVERY	SAMPLE NO. AND TYPE	SOIL PROFILE	U.S.C.S. SYMBOL	DESCRIPTION	REMARKS
0								SET UP AND STARTED DRILLING A 7:30 Hard red brick, rubble top 3'. Very tough to drill through. Melted auger bit off. Moved hole several feet north began augering down. They have 5 men out here today. Hammed visited. Put on rock bit at 8:15 6.5' Deep Punched through rubble. Tryed second ST sampler. Began rotary drilling with rock bit and water. Prime pump 8:30 - 8:38. Mud rod and reprimed pump at 8:48-8:50
			10%	ST-1		SM-SC	Shelby tube was bent by concrete blocks, brick, rubble. Black silty sandy clay, oily sludge.	
5								
			60%	ST-2		ML-CL	Brown and gray silty clay w/ Black oily sludge, brick rubble.	
10								
			100%	ST-3		CL-ML	Brown and gray silty clay w/ Black oily sludge. Bottom 1' Brown and gray stiff clay.	
15								Pulled out of hole with rock bit began reaming with 16" wing bit at 9:15, Broke 16" bit in hole at 9:45 AM
			100%	ST-4		CL	Brown and grey stiff clay.	
20								MOVED HOLE 15' NE TO AVOID RUBBLE. FREE ACCT AT 4'-6'.
25								
30								
35								
40								
45								

NOTES:

D'APPOLONIA

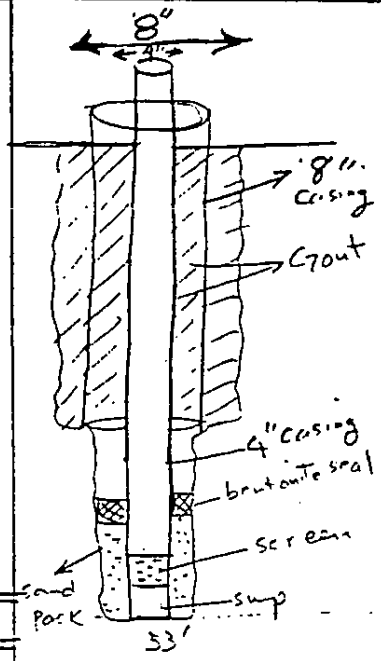
2 2 120

VISUAL CLASSIFICATION OF SOILS

PROJECT NAME Exxon BR PROJECT NUMBER 84 6162-01
FIELD ENG./GEO. ZoT APPROX. ELEV.
COORDINATES DRILLING METHODS Rotary Auger

PAGE 2 OF 3
BORING NO. S-4
DATE 7/3/84

CASING INFORMATION		GROUNDWATER LEVEL DATA			
SIZE	DEPTH	ACTUAL TIME	DEPTH	ACTUAL TIME	DEPTH
8"	23'				

DEPTH	CASING BLOWS PER 30 CM.	BLOWS ON SAMPLER PER 15 CM.	SAMPLER RECOVERY	SAMPLE NO. AND TYPE	SOIL PROFILE	U.S.C.S. SYMBOL	DESCRIPTION	REMARKS
5'								S-4 was washed down to 22 ft. Previously. — ended 2:10 P.M.
10'								S-4, 8" casing was set a bit off from straight line. 1:30 P.M. 500 gallon water tank was filled up w/water.
15'								Steam cleaned all drilling pipes, drill bit etc..
20'								
25'			60%	ST-5				Dark gray silty clay medium (hardness) slight odor. (trace of organics) wood frags.
30'			80%	ST-6			No odor, silty clay	
							soft, Dark Gray. trace of organics	
35'				ST-7			* No odor, Dark-Gray / tan clayey silt * trace of organics	soft. very wet sample 80% wet.
40'			70%	ST-8			No odor, Dark-Gray Clayey silt w/trace of pyrite, organics & Very Fine sand.	soft
45'				ST-9			same as above sample.	

NOTES:

* change in lithology

(4:55 p.m. S-4 completed)

Pellets = 2 ft.

Screened = 45'-50'
Bentonite seal = 41'-42'
Sand pack = 42'-54'
Sump = 3' (53-50)
Grouted = 40 to close to surface
bottom of the well = 54'

D'APPOLONIA

2 2 120

VISUAL CLASSIFICATION OF SOILS

PROJECT NAME Exxon PROJECT NUMBER 846162-01
FIELD ENG./GEO. ZOT APPROX. ELEV.
COORDINATES DRILLING METHODS Rotary Auger

PAGE 3 OF 3
BORING NO. S-4
DATE 7/3/84

CASING INFORMATION		GROUNDWATER LEVEL DATA			
SIZE	DEPTH	ACTUAL TIME	DEPTH	ACTUAL TIME	DEPTH

DEPTH	CASING BLOWS PER 30 CM.	BLOWS ON SAMPLER PER 15 CM.	SAMPLER RECOVERY	SAMPLE NO. AND TYPE	SOIL PROFILE	U.S.C.S. SYMBOL	DESCRIPTION	REMARKS
							Dark-Gray clayey silt. trace of organics & sand	semi wet ≈50% No odor very fine-grained
50'			60%	ST-10				
							Screen for S-4 is set from 45'-50' below ground surface.	
55'								Bottom of S-4 at 54'
							T.D. = 54 ft.	

NOTES:

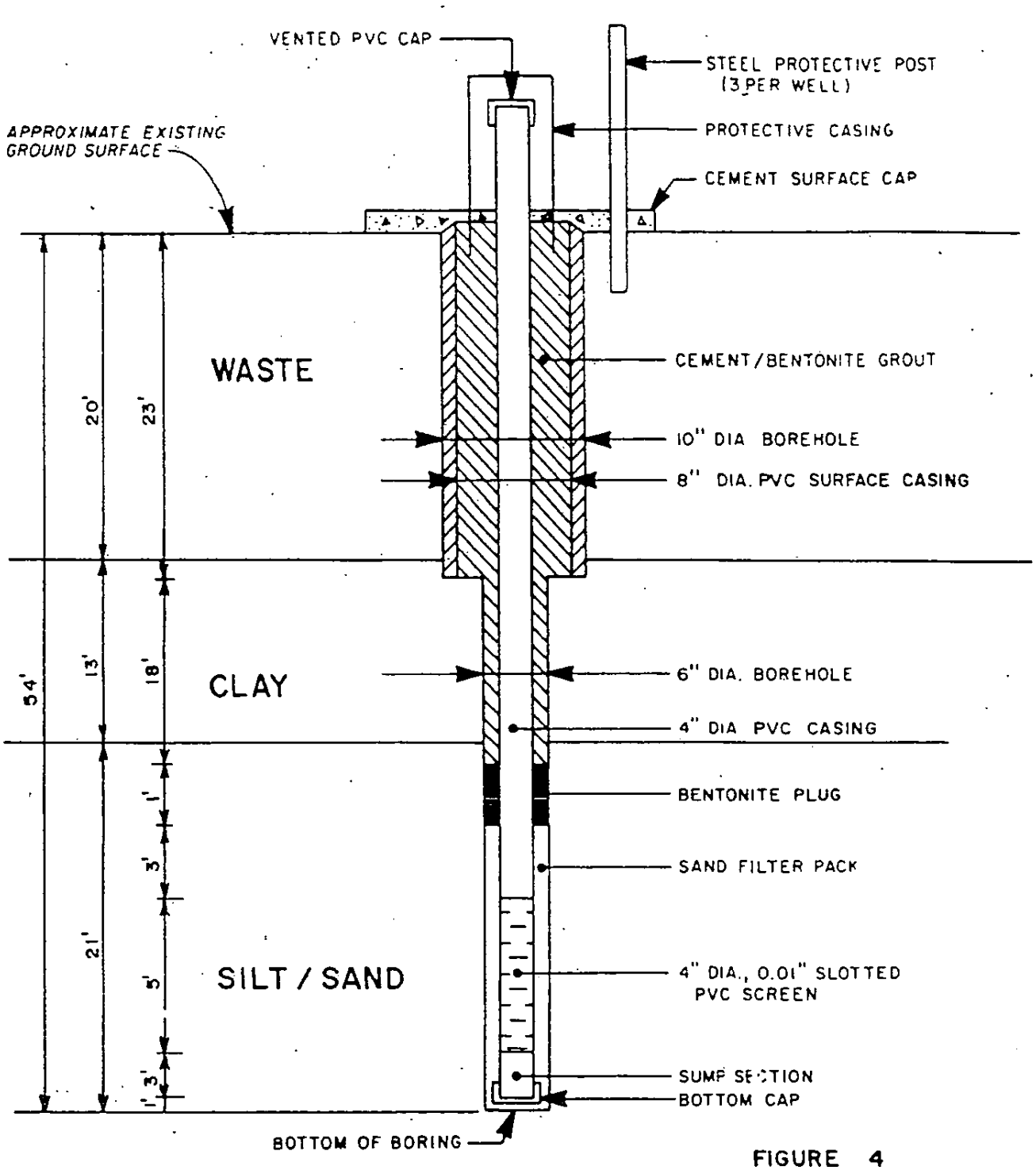


FIGURE 4

S-4 WELL

COMPLETION DETAILS

NOTE:
S-1 AND S-2 WERE PLUGGED AND ABANDONED.

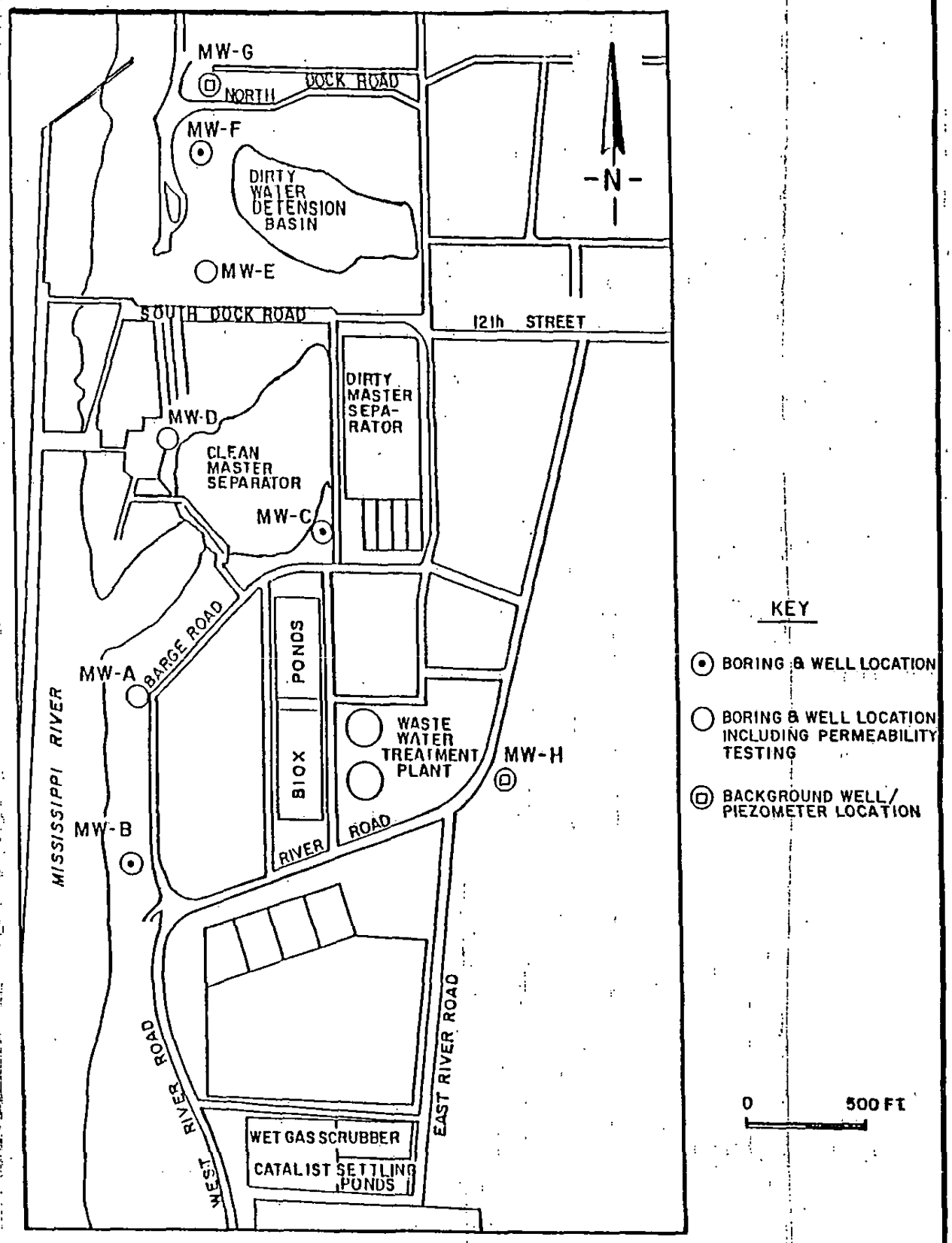
PREPARED FOR

EXXON USA

BATON ROUGE REFINERY
BATON ROUGE, LOUISIANA

D'APPOLONIA

DRAWN BY | 8/3/84 | APPROVED BY | NUMBER 84 6102-A



ERM-Southwest, Inc.

FIGURE 2-1
SOLID WASTE MONITORING WELL LOCATIONS

EXXON BATON ROUGE REFINERY

W.O. NO. 14-34

D.D.F.

TABLE 3-5

WELL COMPLETION DATA

Well Number	Date of Completion	Well Diameter (in.)	Top of PVC Casing Elevation (MSL, ft.)	Screen Length (ft.)	Screen Interval	Depth (ft.)	Lithology
W-A	06/23/86	2	54.24	10'/5' (split screen)	47.24 to 37.28 32.24 to 27.24	30	Clay, sand, silty clay (fill)
W-B	06/26/86	2	39.87	5	32.87 to 27.87	20	Clayey sand, clay (fill)
W-C	06/24/86	2	45.5	5'/5' (split screen)	38 to 33 28 to 23	27	Clayey silt, clay (fill)
W-D	06/24/86	2	46.05	5	38.05 to 33.05	15	Silty clay (fill)
W-E	06/25/86	2	40.89	10	33.09 to 23.09	17	Clay, clayey sand (fill)
W-F	06/25/86	2	47.51	10	35.71 to 25.71	22	Clayey silt, silty sand (fill)
W-G	06/25/86	2	45.35	10	39.55 to 29.55	20	Clay, sand, silty clay (fill)
W-H	06/25/86	2	57.63	10	46.43 to 36.43	22	Clay (fill)

Eli-Southwest, Inc.

Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W. O. Number 14-36

Well Number MW-A Total Depth 30' Diameter 8"

Surface Elevation 52.24' Water Level: Initial – 24-hrs. 36.2'

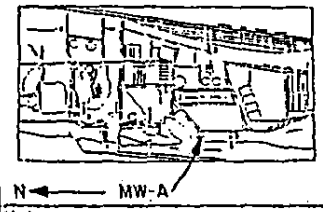
Screen: Dia. 2" Length 10'/5' Slot Size 0.01"

Casing: Dia. 2" Length 12'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-23-86

Sketch Map



Notes TOP OF CASING ELEVATION: 54.24'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-5'	0-1' 1-5'	Sand: Light brown, medium grained Sandy Clay: Dark brown, olive green to brown in color from 2'-5'.
5					5-10'	5-10'	Clay: Dark olive to brown, slightly sandy, pebbles, small sand lenses present.
10					10-15'	10-11' 11-15'	Sand: Medium-grained, black organic looking material present. Sandy Clay: Green to olive, strong hydrocarbon odor.
15 ▼					15-20'	15-25'	Silty Clay: Dark green to brownish gray; silt content increases at 18', contains oily material from 20-25'.
20					20-25'		
25					25-30'	25-30'	Clay: Olive, stiff.
30							

ERM-Southwest, Inc.

Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W.O. Number 14-36

Well Number MW-8 Total Depth 20' Diameter 8"

Surface Elevation 37.87' Water Level: Initial — 24-hrs. —

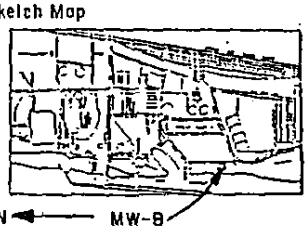
Screen: Dia. 2" Length 5' Slot Size 0.01"

Casing: Dia. 2" Length 7'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-26-86

Sketch Map



Notes TOP OF CASING ELEVATION: 39.87'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-5'	0-2'	Road Fill: Rock and gravel rubble.
						2-7'	Sand: Greenish gray, fine to medium grained, pebbles.
5					5-10'		
						7-9'	Clayey Sand: Green, very fine grained, saturated.
						9-14'	Clay: Olive green, stiff, hard.
10					10-15'		
						14-15'	Sandy Clay: Olive green, soft, slightly moist.
15					15-20'	15-20'	Sand: Green, fine to medium grained, saturated.
20							

ERM-Southwest, Inc.

Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W.O. Number 14-36

Well Number MW-C Total Depth 27' Diameter 8"

Surface Elevation 44.0' Water Level: Initial — 24-hrs. 33.5'

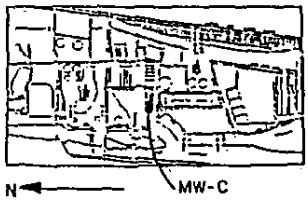
Screen: Dia. 2" Length 5'/5' Slot Size 0.01"

Casing: Dia. 2" Length 13'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-24-86

Sketch Map



Notes TOP OF CASING ELEVATION: 45.5'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-2'	0-2'	Road Fill: Rock and gravel rubble.
					2-7'	2-4.5'	Clay: Contains shells, pebbles, and dark black material; strong hydrocarbon odor; thin medium-grained sand seam from 4'-4.5'.
5						4.5-20'	Clayey Silt: Olive to greenish black, plant fragments present; strong hydrocarbon odor; black oily material from 17'-20'.
					7-12'		
▼10							
					12-17'		
15							
					17-22'		
20						20-27'	Clay: Green to olive; gradational upper boundary, stiff; black oily material from 21'-22'.
					22-27'		
25							

Page ____ of ____

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Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W.O. Number 14-36

Well Number MW-D Total Depth 15' Diameter 8"

Surface Elevation 44.05' Water Level: Initial — 24-hrs. —

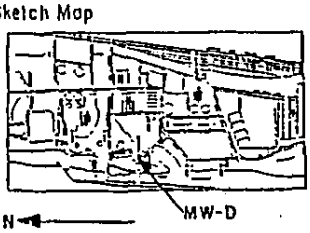
Screen: Dia. 2" Length 5' Slot Size 0.01"

Casing: Dia. 2" Length 8'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-24-86

Sketch Map



Notes TOP OF CASING ELEVATION: 46.05'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-5'	0-1'	Road Fill: Rock and gravel rubble.
						1-3'	Sand: Orange brown, medium grained, gradational basal boundary.
						3-5'	Clayey Silt: Gray, contains pebbles and chert fragments.
5					5-10'	5-10'	Silty Clay: Gray, contains pebbles, slight hydrocarbon odor.
10					10-15'	10-15'	Silty Clay: Olive green, soft, very homogeneous. Distinct from 5'-10' silty clay interval.
15							

ERM-Southwest, Inc.

Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W. O. Number 14-36

Well Number MW-E Total Depth 17' Diameter 8"

Surface Elevation 38.09' Water Level: Initial — 24-hrs. 34.47'

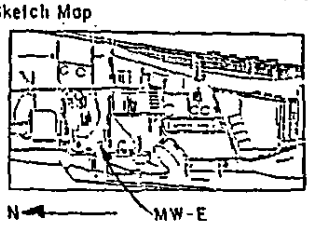
Screen: Dia. 2" Length 10' Slot Size 0.01"

Casing: Dia. 2" Length 7'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-25-86

Sketch Map



Notes TOP OF CASING ELEVATION: 40.89'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-2'	0-2'	Road Fill: Rock and gravel rubble.
					2-7'	2-3'	Silty Clay: Olive green, soft.
						3-4'	Clay: Orange to oranglsh brown, very stiff, hard, shell fragments present.
						4-8'	Sand: Green to greenish gray, saturated, minor clay component towards base of interval. Slight hydrocarbon odor from 4'-5'.
5					7-12'		
						8-10'	Clayey Sand: Greenish gray, fine to medium grained, moist.
10						10-17'	Clay: Greenish or olive, soft, plant fragments, some moisture.
					12-17'		
15							

ERM-Southwest, Inc.

Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W.O. Number 14-36

Well Number MW-F Total Depth 22' Diameter 8"

Surface Elevation 44.71' Water Level: Initial — 24-hrs. 35.76'

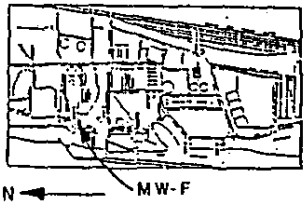
Screen: Dia. 2" Length 10' Slot Size 0.01"

Casing: Dia. 2" Length 12'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-25-86

Sketch Map



Notes TOP OF CASING ELEVATION: 47.51'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-2'	0-2'	Road Fill: Rock and gravel rubble.
					2-7'	2-6'	Silty Clay: Olive green with light gray and orangish brown mottling, contains plant roots and pebbles: very high silt content.
5						6-7'	Clayey Silt: Light gray, grading to a stiff, hard olive clay.
					7-12'	7-11.5'	Clay: Green to olive with orange to light gray mottling, stiff, fairly hard.
10							
					12-17'	11.5-17'	Silty Sand: Very dark green, fine grained saturated from 14'-16': moist otherwise oily material present from 14'-16'. Clay content increases at base of interval.
15							
					17-22'	17-22'	Clay: Dark olive green, stiff but soft, some plant fragments.
20							

ERM-Southwest, Inc.

Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W.O. Number 14-36

Well Number MW-G Total Depth 20' Diameter 8"

Surface Elevation 43.55' Water Level: Initial — 24-hrs. 39.22'

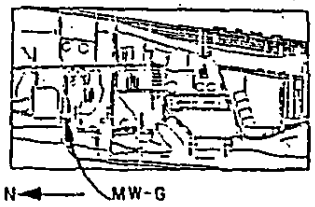
Screen: Dia. 2" Length 10' Slot Size 0.01"

Casing: Dia. 2" Length 7'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-25-86

Sketch Map



Notes TOP OF CASING ELEVATION: 45.35'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-5'	0-2'	Road Fill: Rock and gravel rubble.
						2-5'	Clay: Brown, stiff; contains brick rubble, pebbles, and roots; some sand patches.
5					5-10'	5-12'	Sand: Black, fine to medium grained; black oily material present; clayey at bottom of interval.
10					10-15'		
						12-20'	Silty Clay: Green, homogeneous clay much stiffer and less silty toward base of interval.
15					15-20'		
20							

ERM-Southwest, Inc.

Drilling Log

Project HYDROGEOLOGIC INVESTIGATION Owner EXXON COMPANY, U.S.A.

Location BATON ROUGE, LA. W.O. Number 14-36

Well Number MW-H Total Depth 22' Diameter 8"

Surface Elevation 55.43' Water Level: Initial — 24-hrs. 46.55'

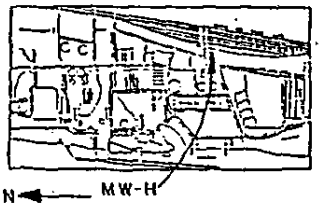
Screen: Dia. 2" Length 10' Slot Size 0.01"

Casing: Dia. 2" Length 10'/3' SUMP Type SCH. 40 PVC

Drilling Company ELI Drilling Method HOLLOW STEM AUGER

Driller G. MARCHESE Log By S. MacDONALD Date Drilled 6-25-86

Sketch Map



Notes TOP OF CASING ELEVATION: 57.63'

DEPTH (FEET)	GRAPHIC LOG	WELL CONSTRUCTION	SAMPLE TYPE	COHESIVE STRENGTH (TONS/SQ.FT.)	SAMPLE INTERVAL	DESCRIPTION INTERVAL	Description/Soil Classification (Color, Texture, Structures)
0					0-5'	0-2'	Road Fill: Rock and gravel rubble.
						2-7'	Silty Clay: Brown to green, pebbles, moderately stiff, minor fine grained sand component.
5					5-10'		
						7-12'	Clay: Green with gray and orange-brown mottling, pebbles, sand pockets with dark orange material present.
▼ 10					10-15'		
						12-17'	Clay: Green, soft, pebbles and brick fragments, moist, some sand intermixed, dark black oily looking material present.
15					15-20'		
						17-22'	Clay: Yellow-green with brown mottling, very stiff and hard. Believed to be Pleistocene clay.
20					20-22'		
25							

LOG OF BORING:	PLATE:
DM-1	E-2, E-3
DM-2	E-4
DM-3	E-5
DM-4	E-6
DM-5	E-7
DM-6	E-8, E-9
DM-7	E-10
DM-7A	E-11
DM-7B	E-11
DM-8	E-12
DM-8A	E-12
DM-9	E-13, E-14
DM-10	E-15, E-16
DM-10A	E-16
DM-11	E-17, E-18, E-19
DM-12	E-20, E-21
DM-13	E-22, E-23
DM-14	E-24, E-25
DM-15	E-26, E-27
DM-16	E-28
DM-17	E-29
DM-18	E-30
DM-19	E-31
DM-20	E-32, E-33
DM-21	E-34
DM-22	E-35
DM-23	E-36
DM-24	E-37
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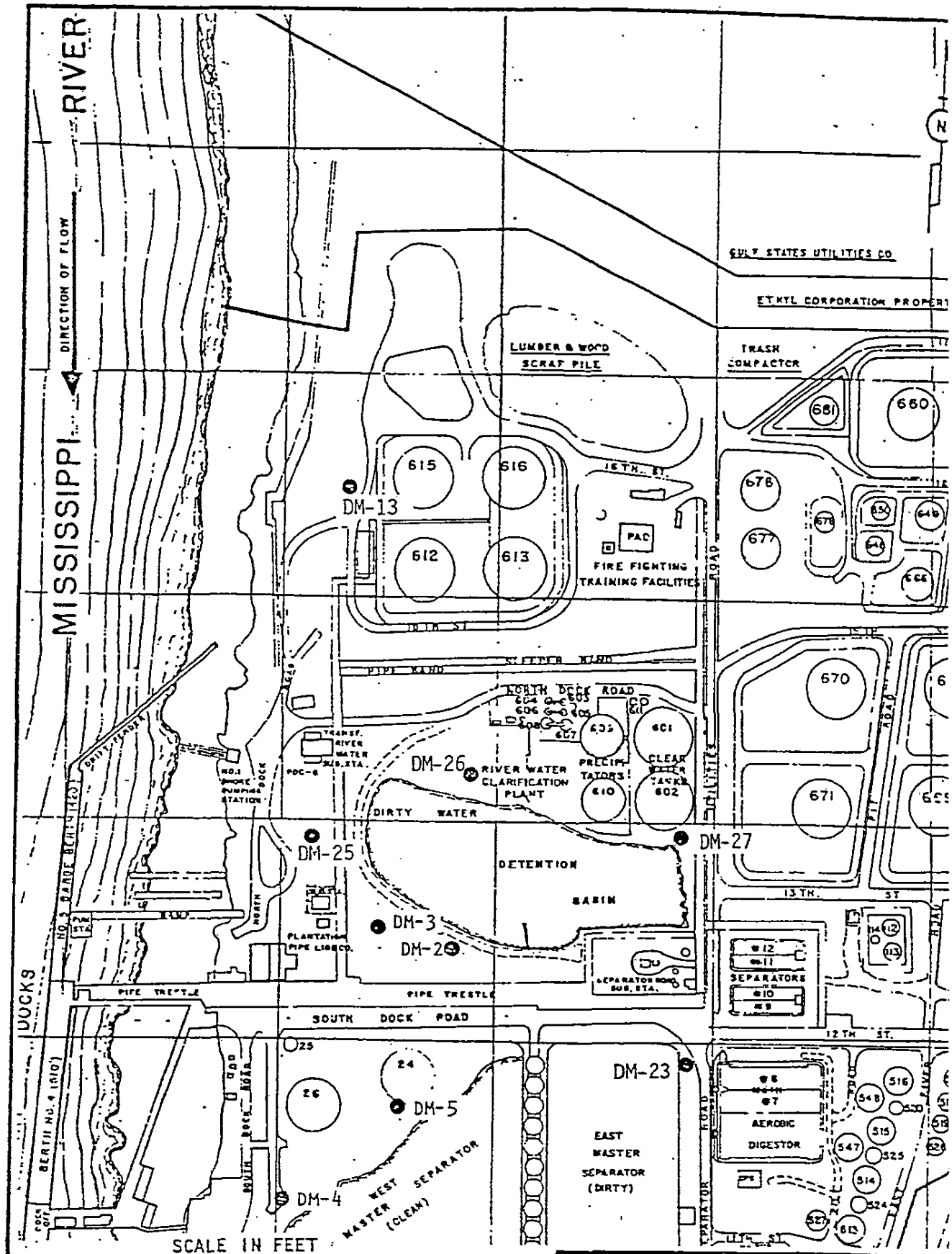
DM-26	E-39
DM-26A	E-40
DM-27	E-41
B-1	E-42
B-2	E-43



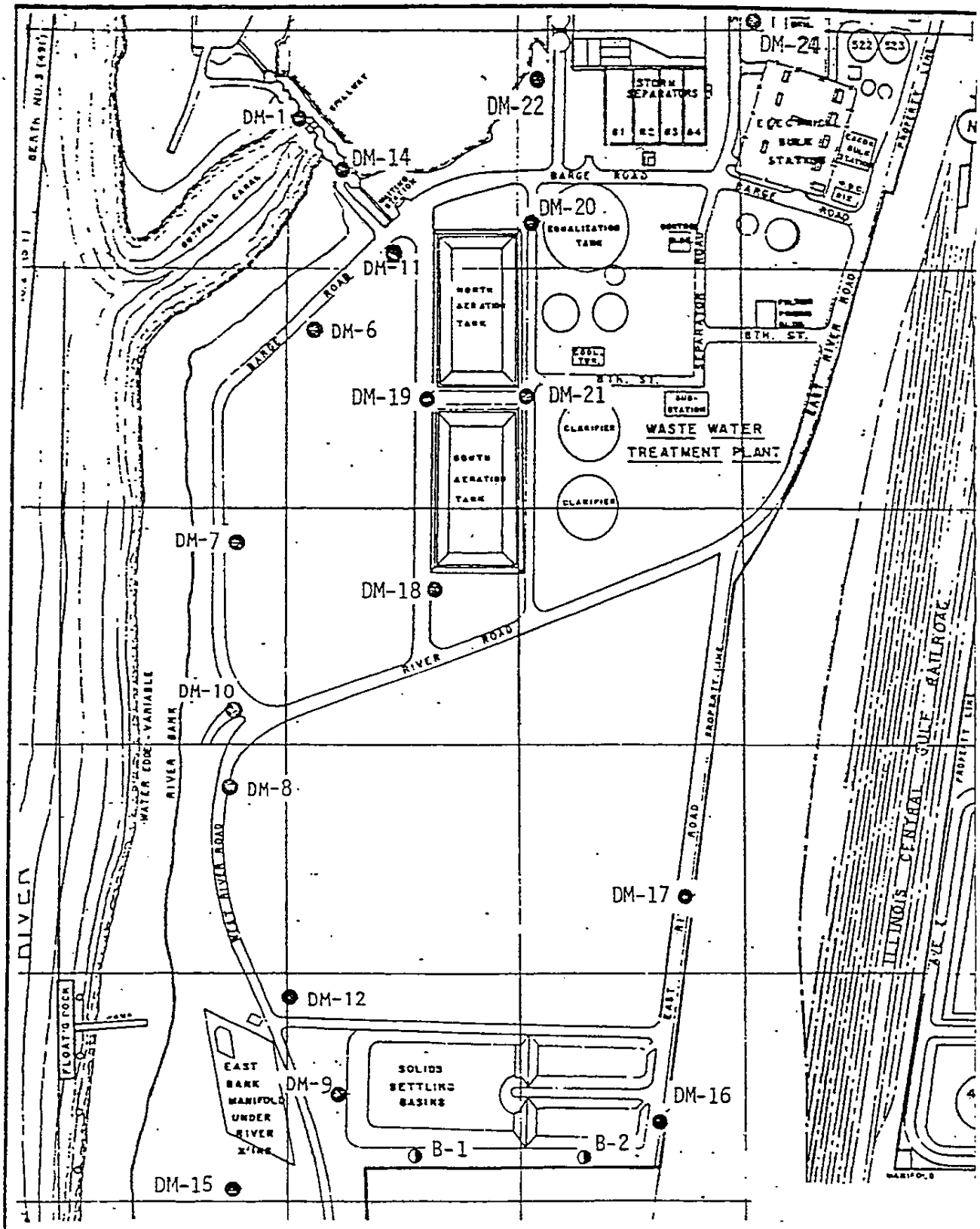
LEGEND

● MONITOR WELLS

BATON ROUGE REFINERY
LOUISIANA
FOR EXXON USA

MONITOR WELL LOCATIONS
REFINERY

25



SCALE IN FEET

0 200 400

LEGEND

● MONITOR WELLS

◑ BORINGS ADVANCED FOR SUBSURFACE DATA ONLY

BATON ROUGE REFINERY
LOUISIANA
FOR EXXON USA

MONITOR WELL LOCATIONS
REFINERY

2E

BORING DM-1

SURFACE ELEVATION 36.96'
COORDINATES N 9349
E 8552

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS DESCRIPTION

REINFORCED CONCRETE
BACKFILL TO COFFER DAM CELL

SANDY SILT, TRACES OF GRAVEL
OIL PRESENT, STRONG HYDROCARBON ODOR

GRAY, SILTY CLAY, SOFT, OIL PRESENT

OIL IN DRILLING MUD DECREASES

ESTIMATED BOTTOM OF COFFER DAM PILING

GRAY SILT WITH ZONES OF SILTY CLAY

(CONTINUED ON FOLLOWING PLATE)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ☑ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-1 (cont'd)

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	STRENGTH TEST RESULTS: CONFINING PRESSURE (psf)	STRENGTH TEST RESULTS: PEAK SHEAR STRENGTH (psf)	% PASSING NO 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	ATTERBERG LIMITS: PL (%)	ATTERBERG LIMITS: PI (%)	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE TYPE	DEPTH IN FEET
										P	U	70
1.7×10^{-6}				50	94	27				P	U	75
8.6×10^{-5} (FIELD)												80
												85
												90
												95
												100
												105
												110
												115
												120
												125
												130
												135
												140

SAMPLING — SYMBOLS — DESCRIPTION

BORING TERMINATED AT A DEPTH OF 84.0 FEET ON 9/19/79

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANC WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

DAMES & MOORE

BORING DM-2

SURFACE ELEVATION 38.38'
COORDINATES N 10,238
E 8,922

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	STRENGTH TEST RESULTS: CONFINING PRESSURE (psf)	STRENGTH TEST RESULTS: PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	ATTERBERG LIMITS: PL (%)	ATTERBERG LIMITS: PI (%)	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	0	■	ML	BROWN AND LIGHT GRAY CLAYEY SILT WITH POCKETS OF CLAYEY SAND AND GRAVEL, OILY
										P	U	5	■	CL	GREENISH GRAY AND DARK GRAY SILTY CLAY, SOFT, ODOR OF O WOOD FRAGMENTS
										P	U	10	□		GRADES BLACK WITH OIL
							74	32	42	P	U		■		GRAY, CLAY, SOFT
										P	U	15	■	CH	WOOD FRAGMENTS
5.4×10^{-8}					81	37				P	U	20	■ ■		GRAY SILTY CLAY, SOFT
										P	U	25	■	CL	
										P	U	30	■		GRAY, CLAYEY SILT
										P	U	35	■	ML	
										P	U	40	■		
3.9×10^{-6}				77	89	31				P	U	45	■		BORING TERMINATED AT A DEPTH OF 47.0 FEET ON 9/25/79
												50			
												55			
												60			
												65			
												70			

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-3

SURFACE ELEVATION 37.92'
COORDINATES N 10,283
E 8751

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
							57	26	31	P	U
										P	U
										P	U
										P	U
										P	U
							53	24	29	P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
ML	GRAY AND BLACK, CLAYEY SILT, OIL PRESENT
CL	BROWN SILTY CLAY
	GRADES GREENISH GRAY
ML	GRAY SILT
CH	GRAY, CLAY, SOFT, OILY ODOR
	GRAY CLAY WITH TRACES OF SILT
	FINE SILT LENSES PRESENT
CH	CLAYEY SILT LENSE
ML	GRAY SANDY SILT
	CLAY ZONE
CL	GRAY SILTY CLAY, STIFF

BORING TERMINATED AT A DEPTH OF 72.0 FEET ON 9/22/79

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

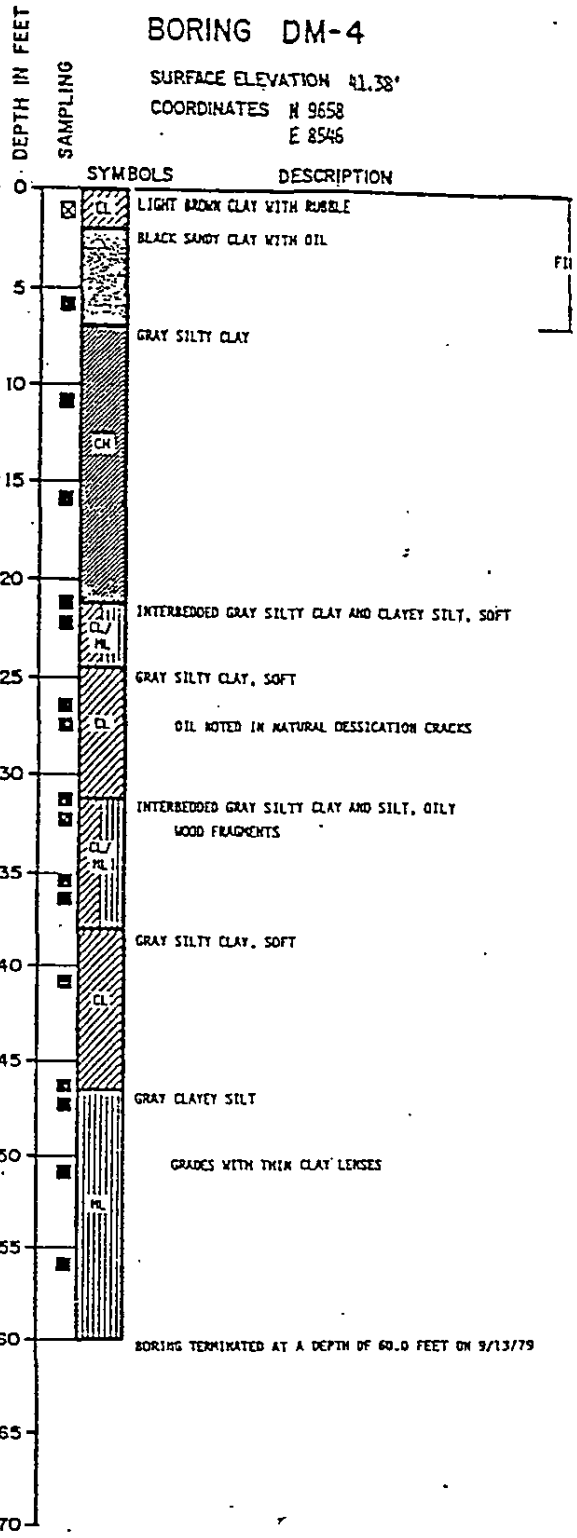
NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORD WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM

LOG OF BORING

BORING DM-4

SURFACE ELEVATION 41.38'
COORDINATES N 9658
E 8546

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
							56	27	29	P	U
7.7×10^{-8}					85	34				P	U
										P	U
							39	25	14	P	U
										P	U
										P	U
							24	18	26	P	U
										P	U
										P	U
4.9×10^{-6} (FIELD)										P	U



KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

DAMES & MOORE

BORING DM-5

SURFACE ELEVATION 41.31'

COORDINATES N 9869
E 8806

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
4.1×10^{-8} 3.8×10^{-6} (FIELD)					75	45				P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
CL	GRAY AND BROWN SANDY CLAY WITH SHELLS AND GRAVEL
	FINE TO MEDIUM SAND, LOOSE. PERCHED WATER TABLE AT 2 FE 9/19/79
SP	
	GRAY AND BLACK CLAY WITH TRACES OF OIL AND WOOD FRAGMENT
CH	GRADES WITH TRACES OF SAND
	VISIBLE OIL GRADES OUT
	GRADES WITH SILT ZONES
	BORING TERMINATED AT A DEPTH OF 26.5 FEET ON 9/19/79

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

DAMES & MOORE

BORING DM-6

SURFACE ELEVATION 52.29'
COORDINATES N 8905
E 8584

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	STRENGTH TEST RESULTS: CONFINING PRESSURE (psf)	STRENGTH TEST RESULTS: PEAK SHEAR STRENGTH (psf)	% PASSING NO 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	ATTERBERG LIMITS: PL (%)	ATTERBERG LIMITS: PI (%)	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	0	■		GRAY SANDY CLAY WITH OILY SLUDGE, SOFT
															GRADES BLACK WITH MORE SAND, AND DEBRIS
										P	U	5	■		
															GRADES WITH LESS SAND
										P	U	10	■		
										P	U	15	■		GRADES GRAY
										P	U	20	■		
															GRAY, SLIGHTLY SILTY CLAY, MEDIUM STIFF
							71	22	49	P	U	25	■		
															GRADES WITH MORE SILT
										P	U	30	◪		FREE OIL NOTED IN DESSICATION CRACKS
										P	U	35	■		
							55	21	34	P	U	40	⊠ ■		
												45		CH	NO FREE OIL PRESENT
										P	U		⊠ ⊠		
										P	U	50	■		
										P	U	55	■		
							64	23	41	P	U	60	⊠		GRADES WITH OCCASIONAL FINE SILT ZONES
										P	U	65	■		
												70			

(CONTINUED ON FOLLOWING PLATE)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-6 (cont'd)

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	70	■		
										P	U		□		
										P	U	75	■	CH	
										P	U	80	■		GRADES WITH MORE SILT
										P	U				INTERBEDDED GRAY SILT AND SILTY CLAY
										P	U	85	■	ML/CL	
1.8×10^{-5} (FIELD)										P	U	90	■		
												95			BORING TERMINATED AT A DEPTH OF 95.0 FEET ON 9/10/79
												100			
												105			
												110			
												115			
												120			
												125			
												130			
												135			
												140			

KEY

■ INDICATES UNDISTURBED SAMPLE

⊠ INDICATES DISTURBED SAMPLE

□ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY

◪ INDICATES STANDARD PENETRATION TEST SAMPLE

P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

U - DAMES & MOORE "U" BIT

T - DAMES & MOORE THIN-WALL

P - DAMES & MOORE PISTON

S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANC WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

DAMES & MOORE

BORING DM-7

SURFACE ELEVATION 52.77'
COORDINATES N 8466
E 8416

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	STRENGTH TEST RESULTS: CONFINING PRESSURE (psf)	STRENGTH TEST RESULTS: PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	ATTERBERG LIMITS: PL (%)	ATTERBERG LIMITS: PI (%)	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE TYPE	DEPTH IN FEET
										P	U	0
										P	U	5
										P	U	10
										P	U	15
										P	U	20
										P	U	
					82	36				P	U	25
							77	26	46	P	U	30
										P	U	35
									N.P	P	U	
										P	U	40
8.4×10^{-6} (FIELD)										P	U	45
												50
												55
												60
												65
												70

SYMBOLS

DESCRIPTION

DARK GRAY AND BLACK CLAY WITH RUBBLE AND OILY WASTE

FI

GRAY CLAY, SOFT WITH TRACES OF OIL

GRADES WITH SILT AND TRACE OF OIL, MEDIUM STIFF

GRADES STIFF WITH LESS SILT

GRADES WITH MORE SILT

INTERBEDDED GRAY SILT AND SILTY CLAY

BORING TERMINATED AT A DEPTH OF 48.0 FEET ON 9/9/79

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-7A

COORDINATES ADJACENT DM-7

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20

SAMPLING

SYMBOLS DESCRIPTION

DARK GRAY CLAY, SANDY WITH GRAVEL, OILY

GRAY CLAY, WITH OIL

BORING TERMINATED AT A DEPTH OF 8.5 FEET ON 9/6/79
OBSTRUCTION IN HOLE

BORING DM-7B

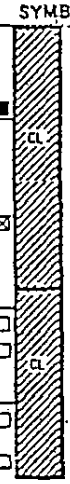
COORDINATES ADJACENT DM-7

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30

SAMPLING

SYMBOLS DESCRIPTION



DARK GRAY, SILTY CLAY WITH RUBBLE, OILY

BORING TERMINATED AT A DEPTH OF 24.0 FEET ON 9/6/79
RUBBLE CAVING INTO HOLE

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ☒ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

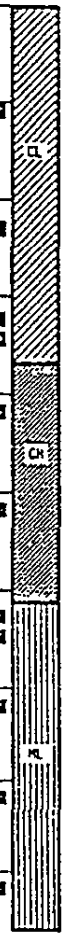
LOG OF BORINGS

BORING DM-8

SURFACE ELEVATION 52.97'
COORDINATES N 7942
E 8393

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET
												0
										P	U	5
										P	U	10
										P	T	15
					79	43				P	U	20
							60	22	38	P	U	25
1.8×10^{-5}				85	92	30				P	U	30
										P	U	35
4.1×10^{-4}										P	U	40
										P	U	45
												50

SYMBOLS



DESCRIPTION

BLACK CLAY WITH SILT, RUBBLE, TRASH AND OILY WASTE

GRAY CLAY WITH TRACE OF SILT

GRADES GRAY-BROWN, LESS SILT

GRADES BROWN

LIGHT BROWN SILT WITH CLAY

CLAY GRADES OUT

GRADES GRAY

GRADES WITH FINE SAND

BORING TERMINATED AT A DEPTH OF 48.0 FEET ON 9/12/79

BORING DM-8A

SURFACE ELEVATION
COORDINATES

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET
										P	U	0
												5
												10

SYMBOLS

DESCRIPTION

GRAY SILTY CLAY WITH GRAVEL

BORING TERMINATED AT A DEPTH OF 5.0 FEET ON 9/12/79 BECAUSE OF BROKEN AUGER

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ☒ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ☑ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORD WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM

LOG OF BORINGS

BORING DM-9

SURFACE ELEVATION 48.40'
COORDINATES N 7267
E 8639

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
					77	44				P	U
1.1×10^{-7}				99	85	34				P	U
							56	22	34	P	U
1.9×10^{-8}					74	45				P	T
							78	27	51	P	U
1.6×10^{-6}					92	29				P	U
							33	26	7	P	U
										P	U
										P P	U U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS — DESCRIPTION

- DARK GRAY SANDY CLAY WITH GRAVEL, OILY
- GRAVEL GRADES OUT
- CL — OCCASIONAL SHELLS
- PERCHED WATER TABLE AT 13 FEET
- SP — BLACK FINE TO MEDIUM SAND
- GRAY CLAY, MEDIUM STIFF. TRACES OF ROOTS
- CH
- GRAY SILTY CLAY
- CH
- GRADES WITH LESS SILT
- GRAY CLAYEY SILT, LOOSE
- CL/ML

(CONTINUED ON FOLLOWING PLATE)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCOR WITH THE UNIFIED SOIL CLASSIFICATION SYSTE

LOG OF BORING

DAMES & MOO

BORING DM-9 (cont'd)

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING SYMBOLS	DESCRIPTION
										P	U	70		
													CL/ ML	GRADES WITH MORE SILT
										P	U	75		GRAY CLAYEY SILT
													ML	GRADES LESS CLAYEY
										P	U	80		GRAY SILTY CLAY
													CL	GRAY SILT
										P	U	85		
													ML	
2.2×10^{-5} (FIELD)										P	U	90		
										P	U	95		BORING TERMINATED AT A DEPTH OF 96.0 FEET ON 9/13/79
												100		
												105		
												110		
												115		
												120		
												125		
												130		
												135		
												140		

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ☒ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORD WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM

LOG OF BORING

BORING DM-10

SURFACE ELEVATION 51.26'
COORDINATES N 8103
E 8409

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
							84	26	59	P	U
										P	U
										P	U
										P	U
										P	U
							42	21	21	P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS — DESCRIPTION

GRAY SILTY CLAY WITH RUBBLE AND TRACES OF OIL

GRAY CLAY, MEDIUM STIFF (CH)

GRAY SILTY CLAY, STIFF (CL)

GRAY AND DARK BROWN CLAY, MEDIUM STIFF (CH)

BROWN AND GRAY MOTTLED SILTY CLAY (CL)

GRAY SILT (ML)

GRADES CLAYEY

(CONTINUED ON FOLLOWING PLATE)

KEY

- INDICATES UNDISTURBED SAMPLE
- INDICATES DISTURBED SAMPLE
- INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDA
WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-10 (cont'd)

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	70	■	ML	GRAY SILTY CLAY AND INBEDDED CLAYEY SILT
									H.P.	P	U	75	■	CL/ML	
										P	U	80	■		GRADES VERY SILTY
															GRAY CLAYEY SILT
										P	U	85	■	ML	
										P	U	90	■		GRAY SILTY CLAY AND INTERBEDDED CLAYEY SILT
										P	U	95	■	CL/ML	
										P	U	100	■	SM	GRAY FINE SILTY SAND WITH WOOD FRAGMENTS
															GRAY FINE TO COARSE SAND, GRAVELLY, DENSE
										151	U	105	■	SW	GRADES WITH SILT AND GRAVEL TO 1 INCH
4.3×10^{-3} (FIELD)										162	U	110	■		
												115			BORING TERMINATED AT A DEPTH OF 115.0 FEET ON 9/6/79
												120			

BORING DM-10A

SURFACE ELEVATION

COORDINATES

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	0	■		BROWN CLAY WITH SHELLS, GRAVEL AND RUBBLE
												5			BORING TERMINATED AT A DEPTH OF 4.0 FEET ON 9/5/79 LOW PRESSURE STEAM LINE PENETRATED
												10			

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORINGS

BORING DM-11

SURFACE ELEVATION 53.72'
COORDINATES N 9071
E 8754

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING SYMBOLS	DESCRIPTION
										P	U	0		BLACK CLAYEY SAND WITH OILY SLUDGE AND TRACES OF GRAVEL
										P	U	5		DARK GRAY, MEDIUM SAND
										P	U	10		BLACK OILY SLUDGE WITH RUBBLE
										P	U	15		
										P	U	20		
														GRAY CLAY, MEDIUM STIFF
										P	U	25		FREE OIL IN NATURAL DESSICATION CRACKS
							85	28	57	P	U	30	CH	GRADES SILTY WITH ROOT FRAGMENTS, FREE OIL IN NATURAL DESSICATION CRACKS
										P	U	35		
														INTERBEDDED GRAY SILTY CLAY AND CLAYEY SILT
7.4×10^{-6}				76	90	32				P	U	40		
									N.P	P	U	45		
2.0×10^{-8} 3.5×10^{-7}				98	80 86	41 34				P	U	50		
							27	24	4	P	U	55	CL/ML	
										P	U	60		
										P	U	65		
												70		

(CONTINUED ON FOLLOWING PLATE)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-11 (cont'd)

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
1.9×10^{-8}					83	37				P	U	70	■ ■	CL/ ML	GRAY CLAY, MEDIUM STIFF
							90	35	55	P	U	75	■	CH	
										P	U	80	■	CL	GRAY SILTY CLAY, MEDIUM STIFF
										P	U	85	■		
										P	U	90	■	ML	GRAY CLAYEY SILT WITH THIN SILTY CLAY ZONES
										P	U	95	■		
							55	25	29	P	U	100	⊠	CL	GRAY SILTY CLAY WITH THIN SILT LAYERS
										P	U	105	⊠		
										P	U	110	■		
							50	20	31	P	U	115	■		
										P	U	120	⊠		SILT LAYERS GRADE OUT OCCASIONAL WOOD FRAGMENTS
										P	U	125	⊠		
										P	U	130	□	SM	SILTY SAND, DENSE
														CL	GRAY SILTY CLAY
										P	U	135	■	SW	GRAY FINE-COARSE SAND WITH GRAVEL, DENSE
												140			

(CONTINUED ON FOLLOWING PLATE)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDA WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-11 (cont'd)

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	STRENGTH TEST RESULTS: CONFINING PRESSURE (psf)	STRENGTH TEST RESULTS: PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	ATTERBERG LIMITS: PL (%)	ATTERBERG LIMITS: PI (%)	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE TYPE	DEPTH IN FEET	SAMPLING
2.7×10^{-4} (FIELD)										83	U	140	
												145	
												150	
												155	
												160	
												165	
												170	
												175	
												180	
												185	
												190	
												195	
												200	
												205	
												210	

SYMBOLS

DESCRIPTION

BORING TERMINATED AT A DEPTH OF 155.0 FEET ON 9/12/79

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ☒ INDICATES DISTURBED SAMPLE
- ☐ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ☑ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-12

SURFACE ELEVATION 51.86'
COORDINATES N 7489
E 8530

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	STRENGTH TEST RESULTS: CONFINING PRESSURE (psf)	STRENGTH TEST RESULTS: PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	ATTERBERG LIMITS: PL (%)	ATTERBERG LIMITS: PI (%)	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
1.6×10^{-7}					92	28				P	U
										P	U
									N.P.	P	U
										P	U
1.6×10^{-6}					98	31				P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SYMBOLS — SAMPLING

DESCRIPTION

GRAY AND BLACK CLAY, SOFT, VERY OILY, OCCASIONAL RUBBLE

FI

GRAY SILT, VERY OILY

GRAY, SILTY CLAY

INTERBEDDED GRAY SILT AND SILTY CLAY

GRAY SILT

OCCASIONAL THIN ZONE OF SILTY CLAY

(CONTINUED ON FOLLOWING PLATE)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDA WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

BORING DM-12 (cont'd)

PERMEABILITY (cm/s)	STRENGTH TEST RESULTS: TYPE OF TEST	STRENGTH TEST RESULTS: CONFINING PRESSURE (psf)	STRENGTH TEST RESULTS: PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	ATTERBERG LIMITS: PL (%)	ATTERBERG LIMITS: PI (%)	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE TYPE	DEPTH IN FEET	SAMPLING
										P	U	70	■
										P	U	75	■
							30	28	2	P	U	80	■
										P	U	85	■
										P	U	90	■
									N.P.	P	U	95	■
										P	U	100	■
										P	U	105	■
										61	U	110	■
										111	U	115	■
4.8×10^{-3} (FIELD)										127	U	120	■
												125	
												130	
												135	
												140	

SYMBOLS

DESCRIPTION

INTERBEDDED GRAY SILT, CLAYEY SILT AND SILTY CLAY

WOOD FRAGMENTS

GRAY FINE CLAYEY SAND

GRAY SILT WITH TRACES OF SAND

GRADES SANDY

MEDIUM TO COARSE SAND WITH GRAVEL, MEDIUM DENSE

GRADES DENSE

BORING TERMINATED AT A DEPTH OF 124.0 FEET ON 9/18/79

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANC WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.

LOG OF BORING

DAMES & MOORI

BORING DM-13

SURFACE ELEVATION 41.8 FT.
COORDINATES N 11222.82
E 8528.76

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
FIL	BROWN SILTY CLAY WITH GRAVEL AND ORGANICS (ROOTS) (VERY STIFF)
	GRADES WITH STRONG CHEMICAL ODOR
	GRADES WITH INCREASING SILT CONTENT
	BLACK CLAYEY SILT MIXED WITH OILY WASTE (SOFT)
	GRADES BROWN IN COLOR
	GRADES WITH BLACK CLAY
CL	GRAY MOTTLED BROWN SILTY CLAY WITH STRONG CHEMICAL ODOR (MEDIUM STIFF)
CH	GRAY PLASTIC CLAY WITH BLACK ORGANICS AND FAINT CHEMICAL ODOR (SOFT TO MEDIUM SOFT) AND SLICKENSIDES
	GRADES WITH BROWN MOTTLING AND INCREASING SILT CONTENT (SOFT)
CL	GRAY SILTY CLAY WITH FINE SAND (MEDIUM SOFT)
	GRADES WITH SAND
SM	GRAY SILTY FINE SAND (LOOSE TO MEDIUM DENSE)
	GRADING WITH CLAYEY LENSES
ML	GRAY SANDY SILT (VERY SOFT)
SM	GRAY SILTY CLAYEY FINE SAND (MEDIUM DENSE)
	GRADES WITH INCREASING SILT CONTENT AND SILT SEAMS (MEDIUM SOFT TO MEDIUM STIFF)
	GRADES WITH TRACE OF CLAY

(CONTINUED ON FOLLOWING PLATE)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

FILE 8037-099-12, 0106

LOG OF BORING

DAMES & MOOR

BORING DM-13 (cont'd)

SURFACE ELEVATION

COORDINATES

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										128	U
										79	U

DEPTH IN FEET: 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140

SAMPLING SYMBOLS: SM, ML, SM, ML, CL, SW

DESCRIPTION

GRAY CLAYEY SILT WITH TRACE OF VERY FINE SAND (MEDIUM STIFF)

GRADES WITH INCREASING SAND CONTENT (MEDIUM STIFF)

GRAY SILTY CLAYEY VERY FINE SAND (MEDIUM DENSE)

GRADES WITH INCREASING FINE SAND

GRADES WITH SILTY CLAY LENSES

GRAY CLAY SEAM (VERY STIFF) TO STIFF

GRAY CLAYEY SILT WITH FINE SAND (MEDIUM STIFF TO STIFF)

GRAY SILTY CLAY WITH FINE SAND LENSES (MEDIUM STIFF) TO STIFF

GRADES WITH SILT LENSES

FINE TO COARSE GRAVELLY SAND, WELL GRADED (DENSE)

GRADES WITH CLAYEY LENSES AND SILT

BORING TERMINATED AT A DEPTH OF 131.0 FEET ON 1/21/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

FILE 8037-039-12, D106

LOG OF BORING

DAMES & MOORE

BORING DM-14

SURFACE ELEVATION 37.6 FT.
COORDINATES N 9241.33
E 8655.93

OTHER TESTS	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS DESCRIPTION

CONCRETE PAD
SILTY CLAY WITH RUBBLE

FIL

GRAY SILTY CLAY WITH LITTLE FINE SAND (STIFF)

(CONTINUED)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ☒ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-14 (cont'd)

SURFACE ELEVATION

COORDINATES

OTHER TESTS	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING		DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE				
										P	U	70	■	CL	
												75			
										P	U	80	■	SM	GRAY SILTY FINE SAND (DENSE)
												85			CHANGE APPROXIMATE GRAY PLASTIC CLAY (STIFF)
										P	U	90	■	CH	
												95			CHANGE APPROXIMATE GRAY SILTY CLAY WITH CLAY STRINGERS AND TRACE VERY FINE SAND (STIFF TO VERY STIFF)
										P	U	100	■	CL/CH	
												105			CHANGE APPROXIMATE FINE TO COARSE SAND (SUBANGULAR) WITH OCCASIONAL ROUNDED PEA GRAVEL (LOOSE)
										P	U	110	⊠	SP	
												115			BORING TERMINATED AT A DEPTH OF 112.0 FEET ON 1/25/80
												120			
												125			
												130			
												135			
												140			

KEY

■ INDICATES UNDISTURBED SAMPLE

⊠ INDICATES DISTURBED SAMPLE

□ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY

◪ INDICATES STANDARD PENETRATION TEST SAMPLE

P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

U - DAMES & MOORE "U" BIT

T - DAMES & MOORE THIN-WALL

P - DAMES & MOORE PISTON

S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

BORING DM-15

SURFACE ELEVATION 44.0 FT.
COORDINATES N 7058.52
E 8389.20

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
	BLACK/BROWN SILTY GRAVEL COMPACT MEDIUM DENSE WITH OILY WASTE AND STRONG CHEMICAL ODOR
	GRADES WITH GREEN/GRAY CLAY SEAMS
	GRADES WITH RUBBLE (LOSING CIRCULATION)
FILL	
	GRAY PLASTIC CLAY WITH OCCASIONAL ROUNDED GRAVEL (STIFF)
CH	GRADES WITH INCREASING SILT CONTENT (STIFF). TRACE CHEMICAL ODOR
	GRAY SILTY CLAY WITH TRACE OF VERY FINE SAND (MEDIUM STIFF TO STIFF) CHEMICAL ODOR
ML	GRADES TO STIFF
	GRAY CLAYEY SILT WITH VERY FINE SAND SLIGHT CHEMICAL ODOR (MEDIUM DENSE)
ML CL	
	GRAY, SILTY CLAY WITH OCCASIONAL ROUNDED PEBBLES SLIGHT CHEMICAL ODOR AND TRACE OF BLACK ORGANICS (MEDIUM STIFF)
CL	
	BROWN CLAY WITH TRACE OF SILT (SOFT TO MEDIUM STIFF)
CL	GRADES WITH SILT LENSES
	GRAY, SILTY CLAY WITH TRACE FINE SAND (MEDIUM STIFF)
	GRADES BROWNISH IN COLOR AND WITH TRACE OF ORGANICS (STIFF)
CL	
	GRADES GRAY AND WITH TRACE FINE SAND (STIFF)
	GRADES STIFFER

(CONTINUED)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P – IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U – DAMES & MOORE "U" BIT
- T – DAMES & MOORE THIN-WALL
- P – DAMES & MOORE PISTON
- S – STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

FILE

LOG OF BORING

BORING DM-15 (cont'd)

SURFACE ELEVATION

COORDINATES

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140

SAMPLING

SYMBOLS

DESCRIPTION

- GRADES WITH INCREASING CLAY CONTENT
- CL — GRADES WITH SILTY STRINGERS AND BROWN MOTTLING (VERY STIFF)
- GRAY AND BROWN CLAYEY SILT WITH FINE SAND (DENSE)
- ML/CL — GRADES WITH SILT AND SAND LENSES (MEDIUM DENSE)
- GRAY SILTY FINE SAND WITH TRACE ORGANICS (MEDIUM DENSE)
- SM
- GRAY, SANDY SILT (MEDIUM DENSE) GRADES WITH CLAYEY LENSES
- ML
- FINE TO COARSE SAND WITH OCCASIONAL ROUNDED GRAVEL (LOOSE)
- SP
- GRAY, SILTY CLAY WITH FINE SANDY STREAKS
- CL
- MEDIUM TO COARSE SAND WITH OCCASIONAL ROUNDED GRAVEL (LOOS GRADES WITH CLAYEY STREAKS
- SP

BORING TERMINATED AT A DEPTH OF 117.0 FEET ON 1/15/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ☒ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-16

SURFACE ELEVATION 50.1 FT.
COORDINATES N 7179.08
E 9309.71

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	0	■		BROWN SILTY CLAY AND FINE SAND WITH STRONG CHEMICAL ODOR AND OILY RESIDUE (VERY STIFF TO DENSE)
										P	U	5	■		GRADES WITH OCCASIONAL ROUNDED PEA GRAVEL; STRONG CHEMICAL ODOR
										P	U	10	■		GRADES TO SILTY FINE SAND (DENSE) STRONG CHEMICAL ODOR
												15			GRADES WITH RUBBLE
										P	U		■	CL	GRAY MOTTLED BROWN SILTY CLAY WITH FINE SAND (MEDIUM STIFF) MODERATE CHEMICAL ODOR
												20			
										P	U	25	■		GRADES MEDIUM STIFF AND WITH TRACE OF ORGANICS (ROOT
										P	U		■	CH	GRAY MOTTLED BROWN CLAY WITH TRACE BLACK ORGANICS AND SLICKENSIDES (VERY STIFF)
												30			BORING TERMINATED AT A DEPTH OF 32.0 FEET ON 1/15/80
												35			
												40			
												45			
												50			
												55			
												60			
												65			
												70			

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ☒ INDICATES DISTURBED SAMPLE
- ☐ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-17

SURFACE ELEVATION 52.4 FT.
COORDINATES N 7620.34
E 9365.35

OTHER TESTS	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (psf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING		DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE				
										P	U	0	■	FIL	DARK GRAY SILTY CLAY WITH SAND AND FINE GRAVEL (STIFF) STRONG CHEMICAL ODOR
										P	U	5	◪		GRADES WITH INCREASING GRAY CLAY CONTENT (STIFF) STRONG CHEMICAL ODOR
										P	U	10	⊠		GRADES WITH ORGANICS (WOOD) AND FINE SAND (VERY DENSE) STRONG CHEMICAL ODOR
										P	U	15	■		GRADES WITH RUBBLE (VERY DENSE) STRONG CHEMICAL ODOR
										P	U	20	■	CL	CHANGE APPROXIMATE GRAY MOTTLED BROWN SILTY CLAY WITH VERY FINE SAND (STIFF) AND MODERATE CHEMICAL ODOR
										P	U	25	■	CH	CHANGE APPROXIMATE GRAY MOTTLED BROWN CLAY (STIFF)
												30			BORING TERMINATED AT A DEPTH OF 32.0 FEET ON 1/16/80
												35			
												40			
												45			
												50			
												55			
												60			
												65			
												70			

KEY

■ INDICATES UNDISTURBED SAMPLE

⊠ INDICATES DISTURBED SAMPLE

□ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY

◪ INDICATES STANDARD PENETRATION TEST SAMPLE

P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

U - DAMES & MOORE "U" BIT

T - DAMES & MOORE THIN-WALL

P - DAMES & MOORE PISTON

S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-18

SURFACE ELEVATION 54.1 FT.
COORDINATES N 8377.82
E 8820.84

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	0	■		GREENISH GRAY/BROWN CLAY GRADING TO CLAYEY SILT (STIFF) SLIGHT CHEMICAL ODOR
										P	U	5	■		BROWN SILTY FINE SAND (DENSE) STRONG CHEMICAL ODOR
										P	U	10	■		GRADES GRAY IN COLOR (VERY DENSE) STRONG CHEMICAL ODOR
										P	U	15	■		GRADES WITH FINE TO MEDIUM COARSE ROUNDED GRAVEL (STRONG CHEMICAL ODOR)
										P	U	20	■		GRADES GRAY AND BROWN (DENSE) STRONG CHEMICAL ODOR
										P	U	25	■		GRADES VERY DENSE (STRONG CHEMICAL ODOR)
										P	U	30	■		BROWN AND BLACK SILTY CLAY (MEDIUM STIFF) STRONG CHEMICAL ODOR
										P	U	35	■		GRADES GRAY AND BROWN WITH OCCASIONAL SILT STRINGERS (STIFF) STRONG CHEMICAL ODOR
										P	U	40	■	CH	GRADES WITH MODERATE CHEMICAL ODOR (STIFF)
										P	U	45	■		GRADES WITH STRONG CHEMICAL ODOR AND TRACE ORGANICS (ROOTS)
										P	U	50	■		GRAY, SILTY CLAY WITH TRACE VERY FINE SAND AND SLIGHT CHEMICAL ODOR (MEDIUM STIFF)
										P	U	55	■	CL	GRADES WITH CLAY LENSES (NO ODOR)
										P	U	60	■		(GRADES STIFF)
										P	U	65	■	ML/CL	GRAY WITH BROWN CLAYEY SILT WITH TRACE VERY FINE SAND AN STRONG CHEMICAL ODOR
												70	■	SM	GRAY SILTY FINE SAND (MEDIUM DENSE)

BORING TERMINATED AT A DEPTH OF 72.0 FEET ON 1/18/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

FILE 8812-099-12, 0106

LOG OF BORING

DAMES & MOORE

BORING DM-19

SURFACE ELEVATION 52.8 FT.
COORDINATES N 8741.09
E 8813.84

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS

DESCRIPTION

GRAY MOTTLED BROWN SILTY CLAY WITH OCCASIONAL SHELL AND SHELL FRAGMENTS (STIFF) (SLIGHT CHEMICAL ODOR)

GRADES DARK BROWN SILTY FINE TO MEDIUM SAND WITH OCCASIONAL ROUNDED FINE GRAVEL (LOOSE TO MEDIUM DENSE) STRONG CHEMICAL ODOR

GRADES WITH POCKETS OF BLACK SOFT CLAY (SOFT TO LOOSE) STRONG CHEMICAL ODOR

GRADES WITH FINE SILTY SAND (LOOSE) STRONG CHEMICAL ODOR

GRADES VERY LOOSE

CL — BROWN SILTY CLAY WITH FINE SAND; STRONG CHEMICAL ODOR (MEDIUM STIFF)

CH — GRAY MOTTLED BROWN PLASTIC CLAY (STIFF) SLICKENSIDES; STRONG CHEMICAL ODOR

GRADES WITH ORGANICS (ROOTS) (STIFF) STRONG CHEMICAL ODOR

GRADES MEDIUM STIFF TO STIFF; OIL FISSURES STRONG CHEMICAL ODOR

GRADES WITH GRAY SILTY CLAY AND FINE SAND STRINGERS (STIFF) ROOTS NO CHEMICAL ODOR

ML/CL — GRAY CLAYEY SILT WITH FINE SAND AND TRACE ORGANICS (MEDIUM STIFF)

GRADES STIFF

CL — GRAY SILTY CLAY (STIFF)

BORING TERMINATED AT A DEPTH OF 60.0 FEET ON 1/18/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-20

SURFACE ELEVATION 52.4 FT.
COORDINATES N 9117.51
E 9001.70

OTHER TESTS	STRENGTH TEST-RESULTS			% PASSING NO 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS — DESCRIPTION

GRAY SILTY CLAY WITH FINE SAND AND SHELLS, MODERATE CHEMICAL ODOR (STIFF)

GRADES WITH SILT SEAMS

GRADES LIGHT BROWN TO TAN WITH WOOD DEBRIS (STIFF)

BROWN FINE TO COARSE SAND MOTTLED BLACK (DENSE TO VERY DENSE) STRONG CHEMICAL ODOR

GRADES WITH TRACE COARSE GRAVEL

FILL

GRADES WITH TRACE OF CLAY

GRAY MOTTLED BROWN PLASTIC CLAY WITH FRACTURES AND ABUNDANT ORGANICS (WOOD AND ROOTS) STRONG CHEMICAL ODOR

GRADES WITH OCCASIONAL ROUNDED GRAVEL (STRONG CHEMICAL ODOR)

CHEMICAL ODOR PERSISTS

CH

GRADES WITH SLIGHT CHEMICAL ODOR (STIFF)

GRADES WITH ORGANICS (WOOD) NO CHEMICAL ODOR (STIFF)

GRAY SILTY CLAY WITH TRACE FINE SAND AND TRACE OF ORGANICS (SOFT)

CL

GRADES WITH HIGHLY PLASTIC CLAY SEAM

GRADES STIFF

(CONTINUED)

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-20 (cont'd)

SURFACE ELEVATION

COORDINATES

OTHER TESTS	STRENGTH TEST RESULTS			% PASSING NO 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING		DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE				
										P	U	70	■	CL	GRADES WITH LITTLE FINE SAND
															GRAY CLAYEY SILT WITH LITTLE FINE SAND (LOOSE TO MEDIUM DENSE)
										P	U	75	■	ML	
												80			BORING TERMINATED AT A DEPTH OF 82.0 FEET ON 1/17/80
												85			
												90			
												95			
												100			
												105			
												110			
												115			
												120			
												125			
												130			
												135			
												140			

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-21

SURFACE ELEVATION 52.9 FT.
COORDINATES N 8734.83
E 9002.45

OTHER TESTS	STRENGTH TEST-RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS

DESCRIPTION

GRAY/MOTTLED BROWN CLAY AND FINE TO COARSE SAND (STIFF) MODERATE CHEMICAL ODOR

GRAY/BROWN FINE TO MEDIUM GRAINED SAND (MEDIUM DENSE)

DRILLING BECOMES HARDER

DARK BROWN FINE TO COARSE SAND (VERY DENSE) WITH OIL AND STRONG CHEMICAL ODOR

GRADES WITH TRACE OF SILT AND COARSE GRAVEL (STRONG CHEMICAL ODOR) (DENSE)

GREEN/GRAY MOTTLED BLACK PLASTIC CLAY (SOFT) STRONG CHEMICAL ODOR

CL/CH

GRADES WITH TRACE SILT AND MODERATE CHEMICAL ODOR (SOFT)

GRAY SILTY CLAY WITH TRACE ORGANICS (SOFT)

CL

GRADES WITH TRACE OF VERY FINE SAND

CH

GRAY PLASTIC CLAY WITH OXIDIZED FRACTURES AND TRACE ORGANICS (ROOTS) STIFF (SLICKENSIDES)

BORING TERMINATED AT A DEPTH OF 51.5 FEET ON 1/18/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-22

SURFACE ELEVATION 43.5 FT.
COORDINATES N 9360.94
E 9101.88

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
—										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
	GRAY/GREEN MOTTLED CLAY WITH FINE SAND AND SHELLS (STIFF) STRONG CHEMICAL ODOR
	GRADES TAN IN COLOR AND WITH POCKETS OF FINE SAND (STIFF)
	FILL
	GRAY MOTTLED BROWN SILTY CLAY WITH ORGANICS (WOOD, ROOTS) (SOFT) OIL OBSERVED IN FRACTURES, STRONG CHEMICAL ODOR
CL/CH	GRADES WITH SEAM OF WOOD AND WOOD FRAGMENTS
	GRADES WITH MORE PLASTICITY (CLAYEY) (MEDIUM STIFF) STRONG CHEMICAL ODOR
	GRAY SPECKLED BROWN CLAY WITH TRACE ORGANICS (ROOTS)(MEDIUM STIFF)
CH	
	GRAY CLAYEY SILT WITH TRACE FINE SAND AND ORGANICS (ROOTS) (MEDIUM STIFF)
ML	
	GRAY, SILTY CLAY (MEDIUM STIFF)
CL	
	GRADES WITH VERY FINE TO FINE SAND (MEDIUM STIFF)
CH	GREENISH GRAY MOTTLED BROWN WITH TRACE ORGANICS (ROOTS) (STIFF)

BORING TERMINATED AT A DEPTH OF 66.5 FEET ON 1/22/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-23

SURFACE ELEVATION 46.9 FT.
COORDINATES N 9948.90
E 9414.17

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	0	■	CH	LIGHT GRAY MOTTLED TAN AND BROWN PLASTIC CLAY WITH TRACE BLACK ORGANICS (SLICKENSIDES) (STIFF)
										P	U	5	■		GRADES MEDIUM GRAY MOTTLED BROWN CLAY (SLICKENSIDES) SLIGHT CHEMICAL ODOR (STIFF)
										P	U	10	■		GRADES TAN AND BROWN MOTTLED GRAY (VERY STIFF) (SLICKENSIDES)
										P	U	15			
												20	■		
												25			BORING TERMINATED AT A DEPTH OF 25.0 FEET ON 1/26/80
												30			
												35			
												40			
												45			
												50			
												55			
												60			
												65			
												70			

KEY

■ INDICATES UNDISTURBED SAMPLE

⊠ INDICATES DISTURBED SAMPLE

□ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY

◪ INDICATES STANDARD PENETRATION TEST SAMPLE

P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

U - DAMES & MOORE "U" BIT

T - DAMES & MOORE THIN-WALL

P - DAMES & MOORE PISTON

S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

FILE 8037-099-12, 0108

LOG OF BORING

DAMES & MOORE

BORING DM-24

SURFACE ELEVATION 48.2 FT.

COORDINATES N 9524.43
E 9435.70

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
	BROWN SILTY CLAY WITH TRACE FINE TO COARSE SAND AND ABUNDANT ORGANICS (STIFF)
	GRADES WITH GRAY/GREEN MOTTLING AND POCKETS OF SOFT SILT WITH TRACE FINE GRAVEL AND SLIGHT CHEMICAL ODOR
	DRILLING BECOMES HARD AND SLOW
	OIL ENCOUNTERED IN DRILL WASH
	FILL
ML	GREENISH GRAY CLAYEY SILT, STRONG CHEMICAL ODOR (SOFT)
CH	GRAY AND TAN MOTTLED CLAY WITH TRACE OF SILT (MEDIUM STIFF)
	APPROXIMATE CHANGE
CH	GRAY/BROWN MOTTLED TAN CLAY WITH CALCAREOUS NODULES, SLICKENSIDES AND TRACE ORGANICS (VERY STIFF TO STIFF)

BORING TERMINATED AT A DEPTH OF 30.0 FEET ON 1/24/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ☑ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

BORING DM-25

SURFACE ELEVATION 37.4 FT.
COORDINATES N 10459.16
E 8570.80

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
	BROWN AND GRAY SILTY FINE TO MEDIUM SAND WITH ORGANICS DENSE — FILL
	CHANGE APPROXIMATE
SM	DARK GRAY/BLACK FINE SAND WITH SILT (STRONG CHEMICAL ODOR) (MEDIUM DENSE)
CH/CL	GRAY MOTTLED BROWN PLASTIC CLAY WITH ORGANICS (WOOD) TRACE VERY FINE SAND (MODERATE CHEMICAL ODOR) (STIFF)
	GRADES WITH TRACE OF SILT (MODERATE CHEMICAL ODOR)
ML	GRAY CLAYEY SILT WITH TRACE ORGANICS (WOOD, ROOTS) (VERY SOFT)
	GRADES WITH INCREASING ORGANIC (WOOD) CONTENT (SOFT)
	GRADES WITH TRACE OF VERY FINE SAND
CL	GRAY MOTTLED TAN SILTY CLAY WITH ORGANICS (ROOTS) AND VERTICAL FRACTURES (STIFF)
ML	GRAY CLAYEY SILT WITH TRACE ORGANICS (SOFT)
	GRADES WITH TRACE OF VERY FINE SAND

BORING TERMINATED AT A DEPTH OF 46.5 FEET ON 1/20/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-26

SURFACE ELEVATION 44.1 FT.

COORDINATES N 10607.14
E 8950.47

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
										P	U	0	■		YELLOW BROWN SILTY CLAY, TRACE COARSE TO FINE SHELL AND WOOD FRAGMENTS; WITH SLIGHT CHEMICAL ODOR
										P	U	5	■		GRADING WITH DARK GRAY/BROWN MOTTLING; WITH COARSE GRAVEL-SIZED BRICK FRAGMENTS DIFFICULT DRILLING
										P	U	10	■		GRADING GREEN/GRAY IN COLOR AND WITH MODERATE CHEMICAL ODOR
														CL	CHANGE APPROXIMATE DARK GRAY SILTY CLAY, TRACE ROOT FRAGMENTS, TRACE FINE SAND
										P	U	15	□		BORING TERMINATED AT A DEPTH OF 16.5 FEET ON 1/19/80 DUE TO BOREHOLE BEING DEFLECTED DUE TO RUBBLE
												20			
												25			
												30			
												35			
												40			
												45			
												50			
												55			
												60			
												65			
												70			

KEY

■ INDICATES UNDISTURBED SAMPLE

⊠ INDICATES DISTURBED SAMPLE

□ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY

◪ INDICATES STANDARD PENETRATION TEST SAMPLE

P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

U - DAMES & MOORE "U" BIT

T - DAMES & MOORE THIN-WALL

P - DAMES & MOORE PISTON

S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING DM-26A

SURFACE ELEVATION APPROX. 44 FT.

COORDINATES 5 FT. NORTH OF DM-26

OTHER TESTS	STRENGTH TEST RESULTS			% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SAMPLING	
	TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)				LL (%)	PL (%)	PI (%)	BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U
										P	U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS DESCRIPTION

BOREHOLE DRILLED THROUGH FILL LAYER AS A CONTINUATION OF BORING DM-26 (TERMINATED BY RUBBLE OBSTRUCTION)

FI

CHANGE APPROXIMATE

DARK GRAY SILTY CLAY, TRACE ROOT FRAGMENTS, TRACE FINE SAN

CL

GRADING WITH MODERATE CHEMICAL ODOR

CHANGE APPROXIMATE

GRAY BROWN SILTY CLAY, TRACE FINE SAND (MEDIUM STIFF); WITH SLIGHT CHEMICAL ODOR

GRADING SOFT

CH/CL

GRADES WITH DARK GRAY MOTTLING SLIGHT CHEMICAL ODOR (SOFT)

GRAY, CLAYEY SILT WITH SOME VERY FINE SAND (SOFT)

ML

BORING TERMINATED AT A DEPTH OF 52.0 FEET ON 1/19/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ☑ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:

THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDAN WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

FILE 8037-089-12, 0106

LOG OF BORING

DAMES & MOOR

BORING DM-27

SURFACE ELEVATION 47.7 FT.
COORDINATES N 10483.31
E 9957.98

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE
										P	U
										P	U
										P	U
										P P	U U

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

SAMPLING

SYMBOLS	DESCRIPTION
	CONCRETE SLAB
	GRAY MOTTLED BROWN SILTY CLAY WITH OCCASIONAL ROUNDED GRAVEL (PEBBLES) (STIFF) SLIGHT CHEMICAL ODOR
	GRAY MOTTLED BLACK SILTY CLAY WITH OCCASIONAL ORGANICS (ROOTS) (STIFF) AND STRONG CHEMICAL ODOR
CL	GRAY/BROWN SILTY CLAY WITH TRACE FINE SAND (STIFF)
	GRADES WITH TRACE ORGANICS AND INCREASING CLAY CONTENT (STIFF)
CH	GRAY MOTTLED BROWN CLAY WITH SLICKENSIDES (STIFF)

FIL

BORING TERMINATED AT A DEPTH OF 29.0 FEET ON 1/26/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ☒ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

BORING B-1

SURFACE ELEVATION 48.6 FT.
COORDINATES N 7064.75
E 8774.08

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING	SYMBOLS	DESCRIPTION
												0			DARK GRAY SANDY SILTY CLAY WITH STRONG CHEMICAL ODOR (STIFF TO VERY STIFF)
										P	U	5	■		
										P	U	10	■		GRADES BROWN AND BLACK WITH TRACE OF ORGANICS STRONG CHEMICAL ODOR (STIFF)
										100/4"	U BAG	15	⊠		GRAY BRITTLE GYPSUM LAYER
															GRAY MOTTLED BROWN PLASTIC CLAY WITH ABUNDANT ORGANICS (ROOTS) (MEDIUM STIFF)
										P	U	20	■	CH	
										P	U	25	■	CL	GRAY MOTTLED BROWN SILTY CLAY WITH TRACE OF VERY FINE SAND AND ORGANICS (MEDIUM STIFF)
															BORING TERMINATED AT A DEPTH OF 26.5 FEET ON 1/24/80
												30			
												35			
												40			
												45			
												50			
												55			
												60			
												65			
												70			

FILL

KEY

■ INDICATES UNDISTURBED SAMPLE
⊠ INDICATES DISTURBED SAMPLE
□ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
◪ INDICATES STANDARD PENETRATION TEST SAMPLE
P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

U - DAMES & MOORE "U" BIT
T - DAMES & MOORE THIN-WALL
P - DAMES & MOORE PISTON
S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

67

DAMES & MOORE

BORING B-2

SURFACE ELEVATION 50.5 FT.
COORDINATES N 7065.88
E 9135.30

OTHER TESTS	STRENGTH TEST RESULTS: TYPE OF TEST	CONFINING PRESSURE (psf)	PEAK SHEAR STRENGTH (psf)	% PASSING NO. 200 SIEVE	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LL (%)	PL (%)	PI (%)	SAMPLING: BLOW COUNT	SAMPLE TYPE	DEPTH IN FEET	SAMPLING
												0	
										P	U	5	■
										P	U	10	⊠
										P	U	15	■
										P	U	20	■
										P	U	25	■
										P	U	30	■
												35	
												40	
												45	
												50	
												55	
												60	
												65	
												70	

SYMBOLS	DESCRIPTION
GM	GRAVEL FILL
	GRAY/BROWN SILTY SANDY CLAY FILL WITH OIL AND STRONG CHEMICAL ODOR (MEDIUM STIFF)
	GRADES WITH RUBBLE AND GYPSUM FRAGMENTS (STRONG CHEMICAL ODOR) (STIFF)
	GRADES BLACK AND GRAY/GREEN WITH STRONG CHEMICAL ODOR (STIFF)
	GYPSUM LAYER (BRITTLE)
CL	BLACK SILTY CLAY
CH	DARK GRAY MOTTLED BLACK CLAY (MEDIUM STIFF) WEAK SLICKENSIDES AND TRACE OF GYPSUM (CHEMICAL ODOR)
	GRADES WITH BROWN MOTTLING AND ORGANICS (ROOTS) (MEDIUM STIFF)

BORING TERMINATED AT A DEPTH OF 31.5 FEET ON 1/24/80

KEY

- ■ INDICATES UNDISTURBED SAMPLE
- ⊠ INDICATES DISTURBED SAMPLE
- □ INDICATES SAMPLING ATTEMPT WITH NO RECOVERY
- ◪ INDICATES STANDARD PENETRATION TEST SAMPLE
- P - IN BLOW COUNT COLUMN INDICATES SAMPLER HYDRAULICALLY PUSHED

SAMPLE TYPE

- U - DAMES & MOORE "U" BIT
- T - DAMES & MOORE THIN-WALL
- P - DAMES & MOORE PISTON
- S - STANDARD SPLIT-SPOON

NOTE:
THE SOIL CONDITIONS ARE DESCRIBED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM, PLATE A-2.

LOG OF BORING

DAMES & MOORE

Attachment 1

ERM-Southwest, inc.

By SEM Date 7/11/86 Subject EXXON Baton Rouge : In Situ Sheet No. 1 of 2

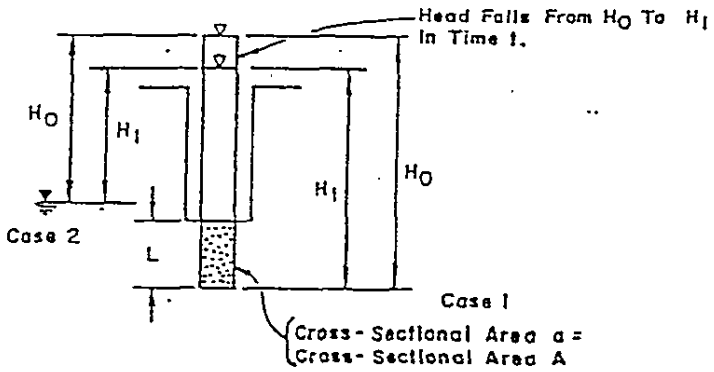
Chkd By ____ Date ____ PERMEABILITY ("SLUG") TESTS W.O. No. 14-36

For Boring

METHOD

The determination of in situ hydraulic conductivity (Permeability) was accomplished by drilling an 8" ϕ hole into the soil and forcing a 2" ϕ PVC pipe 6" into the bottom of the borehole. The PVC pipe was filled with water and the drop in water level was measured over time.

The permeability is calculated by applying Darcy's LAW to a falling-head test in the field and using the equation given below.



$$K = \frac{L}{t} \ln(H_0/H_1)$$

Where a = A

Case 1: For unsaturated soils
Case 2: For saturated soils

Appendix M
Attachment 2

Measurement of Parameters: Piezometer Tests[a]

It is possible to determine in-situ hydraulic conductivity values by means of a test carried out in a single piezometer. One such test is suitable for point piezometers that are screened or slotted over the entire thickness of a confined aquifer. The test is initiated by causing an instantaneous change in the water level in a piezometer through a sudden removal of water from the well. The recovery of the water level with time is then observed. When water is removed the tests are often called bail tests.

The method of interpreting the water level versus time data that arise from a bail test is based on the Hvorslev (1951) method for a point piezometer. His initial analysis assumed a homogeneous, isotropic, infinite medium in which both soil and water are incompressible. With reference to the bail test of Figure 1a), Hvorslev reasoned that the rate of inflow, q, at the piezometer tip at any time t is proportional to the hydraulic conductivity, K, of the soil and to the unrecovered head difference, H - h, so that

$$q(t) = \pi r^2 (dh/dt) = FK(H - h) \quad \text{(Equation 1)}$$

where F is a factor that depends on the shape and dimensions of the piezometer intake. If $q = q_0$ at $t = 0$, it is clear that q(t) will decrease asymptotically toward zero as time goes on.

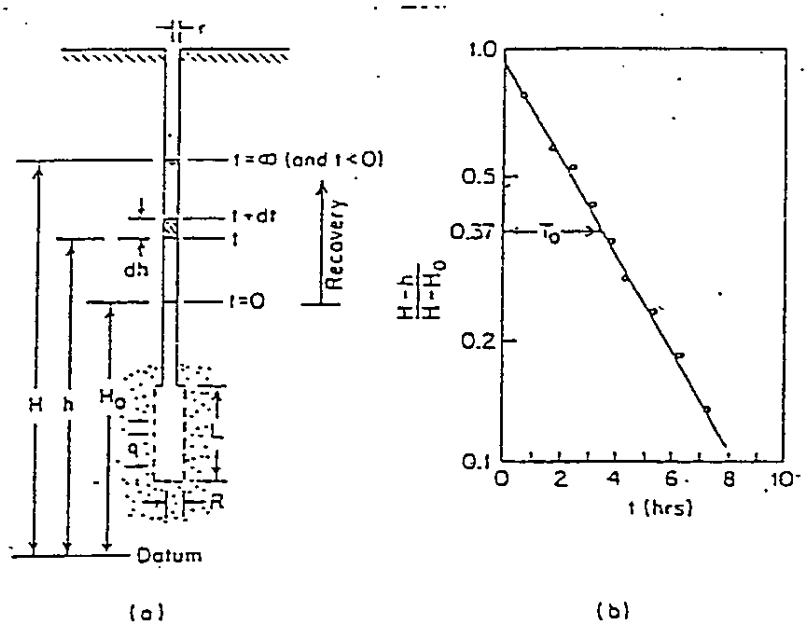


Figure - 1 Hvorslev piezometer test. (a) Geometry; (b) method of analysis.

a Reference:
Freeze, R.A. and Cherry, J.A., 1979: Ground Water; Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 604 pages.

Hvorslev (1951) as given in Freeze and Cherry (1979):

Attachment 2 (Cont

Hvorslev defined the basic time lag, T_0, as

$$T_0 = (\pi r^2/FK) \qquad \text{(Equation 2)}$$

When this parameter is substituted in Equation 1, the solution to the resulting ordinary differential equation, with the initial condition, $h = H_0$ at $t = 0$, is

$$(H - h/H - H_0) = e^{-t/To} \qquad \text{(Equation 3)}$$

A plot of field recovery data, $H - h$ versus t, should therefore show an exponential decline in recovery rate with time. If, as shown on Figure 1(b), the recovery is normalized to $H - H_0$ and plotted on a logarithmic scale, a straight-line plot results. Note that for $H - h/H - H_0 = 0.37$, $n\ (H - h/H - H_0) = -1$, and from Equation 3, $T_0 = t$. The basic time lag, T_0, can be defined by this relation; or if a more physical definition is desired, it can be seen, by multiplying both top and bottom of Equation 2 by $H - H_0$, that T_0 is the time that would be required for the complete equalization of the head difference if the original rate of inflow were maintained. That is, $T_0 = V/q_0$, where V is the volume of water removed or added.

To interpret a set of field recovery data, the data are plotted in the form of Figure 1(b). The value of T_0 is measured graphically, and K is determined from Equation 2. For piezometer intake of length L and radius R (Figure 1(a)), with $L/R > 8$, Hvorslev (1951) has evaluated the shape factor, F. The resulting expression for K is

$$K = [r^2 \ln(L/R)]/(2LT_0) \qquad \text{(Equation 4)}$$

ERM-Southwest, inc.

By SEM Date 7/10/86 Subject Exxon - Baton Rouge Sheet No. ____ of ____

Chkd By ____ Date ____ M.W. Recovery Tests W.O. No. 14-36

MW-A: Initial Water Level = 18.04'
TOTAL Depth of Well = 28'

ELAPSED TIME (MIN)	DEPTH (h) (ft)	DEPTH (H) (ft)	DEPTH (H_o) (ft)	$\frac{H-h}{H-H_o}$
t_o	0	9.96	0	1.0
0.82	0.5			0.95
1.93	1.0			0.90
3.03	1.5			0.85
4.18	2.0			0.80
5.43	2.5			0.75
6.93	3.0			0.70
8.65	3.5			0.65
11.03	4.0			0.60
14.65	4.5			0.55
19.82	5.0			0.50

MW-B: Initial Water Level = 12.54'
TOTAL Depth of Well = 13'
(NOT A Sufficient Amount of WATER To Perform TEST)

MW-C: Initial Water Level = 12'
TOTAL Depth of Well = 24'

t_o	0	12.0'	0	1.0
0.65	0.5			0.96
1.40	1.0			0.92
2.13	1.5			0.88
2.78	2.0			0.83
3.83	2.5			0.79
4.58	3.0			0.75
5.53	3.5			0.71
6.72	4.0			0.67
7.95	4.5			0.63
9.73	5.0			0.58
11.62	5.5			0.54
13.63	6.0			0.50
15.97	6.5			0.46

ERM-Southwest, inc.

By _____ Date _____ Subject _____ Sheet No. _____ of _____

Chkd By _____ Date _____ _____ W.O. No. _____

MW-D: Initial Water Level = Dry well
TOTAL Depth of Well = 14'
(Recovery Test NOT Possible)

MW-E: Initial Water Level = 6.42'
TOTAL Depth of Well = 17'

ELAPSED TIME (MIN)	DEPTH (h) (ft)	DEPTH (H) (ft)	DEPTH (H_0) (ft)	$\frac{H-h}{H-H_0}$
t_0	5.0	10.58	5.0	1.0
0.25	5.5			0.91
0.58	6.0			0.82
0.95	6.5			0.73
1.40	7.0			0.64
1.90	7.5			0.55
2.62	8.0			0.46
3.52	8.5			0.37
4.70	9.0			0.28
10.00	9.12			0.26

MW-F: Initial Water Level = 11.75'
TOTAL Depth of Well = 22'

t_0	2.5	10.25	2.5	1.0
0.37	3.0			0.94
0.67	3.5			0.87
1.08	4.0			0.81
1.63	4.5			0.74
2.17	5.0			0.68
2.73	5.5			0.61
3.43	6.0			0.55
4.20	6.5			0.48
5.22	7.0			0.42
6.78	7.5			0.36
9.53	8.0			0.29

ERM-Southwest, inc.

By _____ Date _____ Subject _____ Sheet No. _____ of _____

Chkd By _____ Date _____ _____ W.O. No. _____

MW-G: Initial Water Level = 6.13'
TOTAL Depth of Well = 18'

ELAPSED TIME (MIN)	DEPTH (h) (ft)	DEPTH (H) (ft)	DEPTH (H_o) (ft)	$\frac{H-h}{H-H_o}$
t_o	9.0	11.87	9.0	1.0
0.03	9.5			0.83
0.10	10.0			0.65
0.53	10.5			0.48
1.57	11.0			0.30
8.00	11.5			0.13

MW-H: Initial Water Level = 11.08'
TOTAL Depth of Well = 22'

t_o	0.5	10.92	0.5	1.0
0.73	1.0			0.95
1.47	1.5			0.90
2.12	2.0			0.86
2.72	2.5			0.81
3.48	3.0			0.76
4.33	3.5			0.71
5.15	4.0			0.66
6.20	4.5			0.62
7.33	5.0			0.57
8.65	5.5			0.52
10.55	6.0			0.47
13.63	6.5			0.42
19.50	7.0			0.38

ERM-Southwest, inc.

By SEM Date 7/11/86 Subject Calculation of EFFECTIVE Sheet No. ___ of ___

Chkd By ___ Date ___ Radius W.O. No. ___

$$R = V_B = V_B - V_W$$

$$V_W = \pi r^2 = \pi (0.083)^2 = 0.022 \text{ ft}^2$$

$$V_B = \pi r^2 = \pi (0.33)^2 = 0.34 \text{ ft}^2 - 0.022 \text{ ft}^2 = 0.32$$

$$R = \sqrt{\frac{(.40)(0.32)\text{ft}^2 + 0.022 \text{ ft}^2}{\pi}}$$

$$R = \sqrt{0.048} = 0.22 \text{ ft} = \boxed{6.66 \text{ cM}}$$

ERM-Southwest, inc.

By SEM Date 7/11/86 Subject Calculations of Sheet No. ___ of ___

Chkd By ___ Date ___ Hydraulic Conductivity W.O. No. ___

METHOD: USING Hvorslev's Equation

$$K = \frac{r^2 \ln(4/R)}{2 L T_0}$$

MW-A:

r = well radius = 1" = 2.54 cm

L = length of Screen = 305 cm (used 10' vs 15' DUE TO initial water level)

R = EFFECTIVE Radius = 6.66 cm

T_0 = from graph = 1584 SEC

$\ln(4/R) = \ln(\ /6.66\text{ cm})$

$$\therefore K = \frac{(2.54\text{ cm})^2 \ln(305/6.66)}{2(305)(1584\text{ SEC})} = \frac{24.7}{966{,}240} = 2.6\times10^{-5}\text{ cm/sec}$$

MW-C:

r = 1" = 2.54 cm

L = 305 cm

R = 6.66 cm

T_0 = 1194

$$\therefore K = \frac{(2.54\text{ cm})^2 \ln(305/6.66)}{2(305)(1194\text{ SEC})} = \frac{24.7}{728{,}340} = 3.4\times10^{-5}\text{ cm/sec}$$

ERM-Southwest, inc.

By _____ Date _____ Subject _____ Sheet No. ____ of ____

Chkd By ____ Date _____ _____ W.O. No. _____

MW-E:

$r = 1'' = 2.54$ cm

$L = 305$ cm

$R = 6.66$ cm

$T_0 = 318$ SEC

$$\therefore K = \frac{(2.54\text{ cm})^2 \ln(305\text{cm}/6.66\text{cm})}{2(305\text{ cm})(318\text{ SEC})}$$

$$= \frac{24.7}{193,980} = 1.3 \times 10^{-4}\text{ cm/SEC}$$

MW-F:

$r = 1'' = 2.54$ cm

$L = 305$ cm

$R = 6.66$

$T_0 = 405$ SEC

$$K = \frac{(2.54)^2 \ln(305/6.66)}{2(305)(405)} = \frac{24.7}{247,050} = 1 \times 10^{-4}\text{ cm/SE}$$

ERM-Southwest, inc.

By _____ Date _____ Subject _____ Sheet No. _____ of _____

Chkd By _____ Date _____ _____ W.O. No. _____

MW-G: $r = 1'' = 2.54$ cm

$L = 10' = 305$ cm

$R = 6.66$ cm

$T_0 = 165$ SEC

$$\therefore \quad K = \frac{(2.54)^2 \ln(305/6.66)}{2(305)(165)} = \frac{24.7}{100,650} = 2.5 \times 10^{-4} \text{ CM/SEC}$$

MW-H: $r = 1'' = 2.54$ cm

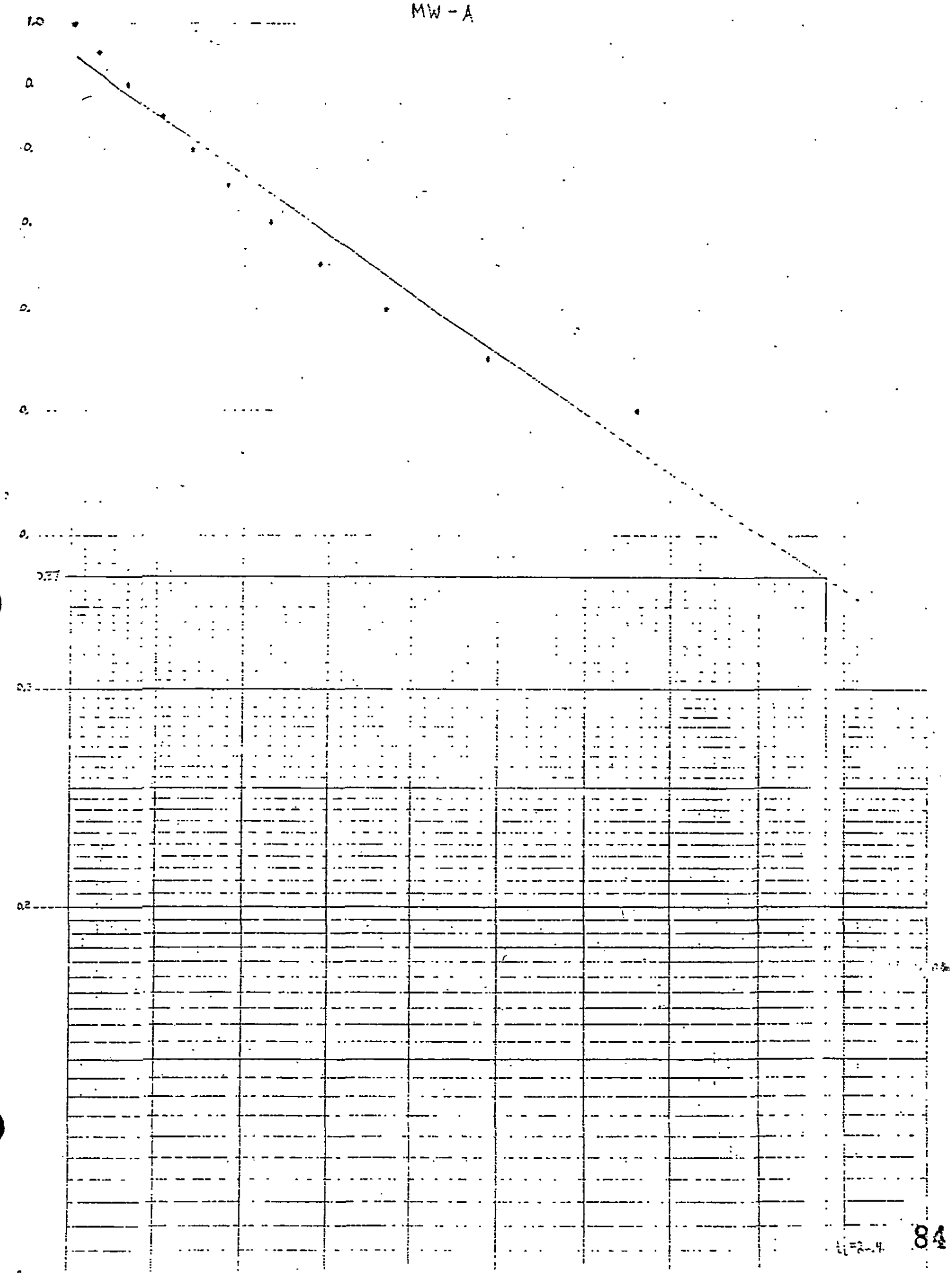
$L = 10' = 305$ cm

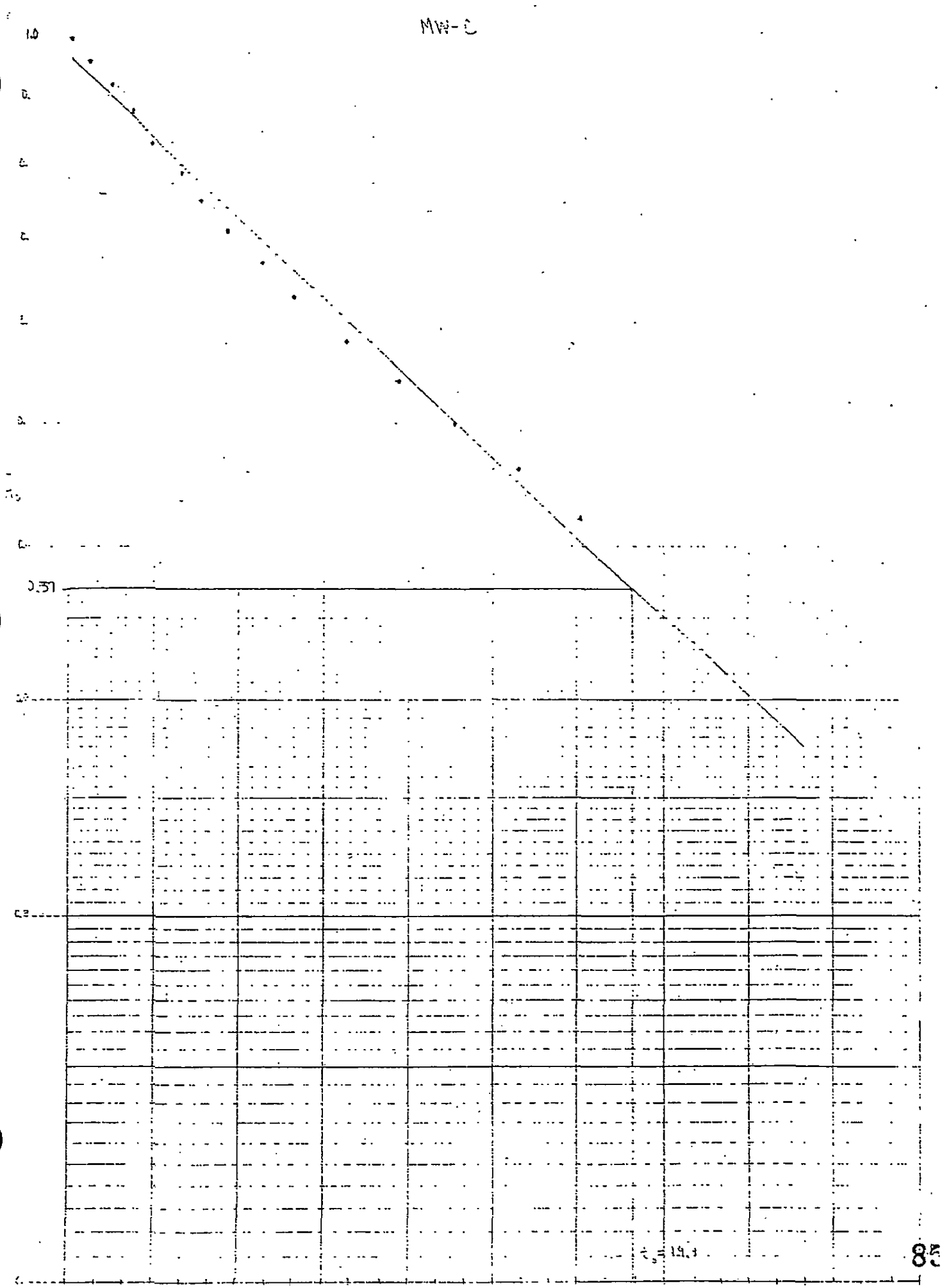
$R = 6.66$ cm

$T_0 = 1002$ SEC

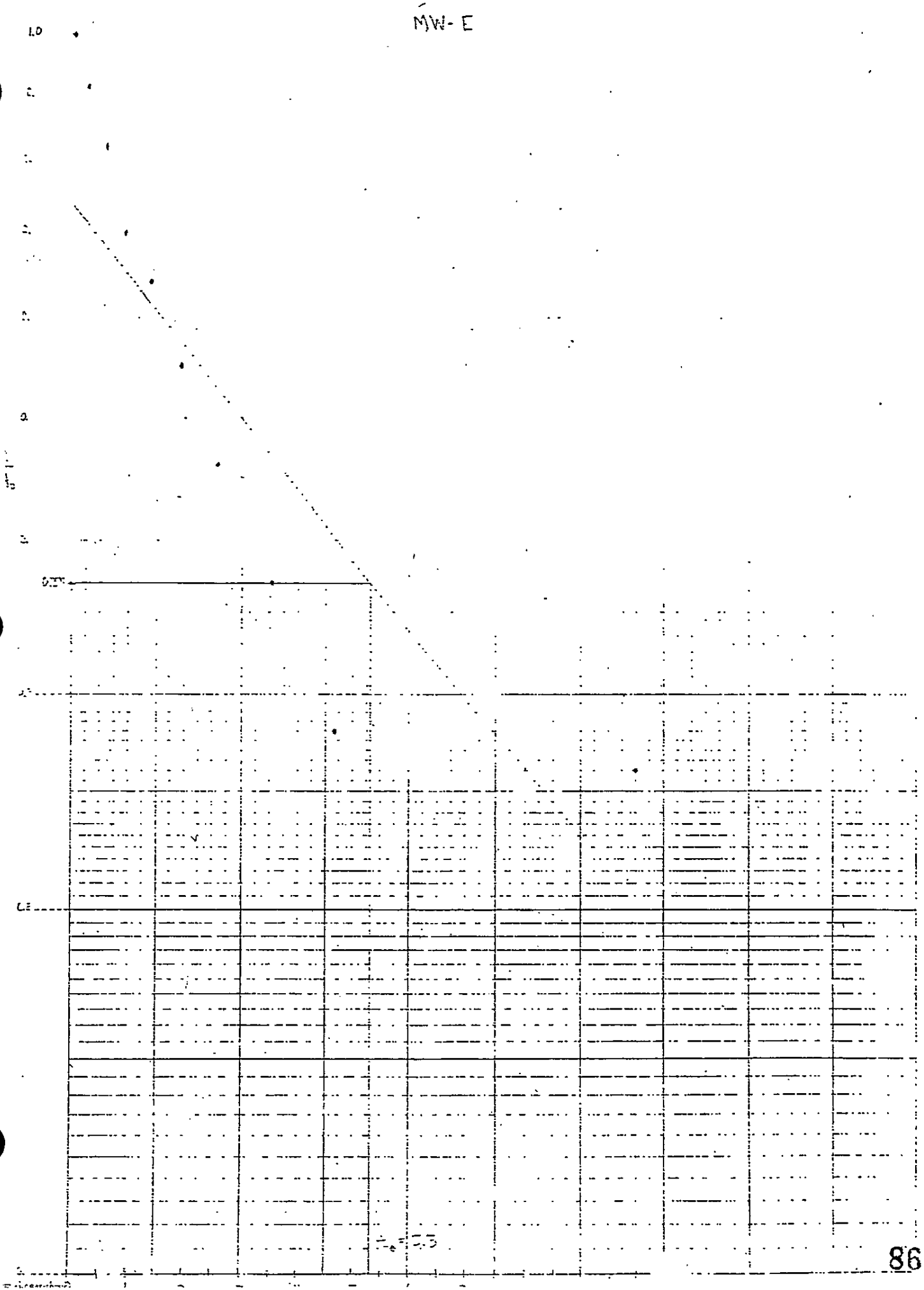
$$\therefore \quad K = \frac{(2.54)^2 \ln(305/6.66)}{2(305)(1002)} = \frac{24.7}{611,220} = 4 \times 10^{-5} \text{ CM/SEC}$$

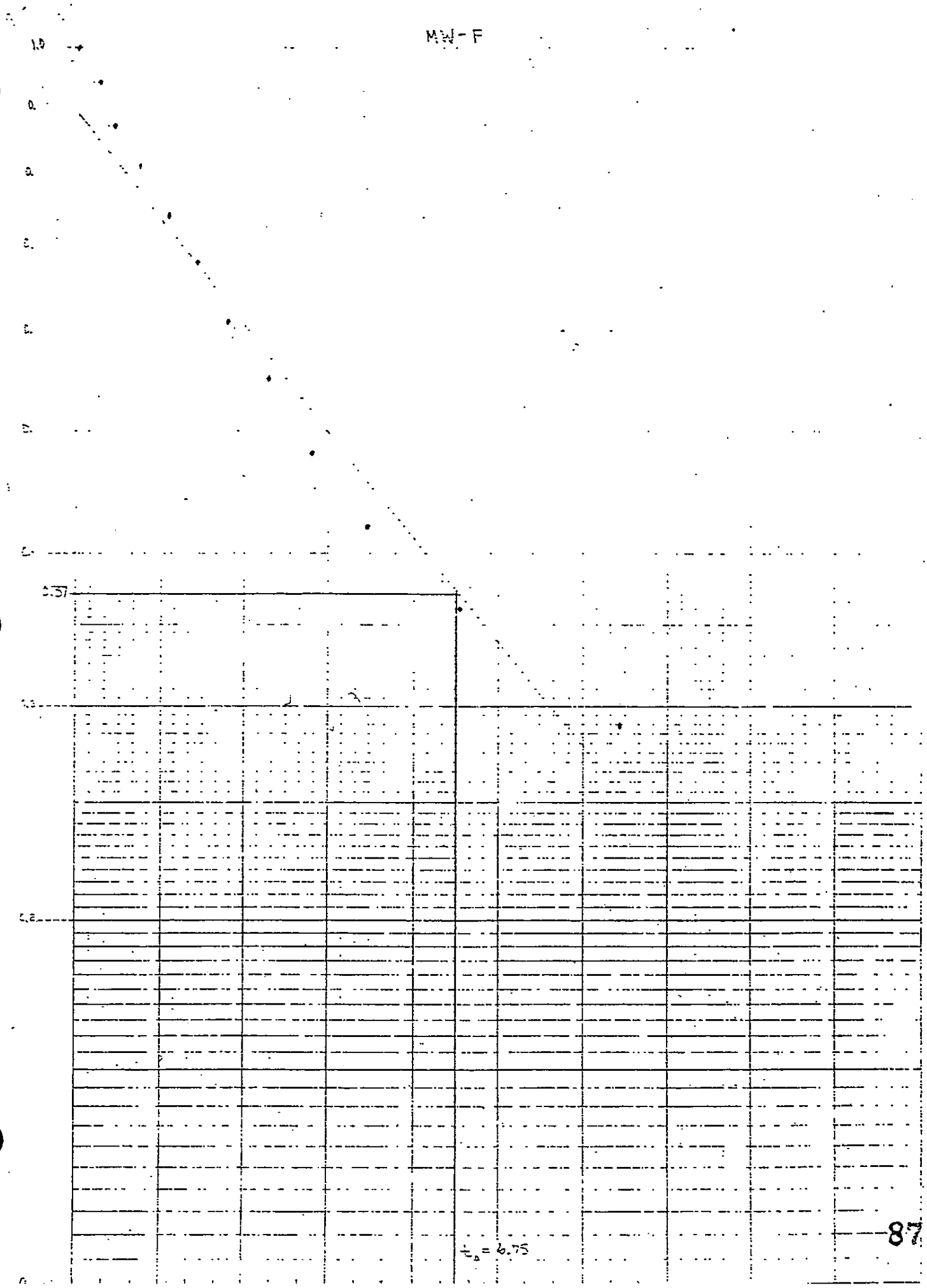
MW - A



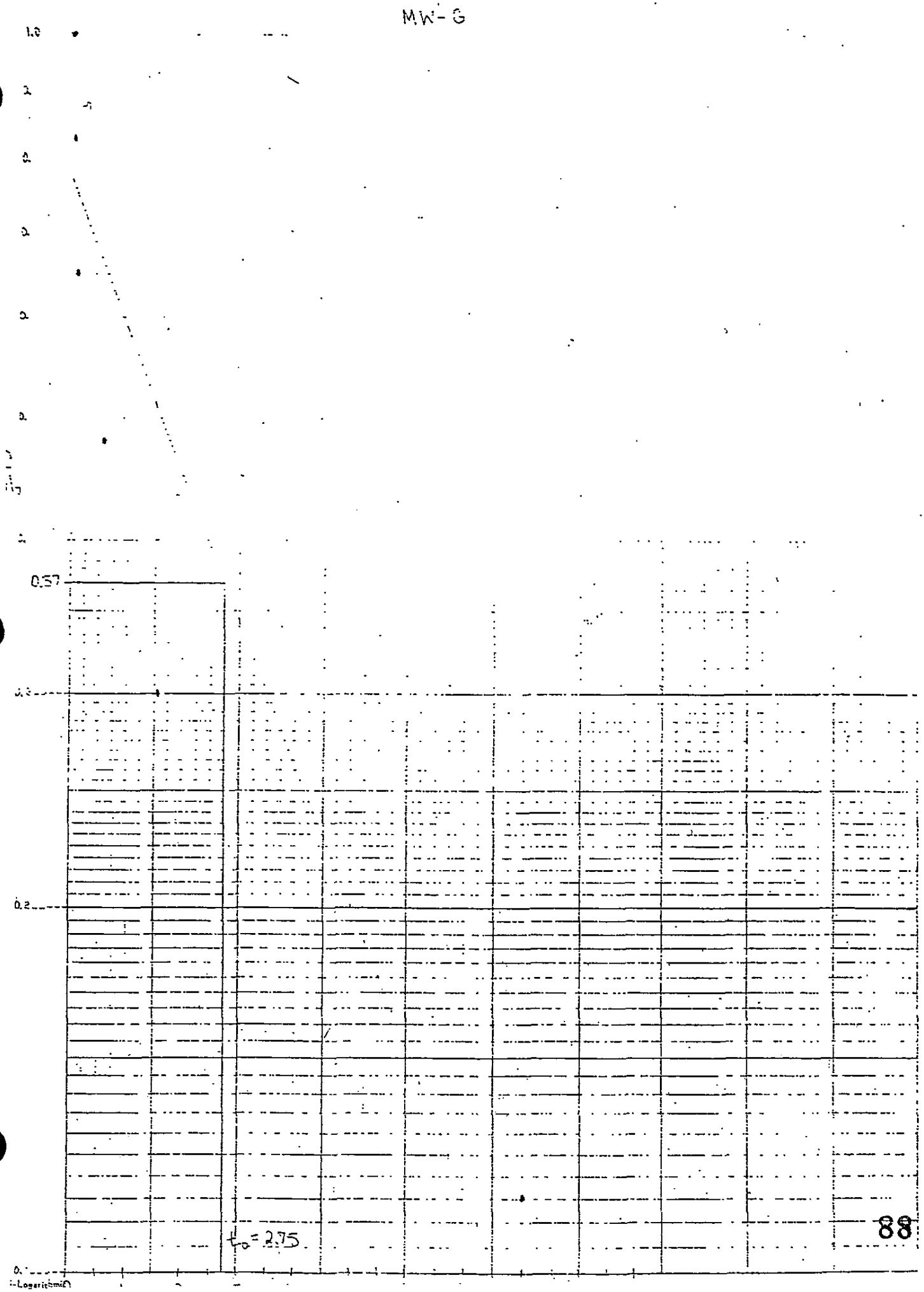

MW-C
1.0
0.37

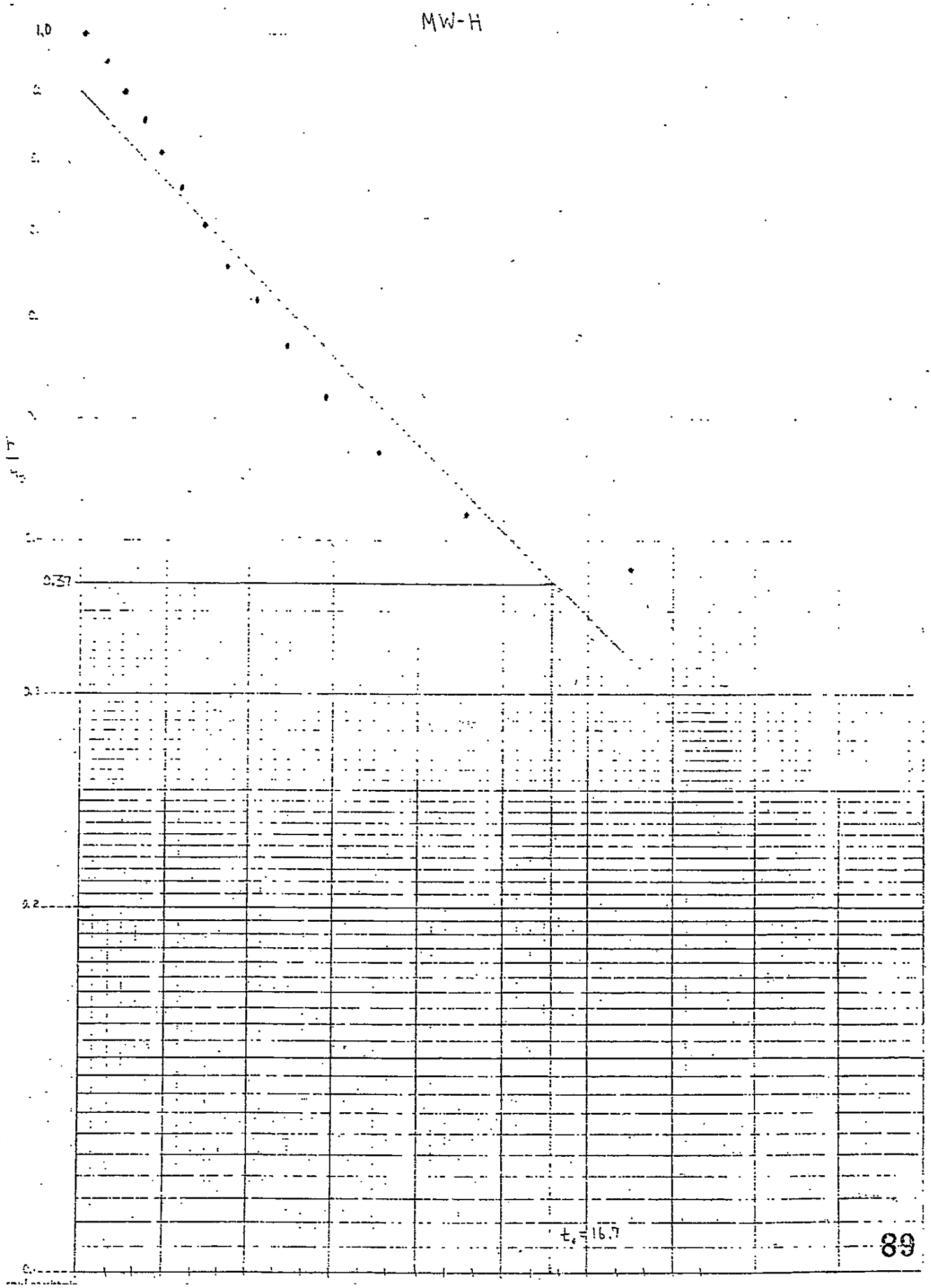
MW-E




MW-F
1.0
0.57
$t_\Delta = 6.75$

MW-6




MW-H
1.0
0.37
0.2
$t_e = 16.7$

RECEIVED AUG 26 1985

August 21, 1985

Mr. Charles Feerick
Groundwater Specialist
Exxon Company, USA
P. O. Box 551
Baton Rouge, Louisiana 70821

Project No. 846126-01

Report
Plug and Abandon
Twenty Monitor Wells
Exxon Company, USA
Baton Rouge, Louisiana

Dear Mr. Feerick:

IT Corporation (IT) was contracted by Exxon Company, USA, under Contract No. PH 21008-X-17542, to plug and abandon twenty (20) groundwater monitor wells located within the Exxon Waste Water Treatment Plant at the Baton Rouge Refinery (See Figure 1). A site visit was made on April 26, 1985, to gather construction details and determine locations and access problems, if any, of the twenty (20) monitor wells. The casing extension of monitor well DM-17 could not be found during the site visit. Locations of monitor wells are indicated in Figure 2.

The twenty (20) groundwater monitor wells ranged in depth from 30 feet to 129 feet and were constructed using 5 feet, 10 feet or 20 feet (DM-9) of slotted well screen (Table 1). The wells were constructed using three (3) inch ABS pipe (M-1 and M-3 were two (2) inch steel pipe) with approximately two and one half (2.5) feet of stickup, a two foot by two foot concrete pad, and two to four bump posts depending upon location.

Prior to plugging, each well was sounded to confirm that the casing was clear for the total depth of the well and the cement pad and bump posts were removed. An attempt was made at each well to pull the casing from the borehole using the "sand line" on a Failing 1500 truck mounted drill rig. All attempts were unsuccessful. The ABS casing sheared at the ground surface or insufficient force was available.

Drill stem was then tripped into the well to within approximately one (1) foot of the bottom of the well. A cement/bentonite grout was then prepared by mixing one bag of Portland cement with 1/4 bag of bentonite gel powder per ten (10) gallons of water. The cement/bentonite slurry was then pumped down the drill stem until surface returns were

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IT Corporation · 8116 One Calgary Avenue

observed. Several lengths of drill stem were removed and the cement/bentonite slurry again pumped into the well. This continued until all the drill stem was removed from the well.

A specially designed cap was then placed on the well stand pipe and a hose connection made to the cap. This cap allowed additional grout to be pumped into the well under pressure, insuring that the cement/bentonite was injected through the well screen and into the sand pack. The well casing was then cut off approximately three (3) inches below ground surface. After the cement/bentonite grout was allowed to cure for 24 hours, additional grout was placed in the casing to finish to ground surface elevation.

Monitor Well DM-17 could not be found by IT during the original Plug and Abandonment effort. A rubber tire backhoe was used to excavate an area approximately 60 feet long by 20 feet wide by 2 feet deep in an unsuccessful attempt to locate the casing. Exxon personnel subsequently researched completion documentation and located the well using plant coordinates. IT returned on July 10, 1985, and plugged DM-17 using the procedures stated above.

The twenty (20) groundwater monitor wells at the Exxon Refinery Waste Water Treatment plant were plugged in accordance with drilling procedures acceptable to the Department of Environmental Quality, Hazardous Waste Division, in order to assure that any potential vertical contaminant migration is prevented. The State of Louisiana Department of Transportation and Development (DOTD), Office of Public Works, Water Resources Division regulations applicable to this work were also followed during the Plug and Abandonment operations.

DOTD form LDPW-GW-2 for Water-Well Abandonment and Plugging, was prepared for each monitor well and filed with the Louisiana DOTD Office of Public Works. Copies of these documents are included in Attachment A.

IT appreciates the opportunity to complete this project for Exxon. Should you have any questions please do not hesitate to call.

Very truly yours,

Russell E. Blom

Russell E. Blom
Group Project Manager

REB:gfw

cc: Mr. Bo Bolourchi, Louisiana DOTD, Office of Public Works

TABLES

TABLE I

WELL COMPLETION DATA
MONITOR WELL PLUG AND ABANDONMENT
EXXON BATON ROUGE REFINERY
BATON ROUGE, LOUISIANA

Monitor Well	Total Depth, Feet	Screened Interval Feet below Ground Surfa
M-1	48	41-46
M-8	50	40-50
DM-1	80	70-80
DM-5	25	15-25
DM-8	50	40-50
DM-9	93	70-90
DM-13	129	119-129
DM-14	110	100-110
DM-15	115	105-115
DM-16	30	18-28
DM-17	30	18-28
DM-20	80	68-78
DM-21	53	40-50
DM-22	64	54-64
DM-23	25	13-23
DM-24	30	18.5-28.5
DM-25	46.5	30-40
DM-26	52	40-50
DM-27	29	17-27
DM-28	50	40-50

FIGURES

2000 0 2000 FEET
SCALE

FIGURE 1

SITE LOCATION MAP

REFERENCE: U.S.G.S. 7.5 MINUTE BATON ROUGE WEST QUADRANGLE, 1963, PHOTOREVISED 1971.

PREPARED FOR

EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

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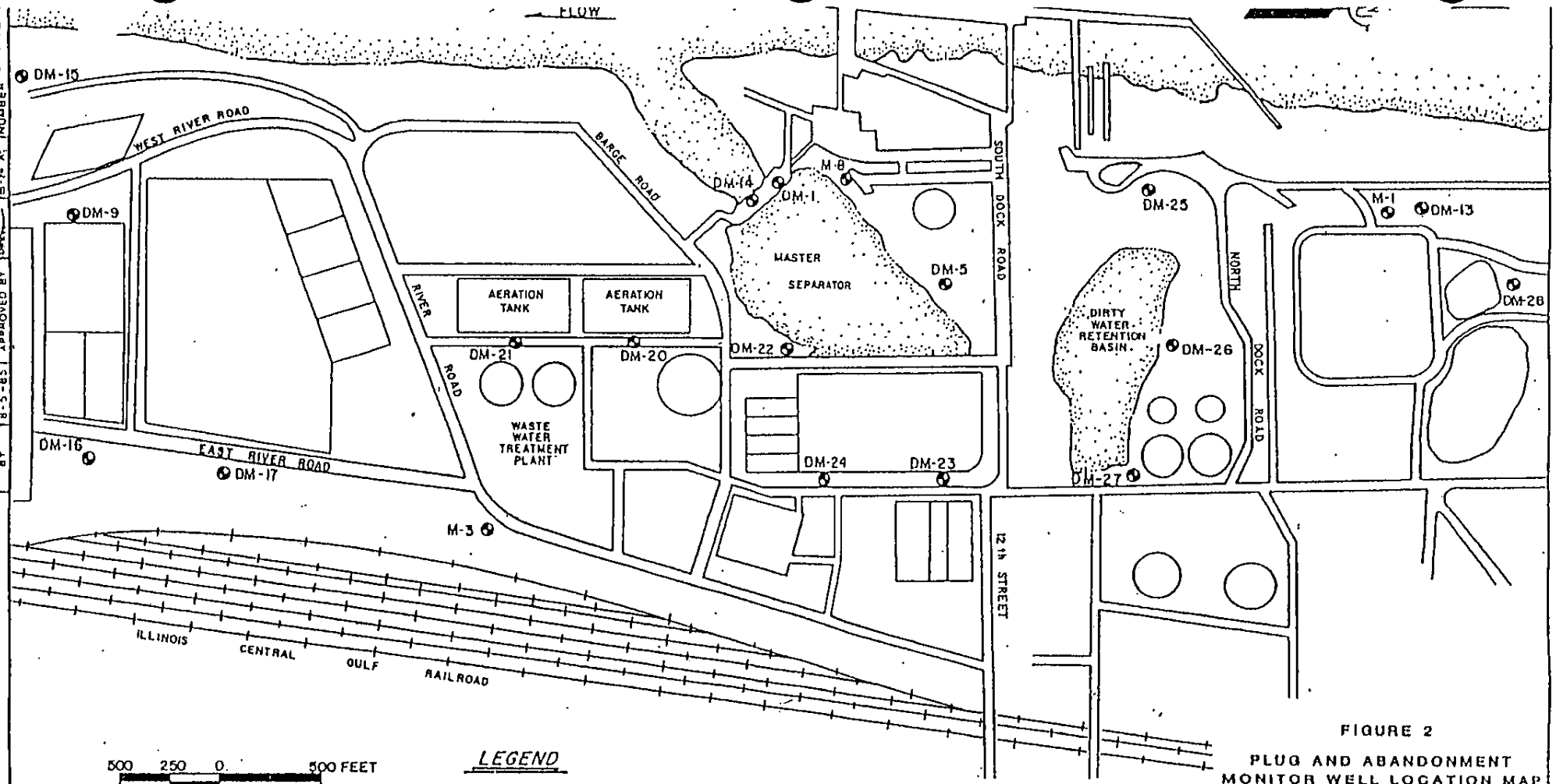

FIGURE 2

PLUG AND ABANDONMENT
MONITOR WELL LOCATION MAP
BATON ROUGE REFINERY

PREPARED FOR

EXXON COMPANY, U.S.A.
BATON ROUGE, LOUISIANA

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Do Not Scale This Drawing

DRAWN BY R. KEEL 8-5-83 | CHECKED BY | APPROVED BY | DRAWING NUMBER 84162-1

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ATTACHMENT A

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING
FORM LDPW-GW-2

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

FORM LOWWA REV. 1/70

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY BR, LA
OWNERS WELL NUMBER (if any) M-1

2. LOCATION OF WELL: Parish: EBR in SECTION 43
TOWNSHIP 6S RANGE: 1W in the well's hole approximately ____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 48 ft., Depth of completed well, 46 ft., Date completed 1982 by (Give name and address of water well contractor who installed well or hole): GERRATY & MILLER

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD CUT CASING 3" BELOW GROUND SURFACE, ALLOW CEMENT TO CURE, TOP OFF TO GROUND SURFACE 46 FEET OF CASING AND SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16, 19 85 by (name and address of contractor or owner) IT CORP. 8116 ODE CALAIS STREET BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
2 2		–	0
1 2	3 5	6 11	12 28

(SIGNATURE) (DATE) 8/20/85

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

FORM LOWWA REV. 1/70

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY BR LA.
OWNERS WELL NUMBER (if any) M-3

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W in the well's hole approximately ____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 49 ft., Depth of completed well, 47 ft., Date completed 1982 by (Give name and address of water well contractor who installed well or hole): GERRATY & MILLER

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD CUT CASING 3" BELOW GROUND SURFACE ALLOW CEMENT TO CURE, TOP OFF TO GROUND SURFACE 47 FT OF CASING & SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16, 19 85 by (name and address of contractor or owner) IT CORP. 8116 ODE CALAIS STREET BATON ROUGE LA 70809

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N. A

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (if different from owner when drilled, note in item 6) EXXON USA
ADDRESS: 4045 SCENIC HWY B.R. LA
OWNERS WELL NUMBER (if any) DM-1

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near approximately
Miles from SEE ATTACHED MAP (CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 80 ft., Depth of completed well, 80 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of cement and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING TO 3" BELOW GROUND SURFACE, MUD GROUT TO CURB, TOP OFF TO GROUND SURFACE LEFT 80 FEET OF CASING & SCREEN IN HOLE

6. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 15, 19 85 by (name and address of contractor or owner) IT CORP 9116 ONE CALAIS STE 2 BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
2 2		–	0
1 2	3 5	6 11	12 28

(SIGNATURE) 8/20/85 (DATE)

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER (if different from owner when drilled, note in item 6) EXXON USA
ADDRESS: 4045 SCENIC HWY, BR. LA
OWNERS WELL NUMBER (if any) M-B

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near approximately
Miles from SEE ATTACHED MAP (CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 50 ft., Depth of completed well, 48 ft., Date completed 1982 by (Give name and address of water-well contractor who installed well or hole) GEILKEY & MILLER

4. Describe in detail how well or hole was plugged: (materials used, amount of cement and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CONCRETE PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE MUD CEMENT TO CURB AND TOP OFF TO GROUND SURFACE 50 FEET OF CASING & SCREEN LEFT IN HOLE

6. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16, 19 85 by (name and address of contractor or owner) IT CORP 9116 ONE CALAIS STE 2 BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

FORM LOTW-6W REV. 1/

LA. OFFICE OF PUBLIC WORKS

This form is used for an abandoned hole or well

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON, USA
ADDRESS: 4045 SCENIC HWY BATON ROUGE LA
OWNERS WELL NUMBER (if any) DM-9

2. LOCATION OF WELL: Parish: EBR in SECTION 45
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)
(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 93 ft., Depth of completed well, 90 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING AT GROUND SURFACE, ALLOW GROUT TO CURE, TOP OFF TO GROUND SURFACE LEFT 90 FEET OF CASING AND SCREEN IN HOLE

5. REMARKS: UNABLE TO ATTEMPT TO PULL CASING DUE TO PIPELINE AND CONDUIT OVER WELL LOCATION

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16, 19 85 by (name and address of contractor or owner) IT CORP. 8116 ONE CALAIS STE 2D BATON ROUGE, LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
2 2		–	0
1 2	3 5	6 11	12 28

[signature] (SIGNATURE) 8/20/85 (DATE)

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

FORM LOTW-6W REV. 1/

LA. OFFICE OF PUBLIC WORKS

This form is used for an abandoned hole or well

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY BR, LA
OWNERS WELL NUMBER (if any) DM-5

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)
(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 25 ft., Depth of completed well, 25 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CONCRETE PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW CEMENT TO CURE AND TOP OFF TO GROUND SURFACE 25 FEET OF CASING & SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 17, 19 85 by (name and address of contractor or owner) IT CORP. 8116 ONE CALAIS STE 2D BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number

[signature]

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 635 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY B.R. LA.
OWNERS WELL NUMBER (if any) DM-14

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 110 ft., Depth of completed well, 108 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): JAMES A. MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of cement and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD CUT CASING 3" BELOW GROUND SURFACE, ALLOW CEMENT TO CURE, TOP OFF TO GROUND SURFACE 108 FT OF CASING AND SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY - 16 19 85 by (name and address of contractor or owner) IT CORP 8116 ONE CALAIS STE. BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
2 2		–	0
1 2	3 5	6 11	12 24

(SIGNATURE) (DATE) 8/20/85

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 635 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY BR, LA
OWNERS WELL NUMBER (if any) DM-13

2. LOCATION OF WELL: Parish: EBR in SECTION 43
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 129 ft., Depth of completed well, 129 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): JAMES A. MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of cement and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW CEMENT TO CURE, TOP OFF TO GROUND SURFACE, 129 FEET OF CASING AND SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 15 19 85 by (name and address of contractor or owner) IT CORP 8116 ONE CALAIS STE. 3D BATON ROUGE LA 70809

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY. BR, LA
OWNERS WELL NUMBER (if any) DM-16

2. LOCATION OF WELL: Parish: EBR in SECTION 45
TOWNSHIP 6S RANGE: 1W ; well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 30 ft., Depth of completed well, 28 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE PUMP POSTS AND CONCRETE PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW GROUT TO CURE TO DEE TO GROUND SURFACE. LEFT 28 FEET OF CASING AND SCREEN IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16 19 85 by (name and address of contractor or owner) IT CORP 8116 OLD CALAIS STE 2D BATON ROUGE LA 70809

(SIGNATURE) (DATE) 8/20/85

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OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
22		–	0
1 2	3 5	6 11	12 26

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 5) EXXON USA
ADDRESS. 4045 SCENIC HWY BATON ROUGE, LA
OWNERS WELL NUMBER (if any) DM-15

2. LOCATION OF WELL: Parish: EBR in SECTION 45
TOWNSHIP 6S RANGE: 1W ; well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 115 ft., Depth of completed well, 115 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE PUMP POSTS AND CONCRETE PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD CUT CASING TO 3" BELOW GROUND SURFACE, ALLOW CEMENT TO CURE, TOP OFF TO GROUND SURFACE 115 FEET CASING AND SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16 19 85 by (name and address of contractor or owner) IT CORP. 8116 OLD CALAIS STE 2D BATON ROUGE LA 70809

8/20/85

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

Form LDPW-WW Rev. 1/11

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY, B.R., LA
OWNERS WELL NUMBER (if any) DM-20

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W ... well is near ... approximately ... Miles from SEE ATTACHED MAP (CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION. Depth of hole 25 ft., Depth of completed well, 23 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CONCRETE PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING TO 3" BELOW GROUND SURFACE, ALLOW GROUT TO CURE, TOP OFF TO GROUND SURFACE, LEFT 23 FEET OF CASING AND SCREEN IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16, 19 85 by (name and address of contractor or owner) IT CORP 8114 CODE CALAIS STE 2 BATON ROUGE, LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
2 2		–	0
1 2	3 6	4 11	12 26

(SIGNATURE) 8/20/85 (DATE)

SEE REVERSE SIDE OF 3RD COPY FOR INSTRUCTIONS

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

Form LDPW-WW Rev. 1/11

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY BR, LA
OWNERS WELL NUMBER (if any) DM-17

2. LOCATION OF WELL: Parish: EBR in SECTION 45
TOWNSHIP 6S RANGE: 1W ... well is near ... approximately ... Miles from SEE ATTACHED MAP (CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 30 ft., Depth of completed well, 28 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole) DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE ALLOW CEMENT TO CURE AND TOP OFF TO GROUND SURFACE, LEAVE 28 FEET OF CASING AND SCREEN IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on JULY 10, 19 85 by (name and address of contractor or owner) IT CORP. 8114 CODE CALAIS STE 2 BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number

(SIGNATURE) (DATE)

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

FORM LDPW-6W
REV. 1/7

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL-OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY B.R., LA
OWNERS WELL NUMBER (if any) DM-22

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 64 ft., Depth of completed well, 64 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CONCRETE PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD. CUT CASING 3" BELOW GROUND SURFACE, ALLOW CEMENT TO CURE, TOP OFF TO GROUND SURFACE 64' OF CASING & SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 16, 19 85 by (name and address of contractor or owner) IT CORP 8116 ONE CALAIS STE 2D BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
2 2			0
1 2	3 5	6 11	12 26

[signature] (SIGNATURE) 8/20/85 (DATE)

SEE REVERSE SIDE OF 3RD COPY FOR INSTRUCTIONS

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

FORM LDPW-6W
REV. 1/7

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY, BR. LA.
OWNERS WELL NUMBER (if any) DM-21

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from _____
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 53 ft., Depth of completed well, 50 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW GROUT TO CURE, TOP OFF TO GROUND SURFACE, 50 FEET OF CASING AND SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 14, 19 85 by (name and address of contractor or owner) IT CORP 8116 ONE CALAIS STE 2D BATON ROUGE LA 70809

OFFICE USE ONLY

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

FORM LOPW-
REV. 1/

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY BR, LA
OWNERS WELL NUMBER (if any) DM-24

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 30 ft., Depth of completed well, 28.5 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of ca and/or screen removed, or left in hole, etc.) REMOVED BUMP POSTS AND CEME PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW GROUT TO CURE TOP OFF TO GROUND SURFACE LET 28.5 FEET OF CASING AND SCREEN IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Reg tions of the State on MAY 14, 1985 by (name and add of contractor or owner) IT CORP 8116 ONE CALAIS STE 2 BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
22		–	0
1 2	3 6	8 11	12 26

[signature] (SIGNATURE) 8/20/85 (DATE)

SEE REVERSE SIDE OF 3RD COPY FOR INSTRUCTIONS

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

FORM LOPW-
REV.

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORK

1. WELL OWNER: (if different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY BR., LA.
OWNERS WELL NUMBER (if any) DM-23

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 25 ft., Depth of completed well, 23 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of ce and/or screen removed, or left in hole, etc.) REMOVE BUMP POSTS AND CEME PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW GROUT T CURE TOP OFF TO GROUND SURFACE LEFT 23 FE OF CASING AND SCREEN IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Reg tions of the State on MAY 14, 1985 by (name and add of contractor or owner) IT CORP. 8116 ONE CALAIS STE BATON ROUGE LA. 70809

OFFICE USE ONLY

State	Parish	Local Well No	Identification Number

[signature] 8/20/85

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY B.R., LA
OWNERS WELL NUMBER (if any) DM-26

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 52 ft., Depth of completed well, 50 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE PUMP POLES AND CEMENT PAD ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW GROUT TO CURE. TOP OFF TO GROUND SURFACE, 50 FEET OF CASING AND SCREEN LEFT IN HOLE.

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 15, 19 85 by (name and address of contractor or owner) IT CORP. 8116 ONE CALAIS STE 3 BATON ROUGE, LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
2 2		–	0
1 2	3 5	6 11	12 26

(SIGNATURE) (DATE) 8/20/85

SEE REVERSE SIDE OF 3RD COPY FOR INSTRUCTIONS

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 636 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 5) EXXON USA
ADDRESS: 4045 SCENIC HWY B.R., LA
OWNERS WELL NUMBER (if any) DM-25

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 465 ft., Depth of completed well, 410 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE PUMP POLES AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW GROUT TO CURE, TOP OFF TO GROUND SURFACE 40 FEET OF CASING AND SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 15, 19 85 by (name and address of contractor or owner) IT CORP 8116 ONE CALAIS STE 20 BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number

(SIGNATURE) (DATE)

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 6) EXXON USA
ADDRESS 4045 SCENIC HWY BR LA
OWNERS WELL NUMBER (if any) DM-28

2. LOCATION OF WELL: Parish: EBR in SECTION 43
TOWNSHIP 6S RANGE: 1W, well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 50 ft., Depth of completed well, 50 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE PUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW CEMENT TO CURE TOP OF TO GROUND SURFACE
50 FEET OF CASING & SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 15, 19 85 by (name and address of contractor or owner) IT CORP 8116 ODE CALAIS STE 2D BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
22		–	0
1 2	3 5	6 11	12 28

(SIGNATURE) (DATE) 8/20/85

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Ash Data Products, Inc., Chalmette, LA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF PUBLIC WORKS
WATER-WELL ABANDONMENT AND PLUGGING (STATE ACT 535 (1972))

This form is used for an abandoned hole or well

LA. OFFICE OF PUBLIC WORKS

1. WELL OWNER: (If different from owner when drilled, note in item 5) EXXON USA
ADDRESS 4045 SCENIC HWY BR, LA
OWNERS WELL NUMBER (if any) DM-27

2. LOCATION OF WELL: Parish: EBR in SECTION 44
TOWNSHIP 6S RANGE: 1W, well is near _____ approximately _____ Miles from SEE ATTACHED MAP
(CROSSROADS, TOWN, RAILROAD, ANY LANDMARK, ETC.)

(IF POSSIBLE PLEASE ATTACH MAP OR PLAT SHOWING LOCATION)

3. WELL INFORMATION: Depth of hole 29 ft., Depth of completed well, 27 ft., Date completed 1980 by (Give name and address of water-well contractor who installed well or hole): DAMES & MOORE

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) REMOVE PUMP POSTS AND CEMENT PAD, ATTEMPT TO PULL CASING, GROUT WITH 4:1 CEMENT/BENTONITE BY TREMIE METHOD, CUT CASING 3" BELOW GROUND SURFACE, ALLOW GROUT TO CURE TOP OFF TO GROUND SURFACE
27 FEET OF CASING & SCREEN LEFT IN HOLE

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on MAY 15, 19 85 by (name and address of contractor or owner) IT CORP 8116 ODE CALAIS STE 2D BATON ROUGE LA 70809

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number
22		–	0
1 2	3 5	6 11	12 28

(SIGNATURE) (DATE) 8/20/85

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