APPENDIX B

OPERATIONAL HISTORY DOCUMENTS

9870032

436890

UNITED STATES OF AMERICA

State of Louisiana

DUPLICATE

WADE O. MARTIN, JR.

I, the undersigned Secretary of State, of the State of Louisiana

DO HEREBY CERTIFY that an Agreement of Merger whereby DELTA MUD & CHEMICAL COMPANY, INC., GEM OIL TOOL CO., INC., INTRACOASTAL DRILLING INCORPORATED, DELTA SAFETY & SUPPLY CO., INC., PETROLEUM TREATERS, INC., all domiciled at Houma, Louisiana, ARNOLD & CLARKE CHEMICAL COMPANY, INC., domiciled at Houston, Texas, and ACCRON INDUSTRIES, INC., a Texas corporation not qualified to do business in Louisiana, are merged into

DELTA IRON WORKS, INC.,

A Delaware corporation domiciled at Wilmington,

Certified as a true and correct copy on December 21, 1972, by the Secretary of State of Delaware,

Was filed and recorded in this Office on December 29, 1972, in the Record of Charters Book 300,

By virtue of this Agreement, I further certify that DELTA MUD & CHEMICAL COMPANY, INC., GEM OIL TOOL CO., INC., INTRACOASTAL DRILLING INCORPORATED, DELTA SAFETY & SUPPLY CO., INC., PETROLEUM TREATERS, INC., all domiciled at Houma, Louisiana, and ARNOLD & CLARKE CHEMICAL COMPANY, INC., domiciled at Houston, Texas, are no longer qualified to transact business in this State.

FILED FOR RECORD
PARISH OF
TERREBONNE, LA.
JAN 15 AM 9:54
Ray B. Herst
DEPUTY
CLERK OF COURT

In testimony whereof, I have hereunto set my hand and caused the Seal of my Office to be affixed at the City of Baton Rouge on, December 29, 1972.

Wade O Martin Jr.

Secretary of State

CERTIFICATE 100-A

FRANKLIN PRINTING CO. INC., N. O.

Recorded Jan. 15, 1973

Clerk

449428

UNITED STATES OF AMERICA

State of Louisiana

UNION JUSTICE AND CONFIDENCE

WADE O. MARTIN, JR.

I, the undersigned Secretary of State, of the State of Louisiana

DO HEREBY CERTIFY that the annexed and following is a True and Correct copy of an Agreement of Merger whereby DELTA IRON WORKS, INC., domiciled at Wilmington, Delaware is merged into

CHROMALLOY AMERICAN CORPORATION,

A Delaware corporation domiciled at Wilmington,

As shown by comparison with document filed and recorded in this Office on February 26, 1973.

In testimony whereof, I have hereunto set my hand and caused the Seal of my Office to be affixed at the City of Baton Rouge on,

July 13, 1973.

Wade O Martin Jr.

Secretary of State

CERTIFICATE 102-A

FRANKLIN PRINTING CO. INC., N.O.

CERTIFICATE OF OWNERSHIP AND MERGER

MERGING

DELTA IRON WORKS, INC.

INTO

CHROMALLOY AMERICAN CORPORATION

Chromalloy American Corporation, a corporation organized and existing under the laws of Delaware.

DOES HEREBY CERTIFY:

FIRST: That this corporation was incorporated on the 26th day of August 1968, pursuant to the General Corporation Law of the State of Delaware.

SECOND: That this corporation owns all of the outstanding shares of the stock of Delta Iron Works, Inc., a corporation incorporated on the 7th day of July 1969, pursuant to the General Corporation Law of the State of Delaware.

THIRD: That this corporation, by the following resolutions of its board of directors, duly adopted on the 8th day of December, 1972, determined to and pursuant to Section 253 of the Delaware Corporation Law, does hereby merge into itself the said Delta Iron Works, Inc.:

> RESOLVED, that the merger into this Corporation of Delta Iron Works, Inc., a wholly-owned subsidiary of this Corporation, is hereby authorized and approved, and upon the effective date of said merger, this Corporation assumes all of said subsidiary's respective obligations; and be it further
>
> RESOLVED, that the merger of the foregoing Delaware subsidiary shall be effective upon the date of filing with the Secretary of State of Delaware of the Certificate of Ownership and Merger hereinafter referred to; and be it further
>
> RESOLVED, that upon the effective date of the merger, the officers of Delta Iron Works, Inc., which is a wholly-owned subsidiary of this Corporation, will remain as the officers of the newly created division of this Corporation, respectively; and be it further

RESOLVED, that the proper officers of this Corporation be and they are hereby directed to make and execute, under the corporate seal of this Corporation, a Certificate of Ownership and Merger setting forth a copy of the resolutions to merge said Delta Iorn Works, Inc. into this Corporation, and for this Corporation to assume their liabilities and obligations on the date of adoption hereof, and to cause the same to be filed with the Secretary of State and a certified copy in the Office of the Recorder of Deeds of New Castle County, and to do all acts and things whatsoever, whether within or without the State of Delaware, which may be in anywise necessary or proper to effect said merger.

FOURTH: Anything herein or elsewhere to the contrary notwithstanding, this merger may be terminated and abandoned by the Board of Directors of Chromalloy American Corporation at any time prior to the date of filing the merger with the Secretary of State.

IN WITNESS WHEREOF, said Chromalloy American Corporation has caused its corporate seal to be hereunto affixed and this certificate to be signed by W. S. Walch, its Executive Vice President, and attested by W. B. Roberts, its Secretary, this 22nd day of December, 1972.

CHROMALLOY AMERICAN CORPORATION

By W. S. Walch
W. S. Walch, Executive Vice President

(CORPORATE SEAL)

Attest:

By W. B. Roberts
W. B. Roberts, Secretary

2

STATE OF MISSOURI)
) ss.
COUNTY OF ST. LOUIS)

BE IT REMEMBERED that on this 22nd day of December, 1972, personally came before me, a Notary Public in and for the County and State aforesaid, W. S. Walch, Executive Vice President of Chromalloy American Corporation, a corporation of the State of Delaware, and he duly executed said certificate before me and acknowledged the said certificate to be his act and deed and the act and deed of said corporation and the facts stated therein are true; and that the seal affixed to said certificate and attested by the Secretary of said corporation is the common or corporate seal of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and seal of office the day and year aforesaid.

Elagene J. Baer
Elagene J. Baer, Notary Public

My Commission Expires October 23, 1973

(SEAL)

3

jcd

State of Delaware

Office of Secretary of State

I, **Robert H. Reed,** *Secretary of State of the State of Delaware,*

do hereby certify *that the above and foregoing is a true and correct copy of* Certificate of Ownership of the "CHROMALLOY AMERICAN CORPORATION", merging "DELTA IRON WORKS, INC.", pursuant to Section 253 of the General Corporation Law of the State of Delaware, as received and filed in this office the twenty-ninth day of December, A.D. 1972, at 9 o'clock A M.

In Testimony Whereof, *I have hereunto set my hand and official seal at Dover this* fourteenth *day of* February *in the year of our Lord one thousand nine hundred and* seventy-three.

Robert H. Reed

Secretary of State

J A Biddle

Ass't Secretary of State

FILED FOR RECORD
PARISH OF
TERREBONNE, LA.
1973 JUL 18 AM 9:30
Jane A Talbot
DEPUTY
CLERK OF COURT

FORM 120

Recorded July 18, 1973
Robert Boudreaux
Clerk

778913

STATE OF LOUISIANA

PARISH OF ST. LANDRY

CASH SALE

BE IT KNOWN that on the 8th day of the month of April, in the year of Our Lord, One Thousand, Nine Hundred and Eighty-Six, before me, the undersigned authority, a Notary Public, duly commissioned and qualified and sworn, in and the Parish and State above written and in the presence of the witnesses hereinafter named and undersigned, personally came and appeared:

W. SIMMONS SANDOZ, a person of full age of majority and a resident of Opelousas, St. Landry Parish, Louisiana, and whose mailing address is P. O. Drawer 900, Opelousas, Louisiana, appearing herein as Trustee of the estate of DELTA SERVICES INDUSTRIES, United States Bankruptcy Court for the Western District of Louisiana, case no. 84-4584,

who declared that for, and in consideration of the sum and price hereinafter set forth he does by these presents, grant, bargain, sell, convey, transfer assign and set over with subrogation to all his rights and actions of warranty against all previous owners unto DEAN BOATS, INC., a Louisiana Corporation domiciled in Braithwaite, Louisiana, and having a mailing address of Rt. 1, Box 216, Braithwaite, Louisiana 70040.

here present and accepting for itself, its heirs and assigns, acknowledges delivery and possession thereof, the following described property, to wit:

A tract of land located in Sections 12, 42, 101 & 104, T-17-S, R-17-E, Terrebonne Parish, Louisiana, and described as follows:

COMMENCING at conventional northwest corner of Section 12, T-17-S, R-17-E; thence S81°57'10"E on and along the section line common to Section 12 and 101, T-17-S, R-17-E, and the southerly lot line of lot F of the Subdivision of Lot 198 of Crescent Plantation Subdivision by Joseph Villavaso, dated April 1925, for a distance of 424.82 feet to a point on the southerly right-of-way line of Industrial Boulevard (Terrebonne Parish Road No. 18);

THENCE, on and along the southerly right-of-way line of said Industrial Boulevard on an arc to the left having a central angle of 20°56'53", a radius of 1,115.68 feet, and a distance of 407.90 feet to a point;

THENCE S3°01'44"W a distance of 430.[illegible] feet to an intersection with the westerly projection of the average centerline of an existing fence;

THENCE, S88°59'46"E on and along said average centerline of existing fence and projection thereof a distance of 1,190.43 feet to its intersection with the average centerline of an existing drainage ditch;

THENCE, N1°10'00"E on and along said average centerline of existing drainage ditch a distance of 478.01 feet to its intersection with the southerly right-of-way line of said Industrial Boulevard;

THENCE, S82°00'00"E on and along said southerly right-of-way line of said Industrial Boulevard a distance of 65.46 feet to its intersection with the westerly property line of Placid Oil Company;

THENCE, S1°10'00"W on and along said westerly property line a distance of 1,585.00 feet to a point;

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& SCHIFF
A PROFESSIONAL
LAW CORPORATION
137 WEST LANDRY STREET
OPELOUSAS, LA. 70571-0900

THENCE, N88°50'00"W on and along Placid Oil Company's northerly property line a distance of 566.17 feet to a point;

THENCE, S1°10'00"W on and along Placid Oil Company and Peurod Drilling Company's westerly property line a distance of 1,441.64 feet to a point;

THENCE, N89°29'27"W a distance of 997.85 feet to a point, said point being on the northeasterly bankline of Bayou LaCarpe;

THENCE, N31°27'33"W on and along said northeasterly bankline a distance of 115.81 feet to a point;

THENCE, N26°02'03"W on and along said northeasterly bankline a distance of 239.30 feet to a point;

THENCE, N27°12'39"W on and along said northeasterly bankline a distance of 134.06 feet to a point;

THENCE, N29°47'19"W on and along said northeasterly bankline of Bayou LaCarpe a distance of 79.21 feet to a point, said point being on the southwesterly edge of an existing bulkhead;

THENCE, N27°17'13"W on and along said southwesterly edge of bulkhead a distance of 206.42 feet to a point;

THENCE N8°37'15"W on and along said southwesterly edge of bulkhead a distance of 521.96 feet to a point;

THENCE, N4°56'31"W on and along said southwesterly edge of bulkhead a distance of 17.76 feet to a point, said point being on the southerly lot line of Lot "A" of the Subdivision of Lot 198 of Crescent Plantation by Joseph Villavaso, dated April 1925, said point also being on the Section line common to Sections 47 and 104, T-17-S, R-17-E;

THENCE, N72°16'47"E on and along said southerly lot line and section line a distance of 350.96 feet to a point, said point being at the southeast corner of said Lot "A" and the section-corner common to Sections 12, 47 and 104, T-17-S, R-17-E;

THENCE, N8°29'12"W on and along the easterly line of said Lot "A" and the section line common to Sections 12 and 104, T-17-S, R-17-E, a distance of 601.89 feet to a point, said point being at the corner common to Lot "A" and Lot "B" of the said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N89°42'12"W on and along the Lot line common to Lot "A" and Lot "B" and the projection thereof a distance of 103.08 feet to its intersection with the southwesterly projections of the average northeasterly bankline of Bayou LaCarpe;

THENCE N2°31'54"E on and along the average projection of the northeasterly bankline of Bayou LaCarpe a distance of 133.31 feet to a point;

THENCE, N24°49'13"W on and along said southwesterly edge of an existing bulkhead a distance of 192.05 feet to a point, said point being on the lot line common to Lots "B" and "C" of said subdivision of Lot 198 of Crescent Plantation Subdivision;

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LAW CORPORATION
137 WEST LANDRY STREET
OPELOUSAS, LA. 70571-0900

THENCE, N84°06'18"E along the lot line common to said lots "B" and "C" a distance of 130.[illegible] feet to a point being on the section line common to Sections 12 and 104, T-17-S, R-17-E;

THENCE, N8°29'12"W on and along said common section line a distance of 962.56 feet to a point, said point being at the corner common to Lot "C" and Lot "D" of said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, S52°30'41"W on and along the lot line common to Lot "C" and Lot "D" a distance of 682.15 feet to its intersection with the southwesterly edge of an existing bulkhead;

THENCE, N47°09'10"W on and along said southwesterly edge of existing bulkhead a distance of 47.34 feet to a point;

THENCE, 45°14'03"W on and along said southwesterly edge of existing bulkhead a distance of 162.74 feet to a point;

THENCE, N45°41'22"W on and along said southwesterly edge of bulkhead a distance of 7.12 feet to a point; said point being on the lot line common to Lot "D" and Lot "E" of said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N53°31'31"E on and along the lot line common to Lot "D" and Lot "E" of said Subdivision of Lot 198 of Crescent Plantation Subdivision a distance of 820.98 feet to a point, said point being the point of beginning and containing an area of 110.2759 acres, more or less.

The above described Tract is more fully shown on a plat prepared by T. Baker Smith & Son, Inc., titled "Chromalloy American Corporation, Chromalloy Natural Resources Division, Survey of Property in Sections 12, 47, 101 and 104, T-17-S, R-17-E, Terrebonne Parish, Louisiana", dated July 16, 1980, revised July 24, 1980.

LESS AND EXCEPT:

A certain tract of land situated in the Parish of Terrebonne, State of Louisiana, located in Section 12, T-17S-R17E, and being more particularly described on a map made by Douglass S. Talbot, R.L.S., dated June 15, 1981, the latest revision being July 13, 1981, and being more particularly described as follows:

Commencing at the conventional property corner marking Sections 12 and 101, said corner being northwest corner of Section 12, T-17S-R17E, Terrebonne Parish, marked "z" on above described plat; thence S 27°35'56" E a distance of 2,706.40 feet to point "A", said point of beginning;

Thence S 88°33'37" E a distance of 301.26 feet to point "B",

Thence S01°22'19" W a distance of 601.11 feet to point "C",

Thence N 88°33'37" W a distance of 301.57 feet to point "D",

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OPELOUSAS, LA. 70571-0900

Thence N 01°26'23" E a distance of 601.11 feet to point "A", the point of beginning.

Said property containing 4.17 acres and being bounded on the north, south, east and west by property belonging to Delta Services Industries, together with bulkheading, mooring dolphins, oxygen, propane, compressed air, water and electrical service lines, and all improvements thereon, and property functionally related and subordinate to said property.

Together with all buildings and improvements thereon and all rights, ways, servitudes and privileges thereunto belonging or in anywise appertaining, including all ownership rights and privileges to the buildings constructed and/or owned located on adjacent leased properties and specifically including that building on the leased property known as the Ellender property shown as Lot A on the plat to the extent that these rights are enjoyed by the vendor.

This sale is made and accepted for and in consideration of the price and sum of ONE MILLION THREE HUNDRED THIRTY-SIX THOUSAND FOUR HUNDRED SEVEN AND 50/100 ($1,336,407.50) DOLLARS, cash paid in hand, the receipt whereof is hereby acknowledged and the full acquittance and discharge granted therefor.

Pursuant to LSA-R.S. 35:11B, the parties hereto declare that the property herein conveyed is not the family home of vendor or vendee.

Contracting parties dispense me, Notary, from the production of the tax receipts and the Certificate of Mortgage required by law.

DONE AND PASSED at Opelousas, St. Landry, Louisiana on the day, month and year aforesaid in the presence of the witnesses cited below who have signed with the appears and me, Notary, after reading the whole.

WITNESSES:

W. Simmons Sandoz, Trustee

NOTARY PUBLIC

SANDOZ, SANDOZ
& SCHIFF
A PROFESSIONAL
LAW CORPORATION
137 WEST LANDRY STREET
OPELOUSAS, LA. 70571-0800

UNITED STATES BANKRUPTCY COURT
EASTERN DISTRICT OF LOUISIANA

IN THE MATTER OF	NUMBER
DELTA SERVICES INDUSTRIES, d/b/a DELTA FABRICATION, DELTA CONSTRUCTION, DELTA STEEL SALES, DELTA SAFETY & SUPPLY DELTA FIRE SYSTEMS, DELTA SHIPYARD, and HELDENBRAND	84-01992K
DEBTOR	CHAPTER 7

ORDER CONVERTING PROCEEDING FROM
CHAPTER 11 to CHAPTER 7
AND APPOINTING INTERIM TRUSTEE

Considering the foregoing motion of the debtor herein,

IT IS ORDERED that the voluntary Petition for Relief filed under Chapter 11 of the Bankruptcy Code on September 21, 1984 by DELTA SERVICES INDUSTRIES be and it hereby is CONVERTED to Liquidation under Chapter 7 of the Bankruptcy Code.

IT IS FURTHER ORDERED that DELTA SERVICES INDUSTRIES, through its proper officer(s), file a list of all obligations incurred during the Chapter 11 proceeding which remain unpaid. Said list is to include each creditor's full name, complete mailing address and the amount owing and is to be filed with this Court no later than NOVEMBER 30, 1984.

IT IS FURTHER ORDERED that DELTA SERVICES INDUSTRIES, through its proper officer(s), file with this Court no later than NOVEMBER 30, 1984 a financial statement showing its operations

during the Chapter 11 proceeding. Said financial statement is to include a balance sheet and profit and loss statement with a list of all assets.

IT IS FURTHER ORDERED that W. SIMMONS SANDOZ of 137 West Landry Street, P. O. Drawer 900, Opelousas, Louisiana 70570 be and he hereby is appointed INTERIM TRUSTEE with a $25,000.00 Surety Bond.

New Orleans, Louisiana, October 29, 1984.

T. H. KINGSMILL, JR.
BANKRUPTCY JUDGE

Delta Services Industries
c/o Leon Toups, President
P. O. Box 101
Houma, LA 70361

Peter J. Butler &
Aubrey Hirsch, Jr.
Co-counsel for Debtor
712 American Bank Building
New Orleans, LA 70130

Ronald J. Hof &
Merrill T. Landwehr
Co-counsel for Debtor
821 Gravier Street, Suite 1100
New Orleans, LA 70427

W. Simmons Sandoz
Interim Trustee
P. O. Drawer 900
137 West Landry Street
Opelousas, LA 70570

S. J. Beaulieu
Chief Deputy Clerk

10/29/84 - gmn

IN THE UNITED STATES BANKRUPTCY COURT

FOR THE EASTERN DISTRICT OF LOUISIANA

IN RE:

DELTA SERVICES INDUSTRIES
Tax I.D. #72-0894012
a/k/a DELTA FABRICATION
DELTA CONSTRUCTION
DELTA STEEL SALES
DELTA SAFETY & SUPPLY
DELTA FIRE SYSTEMS
DELTA SHIPYARD and
HELDENBRAND

CASE NO. 84-01992

Debtors

ORDER

On considering the foregoing Motion to Ratify Sale and Cancel Liens in and to the following described property, to wit:

> A tract of land located in Sections 12, 47, 101 & 104, T-17-S, R-17-E, Terrebonne Parish, Louisiana, and described as follows:
>
> COMMENCING at conventional northwest corner of Section 12, T-17-S, R-17-E; thence S81°57'12"E on and along the section line common to Section 12 and 101, T-17-S, R-17-E, and the southerly lot line of Lot E of the Subdivision of Lot 198 of Crescent Plantation Subdivision by Joseph Villavaso, dated April 1925, for a distance of 424.82 feet to a point on the southerly right-of-way line of Industrial Boulevard (Terrebonne Parish Road No. 18);
>
> THENCE, on and along the southerly right-of-way line of said Industrial Boulevard on an arc to the left having a central angle of 20°56'53", a radius of 1,115.68 feet, and a distance of 407.90 feet to a point;
>
> THENCE S1°01'44"W a distance of 480.22 feet to an intersection with the westerly projection of the average centerline of an existing fence;

THENCE, S88°59'46"E on and along said average centerline of existing fence and projection thereof a distance of 1,190.43 feet to its intersection with the average centerline of an existing drainage ditch;

THENCE, N1°10'00"E on and along said average centerline of existing drainage ditch a distance of 328.01 feet to its intersection with the southerly right-of-way line of said Industrial Boulevard;

THENCE, S82°00'00"E on and along said southerly right-of-way line of said Industrial Boulevard a distance of 65.46 feet to its intersection with the westerly property line of Placid Oil Company;

THENCE, S1°10'00"W on and along said westerly property line a distance of 1,585.00 feet to a point;

THENCE, N88°50'00"W on and along Placid Oil Company's northerly property line a distance of 566.17 feet to a point;

THENCE, S1°10'00"W on and along Placid Oil Company and Penrod Drilling Company's westerly property line a distance of 1,441.64 feet to a point;

THENCE, N89°29'27"W a distance of 997.85 feet to a point, said point being on the northeasterly bankline of Bayou LaCarpe;

THENCE, N31°27'33"W on and along said northeasterly bankline a distance of 115.81 feet to a point;

THENCE, N26°02'03"W on and along said northeasterly bankline a distance of 238.30 feet to a point;

THENCE, N27°12'39"W on and along said northeasterly bankline a distance of 134.06 feet to a point;

THENCE, N29°47'19"W on and along said northeasterly bankline of Bayou LaCarpe a distance of 79.21 feet to a point, said point being on the southwesterly edge of an existing bulkhead;

THENCE, N27°17'13"W on and along said southwesterly edge of bulkhead a distance of 206.42 feet to a point;

THENCE N8°37'15"W on and along said southwesterly edge of bulkhead a distance of 521.96 feet to a point;

THENCE, N4°56'31"W on and along said southwesterly edge of bulkhead a distance of 17.76 feet to a point, said point being on the southerly lot line of Lot "A" of the Subdivision of Lot 198 of Crescent Plantation by Joseph Villavaso, dated April 1925, said point also being on the Section line common to Sections 47 and 104, T-17-S, R-17-E;

THENCE, N72°16'47"E on and along said southerly lot line and section line a distance of 350.96 feet to a point, said point being at the southeast corner of said Lot "A" and the section-corner common to Sections 12, 47 and 104, T-17-S, R-17-E;

THENCE, N8°29'12"W on and along the easterly line of said Lot "A" and the section line common to Sections 12 and 104, T-17-S, R-17-E, a distance of 601.89 feet to a point, said point being at the corner common to Lot "A" and Lot "B" of the said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N89°42'12"W on and along the Lot line common to Lot "A" and Lot "B" and the projection thereof a distance of 103.08 feet to its intersection with the southwesterly projections of the average northeasterly bankline of Bayou LaCarpe;

THENCE N2°31'54"E on and along the average projection of the northeasterly bankline of Bayou LaCarpe a distance of 133.31 feet to a point;

THENCE, N24°49'13"W on and along said southwesterly edge of an existing bulkhead a distance of 192.05 feet to a point, said point being on the lot line common to Lots "B" and "C" of said subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N84°06'18"E along the lot line common to said Lots "B" and "C" a distance of 130.53 feet to a point being on the section line common to Sections 12 and 104, T-17-S, R-17-E;

THENCE, N8°29'12"W on and along said common section line a distance of 962.56 feet to a point, said point being at the corner common to Lot "C" and Lot "D" of said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, S52°30'41"W on and along the lot line common to Lot "C" and Lot "D" a distance of 682.15 feet to its intersection with the southwesterly edge of an existing bulkhead;

THENCE, N47°09'10"W on and along said southwesterly edge of existing bulkhead a distance of 47.34 feet to a point;

THENCE, 45°14'03"W on and along said southwesterly edge of existing bulkhead a distance of 162.74 feet to a point;

THENCE, N45°41'22"W on and along said southwesterly edge of bulkhead a distance of 2.32 feet to a point; said point being on the lot line common to Lot "D" and Lot "E" of said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N53°31'31"E on and along the lot line common to Lot "D" and Lot "E" of said Subdivision of Lot 198 of Crescent Plantation Subdivision a distance of 820.98 feet to a point, said point being the point of beginning and containing an area of 110.2759 acres, more or less.

The above described Tract is more fully shown on a plat prepared by T. Baker Smith & Son, Inc., titled "Chromalloy American Corporation, Chromalloy Natural Resources Division, Survey of Property in Sections 12, 47, 101 and 104, T-17-S, R-17-E, Terrebonne Parish, Louisiana", dated July 16, 1980, revised July 24, 1980.

LESS AND EXCEPT:

A certain tract of land situated in the Parish of Terrebonne, State of Louisiana, located in Section 12, T-17S-R17E, and being more particularly described on a map made by Douglass S. Talbot, R.L.S., dated June 15, 1981, the latest revision being July 13, 1981, and being more particularly described as follows:

Commencing at the conventional property corner marking Sections 12 and 101, said corner being northwest corner of Section 12, T-17S-R17E, Terrebonne Parish, marked "z" on above described plat; thence S 27°35'56" E a distance of 2,206.40 feet to point "A", said point of beginning;

Thence S 88°33'37" E a distance of 301.86 feet to point "B",

Thence S01°22'19" W a distance of 601.11 feet to point "C",

Thence N 88°33'37" W a distance of 302.57 feet to point "D",

Thence N 01°26'23" E a distance of 601.11 feet to point "A", the point of beginning.

Said property containing 4.17 acres and being bounded on the north, south, east and west by property belonging to Delta Services Industries, together with bulkheading, mooring dolphins, oxygen, propane, compressed air, water and electrical service lines, and all improvements thereon, and property functionally related and subordinate to said property.

Together with all buildings and improvements thereon and all rights, ways, servitudes and privileges thereunto belonging or in anywise appertaining, including all ownership rights and privileges to the buildings constructed and/or owned located on adjacent leased properties and specifically including that building on the leased property known as the Ellender property shown as Lot A on the plat to the extent that these rights are enjoyed by the vendor.

and the same appearing proper in the premises,

IT IS ORDERED that sale of foregoing described property by W. SIMMONS SANDOZ, Trustee herein, to DEAN BOATS, INC. of Rt. 1, Box 216, Braithwaite, Louisiana 70040, in the amount of ONE MILLION THREE HUNDRED THIRTY-SIX THOUSAND FOUR HUNDRED SEVEN AND 50/100 ($1,336,407.50) DOLLARS, be and the same is hereby ratified.

IT IS FURTHER ORDERED that the Clerk of Court and Recorder of Mortgages in the Parish of Terrebonne, State of Louisiana, be and he is hereby authorized and directed to cancel and erase from the records of his office the following liens, mortgages and encumbrances, but ONLY INSOFAR as they may effect the above described property, to wit:

(1) A Collateral Mortgage in favor of any person, firm or corporation willing to loan same and against Delta Services Industries, Delta Services, Inc. and Granite Capital Corporation in the sum of $40 million, represented by one certain promissory note dated February 11, 1981, made payable to the order of bearer, due on demand at the Chase Manhattan Bank, (National Association), One Chase Manhattan Plaza, New Yor, New York 10081, which said note stipulates to bear interest at the rate of twenty (20%) percent per annum from date until paid, payable on demand. Inscribed February 12, 1981, in Mortgage Book 544, Folio 562, Entry No. 645055.

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(2) A Collateral Mortgage in favor of any person, firm or corporation willing to loan same and against Delta Services Industries, Delta Services, Inc. and Granite Capital Corporation in the sum of $500,000.00, represented by one certain promissory note dated February 11, 1981, made payable to the order of bearer, due on demand at the Chase Manhattan Bank (National Association), One Chase Manhattan Plaza, New York, New York 10081, which said note stipulates to bear interest at the rate of twenty (20%) percent per annum from date until paid, payable on demand. Inscribed February 12, 1981, in Mortgage Book 544, Folio 655, Entry No. 645057.

(3) A Judicial Mortgage in favor of Nina Nolen and against Kerry Chauvin, Delta Services Industries and Northwest Insurance Company, rendered and signed October 19, 1983, in the matter of "Nina Nolen vs. Kerry Chauvin and Delta Services Industries", versus no. 66856 of the Civil Docket of the 32nd Judicial District Court of the Parish of Terrebonne, Louisiana, in the full and true sum of $19,177.34, together with the interest from date of judicial demand until paid, and costs as provided therein.

Opelousas, Louisiana, this 8th day of April, 1986.

signed: T. H. Kingsmill, Jr.
Judge, U.S. Bankruptcy Court

TRUE COPY

APR 8 1986

FRANK J. [illegible] Clerk
UNITED STATES BANKRUPTCY COURT
NEW ORLEANS, LA.

'86 APR -9 [illegible]

Nancy A. [illegible]
DEPUTY CLERK

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843349

DEAN BOATS INC.
Route 1 Box 216
Braithwaite, Louisiana 70040

RESOLUTION OF THE INCORPORATORS/DIRECTORS

WHEREAS Dean Boats Inc., a corporation existing pursuant to the law of Louisiana acting by and with unanimous consent of its incorporators/directors [no shares having ever been issued] is in inactive status and whereas certain property was acquired by the Corporation through contributions to capital of Lynn B. Dean and whereas the Corporation has no current or immediate intention of utilizing such property; it is therefore,

RESOLVED, that Dean Boats Inc. by these presents hereby conveys, sets over, transfers, abandons and delivers with full substitutions and subrogation in and to all rights of warranty which Dean Boats Inc. has or may have against all preceding owners and vendors, unto Lynn B. Dean here present and accepting for himself, his heirs and assigns, acknowledges delivery and possession of the following described property:

> A certain tract of land located in Sections 12, 47, 101 & 104, T-17-S, R-17-E, Terrebonne Parish, Louisiana and described as follows:
>
> COMMENCING at conventional northwest corner of Section 12, T-17-S, R-17-E; thence S 81° 57' 12" E on and along the section line common to Section 12 and 101, T-17-S, R-17-E and the southerly lot line of Lot E of the Subdivision of Lot 198 of Crescent Plantation Subdivision by Joseph Villavaso, dated April, 1925, for a distance of 424.82 f et to a point on the southerly right-of-way line of Industrial Boulevard (Terrebonne Parish Road Number 18);

THENCE, on and along the southerly right-of-way line of said Industrial Boulevard on an arc to the left having a central angle of 20° 56' 53", a radius of 1,115.68 feet and a distance of 407.90 feet to a point;

THENCE, S 1° 1' 44" W a distance of 430.22 feet to an intersection with the westerly projection of the average centerline of an existing fence;

THENCE, S 88° 59' 46" E on and along said average centerline of existing fence and projection thereof a distance of 1,190.43 feet to its intersection with the average centerline of an existing drainage ditch;

THENCE, N 1° 10' 00" E on and along said average centerline of existing drainage ditch a distance of 328.01 feet to its intersection with the southerly right-of-way line of said Industrial Boulevard;

THENCE, S 82° 00' 00" E on and along said southerly right-of-way line of said Industrial Boulevard a distance of 65.46 feet to its intersection with the westerly property line of Placid Oil Company;

THENCE, S 1° 10' 00" W on and along said westerly property line a distance of 1,585.00 feet to a point;

THENCE, N 88° 50' 00" W on and along Placid Oil Company's northerly property line a distance of 566.17 feet to a point;

THENCE, S 1° 10' 00" W on and along Placid Oil Company and Penrod Drilling Company's westerly property line a distance of 1,441.64 feet to a point;

THENCE, N 89° 29' 27" W a distance of 997.85 feet to a point, said point being on the northeasterly bankline of Bayou LaCarpe;

THENCE, N 31° 27' 33" W on and along said northeasterly bankline a distance of 115.81 feet to a point;

THENCE, N 26° 02' 03" W on and along said northeasterly bankline a distance of 238.30 feet to a point;

THENCE, N 27° 12' 39" W on and along said northeasterly bankline a distance of 134.06 feet to a point;

THENCE, N 29° 47' 19" W on and along said northeasterly bankline of Bayou LaCarpe a distance of 79.21 feet to a point, said point being on the southwesterly edge of an existing bulkhead;

THENCE, N 27° 17' 13" W on and along said southwesterly edge of bulkhead a distance of 206.42 feet to a point;

THENCE, N 8° 37' 15" W on and along said southwesterly edge of bulkhead a distance of 521.96 feet to a point;

THENCE, N 4° 56' 31" W on and along said southwesterly edge of bulkhead a distance of 17.76 feet to a point, said point being on the southerly lot line of Lot "A" of the Subdivision of Lot 198 of Crescent Plantation by Joseph Villavaso, dated April, 1925, said point also being on the Section line common to Sections 47 and 104, T-17-S, R-17-E;

THENCE, N 72° 16' 47" E on and along said southerly lot line and section line a distance of 350.96 feet to a point, said point being at the southeast corner of said Lot "A" and the section-corner common to Sections 12, 47 and 104, T-17-S. R-17-E;

THENCE, N 8° 29' 12" W on and along the easterly line of said Lot "A" and the section line common to Sections 12 and 104, T-17-S, R-17-E, a distance of 601.89 feet to a point, said point being at the corner common to Lot "A" and Lot "B" of the said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N 89° 442' 12" W on and along the Lot line common to Lot "A" and Lot "B" and the projection thereof a distance of 103.08 feet to its intersection with the southwesterly projections of the average northeasterly bankline of Bayou LaCarpe;

THENCE, N 2° 31' 54" E on and along the average projection of the northeasterly bankline of Bayou LaCarpe a distance of 133.31 feet to a point;

THENCE, N 24° 49' 13" W on and along said southwesterly edge of an existing bulkhead a distance of 192.05 feet to a point, said point being on the lot line common to Lots "B" and "C" of said subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N 84° 6' 18" E along the lot line common to said Lots "B" and "C" a distance of 130.53 feet to a point being on the section line common to Sections 12 and 104, T-17-S, R-17-E;

THENCE, N 8° 29' 12" W on and along said common section line a distance of 962.56 feet to a point, said point being at the corner common to Lot "C" and Lot "D" of said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, S 52° 30' 41" W on and along the lot line common to Lot "C" and Lot "D" a distance of 682.15 feet to its intersection with the southwesterly edge of an existing bulkhead;

THENCE, N 47° 9' 10" W on and along said southwesterly edge of existing bulkhead a distance of 47.34 feet to a point;

THENCE, N 45° 14' 3" W on and along said southwesterly edge of existing bulkhead a distance of 162.74 feet to a point;

THENCE, N 45° 41' 22" W on and along said southwesterly edge of bulkhead a distance of 2.32 feet to a point; said point being on the lot line common to Lot "D" and Lot "E" of said Subdivision of Lot 198 of Crescent Plantation Subdivision;

THENCE, N 53° 31' 31" E on and along the lot line common to Lot "D" and Lot "E" of said Subdivision of Lot 198 of Crescent Plantation Subdivision a distance of 820.98 feet to a point; said point being the point of beginning and containing an area of 110.2759 acres, more or less.

The above described Tract is more fully shown on a plat prepared by T. Baker Smith & Son, Inc. titled "Chromalloy American Corporation, Chromalloy Natural Resources Division, Survey of Property in Sections 12, 47, 101 and 104, T-17-S, R-17-E, Terrebonne Parish, Louisiana" dated July 16, 1980, evised July 24, 1980.

<u>LESS AND EXCEPT</u>:

A certain tract of land situated in the Parish of Terrebonne, State of Louisiana located in Section 12, T-17-S, R-17-E and being more particularly described on a

map made by Douglass S. Talbot, R.L.S. dated June 15, 1981, the latest revision being July 13, 1981 and being more particularly described as follows:

Commencing at the conventional property corner marking Sections 12 and 101, said corner being northwest corner of Section 12, T-17-S, R-17-E, Terrebonne Parish, Louisiana marked "z" on above described plat; thence S 27° 35' 56" E a distance of 2,206.40 feet to point "A", said point of beginning;

Thence S 88° 33' 37" E a distance of 301.86 feet to point "B";

Thence S 1° 22' 19" W a distance of 601.11 feet to point "C";

Thence N 88° 33' 37" W a distance of 302.57 feet to point "D";

Thence n 1° 26' 23" E a distance of 601.11 feet to point "A", the point of beginning.

Said property containing 4.17 acres and being bounded on the north, south, east and west by property belonging to Delta Services Industries, together with bulkheading, mooring dolphins, oxygen, propane, compressed air, water and electrical service lines and all improvements thereon and property functionally related and subordinate to said property.

Together with all buildings and improvements thereon and all rights, ways, servitudes and privileges thereunto belonging or in anywise appertaining, including all ownership rights and privileges to the buildings constructed and/or owned located on adjacent leased properties and specifically including that building on the leased property known as the Ellender property shown as Lot A on the plat to the extent these rights are enjoyed by the vendor.

Being the same property acquired by Dean Boats Inc. from W. Simmons Sandoz, trustee of the estate of Delta Services Industries, bankrupt in an Act of Cash Sale passed before George J. Dowd, N.P. on April 8, 1986 and recorded in Conveyance Office Book 1050, Folio 535 under Entry Number 778913 in the office of the Clerk of Court and Recorder of the Parish of Terrebonne, Louisiana on April 9, 1986.

Page 6
Resolution of Dean Boats Inc.

To Have and To Hold said interest in and to said property unto the said Lynn B. Dean, his heirs, successors and assigns forever.

IN WITNESS WHEREOF, I have signed my name at Houma, Louisiana on March 31, 1989.

WITNESSES:

Laurence Nicosia
Print name:
LAWRENCE NICOSIA

Harold Burt
Print name:
HAROLD BURT

Lynn B. Dean
LYNN B. DEAN

Chas Hudson
ATTORNEY/NOTARY PUBLIC

IN WITNESS WHEREOF, we have signed our names at Braithwaite, Louisiana on March 31, 1989.

WITNESSES:

Walter J. Cure
Print name:
WALTER J. CURE IV

Douglas Dean
Print name:
Douglas Dean

Nettie L. Dean
NETTIE L. DEAN

Jacqueline M. Dean
JACQUELINE M. DEAN

Marvin H. Acosta
MARVIN H. ACOSTA

Chas Hudson
ATTORNEY/NOTARY PUBLIC

FILED FOR RECORD
PARISH OF
TERREBONNE

'89 MAR 31 P12:17

DEPUTY CLERK OF COURT

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ACT OF SALE

STATE OF LOUISIANA

PARISH OF TERREBONNE

KNOW ALL MEN BY THESE PRESENTS, that Delta Services Industries, a Louisiana partnership (hereinafter called "Company"), appearing herein through and represented by its partners Delta Services, Inc. and Granite Capital Corporation, through their respective undersigned officers, duly authorized (said corporations comprising the only partners of said partnership), does by these presents grant, bargain, sell convey, transfer, assign, set over, abandon and deliver, with all legal warranties of title, and with full substitution and subrogation in and to all rights and actions of warranty which it has or may have against all preceding owners and vendors, subject, however, to Permitted Encumbrances as defined in the Lease Agreement between the parties hereto dated as of July 1, 1981 (the "Lease"), between the Company and the Terrebonne Parish Port Commission, an agency and political subdivision of the State of Louisiana (hereinafter called the "Commission"), created, operating and existing under the provisions of Chapter 23, Title 34 of the Louisiana Revised Statutes of 1950, as amended; unto:

The Commission, appearing herein through and represented by A. J. Buquet and Ernest J. Yancey, who are respectively the President and Secretary of the Commission; acting on behalf of the Commission by the authority of a resolution adopted at a meeting held on June 16, 1981, said Commission being here present, accepting and purchasing for itself, its successors and assigns, and acknowledging due delivery and possession thereof, all and singularly the property described on the schedule attached hereto.

TO HAVE AND TO HOLD the above described property unto the Commission, its successors and assigns, forever.

This sale is made pursuant to the Lease and subject to the terms and conditions thereof and, in the event of any inconsistency therewith, the terms of such Lease shall govern.

This sale is made and accepted for and in consideration of the sum of $ 2,030,901.30 cash, receipt of which is hereby acknowledged, pursuant to the terms and conditions contained in the Lease.

All taxes due and exigible have been paid.

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Except as provided expressly in the Lease, the parties hereto waive the production of mortgage, conveyance, tax and other certificates and relieve and release any and all Notaries who notarize the Acknowledgements hereof from any and all liability and responsibility in connection with the non-production of said certificates.

WITNESS the signature of the parties this 18th day of September, 1981, in the presence of the undersigned competent witnesses.

WITNESSES:

Jane A. Diamond

Mary D. Lirette

DELTA SERVICES INDUSTRIES

By: Len W. Fry
for Delta Services, Inc.
Partner

By: [illegible]
for Granite Capital Corporation
Partner

TERREBONNE PARISH PORT COMMISSION

Jane A. Diamond

Mary D. Lirette

BY: [illegible]
President

BY: [illegible]
Secretary

960

STATE OF LOUISIANA

PARISH OF TERREBONNE

BE IT KNOWN, that on this 18th day of September, in the year 1981, before me, Notry Public, duly commissioned and qualified in and for the State and Parish aforesaid, and in the presence of the witnesses hereinafter named and undersigned, personally came and appeared: LEON H. TOUPS and STEPHEN L. BERNSTEIN, President and Vice-President of Delta Services, Inc. and Granite Capital Corporation respectively; that the seal impressed beside their respective signatures on the foregoing act of sale is the official seal of each corporation, and that the aforesaid act of sale is signed and sealed by them on behalf of said corporations by authority of resolutions adopted by their respective Board of Directors at meetings held on September 18, 1981 and September 18, 1981, and that the said LEON H. TOUPS and STEPHEN L. BERNSTEIN acknowledge said act of sale to be the free act and deed of said corporations respectively.

IN WITNESS WHEREOF, said appearers have signed these presents before me and in the presence of the undersigned competent witnesses and I have hereunto set my hand and seal with said appearers and said witnesses all on the day first above written.

WITNESSES:

APPEARERS:

LEON H. TOUPS

STEPHEN L. BERNSTEIN

NOTARY PUBLIC

960

STATE OF LOUISIANA

PARISH OF TERREBONNE

BE IT KNOWN, that on this 18th day of September, in the year 1981, before me, Notary Public, duly commissioned and qualified in and for the State and Parish aforesaid, and in the presence of the witnesses hereinafter named and undersigned, personally came and appeared: A. J. Buquet and Ernest J. Yancey, who, being first duly sworn; did depose and say that they are respectively the President and Secretary of the Terrebonne Parish Port Commission; that the seal impressed beside their signatures in the foregoing act of sale is the official seal of said Commission, and that the aforesaid act of sale was signed and sealed by them on behalf of said Commission by authority of a resolution adopted at a meeting held on June 16, 1981, and that the said A. J. Buquet and Ernest J. Yancey acknowledged said act of sale to be the free act and deed of said Commission.

IN WITNESS WHEREOF, said appearers have signed these presents before me and in the presence of the undersigned competent witnesses and I have hereunto set my hand and seal with said appearers and said witnesses all on the day first above written.

WITNESSES:

Jane A. Diamond

A J Buquet
President - A. J. BUQUET

Mary D. Lirette

E J Yancey
Secretary - ERNEST J. YANCEY

NOTARY PUBLIC

SCHEDULE ATTACHED TO ACT OF SALE FROM
DELTA SERVICES INDUSTRIES TO
TERREBONNE PARISH PORT COMMISSION
DATED SEPTEMBER 18, 1981
(PROPERTY DESCRIPTION)

A certain tract of land situated in the Parish of Terrebonne, Louisiana and located in Section 12, T-17-S, R-17-E, and being more particularly described on a map made by Douglass S. Talbot, Reg. L.S., dated June 15, 1981, the latest revision being July 13, 1981, a copy of which is annexed hereto, as follows:

COMMENCING at the conventional property corner marking Section 12 and 101, said corner being northwest corner of Section 12, T-17-S, R-17-E, Terrebonnne Parish, marked "Z" on attached plat; thence S27°35'56"E a distance of 2206.40 feet to point "A", the point of beginning;

THENCE proceeding S88°33'37"E a distance of 301.86 feet to point "B";

THENCE proceeding S01°22'19"W a distance of 601.11 feet to point "C";

THENCE proceeding N88°33'37"W a distance of 302.57 feet to point "D";

THENCE proceeding N01°26'23"E a distance of 601.11 feet to point "A", the point of beginning.

Said property containing 4.17 acres together with bulkheading, mooring dolphins, oxygen, propane, compressed air, water and electrical service lines, and all improvements thereon, and property functionally related and subordinate to said property, and being bounded on the North, South and West by property belonging to Delta Services Industries.

FILED FOR RECORD
PARISH OF
TERREBONNE, LA.

SEP 22 1 53 PM '81

Nancy A Boudreaux
DEPUTY CLERK OF COURT

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845055

ACT OF EXCHANGE

BETWEEN LYNN B. DEAN | **STATE OF LOUISIANA**

AND

SEQUA ENGINEERED SERVICES, INC. AND CHROMALLOY AMERICAN CORPORATION, A WHOLLY OWNED SUBSIDIARY OF SEQUA CORPORATION | **PARISH OF TERREBONNE**

BEFORE ME, the undersigned Notary in and for the Parish and State aforesaid, and in the presence of the undersigned, competent witnesses:

> **PERSONALLY CAME AND APPEARED** the following parties: **LYNN B. DEAN,** a person of full age and a resident of St. Bernard Parish, Louisiana **(DEAN)**; and
>
> **SEQUA ENGINEERED SERVICES, INC.,,** a subsidiary of Sequa Corporation, a foreign corporation authorized to do and doing business in the state and parish aforesaid **(SEQUA)**; and
>
> **CHROMALLOY AMERICAN CORPORATION,** a wholly owned subsidiary of Sequa Corporation, a foreign corporation authorized to do and doing business in the state and parish aforesaid **(CHROMALLOY)**.

Said parties declare that **DEAN** and **CHROMALLOY** own immovable property in proximity to each other in Terrebonne Parish, Louisiana. **CHROMALLOY** and **SEQUA** are subsidiaries of the same corporation, namely Sequa Corporation, who desires to benefit the said Sequa Corporation and its subsidiaries with the subject exchange, the parties believing that their respective clients and customers will be best served if the said Act of Exchange takes place, and so for such purpose, they did and do by these presents, make an exchange of property on the express terms and conditions set forth as follows:

1) The exchange is to be acre-for-acre of immovable property considered by the parties as having the same monetary value.

   a) The exchange will transfer to **DEAN** title to all water bottoms including land under the slip/canal of the property described as Parcel I of Tract III on the plat of T. Baker Smith & Sons dated June 11, 1986, revised July 15, 1986.

   b) The exchange will transfer the house trailer on said Parcel I of Tract III to **DEAN** on a "as is, where is" basis, without any warranty as to the fitness or condition of the subject trailer, the said **DEAN** being aware of the condition of said trailer.

2) It is understood that **DEAN** has relocated the subject road as a material inducement for **SEQUA** or any of its divisions or subsidiaries, including Gemoco, to enter into this agreement, and agrees that a main access road will never be located east of the Delta Safety and Supply Building and west of the Gemoco property line.

3) **DEAN** will have use of all existing utilities, including water, natural gas, telephone and electricity lines which serve the property of **DEAN** and which are located on **SEQUA** (Gemoco) property.

4) In the event of a major repair and/or increase in capacity or demand, the end user will relocate the utility to end user's property at its cost.

5) **SEQUA** (Gemoco) will have the use of one of the buildings on the property it is exchanging (known as the D & S Chemical Corporation property) or equivalent square footage for the lesser of,

   one (1) year; or

   DEAN shall have the right to substitute use of an equivalent building during the period of time but such substitution shall not require **SEQUA** (Gemoco) to relocate more than once, in such one (1) year period.

   a) **SEQUA** will disconnect water line or lines servicing the former Heldenbrand office building and connect to its meter within 30 days of this exchange.

b) Coincident with the transfer, **DEAN** will have electric power meter or meters read and his name removed as the responsible party with the appropriate utility company. **SEQUA** may have the power turned on for its account if it wishes.

6. **DEAN** will extend a spur from the presently existing railroad track which by use of good practices in construction of railroad tracks will curve east intersecting the property being transferred to **SEQUA** in the vicinity of the southwestern corner.

   a) From and east of the point of tangent with said curve the center of the straight portion of the spur will be the southern boundary of **SEQUA** property and the northern boundary of **DEAN** property.

   b) Any fence erected by **SEQUA** shall not approach the center line of the railroad spur closer than 25 ft., including the curved portion of the spur in the vicinity of the southwestern corner of the property being transferred to **SEQUA**.

7. **SEQUA** is to have the right of first refusal on the property referred to by the parties as "the ball park" which comprises 3.5532 acres, with a frontage of 439.40 feet on the south side of Industrial Boulevard, as more clearly depicted on that survey of property for Gemoco, a Division of Chromalloy American Corporation and Elevating Boats, Inc. in Section 12, T17S, R17E, Terrebonne Parish, Louisiana, prepared by T. Baker Smith & Son, Inc., dated February 16, 1989, revised March 15, 1989.

   a) This right of first refusal does not apply to transfers to or creation of security interests in favor of persons related to **DEAN** or to Lynn Dean's affiliated or related entities, provided that said parties or entities, ~~comply with the provisions of paragraph~~ 10, such that the use ~~of the exchanged property shall be restricted to heavy-duty industrial activities, which is the nature of the adjacent use of properties.~~

   b) This right will not apply in the event of a sale of all or substantially all of Dean's businesses.

8. All drainage and all runoff to remain as exists at the time of exchange unless both parties agree in writing to a change.

For and in consideration of the transfer to him as hereinafter set forth, **DEAN** does hereby grant, bargain, assign, set over, transfer and deliver with all legal warranties and with full substitution and subrogation in and to all the rights and actions of warranty which he has or may have against all preceding owners and vendors, unto **SEQUA** the following described property situated in Terrebonne Parish, Louisiana:

> Commencing at the conventional northwest corner of Section 12, T17S, R17E, thence S 73° 29' 37" E a distance of 765.83 feet to the point of beginning;
>
> Thence along a curve to the left having a delta of 2° 54' 14", radius of 1,115.68 feet, arc-length of 56.54 feet and a tangent of 28.28 feet to a point;
>
> Thence S 1° 01' 44" E a distance of 480.23 feet to a point along a common line with GEMOCO:
>
> Thence S 88° 59' 46" E a distance of 556.50 feet to a point along a common line with GEMOCO;
>
> Thence S 1° 00' 14" W a distance of 407.31 feet to a point;
>
> Thence N 88° 59' 46" W a distance of 416.16 feet to a point;
>
> Thence N 27° 40' 22" W a distance of 395.05 feet to a point;
>
> Thence N 0° 19' 56" E a distance of 549.57 feet to the point of beginning containing 5.4983 acres more or less. The above described property is more fully shown on a plat prepared by T. Baker Smith & Son, Inc. dated February 16, 1989, and revised March 15, 1989, entitled "Survey of Property for Gemoco, Division of Chromalloy American Corporation and Elevating Boats, Inc. in Section 12, T17S-R17E Terrebonne Parish, Louisiana."
>
> Being part of the property acquired by LYNN B. DEAN in a Resolution of the Incorporators/Directors of Dean Boats, Inc. passed before Charles Hooker N.P. on March 31, 1989 and recorded in Conveyance Office Book Number 1184 under Entry number 843349 in the office of the Clerk of Court and Recorder of the Parish of Terrebonne, Louisiana, on March 31, 1989.

And now, for and in consideration of the transfer to it as aforesaid, Chromalloy, on behalf of **SEQUA**, does hereby grant, bargain, assign, set over, transfer and deliver with all legal warranties and with full substitution and subrogation in and to all the rights and actions of warranty which it has or may have against all preceding owners and vendors, unto **DEAN** the following described property (two [2] parcels) situated in Terrebonne Parish, Louisiana:

First,

Commencing at the conventional northwest corner of Section 12, T17S, R17E; thence S 77° 36' 28" E a distance of 1,579.99 feet to the point of beginning;

Thence S 82° 00' 00" E a distance of 439.40 feet to a point;

Thence S 1° 10' 00" W a distance of 328.01 feet to a point along a common line with Lynn B. Dean;

Thence N 88° 59' 46" W a distance of 436.28 feet to a point along a common line with **DEAN**;

Thence N 1° 10' 00" E a distance of 381.53 feet to the point of beginning containing approximately 3.5532 acres, more or less. The above described property is more fully shown on a plat prepared by T. Baker Smith & Son, Inc., dated February 16, 1989, revised March 15, 1989, entitled "Survey of Property for Gemoco, Division of Chromalloy American Corporation and Elevating Boats, Inc. in Sections 12, T17S-R17E Terrebonne Parish, Louisiana.

Second,

Commencing at the conventional northwest corner of Section 12, T17S, R17E marked "A"; thence S 22° 27' 39" E a distance of 3,704.86 feet to the point of beginning marked "B";

Thence N 89° 29' 27" W a distance of 464.47 feet to a point;

Thence S 6° 57' 35" E a distance of 294.73 feet to a point;

Thence S 89° 6' 00" E a distance of 188.32 feet to a point;

Thence N 1° 39' 15" E a distance of 43.38 feet to a point;

Thence N 89° 53' 15" E a distance of 234.14 feet to a point;

Thence N 1° 10' 00" E a distance of 247.62 feet to the point of beginning marked "B" containing approximately 2.7457 acres more or less. The above described property is more fully shown as Parcel I of Tract III on a plat prepared by T. Baker Smith & Son, Inc. dated June 11, 1986 and revised July 15, 1986 entitled, "D & S Chemical Corporation Subdivision of Tract III Located in Sections 12 & 47, T17S-R17E, Terrebonne Parish, Louisiana.

This exchange is made and mutually delivered and accepted by the parties to this Act of Exchange. It is further agreed and understood that the properties being exchanged are equal in value.

9) It is understood and agreed that any buildings located on property transferred by **SEQUA** to **DEAN** are sold on a "as is, where is" basis, without any warranty or representations as to the fitness or condition of said buildings for any particular purpose, it being understood that **DEAN** has inspected the subject buildings and is familiar with and aware of the condition of said buildings.

10) In spite of the exchange and transfer of property, it is also understood that **SEQUA** shall have use of that former processing building comprising approximately 8,120 sq. ft. in accord with the provisions of this agreement.

11) **SEQUA** further agrees to vacate all contents of the 5,000 sq. ft. building which is being transferred herewith within thirty (30) days from the date of the Act of Exchange, and to turn over all utilities to **DEAN** at the time of the said Act of Exchange.

TO HAVE AND TO HOLD the above described properties unto said parties, respectively, the one exchanger unto the other, their heirs, successors and assigns forever.

All state, parish, and city taxes for three years preceding passage of this Act of Exchange up to and including the taxes due and exigible in 1988 are paid and the parties agree that each will pay the taxes for the current year on their

respective properties acquired in this exchange.

The parties to this act waive any conveyance, mortgage and any other certificates and relieve and release me, notary, from any and all responsibilities in connection therewith.

THUS DONE, READ AND SIGNED in Houma, Louisiana on the 28th day of April, 1989, in the presence of the two undersigned competent witnesses who sign their names together with said appearers and me, notary.

WITNESSES:

Denise Picke

Lucille P. Womack

Lynn B. Dean

LYNN B. DEAN

SEQUA ENGINEERED SERVICES, INC.

BY: Robert W. Weiner

Title: President

Notary Public

THUS DONE, READ AND SIGNED in St. Louis, Missouri, on the 27th day of April, 1989, in the presence of the two undersigned competent witnesses who sign their names together with said appearers and me, notary.

WITNESSES:

Gloria J. Weber

Linda E. Burton

CHROMALLOY AMERICAN CORPORATION, A SUBSIDIARY OF SEQUA CORPORATION

BY: [illegible]

Title: Vice President & Secretary

Mavis S. Farnsworth

NOTARY PUBLIC

MAVIS S. FARNSWORTH, NOTARY PUBLIC
ST. LOUIS COUNTY, STATE OF MISSOURI
MY COMMISSION EXPIRES 8/27/92

Sequa Corporation

120 South Central Avenue
St. Louis, Missouri 63105
314 726-9200

John J. Dowling III
Associate General Counsel

SEQUA

April 27, 1989

Lynn B. Dean
Houma, LA

Dear Mr. Dean:

The undersigned is counsel to Sequa Corporation and its wholly owned subsidiaries Chromalloy American Corporation ("Chromalloy") and Sequa Engineered Services, Inc. ("SES").

Please be advised that the Act of Exchange has been duly authorized by all necessary corporate action on the part of Chromalloy and Sequa and that Robert P. Vilyus is a duly appointed officer of SES and authorized to execute the Act of Exchange on behalf of SES and that John J. Dowling III is a duly appointed officer of Chromalloy and authorized to execute the Act of Exchange on behalf of Chromalloy.

Very truly yours,
SEQUA CORPORATION

John J. Dowling III

JJD:mf

FILED FOR RECORD
April 28 19 89 at
3:36 o'clock P. M.
Cynthia P. Tempelt
Clerk of Court
Parish of Terrebonne, La.

Part of Entry Number 845055, being an Attached Plat

has been removed from the Original Acts and placed in

Map Volume 69 Folio 14 Map Number 8203

Date of Recordation April 28, 1989

Recorded in Conveyance Book 1188 Folio 630

Map Description: D & S Chemical Corporation
Subdivision of Tract III located in
Sections 12 & 47, T17S-R17E,
Terrebonne Parish, Louisiana.

Act Description: Exchange between Lynn B. Dean &
Sequa Engineered Services, Inc., et al
Chromalloy American Corp., et al

Part of Entry Number 845055, being an Attached Plat

has been removed from the Original Acts and placed in

Map Volume 69 Folio 14 Map Number 8204

Date of Recordation April 28, 1989

Recorded in Conveyance Book 1188 Folio 630

Map Description: Survey of property for Gemoco, Division of Chromalloy American Corporation & Elevating Boats, Inc. in Section 12, 17S-R17E

Act Description: Exchange between Lynn B. Dean & Sequa Engineered Services, Inc., et al Chromalloy American Corp., et al

639

007071

STATE OF LOUISIANA

PARISH OF ST. BERNARD

UNANIMOUS CONSENT AND RESOLUTION OF THE INCORPORATORS/DIRECTORS OF DEAN BOATS, INC.

BEFORE ME, the undersigned Notary Public in and for the parish and state aforesaid and in the presence of the undersigned, competent witnesses, personally came and appeared:

> DEAN BOATS, INC., represented by its duly authorized, undersigned president, Lynn B. Dean, authorized so to appear by virtue of a corporate resolution attached hereto and made part hereof;
>
> LYNN B. DEAN, a person of full age and a resident of St. Bernard Parish, Louisiana, married but once and then to Jacqueline Miles, with whom he lives and resides at 1404 Colonel Drive, Chalmette, Louisiana, 70043, and the said JACQUELINE MILES DEAN, both appearing herein individually and as incorporators/directors of Dean Boats, Inc.;
>
> NETTIE L. DEAN, a person of full age and a resident of St. Bernard Parish, Louisiana, appearing herein as an incorporator/director of Dean Boats, Inc.;
>
> MARVIN H. ACOSTA, a person of full age and a resident of St. Bernard Parish, Louisiana, appearing herein as an incorporator/director of Dean Boats, Inc.

Said parties declare that it was their intention to transfer by unanimous consent of the incorporators/directors of Dean Boats, Inc. that property more fully described in a transfer of real estate to Lynn B. Dean, dated and recorded March 31, 1989 at COB 1184, folio 741, under Entry No. 843349, records of Terrebonne Parish, Louisiana.

That to whatever extent the said document recorded aforesaid, entitled "Resolution of the Incorporators/Directors" may have failed to accomplish the foregoing goal, the parties hereto do wish to ratify, affirm and correct the said document so that the property therein transferred becomes the property of Lynn B. Dean. Furthermore, the wife of the said Lynn B. Dean, Jacqueline Miles Dean, joins herein as both the spouse of the said Lynn B. Dean, to whom she was married at the time of the original transaction of March 31, 1989 and is still married to the said party, and who also appears as an

incorporator/director and who does ratify and affirm the said transaction.

The consideration for the subject transfer is to reimburse the said Lynn B. Dean for contributions to capital which he has made to Dean Boats, Inc., the said contributions to capital being equal in value to the property which was transferred at COB 1184, folio 741, said parties estimating that the subject property was worth $1,336,407.50.

THUS DONE AND SIGNED in the presence of the undersigned competent witnesses and me, Notary, after a due reading of the whole, on the 6th day of November, 1992.

WITNESSES:

DERRILL J. RICHE

H.B. WOLFE

DEAN BOATS, INC.

BY: LYNN B. DEAN, PRESIDENT

LYNN B. DEAN

JACQUELINE MILES DEAN

NETTIE L. DEAN

MARVIN H. ACOSTA

NOTARY PUBLIC

JAMES M. FUNDERBURK

RESOLUTION OF THE BOARD OF DIRECTORS OF DEAN BOATS, INC.

BE IT RESOLVED that Lynn B. Dean, the president of Dean Boats, Inc., be and he is hereby authorized by and on behalf of this corporation to sign any and all necessary documents, including transfers of real estate, declarations, ratifications, acts of correction and generally any and all documents so as to reimburse the said Lynn B. Dean for contributions to capital which he has made to this corporation, the said property being described as a certain tract of land located in Sections 12, 47, 101 and 104, T17S, R17E, Terrebonne Parish, Louisiana, more fully shown on a plat prepared by T. Baker Smith & Son, Inc. entitled "Chromalloy American Corporation, Chromalloy Natural Resources Division, Survey of Property in Sections 12, 47, 101 and 104, T17S, R17E, Terrebonne Parish, Louisiana, dated July 16, 1980, revised July 24, 1980."

BE IT FURTHER RESOLVED that said president, in his sole and uncontrolled discretion, may sign any and all documents containing any and all terms and conditions which the said president deems wise and necessary.

BE IT FURTHER RESOLVED that this resolution is done by the unanimous consent of all incorporators/directors whose signatures appear below, adopted on March 31, 1989, and ratified and affirmed on November 2, 1992.

Lynn B. Dean
LYNN B. DEAN

Jacqueline Miles Dean
JACQUELINE MILES DEAN

Nettie T. Dean
NETTIE T. DEAN

Marvin H. Acosta
MARVIN H. ACOSTA

SECRETARY'S CERTIFICATE

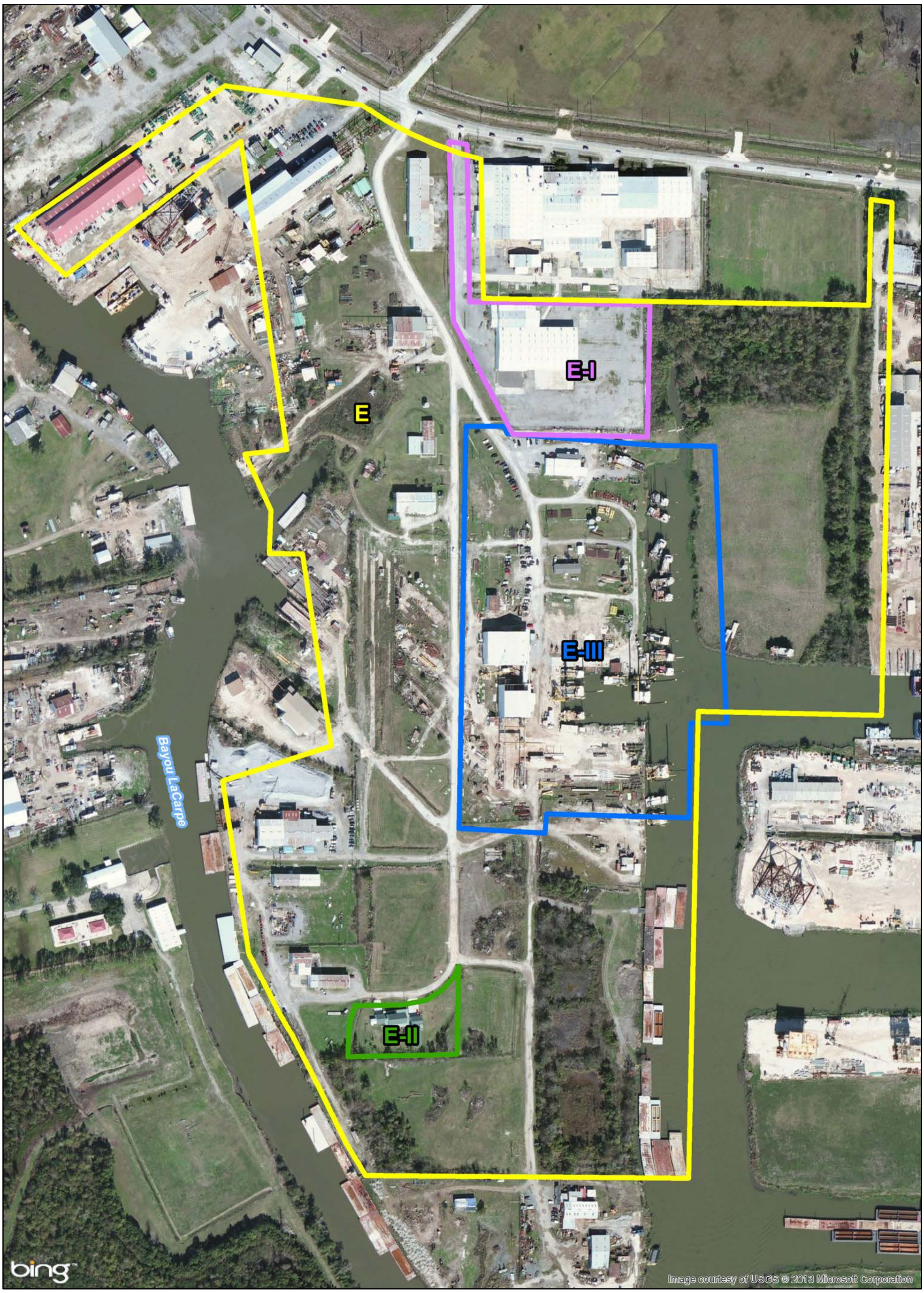
I HEREBY CERTIFY that the above and foregoing Resolution of the incorporators and board of directors of Dean Boats, Inc. was signed unanimously by the said incorporators and directors after notice and call, said meeting having been held March 31, 1989, and that the said Lynn B. Dean, Jacqueline Miles Dean, Nettie L. Dean and Marvin H. Acosta comprise all of the incorporators and members of the Board of Directors of this corporation.

SECRETARY NETTIE L. DEAN
NOVEMBER 2, 1992

FILED FOR RECORD
PARISH OF
TERREBONNE

'92 NOV -6 P1:46

Kim A. Marcel
DEPUTY CLERK



Delta Shipyard
Deed Descriptions

Houma, Terrebonne Parish, LA

Exhibit E
Exhibit E, Less & Except, Lot I, 19.813ac
Exhibit E, Less & Except, Lot II, 1.322ac
Exhibit E, Less & Except, Lot III, 5.4983ac

0 0.045 0.09 0.135 0.18
Miles

N W E S

Deed boundaries delineated by EPA Region 6 GIS using official U.S., State of Louisiana and Terrebonne Parish deeds. Aerial provided by Bing Maps.

EPA Region 6 SF
GIS Support
July 12, 2013
20130712JD01

LOCKHEED MARTIN

Delta Shipyard
200 Dean Court
Houma, LA 70363

Inquiry Number: 3245322.1
February 3, 2012

The EDR Chain of Title Report

EDR Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Chain of Title

The EDR Chain of Title Report tracks a line of successive owners from the present back to 1940 of a particular parcel of property, linked together by recorded transactions which pass title. Available nationwide, this report provides a summary of a property's ownership history and is a valuable source for determining the prior uses of a property

A network of professional abstractors following established procedures, uses client supplied address Information to locate:

- Historical Chain of Title research
- Leases and Miscellaneous

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EDR Chain of Title

TARGET PROPERTY INFORMATION

ADDRESS

Delta Shipyard
200 Dean Court
Houma, LA 70363

Research Source

Source 1:	Terrebonne County Recorder of Deeds
Source 2:	N/A
Examiner's Note:	Public records of Terrebonne County, LA were searched from January 1, 1940 to January 20, 2012, and no other deeds vesting title in the subject property were found of record during the period searched.

PROPERTY DESCRIPTION

Current Owner:	Lynn B. Dean
Legal Description:	See Deed Attached
Property Identifiers:	APN: R04-26993
General Comments:	N/A

HISTORICAL CHAIN OF TITLE

See Exhibit "A"

LEASES AND MISCELLANEOUS

No liens were found of record searching back during the time period of the attached chain. See attached deed for any restrictions , AUL's, amendments, leases or agreements.

Chain of Title

Exhibit “A”

EDR Chain of Title

HISTORICAL CHAIN OF TITLE

Chain 1

Type of Deed:	Deed
Title is vested in:	Lynn B. Dean
Title received from:	Lynn B. Dean and Jacqueline Miles Dean
Date Executed:	November 6, 1992
Date Recorded:	November 6, 1992
Book:	1341
Page:	189
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	N/A

Chain 2

Type of Deed:	Deed
Title is vested in:	Lynn B. Dean
Title received from:	Sequa Engineered Services, Inc. and Chromalloy American Corporation
Date Executed:	April 28, 1989
Date Recorded:	April 28, 1989
Book:	1188
Page:	630
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	According to county records Lynn Dean D/b/a Dean Boats Inc changed names with the State to Sequa Engineered Services, Inc.

Chain 3

Type of Deed:	Deed
Title is vested in:	Sequa Engineered Services, Inc. and Chromalloy American Corporation
Title received from:	Dean Boats Inc./Delta Service Industries
Date Executed:	March 31, 1989
Date Recorded:	March 31, 1989
Book:	1184
Page:	741
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	This document is a Resolution of the Incorporators/Directors

EDR Chain of Title

Chain 4

Type of Deed:	Deed
Title is vested in:	Delta Service Industries
Title received from	W. Simmons Sandez
Date Executed:	April 8, 1986
Date Recorded:	April 8, 1986
Book:	1050
Page:	535
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	N/A

Chain 5

Type of Deed:	Deed
Title is vested in:	W. Simmons Sandez
Title received from	Paul Mathis
Date Executed:	February 12, 1980
Date Recorded:	February 16, 1980
Book:	832
Page:	708
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	N/A

Chain 6

Type of Deed:	Deed
Title is vested in:	Paul Mathis
Title received from	Chester Coger and Greta Coger
Date Executed:	November 27, 1971
Date Recorded:	November 30, 1971
Book:	660
Page:	1224
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	N/A

EDR Chain of Title

Chain 7

Type of Deed:	Deed
Title is vested in:	Chester Coger and Greta Coger
Title received from	Marcus Hodson and Eva Hodson
Date Executed:	January 16, 1963
Date Recorded:	January 19, 1963
Book:	515
Page:	978
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	N/A

Chain 8

Type of Deed:	Deed
Title is vested in:	Marcus Hodson and Eva Hodson
Title received from	Freddie Banks and Julia Banks
Date Executed:	May 11, 1954
Date Recorded:	May 14, 1954
Book:	421
Page:	243
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	N/A

Chain 9

Type of Deed:	Deed
Title is vested in:	Freddie Banks and Julia Banks
Title received from	Gerlean Marshall and Doretha Marshall
Date Executed:	July 10, 1945
Date Recorded:	July 12, 1945
Book:	287
Page:	602
Volume:	
Instrument #:	
Docket:	
Land Record Comments:	N/A

EDR Chain of Title

Chain 10

Type of Deed:	Deed
Title is vested in:	Gerlean Marshall and Doretha Marshall
Title received from	Woodrow Chambers and Mae Ella Chambers
Date Executed:	October 6, 1932
Date Recorded:	October 10, 1932
Book:	146
Page:	331
Volume:	
Instrument #:	
Docket:	

Land Record Comments:	N/A

EDR Chain of Title

DEED EXHIBIT

907070

DECLARATION OF MARITAL STATUS AND RATIFICATION OF ACT OF EXCHANGE

STATE OF LOUISIANA

PARISH OF ST. BERNARD

BY: LYNN B. DEAN AND JACQUELINE MILES DEAN

BEFORE ME, the undersigned Notary Public in and for the parish and state aforesaid and in the presence of the undersigned, competent witnesses, personally came and appeared:

> LYNN B. DEAN, a person of full age, married but once and then to Jacqueline Miles, with whom he lives and resides at 8404 Colonel Drive, Chalmette, Louisiana, 70043, and the said JACQUELINE MILES DEAN.

Said parties declare and acknowledge that they have been married but once and then to each other continuously for a period of forty-five (45) years, and that they presently live and reside together at 8404 Colonel Drive, Chalmette, Louisiana, 70043.

Said parties further make reference to that one certain Act of Exchange between Lynn B. Dean, Sequa Engineered Services, Inc. and Chromalloy American Corporation dated April 27 and April 28, 1989, recorded at COB 1188, folio 630, Entry No. 845055, records of Terrebonne Parish, Louisiana, and the said Jacqueline Miles Dean does hereby join her said husband, Lynn B. Dean in ratifying, affirming and to whatever extent necessary, correcting said Act of Exchange, the said Jacqueline Miles Dean agreeing to be bound thereby.

IN WITNESS WHEREOF, the said parties have executed this document this 6th day of November, 1992.

WITNESSES:

BERRILL J. RICHE

H.B. WOLFE

LYNN B. DEAN

JACQUELINE MILES DEAN

NOTARY PUBLIC
JAMES M. FUNDERBURK

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TERREBONNE

'92 NOV -6 P1:43

DEPUTY CLERK OF COURT

189

55

COPY

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION

FOR
DELTA SHIP YARD
HOUMA, LOUISIANA

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS — LAND SURVEYORS
ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

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H	Job Ticket for Gas Freeing

DEPARTMENT OF NATURAL RESOURCES

Hazardous Waste Facilities Permit Application

FOR DEPARTMENT USE	
1.	DATE RECEIVED
2.	NOTIFICATION NO.

ORGANIZATIONAL INFORMATION

3. FACILITIES NAME: Delta Shipyard

4. LOCATION: Industrial Blvd., Houma, Louisiana PARISH: Terrebonne

	OPERATOR	OWNER (if different)
5. NAME:	Delta Shipyard	
6. ADDRESS:	P.O. Box 101, Houma, LA 70361	
7. CONTACT:	Chris Olivier	
8. TELEPHONE:	504-868-7450	

OPERATIONS INFORMATION

9. PURPOSE: Treat ☒ Store ☐ Dispose ☐

10. SITE STATUS: Owned Leased Lease Term____ years. Delta Shipyard (Property Owner)
Optioned To:____ (Date)

11. OPERATION STATUS: Existing ☒ To Be Modified ☐ Proposed ☐ Under Const. ☐

12. ENVIRONMENTAL PERMITS: (List)
EPA-notification Hazardous Waste Activity I.D. NO. LAD058473413, NPDES-application date 5/2/80 (No. LA 0059897)

13. OTHER COMPANY HAZARDOUS WASTE OPERATIONS:
None

14. OPERATIONS IN OTHER STATES:
None

15. ZONING: Yes ☐ No ☒ Requested ☐ Zoning Industrial Area
Issued by: Parish ☒ Municipality ☐

16. HAZARDOUS WASTE FACILITIES OR TECHNIQUES INCLUDED: Thermal Treatment ☐
Chemical Treatment ☐ Physical Treatment ☒ Biological Treatment ☒
Injection Well ☐ Landfarm ☐ Burial ☒ Storage ☐ Other ☐ (List)

17. ORGANIZATIONAL STRUCTURE: Applicant is: Individual ☐ Partnership ☐ Corporation ☒
Applicant is controlled directly or indirectly by the following corporation or legal entity: (name and address) Delta Services Industries, Inc., P.O. Box 101, Houma, LA 70361, Phone: (504) 868-7450
If company is closely held (less than 10 stockholders) or if one individual controls more than 50% of the stock, list the major owners or stockholders owning more than 10% of the company:

* Note: See Section 9 for more details.

CERTIFICATION

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 imprisonment.

18. SIGNATURE: Delta Shipyards, Inc. (Name of Company)

By: Chris Olivier Vice-President (Name and Title) Mon. February 16, 1981 (Date Signed)

DNR FORM HW-2

SUPPLEMENTARY INFORMATION

CHECK LIST

APPLICANT CHECK LIST					FOR DEPARTMENT USE		
NOT APP.	PREV. SUBM. DATE	ATTCH.	PAGE #	Company Name Delta Shipyard	INCL.	NOT APP.	RETURNED DATE
	10/24/80 11/29/79						
	10/24/80 11/29/80		3 of 103	Site Master Plan, (adjoining land areas, contours, access, drainage) Also see F1, F2; App. "A" & "B"			
	10/24/79 11/29/79		3 of 103	Site Layout and Facility Design F1; F2 and F3			
	10/24/79 11/29/79		3 of 103	Site Geology: Geologist Certification see F5, F6 & F7			
	10/24/79 11/29/79		4 of 103	Geological Data see F8,F9,F10,F11 to F25			
	10/24/79 11/29/79		4 of 103	Site Hydrology see F26,F27,F28,F29,F30,F31,F32, F33,T1,T2;F34,F35,F36,F37-38			
	10/24/79 11/29/79		5 of 103 6 of 103	Environmental Factors: List or Map see App. "C" & "D" F39,F40,F41,F42,F43			
	-------		-------	Offsetting Measures			
	10/24/79 11/29/79		6 of 103	Geographical Factors: Map showing bldgs see F29,App "E" F44,F45;T3,T4,T5,T6 & T7			
	--------		-------	Required Data			
	10/24/79 11/29/79		6 of 103	Land Use Map T8;F46,F47,F48,F49,F50			
	10/24/79 11/29/79		7 of 103	Road Map and Traffic Count F51,F52,F53,F54,F55			
	10/24/79 11/29/79		7 of 103 to 17 of 103	Operations Plan			
	10/24/79 11/29/79		7 of 103	Wastes and Quantities			
	10/24/79 11/29/79		7 of 103 to 8 of 103	Methods and Processes Utilized F56,F57,F58,F59, F60,F61,F62,F63,F65,F65			
	10/24/79 11/29/79		8 of 103	Storage and Disposal Procedures			
	10/24/79 11/29/79		8 of 103 to 10 of 103	Monitoring Procedures F66,F67, also page 4 of 103 and App. "F"			
	10/24/79 11/29/79		10 of 103 to 18 of 103	Administrative Procedures			
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	--------		-------	Post—Closure Plans			
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Hazardous Waste Facilities Permit Application
Delta Shipyard, Houma, Louisiana

5.3.4 Supplementary Information --Part II

A. Responses and exhibits

1. Figure 1: Site Master Plan

2a. Site Layout and Facility Design

1). Appendix "A" TOPO of Property Delta Service Industries

2). Appendix "B" Survey of Rights-of-Way Delta Service Industries

3). Figure 2: Aerial Color Photographs.

4). Figure 3: Aerial Drawing

b. Not applicable

c. Not applicable: Note pits located to rear of project location do not belong to Delta Shipyard (Appendix "A")

d. Not available

3. Site Geology:

i). Geological Data:
Figure 4:
a). Fault Zones, Salt Domes and Subsidence Rates

b). Figure 5: Physiographic Features of the Mississippi River Delta Plain and Outlines of the Delta Complexes

c). Figure 6: Major Structural Features in Central Gulf Coastal Plain

d). Figure 7: Diagrammatic Section Through the Mississippi Embayment Showing Possible Strike Fault Systems

ii). Soils Data:

a). Figure 8: Soils Map

b). The Soil Survey of Terrebonne Parish Series 1956 No. 1 Issued Feb. 1960 (Map 28) indicates that Sharkey Clay Swamp, Clays and mucky clays exist in the general area of the project location (permeability rating 0-.2inches/hour).

c). Figure 9: Soil Association Map

d). Figure 10: Soil Subsidence Potential

e). Enclosed is Soil Boring data obtained for the Bayou Dularge Bridge in 1975 figures 11 to 25. The Bayou Dularge Bridge is located approximately 3500' northwest of the Delta Shipyard project location. During the period November 3 and 4, 1980, soil boring data was obtained at the Delta Shipyard site. The field work and laboratory tests were performed by Soil Testing Engineers, Inc. of Baton Rouge. The findings of the borings and the results of the laboratory testing are presented in Appendix "F".

f). Ground Water Availability

1). Figure 26: Geologic Sources of Ground Water Map

2). Figure 27: General Availability of Ground Water

4. Site Hydrology: Figure 28: Map of 1000' & 2000' Radius

a). To our knowledge we are not aware of any facilities which have been classified as hazardous waste facilities located within 1000' of the permiter of the project location.

b). An inquire to the Department of Public Works of the State of Louisiana indicates that there are no operating or abandoned water wells public or private within a 2000' or 2 mile radius of the perimeter of the project location.

c). Not Available.

d). Flood Hazard Boundary Map

1). Figure 30: Map dated 12/2/74

2). Figure 31: Map dated 11/19/76

3). Figure 32: Groundwater Availability and Flood Hazard Area Map

4). As presented in Appendix "F" two (2) observation wells were established by Soil Testing Engineers, Inc. during the period of November 3 and 4, 1980. A proposed scope of services has been developed concerning groundwater monitoring at the proposed site. The proposed Scope of Services is presented in Appendix "G". In early January of 1981 cost estimates based on the proposed scope of work were requested of three laboratories. Only two (2) laboratories had responded by February 5, 1981. Enviro-Med Laboratories, Inc. of Baton Rouge, LA and Shilstone Laboratories of New Orleans, LA. Enviro-Med Laboratories, Inc. has responded in writing and Shilstone response is forth coming.

e). Climate Factors: The project location is situated in a humid subtropical climate which is determined principally by its southern latitude and proximity to the Gulf of Mexico. Temperatures range from a January mean minimum of 46°F to a July mean maximum of 92°F. Precipitation averages 60 to 66 inches annually across Terrebonne Parish. Seasonal rainfall is heaviest during the summer months, and is somewhat less in winter. Fall is the driest season

i). Table 1 depicts the monthly and annual precipitation averages for the Southeast portion of Louisiana.

a). Figure 33: Mean Annual Rainfall Excess Map

ii). Table 2 depcits the monthly and annual temperature averages for Southeast, Louisiana

iii). Impact of Hurricanes: The major flood threat to Terrebonne Parish is from tidal surges caused by hurricanes. A Type-5 Flood Insurance Study for the Louisiana Gulf Coast, including, Terrebonne Parish, has identified areas that will be inundated by the 100-year tidal flood. These areas are shown in Figure 32. (The 100-year flood is a flood of such magnitude that it has a 1% chance of occuring in any given year). The depth of flooding is determined by the land elevation, the distance from the coast, and the velocity and duration of the wind. Elevation-frequency curves for hurricane surges are shown in Figure 34. These elevations are given at the surge reference line (SRL), a synthetic coastline where the maximum surge-heights will occur. Hurricane surge-heights at points inland decrease proportionally with distance from the SRL at the rate of 1 foot per 2.75 miles. The SRL and inland surge-height contours are also shown in Figure 32.

a). Figure 35: Hurricanes from 1800' to 1979

b). Figure 36: Predicted Surge Contours of Terrebonne Parish.

c). Figure 37 & 38: Tornado Occurances in Louisiana-1916-1970.

iv). Rainfall and evapotranspiration rates not available.

v). Prevailing wind direction not available.

5a. Environmental Factors

1). There are presently no documented historical sites within 1000' of the perimeter of the project location to our knowledge

2). Appendix "C" Recreational Areas

3). Appendix "D" Archeological Sites

4). Figure 39: Wildlife Management Areas and Rookeries

5). Figure 40: Marsh Types and Swamps

6). Figure 41: Endangered Species Areas

7). Figure 41: Selected Features of Terrebonne Parish

8). Figure 42: Fisheries Resources of Terrebonne Parish

9). Figure 43: Locations of Oyster Grounds in Terrebonne Parish

b. We feel that all areas of significant importance as indicated in Section 5 Environmental Factors will not be endangered from the operation of the facility. It is the intent of Delta Shipyards to take whatever action which is reasonable and fair to correct any problems which may develop and may cause detrimental impacts to the areas shown as discussed in Section 5 Environmental Factors.

6a. Geographical Factors:

1). Figure 29 depicts a 2 mile radius around the perimeter of the project location.

a). Appendix "E" Map of the City of Houma and surrounding area depicting residential, commercial and industrial areas, etc.

ii). Population

a). Figure 44: Ward Map

b). Table 3:Population trends by Ward Terrebonne Parish

c). Figure 45: Parish Population Projections

d). Table 4:Historical and projected population

e). Table 5:Population trends and projections Terrebonne Parish, City of Houma and State of Louisiana, 1960-1985

iii). Petroleum related industries are the largest employers in the Houma area in terms of annual payroll as can be noted in Tables 6 and 7.

iv). Land Use

a). Table 8:Land use and area for South Central Planning & Development Commission for St. James, St. John, St. Charles, Lafourche and Terrebonne Parishes.

b). Figure 46: Land Use Map of Terrebonne Parish, Louisiana

c). Figure 47: Agriculture Use Map of Terrebonne Parish, Louisiana

d). Figure 48: Existing Developed Areas of Terrebonne Parish, Louisiana

e). Figure 49: Comprehensive Plan Projected Developed Area-1990

f). Figure 50: Houma, Louisiana Growth Trends

v). The Delta Shipyard facility does not at present intend to receive waste from trucks. We have enclosed a map showing the road net around the area Figure 51 and traffic counts from July, 1979, Figure 52

a). The facility does intend to receive waste from barges through the major navigable waterways around the project location, Figures 53 and 54

b). Figure 55 commercial vessel traffic on major navigable waterways in LA, 1978.

7. Operational Plan

a). The waste to be handled at the project location is crude residuals such as diesel, crude oil, gasoline, lube oil, #6 oil, Bunker "C" and fish oil. The estimated quantity of the crude residual to be generated is approximately 1000 tons per year

b). Methods and Processes Utilized: It is Delta Shipyard's intent to operate, control the equipment and conduct the operations of its vessel gas freeing plant as necessary to be in compliance with all Federal State and local regulations relative to pollution prevention, safety and profitable operations.

i). The facility capacity of the gas freeing plant is estimated at approximately 1000 tons per year.

ii). Description of Process: Only residual oil and fuels are handled at the gas freeing facility.

A vessel is first brought to the mooring areas as shown in Figure 56. If a fuel is in a vessel it is removed into storage (Figure 57) through the conventional suction system as shown in Figure 58. If after checking with the customer the fuel is not desired it is pumped into storage at the storage location shown in Figures 59 and 57. Wash water (recycled water out of pit) is then pumped into the vessel as shown in Figure 60. Wash water is then removed as shown in Figure 61 and sent to the treating vessel then to the waste pit and the heating tank as shown in Figure 61.

When a vessel is received with No. 6 oil or Buncker C oil a hot water wash is used. Hot water is injected into the vessel as shown in Figure 62. The hot wash water is then removed by suction hose to the tower and Pump P, then to the treating vessel then to the pit as shown in Figure 63.

When an oily waste from a vessel is received oil and water are separated as shown in Figure 65. Hot water or steam may be sent to heating coils as shown in Figure 64.

7c. Storage and Disposal Procedures

i). Oil cargo barges 120 ft. to 300 ft. long, self propelled vessels 40 ft. to 200 ft. long with drafts not to exceed 8 ft. are the only types of vessels handled.

The only products handled (cleaned) at this facility are:

Diesel	Gasoline	Lube Oil	Bunker "C"
Crude Oil	Fish Oil	#6 Oil	

Products not to be cleaned are:

Styrene	Butane	Benzene	Animal Fats
Coke	Chemical	Soy Beans	
Asphalt	Vegetable Oil	Slop Barges	

The facility has not had problems with odor.

ii). Based on projected use the life of the gas freeing operation is estimated at 30 years.

7d. Monitoring Procedures

A ledger of all activities at the gas freeing plant are kept by the gas freeing plant foreman. These records show all vessels cleaned, types of cargo, plant shut down and emergencies.(Appendix "H)

The gas freeing facility has a drip and discharge collection system as shown in Figure 65. The entire gas freeing plant, with the exception of pump P_5 can be shut down by pulling the master switch inside the control room. Pump P_5 is on the yard air system and can be shut down by closing the valve supplying air.

Each pump has it's own disconnect switch in the control room. (Note: the transfer pumps P_7 and P_8 are centrifugal type and no pressure relief valves are required.

The boilers, normally used to heat water, have fail-safe pilot controls, fuel control and high pressure cut-out. A master gas valve 4" is located at the yard meter, at the intersection of Zerangue and Industrial Blvd.

Emergencies are to be identified and proper action taken by operating personnel as well as the leaderman or Superintendent. Some of these emergencies could be:

a). Explosion-Shut complete plant in and take measures to assist personnel.

b). Oil Spill-Follow shut down, if within our system, notification and clean-up.

c). Personnel Accidents-Follow proper first aid procedures and shut down plant if any danger exists or insufficient personnel to operate.

d). Equipment failure-Shut down until repairs are made or switch to alternate system.

e). Man Overboard-Rescue with life rings, boat, pole, life preserves or any other safe means. Follow first aid procedures.

f). Fume inhalation-Remove worker from location fo fumes and proceed with first aid. Detectors are to be used before entering on uncleaned tank or compartment.

In case of a spill we have containment equipment available.

Oil containment equipment consists primarily of a floating boom will contain any oil spill.

Equipment at the plant be used to "vacuum" the oily surfaces once it is contained. In addition to the "Gas Free" plant personnel there are other laborers at Delta Shipyard that can be called upon for assistance. The plant Superintendent shall make these decisions.

Assistance can also be had from clean up specialists such as:

Oil Mop	(504) 394-6110
Clean Gulf Associates	(504) 366-1735

When transferring fuel with flexible hose one operator shall be on the vessel receiving the fuel and one operator shall stand by the pumps to stop, if land to vessel and that they are to be stored with capped ends within the containment pan. These electrical switches, for hazardous locations, are located adjacent to the pumps P_7 and P_8.

ii). As of this date we have had our monitoring wells established at the site (See Appendix F). We are in the process of establishing monitoring procedures for sampling monitoring wells. (See page 4 of 103 4.d.4).

We have not had problems concerning air pollution at this time. However, should problems develop we will take all necessary action to attempt to correct any problems which may arise.

iii). Security on the Delta Services Industry Yard is handled through use of guards at the entry gates and fenced perimeter where there is no water front.

Passes are required for vehicles to enter the premises.

Vessels are left unattended while moored unless there is danger of taking on water. In this case periodic visits are made.

In the event of unusual weather conditions the vessels are checked for proper mooring.

Customer personnel are allowed access to the vessels while moored but not while gas freeing.

An additional gate within the premises notifies personnel that this is a restricted area.

When the gas freeing is not in use the building housing the electrical switch gear is locked.

In all cases the yard has periodic patrols during non-working hours.

Warning signs are located at various locations as shown in Figure 66.

A). Warning: No Smoking
No Open Lights
No Visitors
B). Danger: No Smoking
No Open Lights in This Area
C). No Smoking-No Open Lights
D). Danger--Gas--Keep Away (Portable Sign)
E). Diesel Fuel--Danger--No Smoking within 10 feet
F). Empty Drums
G). Danger--No Smoking--Matches or Open Lights
H). Notice: No Entry Without Permission

Work is normally conducted during daylight hours. However, should work take place during dark hours lights have been provided.

iv). At present we have a completely closed system and have not experienced any water or air pollution problems. Should problems develop we will take all necessary action to attempt to correct any problems which may arise.

We are in the process of establishing our monitoring program and will provide a copy of our program to the Dept. of Natural Resources as soon as we complete the program.

7e. Administrative Procedures

i). One shift per day is the normal operational set up. Occassionally an emergency job must be performed at night or on weekends. Normal shift is nine (9) hours. (7:00 A.M. to 4:30 P.M.) five (5) days per week.

ii). Security procedures are discussed in Section 7d. iii.

Lighting systems at the gas freeing plant are shown in Figure 67.

iii). Safety and First Aid procedures are listed as follows:

1). No longer are Chemicals used in boat or barge cleaning.

2). At the personnel shelter there are lavatories and showers available.

3). When entering a questionable location there is posted outside a sentry. There are never less than two (2) workers at a location.

4). A First Aid Station is located in the Delta Service Industries, Inc. headquarters building. A full time medic is on duty.

5). The Superintendent of the gas freeing activity has attended U.S. Department of Labor Schools in Marine Safety Training and has been named a "Competent Person". The foreman also has had a short course in Marine Safety training.

6). An independent Marine Chemist is called in to check vessels having had gas or raw Petroleum Products.

7) The Delta Shipyard "Competent Person" will fill out form Mar-9 on dry cargo only.

8). Two additonal supervisory people at Delta Shipyard have had short courses in Marine Safety.

9). Periodic meetings are conducted relating to safety.

10). No welding or cutting is to be done while gas freeing is in progress. No welding or cutting is to be done on or near untested vessel.

11). Approved masks are to be worn when entering questionable areas. A lookout should be posted at the entrance to these areas.

12). Ground clamps are to be attached to all vessels before work.

13). Use approved bronze tools and fittings to maintain a "non-spark" atmosphere.

LIST OF EMERGENCY TELEPHONE NUMBERS

AREA CODE FOR ALL NUMBERS IS 504

NAME	TELEPHONE
U.S. Coast Guard	598-7171
Yard Manager (Chris Olivier)	876-6641
Yard Superintendent (Roy Knight)	537-6991
Gas Free Plant Foreman (Wilson Thibodaux)	446-6209
Gas Free Plant Leaderman (R. Seymore)	575-3420
Houma Fire Department	879-3568
Houma Police Department	868-5500
Terrebonne Parish Sheriff's Office	876-2500
Terrebonne Parish Police Jury	868-3000
La. State Stream Control Commission	389-5309
La. Wildlife & Fisheries Commission	389-5350
Environmental Protection Agency	924-1381
Occupational Safety & Health	589-6166

Unattended Vessels & Morring Vessels

Vessels in the process of being gas freed are tied with adequate lines to dolphins on or near the gas freeing dock to facilitate access to the vessel for the work at hand. Spring lines are used to eliminate any excessive shifting or rubbing of the vessel against the dock.

Immediately upon positioning the vessel the ground clamp shall be attached.

Vessels awaiting gas freeing are moored along the boundaries of the property far enough away to eliminate any possibility of being near "hot work." These unattended vessels shall be inspected periodically to check on lines and other conditions.

Communications

1. At least two persons shall work together.
2. Two (2) phones to DSI central switchboard are in the area. One is at the dock and is an explosion proof instrument. At the leadermans' office there is a regular desk phone.
3. One vehicle shall be kept at the location any time work is done.
4. The phone number of the plant is, 504/868-7240, Extension 2241.

Personnel Shelter

A shelter for change room, shower, lavatories, commode, washing machine, lockers, hot water heater and lunch table is loca ted on the premises adjacent to the vacuum towers. This shelter is about 40 ft. from the diesel transfer switch location. It is a metal building, approximately 40 X 40, on a concrete slab. It also houses the foreman's office, electrical switch gear, the vacuum pumps and one vertical lift pump, P_3.

A second shelter, metal, is located adjacent to the wood gas freeing dock. It covers the motor and pump, P_4, at one end of the suction and discharge manifolds. It is about 12 X 15' and has an open side facing the gas freeing dock. Within this building is an explosion proof telephone set connected to the NCRC plant switchboard, extension 2241, phone 504/868-7240.

Emergency shut down and spill containment equipment is discussed in Section 7d. iii.

Listing and description of equipment at Delta Shipyard "Gas Freeing" Plant.

Pumps:

P_1 4" Marlow self priming centrifugal pump with 20HP TEFC Electric motor, 240/480 v., 3Ø, 60 cycle, 1800 RPM.

P_2 DITTO

P_3 4" Johnston vertical lift pump - with 30HP, 240/480, 3Ø, 60 cycle, 3535 RPM.

P_4 2 1/2 Fairbanks - Morse two stage, model K 2 1/2 M 3 P, figure 4972 A with 8 3/4" Impeller, 578 ft. Head at 3460 RPM - Powered by 60 HP, 230/460, 3Ø, 50 cycle, 3555 RPM, NEMA "B", Code "G", Insulation class "F", maximum ambient temp 40°C.

P_5 Double diaphragm pump - Air Operated - 3" Wilden M-15.

P_6 Gould 2" X 1 1/2 with 7 1/2 HP motor 1750 RPM.

P_7 3" X 2" Gould centrifugal pump, Fig. 3770, with 5HP - 230/460 volt, 3Ø, 60 cycle, 1745 RPM electric motor.

P_8 2" Deming vertical lift pump, #22441, with 3HP - 230/460 volt, 3Ø, 60 cycle, 3505 RPM electric motor.

P_9 2" X 1 1/2" Flange Mounted Centrifugal pump - Gould Figure #3643 with 3HP drive.

VP_1 Gardner-Denver #1 AC-7 Vacuum pump, size 7 1/2 X 4 1/2, with 15HP, 208/220 volt, 3Ø, 60 cycle, 1760 RPM motor.

VP_2 Nash Vacuum Pump size 3 X 2 with 15 HP 208/220 volt phase 60 cycle 1760 RPM motor.

Boilers:

B_1 Boiler, gas fired (two sets of safety controls) "Elesco" superheaters by Broderick Boiler Co. Muncie, Ind. Referred to as "Fire Tube Steel Boiler".

B_2 DITTO

Additional unlabeled devices:

Cleaning Nozzles - Butterworth type "K" tank cleaning machine. Serial #K-13638 and #K-13639.

Gas Detector - Davis "Vapolert" - Ser. #V-290.

Tugger Hoists - (Vessel positioning) - Gardner - Denver Air Tugger Hoist #HK-2000, Drum type.

Fire Extinguishers - 3 units - General #KGC 30 A, Purple "K" for class B & C fires. See dwg. for locations.

Life Rings - 4 units - standard size with rope - See dwg. for locations.

Telephone - Emergency phone 2222 type for hazardous locations next to two - stage water pump. Standard phone to Chromalloy Switchboard in Foreman's room.

Starters for Fuel Transfer pump motors (P_7 and P_8) - starter class I, II, III, NEMA type 5, 7D, 9E, F, G. Group D, EFG, 480 volt, Flexible Cord - within 10 ft. of transfer pumps. Master switches in control house.

CONTINGENCY PLANS

1. Equipment

   a. Oil Boom - This is to be deployed across the canal in the event of a major oil spill. This is located in the Delta Shipyard Warehouse.

   b. Oil mops are stocked by Delta Safety & Supply Co., an associate company, on the same property.

c. "Dica Sorb" a product of Dicalite, New York, is stocked by Delta Mud & Chemical Co., an associate company on the same property.

d. Boats, portable tools, etc. are available at Delta Shipyard.

e. Rearrangement of piping and/or hoses is to be considered in removing an oil spill. Two (2) vacuum towers are available for powering the lift of oily waste from the water surface.

2. Response

a. An oil spill shall be immediately reported to the plant leaderman. The leaderman shall report to either the gas freeing plant foreman or the yard superintendent. Either of these persons shall notify the U.S. Coast Guard of the spill.

This report shall be by phone, 1/504/868-7240, and shall include the magnitude of the spill, actions being taken as well as an estimate of our ability to effectively contain the spill and clean the spill.

b. In the event the oil containment boom is to be used it should be picked up by truck from the Delta Shipyard Warehouse, approximately 600 ft. from the dock. A harbor boat shall be dispatched immediately to the area by Delta Shipyard. If this boat is not available or non working a rental tug shall be used. (Several companies are within a radius of 2 to 5 miles)

The boom is to be anchored at one end and carried by boat across the canal at the canal at the primary or alternate points. Delta Shipyard cranes can be used in assisting loading the boom onto the boat.

After the boom is in place the oil herding and cleanup can begin. Have the ends of the boom monitored to eliminate oil seepage past the boom.

Portable mops may be picked up at Delta Safety & Supply Co. Sorbents may be picked up at Delta Mud & Chemical Co.

The regular gas freeing personnel can rearrange the system to use the existing vacuum towers to remove oil.

If the shipyard supervisors decide to call in clean Gulf Associates or Oil Mop, Inc. they will then decide on the use of skimmers and/or other floating systems.

3. Company Response

Delta Services Industries, Inc. is committed to supply labor, equipment and materials required to clean an oil spill resulting from our operations. This includes labor from associate companies, material and equipment from associate companies, and outside assistance as required.

4. Cleaning Up

The cleaning up of an oil spill shall be dependent upon the type and magnitude of the spill.

Small spills may be effectively cleaned by the use of portable mops. Larger spills may require the use of mechanical moping equipment and/or pumps. Shipyard supervisory personnel and/or the U.S. Coast Guard may give directions on these procedures.

Larger spills may require the deployment of the oil boom. The size of the spill and the wind and water current directions will have a bearing on how quickly the oil is being dispersed.

Delta Shipyard and/or associate company boats may be used to "herd" the oil into pockets for clean-up. When these pockets are formed the oil may be "moped" up, tools used to remove floating water lilies contaminated with oil or oil soaking agents. At times it may be helpful to spread hay on the water and remove after it becomes soaked with oil. "Dica Sorb" or other oil attracting agents may be spread over the water and later removed.

5. Disposition

The oily waste may be disposed of by several ways:

a. Pump into plant treating system
b. Pump into plant storage tanks
c. Truck wastes to an approved and permitted disposal facility

Regulations - Summary

Most regulations written relative to oil handling, transfer and pollution address themselves to plants handling cargo. Even though no cargo, as such, is handled at this facility every effort shall be made to make it a safe work area, reliable cleaning area, a non pollution source, as well as a profit center.

To further these objectives it has been decided to refuse the clean-up of certain products. With this change it is no longer necessary to use either chemicals or steam.

Proper use and maintenance of drip pans, use and inspection of hoses and connections, grounding of vessels, clean up of oily spills proper knowledge and use of electrical systems, inspection and use of safety equipment use of protective equipment, etc., all will contribute to the well being of each worker, protection of the environment and make a profitable operation.

Changes will be made in these procedures to cover any operations or conditions that are unacceptable to the regulatory agencies.

All workers shall exert every effort to eliminate the possibility of oil spills.

iv). A ledger of all activities at the gas freeing plant shall be kept by the gas freeing plant leaderman. This record shall show all vessels cleaned, types of cargo, plant shut down and emergencies. A copy of the job order record is attached as Appendix "F".

v). Qualifications of key operating positions.

Training

Present operating personnel have worked at the facility since it was constructed and put into operation in September, 1968.

This "Operations Manual" is expected to be used to implement future training of new personnel.

The supervisor, Mr. Wilson Thibodaux, has attended three (3) training courses, of three days each, conducted by the U.S. Dept. of Labor (Occupational Safety Div.) for "Competent Persons" and is presently certified as such.

This course covered some of the subject matter contained in the pollution prevention regulations.

Periodically the General Services Foreman goes through a detailed explanation on deploying the oil containment boom and how other facilities can be used in cleaning up a spill. Emphasis is placed on safety, proper working conditions, and obtaining a proper environment for others to do "hot work" on a vessel.

Emphasis is placed on having any new laborer work with an experienced man. All phases of gas freeing are covered in safety meetings.

GAS FREEING PLANT-OPERATING PERSONNEL

WILSON THIBODEAUX- 25 years in construction work, 18 years gas freeing plant foreman, a government approved competent person, certified tankerman.

JOHN JEFFERSON- 12 year employee of Delta Shipyard, 2 years gas freeing plant leaderman and a government approved competent person.

8. Closure Plan

If for some reason, it would become necessary to close our pits, we would substitute a large rectangular tank (presently used for storage) in place of our pits and continue operating in the same manner in which we are presently doing. We are presently using a closed loop system with no overboard discharge for wash down purposes. The oil is removed by use of a weir separator and a heater treater and the reusable oil is sold to a second oil user.

The washwater is treated to be compatible to our boilers and recycled.

If for some reason, this entire facility is closed we plan to do all that is necessary to comply with applicable requirements concerning closure and to insure that we protect the environment and lives of individuals who may be utilizing these facilities.

9. Financial Responsibility

a). Financial Structure of Operating Unit:

i). Exhibit 1-Ownership:

a). Mr. Howard Geneen, Chairman of the Board
b). Ira Hechler Associates
c). Mr. Leon Toups
d). Banker's Trust (New York)
e). Foster Investment, Inc. A joint venture between Delta Services Industries, Inc. and Granite Capital Corp. with Delta Services Industries, Inc. being the managing joint venturer. Delta Services Industries, Inc., P.O. Box 101, Houma, LA 70361, Phone: (504) 868-7450.
f). Exhibit 2-Organizational Chart of Delta Shipyards, Inc.

ii). Exhibit 3-Certificate of Insurance

DELTA SHIPYARD
A DIVISION OF DELTA SERVICES INDUSTRIES
POST OFFICE BOX 101 HOUMA, LOUISIANA 70361
PLANT AND OFFICE: INDUSTRIAL BOULEVARD
PHONE 504/868-7450

September 11, 1980

NEWS RELEASE

Delta Services, Inc. is a Delaware Corporation formed for the purpose of acquiring all of the assets of the Services Group of Chromalloy's Natural Resources Company. This group of companies known as the Services Group has been in existence for approximately 25 years and has a successful history of performance throughout that time. The companies involved in this group include:

(1) Delta Construction..... Don Lefevre, President
(2) Delta Fabrication..... Kerry Chauvin, President
(3) Delta Safety & Supply..... John Ferry, President
(4) Delta Shipyard..... Ralph Arceneaux, President
(5) Heldenbrand..... Jimmy Cole, President

All of these operations have been headquartered in Houma, Louisiana under Chromalloy's ownership and will remain in Houma. These companies operate at a sales volume of approximately 100 Million dollars annually.

The officers of DSI are:

(1) Harold Geneen, Chairman of the Board
(2) Leon Toups, President & Chief Executive Officer
(3) Louis Talbot, Vice President & Chief Operating Officer
(4) Harris Henry, Secretary-Treasurer

Mr. Geneen is the former Chairman of IT&T where he operated as Chief Executive Officer for 20 plus years. Under his leadership IT&T grew from 600 Million dollars in sales to its present 22.5 Billion dollar status. Mr. Geneen is presently Chairman Emeretus of IT&T and resides in New York City. As Chairman of this Board, Mr. Geneen is an active participant as well as an investor in DSI.

Leon Toups is the former President of Chromalloy American Corporation, a 1.6 Billion dollar conglomerate and also the former President of Chromalloy Natural Resources. The Services Group, which were the groups involved in this spinoff, was one of three groups in the Natural Resources Company. The other two groups

EXHIBIT 1

being Drilling Fluids and Manufacturing. Mr. Toups was located in Houma for approximately 6 years as President of the Natural Resources Company. In assuming these new responsibilities he will be located in Houma, Louisiana, which incidentally, is his birthplace.

Mr. Talbot is the former President of the Natural Resources Company and has been with the Delta Companies for approximately 25 years. He is a native of Houma and he will be the Chief Operating Officer of DSI. Mr. Talbot's background involves oil and gas related business for almost all of his professional career.

Mr. Henry is also a native of Houma, Louisiana and was the initial controller of the Delta Companies. He subsequently became the Financial Vice President for the Natural Resources Company and will now be the Secretary-Treasurer for the new DSI.

All of the management of the companies involved has been kept intact and the operating philosophy is to operate with the people that we had prior to the sale. Of course, this will be a private company and that operational philosophy will be different from the Chromalloy environment. We are proud of the fact that all of our people have stayed with us in the transition period.

The transaction with Chromalloy was an asset purchase and DSI has assumed all assets and liabilities from Chromalloy American regarding these companies. We have contracted for the proper insurance for these operations and will furnish ongoing or prospective customers a certificate of insurance. Our banking is presently being conducted with the First National Bank in St. Louis and Bankers Trust in New York City and Houston. These two banks have participated in our transaction with Chromalloy and they afford us comfortable working capital lines to conduct our business. References at the two banks mentioned are First National Bank (Raymond Johnson and Gardner Lloyd) and at Bankers Trust in Houston (Bill Austin and Mike Brown). In additional to these major banks, we are also using local Houma banks for operating and payroll accounts. References may be had from any of our local banks. The offices of DSI will remain headquartered at Houma, Louisiana.

Our legal representation is with the firm of Watkins, Walker & Prejeant, which is in Houma, Louisiana. Ken Watkins is the principal at that firm.

EXHIBIT 1 CONT'D

This is to certify that the policies of insurance as described below have been issued to the insured for whom this certificate is executed and are in force at this time In the event of cancellation of material change in a policy affecting the certificate holder, 10 days prior written notice will be given the certificate holder. This certificate is issued for information only and confers no rights upon the holder.

DELTA SERVICES INDUSTRIES
P.O. BOX 101
HOUMA, LOUISIANA 70361

ISSUED TO: State of Louisiana
Department of Natural Resources
P. O. Box 44066
Baton Rouge, La. 70804

KIND OF INSURANCE	Policy of Binder Number	Effective Date	Expiration Date	Limits of Liability	
Workmen's Compensation	SR37277	9/1/80	9/1/83	Statutory	
Employer's Liability	SR37277	9/1/80	9/1/83	$ 1,000,000.00 C.S.L.	
Longshoremen's & Harbor Worker's	SR37277	9/1/80	9/1/83	Statutory	
Amendment to Coverage B-Maritime	SR37277	9/1/80	9/1/83	$ 100,000 $ 100,000	each person each accident
Public Liability Bodily Injury	SR37277	9/1/80	9/1/83	$ 1,000,000.00 $ Combined Single Limit	
Public Liability Property Damage	SR37277	9/1/80	9/1/83	$ $ Included in Above	
Automobile Liability Bodily Injury	SR37277	9/1/80	9/1/83	$ 1,000,000.00 $ Combined Single Limit	
Automobile Property Damage	SR37277	9/1/80	9/1/83	$ Included in Above	
EXCESS COVERAGE					
*EXCESS MARITIME	37398	9/1/80	9/1/83	$900,000/$900,000 Excess of $100,000/$100,000	
MARINE COVERAGE					
Hull, Collision, Towers Liability				$	Amt. of Insurance
Protection & Indemnity				$	Amt. of Insurance
EXCESS COVERAGE					
Protection & Indemnity				$	Amt. of Insurance
Collision Liability				$	Amt. of Insurance
Towers Liability				$	Amt. of Insurance

General Description of Work Oilfield Construction, Fabrication & General Service
Location of Work Louisiana, Texas & Alaska; and Offshore in Gulf of Mexico

Remarks "SEE REVERSE FOR ADDITIONAL COVERAGES & DIVISIONS"
THIS CERTIFICATE NEITHER NEGATIVELY OR
~~AFFIRMATIVELY EXTENDS, ALTERS OR AMENDS~~
SUCH INSURANCE AS IF AFFORDED BY THE POLICIES.

INSURANCE COMPANY/IES ISSUING COVERAGE
Northwest Insurance Company
*London

Bayly, Martin & Fay
of Louisiana, Inc.
Formerly Harlan of Louisiana Inc
Insurance
1613 Barrow Street
Houma, Louisiana 70360

Dated 9/29/80

BAYLY, MARTIN & FAY OF LOUISIANA, INC.
By [signature] (HOUMA)
AUTHORIZED REPRESENTATIVE

EXHIBIT 3

Reference Sheet

REF+24244

08/02/99 11:15 AM

DELTA SERVICES INDUSTRIES

Delta Services Industries is made up of the following divisions:

Delta Construction, A Division of
Delta Fabrication, A Division of
Delta Safety & Supply, A Division of
** Delta Shipyard, A Division of
Heldenbrand, A Division of

COVERAGES AND LIMITS

1. Workmen's Compensation and Employer's Liability
   A. Employer's Liability Coverage
   B. Voluntary Compensation Endorsement-Ex. Master & Member of Crew
   C. Maritime Liability $100,000/$100,000
   D. Transportation, Wages, Maintenance & Cure
   E. "In Rem" Endorsement
   F. U.S.L. and H.W. Endorsement
   G. Outer Continental Shelf Act Endorsement
   H. Death on the High Seas Endorsement
   I. Blanket Waiver of Subrogation
   J. 30 Days Notice of Cancellation
   K. Extension of Territorial Limits to Include the Gulf of Mexico
   L. Borrowed Servant Endorsement

2. Comprehensive General Liability (Combined Single Limit-$1,000,000.00)
   A. Bodily Injury
   B. Property Damage Broad Form
   C. Watercraft Exclusion Removed (Contractual and C.G.L.)
   D. Blanket Waiver of Subrogation
   E. Blanket "X", "C", and "U" Coverage
   F. 30 Days Notice of Cancellation
   G. "In Rem" Endorsement
   H. Extenstion of Territorial Limits to Include the Gulf of Mexico
   I. Blanket Contractual Liability
      (1) Watercraft Exclusion Liability
   J. Incidental Professional Liability Endorsement
   K. Products and Completed Operations
   L. Personal Injury Liability - Exclusion "A" & "C" Removed
      $1,000,000.00 Combined Single Limit
   M. Additional Insured - (Vendors-Broad Form)
   N. Property of Others in Your Care, Custody, or Control
   O. Additional Insured's Blanket where Required by Contract
   P. Host Liquor Liability

3. Comprehensive Automobile Liability (Combined Single Limit-$1,000,000.00)
   A. Bodily Injury
   B. Property Damage
   C. Medical Payments - $5,000.00 Each Person
   D. Hired and Non-Owned Coverages
   E. Blanket Waiver of Subrogation
   F. 30 Days Notice of Cancellation
   G. Uninsured Motorists - $5,000 Each Person - $10,000 Each Accident
   H. Use of Other Automobiles - Broad Form
   I. Additional Insured's Blanket where Required by Contract

EXHIBIT 3 CONT'D

Reference Sheet

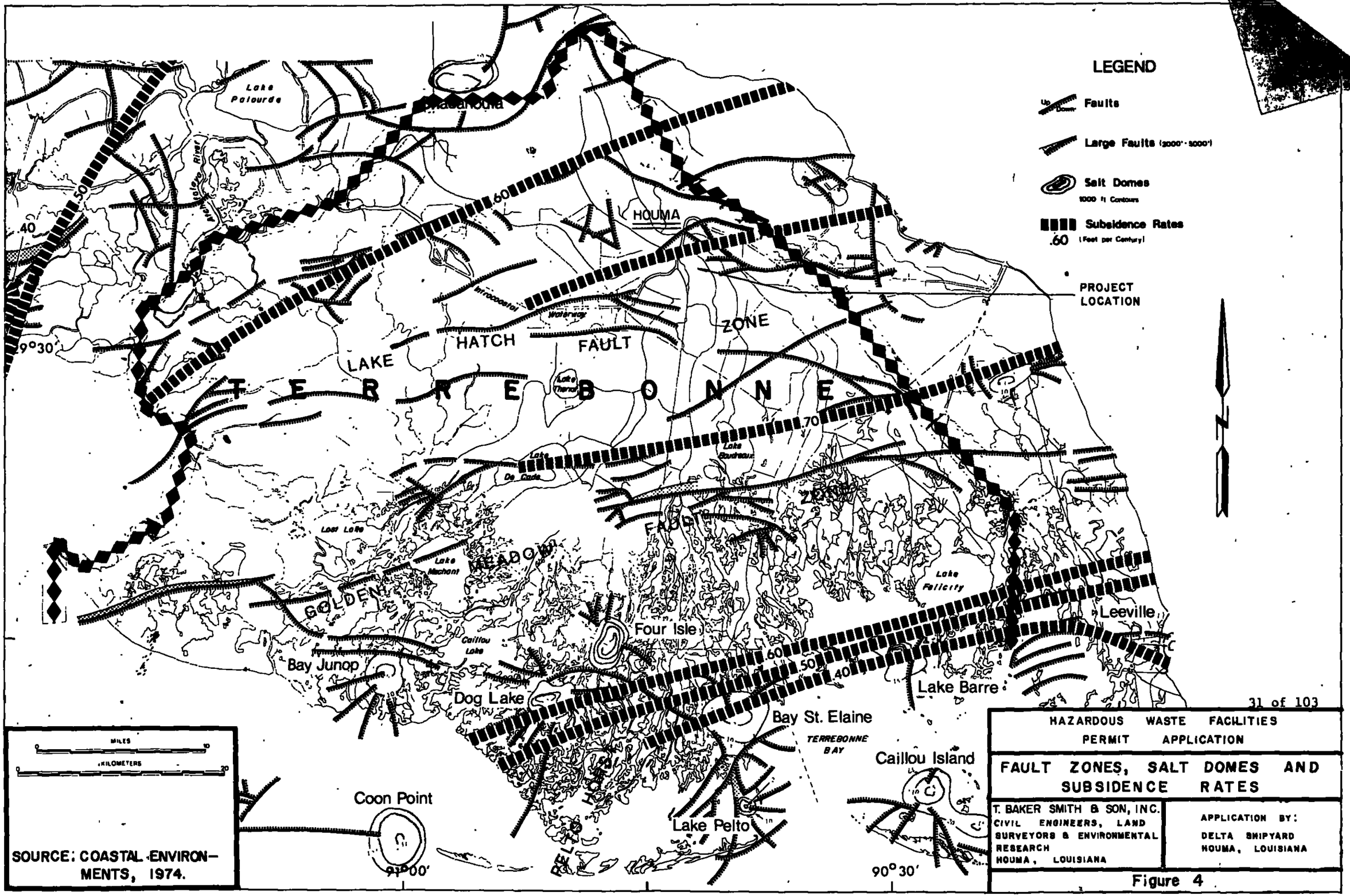
REF+24245

08/02/99 11:15 AM

Reference Sheet

REF+24246

08/02/99 11:15 AM



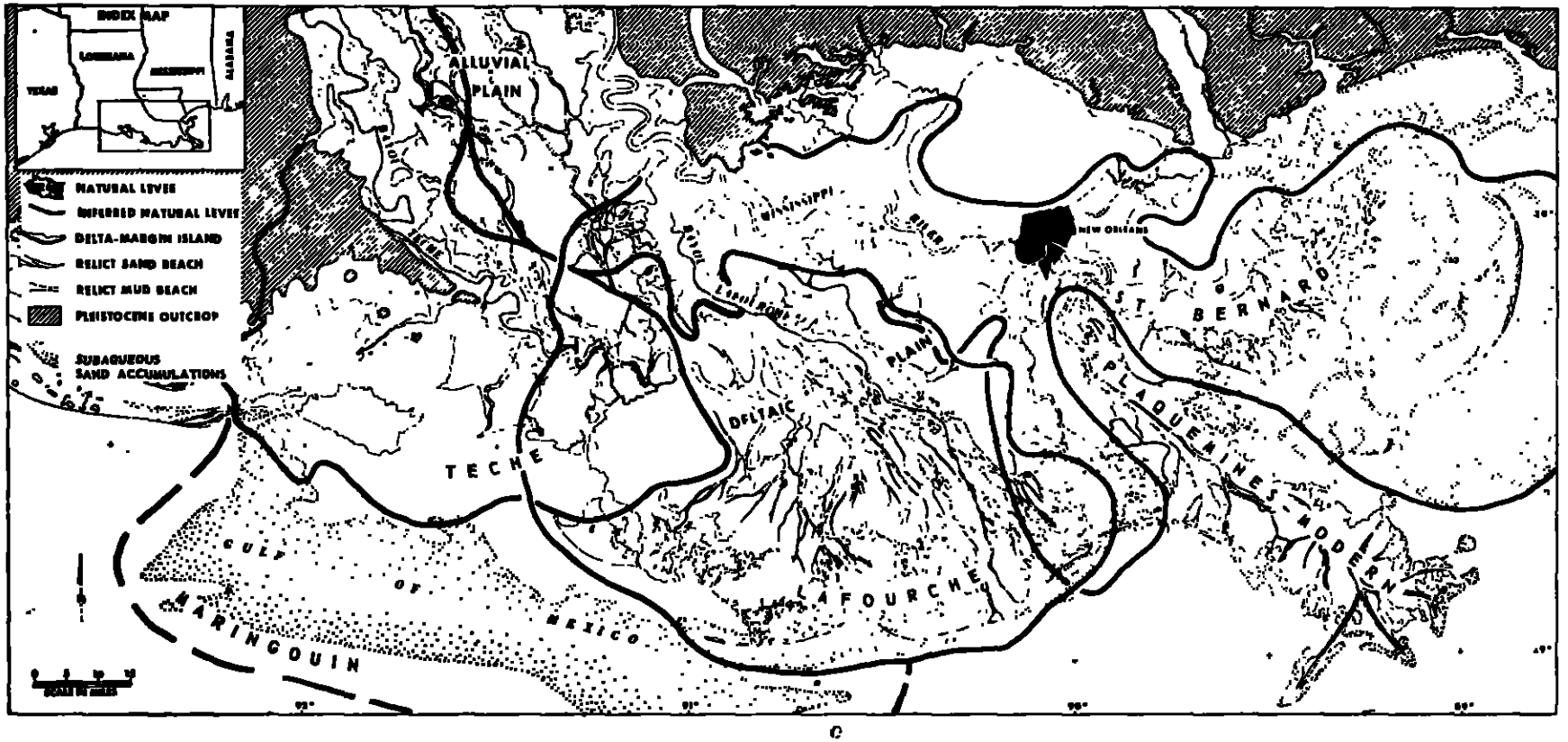
HAZARDOUS WASTE FACILITIES PERMIT APPLICATION

FAULT ZONES, SALT DOMES AND SUBSIDENCE RATES

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 4



SOURCE: FRAZIER, 1967.

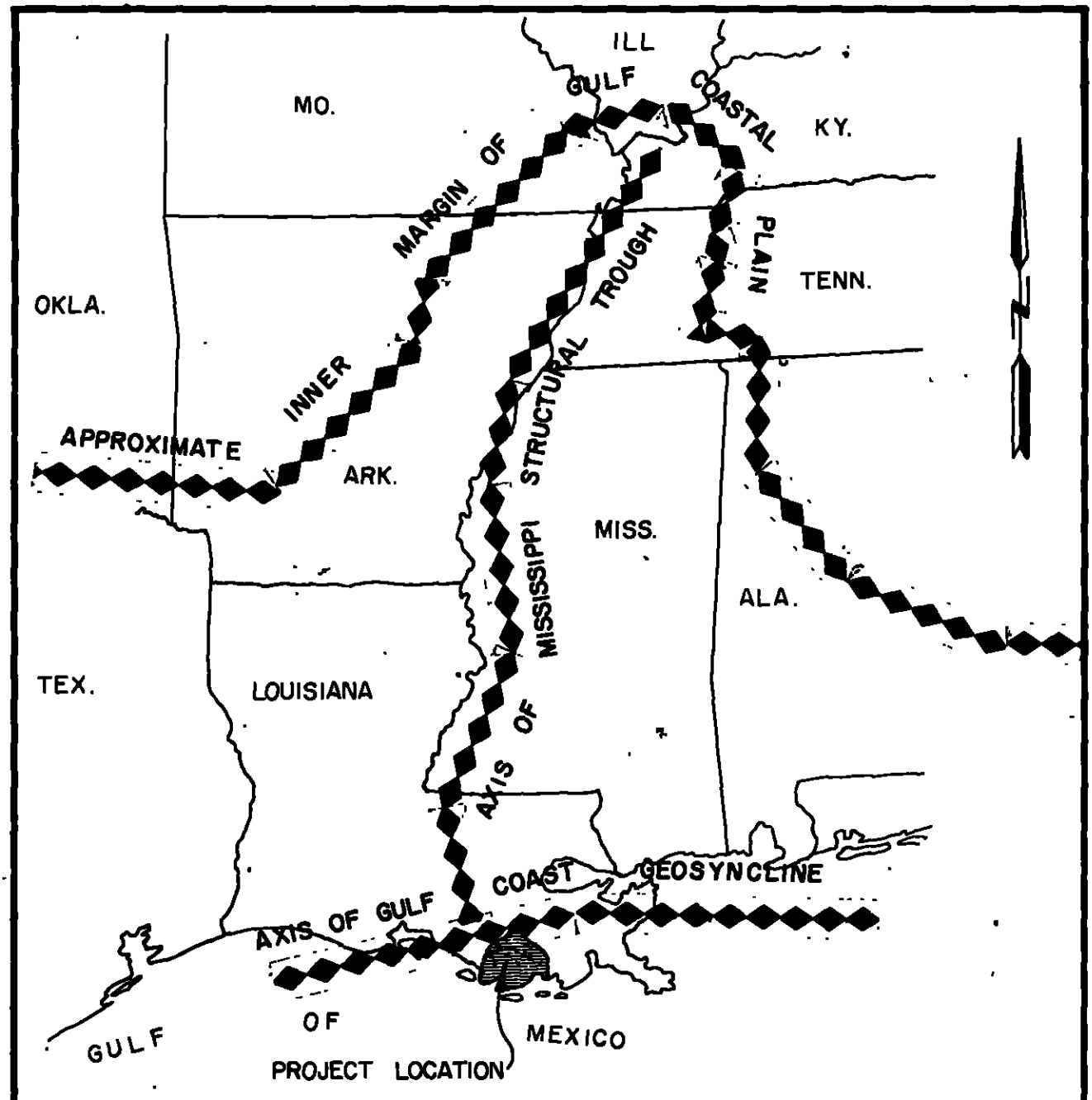
HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION

PHYSIOGRAPHIC FEATURES OF THE MISSISSIPPI RIVER DELTA PLAIN AND OUTLINES OF THE DELTA COMPLEXES

T BAKER SMITH & SON, INC
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 5



SOURCE: FISK, 1944 AND U.S. ARMY CORPS OF ENGINEERS, 1974 A.

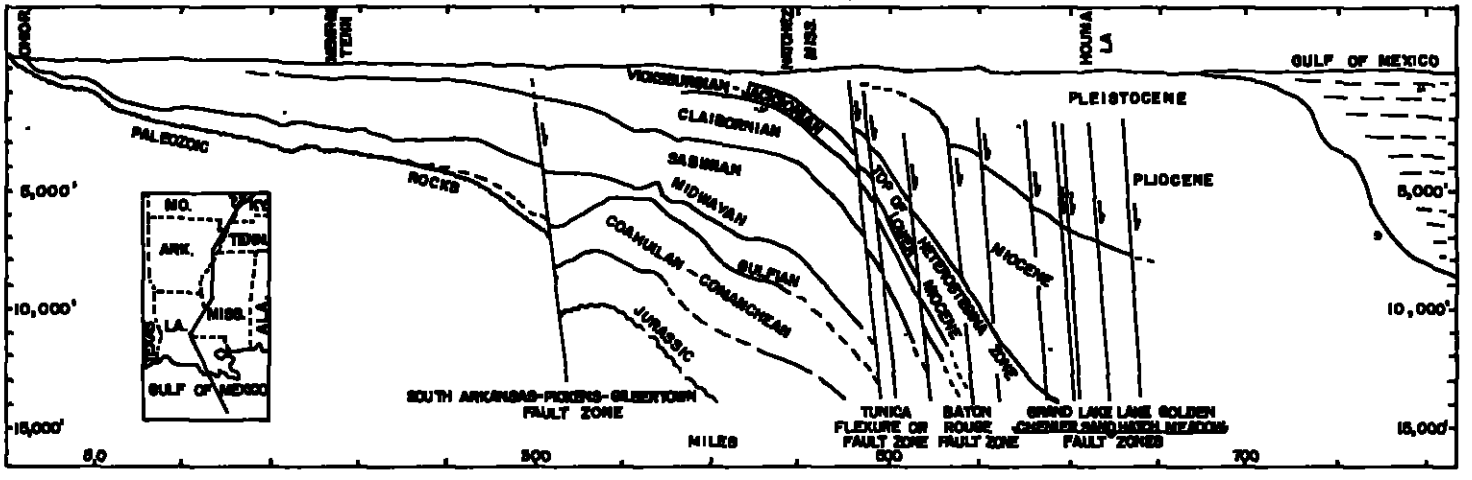
HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION

MAJOR STRUCTURAL FEATURES IN CENTRAL GULF COASTAL PLAIN

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 6



SOURCE: FISK, 1944.

HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION

DIAGRAMMATIC SECTION THROUGH THE MISSISSIPPI EMBAYMENT SHOWING POSSIBLE STRIKE FAULT SYSTEMS

T BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 7

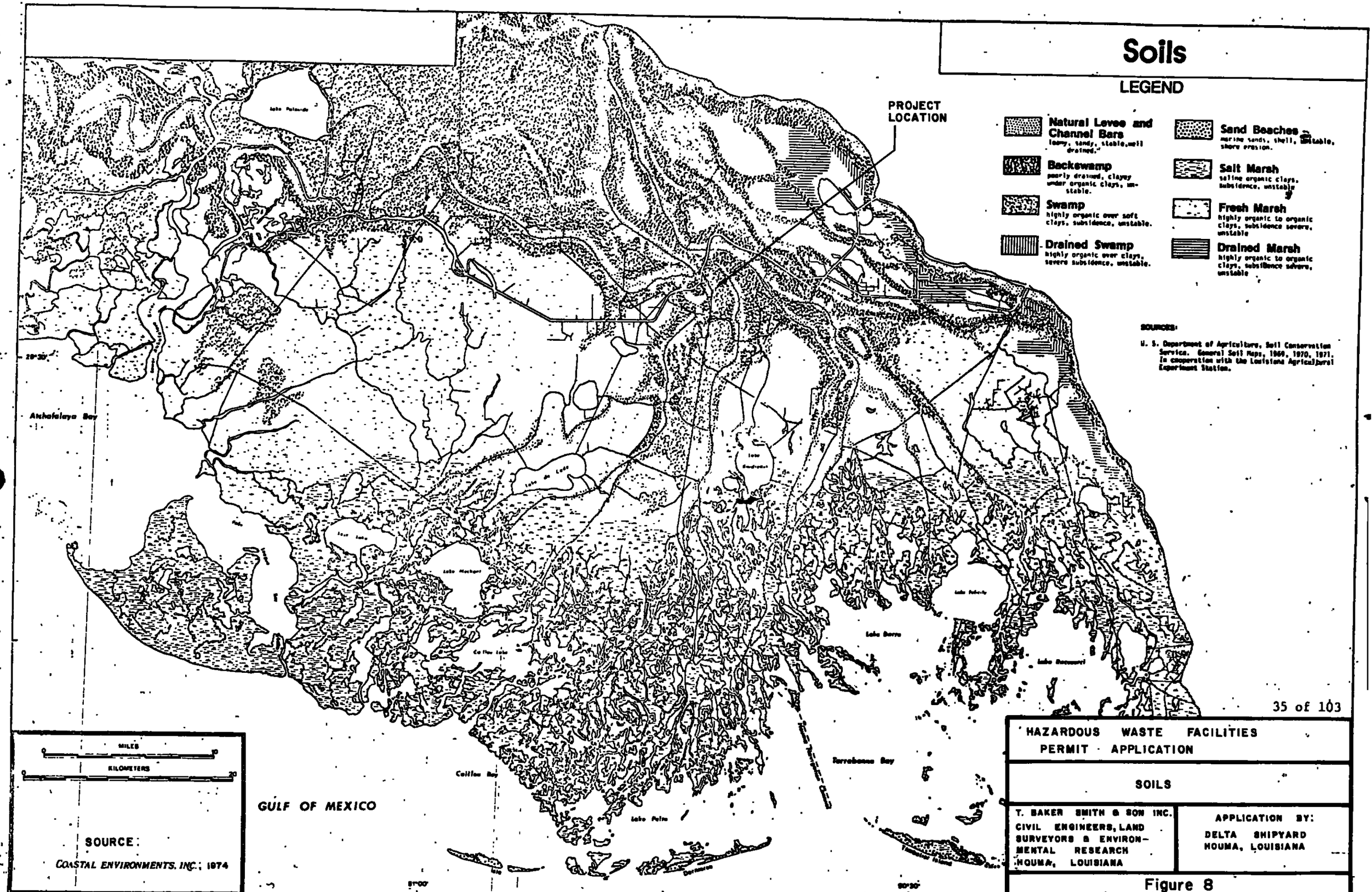
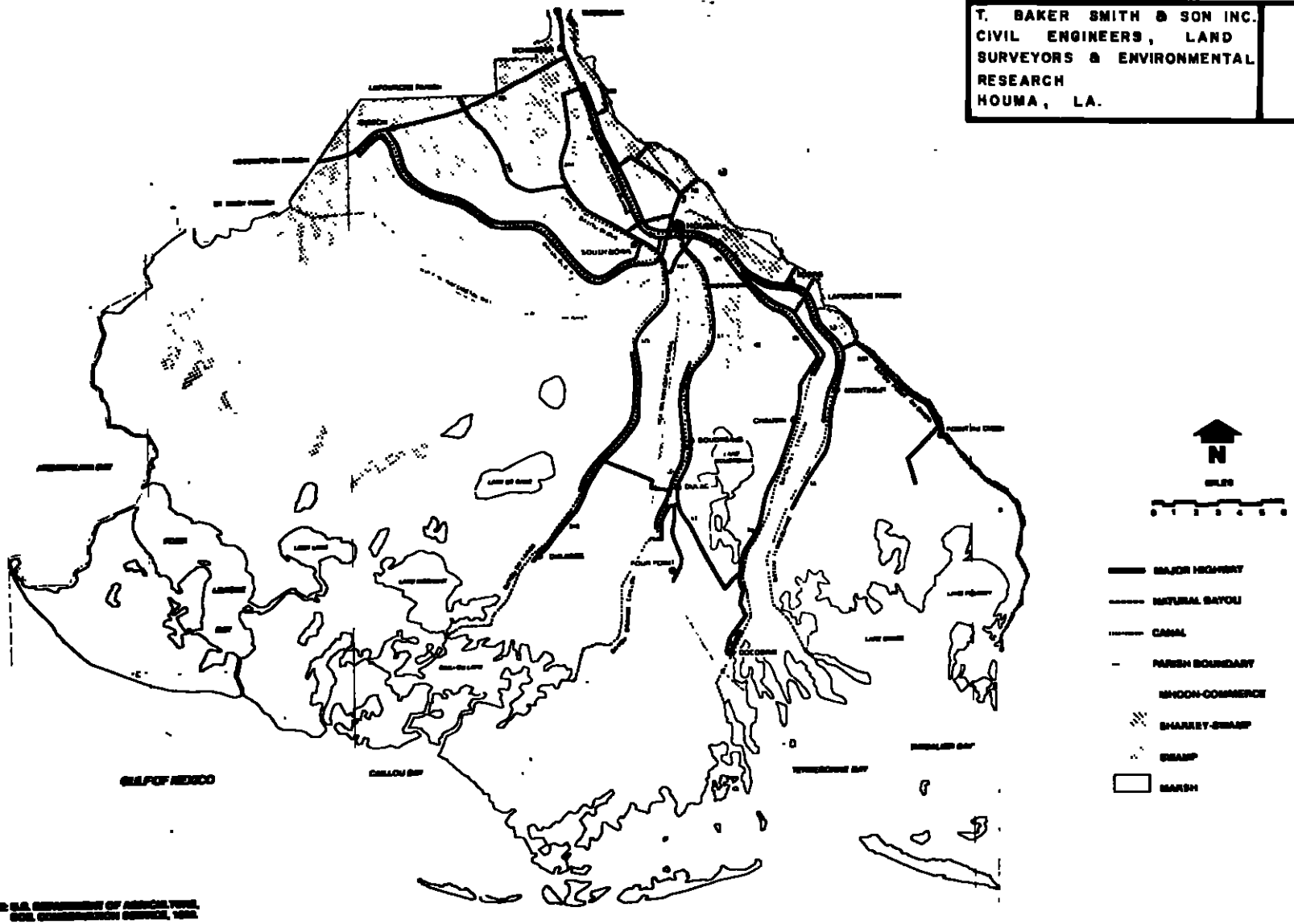

Soils
LEGEND
Natural Levee and Channel Bars
loamy, sandy, stable, well drained.
Backswamp
poorly drained, clayey under organic clays, unstable.
Swamp
highly organic over soft clays, subsidence, unstable.
Drained Swamp
highly organic over clays, severe subsidence, unstable.
Sand Beaches
marine sands, shell, unstable, shore erosion.
Salt Marsh
saline organic clays, subsidence, unstable
Fresh Marsh
highly organic to organic clays, subsidence severe, unstable
Drained Marsh
highly organic to organic clays, subsidence severe, unstable
SOURCES:
U. S. Department of Agriculture, Soil Conservation Service. General Soil Maps, 1969, 1970, 1971. In cooperation with the Louisiana Agricultural Experiment Station.
PROJECT LOCATION
Atchafalaya Bay
Lake Palourde
Lake Mechant
Caillou Bay
Lake Pelto
Terrebonne Bay
Lake Barre
Lake Pelicity
Lake Raccourci
GULF OF MEXICO
MILES
KILOMETERS
SOURCE:
COASTAL ENVIRONMENTS, INC.; 1974
HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION
SOILS
T. BAKER SMITH & SON INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA
APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 8

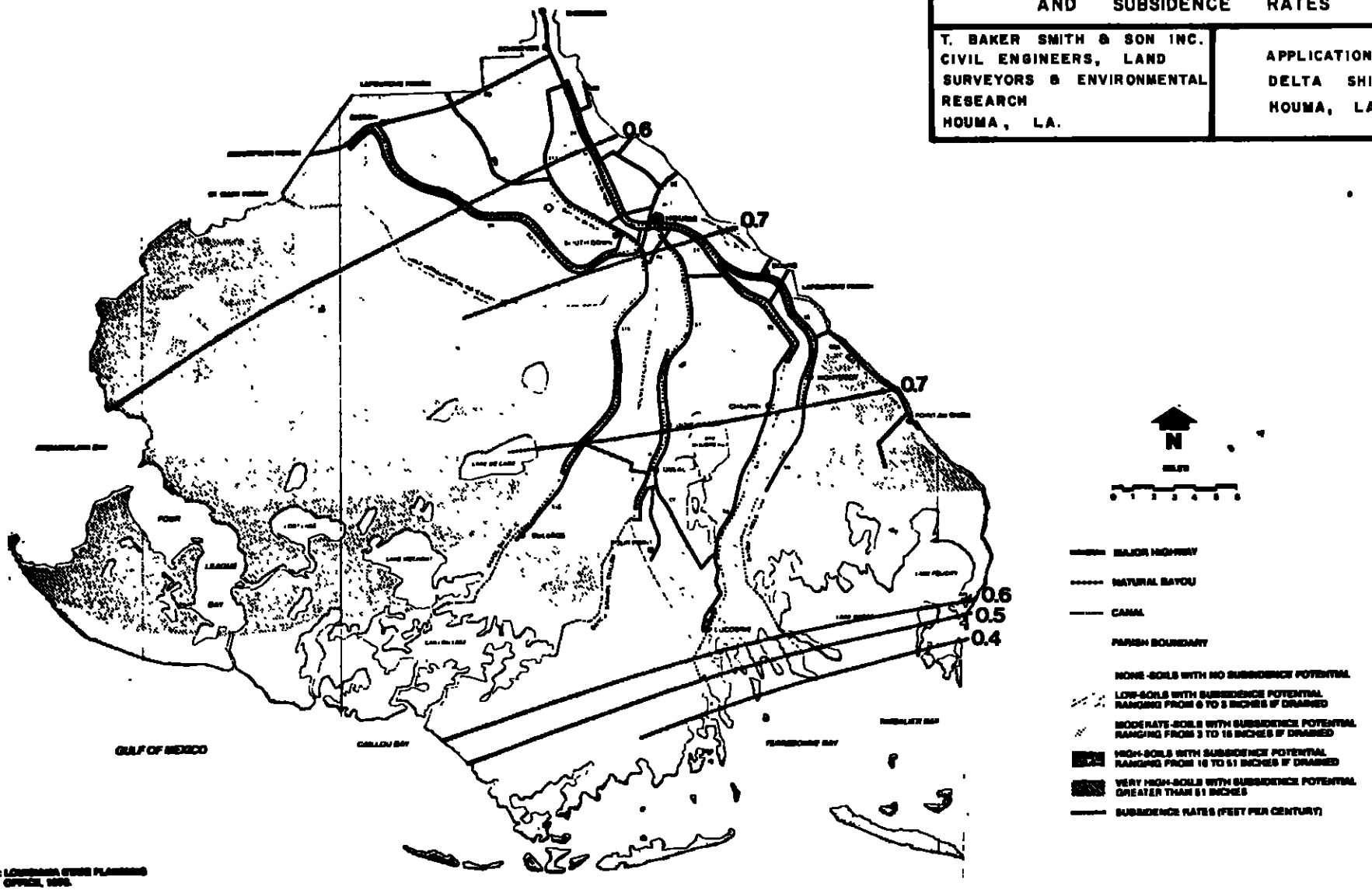
HAZARDOUS WASTE FACILITIES PERMIT APPLICATION	
SOIL ASSOCIATION MAP	
T. BAKER SMITH & SON INC. CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH HOUMA, LA.	APPLICATION BY DELTA SHIPYARD HOUMA, LA.



SOURCE: D.E.I.S.—WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA., DEC 1978

Figure 9

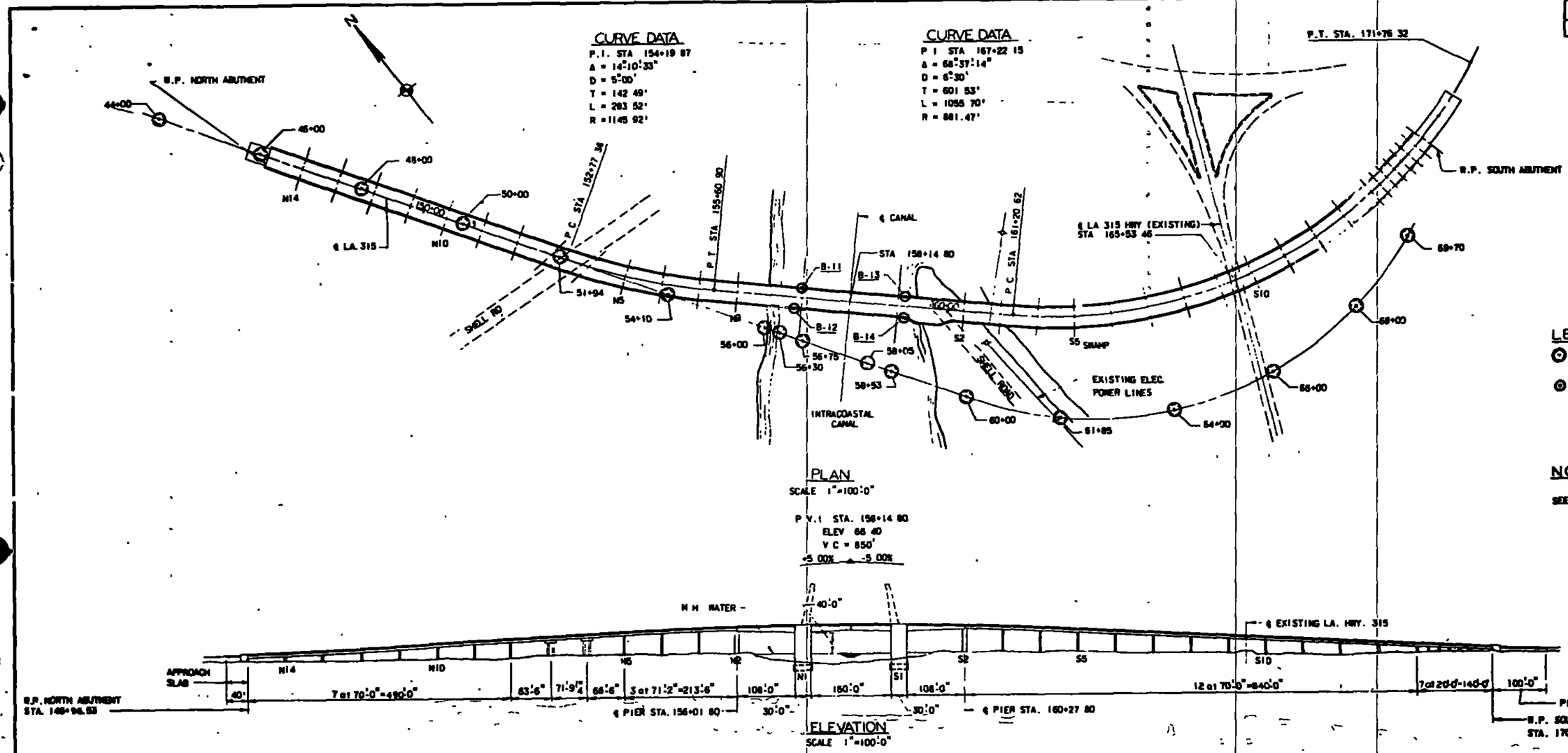
HAZARDOUS WASTE FACILITIES PERMIT APPLICATION	
SOIL SUBSIDENCE POTENTIAL AND SUBSIDENCE RATES	
T. BAKER SMITH & SON INC. CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH HOUMA, LA.	APPLICATION BY: DELTA SHIPYARD HOUMA, LA.



SOURCE: D.E.I.S.– WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA., DEC. 1978

Figure 10

ROUTE	STATE PROJECT	PARISH
LA. 315	245-03-41	TERREBONNE



LEGEND

- ⊙ APPROXIMATE LOCATIONS OF BORINGS TAKEN IN 1987 AND 1988. NUMBERS SH REFER TO STATIONS LISTED ON BORING
- ⊙ LOCATIONS OF BORINGS TAKEN IN 1973 STATION AND OFFSET SEE BORING LOG

NOTES:

FOR LOCATION OF TEST PILES, SEE DWG. NO. 109.

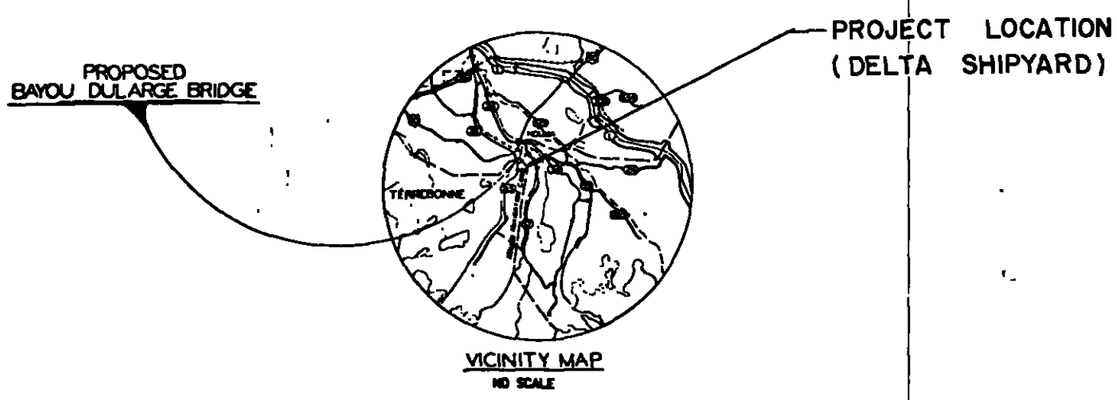


FIGURE 11 38

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAY

BORING LOCATION PLAN

BAYOU DULARGE BRIDGE

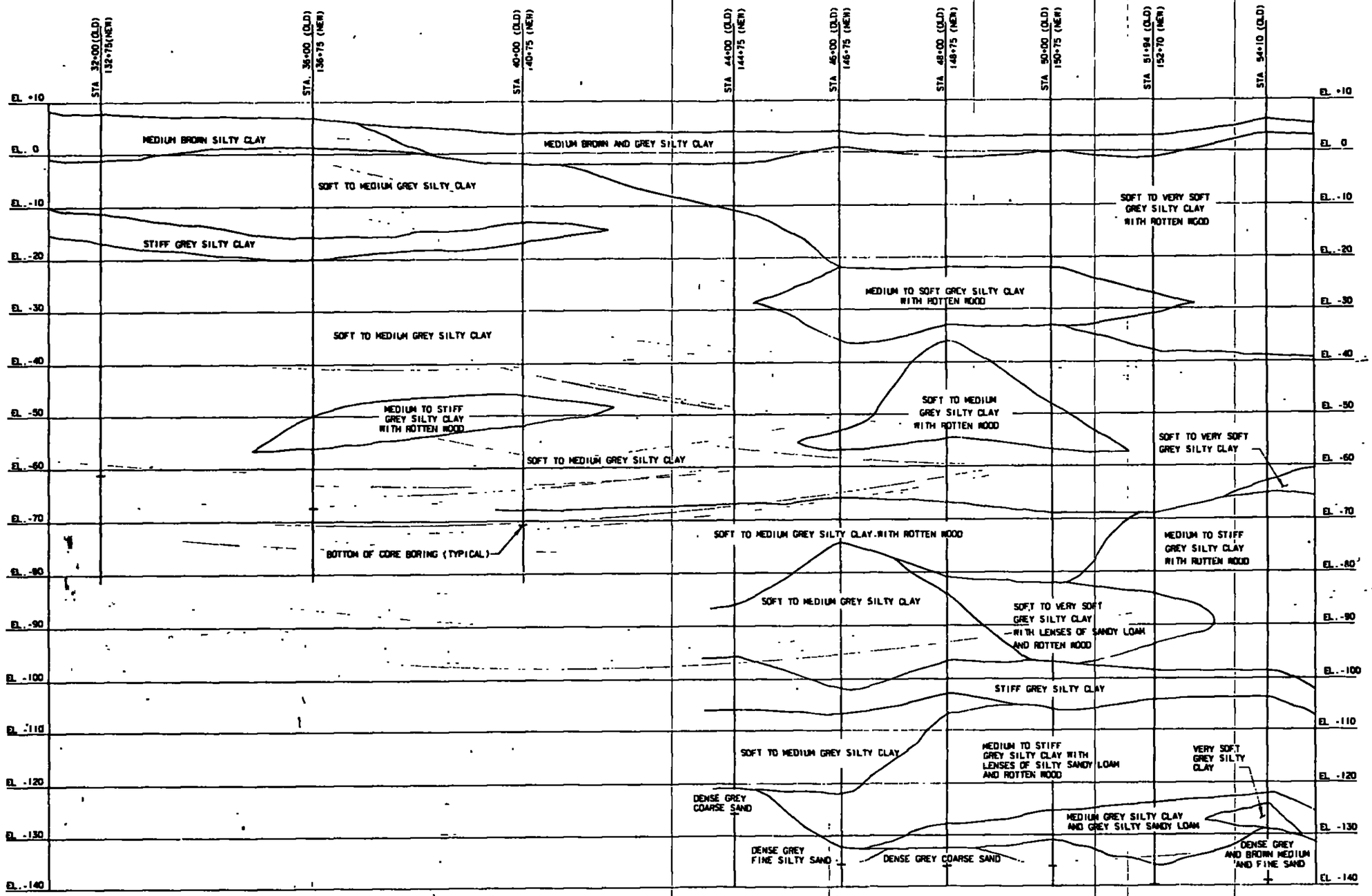
MODJESKI AND MASTERS
CONSULTING ENGINEERS

DATE	DESCRIPTION	BY
	REVISIONS	

DATE: JAN. 1993 | SCALE: 1"=100'-0" | DWG.
DRAWN BY: G.S. | CHKD. BY: DAL | IN CHARGE: T.S.

HALF SCALE PLANS

ROUTE	STATE PROJECT	PARISH
L.A. 315	245-03-41	TERREBONNE



SOIL PROFILE
VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=100'

NOTES:

SOIL PROFILE INFORMATION WAS OBTAINED
CORE BORINGS TAKEN IN AUGUST, 1967 AT TH
SHOWN FROM 56+30 TO 58+53, AND FROM 18 C
BORINGS TAKEN DURING JANUARY, 1969 AT EA
OTHER STATION LOCATIONS SHOWN FOR LOCAT
BORINGS, SEE BORING LOCATION PLAN DWG N

STATION LOCATIONS DESIGNATED AS "OLD"
STATIONS THAT ARE LISTED ON THE BORING L
AND "NEW" STATIONS ARE THE APPROXIMATE C
ING STATIONS ON THE PRESENT STATION LINE
STATIONS ARE NOT SHOWN WHERE THE PRESENT
NOT COINCIDE WITH THE OLD LINE

THE SOIL PROFILE INFORMATION SHOWN W
REVISION UPON COMPLETION OF ADDITIONAL
THE PRESENT STATION LINE

SEE DWG NO 203 FOR ADDITIONAL SOIL PR
INFORMATION

FIGURE 12 39

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

SOIL PROFILE-1
BAYOU DULARGE BRIDG

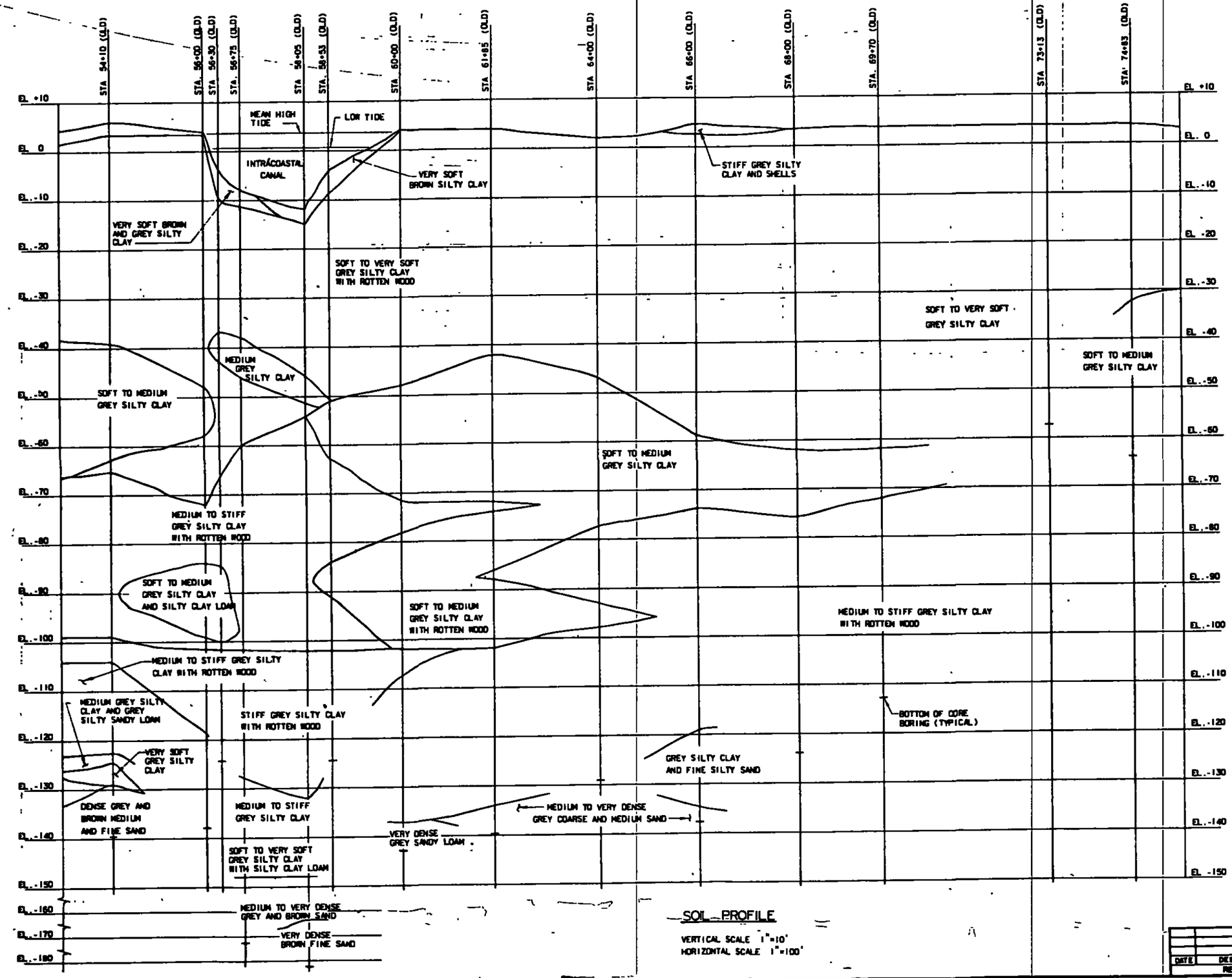
MODJESKI AND MASTERS
CONSULTING ENGINEERS

DATE	DESCRIPTION	BY
	REVISIONS	

DATE JAN. 1975 | SCALE AS NOTED | DWG N
DRAWN BY OLS | CHKD BY | IN CHARGE TS

HALF SCALE PLANS

ROUTE	STATE PROJECT	PARISH
LA. 315	245-03-41	TERREBONNE



SOIL PROFILE

VERTICAL SCALE 1"=10'
HORIZONTAL SCALE 1"=100'

NOTES:
FOR NOTES, SEE SHEET NO. 202

FIGURE 13 40 of

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

SOIL PROFILE-2
BAYOU DULARGE BRIDGE

MODJESKI AND MASTERS
CONSULTING ENGINEERS

DATE	DESCRIPTION	BY
	REVISIONS	

DATE JAN. 1978 | SCALE AS NOTED | DWG NO. 203
DRAWN BY G.L.S. | CHKD BY | IN CHARGE T.S. | APPROV

HALF SCALE PLANS

CLASSIFICATION								TEST PILE Nº
SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	APPROX. ELEVATION	TYPE OF PILE TYPE OF HAMMER ENERGY PER BLOW FT LBS DATE OF DRIVING DATE OF LOADING DESIGN LOAD TONS
GR SILTY CLAY	0.13	VERY SOFT	60.1	38	13		-5	
SILTY CLAY	0.13	SOFT	28	40	21			
GR SILTY CLAY	0.20	SOFT	83	40	14		-10	
SILTY CLAY	0.18	SOFT	42	31	23		-15	
GR SILTY CLAY	0.20	SOFT	78	103	78		-20	
GR SILTY CLAY	0.24	SOFT	64	83	45		-25	
WOOD			(40 BLOWS)					
GR SILTY CLAY	0.10	VERY SOFT	41	40	21		-30	
GR SILTY CLAY		(0.13) SOFT	46	46	30			
GR SILTY CLAY	0.20	MED	38	58	36		-35	
GR SILTY CLAY	0.63	MED	38	43	23			
GR SILTY CLAY	0.24	VERY SOFT	30	30	6		-40	
GR SILTY CLAY	0.01	SOFT	28	42	20		-45	
GR SILTY CLAY	0.22	VERY SOFT	31	32	12		-50	
GR SILTY CLAY	0.33	VERY SOFT	32	31	4		-55	
GR SILTY CLAY	0.07	SOFT	34	56	13			
CLAY	0.06	SOFT	34	41	18		-60	
GR SILTY CLAY	0.23	VERY SOFT	30	35	10			
GR SILTY CLAY	0.68	MED	41	43	30		-65	
GR SILTY CLAY	0.66	MED	32	45	19		-70	
GR SILTY CLAY	1.11	STIFF	26	37	57			
GR SILTY CLAY	0.51	MED	43	43	52		-75	
GR SILTY CLAY	0.33	MED	53	43	49			
GR SILTY CLAY	0.23	MED	32	30	20		-80	
GR SILTY CLAY	0.51	MED	32	39	10		-85	
GR SILTY CLAY	0.30	SOFT	37	45	20		-90	
GR SILTY CLAY	0.73	MED	32	35	14		-95	
GR SILTY CLAY	1.11	STIFF	43	36	20		-100	
							-105	
GR SILTY CLAY	1.36	STIFF	43	34	17		-110	
							-115	
							-120	
							-125	
							-130	
							-135	
							-140	

BORING Nº 1 STA: 514+30
DATE MADE: 10-11-1967 LOCATION: ℄

DRIVING RESISTANCE TONS

CLASSIFICATION								TEST PILE Nº
SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	APPROX. ELEVATION	TYPE OF PILE TYPE OF HAMMER ENERGY PER BLOW FT LBS DATE OF DRIVING DATE OF LOADING DESIGN LOAD TONS
GR-GR SILTY CLAY	0.08	VERY SOFT	112	32	30			
GR SILTY CLAY		VERY SOFT	103	97	31		-5	
GR SILTY CLAY	0.08	VERY SOFT	99	45	22			
GR SILTY CLAY	0.32	SOFT	52	78	36		-10	
GR SILTY CLAY	0.28	SOFT	46	36	35		-15	
GR SILTY CLAY	0.28	SOFT	101	33	63			
GR SILTY CLAY	0.28	SOFT	96	33	18		-20	
GR SILTY CLAY	0.35	SOFT	91	67	46			
GR SILTY CLAY	0.33	SOFT	40	56	38		-25	
GR SILTY CLAY W WOOD	0.45	SOFT	37	45	37		-30	
GR SILTY CLAY W WOOD	0.90	MED	33	60	30			
GR SILTY CLAY	0.82	MED	37	55	30		-35	
GR SILTY CLAY	0.58	MED	38	54	31			
GR SILTY CLAY	0.45	SOFT	32	39	17		-40	
GR SILTY CLAY	0.33	SOFT	32	30	16		-45	
GR SILTY CLAY	0.08	SOFT	32	30	12			
GR SILTY CLAY	0.76	MED	32	44	20		-50	
GR SILTY CLAY	1.12	STIFF	36	43	24		-55	
GR SILTY CLAY	0.60	MED	30	36	11			
GR SILTY CLAY	0.77	MED	48	62	37		-60	
GR SILTY CLAY W WOOD	0.64	MED	43	50	49			
GR SILTY CLAY	1.25	STIFF	44	83	62		-65	
GR SILTY CLAY W WOOD	0.83	MED	45	82	53			
GR SILTY CLAY W WOOD	0.75	MED	51	37	30		-70	
GR SILTY CLAY W WOOD	0.81	MED	43	50	30		-75	
GR SILTY CLAY W WOOD	0.61	MED	32	30	13		-80	
GR SILTY CLAY W WOOD	0.75	MED	37	51	30		-85	
GR SILTY CLAY	0.68	MED	30	46	37		-90	
GR SILTY CLAY W WOOD	1.32	STIFF	40	35	37		-95	
GR SILTY CLAY	0.68	MED	44	43	39		-100	
GR FINE SAND TO GRAVEL		VERY LOOSE	22	NP	NP		-105	
GR SILTY CLAY		STIFF	48	39	NP		-110	
GR SILTY CLAY W WOOD	0.37	SOFT	39	44	NP		-115	
GR-GR MED SAND		MED	32	NP	NP		-120	
							-125	
							-130	

BORING Nº 2 STA: 514+70
DATE MADE: FEB. 8, 1967 LOCATION: ℄

DRIVING RESISTANCE TONS

CLASSIFICATION								TEST PILE Nº
SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	APPROX. ELEVATION	TYPE OF PILE TYPE OF HAMMER ENERGY PER BLOW FT LBS DATE OF DRIVING DATE OF LOADING DESIGN LOAD TONS
GR CLAY, ORG. 15%	0.09	VERY SOFT	160	30	17			
GR SILTY CLAY W WOOD ORG. 8%	0.11	VERY SOFT	109	45	26		-4	
GR SILTY CLAY W WOOD ORG. 6%	0.25	SOFT	65	57	36			
GR SILTY CLAY ORG. 12%	0.22	VERY SOFT	83	88	54		-10	
GR SILTY CLAY ORG. 3%	0.30	SOFT	96	39	30		-15	
GR SILTY CLAY W WOOD	0.30	SOFT	66	40	66		-20	
GR SILTY CLAY ORG. 3%	0.28	SOFT	38	30	34		-25	
GR SILTY CLAY	0.58	MED	38	60	42			
GR SILTY CLAY	0.80	MED	35	61	40		-30	
GR SILTY CLAY	0.21	VERY SOFT	24	33	13		-35	
GR SILTY CLAY W WOOD ORG. 4%	0.42	SOFT	32	36	15			
GR SILTY CLAY	0.28	SOFT	30	30	8		-40	
GR SILTY CLAY SANDY SILTY CLAY ORG.	0.68	MED	36	49	26		-45	
GR SILTY CLAY	0.52	MED	37	44	20			
GR SILTY CLAY	0.68	MED	42	36	16		-50	
GR SILTY CLAY	1.01	STIFF	27	41	24			
GR SILTY CLAY,	0.61	MED	34	33	6		-55	
GR SILTY CLAY ORG. 3%	1.30	STIFF	48	66	48		-60	
GR SILTY CLAY ORG. 3%	0.81	MED	55	65	40			
GR SILTY CLAY W WOOD ORG. 1%	1.13	STIFF	40	83	47		-65	
GR SILTY CLAY W WOOD ORG. 1%	0.68	MED	41	38	40			
GR SILTY CLAY W WOOD ORG. 1%	0.87	MED	32	40	24		-70	
GR SILTY CLAY SANDY CLAY ORG.	0.87	MED	31	42	30		-75	
GR SILTY CLAY ORG. 3%	0.87	MED	32	46	32			
GR SILTY CLAY SANDY SILT ORG. 3%	0.94	MED	38	71	40		-80	
GR SILTY CLAY W WOOD ORG. 1%	0.67	MED	38	46	27		-85	
GR SILTY CLAY ORG.	0.80	MED	32	38	6			
GR SILTY CLAY W WOOD	1.61	STIFF	42	38	20		-90	
GR SILTY CLAY	0.94	MED	51	45	40		-95	
GR SILTY CLAY ORG. 10%	1.27	STIFF	36	73	40			
GR SILTY CLAY ORG. 3%	1.52	STIFF	40	73	30			
GR SILTY CLAY	1.08	STIFF	48	81	50		-105	
GR MED SAND		MED	30	NP	NP		-110	
GR SILTY SAND		MED	30	NP	NP			
GR SILTY SAND	0.42	STIFF	46	36	18		-115	
	0.32	SOFT	33	31	12			
GR FINE SAND		MED	18	NP	NP			
GR FINE SAND		VERY LOOSE	24		MED NP		-125	
GR FINE SAND		VERY DENSE	33	NP	NP		-130	
							-135	

BORING Nº 3 STA: 515+05
DATE MADE: FEB. 24, 1967 LOCATION: ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS
TIME HOURS
SETTLEMENT INCHES

HALF SCALE PLANS

NOTES:

ROUTE	STATE PROJECT	PA
LA.315	248-03-41	TERR

ABBREVIATIONS:

- N P = NON-PLASTIC
- BL = BLUE
- BK = BLACK
- BR = BROWN
- GR = GRAY
- WH = WHITE
- YE = YELLOW
- DK = DARK
- LT = LIGHT
- MED. = MEDIUM
- PENET = PENETRATION
- 1/2 = UNABLE TO TEST BECAUSE OF BLOCKERHEAD

MOISTURE CONTENT = MOISTURE CONTENT OF THE MATERIAL IN ITS NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL

(S) = LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION = UNABLE TO DRIVE SPLIT SPOON SAMPLER INITIAL 6 INCHES.

N = 18 = NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN REQUIRED TO DRIVE 2 IN O.D SPLIT SPOON SAMPLER 1 FT AFTER FIRST 6 INCHES HAVE BEEN DRIVEN 6 IN UNLESS AMOUNT OF PENETRATION SHOWN OTHERWISE

NO CULL = NO PRELIMINARY 6" DRIVING PRIOR TO SECURING DRIVE DATA.

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		Nº OF BLOWS "N"	"q_u" UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ.FT
SAND & SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4-10	
		MEDIUM	10-30	
		DENSE	30-50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2-4	0.25-0.50
		MEDIUM	4-8	0.50-1.00
		STIFF	8-15	1-2
		VERY STIFF	15-30	2-4
		HARD	OVER 30	OVER 4

PILE DATA

LOCATION (BENT)	STATION	PLAN TIP ELEV	CUT-OFF ELEV.	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV.	AS BUIL MAX ELEV

FIGURE 14
CORE BORINGS AND TEST PILES.

BORINGS - I
BAYOU DULARGE BR

STATE OF LOUISIANA
DEPARTMENT OF HIGH

DATE	DESCRIPTION	BY
	REVISIONS	

SURVEYED [illegible] DETAILED —
CHECKED [illegible] CHECKED —
MATERIALS & TESTING SECTION - BRIDG

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
[illegible]		[illegible]	2.88	18	27	[illegible]	
[illegible]	0.15	[illegible]	31.0	65	34	[illegible]	-5
[illegible]	0.30	[illegible]	36	33	16	[illegible]	
[illegible]	0.15	[illegible]	68	30	39	[illegible]	-10
[illegible]		[illegible]	66	63	47	[illegible]	
[illegible]	0.22	[illegible]	107	90	62	[illegible]	-15
[illegible]	0.21	[illegible]	105	33	58	[illegible]	-20
[illegible]	0.21	[illegible]	72	36	43	[illegible]	-25
[illegible]	0.40	SOFT	86	96	51	[illegible]	-30
[illegible]	0.30	SOFT	30	64	13	[illegible]	-35
[illegible]	0.07	MED	40	72	51	[illegible]	
[illegible]	0.40	MED	38	98	49	[illegible]	-40
[illegible]	0.40	SOFT	33	40	30	[illegible]	-45
[illegible]	0.45	SOFT	41	57	36	[illegible]	
[illegible]	0.46	SOFT	35	43	25	[illegible]	-50
[illegible]	0.35	SOFT	30	34	13	[illegible]	
[illegible]	0.50	SOFT	31	39	7	[illegible]	-55
[illegible]	[illegible]	SOFT	31	31	10	[illegible]	
[illegible]	0.55	MED	35	43	20	[illegible]	-60
[illegible]	0.67	MED	37	40	16	[illegible]	-65
[illegible]	[illegible]	MED	50	50	53	[illegible]	-70
[illegible]	1.00	MED	50	37	40	[illegible]	-75
[illegible]	1.12	STIFF	48	68	40	[illegible]	-80
[illegible]	0.80	MED	39	54	26	[illegible]	-85
[illegible]	0.30	MED	41	46	43	[illegible]	-90
[illegible]	0.50	MED	34	35	15	[illegible]	-95
[illegible]	[illegible]	STIFF	48	75	34	[illegible]	-100
[illegible]	[illegible]	STIFF	48	81	35	[illegible]	-105
[illegible]	[illegible]	STIFF	46	75	44	[illegible]	-110
[illegible]	[illegible]	STIFF	34	78	44	[illegible]	-115
[illegible]							-120

TEST PILE Nº

TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW — FT LBS
RATE OF DRIVING
DATE OF LOADING
DESIGN LOAD — TONS

STA. — DRIVING RESISTANCE TONS

BORING Nº 4 — DATE MADE [illegible] — STA. [illegible] LOCATION: [illegible]

TEST LOAD TONS — TIME HOURS — SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION

TEST PILE Nº

TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW — FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD — TONS

STA. — DRIVING RESISTANCE TONS

BORING Nº — DATE MADE: — STA. — LOCATION:

TEST LOAD TONS — TIME HOURS — SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION

TEST PILE Nº

TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW — FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD — TONS

STA. — DRIVING RESISTANCE TONS

BORING Nº — DATE MADE: — STA. — LOCATION.

TEST LOAD TONS — TIME HOURS — SETTLEMENT INCHES

HALF SCALE PLANS

NOTES:

ROUTE	STATE PROJECT	PARISH
LA. 315	245-03-41	TERREBONNE

ABBREVIATIONS:

- N P = NON-PLASTIC
- BL = BLUE
- BK = BLACK
- BR = BROWN
- GR = GRAY
- WH = WHITE
- YE = YELLOW
- DK = DARK
- LT = LIGHT
- MED = MEDIUM
- PENET = PENETRATION
- U/S = UNABLE TO TEST BECAUSE OF SLICKENSIDES

MOISTURE CONTENT = MOISTURE CONTENT OF THE MATERIAL IN ITS NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL.

(3) = LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION = UNABLE TO DRIVE SPLIT SPOON SAMPLER INITIAL 6 INCHES.

N = 18 = NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN. REQUIRED TO DRIVE 2 IN O.D. SPLIT SPOON SAMPLER 1 FT AFTER FIRST 6 INCHES HAVE BEEN DRIVEN 6 IN UNLESS AMOUNT OF PENETRATION SHOWN OTHERWISE

NO CULL = NO PRELIMINARY 6" DRIVING PRIOR TO SECURING DRIVE DATA.

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		Nº OF BLOWS "N"	"q_u" UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ FT
SAND & SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4-10	
		MEDIUM	10-30	
		DENSE	30-50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2-4	0.25-0.50
		MEDIUM	4-8	0.50-1.00
		STIFF	8-15	1-2
		VERY STIFF	15-30	2-4
		HARD	OVER 30	OVER 4

PILE DATA

LOCATION (BENT)	STATION	PLAN TIP ELEV.	CUT-OFF ELEV.	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV.	AS BUILT TIP MAX ELEV	AS BUILT TIP MIN ELEV

FIGURE 15
CORE BORINGS AND TEST PILES

42

BORINGS-2
BAYOU DULARGE BRIDGE

DATED AUGUST 11 - 1967

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

SURVEYED D A C — DETAILED — — TRACED
CHECKED [illegible] — CHECKED — CHECKED

MATERIALS & TESTING — SECTION — BRIDGE DESIGN

DATE	DESCRIPTION	BY

REVISIONS

ROUTE	STATE PROJECT	P.
LA. 315	245-03-41	TERR

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
OR SILTY CLAY	0.93	MED	29	30	9	(33)	-5
OR SILTY CLAY & SANDY LOAM		LOOSE	26	N	P	(32)	
OR & OR SILTY CLAY	0.56	MED	38	67	42	(31)	0
OR SILTY CLAY - 25 SANDY LOAM	0.65	SOFT	38	45	26	(30)	-5
OR SILTY CLAY - ORGANIC 7%	0.65	SOFT	52	67	44	(29)	-10
OR SILTY CLAY	1.02	STIFF	31	56	34	(28)	-15
OR SILTY CLAY	0.78	MED	38	53	26	(27)	
OR SILTY CLAY	0.65	SOFT	30	53	8	(26)	-20
OR SILTY CLAY - SANDY CLAY	0.51	MED	33	48	30	(25)	
OR SILTY CLAY	0.80	MED	33	52	34	(24)	-25
							-30
OR SILTY CLAY	0.27	SOFT	32	33	13	(23)	-35
OR SILTY CLAY	0.63	MED	30	38	13	(22)	-40
OR SILTY CLAY	0.63	MED	23	33	12	(21)	-45
OR. SILTY CLAY	0.66	MED	23	23	0	(20)	-50
							-55
							-60
							-65

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD TONS

STA.

BORING Nº STA: 32+00
DATE MADE: JAN 16, 1963 LOCATION: ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
OR SILTY CLAY	1.02	STIFF	27	42	24	(40)	-5
OR SILTY CLAY	0.56	MED	33	48	28	(39)	
OR SILTY CLAY MIXED WITH SILTY SAND	0.39	SOFT	32	36	16	(38)	0
OR SILTY CLAY - ORGANIC 9%	0.06 %	SOFT	63	86	59	(37)	-5
CLAY - ORGANIC 22%	0.80	MED	123	(PLASTIC)		(36)	-10
OR SILTY CLAY	0.69	MED	36	67	46	(35)	-15
OR SILTY CLAY	1.03	STIFF	29	46	31	(34)	-20
OR SILTY CLAY	0.58	MED	36	58	37	(33)	-25
OR SILTY CLAY	0.52	MED	32	36	18	(32)	
OR SILTY CLAY	0.79	MED	33	50	32	(31)	-30
OR SILTY CLAY	0.56	MED	33	36	16	(30)	-35
OR SILTY CLAY - TR CONCRETIONS -	0.63	MED	30	37	17	(29)	
OR SILTY CLAY	0.52	MED	32	38	18	(28)	-40
OR SILTY CLAY ORGANIC 6%	0.69	MED	34	44	23	(27)	-45
OR SILTY CLAY ORGANIC 8%	0.50	SOFT	34	36	17	(26)	
OR SILTY CLAY ORGANIC 5%	0.70	MED	34	45	25	(25)	-50
OR SILTY CLAY - TR SANDY SHELL & BITTER WOOD - ORGANIC 2%	0.72	MED	33	37	18	(24)	
OR SILTY CLAY - TR BITTER WOOD - ORGANIC 2%	0.62	MED	23	35	15	(23)	-55
OR SILTY CLAY - TR CONCRETIONS -	0.89	MED	30	33	11	(22)	
OR SILTY CLAY	0.69	MED	31	28	6	(21)	-60
OR SILTY CLAY	0.80	MED	32	32	9	(20)	-65
							-70

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD TONS

STA.

BORING Nº STA: 36+00
DATE MADE: JAN 16, 1963 LOCATION: ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
OR & OR SILTY CLAY	1.08	STIFF	29	53	35	(19)	
OR SILTY CLAY ORGANIC 8%	0.45	SOFT	54	81	54	(18)	-5
OR SILTY CLAY ORGANIC 13%	0.27	SOFT	98	85	56	(17)	
OR SILTY CLAY ORGANIC 30%	0.38	SOFT	125	(PLASTIC)		(16)	-10
OR SILTY CLAY ORGANIC 6%	0.23	SOFT	41	53	21	(15)	
OR. SILTY CLAY	1.02	STIFF	32	53	41	(14)	-15
OR & OR SILTY CLAY	0.31	MED	31	60	41	(13)	
OR SILTY CLAY	0.30	SOFT	38	43	27	(12)	-20
OR SILTY CLAY	0.66	MED	36	62	40	(11)	-25
OR SILTY CLAY - STREAK CLAY.	0.69	MED	35	50	32	(10)	-30
OR SILTY CLAY.	0.65	SOFT	32	37	20	(9)	-35
OR SILTY CLAY	0.63	MED	34	45	26	(8)	-40
OR SILTY CLAY	0.58	MED	33	35	14	(7)	-45
OR SILTY CLAY TR BITTER WOOD - ORGANIC 2%	0.94	MED	23	31	9	(6)	-50
OR SILTY CLAY TR BITTER WOOD ORGANIC 2%	1.26	STIFF	30	48	20	(5)	
OR SILTY CLAY	0.81	MED	33	44	25	(4)	-55
OR SILTY CLAY	0.83	MED.	30	28	6	(3)	-60
OR SILTY CLAY	0.75	MED	36	42	21	(2)	-65
OR SILTY CLAY - ORGANIC 9%	1.18	STIFF	33	55	32	(1)	-70
							-75

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD TONS

STA.

BORING Nº STA: 40+00
DATE MADE: JAN 15, 1963 LOCATION ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

NOTES:

ABBREVIATIONS:

- N P = NON-PLASTIC
- CL = CLAY
- BK = BLACK
- BR = BROWN
- GR = GRAY
- WH = WHITE
- YE = YELLOW
- DK = DARK
- LT = LIGHT
- MED = MEDIUM
- PENET = PENETRATION
- U/D = UNABLE TO TEST BECAUSE OF SLICKENSIDES

MOISTURE CONTENT = MOISTURE CONTENT OF THE MATERIAL IN ITS NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL.

(3) = LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION = UNABLE TO DRIVE SPLIT SPOON SAMPLER INITIAL 6 INCHES.

N = 16 = NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN REQUIRED TO DRIVE 2 IN O.D. SPLIT SPOON SAMPLER 6 IN AFTER FIRST HAVING BEEN DRIVEN 6 IN UNLESS AMOUNT OF PENETRATION SHOWN OTHERWISE

NO CULL = NO PRELIMINARY 6" DRIVING PRIOR TO SECURING DRIVE DATA.

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		Nº OF BLOWS "N"	"q_u" UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ.
SAND & SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4-10	
		MEDIUM	10-30	
		DENSE	30-50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2-4	0.25-0.50
		MEDIUM	4-8	0.50-1.00
		STIFF	8-15	1-2
		VERY STIFF	15-30	2-4
		HARD	OVER 30	OVER 4

PILE DATA

LOCATION (BENT)	STATION	PLAN TIP ELEV	CUT-OFF ELEV.	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV.	AS BUI MAX ELEV

FIGURE 16
CORE BORINGS AND TEST PILES.

43

BORINGS-3
BAYOU DULARGE BR

DATED JAN. 23 1963

STATE OF LOUISIANA
DEPARTMENT OF HIGH

SURVEYED C.D. DRAWN
CHECKED J.N.J. CHECKED

MATERIALS & TESTING SECTION - BRI

DATE	DESCRIPTION	BY
	REVISIONS	

HALF SCALE PLANS

CLASSIFICATION — TEST PILE Nº

TYPE OF PILE / TYPE OF HAMMER / ENERGY PER BLOW ___ FT LBS / DATE OF DRIVING / DATE OF LOADING / DESIGN LOAD ___ TONS

BORING Nº — STA. 44+00 — DATE MADE JAN 15 1963 — LOCATION: ℄

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
GR & GR SILTY CLAY ORGANIC 8%	0.82	MED	42	85	60	[illegible]	0
GR SILTY CLAY ORGANIC 19%	0.31	SOFT	122	87	45	[illegible]	-5
CLAY ORGANIC 26%	0.33	SOFT	178	(PLASTIC)		[illegible]	
GR SILTY CLAY	0.16	VERY SOFT	33	38	22	[illegible]	-10
GR SILTY CLAY	0.38	MED	32	61	48	[illegible]	
GR SILTY CLAY	0.56	MED	37	56	37	[illegible]	-15
GR SILTY CLAY - LENSES SILTY LOAM	0.16	VERY SOFT	31	23	9	[illegible]	-20
GR SILTY CLAY TR ROTTEN WOOD ORGANIC 5%	0.50	SOFT	36	57	37	[illegible]	-25
GR SILTY CLAY - TR CONCRETIONS -	0.32	SOFT	41	56	32	[illegible]	
GR SILTY CLAY - ORGANIC 6%	0.41	SOFT	43	55	35	[illegible]	-30
GR SILTY CLAY	0.32	SOFT	32	33	13	[illegible]	-35 / -40
GR SILTY CLAY	0.56	MED	32	41	22	[illegible]	-45 / -50
GR SILTY CLAY ... 5%	0.32	SOFT	31	30	6	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-55
GR SILTY CLAY	0.59	MED	32	33	8	[illegible]	-60
GR SILTY CLAY	0.59	MED	36	37	14	[illegible]	-65
GR SILTY CLAY	0.68	MED	34	37	13	[illegible]	
GR SILTY CLAY ORGANIC 8%	0.70	MED	42	94	52	[illegible]	-70
GR SILTY CLAY TR CONCRETIONS & ROTTEN WOOD ORGANIC 8%	1.08	STIFF	40	72	48	[illegible]	-75 / -80
GR SILTY CLAY TR CONCRETIONS & ROTTEN WOOD - ORGANIC 8%	0.85	MED	34	57	34	[illegible]	-85
GR. SILTY CLAY	0.32	MED	33	47	26	[illegible]	-90 / -95
GR SILTY CLAY ORGANIC 10%	1.07 S/S	STIFF	50	89	63	[illegible]	-100
GR SILTY CLAY CONCRETIONS	1.16	STIFF	32	69	43	[illegible]	-105
GR SILTY CLAY - LENSES GR SILTY LOAM & FINE SAND	0.56	MED	23	31	11	[illegible]	-110
GR SILTY CLAY - LENSES GR FINE SAND	0.33	SOFT	26	25	5	[illegible]	-115
GR SILTY CLAY - LAMINATIONS SILT	0.82 S/S	MED	47	77	43	[illegible]	-120
GR. COARSE SAND		NONE	16	N.	P	[illegible]	-125
							-130

DRIVING RESISTANCE TONS — TEST LOAD TONS — TIME HOURS — SETTLEMENT INCHES

CLASSIFICATION — TEST PILE Nº

TYPE OF PILE / TYPE OF HAMMER / ENERGY PER BLOW ___ FT LBS / DATE OF DRIVING / DATE OF LOADING / DESIGN LOAD ___ TONS

BORING Nº — STA. 46+00 — DATE MADE JAN 14 1963 — LOCATION. ℄

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
GR & GR SILTY CLAY	0.51	MED	50	92	58	C-3	0
GR & GR SILTY CLAY - ORGANIC 13%	0.22 S/S	SOFT	95	130	68	C-4	
GR SILTY CLAY - ORGANIC 21%	0.20	VERY SOFT	265	(PLASTIC)		C-5	-5
CLAY - ORGANIC 32%	0.23	VERY SOFT	214	(PLASTIC)		C-6	
GR SILTY CLAY	0.65	MED	40	69	30	C-7	-10
GR SILTY CLAY	0.80	MED	38	79	53	C-8	-15
GR SILTY CLAY	0.20	VERY SOFT	33	33	13	C-10	-20
GR SILTY CLAY - TR ROTTEN WOOD & SHELL - ORGANIC 7%	0.23	VERY SOFT	49	51	32	C-11	-25
GR SILTY CLAY TR ROTTEN WOOD & SHELL ORGANIC 7%	0.33	SOFT	43	65	41	C-12	
GR SILTY CLAY	0.57	MED	44	70	49	C-13	-30
GR SILTY CLAY - ORGANIC 5%	0.38	SOFT	40	53	36	C-14	
GR SILTY CLAY - ORGANIC 4%	0.53	MED	32	26	6	C-15	-35
GR SILTY CLAY -	0.43	SOFT	31	36	15	C-16	
GR SILTY CLAY -	0.65	MED	34	46	29	C-17	-40
GR SILTY CLAY -	0.90	MED	37	54	31	C-18	-45
GR SILTY CLAY -	0.53	MED	32	39	19	C-19	
GR. SILTY CLAY -	0.38	SOFT	31	31	11	C-20	-50
GR SILTY CLAY - ORGANIC 5%	0.41	SOFT	32	34	12	C-21	
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 3%	0.32	SOFT	31	30	9	C-22	-55
GR SILTY CLAY	0.35	SOFT	35	33	8	C-24	-60 / -65
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 7%	0.45	SOFT	39	39	16	C-26	
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 8%	0.51	MED	51	80	55	C-27	-70
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 8%	0.61	MED	51	88	65	C-28	-75
GR SILTY CLAY	0.32	MED	38	83	57	C-29	
GR SILTY CLAY CONCRETIONS - ORGANIC 7%	1.00	MED	38	76	53	C-30	-80
GR SILTY CLAY	0.65	MED	23	36	17	C-31	-85
GR SILTY CLAY	0.44	SOFT	33	44	26	C-32	-90
GR SILTY CLAY - LENSES SILTY LOAM -	0.39	SOFT	31	28	4	C-33	-95
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 10%	0.51 S/S	MED	54	91	61	C-34	-100
GR SILTY CLAY -	1.20	STIFF	32	61	40	C-35	-105
GR SANDY LOAM & GR SILTY CLAY	0.33	SOFT	27	23	3	C-36	-110
GR SILTY CLAY - LENSES SILTY LOAM - TR ROTTEN WOOD - ORGANIC 8%	0.67	MED	40	43	31	C-37	-115
GR. SILTY CLAY - LENSES SILTY LOAM	0.68	MED	34	44	24	C-38	-120
GR SILTY CLAY - LAMINATIONS SILT -	1.42	STIFF	39	61	35	C-39	-125
GR SILTY CLAY & SILTY SANDY CLAY LOAM - TR ROTTEN WOOD - ORGANIC 2%	0.70	MED	37	41	21	C-40	-130
GR FINE SILTY SAND		NONE	24	N	NP	[illegible]	NOTE SCALE CHANGE
							-140

DRIVING RESISTANCE TONS — TEST LOAD TONS — TIME HOURS — SETTLEMENT INCHES

CLASSIFICATION — TEST PILE Nº

TYPE OF PILE / TYPE OF HAMMER / ENERGY PER BLOW ___ FT LBS / DATE OF DRIVING / DATE OF LOADING / DESIGN LOAD ___ TONS

BORING Nº — STA. 48+00 — DATE MADE JAN 16 1963 — LOCATION. 6' LT ℄

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
GR & GR SILTY CLAY	0.72	MED	43	88	58	C-56	0
GR & GR SILTY CLAY - ORGANIC 16%	0.47 S/S	SOFT	82	92	56	C-57	
GR SILTY CLAY - ORGANIC 7%	0.12	VERY SOFT	127	56	34	C-58	-5
GR SILTY CLAY - ORGANIC 10%	0.12	VERY SOFT	69	90	36	C-59	
GR SILTY CLAY - TR WOOD - ORGANIC 7%	0.48	SOFT	44	70	49	C-60	-10
GR SILTY CLAY	0.65 S/S	MED	48	94	71	C-61	-15
GR SILTY CLAY	0.21	VERY SOFT	32	29	9	C-62	-20
GR SILTY CLAY - ORGANIC 10%	0.23	VERY SOFT	72	89	62	C-64	-25
GR SILTY CLAY - ORGANIC 6%	0.32 S/S	SOFT	51	84	62	C-65	
GR SILTY CLAY - ORGANIC 6%	0.42	SOFT	57	87	62	C-66	-30
GR SILTY CLAY - ORGANIC 5%	0.60	MED	35	54	30	C-67	
GR SILTY CLAY -	0.51	MED	30	33	12	C-68	-35
GR SILTY CLAY - ORGANIC 4%	0.39	SOFT	30	43	23	C-69	-40
GR SILTY CLAY	0.32	SOFT	34	36	15	C-10	
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 5%	0.38	SOFT	38	35	16	C-11	-45
GR SILTY CLAY	0.32	SOFT	35	34	14	C-12	-50
GR SILTY CLAY - ORGANIC 5%	0.30	SOFT	35	30	21	C-14	
GR SILTY CLAY - TR CONCRETIONS -	0.52	MED	33	44	25	C-15	-55
GR. SILTY CLAY	0.51	MED.	34	36	10	C-17	-60 / -65
GR SILTY CLAY - ORGANIC 8%	0.65 S/S	MED	48	59	38	C-19	
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 7%	0.59 S/S	MED	49	80	57	C-20	-70
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 6%	0.83	MED	43	74	45	C-21	-75
GR SILTY CLAY - TR CONCRETIONS - ORGANIC 7%	1.08	STIFF	35	75	50	C-22	
GR SILTY CLAY - TR ROTTEN WOOD & SHELL - ORGANIC 6%	0.95	MED.	33	50	32	C-23	-80
GR SILTY CLAY	0.14	VERY SOFT	30	29	9	C-24	
GR SILTY CLAY	0.52	MED	29	23	8	C-25	-85
GR CLAYEY SILT TR ROTTEN WOOD. ORGANIC 5%		LOOSE	23	N	P	C-26	-90 / -95
GR SILTY CLAY - TR ROTTEN WOOD. ORGANIC 11%	1.32 S/S	STIFF	52	84	59	C-28	-100
GR SILTY CLAY - LENSES SANDY LOAM -	0.28	SOFT	28	30	14	C-29	-105
GR SANDY LOAM - LENSES GR SILTY CLAY	0.23	VERY SOFT	27	25	7	C-30	-110
GR SILTY CLAY LENSES SILTY SANDY LOAM - ORGANIC 6%	0.73	MED.	35	35	18	C-31	-115
GR SILTY CLAY	1.60 S/S	STIFF	38	42	35	C-32	-120
GR SILTY CLAY - LENSES SILTY SANDY LOAM	1.89	STIFF	35	42	21	C-33	-125
GR SANDY LOAM		MED	19	N	P	C-34	-130
GR. AND [illegible] COARSE SAND		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NOTE SCALE CHANGE
							-140

DRIVING RESISTANCE TONS — TEST LOAD TONS — TIME HOURS — SETTLEMENT INCHES

NOTES:

ROUTE	STATE PROJECT
LA. 315	245-03-41

ABBREVIATIONS:

- N P = NON-PLASTIC
- BL = BLUE
- BK = BLACK
- BR = BROWN
- GR = GRAY
- WH = WHITE
- YE = YELLOW
- DK = DARK
- LT = LIGHT
- MED = MEDIUM
- PENET = PENETRATION
- S/S = UNABLE TO TEST BECAUSE OF SLICKENSIDES

MOISTURE CONTENT = MOISTURE CONTENT OF THE MATERIAL IN ITS NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL

③ = LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION = UNABLE TO DRIVE SPLIT SPOON SAMPLER INITIAL 6 INCHES

N = 10 = NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN. REQUIRED TO DRIVE 2 IN O.D. SPLIT SPOON SAMPLER 1 FT AFTER FIRST HAS BE BEEN DRIVEN 6 IN UNLESS AMOUNT OF PENETRATION SHOWN OTHERWISE

NO CULL = NO PRELIMINARY 6" DRIVING PRIOR TO SECURING DRIVE DATA.

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	Nº OF BLOWS "N"	"q_u" UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ. FT.
SAND & SILT	RELATIVE DENSITY	VERY LOOSE LOOSE MEDIUM DENSE VERY DENSE	LESS THAN 4 4-10 10-30 30-50 OVER 50	
CLAY	CONSISTENCY	VERY SOFT SOFT MEDIUM STIFF VERY STIFF HARD	LESS THAN 2 2-4 4-8 8-15 15-30 OVER 30	LESS THAN [illegible] 0.25-0.50 0.50-1.00 1-2 2-4 OVER 4

PILE DATA

LOCATION (BENT)	STATION	PLAN TIP ELEV	CUT-OFF ELEV.	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV.	AS B[UILT] MAX ELEV

DATE	DESCRIPTION	BY
	REVISIONS	

FIGURE 17
CORE BORINGS AND TEST PILES

BORINGS-4
BAYOU DULARGE [B]

DATED JAN. 29 1963

STATE OF LOUISIA[NA]
DEPARTMENT OF HIG[HWAYS]

SURVEYED C G — [illegible]
CHECKED J N J — [illegible]

MATERIALS & TESTING SECTION - BR[...]

HALF SCALE PLANS

CORE BORINGS

Boring — STA 50+00, Date made Dec 18 1968, Location ℄

Soil type & color	Qu	Consistency	Moisture content	Liquid limit	Plasticity index	Sample number
[illegible] & GR SILTY CLAY	0.51	MED	59	97	70	[illegible]
GR SILTY CLAY - ORGANIC 22%	0.10	VERY SOFT	136	(PLASTIC)		[illegible]
ORGANIC 22%	0.08	VERY SOFT	173	(PLASTIC)		[illegible]
SILTY CLAY - ORGANIC 18%	0.11	VERY SOFT	135	77	65	[illegible]
GR SILTY CLAY	0.63	SOFT	46	71	46	[illegible]
GR SILTY CLAY - ORGANIC 7%	0.26	SOFT	53	79	53	[illegible]
GR SILTY CLAY	0.42	SOFT	32	36	12	[illegible]
GR SILTY CLAY - ORGANIC 10%	0.47	SOFT	103	88	57	[illegible]
GR SILTY CLAY	0.32	SOFT	50	69	48	[illegible]
GR SILTY CLAY - ORGANIC 3%	0.38	SOFT	66	83	55	[illegible]
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 3%	0.26	SOFT	60	67	44	[illegible]
GR SILTY CLAY	0.51	MED	35	42	25	[illegible]
GR SILTY CLAY	0.23	VERY SOFT	35	36	14	[illegible]
GR SILTY CLAY	0.57	MED	36	49	32	[illegible]
GR SILTY CLAY	0.48	SOFT	33	33	12	[illegible]
[illegible] CLAY - TR ROTTEN WOOD - ORGANIC 5%	0.63	MED	35	40	20	[illegible]
GR SILTY CLAY - TR CONCRETIONS	0.63	MED	36	45	24	[illegible]
GR SILTY CLAY - LENSES SANDY LOAM	0.47	SOFT	32	34	18	[illegible]
GR SILTY CLAY	0.42	SOFT	32	35	17	[illegible]
GR SILTY CLAY	0.51	MED	36	40	17	[illegible]
GR SILTY CLAY	0.58	MED	36	33	9	[illegible]
GR SILTY CLAY	0.63	MED	39	42	23	[illegible]
GR SILTY CLAY - ORGANIC 3%	0.62 S/S	MED	52	75	53	[illegible]
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 10%	0.85 S/S	MED	61	76	52	[illegible]
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 3%	0.90	MED	43	82	56	[illegible]
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 6%	0.71	MED	41	55	36	[illegible]
GR SILTY CLAY - LENSES SANDY LOAM	0.40	SOFT	30	27	9	[illegible]
GR SILTY CLAY - LENSES SANDY LOAM	0.21	VERY SOFT	33	32	13	[illegible]
GR SILTY CLAY - LENSES SILTY LOAM - TR WOOD - ORGANIC 6%	0.47	SOFT	46	45	27	[illegible]
GR SILTY CLAY - ORGANIC 10%	1.10 S/S	STIFF	58	83	53	[illegible]
GR SILTY CLAY	1.11	STIFF	34	54	32	[illegible]
GR SILTY CLAY - LENSES SILTY CLAY LOAM	0.75	MED	35	48	30	[illegible]
GR SILTY CLAY - LENSES SANDY LOAM - TR ROTTEN WOOD - ORGANIC 10%	1.35	STIFF	45	53	32	[illegible]
GR SILTY CLAY - LENSES SILTY LOAM - ORGANIC 4%	1.61 S/S	STIFF	43	66	46	[illegible]
GR SILTY CLAY - CONCRETIONS SILTY LOAM	1.68	STIFF	41	58	37	[illegible]
GR SILTY SANDY LOAM		MED	31	N	P	[illegible]
GR MED & FINE SAND		DENSE	33	N	P	[illegible]

Boring — STA 51+34, Date made Dec 11, 1968, Location ℄

Soil type & color	Qu	Consistency	Moisture content	Liquid limit	Plasticity index	Sample number
GR & GR SILTY CLAY	0.44	SOFT	46	84	53	C 275
GR SILTY CLAY - ORGANIC 14%	0.38	SOFT	145	(PLASTIC)		C 276
ORGANIC 22%	0.20	VERY SOFT	165	(PLASTIC)		C 277
CLAY - ORGANIC 22%	0.13	VERY SOFT	150	(PLASTIC)		C 278
GR SILTY CLAY - STREAK CLAY - TR ROTTEN WOOD - ORGANIC 15%	0.15	VERY SOFT	71	33	64	C 279
GR SILTY CLAY - ORGANIC 3%	0.32	SOFT	66	119	83	C 280
GR SILTY CLAY - ORGANIC 4%	0.34	SOFT	31	29	8	C 281
GR SILTY CLAY - ORGANIC 5%	0.20	VERY SOFT	34	32	7	C 282
GR SILTY CLAY - ORGANIC 23%	0.26 S/S	SOFT	116	(PLASTIC)		C 283
GR SILTY CLAY - STREAK CLAY	0.34	SOFT	47	78	54	C 284
GR SILTY CLAY - ORGANIC 7%	0.19	VERY SOFT	60	85	53	C 285
GR SILTY CLAY - STREAK CLAY - ORGANIC 7%	0.32	SOFT	48	69	46	C 286
GR SILTY CLAY - STREAK CLAY	0.32	SOFT	33	38	18	C 287
GR SILTY CLAY	0.41	SOFT	31	29	8	C 288
GR SILTY CLAY	0.80	MED	36	56	34	C 290
GR SILTY CLAY	0.36	SOFT	31	28	6	C 293
GR SILTY CLAY	0.48	SOFT	32	40	20	C 295
GR SILTY CLAY & SILTY CLAY LOAM	0.44	SOFT	34	31	7	C 297
GR SILTY CLAY - ORGANIC 17%	0.57	MED	67	54	31	C 298
GR SILTY CLAY - ORGANIC 8%	0.66 S/S	MED	62	83	55	C 299
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 10%	0.82 S/S	MED	56	87	59	C 300
GR SILTY CLAY - ORGANIC 10%	0.38 S/S	MED	33	70	48	C 301
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 8%	0.65	MED	34	45	27	C 303
GR SILTY CLAY	0.38	SOFT	34	33	22	C 304
GR SILTY CLAY - LENSES SILTY LOAM - ORGANIC 8%	0.33	SOFT	32	31	8	C 305
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 5%	0.38	SOFT	32	40	23	C 306
GR SILTY CLAY - LENSES SILTY LOAM	0.85	MED	37	52	33	C 307
GR SILTY CLAY - ORGANIC 11%	0.76 S/S	MED	56	84	51	C 308
GR SILTY CLAY - ORGANIC 8%	1.13	STIFF	56	54	33	C 309
GR SILTY CLAY TR ROTTEN WOOD & CONCRETIONS - ORG 8%	0.76	MED	41	57	35	C 310
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 10%	0.76 S/S	MED	51	61	34	C 311
GR SILTY CLAY - ORGANIC 7%	0.38 S/S	MED	44	68	45	C 312
GR SILTY CLAY - LENSES SILTY CLAY LOAM	0.68	MED	36	38	20	C 313
GR SILTY SANDY LOAM - LENSES CLAY		MED	30	N	P	C 314
GR SILTY SANDY LOAM		SOFT	27	N	P	C 315
GR FINE & MED SAND		VERY DENSE	[illegible]	[illegible]	[illegible]	C 316

Boring — STA 54+10, Date made Dec 10 1968, Location 15 LT ℄

Soil type & color	Qu	Consistency	Moisture content	Liquid limit	Plasticity index	Sample number
GR SILTY CLAY - TR SHELL	0.36	SOFT	48	83	55	C 233
GR SILTY CLAY - ORGANIC 13%	0.28	SOFT	105	73	33	C 234
GR SILTY CLAY - ALT LAYERS HUMUS - ORGANIC 17%	0.03	VERY SOFT	129	30	62	C 236
LAYER GR SILTY CLAY - HUMUS - ORGANIC 12%	0.08	VERY SOFT	252	(PLASTIC)		C 237
GR SILTY CLAY ROTTEN VEGETATION - ORGANIC 9%	0.08	VERY SOFT	53	54	35	C 238
GR SILTY CLAY	0.44	SOFT	39	54	32	C 239
GR SILTY CLAY ORGANIC 8%	0.20	VERY SOFT	52	67	48	C 240
GR SILT WITH CLAY LOAM	0.41	SOFT	32	29	7	C 241
GR SILTY CLAY - ORGANIC 8%	0.26	SOFT	60	85	63	C 242
GR SILTY CLAY	0.38	SOFT	60	85	58	C 244
GR SILTY CLAY - TR ROOTS - ORGANIC 6%	0.28	SOFT	53	76	50	C 245
GR SILTY CLAY - TR LOAM	0.28	SOFT	34	37	17	C 246
GR SILTY CLAY - TR LOAM	0.38	SOFT	33	41	21	C 247
GR SILTY CLAY	0.52	MED	36	53	32	C 248
GR SILTY CLAY - TR CONCRETIONS	0.60	MED	38	77	56	C 249
GR SILTY CLAY - TR LOAM	0.32	SOFT	36	48	30	C 250
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 5%	0.38	SOFT	36	47	31	C 251
GR SILTY CLAY - ORGANIC 5%	0.44	SOFT	37	43	24	C 252
GR SILTY CLAY	0.38	SOFT	31	32	7	C 253
GR SILTY CLAY - TR WOOD - ORGANIC 5%	0.48	SOFT	32	35	18	C 254
GR SILTY CLAY	0.47	SOFT	36	34	13	C 255
GR SILTY CLAY & SILTY CLAY LOAM		LOOSE	32	N	P	C 256
GR SILTY CLAY	0.81	MED	38	41	19	C 257
GR SILTY CLAY - ORGANIC 3%	0.63	MED	48	63	43	C 258
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 13%	0.73	MED	54	82	50	C 259
GR SILTY CLAY - ORGANIC 9%	0.63	MED	43	73	48	C 261
GR SILTY CLAY - ORGANIC 3%	0.82 S/S	MED	50	86	56	C 262
GR SILTY CLAY - ORGANIC 8%	0.82 S/S	MED	39	63	45	C 263
GR SILTY CLAY - ORGANIC 6%	0.92	MED	37	55	31	C 264
GR SILTY CLAY - ORGANIC 7%	0.83	MED	33	44	18	C 265
GR SILTY CLAY ORGANIC 10%	1.04 S/S	STIFF	63	82	52	C 266
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 9%	0.57	MED	43	61	34	C 267
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 8%	0.88 S/S	MED	46	63	42	C 268
GR SILTY CLAY & LENSES SILTY LOAM - ORGANIC 3%	1.19	STIFF	43	66	23	C 269
GR SILTY CLAY ORGANIC 9%	1.08 S/S	STIFF	47	73	42	C 270
GR SILTY CLAY	0.16	VERY SOFT	34	30	12	C 271
GR SILT & FINE SAND STRATA GR SILTY CLAY - TR GRAVEL		VERY STIFF	34	35	[illegible]	C 272
GR FINE & MED SAND		DENSE	[illegible]	[illegible]	[illegible]	[illegible]
GR MED & FINE SAND		DENSE	22	N	P	[illegible]

TEST PILE Nº — TYPE OF PILE / TYPE OF HAMMER / ENERGY PER BLOW FT LBS / DATE OF DRIVING / DATE OF LOADING / DESIGN LOAD TONS

DRIVING RESISTANCE TONS

TEST LOAD TONS — TIME HOURS — SETTLEMENT INCHES

NOTES

ROUTE	STATE PROJECT
LA.315	245-03-41

ABBREVIATIONS

- N P : NON-PLASTIC
- BL : BLUE
- BK : BLACK
- BR : BROWN
- GR : GRAY
- WH : WHITE
- YE : YELLOW
- DK : DARK
- LT : LIGHT
- MED : MEDIUM
- PENET : PENETRATION
- S/S : UNABLE TO TEST BECAUSE OF SLICKENSIDES

MOISTURE CONTENT = MOISTURE CONTENT OF THE MATERIAL IN ITS NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL

(3) = LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION = UNABLE TO DRIVE SPLIT SPOON SAMP[LER] INITIAL 6 INCHES

N = 18 = NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN REQUIRED TO DRIVE 2 IN O.D. SPLIT SPOON SAM[PLER] 1 FT AFTER FIRST HAVING BEEN DRIVE[N] 6 IN UNLESS AMOUNT OF PENETRATION SHOWN OTHERWISE

NO CULL = NO PRELIMINARY, 6" DRIVING PRIOR TO SECURING DRIVE DATA

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	Nº OF BLOWS "N"	*Qu UNCONF[INED] COMPRES[SIVE] STREN[GTH] TONS PE[R]
SAND & SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4-10	
		MEDIUM	10-30	
		DENSE	30-50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS TH[AN]
		SOFT	2-4	0.25-[illegible]
		MEDIUM	4-8	0.50-[illegible]
		STIFF	8-15	1-[illegible]
		VERY STIFF	15-30	2-[illegible]
		HARD	OVER 30	OVE[R]

PILE DATA

LOCATION (BENT)	STATION	PLAN TIP ELEV.	CUT-OFF ELEV	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV	AS[illegible]

FIGURE 18

CORE BORINGS AND TEST PILES

BORINGS - [illegible]

BAYOU DULARGE [illegible]

DATED JAN. 28 1969

STATE OF LOUIS[IANA]

DEPARTMENT OF H[IGHWAYS]

MATERIALS & TESTING SECTION

HALF SCALE PLANS

CLASSIFICATION

SOIL TYPE & COLOR	Qu	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER
GR SILTY CLAY - ORGANIC 6%	1.01	STIFF	36	54	35	[illegible]
GR SILTY CLAY - [illegible] ORGANIC 13%	0.60 S/S	MED	38	66	41	[illegible]
GR SILTY CLAY - ORGANIC 12%	0.50	SOFT	64	66	36	[illegible]
GR SILTY CLAY - TR. ROTTEN ROOTS - ORGANIC 11%	0.26 S/S	SOFT	78	95	65	[illegible]
[illegible] SILTY CLAY - ORGANIC 21%	0.26	SOFT	254	(PLASTIC)		[illegible]
[illegible] SILTY CLAY - [illegible] ORGANIC 21%	0.21	VERY SOFT	139	(PLASTIC)		[illegible]
GR SILTY CLAY - LENSES SILT -	0.34	SOFT	34	39	24	[illegible]
GR SILTY CLAY & ROTTEN VEGETATION - ORGANIC 13%	0.32	SOFT	76	88	57	[illegible]
GR SILTY CLAY - LENSES SILT -	0.23	VERY SOFT	41	43	26	[illegible]
GR SILTY CLAY - [illegible] ORGANIC 13%	0.41	SOFT	113	84	62	[illegible]
GR SILTY CLAY	0.41	SOFT	51	84	66	[illegible]
GR SILTY CLAY ORGANIC 3%	0.46	SOFT	68	32	63	[illegible]
GR SILTY CLAY - LENSES SILT -	0.37	SOFT	38	43	27	[illegible]
GR. SILTY CLAY -	0.50	SOFT	37	55	36	[illegible]
GR SILT WITH CLAY LOAM	0.21	VERY SOFT	30	29	7	[illegible]
GR SILTY CLAY - [illegible]	0.65	MED	36	46	27	[illegible]
GR SILTY CLAY LOAM	0.50	SOFT	29	23	3	[illegible]
GR SILTY CLAY - TR LOAM		SOFT	34	31	9	[illegible]
GR SANDY SILT WITH CLAY LOAM	0.24	VERY SOFT	32	32	9	[illegible]
SILTY CLAY LOAM	0.32	SOFT	34	38	19	[illegible]
GR SILTY CLAY LOAM - TR ROTTEN WOOD - ORGANIC 5%	0.17	VERY SOFT	34	34	12	[illegible]
[illegible] CLAY LOAM (ROTTED WOOD)		SOFT		(NO CORE)		
GR SILTY CLAY - ROTTEN WOOD - TR. CONCRETIONS ORGANIC 11%	0.66 S/S	MED	41	87	53	[illegible]
GR SILTY CLAY - ORGANIC 10%	1.21 S/S	STIFF	54	84	53	[illegible]
GR SILTY CLAY - ORGANIC 8%	0.69 S/S	MED	43	86	59	[illegible]
GR SILTY CLAY WITH LOAM	0.77	MED	33	46	28	[illegible]
GR SANDY SILT WITH CLAY LOAM	0.21	VERY SOFT	32	23	8	[illegible]
GR SILT WITH CLAY LOAM	0.32	SOFT	33	30	10	[illegible]
GR SILTY CLAY WITH LOAM	0.80	MED	38	56	36	[illegible]
GR SILTY CLAY	0.90 S/S	MED	48	86	58	[illegible]
GR SILTY CLAY - TR WOOD - ORGANIC 9%	1.16 S/S	STIFF	41	70	38	[illegible]
GR SILTY CLAY - ORGANIC 10%	1.15 S/S	STIFF	48	76	45	[illegible]
GR SILTY CLAY -	1.02 S/S	STIFF	69	93	47	[illegible]
GR SILTY CLAY - TR CONCRETIONS ORGANIC 10%	0.93 S/S	MED	47	80	56	[illegible]
GR SILTY CLAY - [illegible] SILTY CLAY LOAM	1.13	STIFF	41	56	36	[illegible]
GR SANDY SILT WITH LOAM -		MED	30	N	P	[illegible]
GR SILTY CLAY - [illegible] SANDY SILT	1.30	STIFF	66	79	55	[illegible]

ELEVATION: 10, 5, 0, -5, -10, -15, -20, -25, -30, -35, -40, -45, -50, -55, -60, -65, -70, -75, -80, -85, -90, -95, -100, -105, -110 (NOTE SCALE CHANGE), -120, -130, -140

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW ___ FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD ___ TONS

BORING Nº
DATE MADE [illegible] 9, 1968 STA 56+00 LOCATION ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	Qu	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER
GR & BR SILTY CLAY }		[illegible]		(NO CORE)		
GR SILTY CLAY - ORGANIC 20%	0.09	VERY SOFT	101	(PLASTIC)		C 51
CLAY - ORGANIC 29%	0.05	VERY SOFT	252	(PLASTIC)		C 53
GR SILTY CLAY - ORGANIC 17%	0.03	VERY SOFT	96	59	37	C 55
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 7%	0.26	SOFT	47	72	51	C 56
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 21%	0.19	VERY SOFT	117	(PLASTIC)		C 57
GR SILTY CLAY - ORGANIC 14%	0.14	VERY SOFT	101	104	71	C 60
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 5%	0.14	VERY SOFT	47	44	27	C 61
GR SILTY CLAY	0.21	VERY SOFT	37	40	22	[illegible]
GR SILTY CLAY - ORGANIC 5%	0.36	SOFT	39	58	40	[illegible]
GR SILTY CLAY - STREAK CLAY -	0.63	MED	50	63	42	[illegible]
GR SILTY CLAY -	0.21	VERY SOFT	33	32	10	[illegible]
GR SILTY CLAY -	0.32	SOFT	39	54	33	[illegible]
GR SILTY CLAY -	0.36	SOFT	30	29	10	[illegible]
GR. SILTY CLAY -	0.45	SOFT	35	45	27	C 70
GR SILTY CLAY -	0.96	MED	30	38	17	C 72
GR SILTY CLAY -	0.48	SOFT	35	33	10	C 73
GR SILTY CLAY -	0.45	SOFT	49	67	42	C 75
GR SILTY CLAY - ORGANIC 10%	0.87	MED	48	72	47	C 76
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 12%	0.58 S/S	MED	63	87	43	C 77
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 11%	0.62	MED	55	97	66	C 78
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 4%	0.25	SOFT	35	34	14	C 79
GR SILTY CLAY	0.29	SOFT	33	35	16	C 80
GR. SILTY CLAY - TR SHELLS -	1.02	STIFF	35	60	39	C 81
GR SILTY CLAY	0.82	MED	33	81	57	C 82
GR SILTY CLAY	0.36	SOFT	33	32	11	C 83
GR SILTY CLAY - ORGANIC 10%	1.46 S/S	STIFF	66	78	42	C 84
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 10%	0.86 S/S	MED	43	73	43	C 85
GR SILTY CLAY ORGANIC 9%	1.08 S/S	STIFF	53	75	48	C 86
GR SILTY CLAY - ORGANIC 9%	0.86 S/S	MED	52	75	51	C 87
GR SILTY CLAY & SILTY CLAY LOAM	0.36	SOFT	36	40	22	C 89
GR FINE & MED SAND		MED	20	N	N=[illegible] P	[illegible]
GR SANDY LOAM	NO CORE	VERY DENSE	3" PENET = 28	N	N=50 P	[illegible]

ELEVATION: 10, 5, 0, -5, -10, -15, -20, -25, -30, -35, -40, -45, -50, -55, -60, -65, -70, -75, -80, -85, -90, -95, -100, -105, -110 (NOTE SCALE CHANGE), -120, -130, -140, -150

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW ___ FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD ___ TONS

BORING Nº
DATE MADE DEC 4, 1968 STA 60+00 LOCATION ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	Qu	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER
[illegible] ORGANIC &				(ORGANIC)		
[illegible]	0.10	[illegible] SOFT	[illegible]	(PLASTIC)		[illegible]
ROTTEN WOOD				(NO CORE)		
ROTTEN WOOD & ORGANIC				(NO CORE)		
ROTTEN WOOD ORGANIC 30%	0.10	VERY SOFT	231	(PLASTIC)		C 118
ORGANIC 16%	0.14	VERY SOFT	226	42	22	C 119
ORGANIC 20%	0.08	VERY SOFT	182	(PLASTIC)		C 120
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 5%	0.16	VERY SOFT	39	36	10	C 121
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 7%	0.26	SOFT	63	86	61	C 122
GR SILTY CLAY ORGANIC 8%	0.15	VERY SOFT	82	97	52	C 124
GR SILTY CLAY - ORGANIC 21%	0.21	VERY SOFT	97	(PLASTIC)		C 126
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 6%	0.08	VERY SOFT	43	37	16	C 129
GR SILTY CLAY - ROTTEN WOOD ORGANIC 5%	0.26	SOFT	42	59	40	C 130
GR SILTY CLAY	0.75	MED	36	53	39	C 131
GR SILTY CLAY	0.26	SOFT	32	31	11	C 132
GR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 6%	0.40	SOFT	40	58	42	C 133
GR. SILTY CLAY	0.60	SOFT	30	29	9	C 134
GR SILTY CLAY	0.33	SOFT	32	29	9	C 136
GR SILTY CLAY	0.51	MED	36	43	22	C 137
GR SILTY CLAY	0.23	VERY SOFT	34	31	8	C 138
GR SILTY CLAY	0.86	MED	36	42	18	C 139
GR SILTY CLAY -	0.62 S/S	MED	46	57	36	C 140
GR SILTY CLAY - ORGANIC 7%	0.69	MED	46	51	30	C 141
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 11%	0.87 S/S	MED	62	77	46	C 142
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 10%	0.62 S/S	MED	63	80	53	C 144
GR SILTY CLAY - ORGANIC 7%	0.77	MED	46	86	59	C 145
GR SILTY CLAY - ORGANIC 8%	0.83	MED.	40	59	39	C 146
GR SILTY CLAY - TR ROTTEN WOOD & CONCRETIONS - ORGANIC 2%	0.30	MED	36	48	27	C 147
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 14%	1.23 S/S	STIFF	75	72	39	C 148
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 9%	0.35 S/S	MED	46	73	51	C 149
GR SILTY CLAY - ROTTEN WOOD - ORGANIC 3%	1.00	SOFT	54	90	66	C 150
GR SILTY CLAY -	1.08	STIFF	43	53	33	C 152
GR SILTY CLAY - LENSES SILTY SANDY LOAM	0.71	MED	37	33	10	C 153
GR MED & FINE SAND	NO CORE	VERY DENSE	24 (10" PENET)	N	N=60 P	[illegible]

ELEVATION: 10, 5, 0, -5, -10, -15, -20, -25, -30, -35, -40, -45, -50, -55, -60, -65, -70, -75, -80, -85, -90, -95, -100, -105, -110 (NOTE SCALE CHANGE), -120, -130, -140, -150

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW ___ FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD ___ TONS

BORING Nº
DATE MADE DEC 16, 1968 STA 61+85 LOCATION ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

ROUTE	STATE PROJECT
LA.315	245-03-41

NOTES

ABBREVIATIONS
- N P = NON-PLASTIC
- BL = BLUE
- BK = BLACK
- BR = BROWN
- GR = GRAY
- WH = WHITE
- YE = YELLOW
- DK = DARK
- LT = LIGHT
- MED = MEDIUM
- PENET = PENETRATION
- S/S = UNABLE TO TEST BECAUSE OF SLICKENSIDES

MOISTURE CONTENT = MOISTURE CONTENT OF THE MATERIAL IN ITS NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL.

(3) = LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION = UNABLE TO DRIVE SPLIT SPOON SAMPLER INITIAL 6 INCHES

N = 16 = NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN REQUIRED TO DRIVE 2 IN O.D. SPLIT SPOON SAMPLER 1 FT AFTER FIRST HAVING BEEN DRIVEN 6 IN UNLESS AMOUNT OF PENETRATION SHOWN OTHERWISE

NO CULL = NO PRELIMINARY "6" DRIVING PRIOR TO SECURING DRIVE DATA

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES				
SOIL	DESIGNATION		Nº OF BLOWS "N"	"Qu" UNCONFI[NED] COMPRES[SIVE] STRENG[TH] TONS PER
SAND & SILT	RELATIVE DENSITY	VERY LOOSE LOOSE MEDIUM DENSE VERY DENSE	LESS THAN 4 4-10 10-30 30-50 OVER 50	
CLAY	CONSISTENCY	VERY SOFT SOFT MEDIUM STIFF VERY STIFF HARD	LESS THAN 2 2-4 4-8 8-15 15-30 OVER 30	LESS THA[N] 0.25-0[illegible] 0.50-1 1-2 2-4 OVER [illegible]

PILE DATA							
LOCATION (BENT)	STATION	PLAN TIP ELEV.	CUT-OFF ELEV	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV.	AS[ ] MA[ ] ELE[ ]

FIGURE 19
CORE BORINGS AND TEST PILES

BORINGS-6[illegible]
BAYOU DULARGE

DATED JAN. 24 1969

STATE OF LOUIS[IANA]
DEPARTMENT OF H[IGHWAYS]

SURVEYED [illegible]
CHECKED J H J

MATERIALS & TESTING SECTION

REVISIONS

HALF SCALE PLANS

ROUTE	STATE PROJECT
LA.315	245-03-41

CLASSIFICATION

SOIL TYPE & COLOR	qu	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
WATER & VERY SILTY CLAY ORGANIC 10%	0.22	VERY SOFT	62	68	41	57	-5
SILTY CLAY ORGANIC 13%	0.08	VERY SOFT	195	86	52	58	-10
OR SILTY CLAY	0.11	VERY SOFT	98	60	40	59	-15
OR SILTY CLAY ORGANIC 16%	0.16	VERY SOFT	116	93	58	60	-20
OR SILTY CLAY ORGANIC 10%	0.30	VERY SOFT	88	53	64	61	-25
OR SILTY CLAY ORGANIC 6%	0.16	VERY SOFT	50	33	32	62	-30
OR SILTY CLAY	0.08	VERY SOFT	114	88	53	63	-35
OR SILTY CLAY	0.23	VERY SOFT	41	58	37	64	-40
SILTY CLAY	0.50	SOFT	44	70	[illegible]	65	-45
OR SILTY CLAY TR ROOTS 6%	0.38	SOFT	35	42	[illegible]	66	-50
OR SILTY CLAY	0.61	SOFT	23	23	6	67	-55
OR SANDY-SILTY CLAY	0.66	SOFT	27	26	[illegible]	68	-60
SANDY SILT		LOOSE	23	N	P	69	-65
OR SILTY CLAY	0.30	SOFT	30	23	9	70	-70
OR SILTY CLAY & SILTY CLAY LOAM	0.54	MED	30	30	6	71	-75
OR SILTY CLAY	0.76	MED	38	54	33	72	-80
OR SILTY CLAY ORGANIC 13%	1.19	STIFF	63	86	57	73	-85
OR SILTY CLAY ORGANIC 8%	0.76 -1/2	MED	51	91	60	74	-90
OR SILTY CLAY	0.82 -1/2	MED	42	66	42	75	-95
OR SILTY CLAY TR CONCRETIONS	1.16 -1/2	STIFF	63	95	58	76	-100
OR SILTY CLAY ORGANIC 13%	0.97 -1/2	MED	53	95	63	77	-105
OR SILTY CLAY ORGANIC 11%	1.13 -1/2	STIFF	57	84	56	78	-110
OR SILTY CLAY	0.88	MED	45	66	44	79	-115
							-120

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD TONS

BORING Nº STA 64+00
DATE MADE JAN 7 1969 LOCATION: ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS
TIME HOURS
SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	qu	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
(ORGANIC SUBGRADE)				(NON PLASTIC)			-5
OR SILTY CLAY & SHELLS	1.05	STIFF	27	51	38	57	
OR SILTY CLAY TR ROOTS & ROTTEN WOOD - ORGANIC 5%	0.94	MED	33	44	25	58	0
OR SILTY CLAY TR ROTTEN WOOD ORGANIC 5%	0.56	MED	28	42	23	59	
CL SILTY CLAY - ROTTEN WOOD ORGANIC 32%	0.14	VERY SOFT	256	(PLASTIC)		60	-5
ORGANIC MUCK	0.15	VERY SOFT	275	(PLASTIC)		61	-10
CLAY - ORGANIC 38%	0.14	VERY SOFT	192	(PLASTIC)		62	
OR SILTY CLAY - ORGANIC 5%	0.26	SOFT	43	58	35	63	-15
OR SILTY CLAY - ROTTEN WOOD 23%	0.04	SOFT	121	(PLASTIC)		64	
LOG				(NON PLASTIC)			-20
OR SILTY CLAY ROTTEN WOOD ORGANIC 7%	0.26	SOFT	64	86	58	65	-25
OR SILTY CLAY ORGANIC 3%	0.20	VERY SOFT	99	85	62	66	-30
OR SILTY CLAY TR ROOTS 5%	0.41	SOFT	44	58	36	67	-35
OR SILTY CLAY TR ROOTS WOOD ORGANIC 5%	0.32	SOFT	40	52	34	68	-40
OR SILTY CLAY TR ROTTEN WOOD ORGANIC 7%	0.44	SOFT	97	82	55	69	-45
OR SILTY CLAY TR ROTTEN WOOD ORGANIC 6%	0.14	VERY SOFT	33	29	8	70	-50
OR SILTY CLAY	0.26	SOFT	30	27	5	71	-55
OR SILTY CLAY TR ROTTEN WOOD ORGANIC 3%	0.45	SOFT	30	28	6	72	-60
OR SILTY CLAY ROTTEN WOOD ORGANIC 5%	0.45	SOFT	41	45	24	73	-65
OR SILTY CLAY & SILTY CLAY LOAM		LOOSE	30	N	P	74 75	-70
OR SILTY CLAY TR ROTTEN WOOD ORGANIC 8%	0.70	MED	47	58	37	76	-75
OR SILTY CLAY - ROTTEN WOOD - ORGANIC 12%	0.86	MED.	63	86	53	77	-80
OR SILTY CLAY - ROTTEN WOOD - ORGANIC 10%	0.72 -1/2	MED	68	88	52	78	-85
OR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 8%	0.13 -1/2	VERY SOFT	48	51	22	79	-90
OR SILTY CLAY ORGANIC 11%	0.82 -1/2	MED	66	87	58	80	-95
OR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 8%	0.80	MED	48	73	49	81	-100
OR SILTY CLAY - TR ROTTEN WOOD - ORGANIC 8%	0.88	MED	47	76	45	82	-105
OR SILTY SANDY		DENSE	26	N	NON PLASTIC	83	-110
OR SILTY CLAY		STIFF	38	65	33	84	-115
OR CLAYEY SILT		VERY LOOSE	32	N.	P	85	-120
OR CLAYEY SILT & MED SAND		MED	13	N	NON PLASTIC	86	

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD TONS

BORING Nº STA 66+00
DATE MADE JAN 11 1969 LOCATION: ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS
TIME HOURS
SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	qu	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
OR SILTY CLAY ORGANIC 3%	0.32	VERY SOFT	48	52	29	87	-5
OR SILTY CLAY - ORGANIC 45%	0.02	VERY SOFT	139	(PLASTIC)		88	
OR SILTY CLAY ORGANIC 42%	0.19	VERY SOFT	233	(PLASTIC)		89	-10
OR SILTY CLAY - ORGANIC 6%	0.12	VERY SOFT	56	53	36	90	
OR SILTY CLAY - TR ROOTS - ORGANIC 6%	0.32	SOFT	62	55	36	91	-15
OR. SILTY CLAY - TR ROOTS - ORGANIC 11%	0.25	SOFT	91	83	53	92	-20
OR SILTY CLAY ORGANIC 10%	0.37	SOFT	106	107	75	93	-25
OR SILTY CLAY ORGANIC 10%	0.27	SOFT	67	33	66	94	-30
OR. SILTY CLAY	0.30	SOFT	40	60	37	95	-35
OR SILTY CLAY	0.38	SOFT	37	53	33	96	-40
OR SILTY CLAY	0.46 -1/2	SOFT	39	63	46	97	-45
OR SILTY CLAY	0.46	SOFT	36	52	35	98	-50
OR SILTY CLAY	0.38	SOFT	34	43	24	99	
OR. SANDY - SILTY CLAY	0.08	VERY SOFT	32	29	7	100	-55
							-60
OR SILTY CLAY	0.52	MED	36	42	21	101	-65
							-70
							-75
OR SILTY CLAY ORGANIC 10%	0.82 -1/2	MED	53	90	62	102	-80
							-85
OR SILTY CLAY ORGANIC 7%	0.96 -1/2	MED	42	90	60	103	-90
OR SILTY CLAY ORGANIC 10%	0.94	MED	64	88	60	104	-95
OR SILTY CLAY ORGANIC 3%	0.58 -1/2	MED	52	86	50	105	-100
OR SILTY CLAY ORGANIC 10%	1.18 -1/2	STIFF	87	85	50	106	-105
OR. SILTY CLAY ORGANIC 3%	1.45	STIFF	48	70	44	107	-110
							-115
OR SILTY CLAY ORGANIC 6%	1.50	STIFF	60	68	45	108	-120
OR SILTY CLAY	0.32	MED.	36	50	31	109	-125
							-130

TEST PILE Nº
TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD TONS

BORING Nº STA 68+00
DATE MADE JAN 8 1969 LOCATION ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS
TIME HOURS
SETTLEMENT INCHES

HALF SCALE PLANS

NOTES.

ABBREVIATIONS

- N P : NON-PLASTIC
- BL : BLUE
- BK : BLACK
- BR : BROWN
- GR : GRAY
- WH : WHITE
- YE : YELLOW
- DK : DARK
- LT : LIGHT
- MED : MEDIUM
- PENET : PENETRATION
- B/G : UNABLE TO TEST BECAUSE OF SLIKENSIDE

MOISTURE CONTENT = MOISTURE CONTENT OF THE MATERIAL IN ITS NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL

(3) = LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION = UNABLE TO DRIVE SPLIT SPOON SA INITIAL 6 INCHES

N = 18 = NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN REQUIRED TO DRIVE 2 IN O D SPLIT SPOON S. 1 FT AFTER FIRST HAVING BEEN DR. 6 IN UNLESS AMOUNT OF PENETRAT SHOWN OTHERWISE

NO CULL = NO PRELIMINARY 6" DRIVING PRIO TO SECURING DRIVE DATA.

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		Nº OF BLOWS "N"	UNCO COMPR STRE TONS
SAND & SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4-10	
		MEDIUM	10-30	
		DENSE	30-50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS
		SOFT	2-4	0.25
		MEDIUM	4-8	0.50
		STIFF	8-15	1
		VERY STIFF	15-30	2
		HARD	OVER 30	OV

PILE DATA

LOCATION (BENT)	STATION	PLAN TIP ELEV.	CUT-OFF ELEV.	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV

FIGURE 20
CORE BORINGS AND TEST PIL

BORINGS -
BAYOU DULARG
DATED JAN 10 1969

STATE OF LOU
DEPARTMENT OF

SURVEYED C.R.T. ENGINEER | DETAILED
CHECKED J.N.J. | CHECKED
DATE | CHECK FILE | BY
REVISIONS
MATERIALS & TESTING SECTION

ROUTE	STATE PROJECT	
LA.315	245-05-41	

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
[illegible] SILTY CLAY TR WOOD ORGANIC 2%	0.03	SOFT	42	42	17	[illegible]	
[illegible] SILTY CLAY ORGANIC 15%	0.06	VERY SOFT	39	82	56	[illegible]	-5
SILTY CLAY [illegible] 6%	0.06	VERY SOFT	52	52	34	[illegible]	-10
GR SILTY CLAY WOOD ORGANIC 9%	0.06	VERY SOFT	59	58	71	[illegible]	-15
GR SILTY CLAY - TR WOOD - ORGANIC 10%	0.07	VERY SOFT	129	38	50	[illegible]	-20
GR SILTY CLAY TR WOOD ORGANIC 17%	0.20	VERY SOFT	70	140	75	[illegible]	-25
GR SILTY CLAY	0.20	VERY SOFT	38	52	32	[illegible]	-30
GR SILTY CLAY	0.38	SOFT	33	50	30	[illegible]	
GR SILTY CLAY	0.31	MED	41	48	48	[illegible]	-35
GR SILTY CLAY - LAMINATIONS SILT	0.22	SOFT	35	37	12	[illegible]	-40
GR SILTY CLAY ORGANIC 6%	0.40	MED	33	57	36	[illegible]	
[illegible] ORGANIC 8%	0.46	MED	32	35	15	[illegible]	-45
GR. CLAYEY SILT		LOOSE	30	N	P	[illegible]	-50
GR SILTY CLAY LAMINATIONS	0.80	MED.	30	39	12	[illegible]	-55
GR SILTY CLAY	0.46	SOFT	33	39	10	[illegible]	-60
GR SILTY CLAY [illegible] ORGANIC 9%	0.46	MED	41	48	26	[illegible]	-65
GR SILTY CLAY ORGANIC 8%	1.05	STIFF	46	37	20	[illegible]	-70
SILTY CLAY	0.36	MED	43	33	18	[illegible]	-75
GR SILTY CLAY - WOOD - ORGANIC 10%	0.36	MED	46	38	18	[illegible]	-80

TEST PILE Nº

TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW — FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD — TONS

STA. | ELEVATION

BORING Nº
DATE MADE —
STA [illegible]
LOCATION: ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
GR SILTY CLAY ORGANIC 2%	0.33	VERY SOFT	41	34	9	[illegible]	
GR SILTY CLAY TR WOOD ORGANIC 12%	0.46	SOFT	67	96	37	[illegible]	0
GR GR SILTY CLAY ORGANIC 25%	0.17	VERY SOFT	137	(PLASTIC)		[illegible]	-5
GR SILTY CLAY	0.46	SOFT	40	57	36	[illegible]	-10
GR SILTY CLAY TR WOOD ORGANIC 6%	0.33	SOFT	53	83	53	[illegible]	-15
GR GR SILTY CLAY ORGANIC 24%	0.38	SOFT	159	(PLASTIC)		[illegible]	-20
GR SILTY CLAY ORGANIC 13%	0.38	SOFT	37	102	66	[illegible]	-25
GR SILTY CLAY ORGANIC 10%	0.32	SOFT	76	100	71	[illegible]	-30
GR SILTY CLAY ORGANIC 6%	0.31	SOFT	47	68	44	[illegible]	-35
GR SILTY CLAY	0.39	SOFT	38	52	31	[illegible]	-40
GR. SILTY CLAY	0.46	SOFT	40	65	47	[illegible]	-45
GR SILTY CLAY	0.46	SOFT	23	30	8	[illegible]	-50
GR SILTY CLAY	0.46	VERY SOFT	35	55	13	[illegible]	-55
							-60

TEST PILE Nº

TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW — FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD — TONS

STA. | ELEVATION

BORING Nº
DATE MADE —
STA 73+13
LOCATION: ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

CLASSIFICATION

SOIL TYPE & COLOR	q_u	CONSISTENCY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
GR SILTY CLAY ORGANIC 12%	0.46	SOFT	53	78	45	[illegible]	
GR SILTY CLAY ORGANIC 18%	0.17	VERY SOFT	168	87	33	[illegible]	0
GR GR SILTY CLAY ORGANIC 31%	0.08	VERY SOFT	216	(PLASTIC)		[illegible]	-5
GR SILTY CLAY	0.36	SOFT	61	58	38	[illegible]	-10
GR SILTY CLAY ORGANIC 6%	0.36	SOFT	45	62	42	[illegible]	-15
GR GR SILTY CLAY - ORGANIC 15%	0.17	VERY SOFT	136	(PLASTIC)		[illegible]	-20
GR GR SILTY CLAY ORGANIC 28%	0.16	SOFT	156	(PLASTIC)		[illegible]	-25
GR SILTY CLAY ORGANIC 14%	0.38	SOFT	103	93	66	[illegible]	-30
GR SILTY CLAY ORGANIC 11%	0.38	SOFT	85	93	69	[illegible]	
GR GR SILTY CLAY ORGANIC 20%	0.06	MED	103	(PLASTIC)		[illegible]	-35
GR SILTY CLAY	0.46	SOFT	35	40	18	[illegible]	-40
GR SILTY CLAY	0.36	MED	42	72	52	[illegible]	
GR SANDY - CLAYEY SILT		LOOSE	30	N	P	[illegible]	-45
GR SILTY CLAY - LAMINATIONS SILT ORGANIC 7%	0.38	SOFT	39	53	33	[illegible]	-50
GR SILTY CLAY - ORGANIC 10%	0.38	SOFT	37	81	60	[illegible]	-55
GR SILTY CLAY - LAMINATIONS SILT	0.68	MED	53	75	50	[illegible]	-60
GR SILTY CLAY - LAMINATIONS SILT	0.73	MED.	50	68	43	[illegible]	
GR SILTY CLAY - LAMINATIONS SILT - ORGANIC 9%	0.46	SOFT	52	81	55	[illegible]	-65

TEST PILE Nº

TYPE OF PILE
TYPE OF HAMMER
ENERGY PER BLOW — FT LBS
DATE OF DRIVING
DATE OF LOADING
DESIGN LOAD — TONS

STA. | ELEVATION

BORING Nº
DATE MADE —
STA 76+83
LOCATION ℄

DRIVING RESISTANCE TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

NOTES

ABBREVIATIONS

- NON-PLASTIC
- BLK : BLACK
- BR : BROWN
- GR : GRAY
- WH : WHITE
- YL : YELLOW
- DK : DARK
- LT : LIGHT
- MED : MEDIUM
- PEN. : PENETRATION
- S/O : UNABLE TO TEST BECAUSE OF SLICKENSIDES

MOISTURE CONTENT : MOISTURE CONTENT OF THE MATERIAL IN THE NATURAL STATE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF THE MATERIAL

(3) : LOCATION AND IDENTIFICATION OF THE SAMPLE

NO PENETRATION : UNABLE TO DRIVE SPLIT SPOON SAMPLER INITIAL 6 INCHES

N = 18 : NUMBER OF BLOWS OF 140 LB HAMMER DROPPED 30 IN REQUIRED TO DRIVE 2 IN O.D. SPLIT SPOON SAMPLER 1 FT AFTER FIRST HAVING BEEN DRIVEN 6 IN UNLESS AMOUNT OF PENETRATION GIVEN OTHERWISE

NO CULL : NO PRELIMINARY 6" DRIVING PRIOR TO RECORDING DRIVE DATA.

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" OF BLOWS	"q_u" UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ. FT.
SAND & SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4-10	
		MEDIUM	10-30	
		DENSE	30-50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2-4	0.25-0.50
		MEDIUM	4-8	0.50-1.00
		STIFF	8-15	1-2
		VERY STIFF	15-30	2-4
		HARD	OVER 30	OVER 4

PILE DATA

LOCATION IDENTI	STATION	PLAN TIP ELEV.	CUT-OFF ELEV	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH TIP ELEV	AS BU MAX ELEV

FIGURE 21
CORE BORINGS AND TEST PILES

48

BORINGS-8
BAYOU DULARGE B

DATED JAN 30 1963

STATE OF LOUISIAN
DEPARTMENT OF HIG

SURVEYED [illegible] | DRAWN [illegible]
CHECKED J.H.J. | TRACED [illegible]
MATERIALS & TESTING | SECTION - BR

DATE | DESCRIPTION | BY
REVISIONS

HALF SCALE PLANS

SOIL TYPE & COLOR	qu	φ	TYPE BREAK	γ	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION	STA	TEST PILE No
											TYPE OF PILE
											TYPE OF HAMMER
											ENERGY PER BLOW FT LBS
											DATE OF DRIVING
											DATE OF LOADING
											DESIGN LOAD TONS

BORING Nº 12 STA: 157 + 14
DATE MADE: 1.22.73 LOCATION: 20' RT ℄

DRIVING RESISTANCE
TONS

BORING Nº 11 STA: 157 + 18
DATE MADE: 1.23.73 LOCATION: 20' LT ℄

DRIVING RESISTANCE
TONS

BORING Nº 13 STA. 157 + 20
DATE MADE: 1.26.73 LOCATION: 10' LT ℄

DRIVING RESISTANCE
TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

HALF SCALE PLANS

ROUTE	STATE PROJECT
LA. 315	245-05-41

NOTES

BL. = Blue	CL = Clay	STP = Stone			
BK. = Black	GRAV. = Gravel	Mot. = Mottled			
BR. = Brown	ORG. = Organic	TR = Trace			
GR. = Gray	SA. = Sand	N P = Non-Plastic			
GN. = Green	SH. = Shelly	PENET. = Penetration			
PK. = Pink	SI = Silty	N. C. = No Cull			
WH. = White	ALT. = Alternating	S/S = Slickensides			
YE. = Yellow	CO. = Coarse	YLD. = Yield			
CONC. = Concretions	FI = Fine	M. S. = Multiple Shear			
RTS. = Roots	MED. = Medium	V. S. = Vertical Shear			
BOT. = Bottom	I. O. = Iron Ore	60° S. = Shear Angle			
VEG. = Vegetation	LEN. = Lenses	SL. = Slump			
WD. = Wood	Q. A. = Quick Arcing				

MOISTURE CONTENT = Moisture Content of the material in its natural state as a percentage of the dry weight of the material

③ = Location and Identification of the sample

NO PENETRATION = Unable to drive split spoon sampler beyond 6 inches

N = 16 = Number of blows of 140 lbs. hammer dropped 30 in. ... to drive 2 in. O.D. Split Spoon sampler 1 ft. after ... been driven 6 in. unless amount of penetration shown

NO CULL = No preliminary 6" driving prior to recording drive data

qu = Compressive strength from triaxial undrained shear (tons per sq. ft.)

qc = Compressive strength from consolidated undrained shear ... per sq. ft.)

φ = Angle of internal friction

γ = Wet weight of in-place material (Tons per cu. ft.)

• = Strength determined by PENETROMETER

E 4° = Estimated unconfined compressive strength by correlation ... similar material on this project

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES			
SOIL	DESIGNATION	Nº OF BLOWS "N"	UNC. COMP. STR. TONS
SAND & SILT (RELATIVE DENSITY)	VERY LOOSE / LOOSE / MEDIUM / DENSE / VERY DENSE	LESS THAN 4 / 4-10 / 10-30 / 30-50 / OVER 50	
CLAY (CONSISTENCY)	VERY SOFT / SOFT / MEDIUM / STIFF / VERY STIFF / HARD	LESS THAN 2 / 2-4 / 4-8 / 8-15 / 15-30 / OVER 30	LESS ...

PILE DATA						
LOCATION (BENT)	STATION	PLAN TIP ELEV.	CUT-OFF ELEV.	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH

FIGURE 22.
CORE BORINGS AND TEST P...

BORINGS
BAYOU DULAR...
DATED APRIL 9 1973

STATE OF LO...
DEPARTMENT O...

F.A. NO. SL-3868

DATE	DESCRIPTION	BY
	REVISIONS	

SURVEYED CAPCHET DETAILED –
CHECKED J E G CHECKED –
MATERIAL SECTION

SOIL TYPE & COLOR	qu	qp	TYPE BREAK	γ	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION
[illegible]	[illegible]		SL	[illegible]	30.5	[illegible]	[illegible]	[illegible]	
GR CL OBP 7%	[illegible]		VLB	[illegible]	52	73	45	[illegible]	
GR CL	[illegible]		VLB	[illegible]	40	47	45	[illegible]	
GR SI CL.	[illegible]		VLB	[illegible]	39	47	36	[illegible]	
GR SI CL. w/TR. OBP.	[illegible]		VLB	[illegible]	38	56	32	[illegible]	
GR CL. OBP.	[illegible]		[illegible]	[illegible]	48	80	52	[illegible]	
GR CL. SI.		[illegible]	VLB	[illegible]	30	[illegible]	P	[illegible]	
GR SI. MED SA					-	[illegible]	P	[illegible]	
	[illegible]			[illegible]	[illegible]		[illegible]		
	[illegible]			[illegible]	[illegible]		[illegible]		

TEST PILE No

BORING NO. [illegible]
DATE MADE [illegible]
STA: [illegible]
LOCATION: [illegible]

DRIVING RESISTANCE
TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

SOIL TYPE & COLOR	qu	qp	TYPE BREAK	γ	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION

TEST PILE No

BORING NO
DATE MADE:
STA:
LOCATION:

DRIVING RESISTANCE
TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

SOIL TYPE & COLOR	qu	qp	TYPE BREAK	γ	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SAMPLE NUMBER	ELEVATION

TEST PILE No

BORING NO
DATE MADE.
STA
LOCATION

DRIVING RESISTANCE
TONS

TEST LOAD TONS

TIME HOURS

SETTLEMENT INCHES

HALF SCALE PLANS

NOTES

ROUTE	STATE PROJECT
LA.315	245-03-4

BL - Blue
BR - Brown
GR - Gray
GRN - Green
PK - Pink
WH - White
YE - Yellow
CONC - Concrete
BTS. - Roots
ROT. - Rotten
VEG. - Vegetation
WD - Wood

CL - Clay
GRAV - Gravel
LIMS - Limestone
SA - Sand
SH - Shell
SI - Silty
ALT. - Alternating
CO. - Coarse
FI - Fine
MED - Medium
I.O. - Iron Ore
LIM - Limon
Q.A. - Quick Acting

STD - Sandy
STRING - Stringy
TR - Trace
SOME - Some
PEBBLE - Pebbles
N.C. - No Core
S.S. - Stainless Steel
YLD - Yield
W.S. - Water Sample
V.S. - Vertical Shear
SHEAR ANGLE - Shear Angle
SS - Soil Sample

MOISTURE CONTENT - Moisture content of the material in its natural state as a percentage of the dry weight of the material.

(3) NO PENETRATION - Location and based location of the sample. Unable to drive split spoon sampler without 6 inches.

N - 18 - Number of blows of 140 lbs. hammer dropped 30 in. to drive 2 in. O.D. split spoon sampler 1 ft. after been driven 6 in. unless amount of penetration is [illegible]

NO CORE - No preliminary 6" driving prior to starting core drive [illegible]

qu - Compressive strength from tests of undrained shear [illegible] qu = [illegible]

qp - Compressive strength from unconsolidated undrained [illegible] per sq. ft.

φ - Angle of internal friction.

γ - Wet weight of undisturbed material (lbs per cu. ft.)

• - Strength determined by PENETROMETER.

L4" - Unconfined unit ultimate compressive strength by sample similar material on this project.

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		NO. OF BLOWS "N"	UNC. COMP. ST.
SAND & SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4 - 10	
		MEDIUM	10 - 30	
		DENSE	30 - 50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS
		SOFT	2 - 4	0
		MEDIUM	4 - 8	0
		STIFF	8 - 15	
		VERY STIFF	15 - 30	
		HARD	OVER 30	

PILE DATA

LOCATION (BENT)	STATION	PLAN TIP ELEV.	CUT-OFF ELEV.	PLAN PILE LENGTH	ORDER LENGTH	ORDER LENGTH

FIGURE 23
CORE BORINGS AND TEST P

BORINGS
BAYOU DULAR
DATED APRIL 9 1973

STATE OF LO
DEPARTMENT O

SURVEYED [illegible]
CHECKED J E G

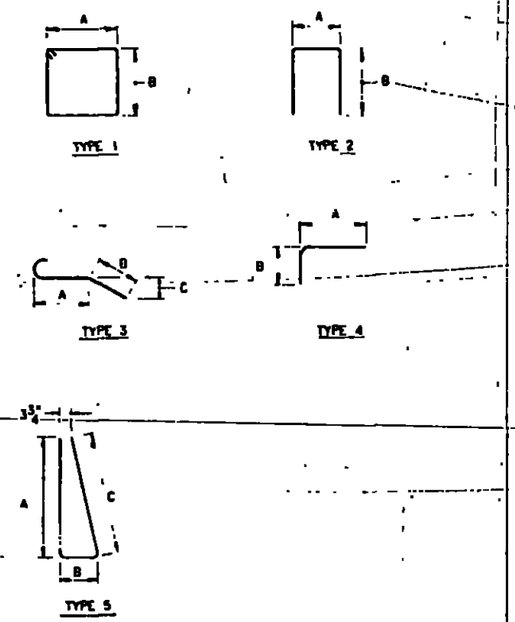
MATERIAL SECTION

DATE | DESCRIPTION | BY
REVISIONS

ROUTE	STATE PROJECT	PARIS
LA 315	245-03-41	TERREBO

BAR SCHEDULE FOR PIER S15-S21 (SO ABUT)

PIERS	MARK	NO	SIZE	LENGTH	TYPE	A	B	C	WEIGHT
S16, S18 & S20	PC401	44	4	8'-4"	1	2'-0"	1'-8"		245
	PC501	2	5	39'-0"	STR				81
	PC601	27	6	2'-0"	STR				81
	PC801	6	8	39'-0"	STR				622
	PC802	8	8	8'-11"	2	6'-7"	1'-2"		190
								TOTAL	1219
S15, S17, & S19	PC401	44	4	8'-4"	1	2'-0"	1'-8"		245
	PC501	2	5	39'-0"	STR				81
	PC601	54	6	2'-0"	STR				162
	PC801	6	8	39'-0"	STR				622
	PC802	8	8	8'-11"	2	6'-7"	1'-2"		190
								TOTAL	1300
S21 (SOUTH ABUT.)	F401	44	4	7'-8"	1	1'-10"	1'-6"		225
	F501	2	5	39'-0"	STR				81
	F502	4	5	5'-8½"	STR				24
	F503	4	5	3'-6"	STR.				15
	F504	4	5	9'-8"	4	7'-10"	1'-10"		40
	F505	20	5	7'-10"	STP				163
	F506	2	5	8'-2¾"	5	3'-6½"	1'-0½"	3'-7¾"	17
	F507	2	5	7'-10¾"	5	3'-5½"	0'-11"	3'-6¼"	16
	F508	2	5	7'-7"	5	3'-4½"	0'-9½"	3'-5"	16
	F509	2	5	7'-3¼"	5	3'-3½"	0'-8"	3'-3¾"	15
	F510	2	5	6'-11½"	5	3'-2½"	0'-6½"	3'-2½"	15
	F601	27	6	2'-0"	STR.				81
	F602	4	6	5'-8"	2	1'-4"	2'-2"		34
	F801	6	8	38'-10"	STR.				622
	F802	8	8	8'-11"	2	6'-7"	1'-2"		190
	F803	6	8	8'-7"	STR.				138
	F901	4	9	7'-2"	3	3'-0"	1'-10"	1'-0½"	97
								TOTAL	1789

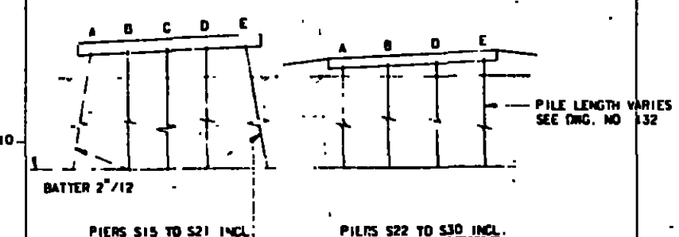


BAR TYPES

PIER DATA (SEE DIAGRAMS BELOW)

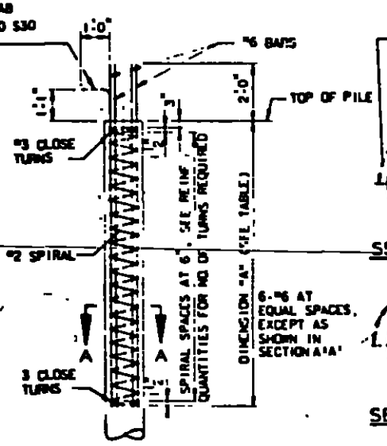
PIER	STATION	PROFILE GRADE	PILE CUT-OFF ELEVATION A	B	C	D	E	LOW GUTTER EL	HIGH GUTTER EL
S15	168+87.80	13.23	9.92	10.25	10.58	10.91	11.24	12.78	14.22
S16	169+07.80	12.47	9.16	9.49	9.82	10.15	10.48	12.02	13.46
S17	169+27.80	11.76	8.46	8.79	9.12	9.45	9.78	11.31	12.75
S18	169+47.80	11.11	7.80	8.13	8.46	8.79	9.12	10.66	12.10
S19	169+67.80	10.50	7.19	7.52	7.85	8.18	8.51	10.05	11.49
S20	169+87.80	9.94	6.64	6.97	7.30	7.63	7.96	9.49	10.93
S ABUT S21	170+07.80	9.44	6.13	6.46	6.79	7.12	7.45	8.99	10.43
S22	170+17.80	9.20	7.53	7.92	-	8.31	8.70	8.75	10.15
S23	170+27.80	8.98	7.31	7.69	-	8.06	8.44	8.53	9.88
S24	170+37.80	8.77	7.10	7.46	-	7.82	8.19	8.32	9.63
S25	170+47.80	8.57	6.90	7.25	-	7.60	7.95	8.12	9.39
S26	170+57.80	8.39	6.71	7.05	-	7.39	7.73	7.94	9.16
S27	170+67.80	8.22	6.53	6.86	-	7.19	7.52	7.77	8.95
S28	170+77.80	8.06	6.37	6.69	-	7.00	7.32	7.61	8.75
S29	170+87.80	7.91	6.22	6.52	-	6.83	7.13	7.46	8.56
S30	170+97.80	7.77	6.08	6.37	-	6.67	6.96	7.32	8.38
S31	171+07.80	7.65						7.20	8.22

— FOR TIMBER PILES, THE CONTRACTOR SHALL DETERMINE AND SUBMIT PILE CUT-OFF ELEVATIONS TO THE LA DEPT OF HIGHWAYS FOR APPROVAL

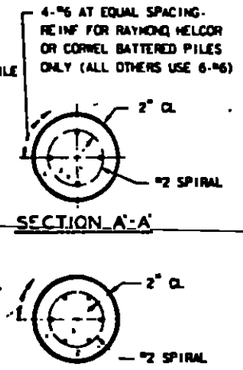


PIERS S15 TO S21 INCL. PIERS S22 TO S30 INCL.

DENT BARS OF PILES FOR PILE SUPPORTED SLAB (PIERS S22 TO S30 INCLUSIVE)



ELEVATION



REQUIREMENTS FOR 14" DIAM CAST-IN PLACE CONCRETE PILES

SHELLS FOR PILES SHALL BE STEEL PIPE PILES, RAYMOND STEP-TAPER PILES, MONOTUBE TAPERED PILES, HELCOR OR CORWEL PILES OR APPROVED EQUAL. THE LOWER SECTION OF THE SHELLS FOR MONOTUBE TAPERED PILES SHALL HAVE THE LONGEST POSSIBLE TAPERED LENGTH TO PROVIDE BUTT DIAMETER OF 8". UPPER SECTIONS SHALL HAVE A CONSTANT CROSS SECTION WITH A DIAMETER OF 14". ENDS OF PILES SHALL BE CLOSED WITH AN APPROVED STEEL TIP.

SHELLS FOR PILING SHALL BE MADE WATERPROOF

ENDS OF STEEL PIPE PILES SHALL BE CLOSED WITH AN APPROVED FLAT PLATE WELDED TO THE PIPE. PLATE DIAMETER SHALL NOT EXCEED PIPE DIAMETER BY MORE THAN ⅛"

THE USE OF GRAVITY HAMMERS FOR DRIVING SHELLS FOR CAST-IN-PLACE CONCRETE PILES WILL NOT BE PERMITTED

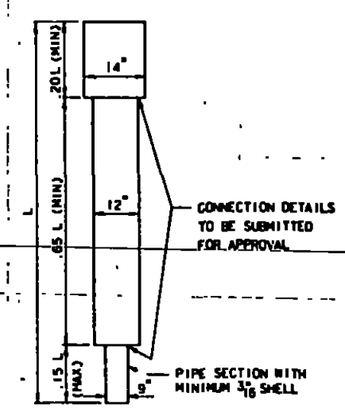
NOTES

FOR GENERAL NOTES SEE DWG NO. 105.

BAR TYPES AND SCHEDULE SHOWN ARE FOR THIS DWG. ONLY.

℄ BAR SCHEDULES SHOWN FOR PIERS S15-S20 ARE PER PIER

GUTTER ELEVATIONS SHOWN ARE FOR AN OFFSET OF 18'-0" FROM ℄ ROADWAY



DETAILS OF HELCOR AND CORWEL PILES

NO SCALE

TABLE OF REQUIRED LENGTH OF REINFORCING (DIMENSION "A")

PILE TYPE	PIER FOOTING PILES: BATTERED	PIER FOOTING PILES: VERTICAL	PILES IN SLAB SPAN BENTS (S15 TO S21)	PILES FOR APPROACH SLAB (S22 TO S30)
RAYMOND, CORWEL HELCOR	25'	10'	50'	10'
MONOTUBE PIPE	10'	10'	25'	10'

MINIMUM REQUIREMENTS FOR PILE ALTERNATES

STEEL PIPE PILES SHALL HAVE A MIN OUTSIDE DIAMETER OF 14" AND MIN SHELL THICKNESS OF 3/16".

RAYMOND STEP TAPER PILES SHALL HAVE A MIN BUTT DIAMETER OF 14" AND MIN POINT DIAMETER OF 9½"

MONOTUBE TAPERED PILES SHALL HAVE MIN. BUTT DIAMETER OF 14" AND MIN POINT DIAMETER OF 8".

HELCOR & CORWEL PILES SHALL CONFORM TO DETAILS SHOWN

REINFORCING STEEL QUANTITIES

DIMENSION "A"	#6 REINFORCEMENT	#2 SPIRAL
50'	6 at 50'-0" = 300'-0"	105 TURNS AT 2'-6¼" = 264'-8¼"
25'	4 at 25'-0" = 100'-0"	55 TURNS AT 2'-6¼" = 138'-7⅜"
25'	6 at 25'-0" = 150'-0"	55 TURNS AT 2'-6¼" = 138'-7⅜"
10'	6 at 10'-0" = 60'-0"	25 TURNS AT 2'-6¼" = 63'-0¼"

ALTERNATE CAST-IN-PLACE PILE DETAILS

HALF SCALE PLANS

FIGURE 24

STATE OF LOUISIANA
DEPARTMENT OF HIGHW

SOUTH APPROACH PILE
& PILE BENT REINFORC

BAYOU DULARGE BR

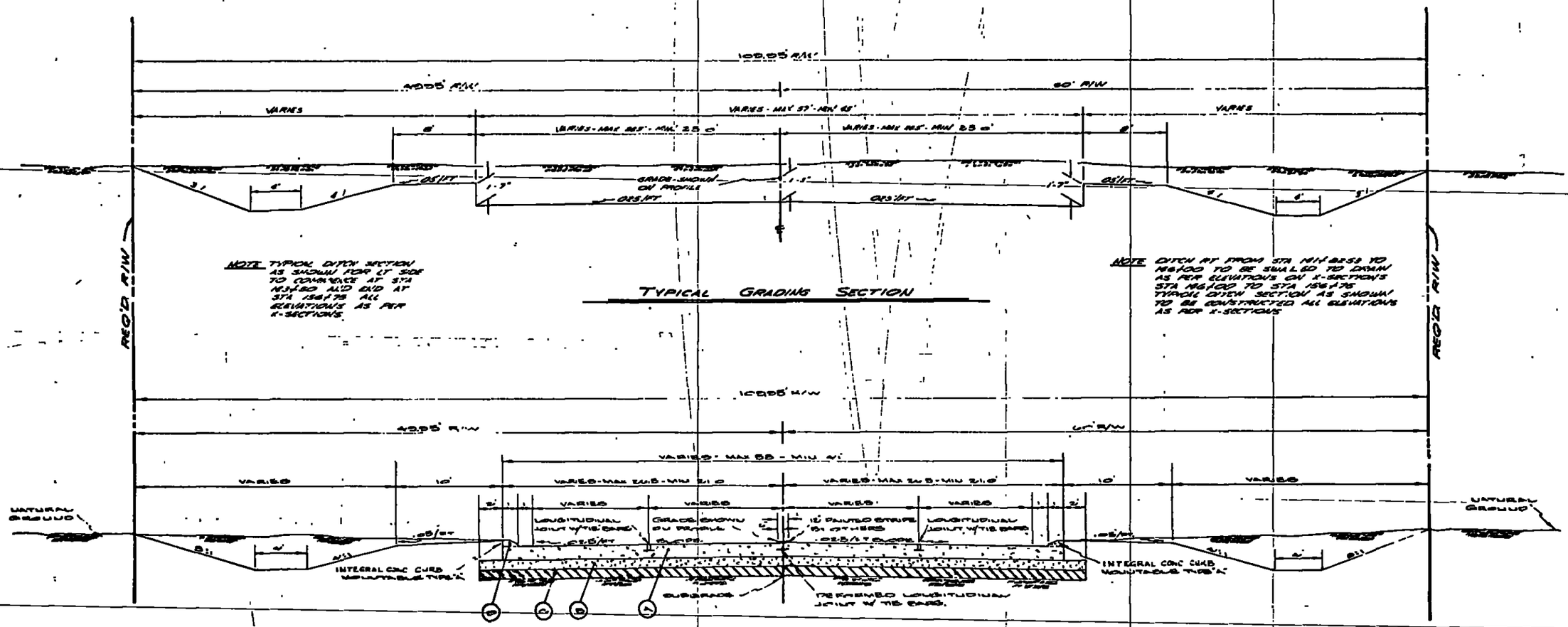
MODJESKI AND MASTER
CONSULTING ENGINEER

DATE	DESCRIPTION	BY
	REVISIONS	

DATE JAN. 1970 | SCALE NO SCALE
DRAWN BY EKR | CHKD BY POP | IN CHARGE

WARD	STATE PROJECT	PARISH
8	H.S.-09-4	TERREBONNE

NOTE
DRAWINGS ARE NOT TO SCALE
THE SECTION TO BE USED AT ANY PARTICULAR LOCATION SHALL BE AS SHOWN ON THE CROSS SECTION UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER. ALL DIMENSIONS SHOWN ARE DESIGN DIMENSIONS AND WILL BE REVISED TO THE NEAREST POSSIBLE LIMITS IN THE FIELD AS DETERMINED BY THE PROJECT ENGINEER. IF TOLERANCES ARE NOT OTHERWISE SPECIFIED ALL DIMENSIONS ON TYPICAL SECTION ARE COMPUTED DIMENSIONS. DENSITY CONTROL SHALL BE MAINTAINED FOR FULL DEPTH OF THE EMBANKMENT. ROW PLUS OR LESS THAN 5' IN HEIGHT OR IN CUT SECTIONS. DENSITY CONTROL SHALL BE REDUCED TO A MINIMUM OF 5" BELOW SUBGRADE. DENSITY REQUIREMENTS MAY BE WAIVED BY THE PROJECT ENGINEER TO CONSTRUCT A SUITABLE DRAINAGE TRAP BY ALTERNATE OPERATION OF NORMAL CONSTRUCTION METHODS



NOTE TYPICAL DITCH SECTION AS SHOWN FOR LT SIDE TO COMMENCE AT STA N.S.1.60 AND END AT STA 156+75 ALL ELEVATIONS AS PER X-SECTIONS.

NOTE DITCH RT FROM STA N.S.1.52 TO N.S.1.00 TO BE SWALED TO DRAIN AS PER ELEVATIONS ON X-SECTIONS STA N.S.1.00 TO STA 156+75 TYPICAL DITCH SECTION AS SHOWN TO BE CONSTRUCTED ALL ELEVATIONS AS PER X-SECTIONS

TYPICAL GRADING SECTION

TYPICAL FINISHED ROADWAY SECTION

STA. 141+82.55 TO STA. 141+80.55

(A) PORTLAND CEMENT CONCRETE PAVEMENT (8" THICK)

(B) AGGREGATE BASE COURSE (6" THICK)

(C) 6" LIME TREATMENT TYPE "D" LIME 12% BY VOLUME (ONE (1) APPLICATION) IN PLAN & MATERIAL BEING TREATED.

(D) INTEGRAL CONC. CURB MOUNTABLE TYPE "A"

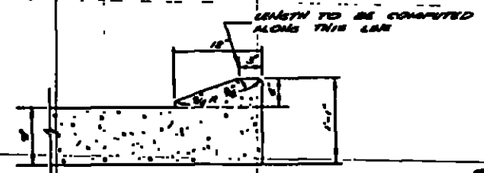


FIGURE 25

STA. 141+82.55 TO STA. 141+

52 o

TYPICAL SECTIONS AND DETAILS

DATED AUGUST 1976

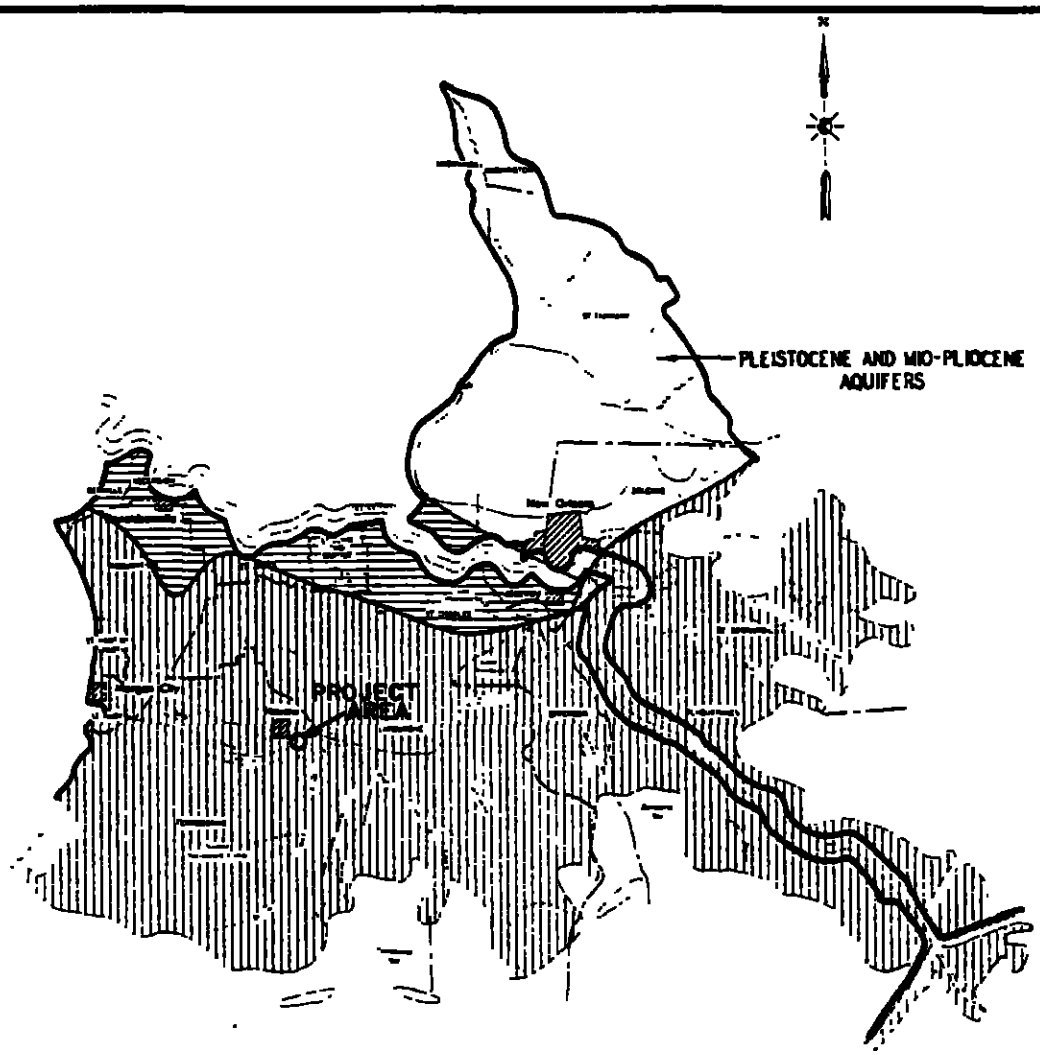
T. BAKER SMITH & SON INC.
CIVIL & CONSULTING ENGINEERS
HOUMA LOUISIANA

DESIGNED | DETAILED | TRACED
CHECKED | CHECKED | CHECKED

DATE	DESCRIPTION	BY

REVISIONS

HALF SCALE PLANS



SCALE IN MILES
10 0 10 20

GEOLOGIC SOURCES OF GROUND WATER

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION IN SECTION 12, TOWNSHIP 17 SOUTH - RANGE 17 EAST, TERREBONNE PARISH, LOUISIANA

LEGEND

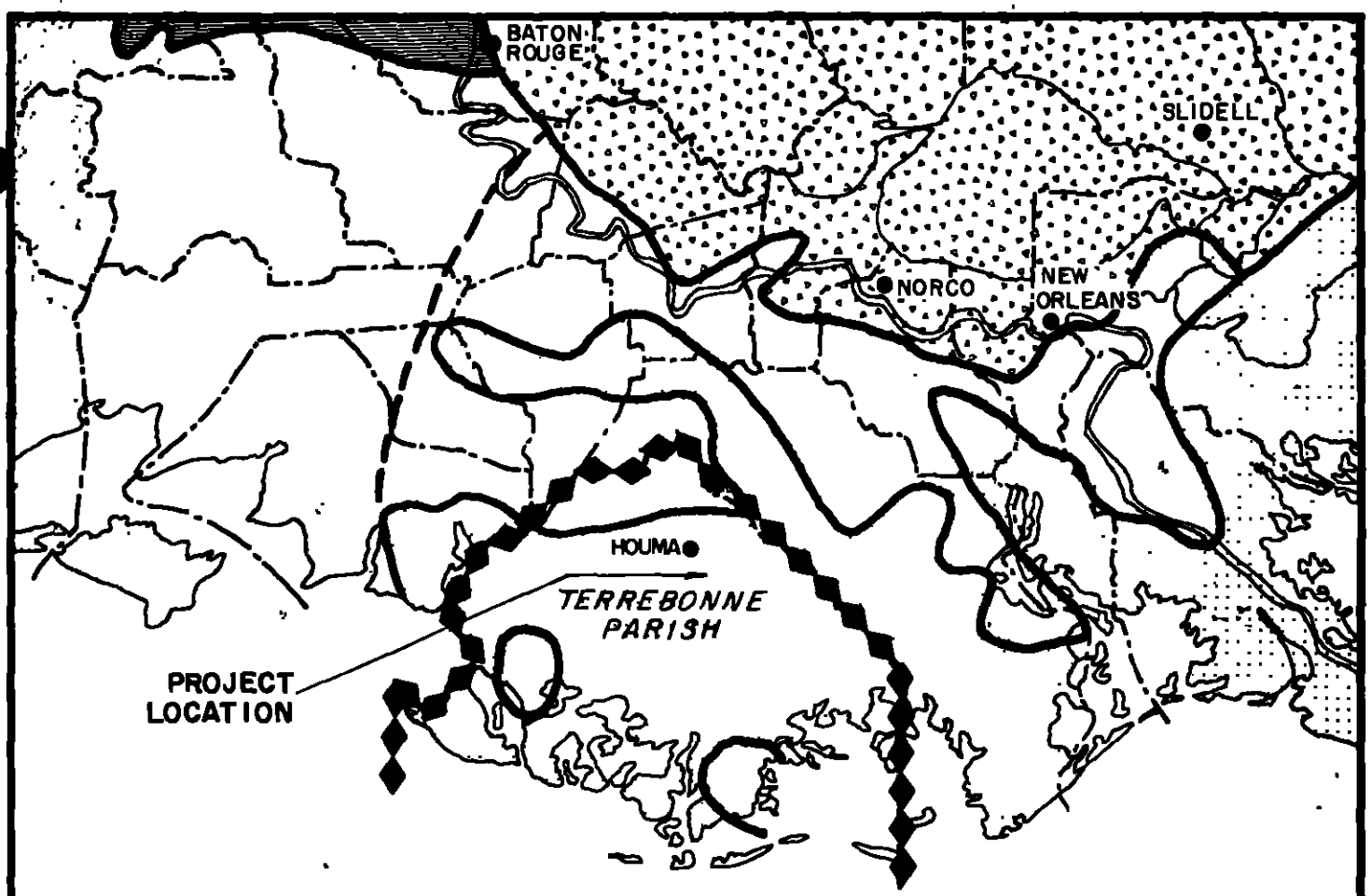
- HYDROLOGICAL BOUNDARY
- STATE BOUNDARY
- PARISH OR COUNTY BOUNDARY
- AREA WHERE FRESH GROUND WATER IS NOT AVAILABLE IN SIGNIFICANT QUANTITIES
- MISSISSIPPI RIVER VALLEY ALLUVIAL AQUIFER

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS,
& ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY: DELTA SHIPYARD
HOUMA, LOUISIANA

NOTIFICATION No. GD-343

Figure 26



Moderate To Large Supplies Of Soft Water

Moderate To Large Supplies Of Hard Water And Small To Large Supplies Of Soft Water

Moderate To Large Supplies Of Hard Water

Little Or No Potable Water

SCALE IN MILES

0 10 20 30 40 50

SOURCE: ROLLO, 1960.

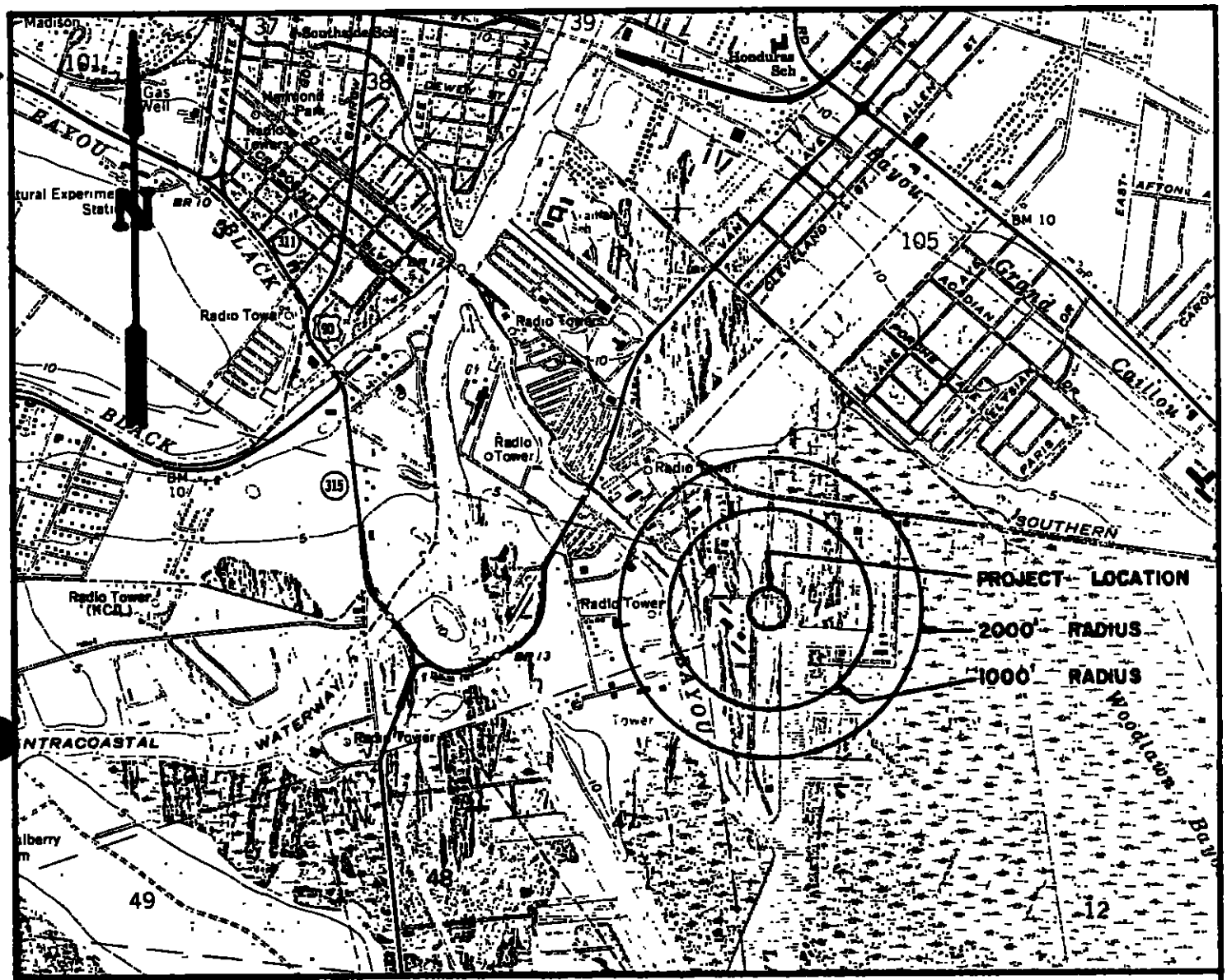
HAZARDOUS WASTE FACILITIES PERMIT APPLICATION

GENERAL AVAILABILITY OF GROUND WATER

T BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 27



SCALE IN FEET

1000' AND 2000' RADIUS FROM PERIMETER OF PROJECT LOCATION

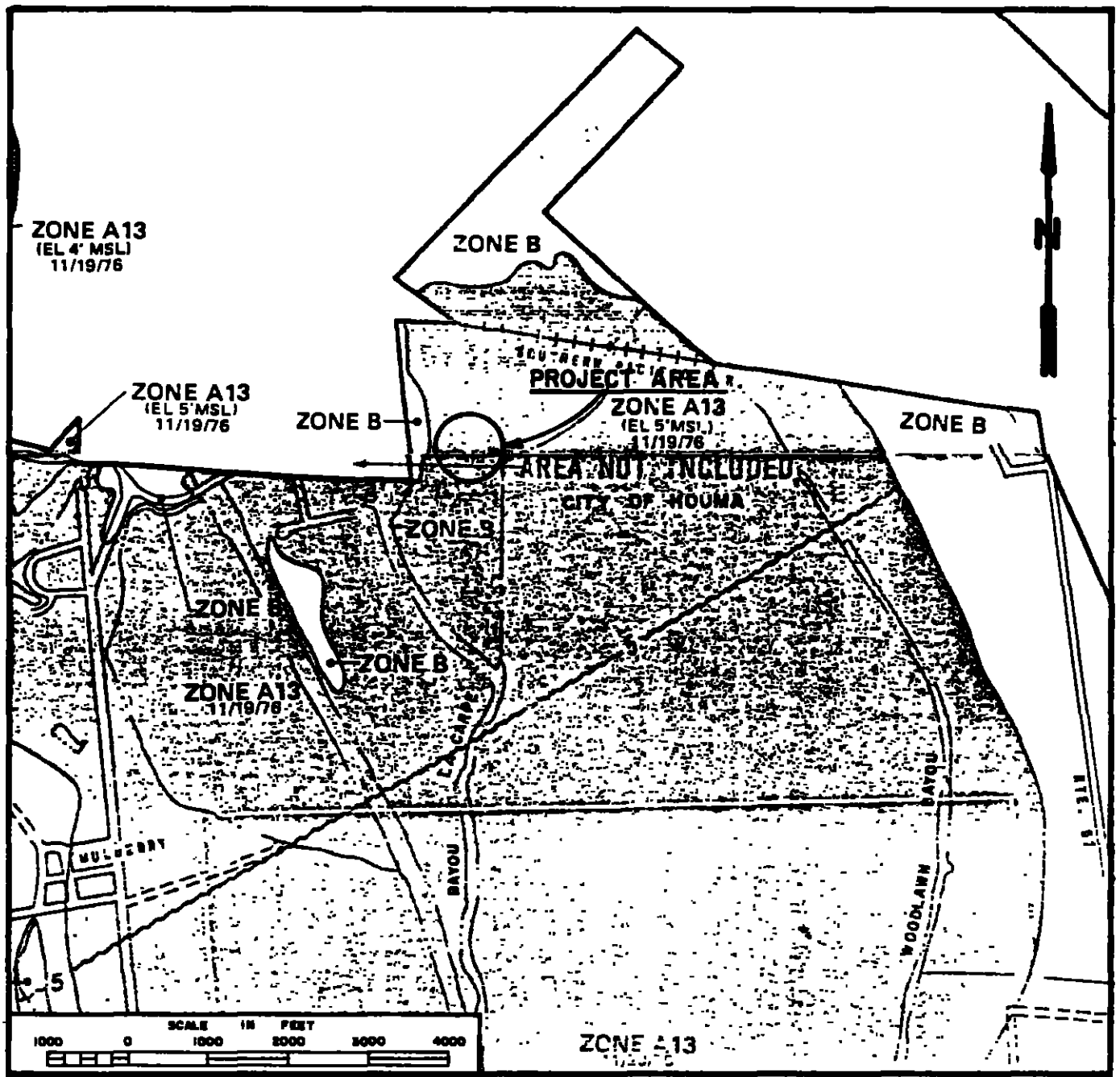
T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS, & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

Figure 28

Reference Sheet

REF+24247

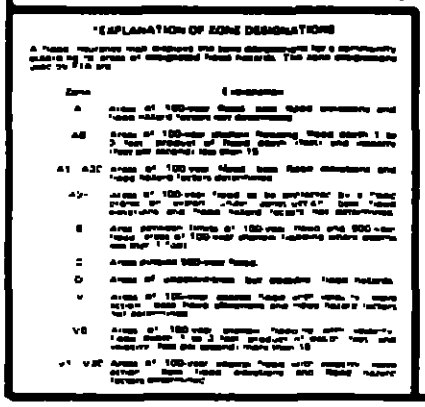
08/02/99 11:15 AM



SOURCE: DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (12/2/74)

FLOOD HAZARD BOUNDARY MAP

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION IN SECTION 12, TOWNSHIP 17 SOUTH - RANGE 17 EAST, TERREBONNE PARISH, LOUISIANA

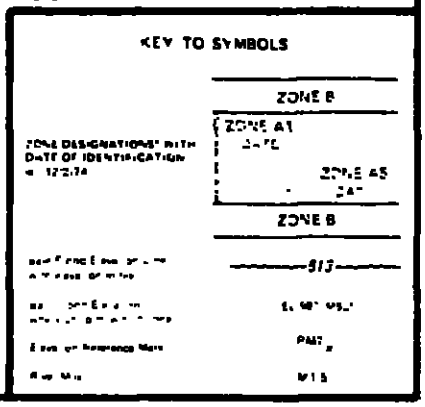


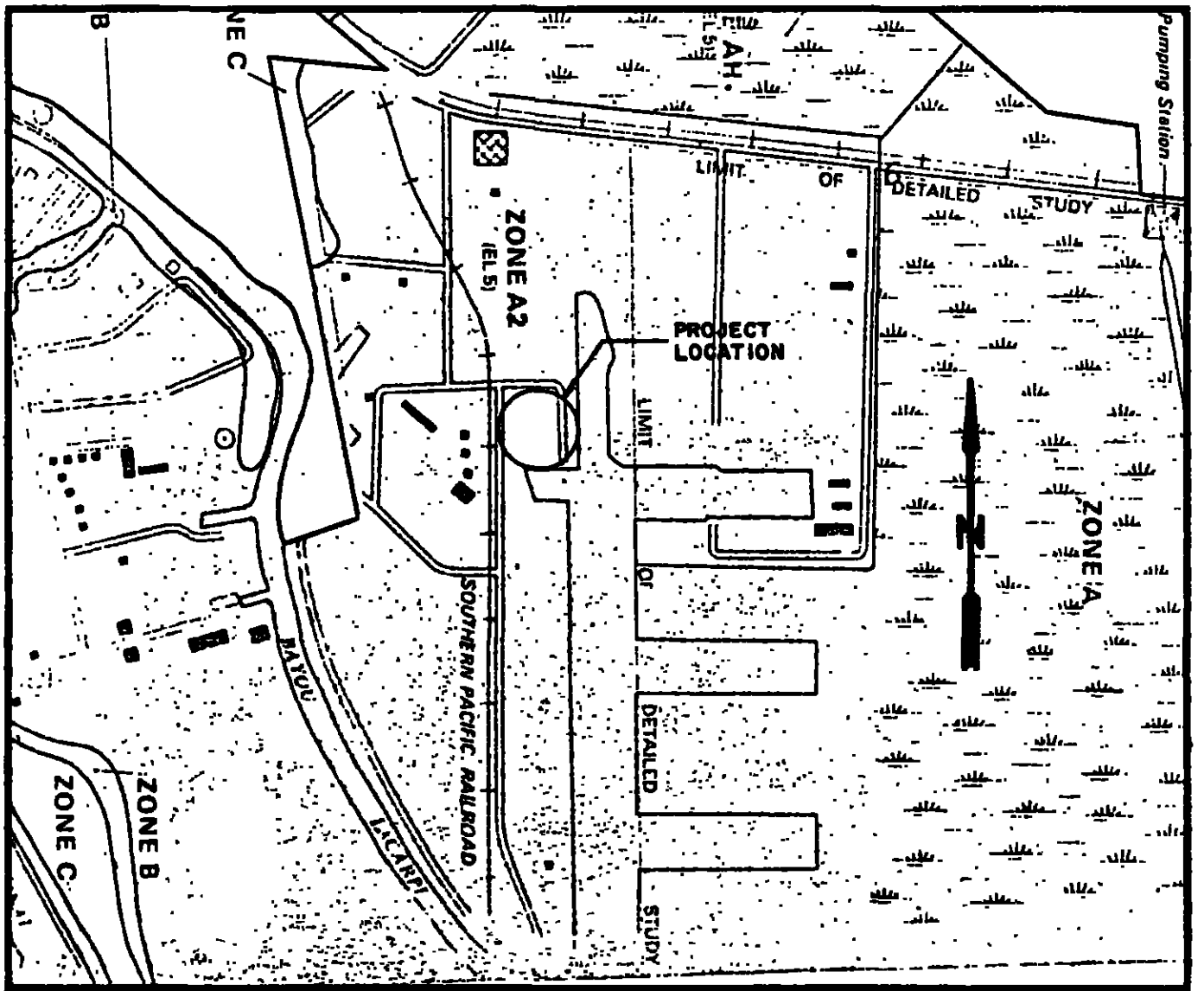
T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS,
& ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

Figure 30

APPLICATION BY: DELTA SHIPYARD
HOUMA, LOUISIANA

NOTIFICATION No. GD-343

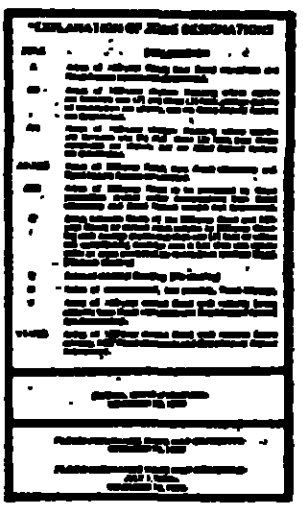




SOURCE: DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (11/19/76)

FLOOD HAZARD BOUNDARY MAP

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION IN SECTION 12, TOWNSHIP 17 SOUTH - RANGE 17 EAST, TERREBONNE PARISH, LOUISIANA



T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS, & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY: DELTA SHIPYARD
HOUMA, LOUISIANA

NOTIFICATION No. 80-343

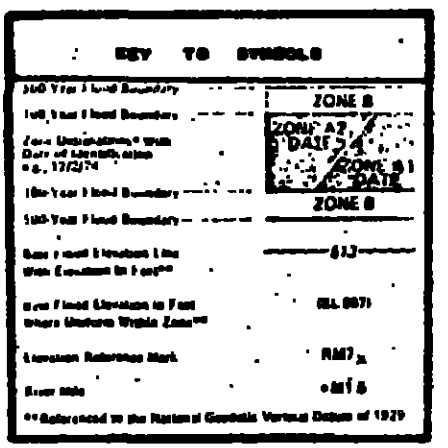
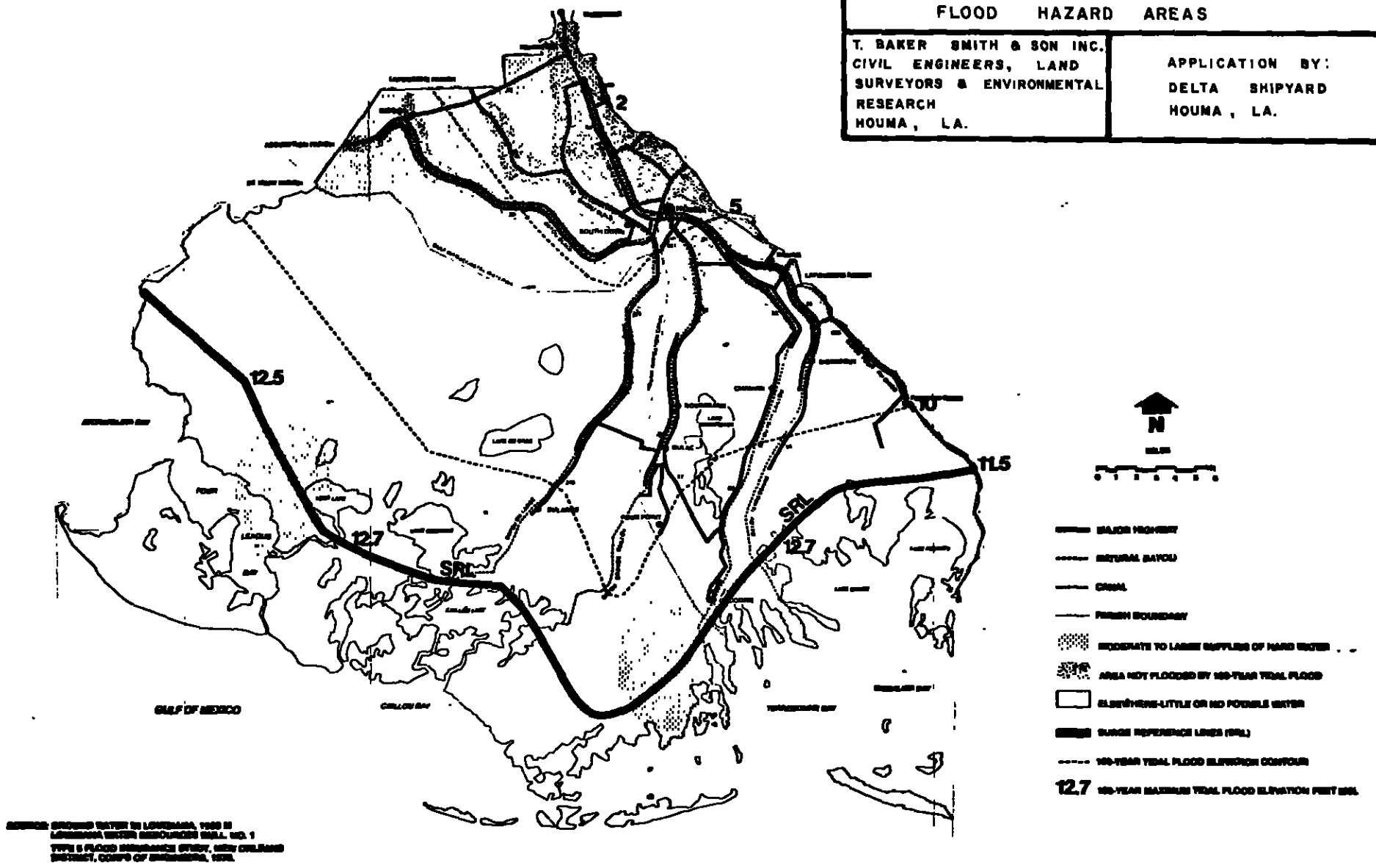


Figure 31

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION	
GROUNDWATER AVAILABILITY & FLOOD HAZARD AREAS	
T. BAKER SMITH & SON INC. CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH HOUMA, LA.	APPLICATION BY: DELTA SHIPYARD HOUMA, LA.



SOURCE : D.E.I.S.– WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA., DEC. 1978

Figure 32

Table 1
Monthly and Annual Precipitation Averages
For the Southeast Portion of Louisiana

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN.
	Inches												
1941	3.56	3.84	4.57	2.10	3.73	8.12	8.10	4.53	7.07	4.63	2.57	4.60	57.42
1942	1.87	9.71	6.66	1.93	5.50	11.51	7.74	8.78	7.12	6.25	1.46	4.75	73.28
1943	2.72	1.78	7.43	1.71	3.98	5.45	6.85	4.48	14.82	0.93	2.81	4.20	57.16
1944	9.28	4.42	4.60	8.14	4.71	3.22	5.64	7.11	6.21	1.00	10.64	2.54	57.45
1945	4.73	4.91	2.40	3.50	3.26	3.53	11.37	8.31	7.00	3.27	1.81	7.12	61.21
1946	5.40	3.50	12.24	2.86	10.79	9.86	7.89	4.26	11.55	0.56	4.47	3.41	76.79
1947	8.37	3.38	7.35	7.52	4.75	4.47	2.88	5.86	4.51	2.11	12.43	7.96	71.59
1948	4.95	1.54	13.96	2.30	3.45	2.73	7.19	6.15	14.59	1.21	12.49	4.89	75.45
1949	2.17	3.49	9.11	8.93	1.35	5.44	8.47	6.67	8.73	4.29	0.39	5.52	64.56
1950	2.39	3.15	6.25	6.94	2.74	5.86	8.36	2.95	2.72	2.26	1.00	6.79	51.41
1951	3.60	2.20	6.85	6.30	2.70	2.79	6.66	3.65	7.39	1.38	3.43	3.17	50.12
1952	2.58	8.98	2.96	5.72	5.42	1.75	7.31	5.96	4.37	0.10	2.41	4.98	52.54
1953	2.23	6.26	3.78	6.32	1.82	8.03	9.03	7.77	2.07	0.53	8.63	11.11	67.58
1954	4.36	1.16	1.76	2.14	4.14	3.82	11.24	2.92	7.26	4.22	2.50	5.59	51.11
1955	5.35	3.56	0.25	4.34	4.08	3.29	9.69	3.60	5.82	2.19	4.08	3.26	55.51
1956	3.67	7.17	3.06	3.61	4.32	9.06	7.02	4.80	11.33	2.65	1.50	5.59	63.78
1957	1.31	3.34	7.78	7.29	2.96	7.79	5.21	6.58	11.55	2.62	5.83	2.63	64.89
1958	7.49	4.64	7.02	2.81	7.65	5.24	9.00	7.73	8.69	2.39	1.44	1.57	65.67
1959	3.40	8.80	3.63	4.22	9.17	9.59	11.71	6.52	4.49	9.14	1.44	2.06	74.17
1960	4.29	5.20	3.19	5.28	3.77	1.77	5.26	8.77	5.66	5.19	0.32	4.29	52.99
1961	6.32	7.14	8.35	3.49	4.76	9.49	7.08	8.08	7.32	1.72	7.11	6.42	77.28
1962	4.30	1.14	2.07	2.24	0.67	6.87	3.99	5.00	4.23	3.03	2.84	3.24	39.62
1963	4.17	5.12	0.91	0.88	2.12	7.59	6.34	3.38	7.08	0.04	8.72	5.24	51.59
1964	7.84	7.24	5.47	5.06	3.10	4.03	9.96	5.56	3.93	5.68	3.51	2.19	63.57
1965	4.97	6.01	3.69	1.01	2.96	4.06	6.58	7.47	9.64	1.18	1.79	7.19	56.55
1966	11.77	11.07	1.96	5.97	9.13	2.72	9.14	6.93	6.67	3.28	1.44	6.55	76.63
1967	4.31	5.74	2.23	1.77	4.04	4.60	6.68	9.36	5.93	5.37	0.29	10.12	60.44
1968	1.46	3.04	2.59	3.41	4.73	3.57	5.30	5.02	2.96	1.67	4.26	6.42	44.43
1969	3.63	4.13	6.74	6.06	6.92	1.47	8.25	6.58	2.75	0.99	1.13	5.48	54.13
1970	3.38	2.22	7.49	0.81	5.78	4.06	6.11	8.26	6.66	6.31	1.07	3.00	55.15
1979 (Houma)	5.67	11.20	1.49	8.36	9.78	6.03	9.63	8.29	4.97	1.57	4.59	2.09	73.67
Normal Division	4.53	4.80	5.21	4.16	4.48	5.39	7.54	6.30	7.00	2.87	3.79	5.06	61.14
Houma	4.69	4.61	5.24	4.35	4.79	6.72	8.13	7.20	7.66	3.32	3.89	5.12	65.72
Schriever	4.58	5.27	5.50	4.73	5.64	5.89	8.47	6.15	7.63	3.03	4.09	5.58	66.56
Morgan City	4.46	4.92	4.51	4.43	4.81	5.66	8.36	7.10	7.03	3.67	4.14	5.24	64.33

SOURCE U S DEPT OF COMMERCE, N O.A A , ENVIRONMENTAL DATA SERVICES

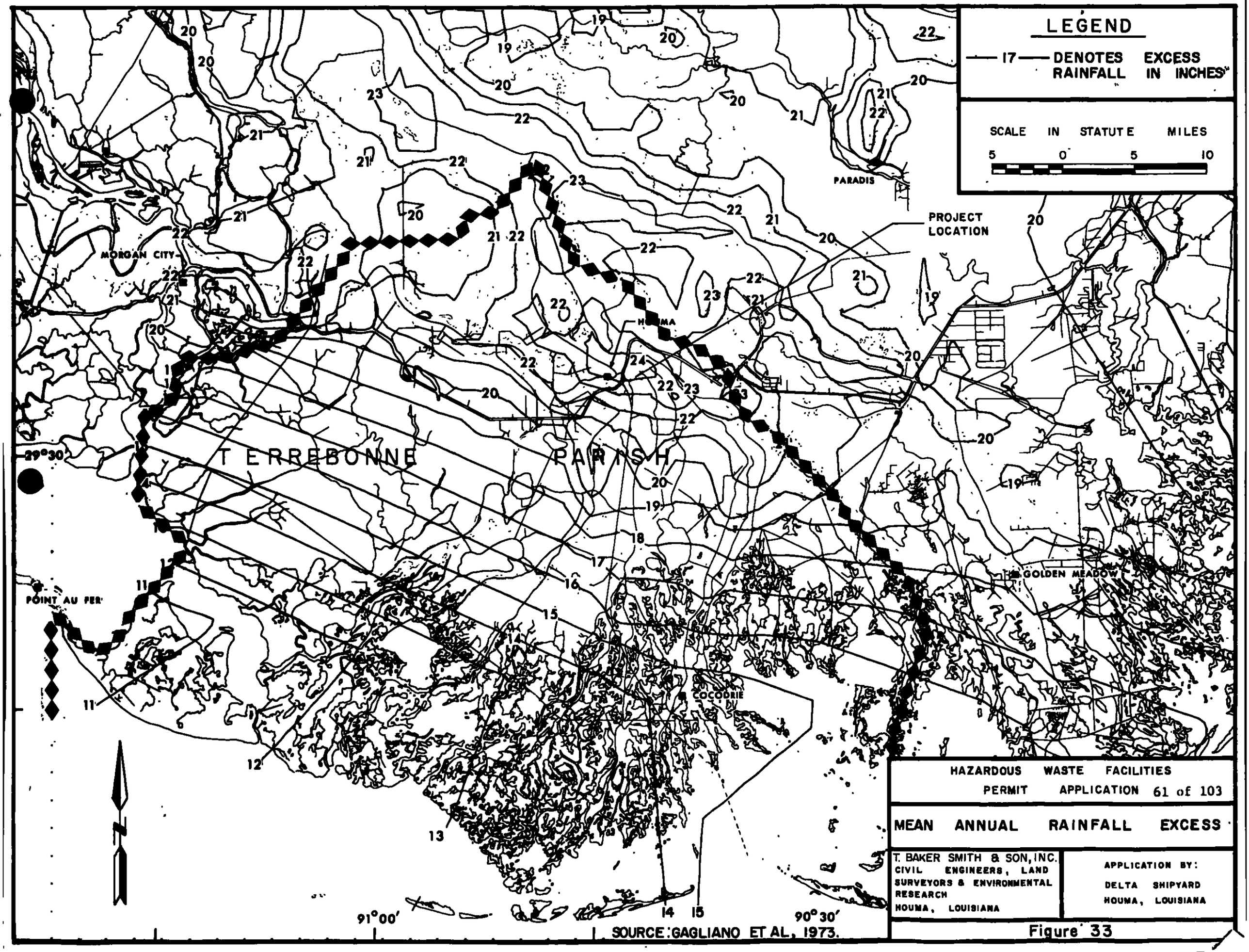
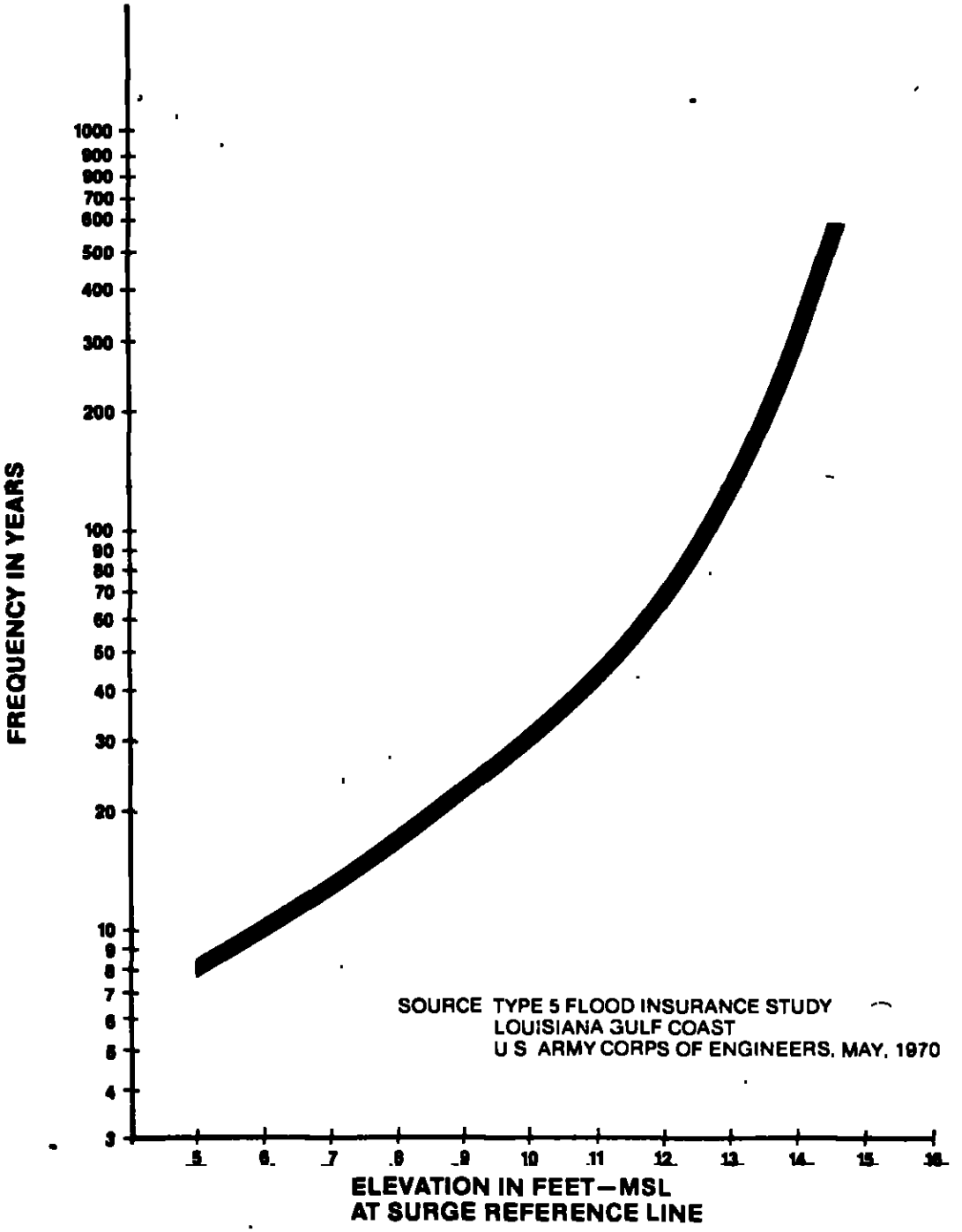

LEGEND
17 DENOTES EXCESS RAINFALL IN INCHES
SCALE IN STATUTE MILES
5 0 5 10
PROJECT LOCATION
PARADIS
MORGAN CITY
HOUMA
TERREBONNE PARISH
GOLDEN MEADOW
POINT AU FER
COCODRIE
29°30'
91°00'
90°30'
SOURCE: GAGLIANO ET AL, 1973.
HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION 61 of 103
MEAN ANNUAL RAINFALL EXCESS
T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA
APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA
Figure 33

Table 2
Monthly and Annual Temperature Averages
For Southeast Louisiana

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN.
						°F							
1941	55.8	53.3	57.5	70.2	75.0	80.3	82.5	84.1	81.1	77.9	60.0	58.9	69.7
1942	51.0	53.3	60.2	67.9	74.5	80.4	82.4	81.7	77.2	71.9	64.1	57.4	68.5
1943	54.9	57.6	60.8	69.3	77.8	82.0	82.8	83.3	76.9	67.8	58.5	55.1	68.9
1944	54.1	63.8	63.5	68.5	75.3	82.9	82.8	82.7	80.5	69.1	63.7	55.3	70.2
1945	54.5	61.3	68.8	71.1	73.6	81.7	81.2	82.6	80.3	70.0	64.9	52.4	70.2
1946	54.6	57.4	64.6	70.5	75.2	78.7	81.7	82.6	78.0	72.7	66.3	59.2	70.1
1947	56.8	50.4	57.2	70.5	75.7	81.8	80.9	82.4	80.3	75.5	61.2	55.9	69.1
1948	47.6	58.6	64.9	72.0	76.7	81.9	82.9	81.9	76.5	69.6	63.8	60.6	69.8
1949	60.2	62.1	62.3	67.4	76.5	81.3	81.9	81.9	7.68	74.8	60.3	59.9	70.6
1950	67.5	61.5	60.1	65.3	76.5	81.0	80.6	81.7	78.9	71.7	58.4	53.1	69.7
1951	55.9	56.7	63.1	66.0	74.6	81.1	82.8	85.2	80.2	73.1	57.3	60.0	69.7
1952	63.0	59.4	61.2	65.9	75.3	82.8	82.5	82.8	77.0	64.3	59.8	55.7	69.1
1953	57.3	57.3	66.8	68.8	77.5	82.8	81.9	81.8	78.7	71.5	61.1	54.4	70.0
1954	57.5	60.4	60.8	72.1	72.0	80.9	82.6	83.4	80.7	71.9	59.3	56.0	69.8
1955	54.5	58.7	65.5	71.0	77.6	78.5	81.4	82.2	80.6	70.5	61.4	56.8	69.9
1956	52.6	61.8	62.9	67.7	77.0	78.8	81.9	82.0	78.0	72.7	61.5	62.2	69.9
1957	61.2	64.1	61.6	69.8	77.0	81.1	84.0	82.1	77.7	67.4	62.7	56.0	70.4
1958	49.3	48.4	58.6	68.9	75.5	81.7	81.9	81.8	80.5	70.5	64.6	53.2	67.9
1959	51.1	58.2	59.8	67.2	76.6	80.5	81.5	82.5	79.9	73.4	59.6	55.7	68.8
1960	53.0	51.2	57.3	69.2	72.8	81.3	84.4	81.5	78.8	72.2	64.2	53.3	68.3
1961	48.8	59.4	65.7	65.5	73.6	78.6	81.1	80.4	79.1	69.9	62.6	58.0	68.6
1962	51.6	63.8	58.6	66.9	77.2	80.7	84.5	83.7	80.2	73.9	59.6	53.4	69.5
1963	49.6	50.7	65.1	72.4	76.8	80.6	82.3	82.8	79.2	72.8	62.3	47.7	68.5
1964	51.2	51.7	61.4	70.7	76.0	80.3	81.2	83.2	79.6	67.1	65.2	57.7	68.8
1965	56.6	55.2	59.5	72.3	75.8	80.1	81.9	80.6	78.5	68.7	66.4	56.7	69.4
1966	49.5	54.1	60.1	69.0	75.3	78.4	82.7	81.1	78.2	68.7	63.7	54.2	67.9
1967	53.6	54.4	64.3	73.2	74.2	80.5	80.5	79.9	75.8	67.6	61.4	59.3	68.7
1968	52.5	48.7	57.7	70.3	74.9	81.0	81.3	81.8	77.6	71.7	58.9	53.8	67.5
1969	54.8	55.4	55.1	69.0	74.3	81.4	83.1	81.2	77.4	71.0	59.5	55.2	68.1
1970	48.0	52.3	60.2	71.0	74.1	79.2	81.4	81.9	80.5	69.3	57.1	59.4	67.9
1979 (Houma)	47.0	53.0	63.0	71.0	74.0	80.0	82.0	82.0	77.0	70.0	57.0	54.0	67.5
Normal Division	54.3	56.7	61.5	69.3	75.5	80.7	82.2	82.2	78.9	71.0	61.6	56.2	69.2
Houma	55.2	57.7	62.3	69.8	75.4	80.3	81.6	81.6	78.3	70.3	61.6	57.0	69.3
Schriever	54.3	56.7	61.4	69.0	74.8	80.1	81.7	81.7	78.1	69.7	60.8	56.0	68.7
Morgan City	54.3	56.8	61.8	69.9	75.9	81.1	82.4	82.4	79.1	70.9	61.4	56.1	69.3

SOURCE U.S. DEPT OF COMMERCE, N.O.A.A., ENVIRONMENTAL DATA SERVICES



HAZARDOUS WASTE FACILITIES PERMIT APPLICATION	
HURRICANE SURGE ELEVATION FREQUENCY CURVES	
T. BAKER SMITH & SON INC. CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH HOUMA, LA	APPLICATION BY: DELTA SHIPYARD HOUMA, LA.

SOURCE. D E.I.S — WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA, DEC 1978

Figure 34

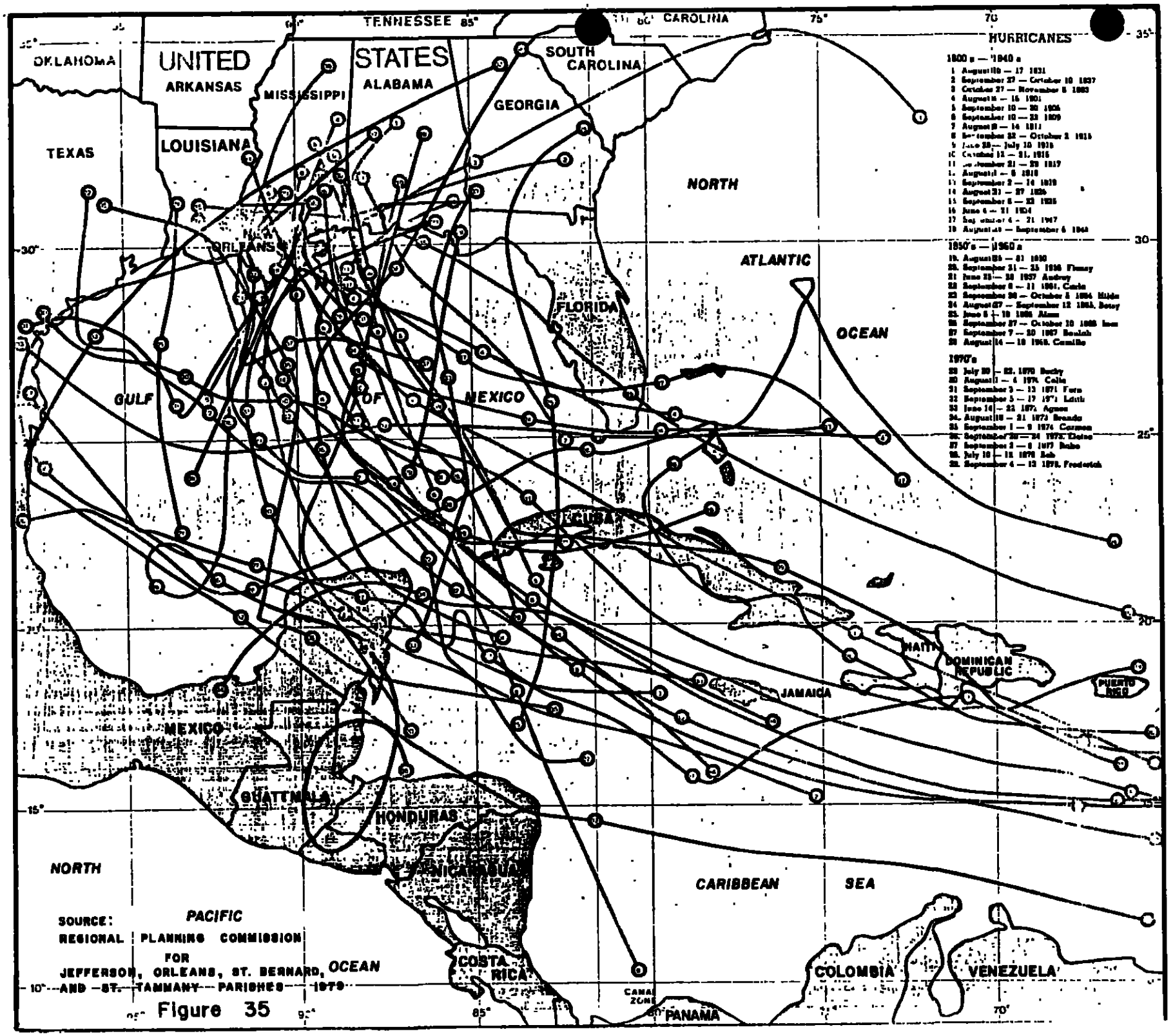
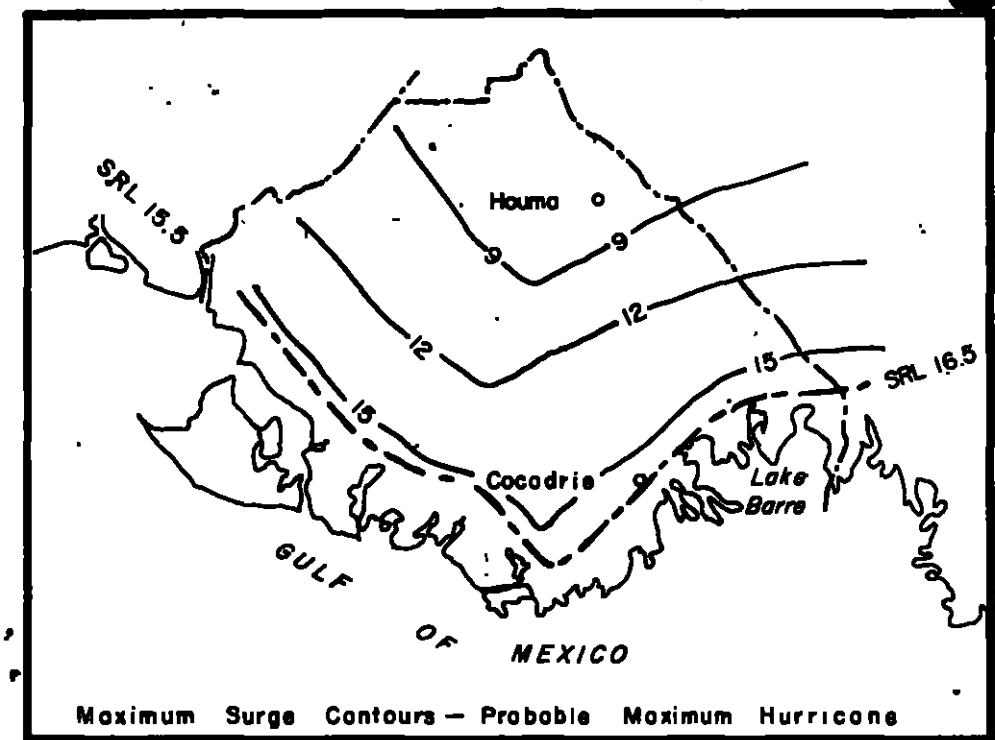
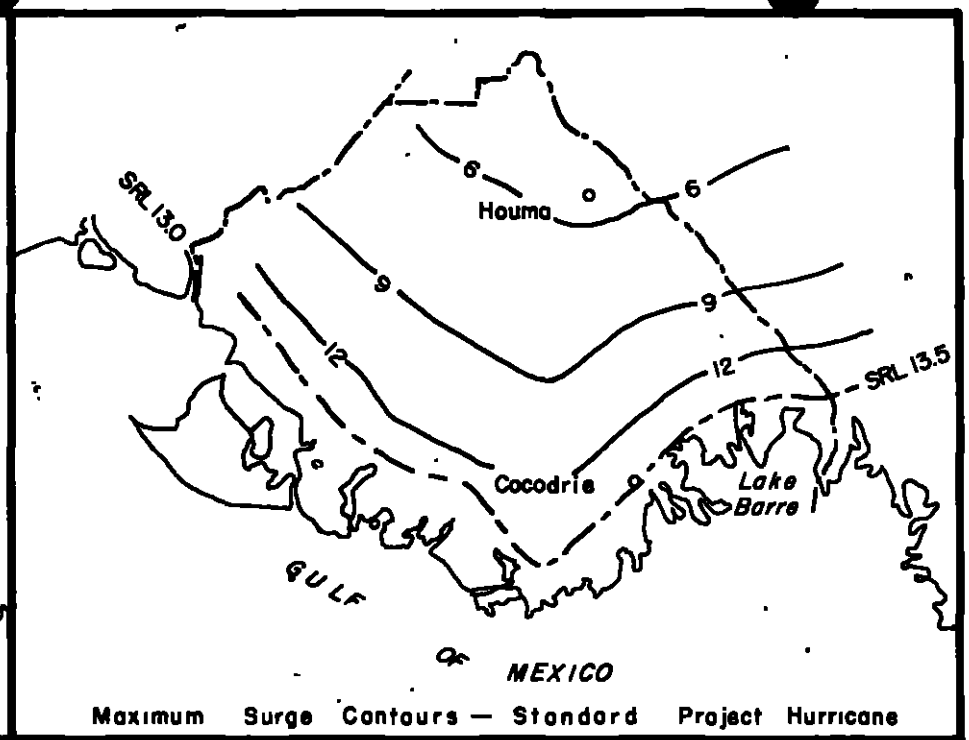

HURRICANES
1800's — 1940's
1950's — 1960's
1970's
UNITED STATES
OKLAHOMA
ARKANSAS
MISSISSIPPI
ALABAMA
GEORGIA
SOUTH CAROLINA
TENNESSEE
CAROLINA
TEXAS
LOUISIANA
NEW ORLEANS
FLORIDA
GULF OF MEXICO
NORTH ATLANTIC OCEAN
CUBA
HAITI
DOMINICAN REPUBLIC
JAMAICA
PUERTO RICO
MEXICO
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
CANAL ZONE
COLOMBIA
VENEZUELA
CARIBBEAN SEA
NORTH PACIFIC OCEAN
SOURCE: REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, ST. BERNARD, AND ST. TAMMANY PARISHES 1979

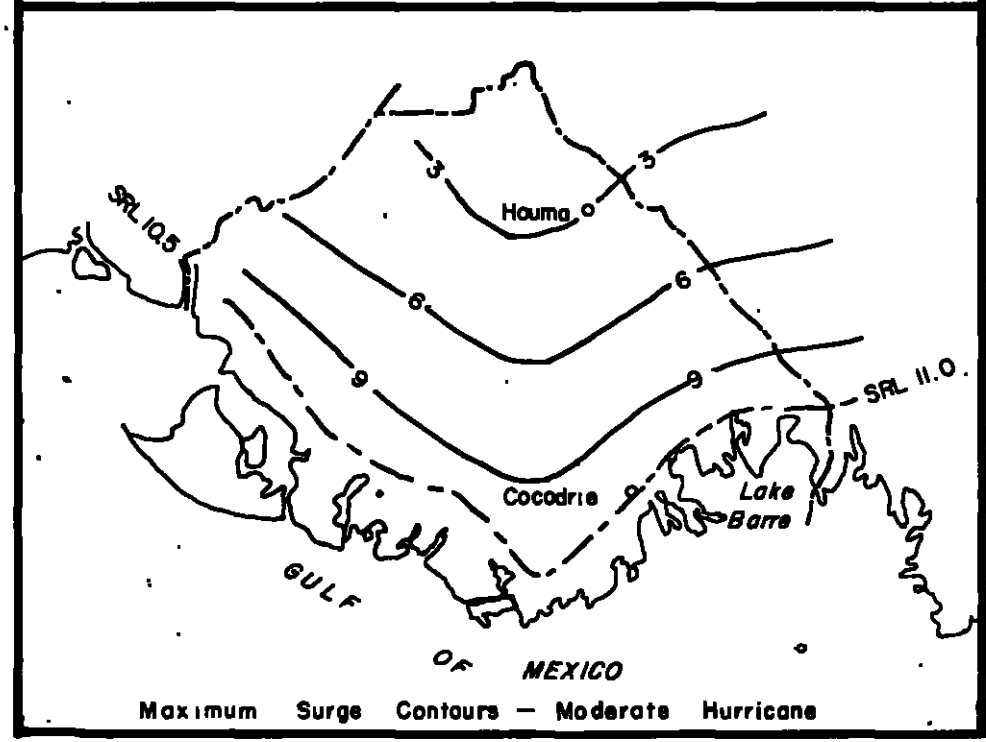
Figure 35



Maximum Surge Contours — Probable Maximum Hurricane



Maximum Surge Contours — Standard Project Hurricane



Maximum Surge Contours — Moderate Hurricane

LEGEND

—— 6 —— Isoline of Maximum Surge Surface Elevation

—— - —— SRL-Surge Reference Line

N

SOURCE: U S ARMY CORPS OF ENGINEERS, 1964.

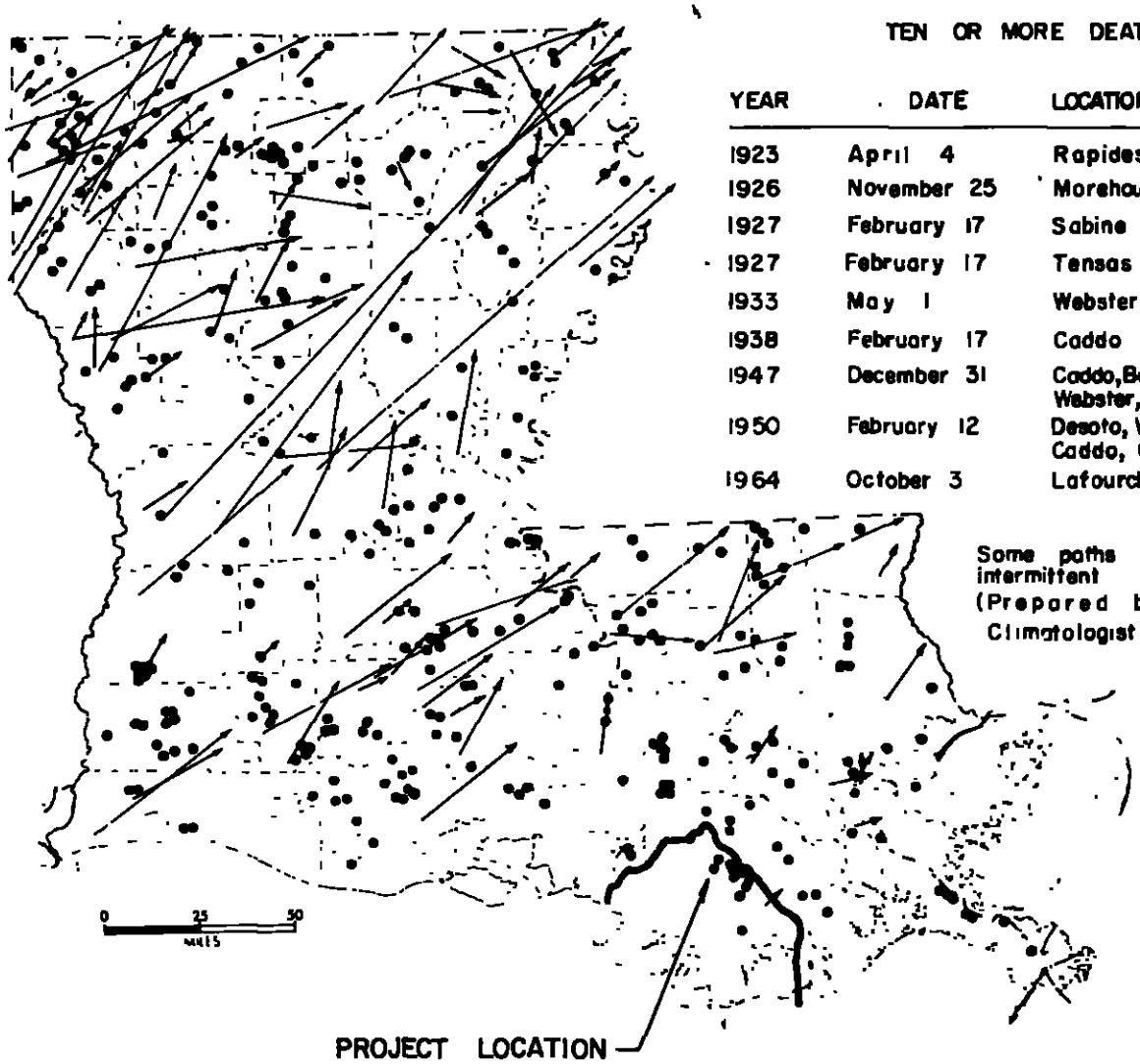
HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION

PREDICTED SURGE CONTOURS

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 36



TEN OR MORE DEATHS

YEAR	DATE	LOCATION (PARISH)	NUMBER DEATHS
1923	April 4	Rapides	14
1926	November 25	Morehouse	11
1927	February 17	Sabine	17
1927	February 17	Tensas	14
1933	May 1	Webster	23
1938	February 17	Caddo	21
1947	December 31	Caddo, Bossier, Webster, Claiborne	18
1950	February 12	Desoto, Webster, Caddo, Claiborne	18
1964	October 3	Lafourche	22

Some paths shown were intermittent
(Prepared by G W Cry, La. State Climatologist, N.O.A.A.)

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION

TORNADO OCCURANCES, 1916—1970

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

SOURCE: NEWTON, 1972.

Figure 37-38

Reference Sheet

REF+24248

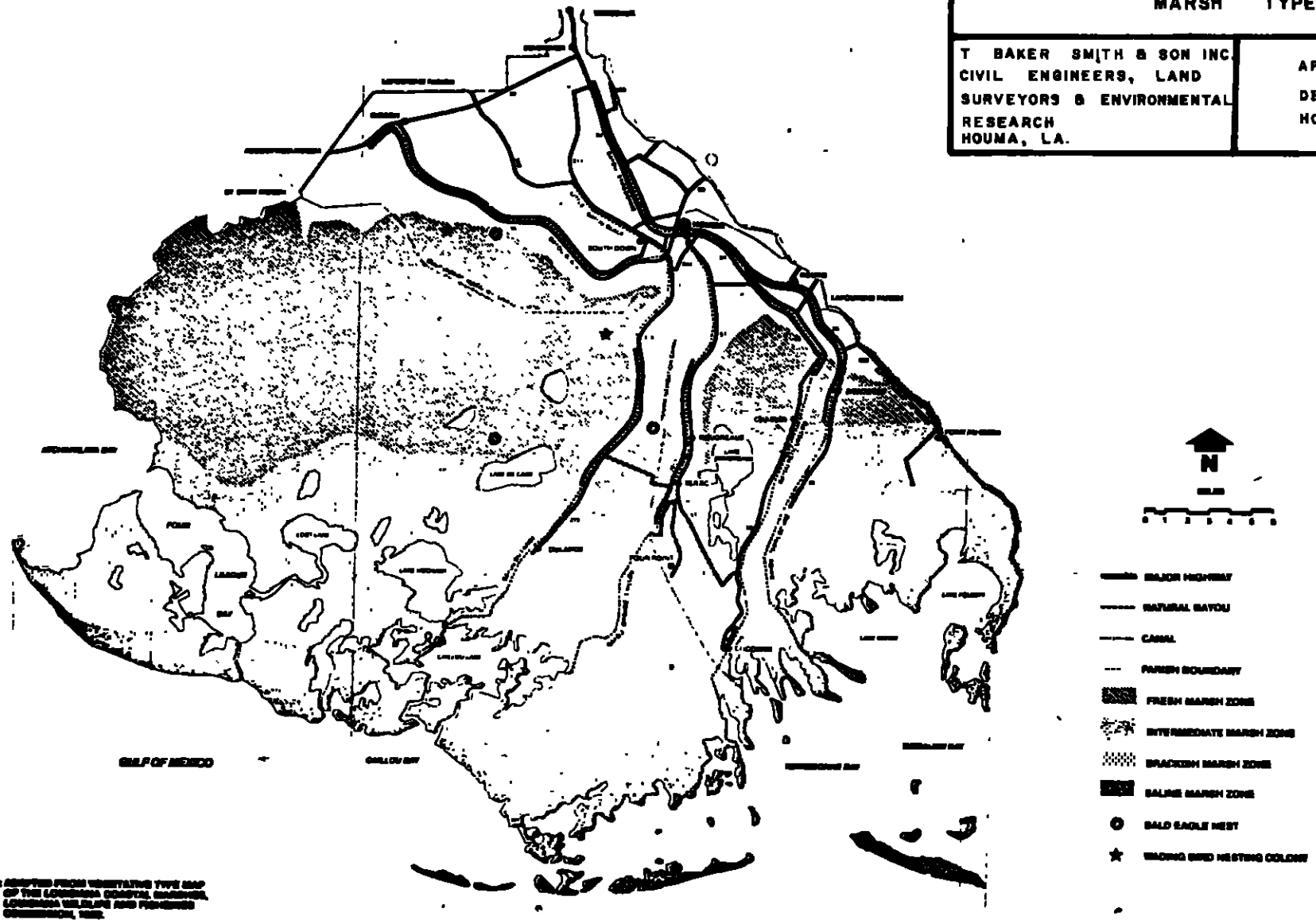
08/02/99 11:15 AM

HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION

MARSH TYPES

T BAKER SMITH & SON INC.
CIVIL ENGINEERS, LAND
SURVEYORS & ENVIRONMENTAL
RESEARCH
HOUMA, LA.

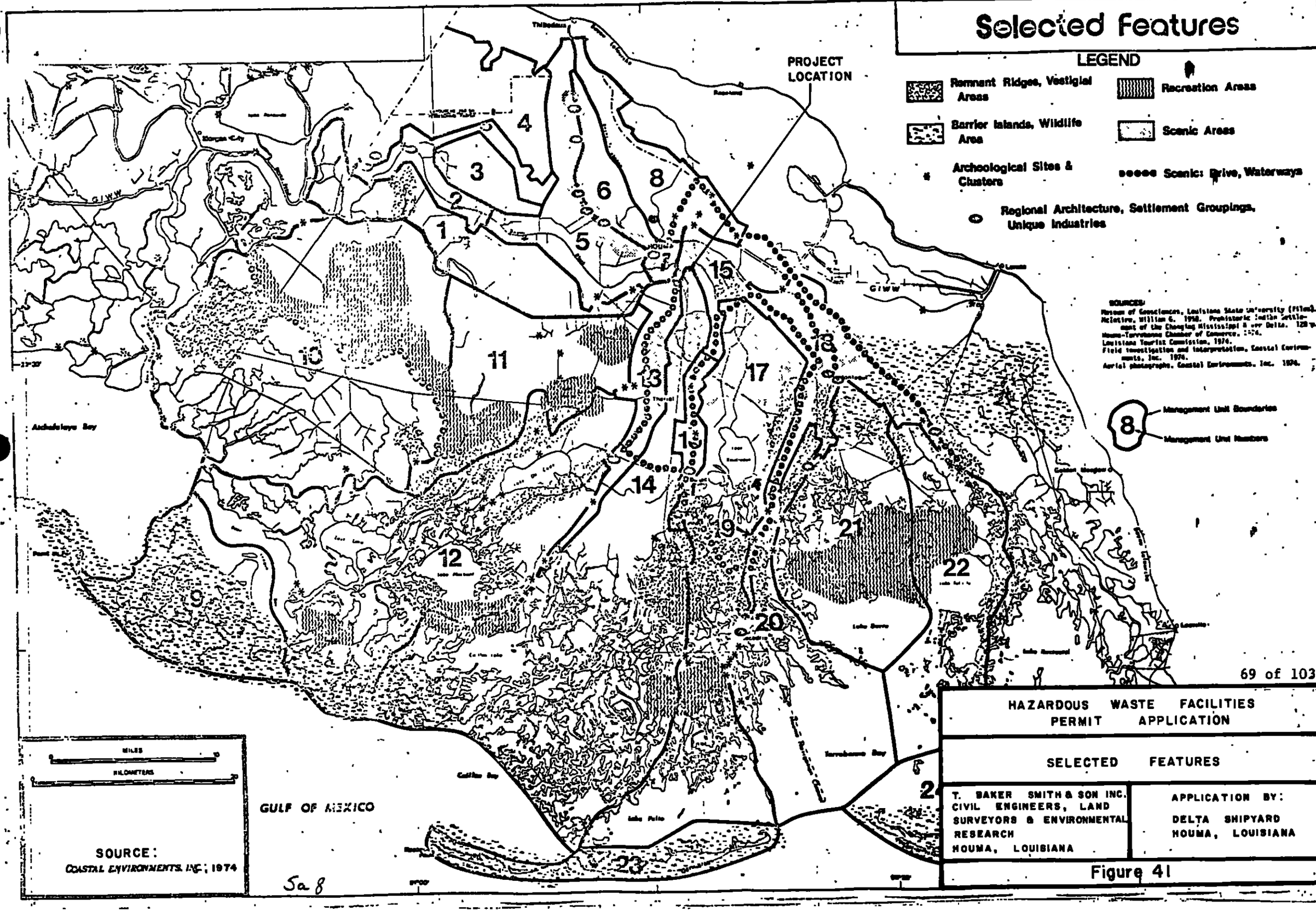
APPLICATION BY:
DELTA SHIPYARD
HOUMA, LA.



SOURCE: D E I.S — WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA, DEC 1978

Figure 40

Selected Features



SOURCES:
Bureau of Conservation, Louisiana State University (Films).
McIntire, William G. 1958. Prehistoric Indian Settlement of the Changing Mississippi River Delta. 128 p.
Houma-Terrebonne Chamber of Commerce. 1974.
Louisiana Tourist Commission, 1974.
Field investigation and interpretation, Coastal Environments, Inc. 1974.
Aerial photographs, Coastal Environments, Inc. 1974.

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION

SELECTED FEATURES

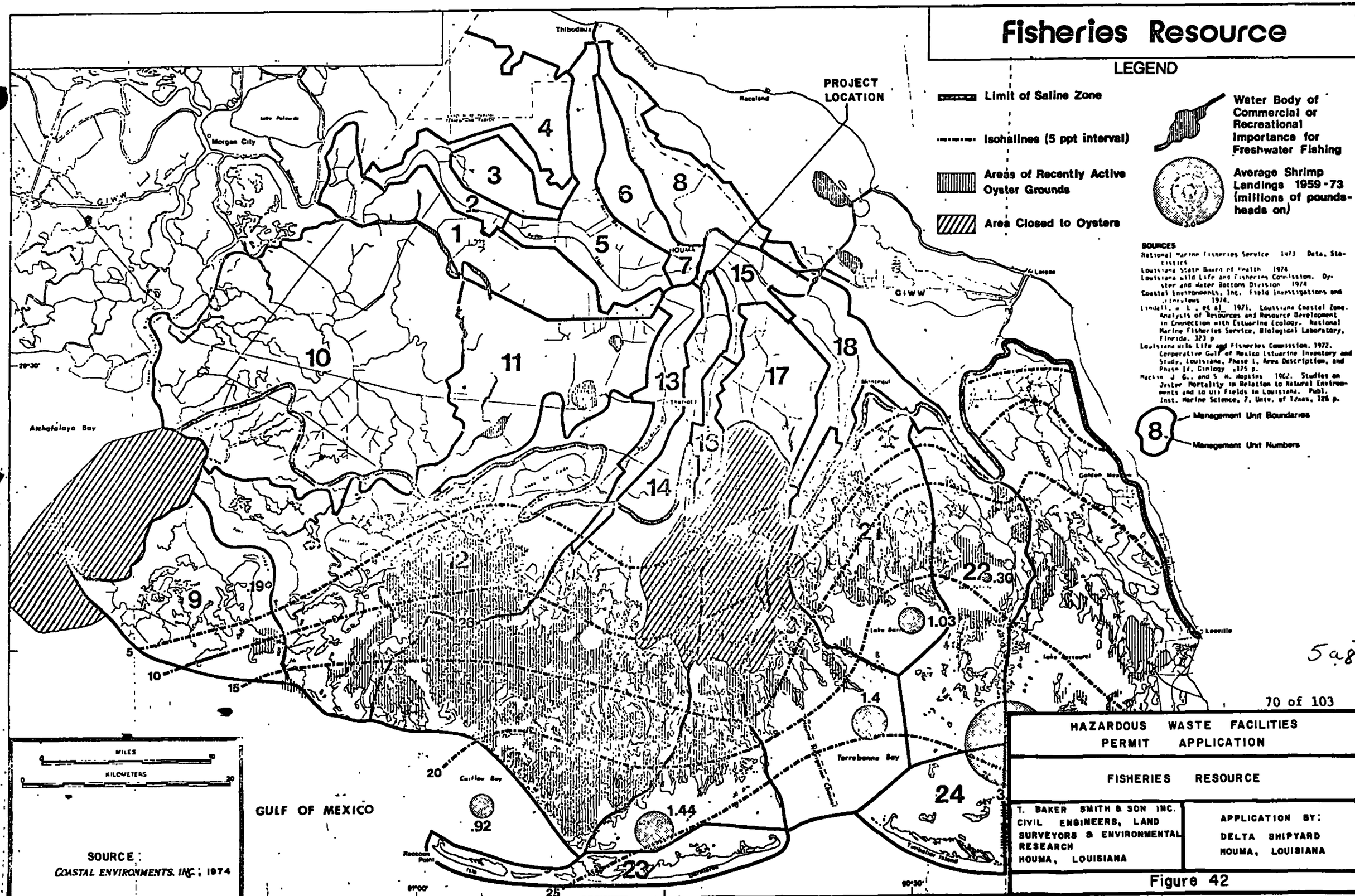
T. BAKER SMITH & SON INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 41

Sa 8

Fisheries Resource



SOURCES

National Marine Fisheries Service 1973 Data, Statistics

Louisiana State Board of Health 1974

Louisiana Wild Life and Fisheries Commission. Oyster and Water Bottoms Division 1974

Coastal Environments, Inc. Field Investigations and Interviews 1974.

Lindall, W. L., et al. 1971. Louisiana Coastal Zone. Analysis of Resources and Resource Development in Connection with Estuarine Ecology. National Marine Fisheries Service, Biological Laboratory, Florida. 323 p.

Louisiana Wild Life and Fisheries Commission. 1972. Cooperative Gulf of Mexico Estuarine Inventory and Study, Louisiana, Phase I, Area Description, and Phase II, Biology. 175 p.

Mackin, J. G., and S. H. Hopkins 1962. Studies on Oyster Mortality in Relation to Natural Environments and to Oil Fields in Louisiana. Publ. Inst. Marine Science, 7, Univ. of Texas, 126 p.

5 of 8

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION

FISHERIES RESOURCE

T. BAKER SMITH & SON INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA

APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 42

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION	
MEAN SALINITY CONDITIONS AND LOCATION OF OYSTER GROUNDS IN TERREBONNE PARISH	
T. BAKER SMITH & SON INC CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH HOUMA, LA.	APPLICATION BY: DELTA SHIPYARD HOUMA, LA.

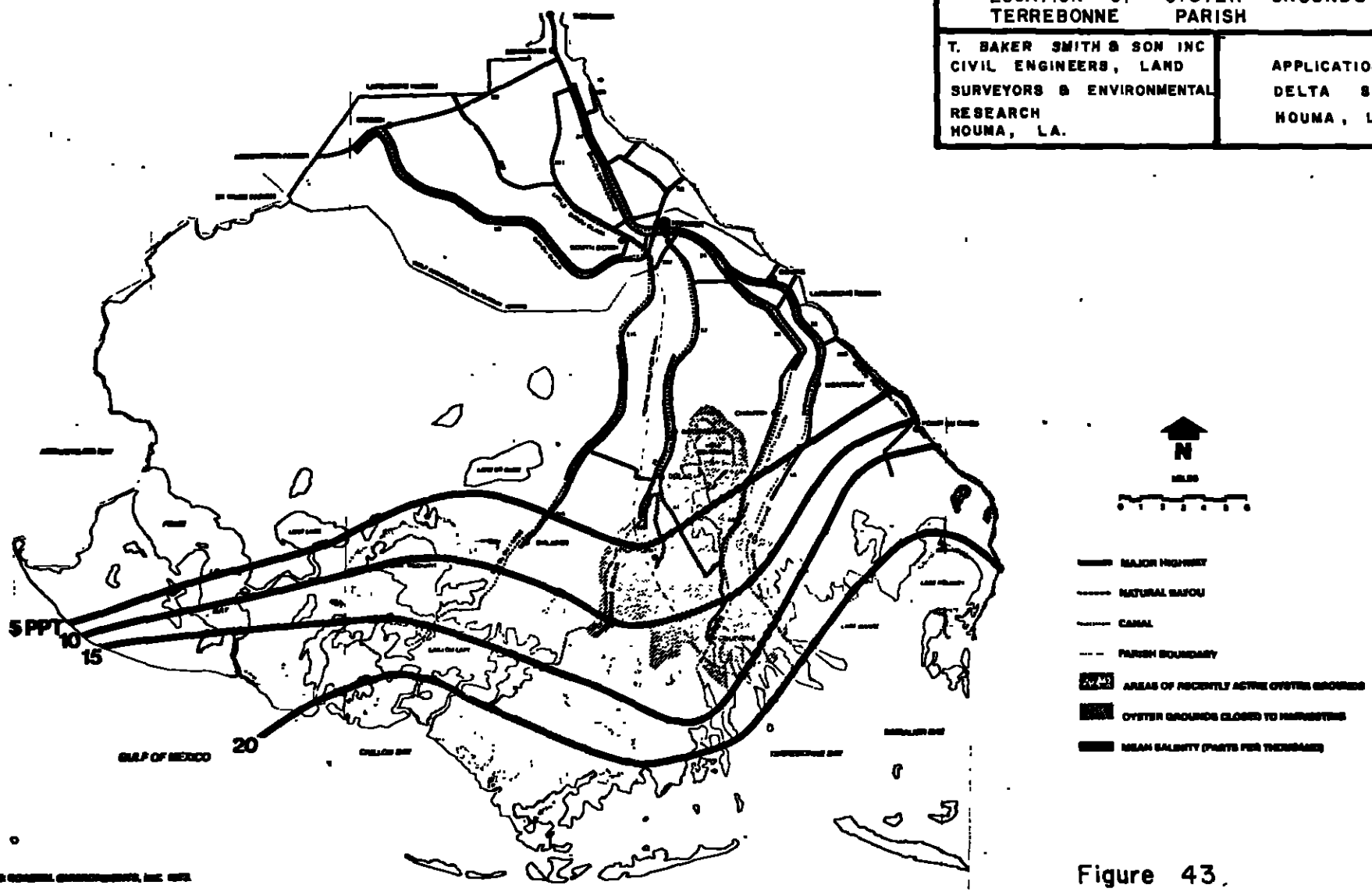


Figure 43.

SOURCE: D.E.I.S.— WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA., DEC. 1978

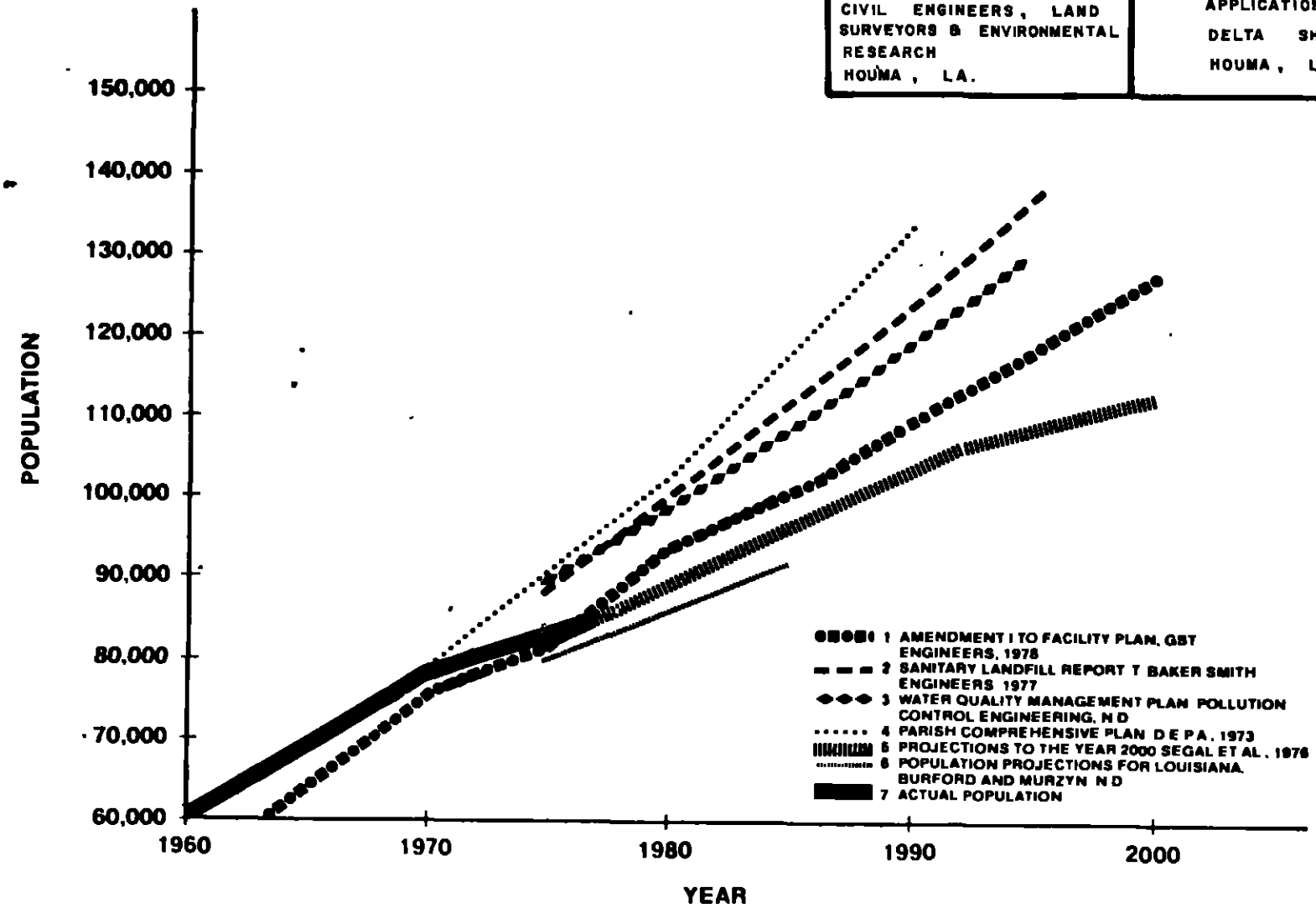
TABLE 3

POPULATION TRENDS BY WARD
TERREBONNE PARISH

Ward	1960 Population	Average Annual Gain 1960-1970 (percent)	1970 Population	Average Annual Gain 1970-1977 (percent)	1977 Population
1	5,040	9.1	9,635	3.9	12,240
2	1,738	-2.3	1,345	-1.2	1,228
3	34,586	1.9	41,243	1.1	44,423
4	3,976	1.9	4,739	1.2	5,138
5	1,499	3.7	2,053	8.8	3,313
6	2,938	0.7	3,139	0.7	3,286
7	5,368	2.2	6,573	1.0	7,055
8	2,183	0.9	2,390	4.1	3,078
9	1,590	2.2	1,934	5.7	2,711
10	1,853	6.2	2,998	1.4	3,284
TOTAL	60,771	2.5	76,049	1.8	85,816

Source: Terrebonne Parish Police Jury

HAZARDOUS WASTE FACILITY PERMIT APPLICATION	
TERREBONNE PARISH POPULATION PROJECTIONS	
T. BAKER SMITH & SON INC CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH HOUMA, LA.	APPLICATION BY: DELTA SHIPYARD HOUMA, LA.



SOURCE: D E.I.S.– WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA., DEC. 1978

Figure 45

Table 4 Historical & projected population data: MDPR, 1960-2000.

Parish/county by planning district	1960	1970	1975	1980	1975-1980 % change	1980 % of total
REGIONAL PLANNING COMMISSION FOR JEFFERSON PARISH, *et al*						
Jefferson	208,769	337,568	398,747	493,427	23.7	24.2
Orleans	627,525	593,471	562,420	550,844	-2.1	27.0
St. Bernard	32,186	51,185	58,232	71,084	22.1	3.5
St. Tammany	38,643	63,585	81,323	86,356	6.2	4.2
Plaquemines	22,545	25,225	26,077	27,677	6.1	1.4
CAPITAL REGIONAL PLANNING COMMISSION						
Livingston	26,974	36,511	42,840	47,961	11.9	2.4
Tangipahoa	59,434	65,875	71,905	72,218	.4	3.5
SOUTH CENTRAL PLANNING AND DEVELOPMENT COMMISSION						
St. James	18,369	19,733	19,599	20,198	3.1	1.0
St. John the Baptist	18,439	23,813	24,796	28,262	14.0	1.4
St. Charles	23,219	29,550	32,162	36,729	14.2	4.8
Lafourche	55,381	68,941	72,999	77,994	6.8	3.8
Terrebonne	60,771	76,049	85,069	88,032	3.5	4.3
ACADIANA PLANNING AND DEVELOPMENT DISTRICT						
Iberia	51,657	57,397	60,973	63,813	4.7	3.1
St. Mary	48,833	60,752	61,224	70,831	15.7	3.5
LA MDPR TOTAL	1,290,745	1,510,195	1,598,366	1,735,426	8.6	85.3
GULF REGIONAL PLANNING COMMISSION						
Hancock	14,039	17,387	18,249	19,200	5.2	.9
Harrison	119,489	134,582	143,528	165,800	15.5	8.1
Jackson	55,522	87,975	105,186	115,000	9.3	5.6
MS MDPR TOTAL	189,059	239,944	266,963	300,000	12.4	14.8

(continued)

Table 4 (concluded)

Parish/county by planning department	1990	1980-1990 % change	1990 % of total	2000	1990-2000 % change	2000 % of total
REGIONAL PLANNING COMMISSION FOR JEFFERSON PARISH, et al						
Jefferson	663,497	30.5	28.4	798,594	20.4	30.8
Orleans	531,028	-3.6	22.7	517,911	-2.5	20.0
St. Bernard	92,045	29.5	3.9	109,412	18.9	4.2
St. Tammany	114,653	32.7	4.9	148,676	29.7	5.7
Plaquemines	32,285	16.6	1.4	32,438	.5	1.2
CAPITAL REGIONAL PLANNING COMMISSION						
Livingston	59,788	24.7	2.6	73,375	22.7	2.8
Tangipahoa	78,722	9.0	3.4	83,876	6.5	3.2
SOUTH CENTRAL PLANNING AND DEVELOPMENT COMMISSION						
St. James	21,477	6.3	.9	22,680	5.6	.9
St. John the Baptist	35,310	24.9	1.5	41,325	17.0	1.6
St. Charles	45,056	22.7	1.9	54,022	19.9	2.1
Lafourche	87,870	12.7	3.8	92,871	5.7	3.6
Terrebonne	102,953	16.9	4.4	111,380	8.2	4.3
ACADIANA PLANNING AND DEVELOPMENT DISTRICT						
Iberia	69,115	8.3	3.0	69,738	.9	2.7
St. Mary	58,335	-17.6	2.5	54,779	-6.1	2.1
LA MDPR TOTAL	1,992,134	14.8	85.3	2,211,077	11.0	85.2
GULF REGIONAL PLANNING COMMISSION						
Hancock	21,200	10.4	.9	23,400	10.4	.9
Harrison	186,800	12.7	8.0	212,200	13.6	8.2
Jackson	135,100	17.5	5.8	147,000	8.8	5.7
MS MDPR TOTAL	343,100	14.3	14.7	382,600	11.5	14.8

Sources: Renner, J.R. 1976.
Mississippi State University, Division of Research, College of Business and Industry 1978.

TABLE 5
POPULATION TRENDS AND PROJECTIONS
TERREBONNE PARISH, CITY OF HOUMA AND
STATE OF LOUISIANA
1960 - 1985

	Terrebonne Parish	City of Houma *	State of Louisiana
1960	60,771	22,561	2,406,150
1970	76,049	30,922	3,644,637
1980	92,000	37,600	4,054,000
1985	100,000	40,800	4,259,000
Change 1960 - 1970			
Absolute	15,278	8,361	1,238,487
Percent	25.1%	37.1%	51.5%
Estimated Change 1970 - 1980			
Absolute	15,951	6,678	409,363
Percent	21.0%	21.6%	11.2%
Estimated Change 1980 - 1985			
Absolute	8,000	3,200	205,000
Percent	8.7%	8.5%	5.1%

* Included in the City of Houma population for 1980 and 1985, is the annexation of the southeast portion of greater Houma which took place in 1977.

Source: U.S. Bureau of the Census
Houma Chamber of Commerce
First Research Consultants

SOURCE FIRST RESEARCH CONSULTANTS
MIAMA, FLORIDA, MARCH 1980

TABLE 6
MAJOR EMPLOYER AND MAJOR INDUSTRIES
HOUMA
1979

MAJOR EMPLOYER

Name	Product or Service	Number of Employees
Chromalloy	Steel structure	1,850
Avondale Shipyards	Steel structure	700
South Coast Sugars	Sugar refining	575
Livingston Oil Co.	Oil recovery	320
Sante Fe Engineering	Steel structure	760
Main Iron Works	Steel structure	325
Quality Shipyards	Steel structure	329
Two R. Drilling Co.	Oil recovery	550
Offshore Food Service	Catering	500
South Central Bell	Communications	500
Texaco, Inc.	Oil production	968
T B W	Machinery	405
Terrebonne General Hospital	Medical services	667
South La. Medical Center	Medical services	515
Patterson Services	Oilfield services	523
Total		9,487

MAJOR INDUSTRIES *

Product or Service	Wages	Number of Employees
Petroleum Products	$102,589,904	6,183
Retail Trade	$ 46,187,192	6,208
Services	$ 35,716,724	3,394
Shipbuilding	$ 26,904,936	1,934
Fabrication	$ 21,848,164	1,691
Wholesale	$ 21,546,948	1,428
Water Transportation	$ 14,153,388	1,364
Highway Construction	$ 11,212,876	831
Trucking	$ 5,326,628	470
Contracting	$ 4,814,636	457
Total		23,960

Source: Houma Chamber of Commerce
Louisiana Office of the Department of Employment Security

* First quarter 1977

SOURCE . FIRST RESEARCH CONSULTANTS
MIAMA, FLORIDA, MARCH -1980

TABLE 7
OCCUPATION OF EMPLOYED PERSONS
TERREBONNE PARISH, CITY OF HOUMA AND
STATE OF LOUISIANA
1970

	Terrebonne Parish		City of Houma		State of Louisiana	
	Absolute	Percent	Absolute	Percent	Absolute	Percent
Total Employed	22,958	100.0%	10,394	100.0%	1,158,245	100.0%
Professional, Technical and Kindred Workers	2,260	9.8%	1,258	12.1%	161,025	13.9%
Managers and Administrators	2,877	12.5%	1,354	13.0%	104,128	9.0%
Sales Workers	1,561	6.8%	757	7.3%	78,328	6.8%
Clerical and Kindred Workers	2,521	11.0%	1,366	13.1%	180,406	15.6%
Craftsmen, Foremen, and Kindred Workers	3,642	15.9%	1,522	14.6%	167,860	14.5%
Operatives (Including Transport)	5,188	22.6%	2,128	20.5%	180,777	15.6%
Laborers (Except Farm)	1,675	7.3%	660	6.3%	70,286	6.1%
Farm (All)	458	2.0%	27	0.3%	37,144	3.2%
Service Workers	2,190	9.5%	1,056	10.2%	134,054	11.6%
Private Household Workers	586	2.6%	266	2.6%	44,237	3.8%

Note: Employed persons 16 years old and over
Percent may not total 100.0% due to rounding

Source: U.S. Bureau of the Census

SOURCE . FIRST RESEARCH CONSULTANTS
MIAMA, FLORIDA . MARCH 1980

Table 8, 1972 Land use and area for
South Central Planning and Development Commission for
St. James, St. John, St. Charles, Lafourche, and Terrebone Parishes.

Land use	Parish		
	St. James	St. John	St. Charles
Residential	1,599[a] (3,952)[b]	1,100 (2,717)	1,699 (4,199)
Commercial	0	0	100 (247)
Industrial	900 (2,223)	200 (494)	10,196 (25,194)
Public	100 (247)	300 (741)	100 (247)
Rights-of-Way	0	0	0
Resource Production	25,690 (53,479)	13,095 (32,357)	9,596 (23,712)
Water	2,799 (6,916)	41,483 (102,505)	37,685 (93,119)
Bays and Estuaries	0	0	0
Wetland	32.288 (79,781)	40,084 (99,047)	51,579 (127,452)
Other	0	100 (247)	300 (741)
Total	63,376 (146,598)	96,362 (238,108)	111,255 (274,911)

(continued)

Table 8 (concluded)

Land use	Parish		Total	Total percentage
	Lafourche	Terrebonne		
Residential	4,898[a] (12,103)[b]	5,398 (13,338)	14,694 (36,309)	1.2
Commercial	200 (494	600 (1,482)	900 (2,223)	0.6
Industrial	37,685 (93,119)	39,384 (97,318)	88,365 (218,348)	6.8
Public	200 (494)	0	700 (1,729)	.05
Rights-of-Way	100 (247)	300 (741)	400 (988)	0.3
Resource Production	50,280 (124,241)	30,987 (76,570)	129,648 (320,359)	9.6
Water	226,208 (558,961)	30,388 (75,088)	338,563 (836,589)	25.9
Bays and Estuaries	42,483 (104,975)	97,061 (239,837)	139,544 (344,812)	10.7
Wetland	194,021 (479,427)	262,894 (649,610)	580,866 (1,435,317)	44.5
Other	5,798 (14,326)	6,697 (16,549)	12,895 (31,863)	0.9
Total	561,873 (1,388,387)	473,709 (1,170,533)	1,306,575 (3,228,537)	100.0

[a]Hectares.
[b]Acres (data were presented as acres in the primary source).

Source: Louisiana State Planning Office 1972.

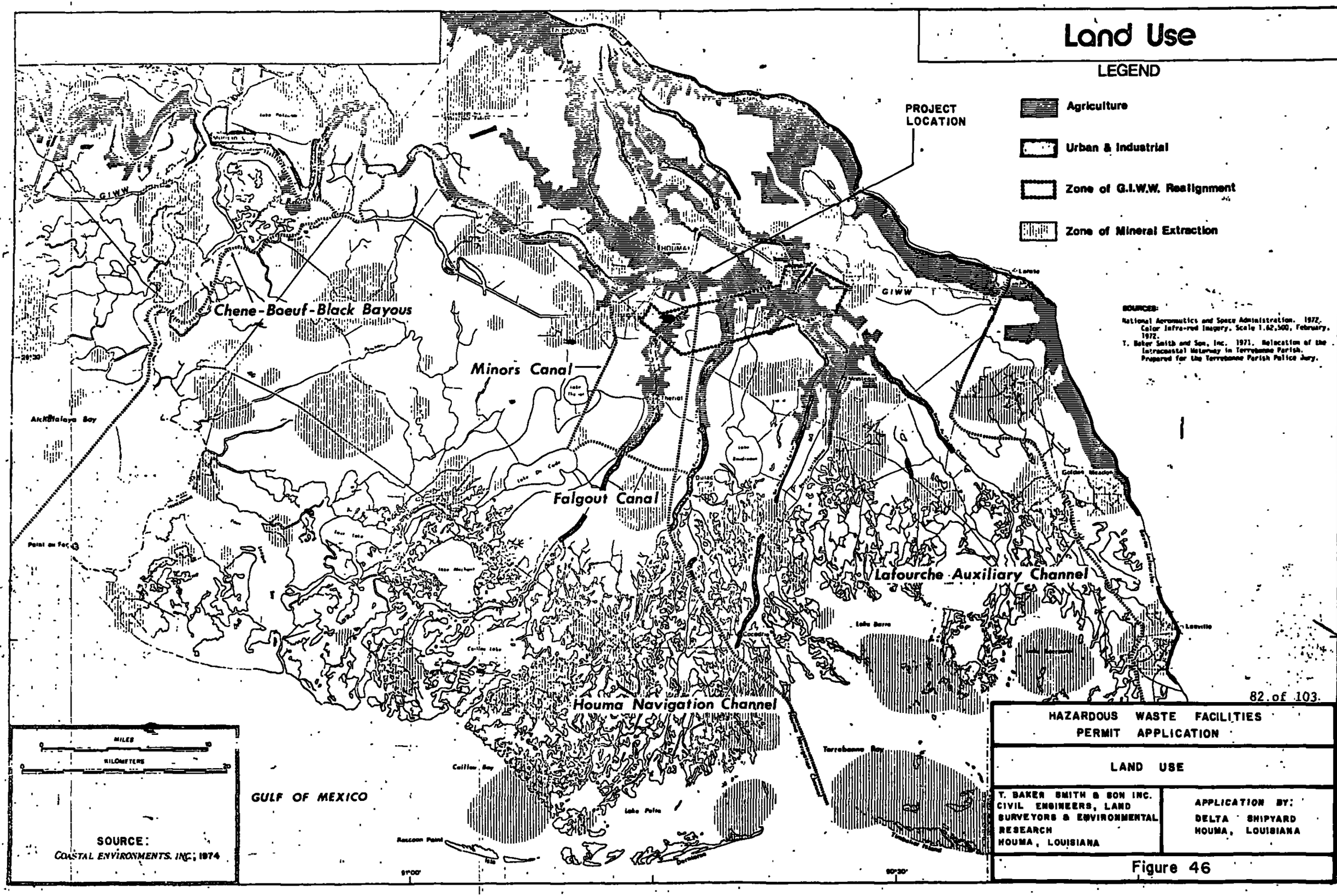

Land Use
LEGEND
Agriculture
Urban & Industrial
Zone of G.I.W.W. Realignment
Zone of Mineral Extraction
PROJECT LOCATION
SOURCES:
National Aeronautics and Space Administration. 1972. Color Infra-red Imagery. Scale 1:62,500, February, 1972.
T. Baker Smith and Son, Inc. 1971. Relocation of the Intracoastal Waterway in Terrebonne Parish. Prepared for the Terrebonne Parish Police Jury.
Chene-Boeuf-Black Bayous
Minors Canal
Falgout Canal
Lafourche Auxiliary Channel
Houma Navigation Channel
GIWW
Atchafalaya Bay
Point au Fer
Caillou Bay
Terrebonne Bay
Lake Pelto
Raccoon Point
GULF OF MEXICO
MILES
KILOMETERS
SOURCE:
COASTAL ENVIRONMENTS, INC., 1974
82 of 103
HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION
LAND USE
T. BAKER SMITH & SON INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA
APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 46

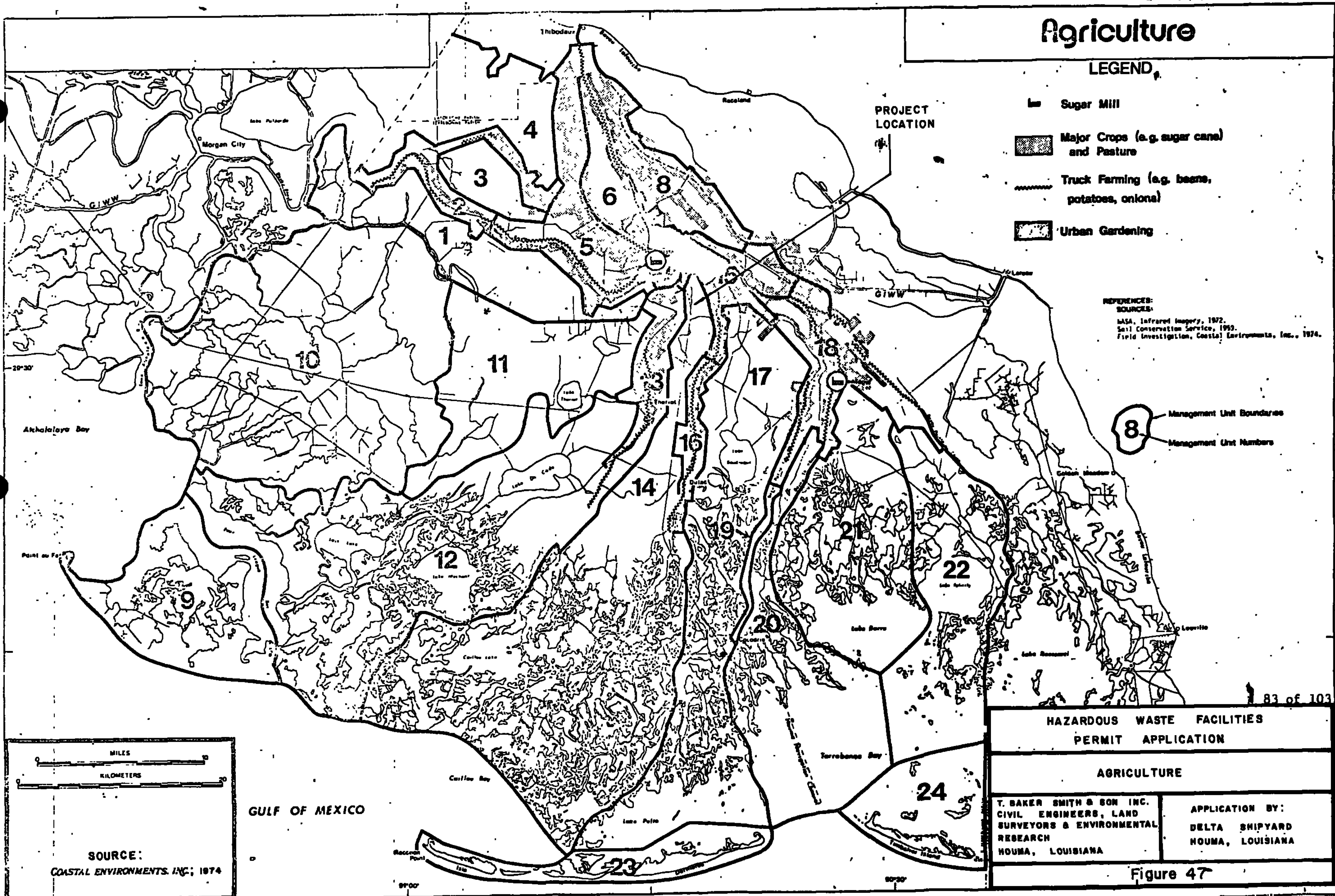

Agriculture
LEGEND
Sugar Mill
Major Crops (e.g. sugar cane) and Pasture
Truck Farming (e.g. beans, potatoes, onions)
Urban Gardening
PROJECT LOCATION
Management Unit Boundaries
Management Unit Numbers
REFERENCES:
SOURCES:
NASA, Infrared Imagery, 1972.
Soil Conservation Service, 1953.
Field Investigation, Coastal Environments, Inc., 1974.
Thibodaux
Raceland
Morgan City
GIWW
Atchafalaya Bay
Point au Fer
GULF OF MEXICO
Caillou Bay
Terrebonne Bay
Lake Barre
Golden Meadow
Leeville
Dulac
MILES
0
10
KILOMETERS
0
20
SOURCE:
COASTAL ENVIRONMENTS, INC., 1974
HAZARDOUS WASTE FACILITIES PERMIT APPLICATION
AGRICULTURE
T. BAKER SMITH & SON INC.
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LOUISIANA
APPLICATION BY:
DELTA SHIPYARD
HOUMA, LOUISIANA

Figure 47

HAZARDOUS WASTE FACILITIES PERMIT APPLICATION	
EXISTING DEVELOPED AREAS	
T. BAKER SMITH & SON INC. CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH HOUMA, LA.	APPLICATION BY: DELTA SHIPYARD HOUMA, LA.

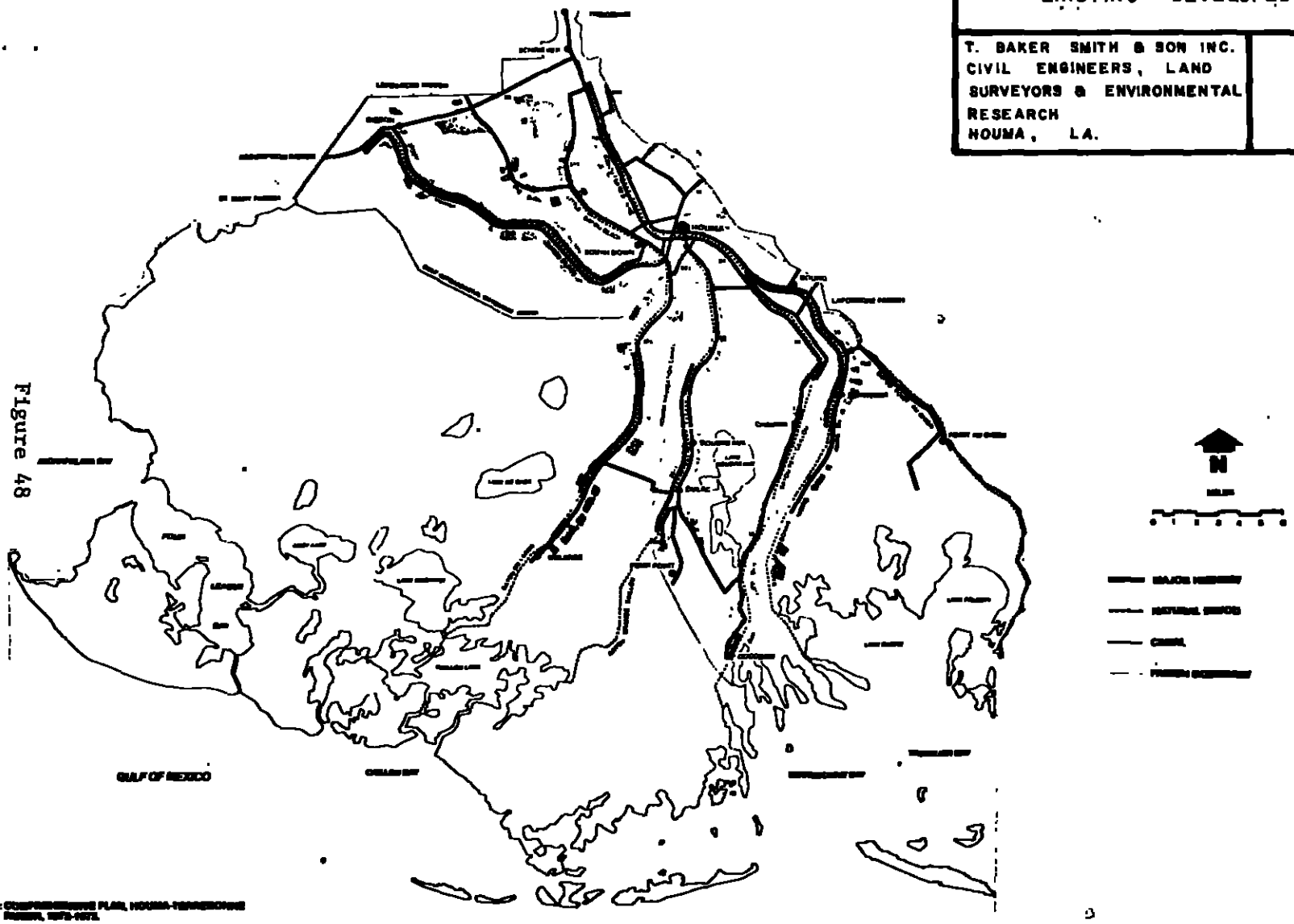


Figure 48

SOURCE: D.E.I.S.-WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA., DEC. 1978

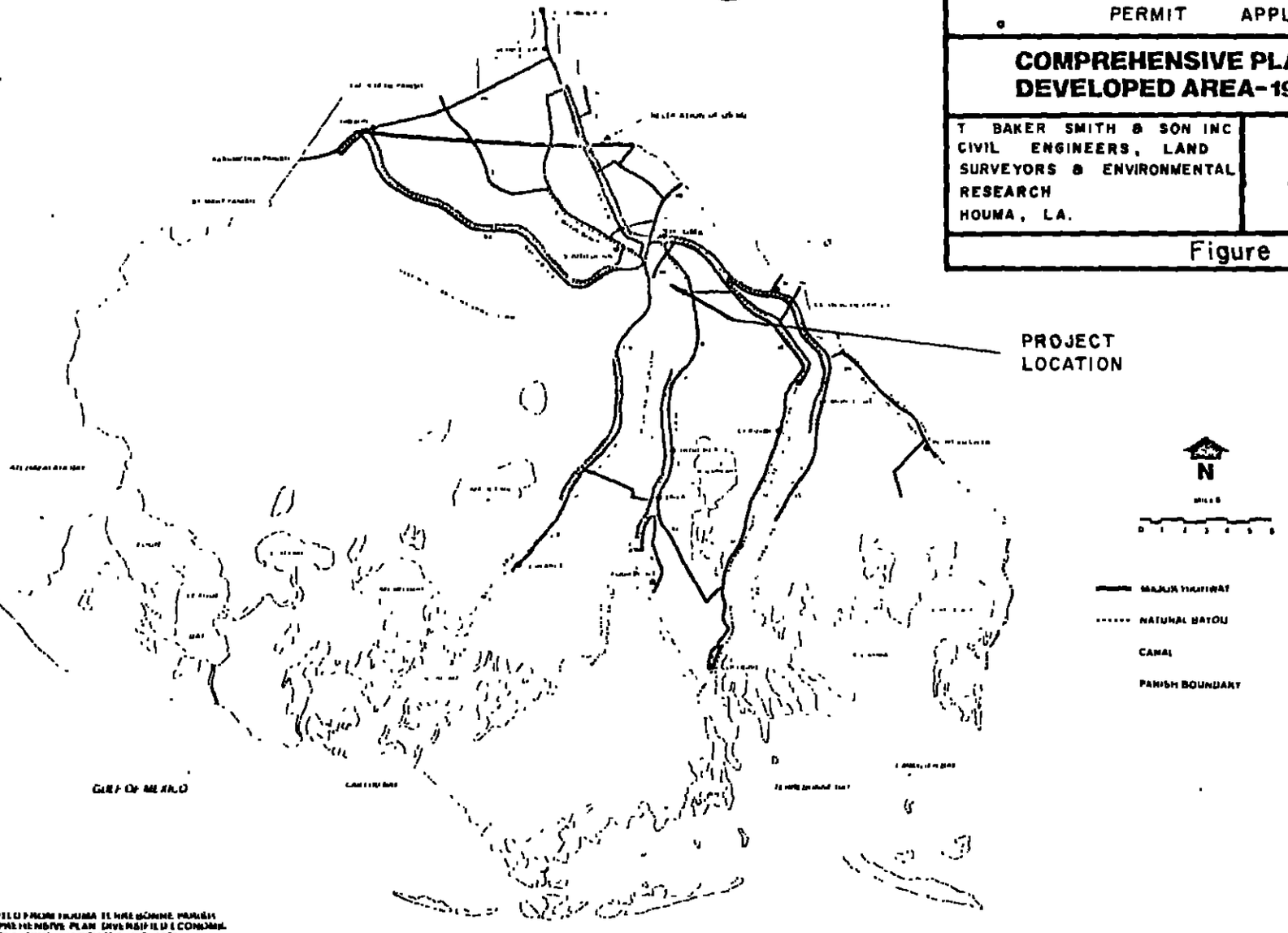
HAZARDOUS WASTE FACILITIES
PERMIT APPLICATION

COMPREHENSIVE PLAN PROJECTED DEVELOPED AREA-1990

T BAKER SMITH & SON INC
CIVIL ENGINEERS, LAND SURVEYORS & ENVIRONMENTAL RESEARCH
HOUMA, LA.

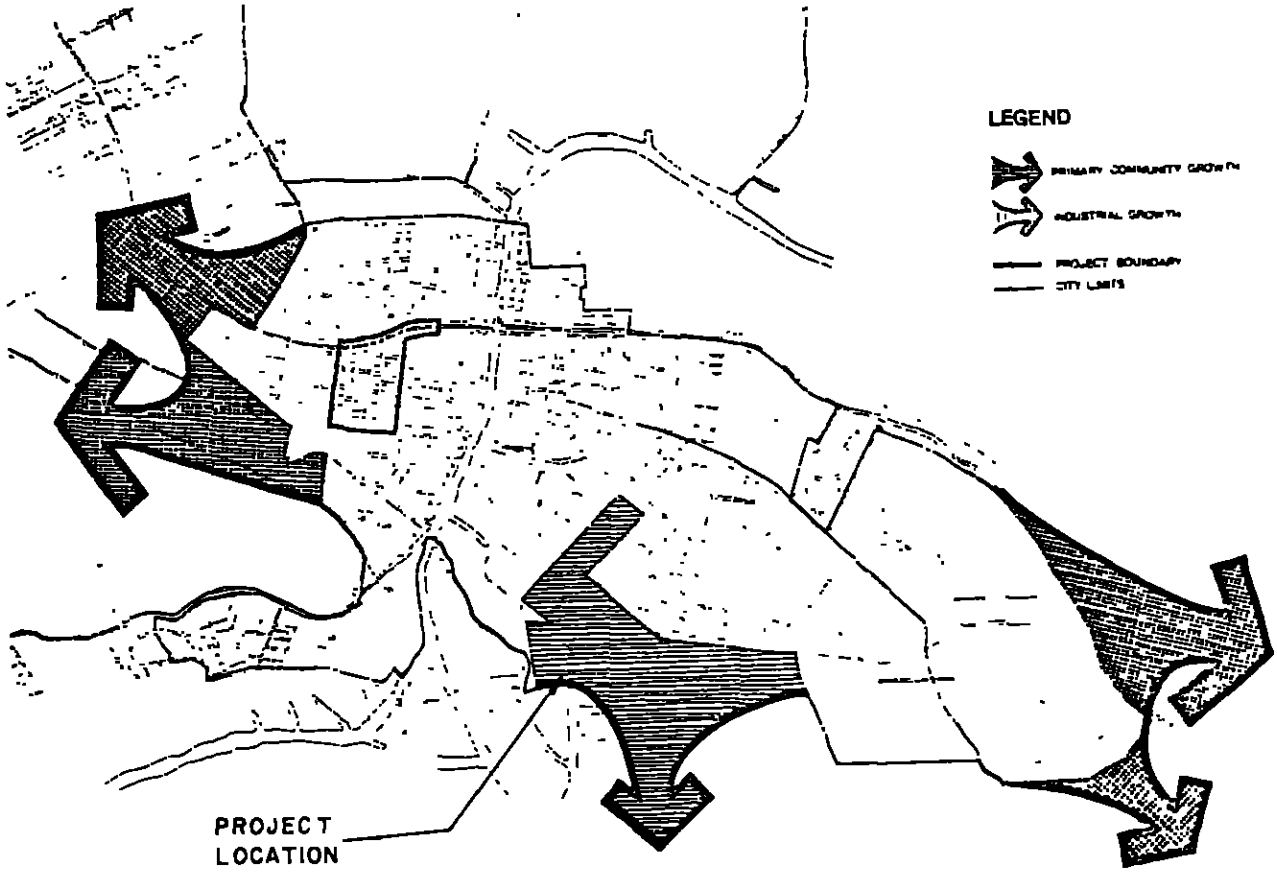
APPLICATION BY:
DELTA SHIPYARD
HOUMA, LA

Figure 49



SOURCE: ADAPTED FROM HOUMA TERREBONNE PARISH COMPREHENSIVE PLAN DIVERSIFIED ECONOMIC AND PLANNING ASSOCIATES INC 1973

SOURCE: DEIS — WASTEWATER TREATMENT FACILITIES TERREBONNE PARISH, LA, DEC. 1980



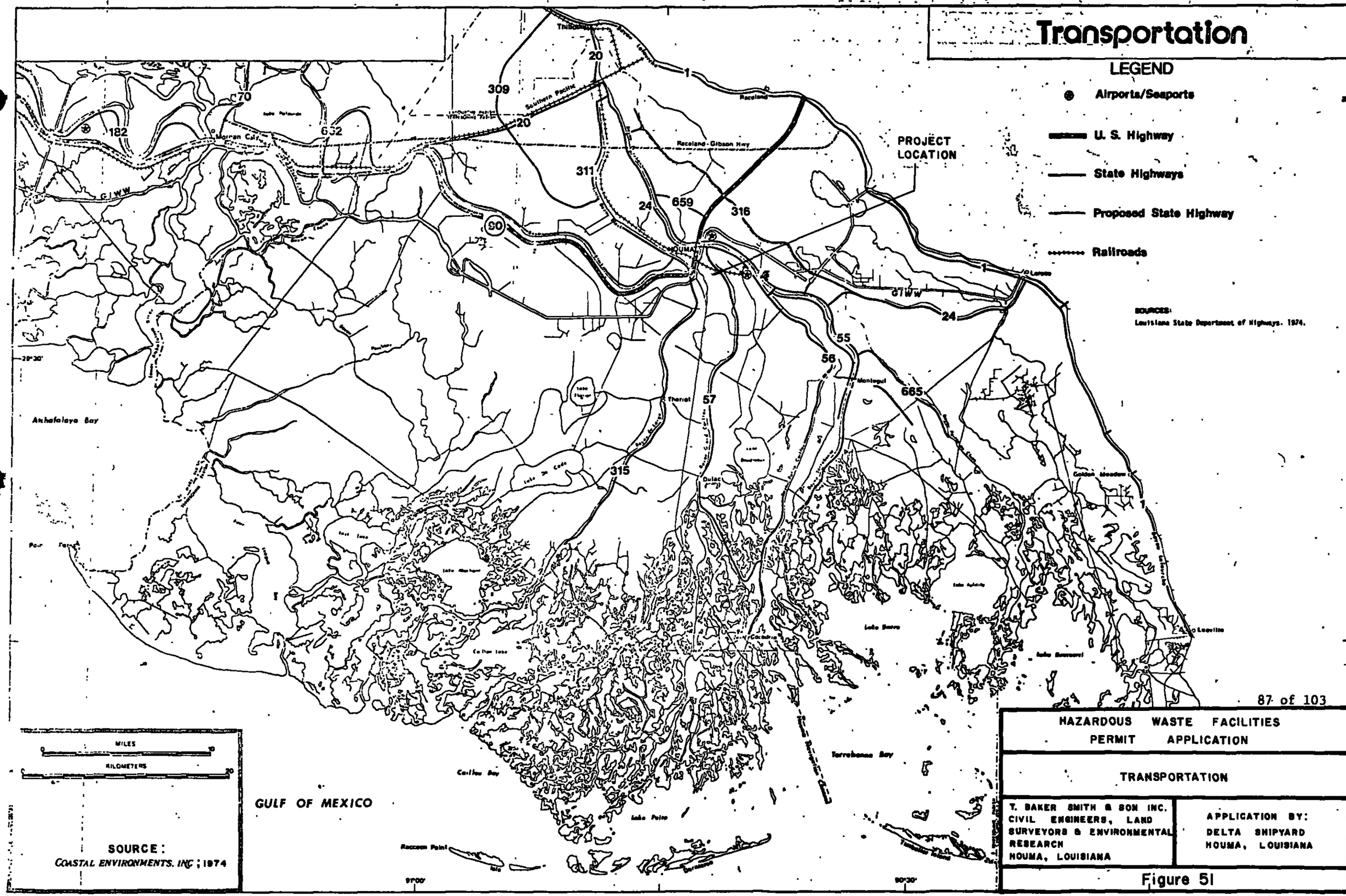
Houma, Louisiana

GROWTH TRENDS

SOURCE FIRST RESEARCH CONSULTANTS
MIAMA, FLORIDA, MARCH 1980

Figure 50

Transportation



The map below shows recent traffic counts on major arteries of the City of Houma July 1979

SOURCE FIRST RESEARCH CONSULTANTS, MIAMA, FLORIDA, MARCH 1980

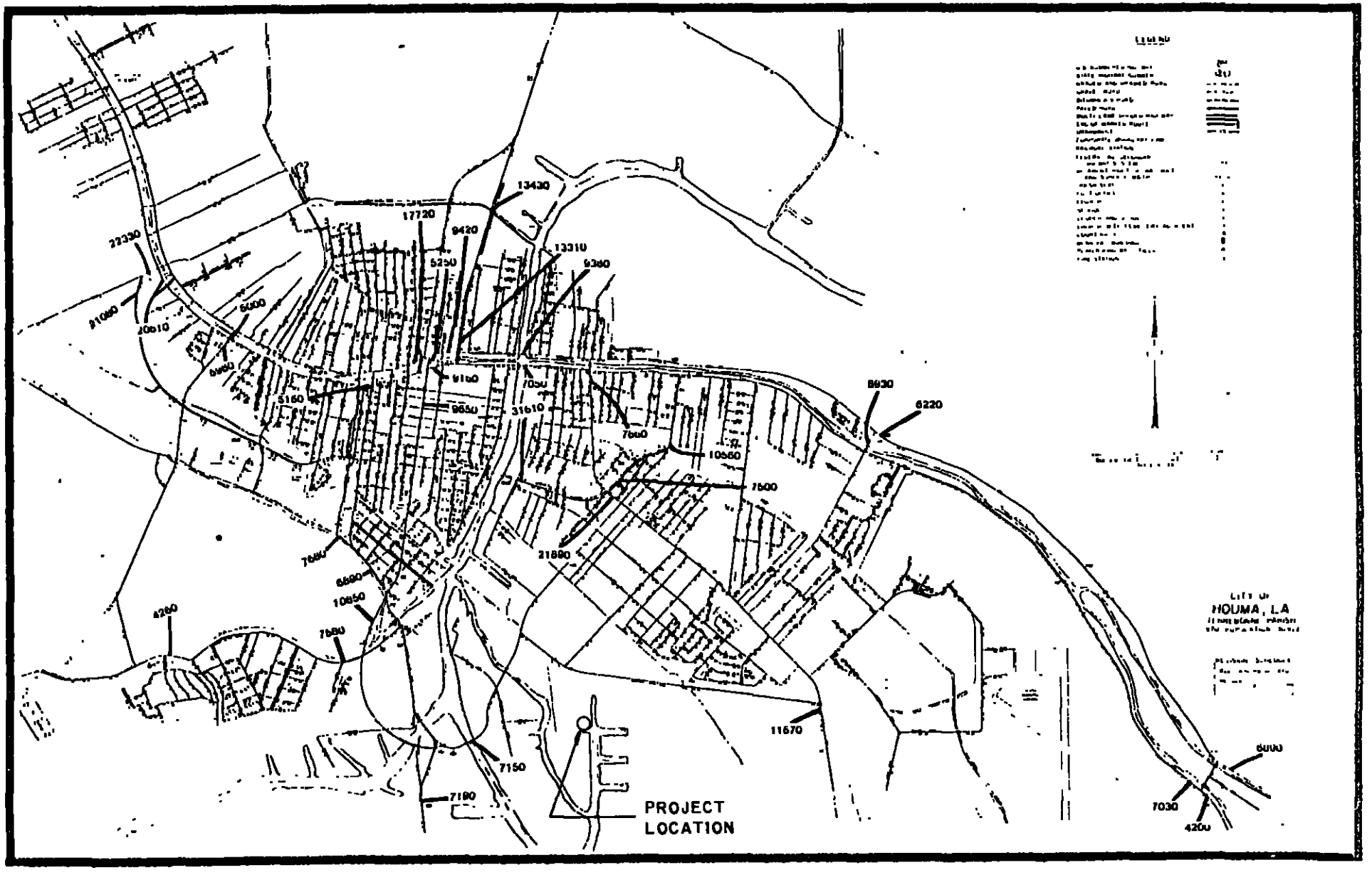


Figure 52

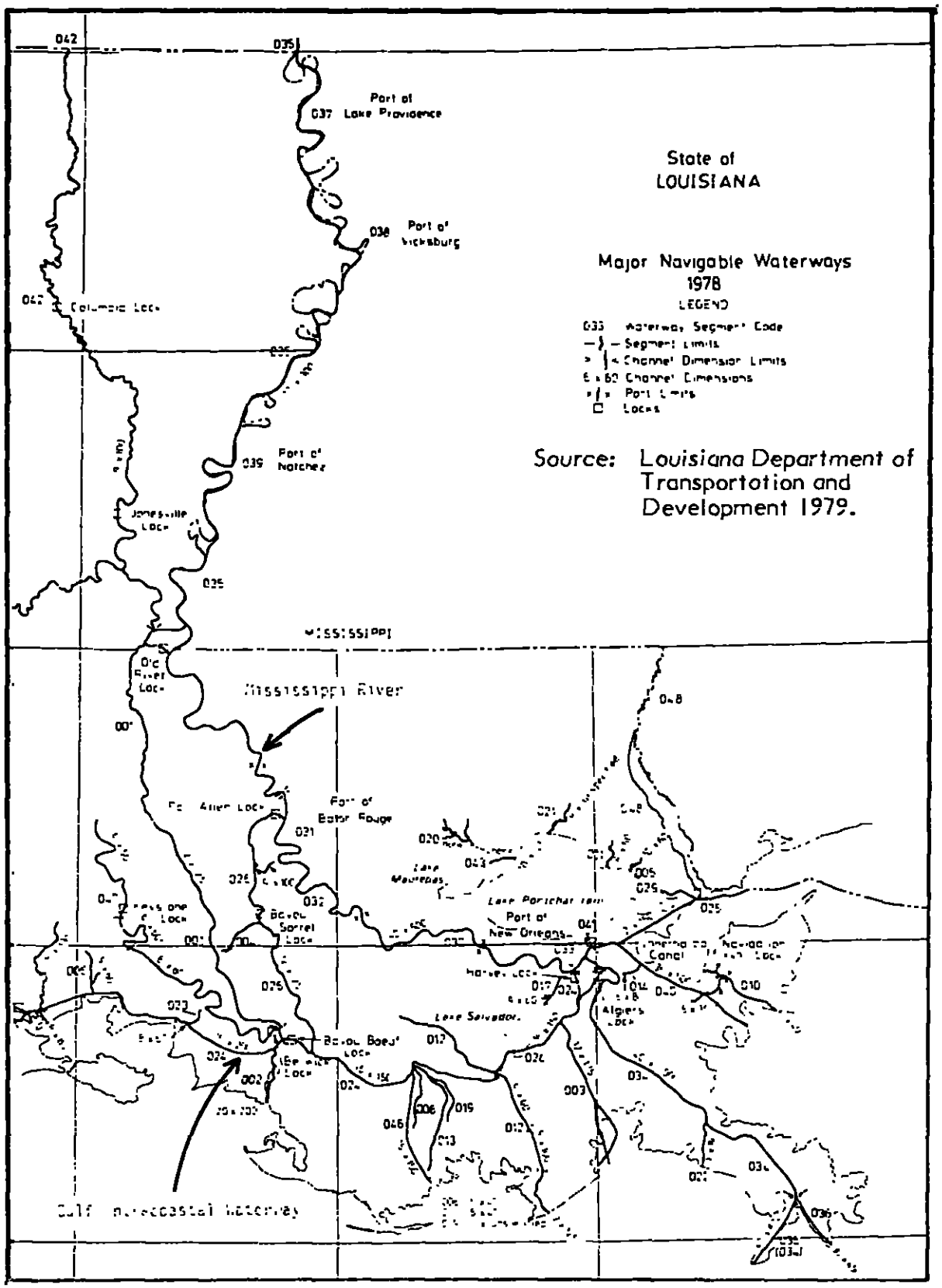


Figure 53 Major navigable waterways in Louisiana, 1978.

Reference Sheet

REF+24249

08/02/99 11:15 AM

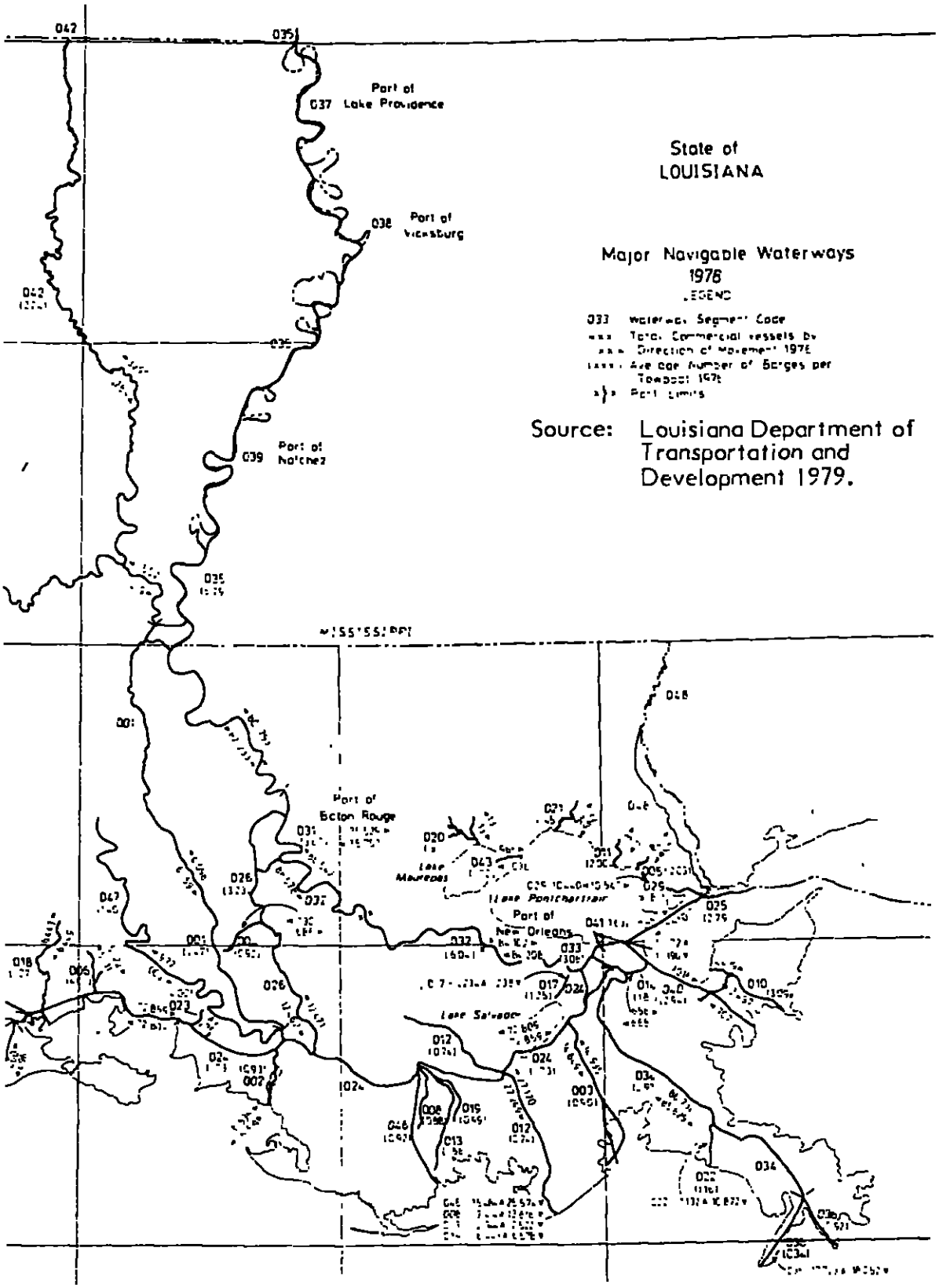


Figure 55 Commercial vessel traffic on major navigable waterways in Louisiana. 1978.

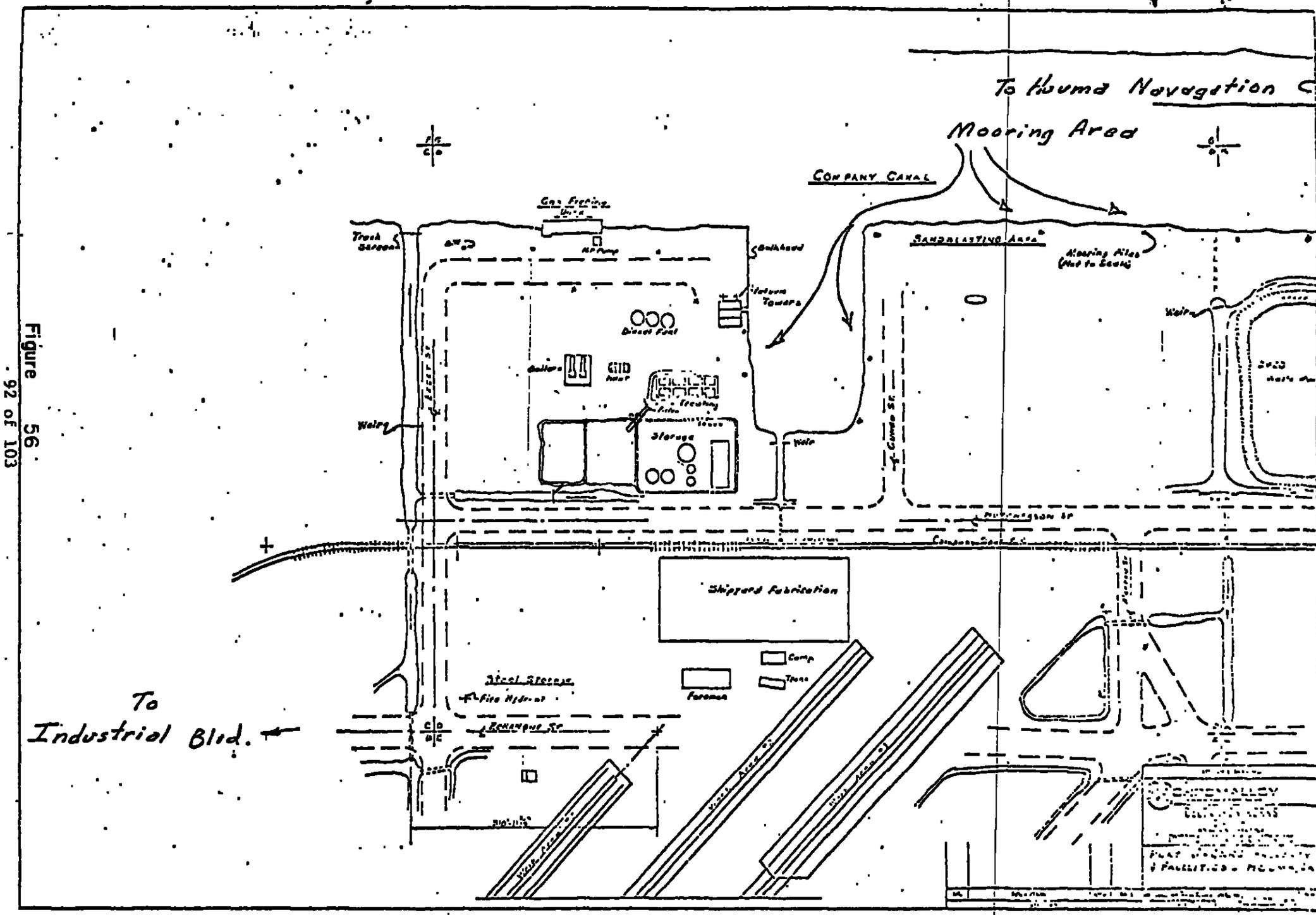

To Houma Navigation Canal
Mooring Area
Company Canal
Sandblasting Area
Mooring Piles (Not to Scale)
Track Screens
Bulkhead
Tatum Towers
Diesel Fuel
Boilers
Heat
Treating
Storage
Weir
Shipyard Fabrication
Comp
Trans
Foreman
Steel Storage
Fire Hydrant
To Industrial Blvd.

Figure 56

Storage Capacity:

Diesel - 2500 Bbl. *

Oil - 3550 Bbl. **

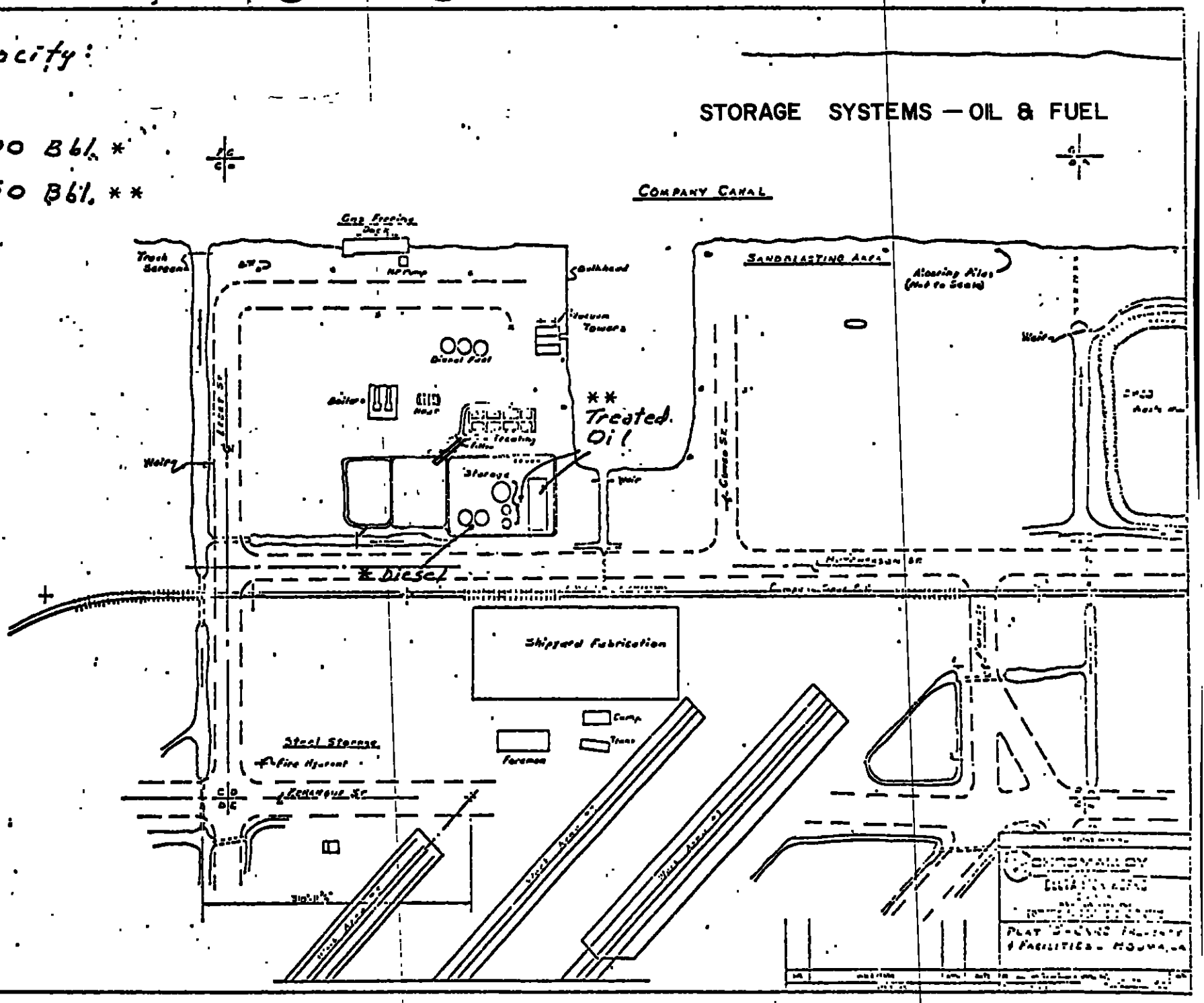


Figure 57

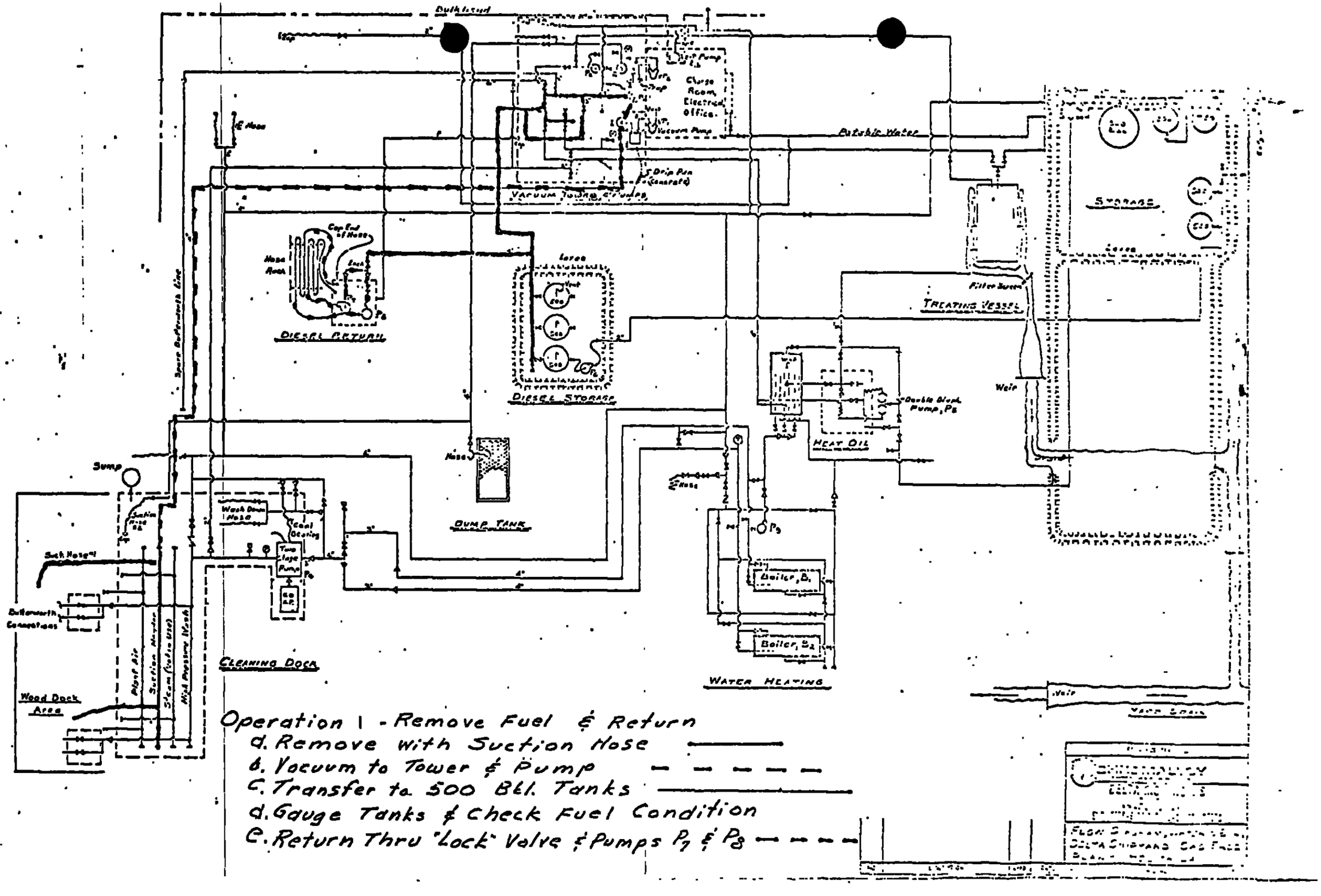
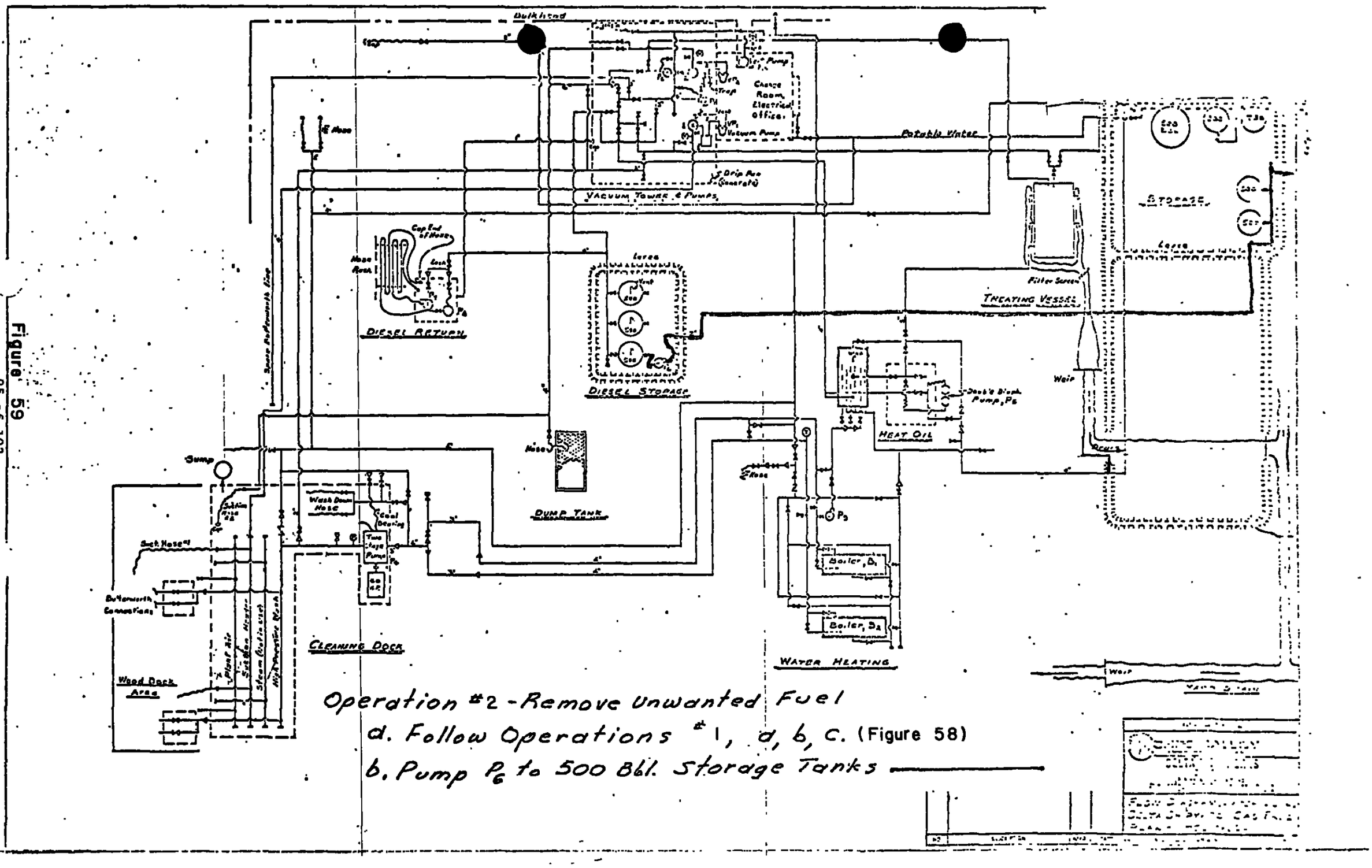

Bulkhead
Charge Room, Electrical Office
Vacuum Pump
Potable Water
Drip Pan (Concrete)
Vacuum Tower & Pumps
Storage
Cap End of Hose
Hose Rack
Lock
Diesel Return
Diesel Storage
Treating Vessel
Filter Screen
Weir
Double Diaph. Pump, P5
Heat Oil
Sump
Wash Down Hose
Coal Bearing
Two Stage Pump
Dump Tank
Boiler, B1
Boiler, B2
Water Heating
Cleaning Dock
Wood Dock Area
Plant Air
Suction Header
Steam (Valve Use)
High Pressure Wash
Spare Butterworth Line
Operation 1 - Remove Fuel & Return
a. Remove with Suction Hose
b. Vacuum to Tower & Pump
c. Transfer to 500 Bbl. Tanks
d. Gauge Tanks & Check Fuel Condition
e. Return Thru "Lock" Valve & Pumps P7 & P8

Figure 58



Operation #2 - Remove Unwanted Fuel

a. Follow Operations #1, a, b, c. (Figure 58)

b. Pump P_6 to 500 Bbl. Storage Tanks

Figure 59

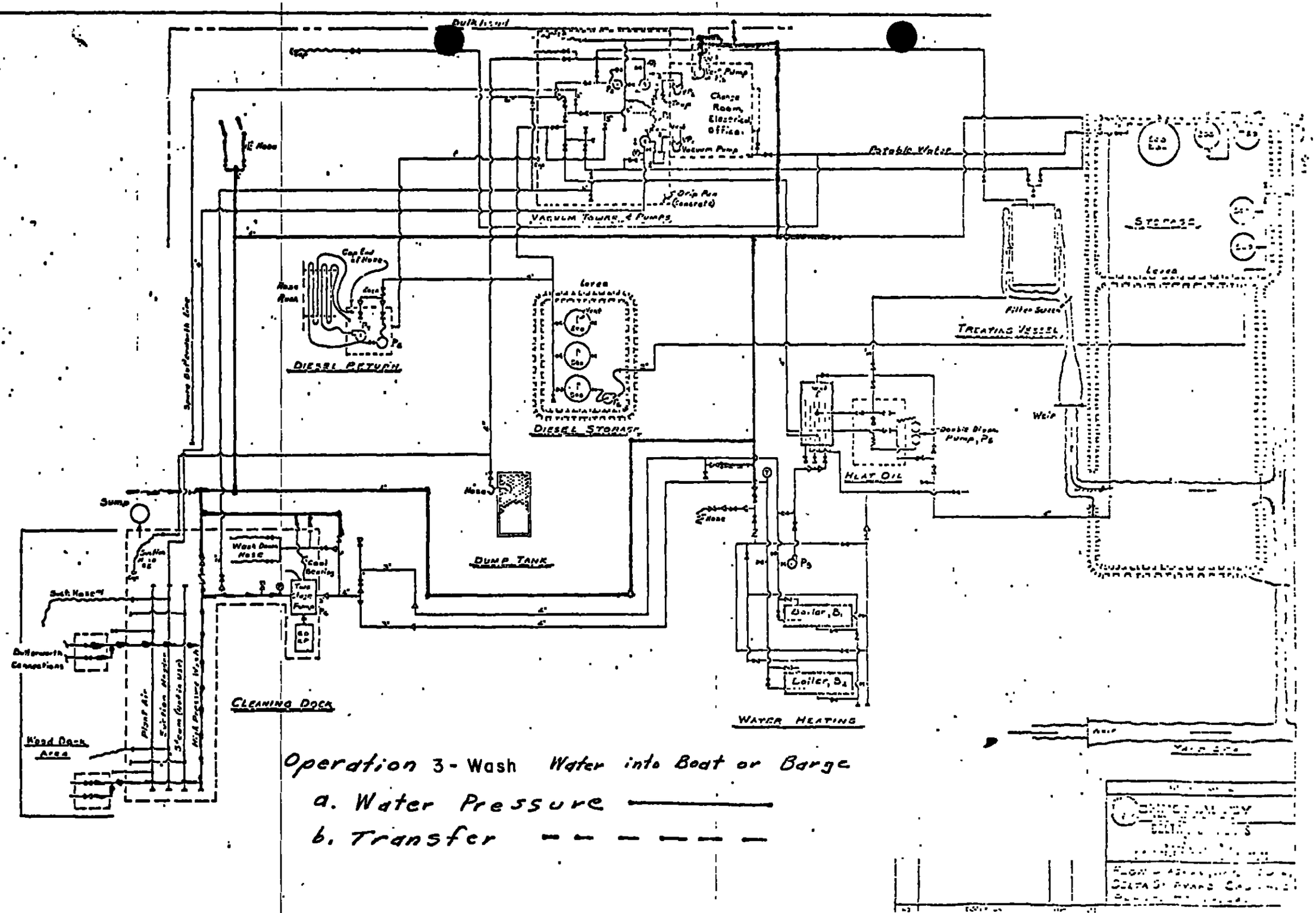


Figure 60

96 of 103

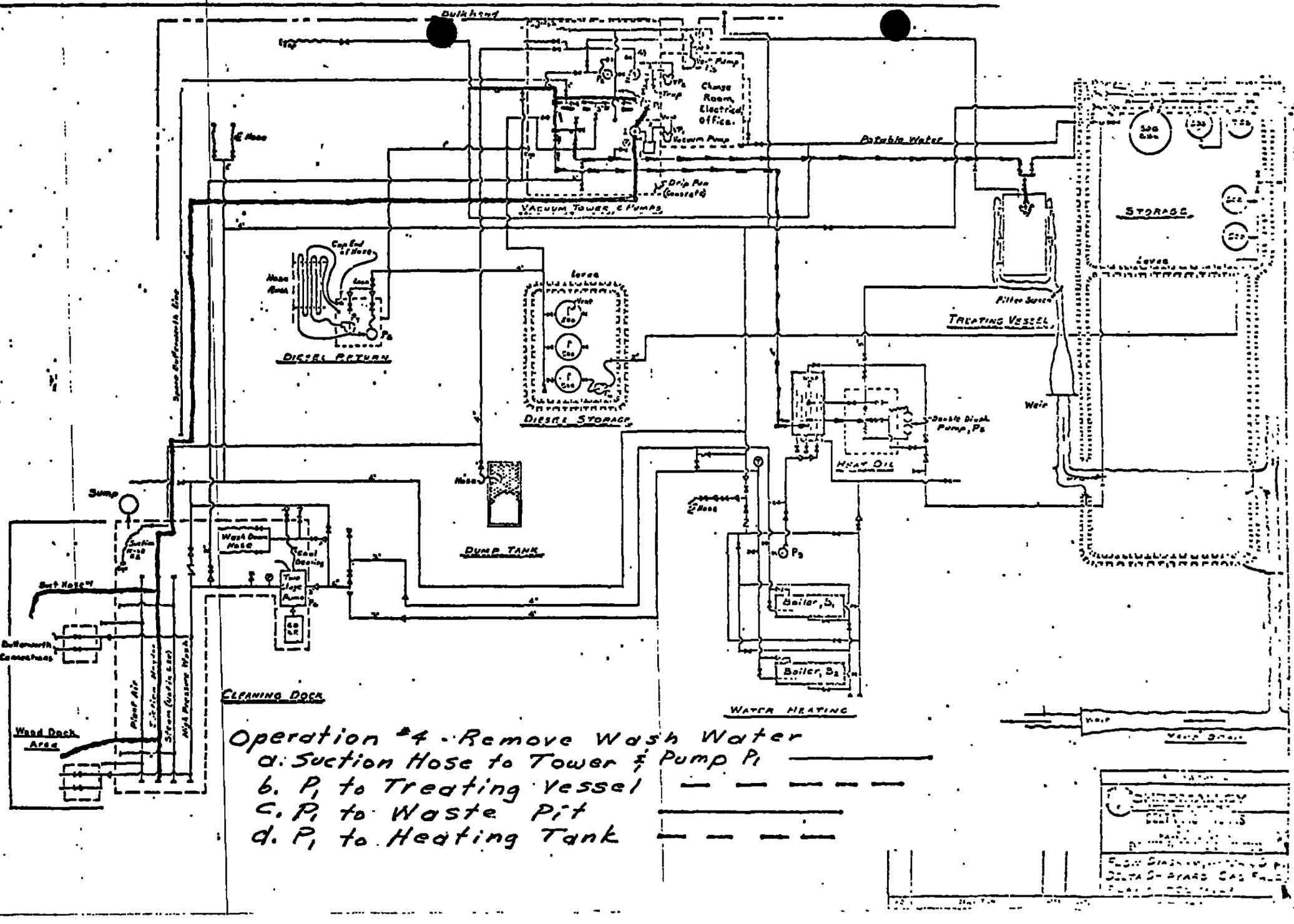

Bulkhead
Change Room, Electrical Office.
Vacuum Pump
Potable Water
Drip Pan (Constant)
VACUUM TOWER & PUMPS
STORAGE
Levee
Filter Screen
TREATING VESSEL
Weir
Double Diaph. Pump, P2
HEAT OIL
Cap End of Hose
Hose Rack
DIESEL RETURN
Levee
DIESEL STORAGE
Spare Butterworth Line
Hose
DUMP TANK
Sump
Suction Hose #2
Wash Down Hose
Coal Bearing
Two Stage Pump
Suct Hose #1
Butterworth Connections
Plant Air
Steam (Not in Use)
High Pressure Wash
Wood Dock Area
CLEANING DOCK
Boiler, B1
Boiler, B2
WATER HEATING
Operation #4 - Remove Wash Water
a. Suction Hose to Tower & Pump P1
b. P1 to Treating Vessel
c. P1 to Waste Pit
d. P1 to Heating Tank

Figure 61

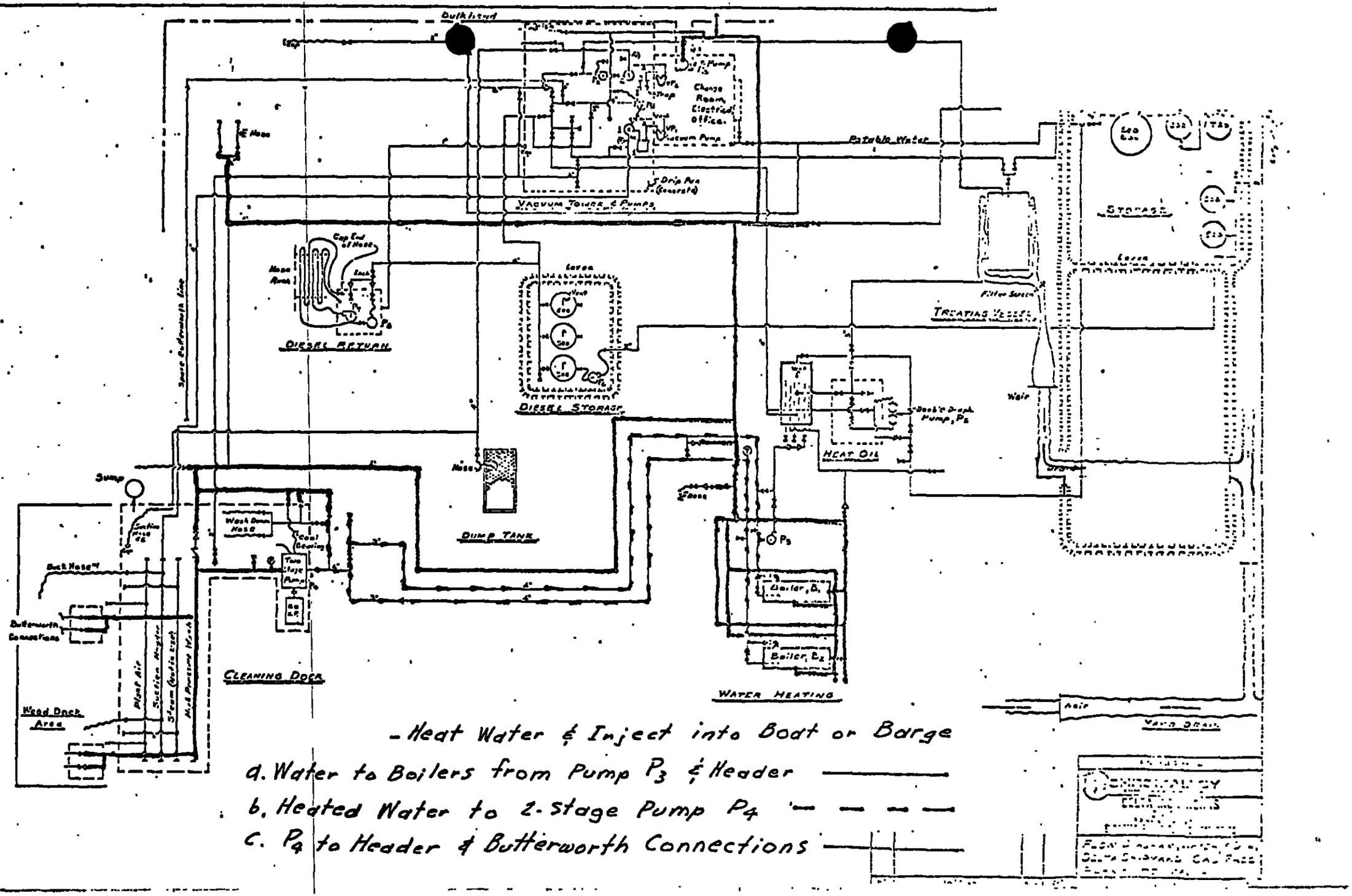

Bulkhead
Change Room, Electrical Office
Vacuum Pump
Potable Water
Drip Pan (Concrete)
VACUUM TOWER & PUMPS
Storage
Cap End of Hose
Hose Rack
DIESEL RETURN
Lever
DIESEL STORAGE
Filter Screen
TREATING VESSEL
Wair
Double Diaph. Pump, P5
HEAT OIL
Hose
DUMP TANK
Sump
Wash Down Hose
Coal Bearing
Two Stage Pump
Buck Hose
Butterworth Connections
Plant Air
Suction Heater
Steam (Not in use)
Mill Pressure Wash
CLEANING DOCK
Wood Dock Area
Boiler, B1
Boiler, B2
WATER HEATING
Air
YARD DRAIN
- Heat Water & Inject into Boat or Barge
a. Water to Boilers from Pump P3 & Header
b. Heated Water to 2-Stage Pump P4
c. P4 to Header & Butterworth Connections

Figure 62

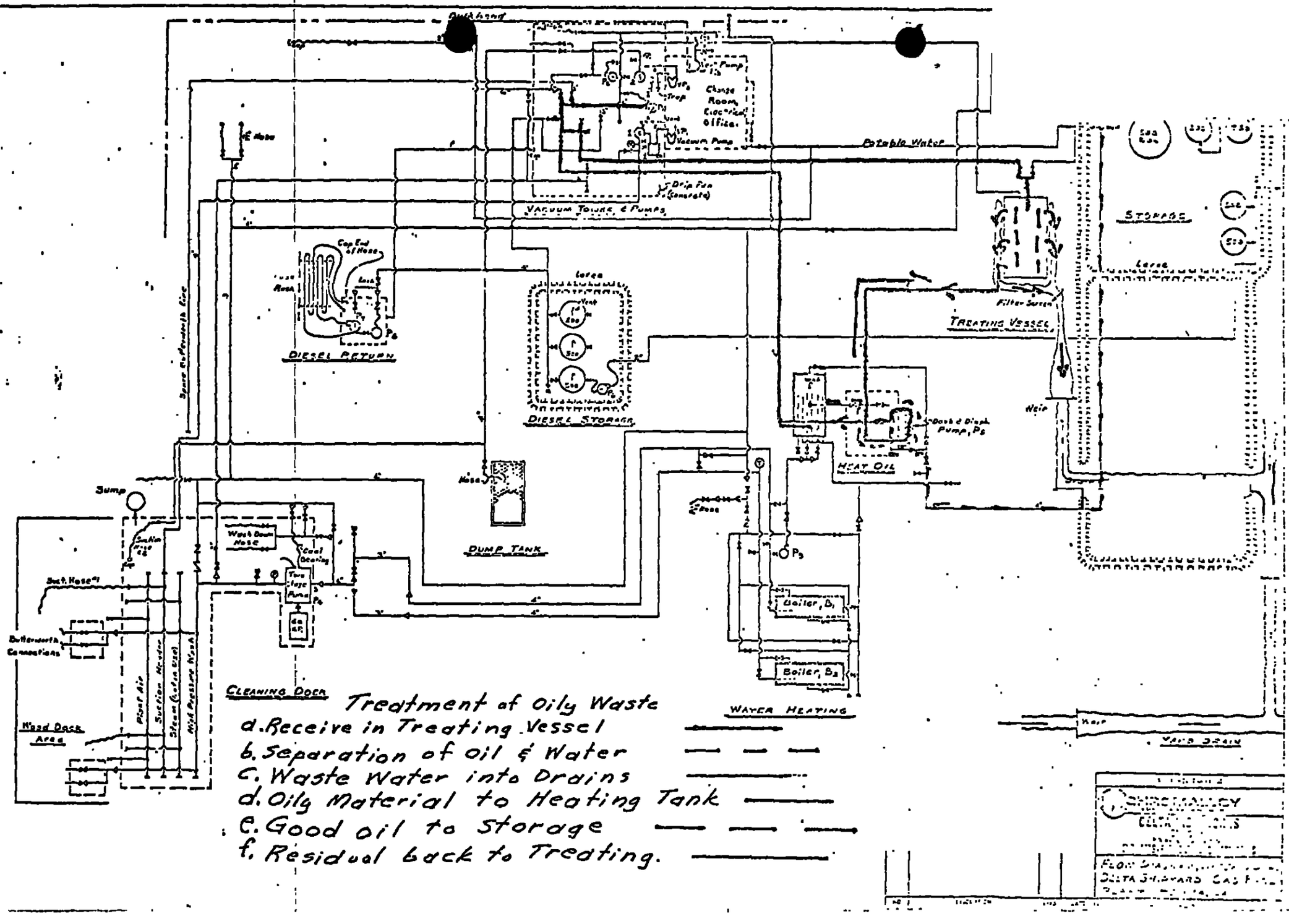

Outboard
Change Room, Electrical Office
Vacuum Pump
Potable Water
Drip Pan (Concrete)
VACUUM TOWER & PUMPS
STORAGE
Large
Filter Screen
TREATING VESSEL
Weir
Cap End of Hose
DIESEL RETURN
Large
DIESEL STORAGE
Dock & Diaph. Pump, P5
HEAT OIL
Hose
DUMP TANK
Sump
Wash Down Hose
Coal Bearing
Suct. Hose #1
Butterworth Connections
Plant Air
Suction Header
Steam (Water Use)
High Pressure Wash
Wood Dock Area
CLEANING DOCK
Boiler, B1
Boiler, B2
WATER HEATING
Weir
YARD DRAIN
Treatment of Oily Waste
a. Receive in Treating Vessel
b. Separation of oil & Water
c. Waste Water into Drains
d. Oily Material to Heating Tank
e. Good oil to Storage
f. Residual back to Treating.

Figure 63

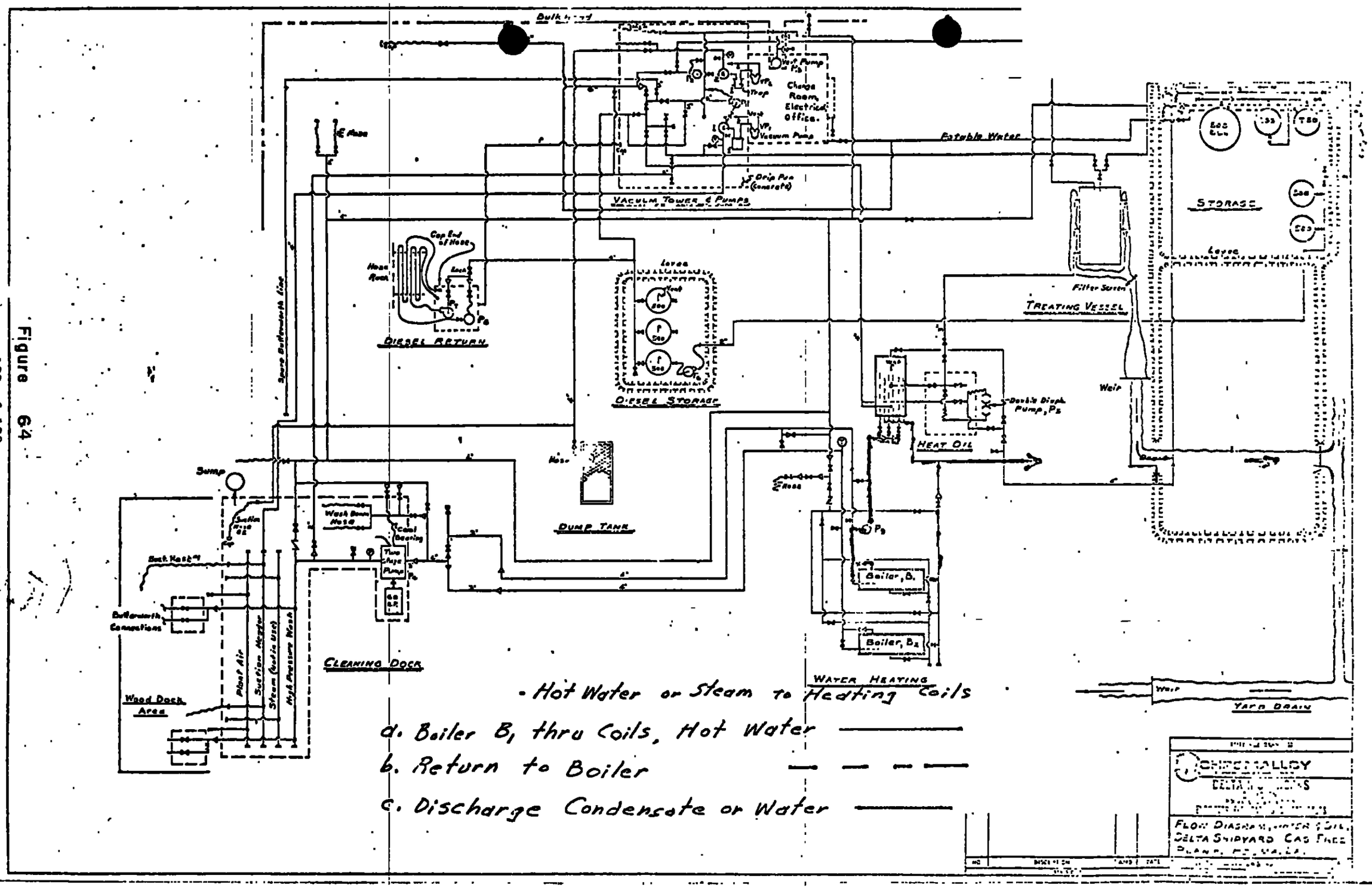
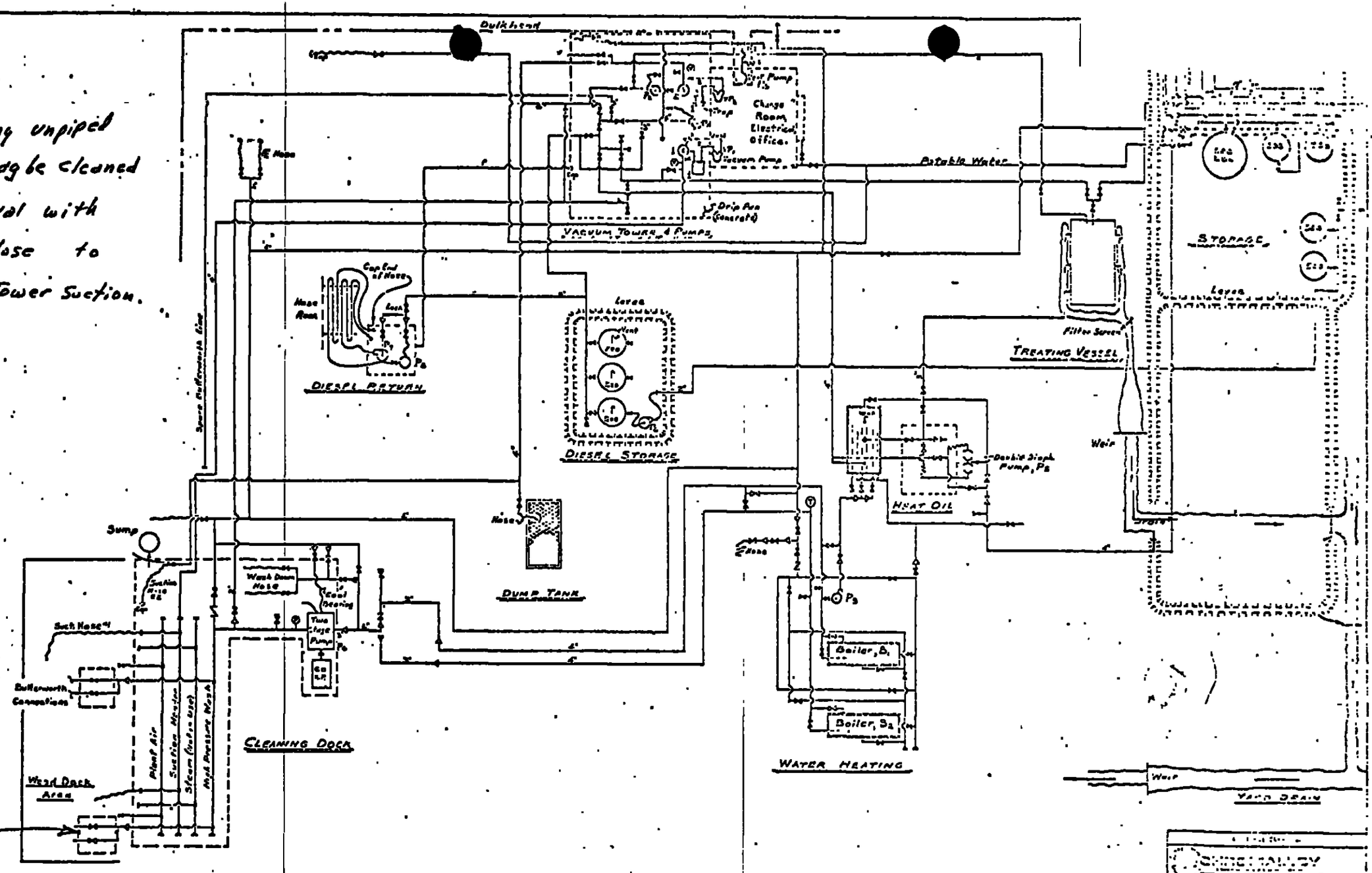

Bulkhead
Charge Room, Electrical Office.
Vacuum Pump
Potable Water
Drip Pan (Concrete)
VACUUM TOWER & PUMPS
STORAGE
Levee
Filter Screen
TREATING VESSEL
Weir
Double Diaph. Pump, P5
HEAT OIL
Cap End of Hose
Hose Rack
DIESEL RETURN
Levee
DIESEL STORAGE
Spare Butterworth Line
Sump
Wash Down Hose
Coal Bearing
Two Stage Pump
DUMP TANK
Boiler, B1
Boiler, B2
WATER HEATING
Butterworth Connections
Plant Air
Suction Header
Steam (Not in Use)
High Pressure Wash
CLEANING DOCK
Wood Dock Area
YARD DRAIN
Hot Water or Steam to Heating Coils
a. Boiler B1 thru Coils, Hot Water
b. Return to Boiler
c. Discharge Condensate or Water
CHRISTMALLOY
FLOW DIAGRAM, WATER & OIL
DELTA SHIPYARD GAS FREE

Figure 64

Note: Any unpiped sump may be cleaned by removal with Suction Hose to Vacuum Tower Suction.



3'-0" x 5'-0" x 6" Deep Sump (2)
Pipe to Main Sump.

Drip & Discharge Collection

Figure 65

LOCATIONS OF SIGNS

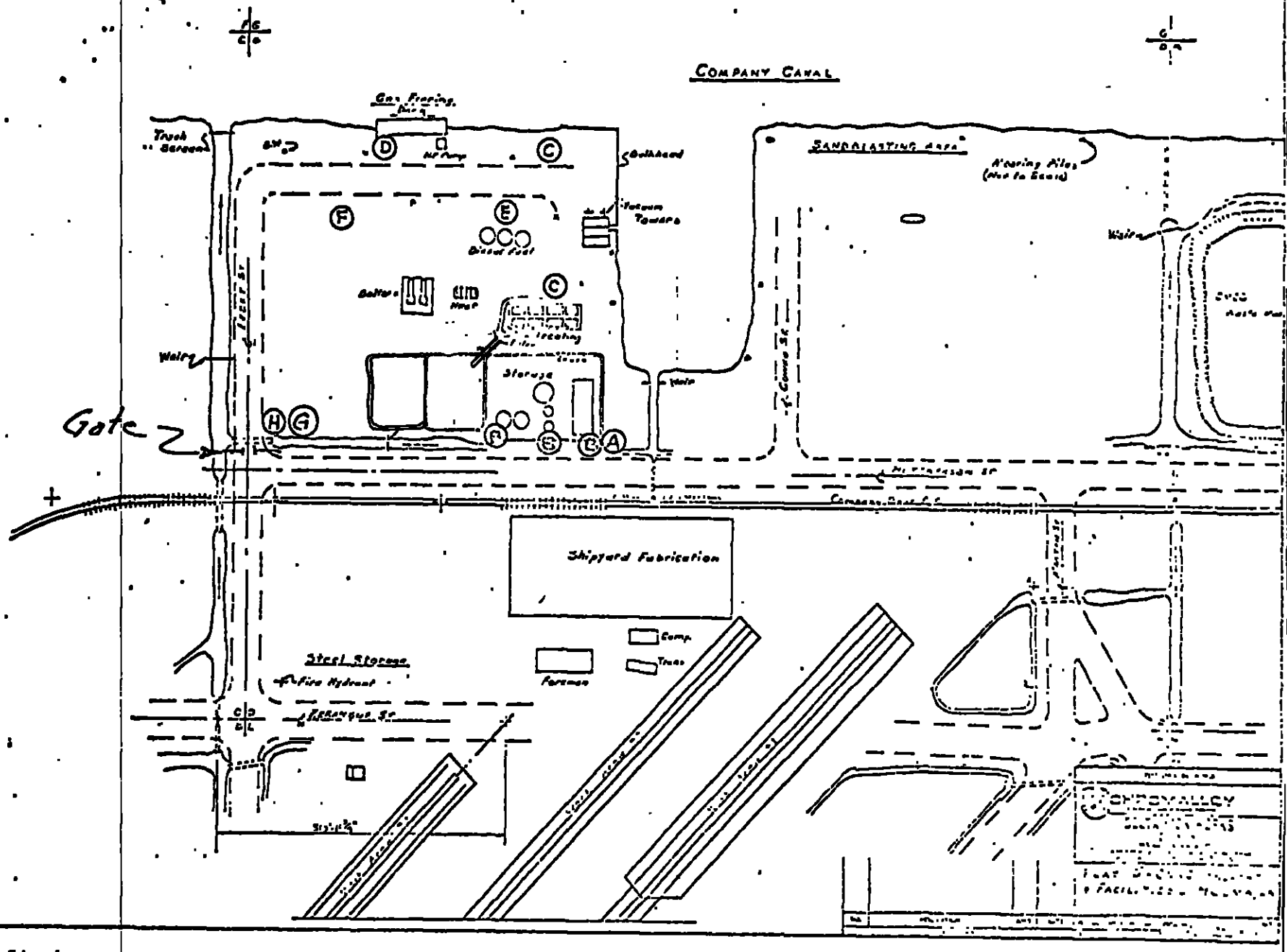


Figure 66

Note: Work is normally conducted during daylight hours.

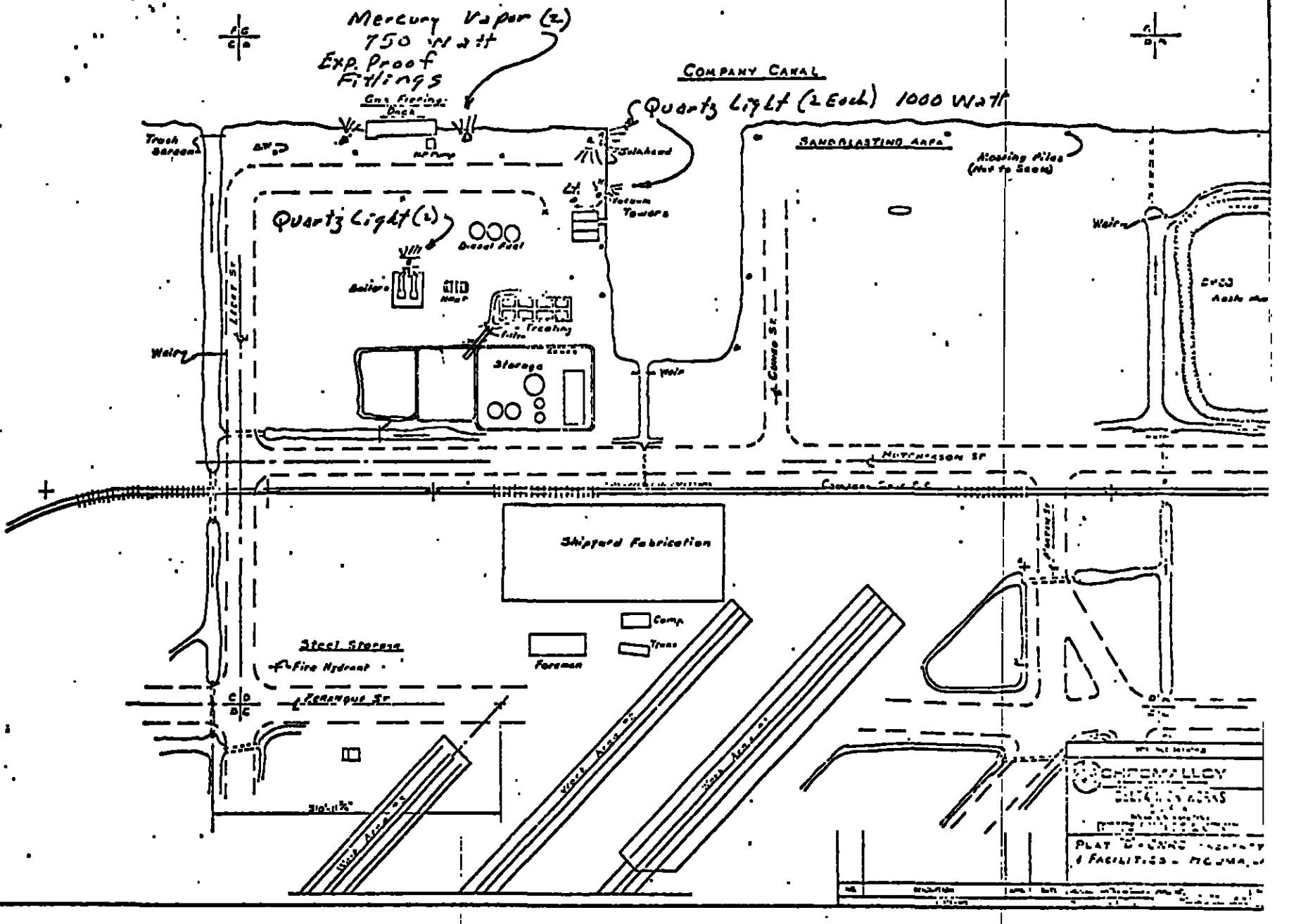


Figure 67

Reference Sheet

REF+24250

08/02/99 11:15 AM

Reference Sheet

REF+24251

08/02/99 11:15 AM

Reference Sheet

REF+24252

08/02/99 11:15 AM

Reference Sheet

REF+24253

08/02/99 11:15 AM

Reference Sheet

REF+24254

08/02/99 11:15 AM

Reference Sheet

REF+24255

08/02/99 11:15 AM

APPENDIX F

PRELIMINARY

REPORT OF

SOIL BORINGS
AND
LABORATORY TESTING

DELTA SHIPYARD DISPOSAL PIT
HOUMA, LOUISIANA

FOR

T. BAKER SMITH & SONS, INC.
ENVIRONMENTAL RESEARCH DIVISION
HOUMA, LOUISIANA

ENGINEERING SERVICES
BY
SOIL TESTING ENGINEERS, INC.
CONSULTANTS IN SOIL ENGINEERING AND FOUNDATION ANALYSIS
BATON ROUGE & LAKE CHARLES, LOUISIANA

SOIL TESTING ENGINEERS, INC.

CONSULTING GEOTECHNICAL ENGINEERS

P O BOX 80379 • 316 HIGHLANDIA DRIVE • BATON ROUGE LOUISIANA 70808 • PHONE (504) 292 4790

GORDON P BOUTWELL JR PHD
RICHARD B ADAMS ME
ROBERT L BRYANT ME
R KENNETH DERICK MS
REGISTERED PROFESSIONAL ENGINEERS

DAN A BROWN MS

November 26, 1980

T. Baker Smith and Sons, Inc.
Environmental Research Division
P. O. Box 2266
Houma, Louisiana 70361

Attention: Mr. Horace J. Thibodaux, RS
Director of Environmental Research

Re: Preliminary Soil Borings
and Laboratory Testing
Delta Shipyard Disposal Pit
Houma, Louisiana
File: 80-173

Gentlemen:

We have completed the field work and laboratory tests performed on samples obtained from two borings completed during the period November 3 and 4, 1980, at the Delta Shipyard disposal pit. Additionally, two observation wells with caps, were installed close to the borings (see Figure 2). The findings of the borings and the results of the laboratory testing are presented herein. The approximate locations of the borings are shown on the Boring Plan, Figure 1. The soil data on this cross section has been interpolated between the borehole locations and does not define continuity of the strata. For details, refer to the individual logs of the borings. The field and laboratory procedures used in this investigation are discussed below.

It should be noted that a geotechnical/geologic report was not requested at this stage. If such a report is later required, then necessary additional borings and testing, as well as engineering analyses can be performed.

FIELD EXPLORATION

General. The borings were made with tractor-mounted, rotary-type drilling equipment. Samples were obtained continuously in the upper 20 feet; below the 20 foot level, samples were generally obtained on 3 to 5 foot centers. The total exploration program consisted of 100 lineal feet of borings, 40 feet of which were sampled continuously. Logs of the borings are attached. The boreholes were grouted with a thick bentonite/cement grout. Two observation wells were installed as indicated on the Monitoring Well logs (W-1 and W-2) and Figure 1.

Sampling Procedures. In the cohesive and semi-cohesive soils, relatively undisturbed samples were secured using a 3 inch diameter, thin-wall Shelby Tube sampler. In this sampling procedure, the borehole is advanced to the desired level, and the tube is lowered to the bottom of the boring. It is then forced about 2 feet into the undisturbed soil in one continuous stroke. The tube is retrieved and the sample extruded by a hydraulic piston. The sample is then visually classified and a penetrometer relative strength test performed. Any disturbed portions are discarded, and the sample protected for transportation to the laboratory.

LABORATORY PROCEDURES

Some samples from the various strata were tested in the laboratory to determine their classifications and permeability characteristics. The samples and types of tests performed were selected by a geotechnical engineer. The testing program conducted is described below.

Classification Tests. Thirteen (13) Atterberg Limit Determinations, and one Separate Moisture Content Determination were conducted to classify the soil types.

Consolidation/Permeability Tests. Two (2) Standard Consolidation tests were performed. These were used in determining the Coefficient of Permeability of fine grained soils. The results are given below.

Boring No.	Depth (feet)	Perm. Coef. (cm/sec.)	Soil Description
B-1	6-8	4.3×10^{-8}	Gray organic clay
B-2	12-14	1.2×10^{-7}	Dark gray organic clay (peat)

Chemical Tests. Fourteen (14) pH determinations were performed to determine soil acidity/alkalinity. The results are give on Table I.

The results of the consolidation test are presented on Figure A-I through A-II; the remainder of the testing program is summarized in the appropriate columns of the boring logs.

We will be happy to answer any questions which may arise concerning this information. It has been a pleasure to work with Mr. Thibodaux on this project, and we look forward to serving T. Baker Smith and Sons again in the future.

Sincerely,

Narendra Dave

Narendra M. Dave
Project Engineer

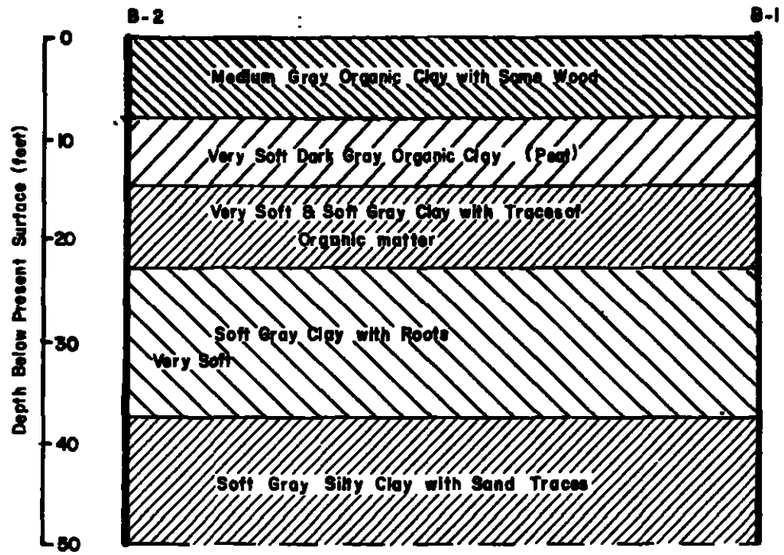
Richard B. Adams

Richard B. Adams, P.E.

/llt

Enclosures

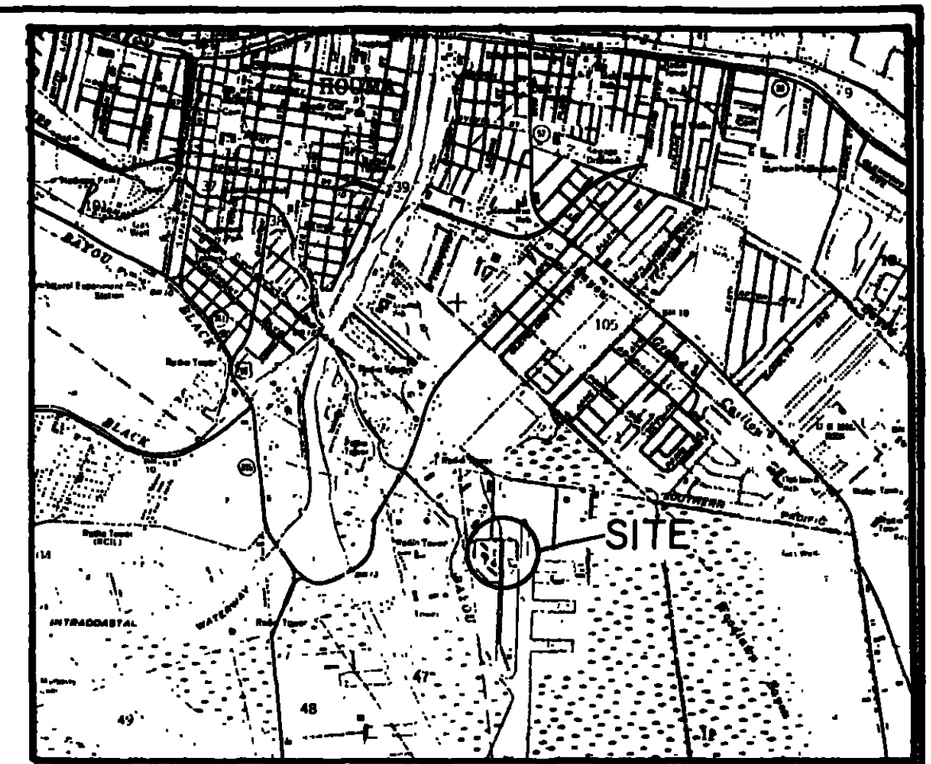
Copies submitted: (4)



SOIL PROFILE

No Horiz. Scale

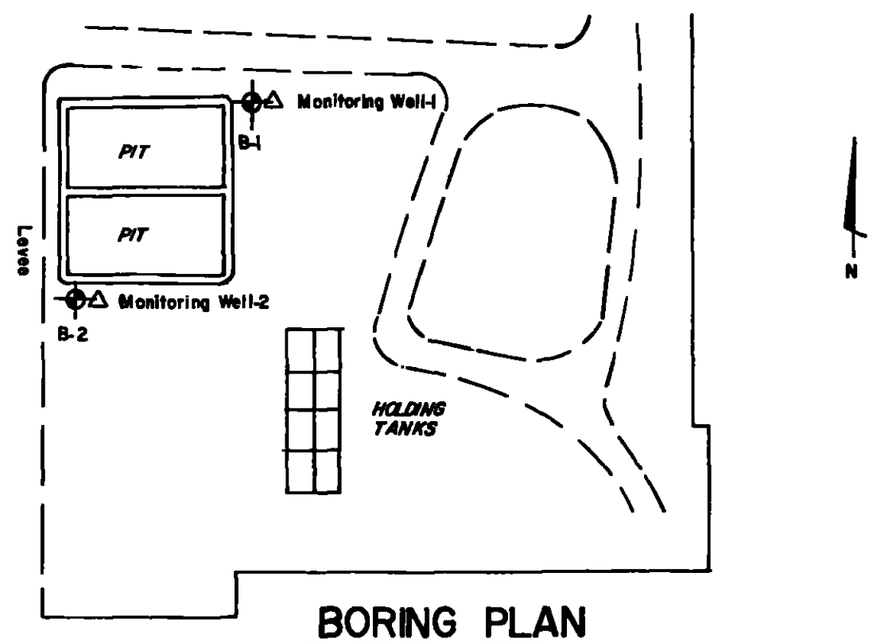
NOTE:
Strata interpolated between borehole locations and do not define continuity between them.



Ref: USC & GS Quad. Map
Houma, Louisiana 1974

VICINITY MAP

0 miles 1
Scale



BORING PLAN

No Scale

WASTE FACILITY
Houma, Louisiana

for

DELTA SHIPYARD
Houma, Louisiana

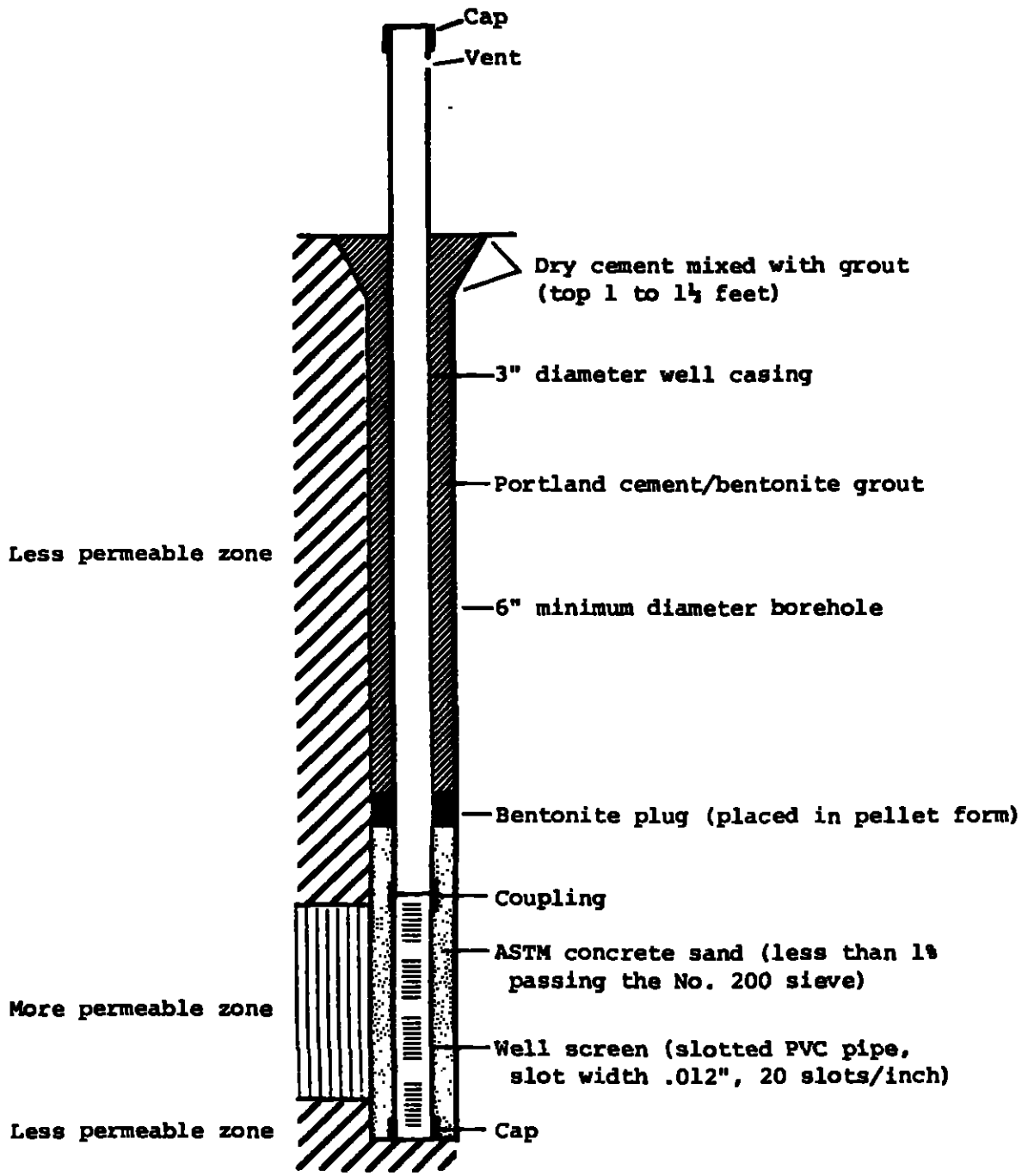
T. BAKER SMITH & SON INC.
ENVIROMENTAL RESEARCH DIVISION
Houma, Louisiana

SOIL INVESTIGATION BY
SOIL TESTING ENGINEERS, INC.
Baton Rouge, La Lake Charles, La

FILE NO	DATE	BY	Ckd		FIGURE NO
80-173	11/24/80	RAK	NMD		1

PROJECT DATA

SOIL TESTING ENGINEERS, INC.



TYPICAL MONITORING WELL SECTION

Delta Shipyard Disposal Pit
Houma, Louisiana

80-173
Figure 2

SOIL BORING LOG

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

Boring No. B-1

Sheet 1 **of** 2

File No. 80-173

Date 11/03/80

Tech. Chenevert

Boring Advance Method: Wash 0' to 50'

Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq.ft)	Compressive Strength (tons/sq.ft.)	Moisture Content (%)	Dry Density (lbs./cu.ft.)	Liquid Limit (%)	Plasticity Index (%)	Description
			1.2 (P)						Medium gray organic clay, w/wood
			0.8 (P)		52		102	74	
	5		0.7 (P)						
			0.5 (P)		78		140	93	
			N.P.						Very soft dark gray organic clay (peat)
	10		0.1 (P)		140		218	135	
			0.1 (P)						
	15		0.5 (P)						Very soft gray clay, w/traces of organic matter
			0.2 (P)		37		66	37	
	20		0.7 (P)						
	25		0.6 (P)						Soft gray clay, w/roots
	30		0.1 (P)		50		77	42	--very soft
	35		0.0 (P)						
	40		1.1 (P)		31				Medium gray silty clay, w/sand traces

SYMBOL

- Standard Penetration Test 140 lb. hammer-30" fall
- Undisturbed Sample 3 in. dia. Shelby Tube
- No Recovery

Compressive Strength from Unconfined Compression Test Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

Boring No. B-1

Sheet 2 **of** 2

File No. 80-173

Date 11/03/80

Tech. Chenevert

FIELD DATA				LABORATORY DATA					
Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq ft)	Compressive Strength (tons/sq. ft.)	Moisture Content (%)	Dry Density (lbs./cu. ft.)	Liquid Limit (%)	Plasticity Index (%)	
									Soft gray silty clay, w/sand traces
	45		0.6 (P)						
	50		0.5 (P)		38		38	14	
									Boring terminated @ 50'

SYMBOL

Standard Penetration Test
140 lb hammer-30" fall

Undisturbed Sample
3 in. dia. Shelby Tube

No Recovery

Compressive Strength from Unconfined Compression Test
Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

Boring No. B-2
Sheet 1 of 2

File No. 80-173
Date 11/04/80
Tech. A. Kahn

Boring Advance Method:
Auger 0' to 2'
Wash 2' to 50'

Ground Water Levels	Depth (feet)	Sampling	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq ft)	Compressive Strength (tons/sq. ft.)	Moisture Content (%)	Dry Density (lbs./cu. ft.)	Liquid Limit (%)	Plasticity Index (%)	Description
▽			1.2 (P)		41		107	68	Medium gray organic clay, w/some wood
▽			0.7 (P)		54		101	54	
	5		0.6 (P)						
			N.P.						
			0.3 (P)		131		154	107	Very soft dark gray organic clay (peat)
	10		0.3 (P)						
			0.4 (P)		110		284	162	
	15		0.5 (P)						Soft gray clay, w/traces of organic matter
			0.2 (P)						
	20		1.2 (P)		39		88	60	
	25		0.5 (P)						Soft gray clay, w/wood & roots
	30		0.4 (P)						
	35		0.1 (P)		35		63	38	--very soft
	40		0.3 (P)						Soft gray silty clay, w/sand traces

SYMBOL

- Standard Penetration Test 140 lb hammer - 30" fall
- Undisturbed Sample 3 in. dia. Shelby Tube
- No Recovery
- Free Water First Encountered
- Water Level After 10 minutes (Prior to Wash Boring)

Compressive Strength from Unconfined Compression Test Unless Noted Otherwise
Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

SOIL BORING LOG

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

Boring No. B-2

Sheet 2 **of** 2

File No. 80-173

Date 11/04/80

Tech. Chenevert

FIELD DATA				LABORATORY DATA					
Ground Water Level	Depth (feet)	Samples	Standard Penetration Test (blows/foot) or Penetrometer (P) (tons/sq ft)	Compressive Strength (tons/sq.ft.)	Moisture Content (%)	Dry Density (lbs./cu.ft.)	Liquid Limit (%)	Plasticity Index (%)	
									Soft gray silty clay, w/sand traces
	45		0.3 (P)		32		35	9	
	50		0.7 (P)						
									Boring terminated @ 50'

SYMBOL

Standard Penetration Test
140 lb. hammer - 30" fall

Undisturbed Sample
3 in. dia. Shelby Tube

No Recovery

Compressive Strength from Unconfined Compression Test
Unless Noted Otherwise

Strata Boundaries May Not Be Exact

SOIL TESTING ENGINEERS, INC.

MONITORING WELL LOG

Boring No. W-1

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

File No. 80-173
Date 11/03/80
By Chenevert

FIELD DATA

GROUND WATER LEVELS	DEPTH (feet)	SAMPLING	Standard Penetration Test (blows/foot) or Penetrometer (P) - Torvane (T) (tons/sq. ft.)
	5		
	10		

Boring Advance Method:
Wash 0' to 12'

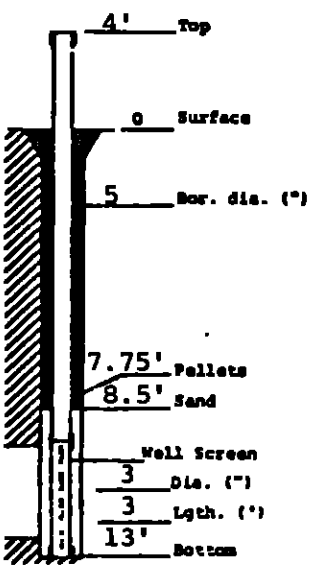
Drill Rig: 200
Driller: James Kelly

SEE BORING B-1

Boring terminated @ 12'

Monitoring Well Data

Well No. 1



Standard Penetration Test
140 lb hammer - 30 in fall

Undisturbed Sample
3 in dia Shelby Tube

No Recovery

Strata boundaries inferred and may not be exact

SOIL TESTING ENGINEERS, INC

MONITORING WELL LOG

Boring No. W-2

Project Delta Disposal Pit
Houma, Louisiana

Client T. Baker Smith & Sons, Inc.
Houma, Louisiana

File No. 80-173
Date 11/04/80
By Chenevert

FIELD DATA

Ground Water Levels	DEPTH (feet)	Sample No.	Standard Penetration Test (blows / foot) or Penetrometer (P) - Torvane (T) (tons / sq. ft.)
	5		
	10		
	15		
	20		

Boring Advance Method: Wash 0' to 20'

Drill Rig: 200

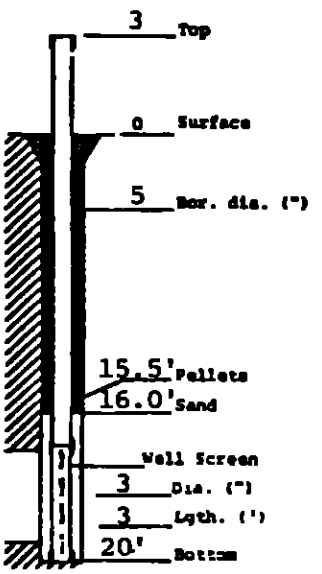
Driller: James Kelly

SEE BORING B-2

Boring terminated @ 20'

Monitoring Well Data

Well No. 2



Standard Penetration Test (140 lb hammer - 30 in fall)

Undisturbed Sample 3 in. dia. Shelby Tube

No Recovery

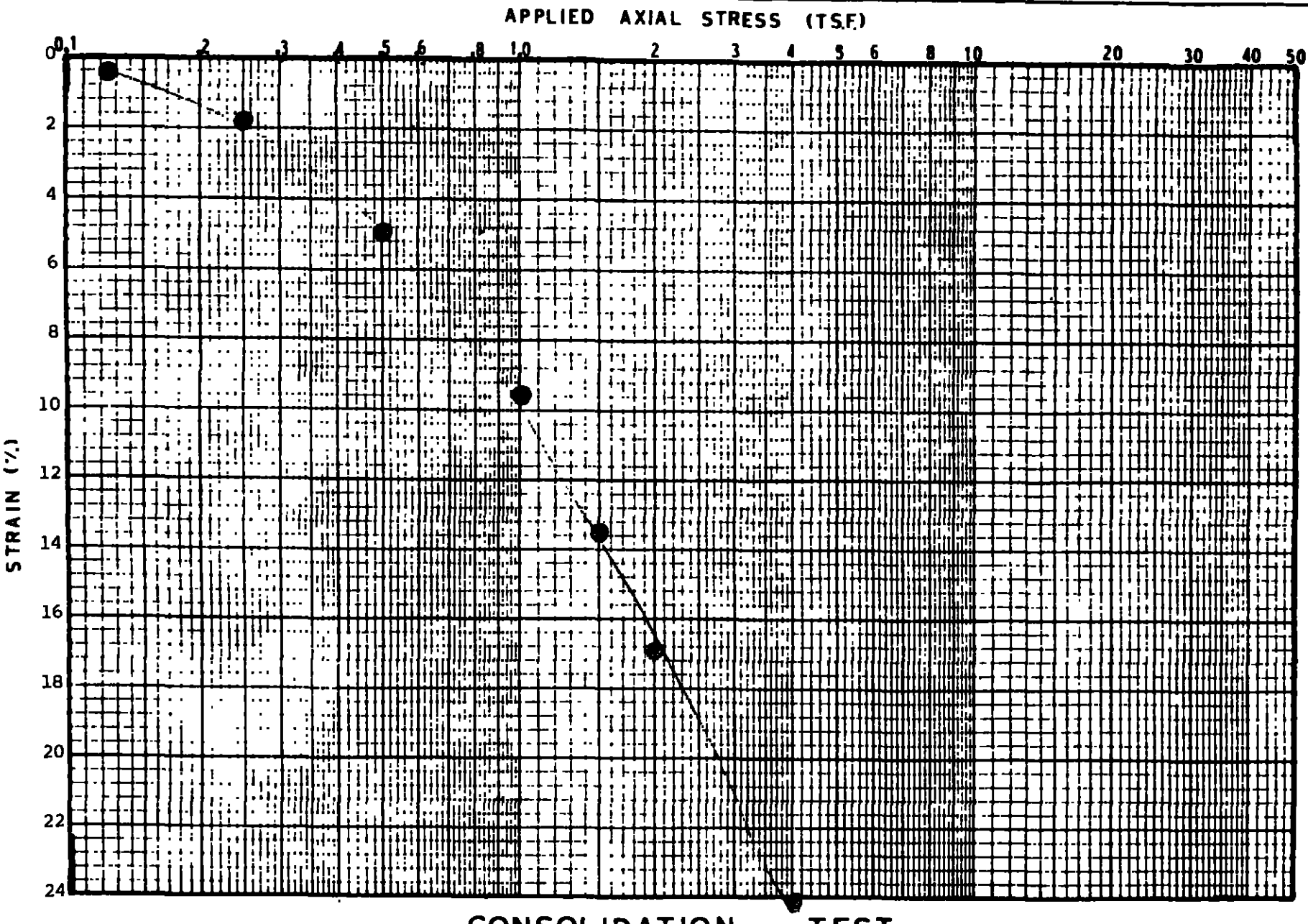
Strata boundaries inferred and may not be exact

SOIL TESTING ENGINEERS, INC

TABLE I

CHEMICAL ANALYSIS

Boring No.	Depth (feet)	pH
1	2.0 to 4	7.3
1	6.0 to 8	7.9
1	10.0 to 12	5.9
1	16.0 to 18	7.3
1	28.0 to 30	8.2
1	38.0 to 40	8.1
2	0 to 2	6.8
2	4.0 to 6	7.7
2	8.0 to 10	7.5
2	12.0 to 14	6.3
2	18.0 to 20	8.0
2	33.0 to 35	8.0
2	43.0 to 45	8.0



CONSOLIDATION TEST

SAMPLE IDENTIFICATION

Boring No. : B-1
Depth (ft.) : 6 to 8
Material : Gray organic clay

CLASSIFICATION DATA

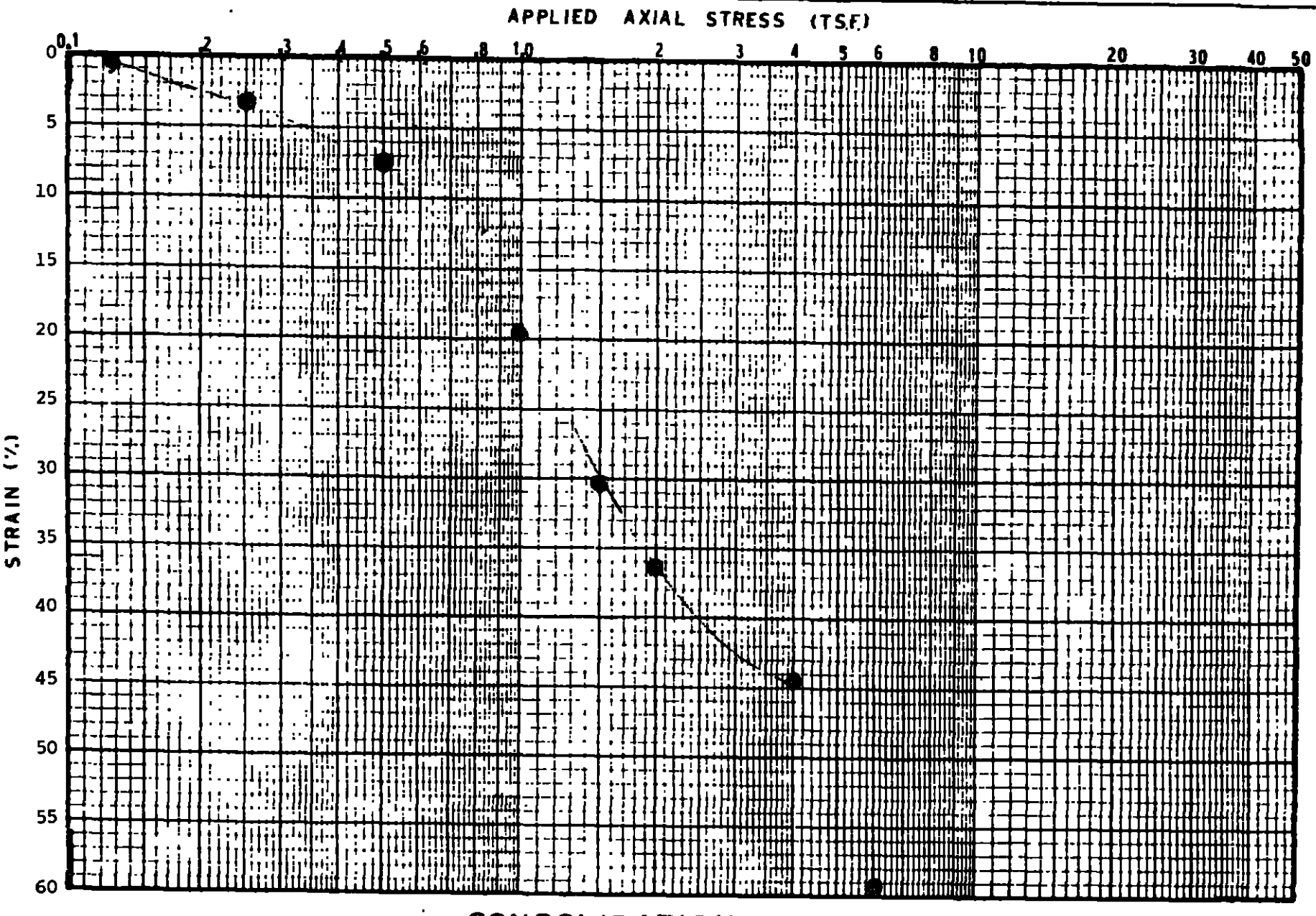
Initial Moisture Content (%) = 84
Initial Dry Density (lbs/cu ft) =
Final Moisture Content (%) = 62

LL = 140
PL = 47
PI = 93

SOIL TESTING ENGINEERS, INC.

FILE NO. 80-173

FIGURE NO A-IA



CONSOLIDATION TEST

SAMPLE IDENTIFICATION

Boring No. : B-2
Depth (ft.) : 12 to 14
Material : Dark gray organic clay (peat)

CLASSIFICATION DATA

Initial Moisture Content (%) = 317
Initial Dry Density (lbs/cu.ft.) =
Final Moisture Content (%) = 179

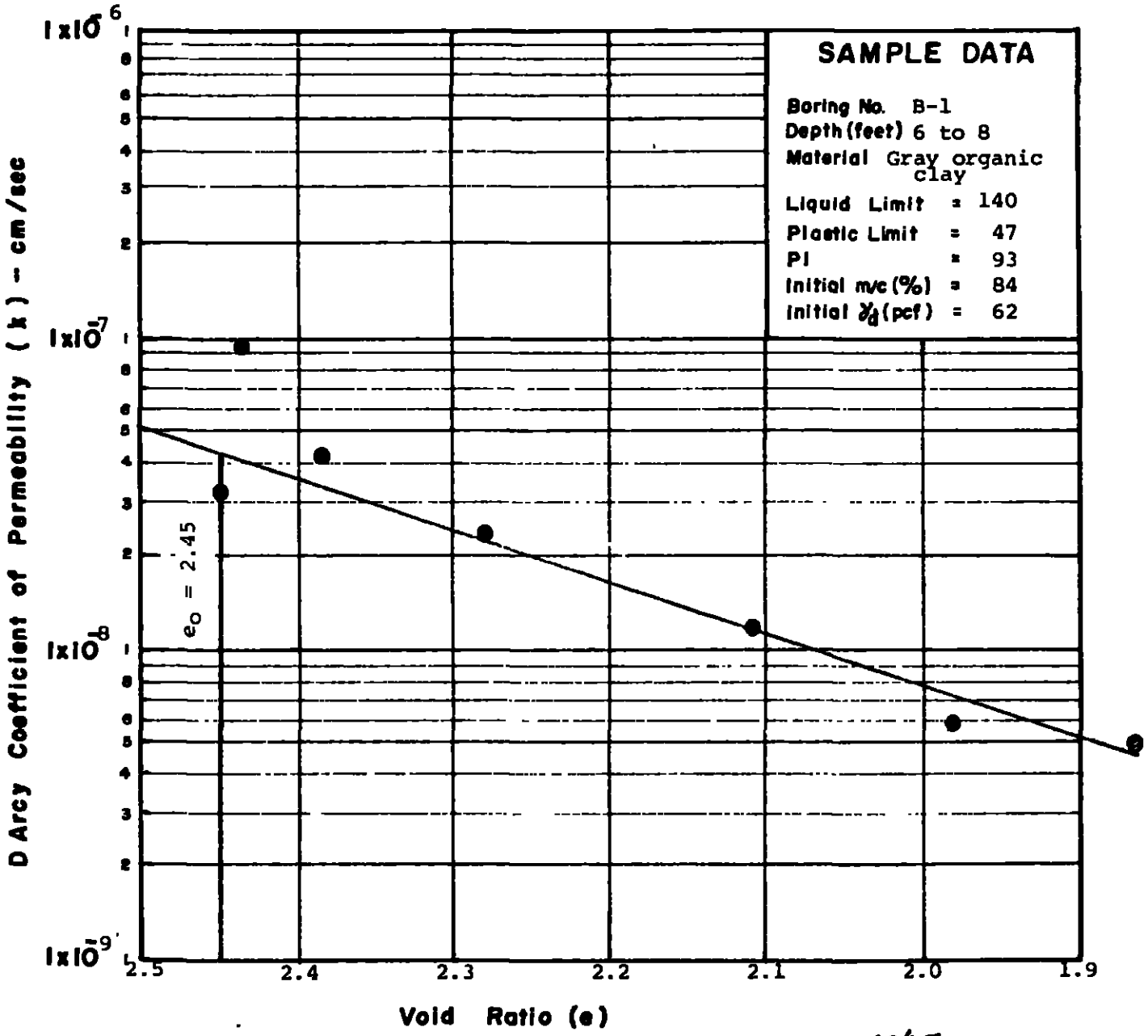
LL = 284
PL = 122
PI = 162

SOIL TESTING ENGINEERS, INC.

FILE NO. 80-173

FIGURE NO. A-IIA

SOIL TESTING ENGINEERS, INC.



$$k = C_v \gamma_w \frac{\Delta e / \Delta \sigma}{1 + e_o}$$

C_v = Coeff. of Consolidation
Δe = Change in Void Ratio
$\Delta \sigma$ = Change in Pressure
γ_w = Unit Weight of Water

● Raw Data Point

—— Best Fit Linear Regression in Stable Range

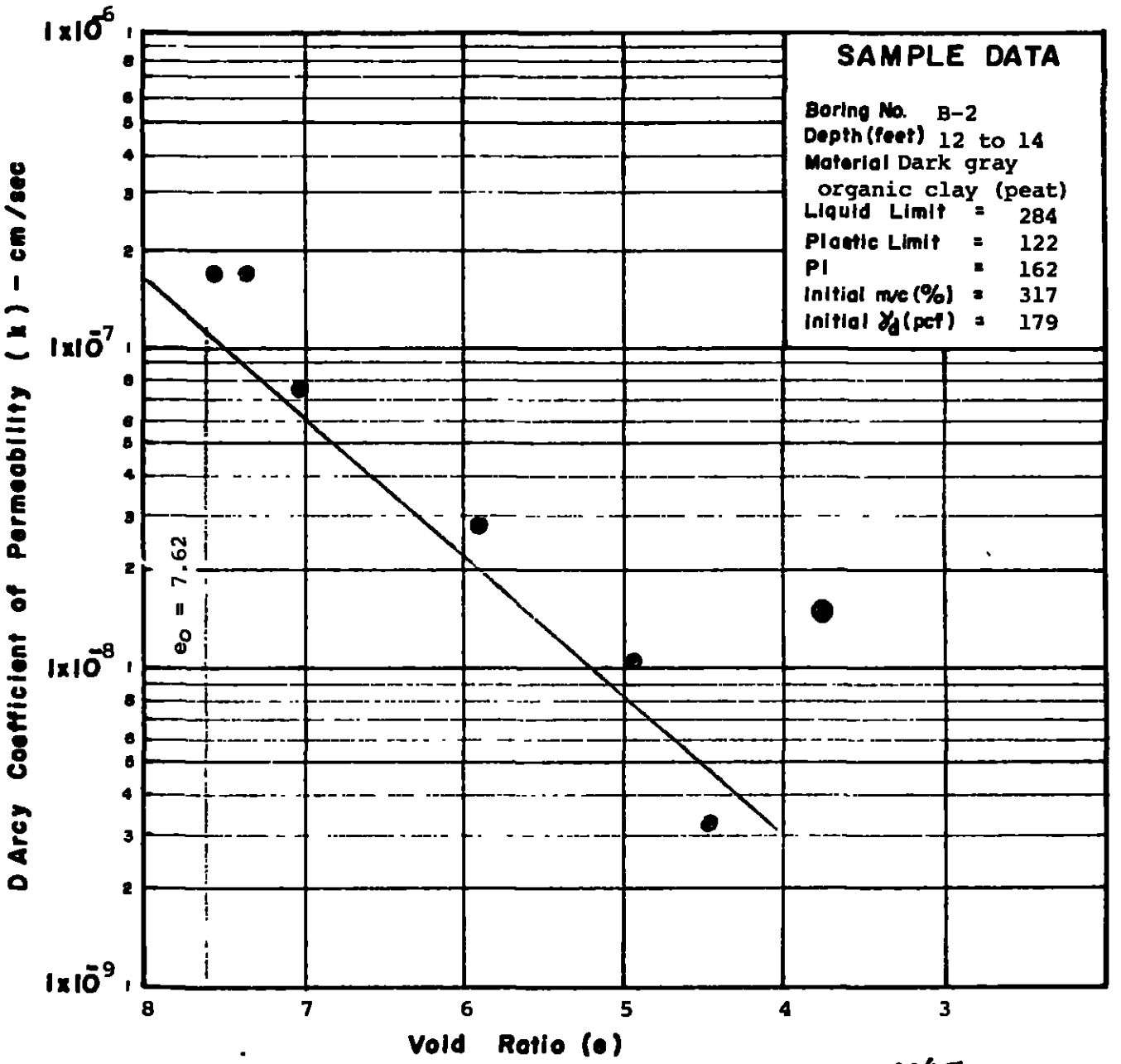
$k = 4.3 \times 10^{-8}$ cm/sec at $e_o = 2.45$

PERMEABILITY DETERMINED BY CONSOLIDATION TEST

Delta Shipyard Disposal Pit
Houma, Louisiana

80-173
Figure A-IB

SOIL TESTING ENGINEERS, INC.



$$k = C_v \gamma_w \frac{\Delta e / \Delta \sigma}{1 + e_o}$$

● Raw Data Point

Best Fit Linear Regression in Stable Range

C_v = Coeff. of Consolidation
Δe = Change in Void Ratio
$\Delta \sigma$ = Change in Pressure
γ_w = Unit Weight of Water

$k = 1.2 \times 10^{-7}$ cm/sec at $e_o = 7.62$

PERMEABILITY DETERMINED BY CONSOLIDATION TEST

Delta Shipyard Disposal Pit
Houma, Louisiana

80-173
Figure A-IIB

D E L T A S H I P Y A R D

8. GAS FREEING

VESSEL: _____ KIND: _____

OWNER: _____

JOB NO.: 02-_____ ; ITEM_____

DATE PERFORMED: _____

WEATHER CONDITIONS: _____

_____

YARD WORK LOAD: LIGHT ( ), MEDIUM ( ), HEAVY ( )

WORK SPECIFICATIONS: _____

_____

_____

_____

_____

SIZE OF BARGE: _____
LAST KNOWN CARGO: _____
NUMBER OF CARGO COMPTS: _____
BUTTERWORH OPENINGS? _____
COLD OR HOT WASH? _____
MARINE CERTIFICATE RATING? _____
WAS PARAFFIN LIGHT, MEDIUM OR HEAVY?: _____

LABOR:

MANHOURS = _____ MH= _____ MH/COMPT.
NO. OF COMPTS NO.

OTHER PERTAINENT DATA: _____

_____

_____

_____

_____

ESTIMATOR: _____

APPENDIX "H"

EXHIBIT "G"

PROPOSED SCOPE OF WORK

1. Laboratory personnel will collect comprehensive operational samples from each of the existing monitoring wells shown in Exhibit "A" attached. The samples will be collected on a quarterly basis for a period of one year. A schedule of collection dates shall accompany your estimate.

2. Once the samples are collected in accord with the Department of Natural Resources, Office of Environmental, Hazardous Waste Management Division, "Analytical Operating Procedures Manual" Provisional Edition dated August 5, 1980, the laboraty analyses from each monitoring well will include the identification of the presence and level of the following parameters.

   a. specific conductivity, mho/cm at 25°C
   b. temperature, C (field and laboratory)
   c. pH
   d. total dissolved solids, mg/liter
   e. total suspended solids, mg/liter
   f. total settleable solids, mg/liter
   g. dissolved organic carbon (DOC), mg/liter
   h. total chlorinated hydrocarbons, mg/liter
   i. phenolic compounds (as phenol), mg/liter
   j. metals:

      antimony, mg/liter
      arsenic, mg/liter
      barium, mg/liter
      beryllium, mg/liter
      cadmium, mg/liter
      chromium, mg/liter
      copper, mg/liter

iron, mg/liter

lead, mg/liter

magnesium, mg/liter

maganese, mg/liter

mercury, mg/liter

nickel, mg/liter

selenium, mg/liter

silver, mg/liter

thalium, mg/liter

vanadium, mg/liter

zinc, mg/liter

k. ammonia (as N), mg/liter

l. chlorides, mg/liter

m. cyanide, mg/liter

n. fluoride, mg/liter

o. nitrate, mg/liter

p. phosphage, total mg/liter

r. ortho-phosphate (as P), mg/liter

s. organic contaminant scanning (volatile, base neutrals, acid extracts) by Gas Chromatography

3. A report of the analysis of samples will be submitted to Delta Shipyard, Inc. Attention: Mr. Chris Olivier, P.O. Box 101, Houma, Louisiana 70361. An estimated time for submitting the report after sample collection shall accompany the estimate.

Alternate No. 1

1. Laboratory personnel shall train Delta Shipyard personnel as to the proper collection technique concerning sample collection and in accord with the Department of Natural Resources "Analytical Operating Procedures Manual" Provisional Edition dated August 5, 1980.
2. Same as No. 2 on sheet 1 of 3.
3. Same as No. 3 on sheet 2 of 3.

PATRICIA L. NORTON
SECRETARY

OFFICE OF SOLID AND HAZARDOUS WASTE

JOHN KOURY
ASSISTANT SECRETARY

February 5, 1986

Mr. Conrad A. Dussel, P.E.
Wink Engineering
7520 Hayne Boulevard
New Orleans, Louisiana 70126-1899

Dear Mr. Dussel:

Re: Delta Shipyard's Waste Sites at Houma and Duson, Louisiana

The Hazardous Waste Division acknowledges receipt of your letter dated July 7, 1985, requesting declassification of the two sites.

A review of the data was made and inspections of both sites were performed by department personnel.

The inspections revealed the following:

1. Duson Site--<u>In addition to items noted in your letter, our inspector identified:</u>

   a. A number of drums containing waste oil located in and near the green maintenance shed on the south portion of the property.

   b. A concrete sump and what appeared to be a pipe cleaning area in an unroofed metal building in the east central portion of the site. The soils immediately adjacent to these areas were devoid of vegetation, indicating some type of contamination.

   c. Drums in and around the pipe and vessel graveyard in the northwest portion of the site. Same were empty and some contained liquids.

2. Houma--<u>In addition to the impoundments described in your letter, our inspector identified:</u>

   a. Numerous drums were observed throughout the site.

In light of the data submitted and our inspector's observations, the Hazardous Waste Division concurs with your position that the impoundments described in your July 5th letter are non-hazardous and should be closed in accordance with Solid Waste Regulations.

With regard to the additional items noted by our inspector, the Hazardous Waste Division requests documentation on the contents of the concrete sump, the pipe cleaning area and the drums at the Duson site. Also, information is needed on the contents of the drums at the Houma site.

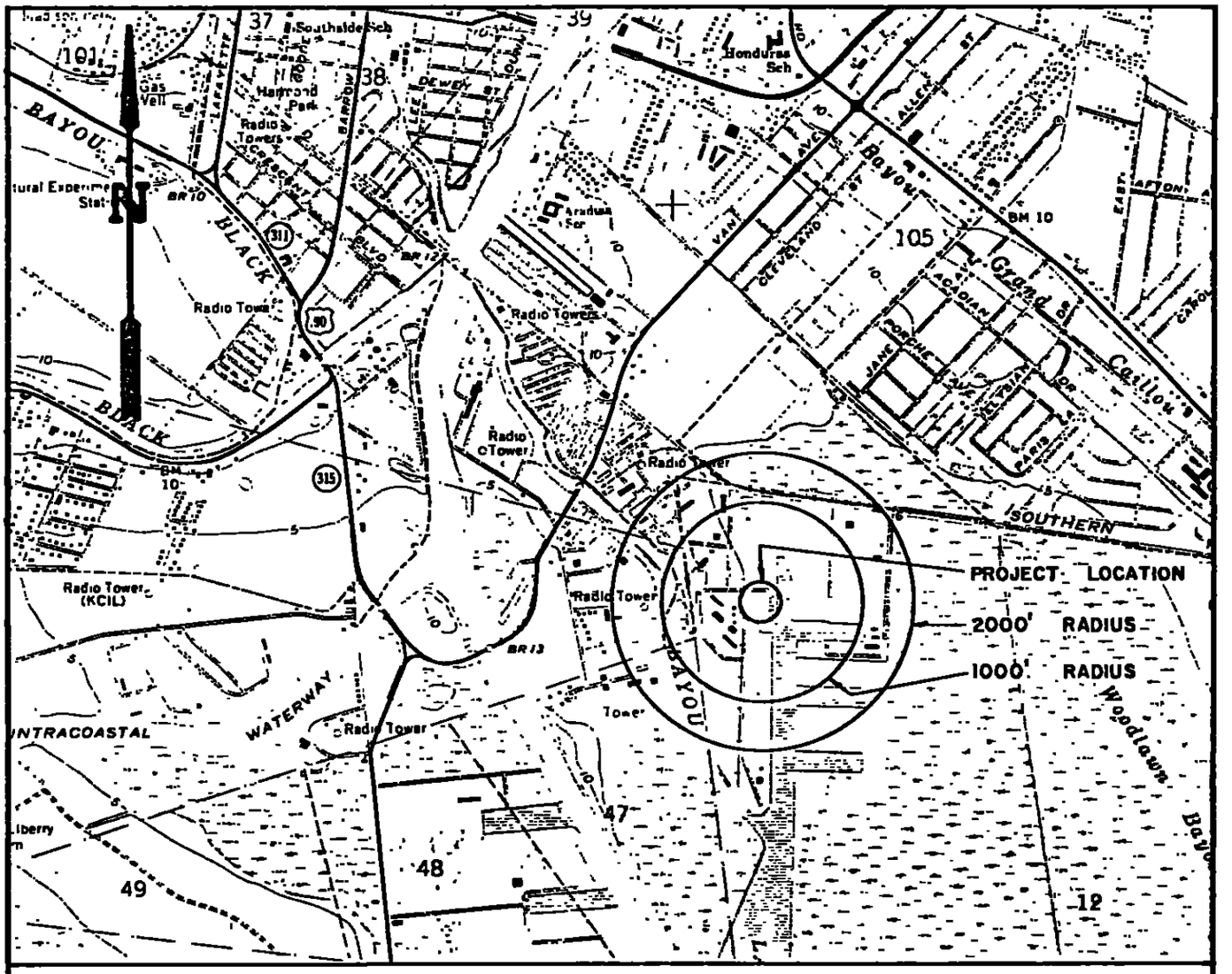
If there are any questions concerning this matter, please feel free to contact this office.

Sincerely yours,

THOMAS H. PATTERSON
Enforcement Program Manager

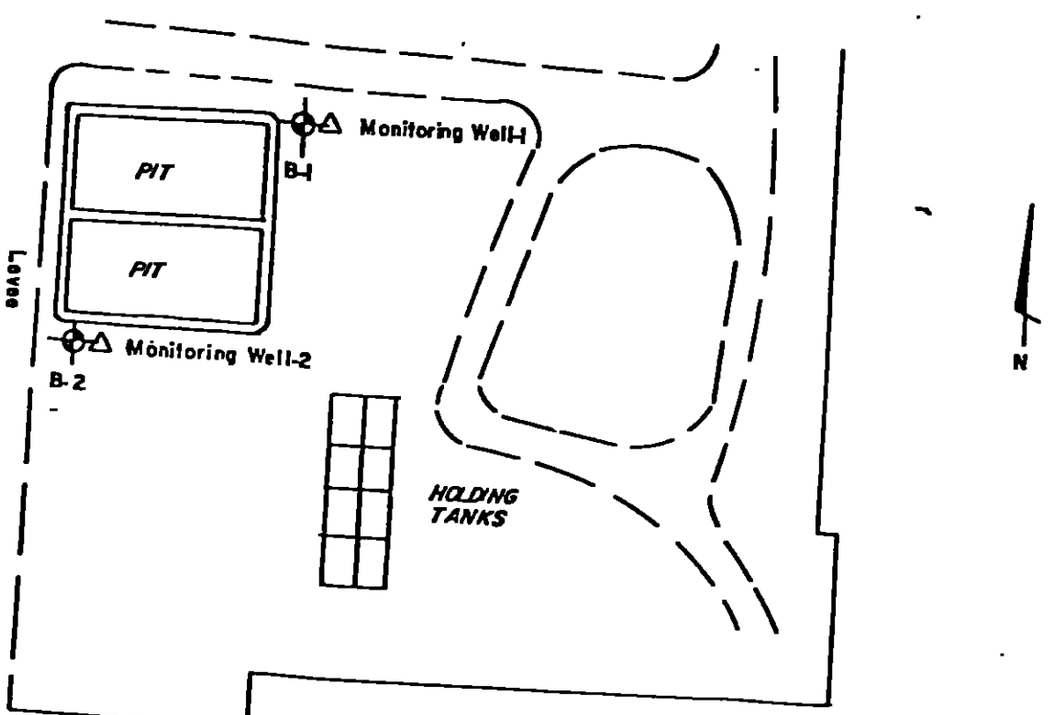
THP:RG:fl
cc: Mr. Paul Miller, Solid Waste Division
Mr. Richard Goudeau, Hazardous Waste Division

EXHIBIT "A"



SCALE IN FEET

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET



BORING PLAN

No Scale

WINK ENGINEERING

A DIVISION OF WINK INCORPORATED

MECHANICAL
CIVIL
ELECTRICAL
PROCESS
INSTRUMENT

7520 HAYNE BLVD. ■ NEW ORLEANS, LA. 70126-1899 ■ TELEPHONE 504/246-7924

SEPTEMBER 6, 1985

MR. BILL DEVILLE
ADMINISTRATOR
LOUISIANA STATE DEPARTMENT OF
ENVIRONMENTAL QUALITY
INACTIVE & ABANDONED WASTE SITES DIVISION
P.O. BOX 44307
BATON ROUGE, LA 70804

RECEIVED
SEP 10
DEPARTMENT OF
ENVIRONMENTAL QUALITY
HAZARDOUS WASTE MANAGEMENT

LETTER NO.: WM59-6
RE: DELTA SHIPYARDS'
WASTE SITES @
HOUMA & DUSON, LA
JOB: 59-051484

DEAR MR. DEVILLE:

IN REFERENCE TO OUR LETTER NO. WM59-5 DATED JULY 5, 1985, A COPY OF WHICH WAS FORWARDED TO YOUR OFFICE BY THE HAZARDOUS WASTE DIVISION CONCERNING THE ABOVE REFERENCED SUBJECT MATTER, WE WOULD LIKE TO CORRECT A POSSIBLE POINT OF MISINTERPRETATION CONCERNING DUSON #1A WASTE SITE, A SUBMERGED TANK FILLED WITH A LIQUID SUBSTANCE.

THIS PARTICULAR LIQUID SAMPLE WAS INADVERTENTLY LISTED WITH THE COMPOSITE SOLID TEST SAMPLE OF DUSON #1. THIS SHOULD BE CORRECTED TO REFLECT ONLY SOLID COMPOSITES OF DUSON #1B. DUSON #1A LIQUID SAMPLE ANALYSIS IS ATTACHED FOR YOUR REVIEW.

IT IS OUR OPINION THAT THIS MATERIAL IS NOT HAZARDOUS AND WILL NOT POSE A THREAT NOW OR IN THE FUTURE TO HUMAN HEALTH OR THE ENVIRONMENT.

PLEASE ADVISE AS SOON AS POSSIBLE THE PROPER CLASSIFICATION AND DISPOSITION OF THESE WASTE SITES.

VERY TRULY YOURS,

Conrad Dussel

CONRAD A. DUSSEL, P.E.
PROJECT ENGINEER

RECEIVED
SEP 13 1985
LA. DEPT. OF
ENVIRONMENTAL QUALITY
IAS DIVISION

CAD:MLV
ATTACHMENT
CC: GLENN MILLER (DEQ, BOX 44066)
DUDLEY DEVILLE (DEQ, BOX 44066)
HOWARD SEIFE (MILBANK, ET AL)

B,F

ENVIRONMENTAL INDUSTRIAL RESEARCH ASSOCIATES, INC.
2445 Florida Ave., Kenner, Louisiana 70062
(504) 469-0333

LABORATORY REPORT

CLIENT: Wink Engineering

Sample Location: Delta Fabricators
Duson, Louisiana #1 A (Liquid)

Sample Description: 1 Water Sample

Laboratory Number: 850871

Sampling Date:	Unknown	Time Sampled:	Unknown
Date Received:	08/26/85	Time Received:	0933 Hrs.
Date Analyzed:	09/03/85	Time Analyzed:	1115 Hrs.
Date Completed:	09/05/85	Time Completed:	1300 Hrs.

Analyses Requested: Reactivity, Corrosivity, Ignitability, & EP Toxicity (metals)

Method of Analyses:

Reactivity: Test Method for Evaluation Solid Waste Physical/Chemical Methods Waste Characterization Branch, EPA, May, 1980.

Corrosivity: Test Method for Evaluation Solid Waste Physical/Chemical Methods Waste Characterization Branch, EPA, May, 1980.

Ignitability: Method - ANSI/ASTM D 93-79, "Standard Method for Flash and Fire Standards, 1978.

Extraction Procedures: Federal Register, Vol. 45, No. 98, page 33127.

Arsenic	Method 303E, Page 160
Barium	Method 303C, Page 157
Cadmium	Method 418C, Page 370
Chromium	Method 303A, Page 152
Lead	Method 303A, Page 152
Mercury	Method 320, Page 217
Selenium	Method 303E, Page 160
Silver	Method 303A, Page 152

Analytical methods according to Standard Methods for the Examination of Water and Wastewater. American Public Health Association, 15th Edition, 1980.

Analyzed by: _____ Date: 9/6/85

Approved by: _____ Date: 9/6/85
Thomas E. Orr - Manager

ENVIRONMENTAL INDUSTRIAL RESEARCH ASSOCIATES, INC.

RESULTS

	#1 A-0.0'
Reactivity:	
Cyanide	0.7 (mg/l)
Sulfide	25.6 (mg/l)
Corrosivity	
pH	7.9 (S.U.)
Ignitability	
Flash Point	>100°C

EP Toxicity	#1 A-0.0'	Max Concen. for EP Toxicity	Detection Limit
Arsenic (mg/l)	0.005	5.0	0.002
Barium (mg/l)	0.17	100.0	0.1
Cadmium (mg/l)	0.060	1.0	0.005
Chromium (mg/l)	0.06	5.0	0.05
Lead (mg/l)	0.50	5.0	0.1
Mercury (mg/l)	0.005	0.2	0.001
Selenium (mg/l)	0.022	1.0	0.002
Silver (mg/l)	0.07	5.0	0.01

COPY

Joan w/o
Dudley
Tom

WINK ENGINEERING

MECHANICAL
CIVIL
ELECTRICAL
PROCESS
INSTRUMENT

7520 HAYNE BLVD ■ NEW ORLEANS LA 70126 1899 ■ TELEPHONE 504/246 7924

JULY 5, 1985

RECEIVED
AUG 1985
DEPARTMENT OF
ENVIRONMENTAL QUALITY
HAZARDOUS WASTE MANAGEMENT

MR. GLENN A. MILLER
ADMINISTRATOR
LOUISIANA DEPARTMENT OF
ENVIRONMENTAL QUALITY
P.O. BOX 44066
BATON ROUGE, LA 70804

LETTER NO.: WM59-5
RE: DELTA SHIPYARD'S WASTE SITES AT HOUMA & DUSON, LOUISIANA
WINK JOB NO.: 59-051485

DEAR MR. MILLER:

THIS LETTER AND ITS ATTACHMENTS ARE PREPARED PURSUANT TO MY TELEPHONE CONVERSATIONS ON JUNE 5, 1985, WITH MESSRS. DUDLEY DEVILLE AND TOM PATTERSON OF YOUR OFFICE. WINK, INC., AN INDEPENDENT CONSULTING ENGINEERING FIRM, HAS BEEN RETAINED TO DETERMINE IF THE ABOVE REFERENCED SITES ARE HAZARDOUS.

THERE ARE CURRENTLY SIX (6) SURFACE IMPOUNDMENTS AT DELTA'S HOUMA YARD: THREE (3) ARE COVERED AND OVERGROWN WITH VEGETATION, WHILE THE REMAINING THREE (3) ARE EXPOSED AND FILLED WITH SLUDGE. AT THE DUSON YARD THERE IS A SUBMERGED, UNCOVERED STEEL TANK FILLED WITH A LIQUID SUBSTANCE. ACCORDING TO OUR RESEARCH, ALL SITES WERE ONCE USED TO DISPOSE OF OIL FIELD DRILLING MATERIAL. THIS PRACTICE CEASED ABOUT 10 YEARS AGO; HOWEVER, IT APPEARS FROM OUR ANALYSIS DUMPING HAS OCCURRED INTERMITTENTLY SINCE THEN. SEVERAL SURFACE SPILLS WERE OBSERVED ON THESE PROPERTIES AND A CHEMICAL ANALYSIS WAS SUBSEQUENTLY MADE.

Have Richard — call C. A. Dussel.

AT ONE TIME THE SURFACE IMPOUNDMENTS AT HOUMA WERE REGISTERED WITH THE DEPARTMENT OF ENVIRONMENTAL QUALITY AS HAZARDOUS WASTE SITES, BUT WERE RECOMMENDED BY YOUR ENFORCEMENT AGENCY IN JANUARY, 1984, TO BE REMOVED FROM THE HAZARDOUS WASTE SYSTEM. CURRENTLY, THESE IMPOUNDMENTS ARE IN THE INACTIVE CLASSIFICATION AS CONFIRMED BY TELEPHONE ON JUNE 5, 1985. TO DETERMINE THE SLUDGE AND LIQUID CHEMICAL COMPOSITION AND THEREFORE THE POTENTIALLY HAZARDOUS NATURE OF THESE SITES, NUMEROUS SAMPLES WERE COLLECTED AT RANDOM LOCATIONS AS INDICATED IN ATTACHMENTS 1, 2, 3, 4, & 5. IMPOUNDMENTS 1, 2, 3 IN HOUMA ARE COVERED WITH A THIN CRUST OF FILL WHILE NOS. 5, 6, 7 ARE EXPOSED. HOUMA AREA NO. 4 AND DUSON AREA NOS. 2 & 3 ARE ESSENTIALLY LOW SPOTS WHERE ACCUMULATIONS OF SLUDGE HAVE SETTLED. DUSON AREA NO. 1 CONSISTS OF A SUBMERGED STEEL TANK OF UNKNOWN DEPTH CONTAINING A LIQUID SUBSTANCE. SOIL SAMPLES WERE TAKEN AT VARIOUS DEPTHS APPROXIMATELY 8" FROM THE SUBMERGED TANK TO CHECK FOR LEAKAGE.

ALL INDIVIDUAL SAMPLES FROM EACH IMPOUNDMENT/AREA WERE THOROUGHLY MIXED TO FORM A COMPOSITE SAMPLE FOR EACH LOCATION. LABORATORY ANALYSES WERE PERFORMED BY WEST-PAINE OF BATON ROUGE, AND THE RESULTS ARE CONTAINED IN ATTACHMENT NO. 6.

THE FOLLOWING TESTS WERE PERFORMED ON EACH SAMPLE: VOA (VOLATILE ORGANIC AROMATICS), CYANIDE, PHENOL (TOTAL), FLASH POINT (BELOW 140^{0}F), PH, EP TOXICITY, AND OIL & GREASE. BASED ON THE ATTACHED ANALYSES, THE EP TOXICITY CONSTITUENTS DO NOT EXCEED THOSE LIMITS DESCRIBED IN CHAPTER 24, TABLE 5. NEITHER DO THE SUMMATION OF CONSTITUENTS LISTED IN PARAGRAPHS 24.1 (D) AND (E) AND CHAPTER 17 EXCEED 1000 PPM. IT IS OUR OPINION THAT THESE SITES ARE NOT TO BE CONSIDERED HAZARDOUS AND WILL NOT NOW OR IN THE FUTURE POSE A THREAT TO HUMAN HEALTH OR THE ENVIRONMENT.

IF YOUR OFFICE IS IN AGREEMENT THAT THESE FACILITIES ARE NOT HAZARDOUS, PLEASE FURNISH THE NECESSARY DOCUMENTS TO AUTHORIZE DECLASSIFICATION OR CONFIRM THAT YOU HAVE CLOSED OUT YOUR FILE.

VERY TRULY YOURS,

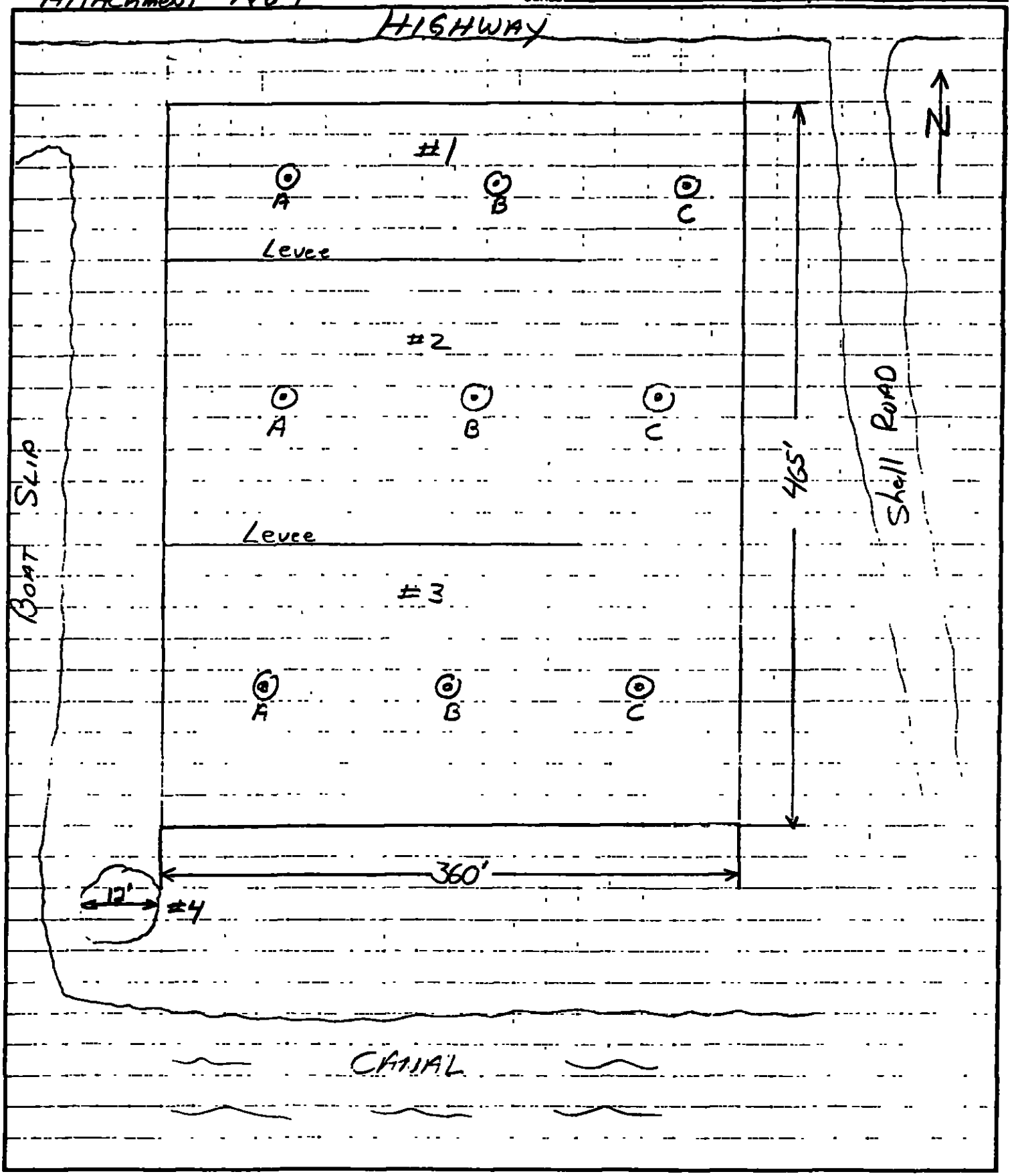
CONRAD A. DUSSEL, P.E.
PROJECT ENGINEER

CAD:MLV
ATTACHMENTS
CC: DUDLEY DEVILLE (DEQ)
TOM PATTERSON (DEQ)
HOWARD SEIFE (MILBANK, ET.AL.)

WINK ENGINEERING
A Division of Wink, Inc.
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899
(504) 246-7924

JOB Delta Shipyard - Houma, LA
SHEET NO 1 OF 1
CALCULATED BY CAO DATE 6/18/85
CHECKED BY DATE
SCALE 3 Covered Pits / 1 open Spill

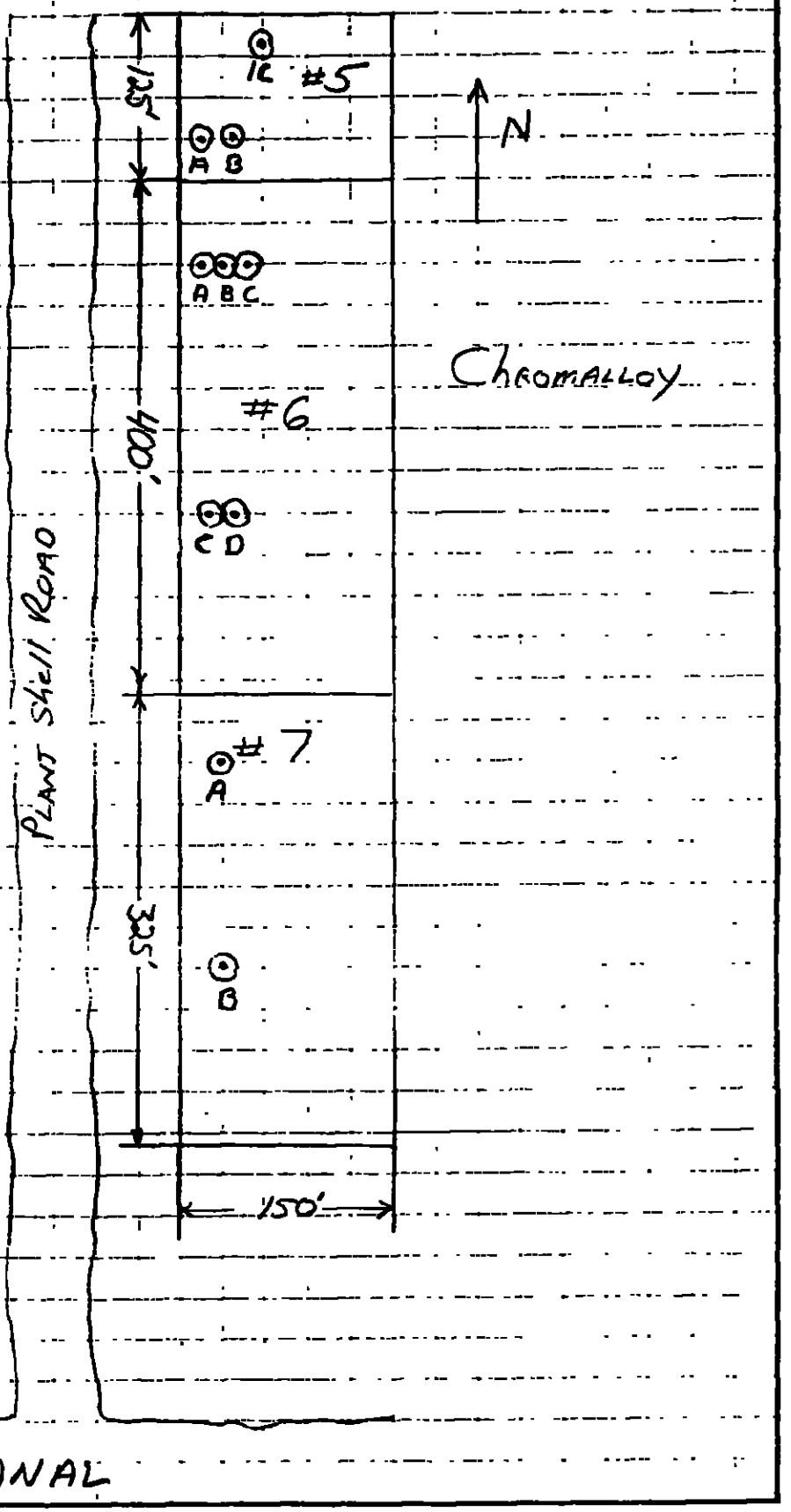
ATTACHMENT No 1



WINK ENGINEERING
A Division of Wink, Inc.
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899
(504) 246-7924

JOB DELTA - SHIPYARD - HOUMA, LA
SHEET NO 1 OF 1
CALCULATED BY CIAO DATE 6/18/85
CHECKED BY DATE
SCALE 3 EXPOSED SURF. IMPOUNDMENTS

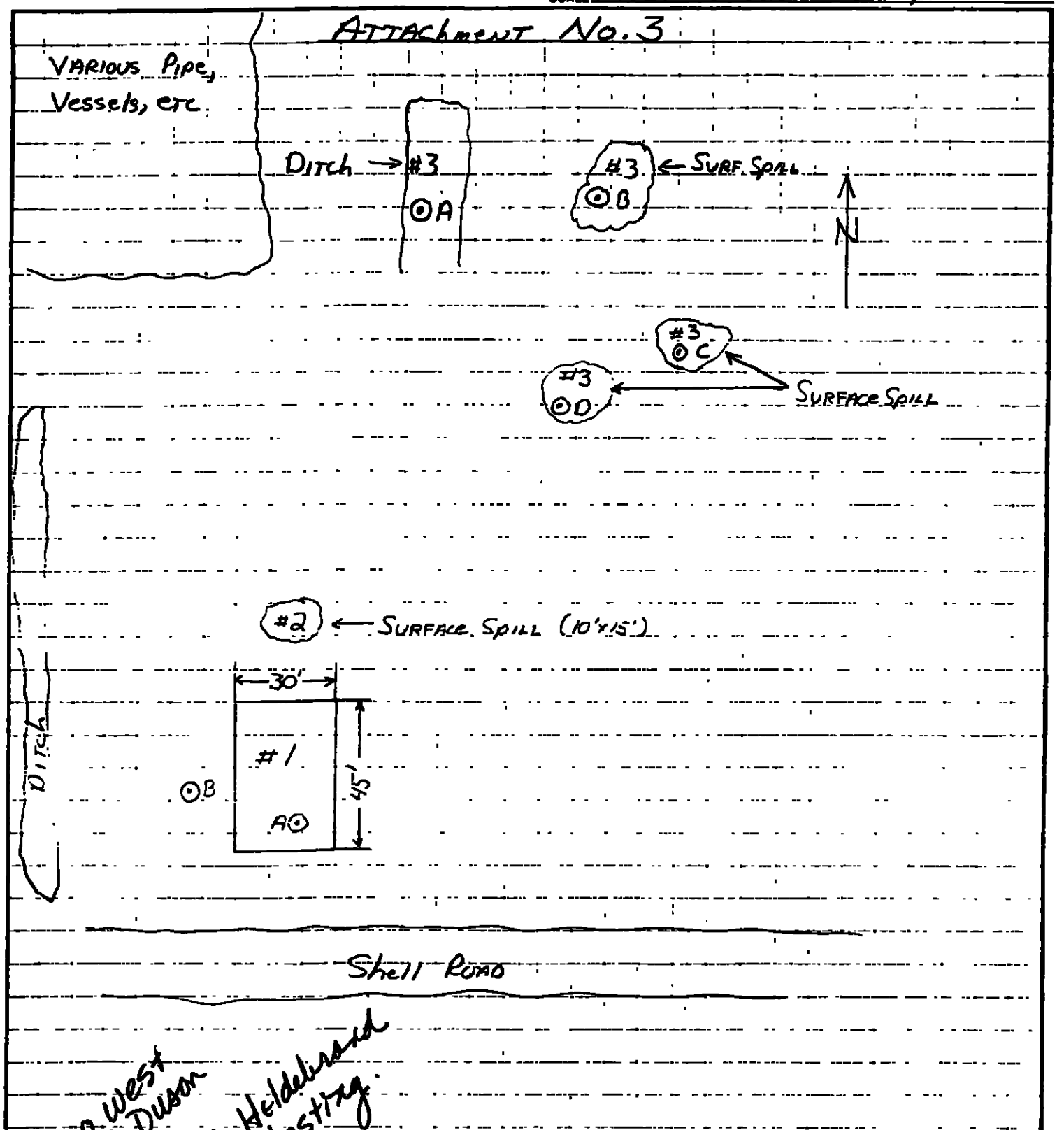
ATTACHMENT No. 2



WINK ENGINEERING
A Division of Wink, Inc.
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899
(504) 246-7924

JOB: DELTA SHIPYARD - DUSON, LA
SHEET NO: 1 OF: 1
CALCULATED BY: CAO DATE: 6/18/85
CHECKED BY: DATE:
SCALE: / SUBMERGED TANK + MISC. SPILLS

ATTACHMENT No. 3



I-10 west off Duson exit next to Heidelberg pipe testing.

ATTACHMENT NO. 4
DELTA SHIPYARD SLUDGE SAMPLING PROTOCOL
HOUMA, LA
MAY 20, JUNE 5 & JUNE 6, 1985

SAMPLE NO.	DEPTH	SAMPLE NO.	DEPTH
1A	1'-6"	5A	2'-0"
1A	2'-6"	5A	3'-0"
1A	4'-6"	5A	4'-0"
1A	5'-6"	5A	5'-6"
1B	1'-0"	5B	0'-6"
1B	3'-0"	5B	1'-6"
1B	5'-6"	5B	3'-6"
1C	SURFACE	5B	5'-0"
1C	2'-0"	5C	SURFACE
1C	3'-0"	5C	1'-0"
1C	4'-6"	5C	2'-0"
1C	5'-6"	5C	5'-6"
2A	1'-0"	6A	0'-6"
2A	3'-6"	6A	2'-0"
2A	5'-6"	6A	4'-0"
2B	0'-6"	6B	1'-0"
2B	2'-6"	6B	2'-6"
2B	4'-0"	6B	3'-6"
2C	1'-0"	6B	5'-6"
2C	3'-0"	6C	1'-0"
2C	5'-6"	6C	2'-0"
3A	0'-6"	6C	3'-0"
3A	1'-6"	6C	4'-0"
3A	3'-6"	6C	5'-0"
3A	4'-6"	6D	SURFACE
3B	1'-0"	6D	1'-6"
3B	3'-0"	6D	2'-6"
3C	0'-6"	6D	3'-0"
3C	2'-0"	7A	SURFACE
3C	4'-0"	7A	2'-0"
4	SURFACE SAMPLES	7A	3'-0"
		7B	0'-6"
		7B	2'-6"
		7B	4'-0"

ATTACHMENT NO. 5
DELTA SHIPYARD SLUDGE SAMPLING PROTOCOL
DUSON, LA
JUNE 5, 1985

SAMPLE NO.	DEPTH
1A	SURFACE (LIQUID)
1B	0'-6" (WITHIN 8" OF PIT)
1B	1'-0"
1B	3'-6"
1B	5'-0"
2	0'-6"
2	1'-0"
2	3'-0"
3A	SURFACE
3B	SURFACE
3C	SURFACE
3D	SURFACE

ATTACHMENT NO. 6

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

SAMPLE ANALYSES

for

WINK ENGINEERING
7520 Hayne Blvd.
New Orleans, Louisiana 70126-1899

ATTENTION: Mr. Conrad A. Dussel

June 11, 1985

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Samples collected by Wink Engineering as documented by the enclosed chain-of-custody form, were received at West-Paine Laboratories, Incorporated on June 5, 1985 and June 7, 1985. The samples were analyzed according to the Environmental Protection Agency protocol:

A. Test Methods for Evaluating Solid Waste, SW-846, July 1982:

Parameter	Method
Cyanide	9010
Ignitability	1010
EP Toxicity Extraction Procedure	1310
Arsenic	7060
Barium	7080
Cadmium	7130
Chromium	7190
Lead	7420
Mercury	7470
Selenium	7740
Silver	7760
Volatile Organic Fraction	8240
pH	9040

B. Standard Methods for the Examination of Water and Wastewater, 15th Edition, 1980:

Parameter	Method
Oil & Grease	503C

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

C. Standard Methods for the Examination of Water and Wastewater, 14th Edition, 1979:

Parameter	Method
Phenol	510A, 510B

The results are on the following pages.

Victor J. Blanchard, III
Manager

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WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: DUSON #1 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.53	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	8.5	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	36,100	10.0/8.4	06-10/1600/RH

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85-2082

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: DUSON #2 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.43	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.2	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	53,000	10.0/8.4	06-10/1600/RH

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85-2082

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: DUSON #3 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.0	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	163,000	10.0/8.4	06-10/1600/RH

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WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: HOUMA #1 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	<0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	7.7	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	4,650	10.0/8.4	06-10/1600/RH

WEST-PAINE Laboratories INC.
7979 OSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

Sample Identification: HOUMA #2 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	<0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	8.2	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	2,980	10.0/8.4	06-10/1600/RH

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WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

Sample Identification: HOUMA #3 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	<0.15	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	7.4	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	150	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	3,100	10.0/8.4	06-10/1600/RH

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: HOUMA #4 Composite

Date Received: June 5, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	0.69	0.020/0.021	06-07/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	7.8	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	311,000	10.0/8.4	06-11/0900/RH

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: HOUMA #5 Composite

Date Received: June 7, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	3.0	0.020/0.020	06-10/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.1	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	104,000	10.0/8.4	06-11/0900/RH

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WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

Sample Identification: HOUMA #6 Composite

Date Received: June 7, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	2.5	0.020/0.020	06-10/0800/BE
Cyanide (mg/kg CN)	<0.5	0.100/0.110	06-07/0930/MS
pH (Units) as 4% w/v	9.3	7.0/7.0	06-10/1200/RC
Flashpoint (^{o}F)	>200	Not Applicable	Not Applicable
Oil & Grease (mg/kg)	183,000	10.0/8.4	06-11/0900/RH

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85-2082

WEST-PAINE Laboratories INC
7975 GSRI AVE • BATON ROUGE LA 70820

WINK ENGINEERING
New Orleans, Louisiana
May 29, 1985

Sample Identification: #7 HOUMA COMPOSITE

Date Received: May 21, 1985

Parameter	Results	Quality Assurance Actual/Found	Date/Time Analyst
Phenol (mg/kg Phenol)	2.3	0.020/0.020	05-24/1630/BE
Cyanide (mg/kg CN)	<0.2	0.10/0.11	05-26/1100/RC
pH (Units) as 4% w/v	9.0	7.0/7.0	05-24/1300/RC
Flashpoint (^{o}F)	>200	------	Not Applicable
Oil & Grease (mg/kg)	331,000	10.0/9.2	05-23/2000/FT

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WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: DUSON #1, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.3	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.008	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 104.44 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: DUSON #2, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.2	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.64 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: DUSON #3, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.3	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	0.12	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.77 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #1, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	<0.1	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.012	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 100.84 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #2, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.02	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.2	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.07 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #3, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.1	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	<0.01	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	<0.005	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.01	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	<0.04	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 102.30 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana

June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #4, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	<0.01	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	0.1	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.008	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	<0.1	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	0.91	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 103.50 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #5, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.04	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	2.6	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	0.48	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	1.5	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 107.50 gm

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70820

WINK ENGINEERING
New Orleans, Louisiana
June 11, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: HOUMA #6, Composite

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.07	5.0	0.050/0.049	06-10/RM
Barium (mg/L Ba)	1.7	100	2.50/2.54	06-10/RM
Cadmium (mg/L Cd)	0.016	1.0	0.250/0.248	06-10/RM
Chromium (mg/L Cr)	0.56	5.0	0.50/0.51	06-10/RM
Lead (mg/L Pb)	1.2	5.0	2.50/2.46	06-10/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0109	06-10/RM
Selenium (mg/L Se)	<0.01	1.0	0.050/0.051	06-09/RM
Silver (mg/L Ag)	<0.01	5.0	0.50/0.50	06-10/RM

Sample Weight: 102.80 gm

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CORRECTED REPORT

WEST-PAINE Laboratories INC.
7915 GSR AVE • BATON ROUGE LA 70820

WINK ENGINEERING
New Orleans, Louisiana
May 29, 1985

The total weight of solid material filtered from the sample as received is listed below. The Extraction Procedure (EP Toxicity Test) was employed as specified in the Federal Register, Monday, May 19, 1980, Appendix II, pages 33127 - 33128. The results below for sample extract, in mg/L, represent the concentration in the final leachate. For purpose of comparison, the maximum allowable concentration of each component is listed.

Sample Identification: #7 HOUMA COMPOSITE

Parameter	Results	Maximum Allowable in Extract	Quality Assurance Actual/Found	Date/ Analyst
Arsenic (mg/L As)	0.09	5.0	0.50/0.49	05-23/VM
Barium (mg/L Ba)	0.7	100	2.50/2.36	05-24/RM
Cadmium (mg/L Cd)	<0.005	1.0	0.250/0.250	05-23/VM
Chromium (mg/L Cr)	0.02	5.0	0.50/0.50	05-24/RM
Lead (mg/L Pb)	0.12	5.0	2.50/2.50	05-24/RM
Mercury (mg/L Hg)	<0.0002	0.2	0.0100/0.0105	05-23/VM
Selenium (mg/L Se)	0.03	1.0	0.050/0.048	05-23/VM
Silver (mg/L Ag)	<0.01	5.0	*0.50/0.50	05-23/VM

Sample Weight: 102.06

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70806

Wink Engineering

New Orleans, Louisiana

060585-51-53

All results in milligrams per kilogram

PRIORITY POLLUTANTS
VOLATILES FRACTIONS

	Duson #1	Duson #2	Duson #3
Benzene	<0.02	<0.02	<0.02
Bromoform	<0.02	<0.02	<0.02
Carbon tetrachloride	<0.02	<0.02	<0.02
Chlorobenzene	<0.02	0.27	<0.02
Chlorodibromomethane	<0.02	<0.02	<0.02
Chloroethane	<0.02	<0.02	<0.02
2-Chloroethylvinyl ether	<0.02	<0.02	<0.02
Chloroform	<0.02	<0.02	<0.02
1,2-Dichlorobenzene	<0.02	<0.02	<0.02
1,4-Dichlorobenzene	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.02	<0.02	<0.02
Dichlorobromomethane	<0.02	<0.02	<0.02
1,1-Dichloroethane	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.02	<0.02	<0.02
1,1-Dichloroethene	<0.02	<0.02	<0.02
trans-1,2-Dichloroethene	<0.02	<0.02	<0.02
1,2-Dichloropropane	<0.02	<0.02	<0.02
cis-1,3-Dichloropropene	<0.02	<0.02	<0.02
trans-1,3-Dichloropropene	<0.02	<0.02	<0.02
Ethylbenzene	0.06	0.65	<0.02
Methylbromide	<0.02	<0.02	<0.02
Methylchloride	<0.02	<0.02	<0.02
Methylene chloride	<0.02	<0.02	<0.02
1,1,2,2-Tetrachloroethane	<0.02	<0.02	<0.02
Tetrachloroethene	<0.02	<0.02	<0.02
Toluene	0.07	0.70	<0.02
1,1,1-Trichloroethane	<0.02	<0.02	<0.02
1,1,2-Trichloroethane	<0.02	<0.02	<0.02
Trichloroethene	<0.02	<0.02	<0.02
Trichlorofluormethane	<0.02	<0.02	<0.02
Vinyl chloride	<0.02	<0.02	<0.02
Total Xylene (semiquantitative)	0.46	6.7	<0.02
Date of Analyses	06-07-85	06-07-85	06-07-85

dsl

85-2082

WEST-PAINE Laboratories INC.
7979 GSRI AVE. • BATON ROUGE, LA 70808

Wink Engineering

New Orleans, Louisiana

060585-54-57

PRIORITY POLLUTANTS
VOLATILES FRACTIONS

All results in milligrams per kilogram.

	Houma #1	Houma #2	Houma #3	Houma #4
Benzene	<0.02	<0.02	<0.02	<0.02
Bromoform	<0.02	<0.02	<0.02	<0.02
Carbon tetrachloride	<0.02	<0.02	<0.02	<0.02
Chlorobenzene	<0.02	<0.02	<0.02	<0.02
Chlorodibromomethane	<0.02	<0.02	<0.02	<0.02
Chloroethane	<0.02	<0.02	<0.02	<0.02
2-Chloroethylvinyl ether	<0.02	<0.02	<0.02	<0.02
Chloroform	<0.02	<0.02	<0.02	<0.02
1,2-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02
1,4-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02
1,3-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02
Dichlorobromomethane	<0.02	<0.02	<0.02	<0.02
1,1-Dichloroethane	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.02	<0.02	<0.02	<0.02
1,1-Dichloroethene	<0.02	<0.02	<0.02	<0.02
trans-1,2-Dichloroethene	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	<0.02	<0.02	<0.02	<0.02
cis-1,3-Dichloropropene	<0.02	<0.02	<0.02	<0.02
trans-1,3-Dichloropropene	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	<0.02	<0.02	<0.02	<0.02
Metnylbromide	<0.02	<0.02	<0.02	<0.02
Methylchloride	<0.02	<0.02	<0.02	<0.02
Methylene chloride	<0.02	<0.02	<0.02	<0.02
1,1,2,2-Tetrachloroethane	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.02	<0.02	<0.02	<0.02
Toluene	0.02	<0.02	<0.02	<0.02
1,1,1-Trichloroethane	<0.02	<0.02	<0.02	<0.02
1,1,2-Trichloroethane	<0.02	<0.02	<0.02	<0.02
Trichloroethene	<0.02	<0.02	<0.02	<0.02
Trichlorofluormethane	<0.02	<0.02	<0.02	<0.02
Vinyl chloride	<0.02	<0.02	<0.02	<0.02
Total Xylene (semiquantitative)	<0.02	<0.02	<0.02	<0.02
Date of Analyses	06-07-85	06-07-85	06-07-85	06-07-85

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70808

Wink Engineering

New Orleans, Louisiana

060785-45-46

All results in milligrams per kilogram

PRIORITY POLLUTANTS
VOLATILES FRACTIONS

	Houma #5	Houma #6
Benzene	<0.04	<0.04
Bromoform	<0.04	<0.04
Carbon tetrachloride	<0.04	<0.04
Chlorobenzene	0.20	0.05
Chlorodibromomethane	<0.04	<0.04
Chloroethane	<0.04	<0.04
2-Chloroethylvinyl ether	<0.04	<0.04
Chloroform	<0.04	<0.04
1,2-Dichlorobenzene	<0.04	<0.04
1,4-Dichlorobenzene	<0.04	<0.04
1,3-Dichlorobenzene	<0.04	<0.04
Dichlorobromomethane	<0.04	<0.04
1,1-Dichloroethane	<0.04	<0.04
1,2-Dichloroethane	<0.04	<0.04
1,1-Dichloroethene	<0.04	<0.04
trans-1,2-Dichloroethene	<0.04	<0.04
1,2-Dichloropropane	<0.04	<0.04
cis-1,3-Dichloropropene	<0.04	<0.04
trans-1,3-Dichloropropene	<0.04	<0.04
Ethylbenzene	0.99	0.57
Methylbromide	<0.04	<0.04
Methylchloride	<0.04	<0.04
Methylene chloride	<0.04	<0.04
1,1,2,2-Tetrachloroethane	<0.04	<0.04
Tetrachloroethene	<0.04	<0.04
Toluene	1.43	0.49
1,1,1-Trichloroethane	<0.04	<0.04
1,1,2-Trichloroethane	<0.04	<0.04
Trichloroethene	<0.04	<0.04
Trichlorofluormethane	<0.04	<0.04
Vinyl chloride	<0.04	<0.04
Total Xylene (semiquantitative)	10.6	3.2
Date of Analyses	06-07-85	06-07-85

WEST-PAINE Laboratories INC.
7979 GSRI AVE • BATON ROUGE, LA 70808

Wink [illegible]neering
New Orleans, Louisiana
052185-45-46

All results in milligrams per kilogram.

PRIORITY POLLUTANTS
VOLATILES FRACTIONS

	Houma #7 Composite
Benzene	<0.02
Bromoform	<0.02
Carbon tetrachloride	<0.02
Chlorobenzene	<0.02
Chlorodibromomethane	<0.02
Chloroethane	<0.02
2-Chloroethylvinyl ether	<0.02
Chloroform	<0.02
1,2-Dichlorobenzene	<0.02
1,4-Dichlorobenzene	<0.02
1,3-Dichlorobenzene	<0.02
Dichlorobromomethane	<0.02
1,1-Dichloroethane	<0.02
1,2-Dichloroethane	<0.02
1,1-Dichloroethene	<0.02
trans-1,2-Dichloroethene	<0.02
1,2-Dichloropropane	<0.02
cis-1,3-Dichloropropene	<0.02
trans-1,3-Dichloropropene	<0.02
Ethylbenzene	<0.02
Methylbromide	<0.02
Methylchloride	<0.02
Methylene chloride	<0.02
1,1,2,2-Tetrachloroethane	<0.02
Tetrachloroethene	<0.02
Toluene	<0.02
1,1,1-Trichloroethane	<0.02
1,1,2-Trichloroethane	<0.02
Trichloroethene	<0.02
Trichlorofluormethane	<0.02
Vinyl chloride	<0.02
Total Xylene (semiquantitative)	<0.02
Date of Analyses	05-27-85

A. Aerial photograph taken from the Northwest a approximately 500 feet taken on October 6, 1980.

B. Aerial photograph taken from the West at approximately 500 feet, taken on October 6, 1980.

Figure 2 Aerial Photographs

C. Aerial photograph taken from the Northwest at approximately 500 feet, taken on Oc tober 6, 1980.

Figure 2 continued Aerial Photographs

Photograph taken October 6, 1980 from the North
(Fuel Storage and Dock Area)

Photograph taken October 6, 1980 from the North
(Fuel Storage)

Figure 3

Photograph taken October 6, 1980 from North
(Dock Area)

Photograph taken October 6, 1980 from the East
(Heater & Boiler)

Figure 3 CONT'D

Photograph taken October 6, 1980 from the Northeast
(Heater & Fuel Storage)

Photograph taken October 6, 1980 from the Northeast
(Heater & Boilers)

Figure 3 CONT'D

Photograph taken October 6, 1980 from the East
(Treatment Unit)

Figure 3 CONT'D

PE

F WF

DELTA SHIPYARD

A DIVISION OF DELTA SERVICES INDUSTRIES

POST OFFICE BOX 101 HOUMA, LOUISIANA 70361

PLANT AND OFFICE: INDUSTRIAL BOULEVARD

PHONE 504/868-7450

June 20, 1984

La. State Department of Natural Resources
Hazardous Waste Management
Post Office Box 44066
Baton Rouge, Louisiana 70804-4066

Attention: Mr. Frank L. Dautriel, Enforcement Manager

Ref: General Inspection Report dated May 14, 1984
(Investigator-Tom Patterson)

Dear Sir:

The contents of eight drums of epoxy paint solids, contaminated with thinner (MEK and Toluene) which is the subject of referenced report has been put in to approved type containers and turned over to an approved Transporter and Disposer on June 20, 1984.

In the future this material, which accumulates at the rate of about 110 gallons per year, will be handled as follows.

1. Spent paint solvents, a mixture of 50% MEK and 50% Toluene, while in a liquid state will be used to fire our two steam boilers located at our barge cleaning facility.

2. Dried epoxy paint solids, which still emits a faint oder of solvents will be placed in type 17-H steel drums and turned over to an approved Transporter and Disposer.

Sincerely,

Ralph A. Arceneaux

Ralph A. Arceneaux
President

RAA/gr

enclosure: Manifest

copy: Tom Patterson, Hazardous Waste Division

RECEIVED

JUN 22 1984

DEPARTMENT OF
ENVIRONMENTAL QUALITY
HAZARDOUS WASTE MANAGEMENT

EPA NO. LAD-058475419

1 MANIFEST NUMBER
Generator I D No GD-343
Sequence No 70

STATE OF LOUISIANA
DEPARTMENT OF NATURAL RESOURCES
HAZARDOUS WASTE MANAGEMENT

P.O. BOX 44066
BATON ROUGE, LOUISIANA 70804

For Dept. Use
Index #
Date

2. WASTE INFORMATION:

HM	SHIPPING DESCRIPTION	HAZARD CLASS	WASTE NUMBER	WEIGHT (TONS)	PACKAGING QTY.	PACKAGING TYPE
x	WASTE PAINT RELATED MATERIALS-FLAMMABLE LIQUID	UN-1263	F-005	3.2 TONS	8/17-H	DRUMS

3 GENERATOR INFORMATION: Identification Number. GD-343 Telephone 504 868-7450
NAME OF COMPANY DELTA SHIPYARD
ADDRESS 101 INDUSTRIAL BLVD., HOUMA, LA ZIP: 70361
SHIPPING LOCATION: DELTA SHIPYARD, HOUMA, LA
CERTIFICATION: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation, and the Louisiana Department of Natural Resources.

Ralph C. Ascencio
Generator Signature

6/20/84
Date

4 TRANSPORTER INFORMATION: Identification Number: EPA NO. LAD075043471 2194-H Telephone: 504-367-1321
NAME OF COMPANY: ASHLAND CHEMICAL CO. DATE OF PICK UP: 6-20-84 TIME: 2:40
CERTIFICATION: This is to certify that the above-named materials were picked up at date and time above and that to the best of the transporter's knowledge, his portion of the manifest is accurately and correctly filled out.

+Herbert Pierre
Transporter Signature

CERTIFICATION: This is to certify that the above-named materials were delivered without incident to the disposer at the date and time below.

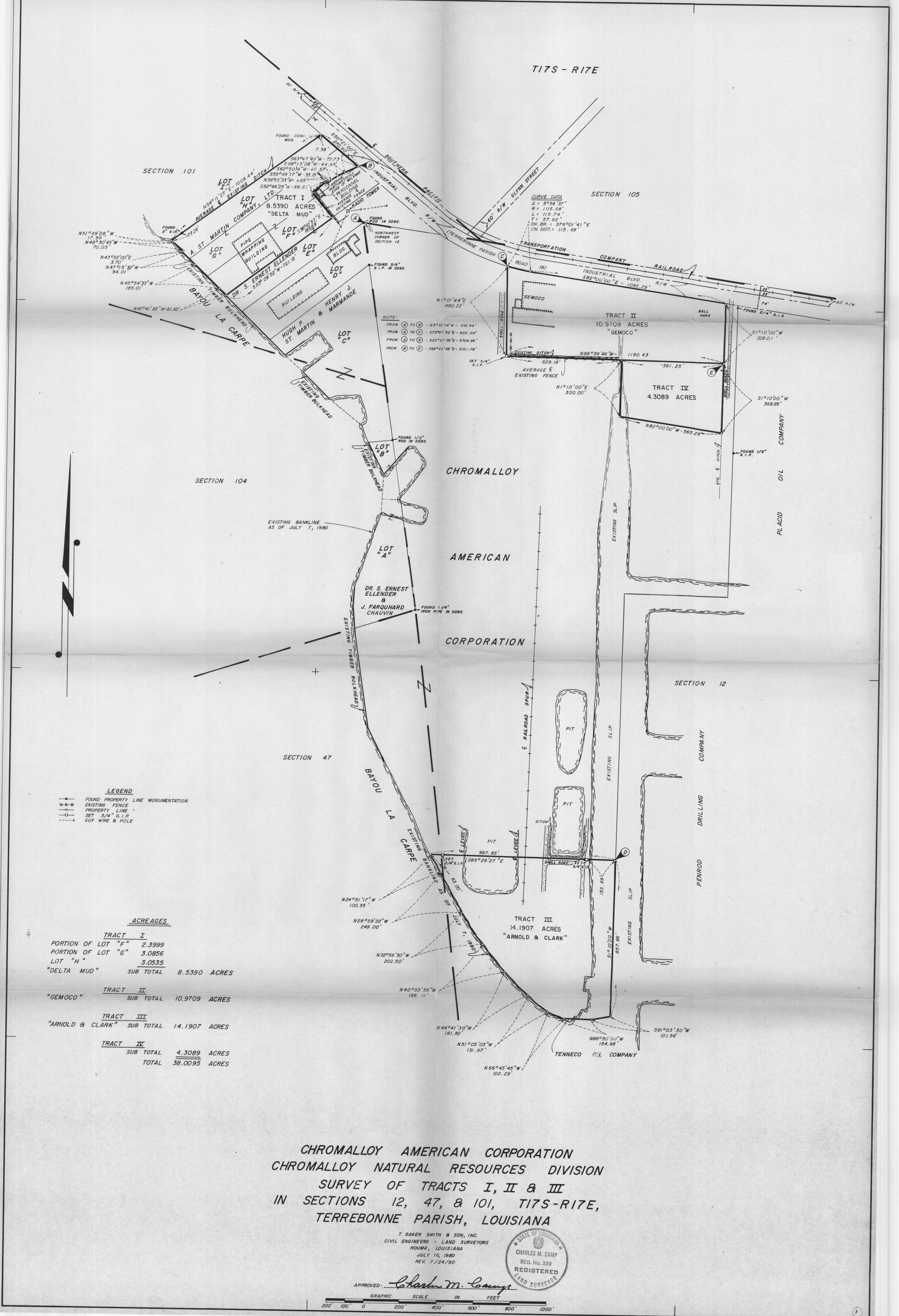
Transporter Signature DATE OF DELIVERY TIME:

5. DISPOSER INFORMATION: Identification Number: FED. NO. LAD000777201 DT-507-P Telephone: 318-583-2144
NAME OF COMPANY: CHEMICAL WASTE MANAGEMENT, INC.
LOCATION WHERE SHIPMENT RECEIVED:
CERTIFICATION: This is to certify acceptance of the hazardous waste, that the waste has been or will be disposed of in accordance with Department of Natural Resources regulations, and that to the best of the disposer's knowledge, his portion is accurately and correctly filled out.

Disposer Signature Date

6. EMERGENCY INFORMATION:
Immediate Response Information: TOLUENE 50% AND MEK-72 50% MIXED WITH SELICA SAND AND SOLIDIFIED EPOXY Telephone: 304-744-3487 713-656-3424
Special Handling Instructions: IF UNDELIVERABLE RETURN TO DELTA SHIPYARD
Comments: CONTENTS OF ALL EIGHT DRUMS APPEAR AS GRAINS OF SAND WITH SMALL CHIPS OF REDDISH, HARD EPOXY WITH THE SMELL OF PAINT THINNER. THERE IS NO LIQUID PRESENT.

A copy of the original
Ralph Ascencio



ACREAGES

TRACT I		
PORTION OF LOT "F"	2.3999	
PORTION OF LOT "G"	3.0856	
LOT "H"	3.0535	
"DELTA MUD" SUB TOTAL	8.5390	ACRES
TRACT II		
"GEMOCO" SUB TOTAL	10.9709	ACRES
TRACT III		
"ARNOLD & CLARK" SUB TOTAL	14.1907	ACRES
TRACT IV		
SUB TOTAL	4.3089	ACRES
TOTAL	38.0095	ACRES

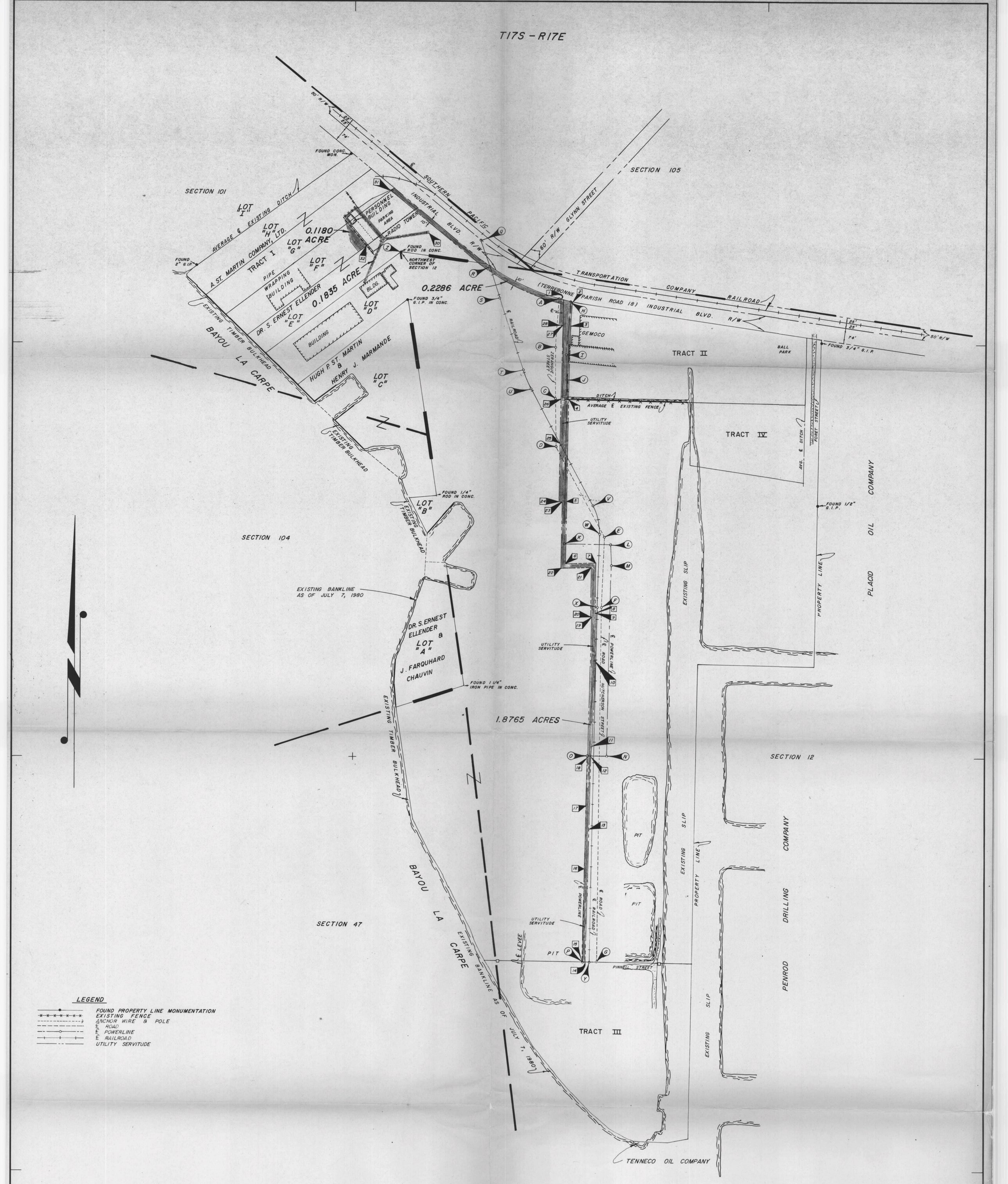
CHROMALLOY AMERICAN CORPORATION
CHROMALLOY NATURAL RESOURCES DIVISION
SURVEY OF TRACTS I, II & III
IN SECTIONS 12, 47, & 101, T17S-R17E,
TERREBONNE PARISH, LOUISIANA

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS - LAND SURVEYORS
HOUMA, LOUISIANA
JULY 16, 1980
REV. 7/24/80

STATE OF LOUISIANA
CHARLES M. CAMP
REG. No. 339
REGISTERED
LAND SURVEYOR

APPROVED: Charles M. Camp

GRAPHIC SCALE IN FEET
200' 100' 0 200' 400' 600' 800' 1000'



DELTA SERVICES INDUSTRIES
SURVEY OF RIGHT-OF-WAY
IN SECTIONS 12 & 101, T17S-R17E
TERREBONNE PARISH, LOUISIANA

T. BAKER SMITH & SON, INC.
CIVIL ENGINEERS - LAND SURVEYORS
HOUMA, LOUISIANA
AUGUST 7, 1980

STATE OF LOUISIANA
CHARLES M. CAMP
REG. No. 339
REGISTERED
LAND SURVEYOR

APPROVED: Charles M. Camp

GRAPHIC SCALE IN FEET
200' 100' 0 200' 400' 600' 800' 1000'

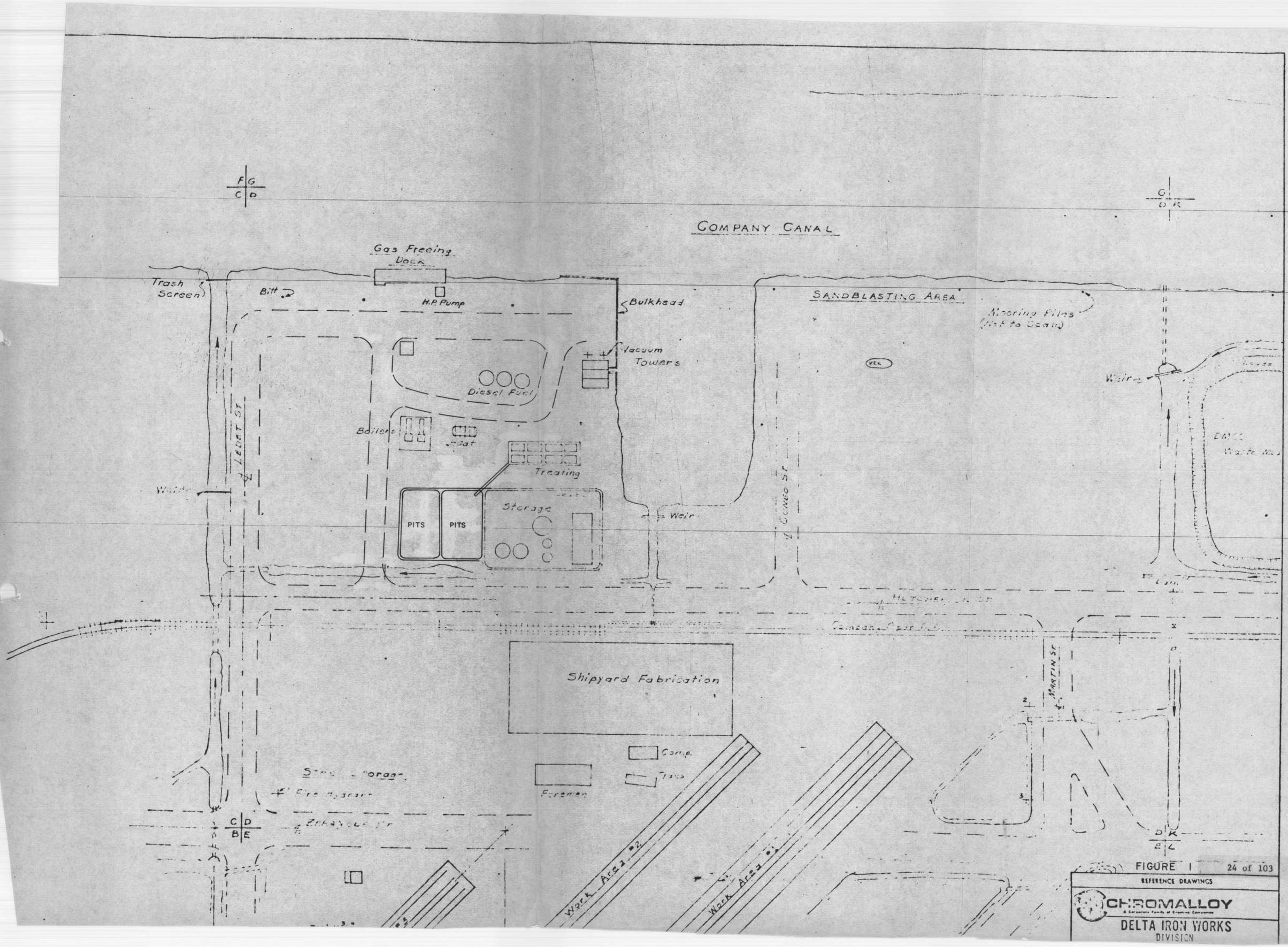


FIGURE 1

REFERENCE DRAWINGS

CHROMALLOY
A Corporate Family of Creative Companies

DELTA IRON WORKS
DIVISION