

JOINT PUBLIC NOTICE

March 24, 2014

U.S. Army Corps of Engineers
New Orleans District
Regulatory Branch
Post Office Box 60267
New Orleans, LA 70160-0267

State of Louisiana
Department of Environmental Quality
Water Quality Certification Section
Post Office Box 4313
Baton Rouge, LA 70821-4313

Project Manager: John C. Price
(504) 862-2272
john.c.price@usace.army.mil
DA Permit Number: MVN-2007-01527-WNN

Project Manager: Elizabeth Johnson
(225) 219-3225
WQC Number: WQC 140320-01

Interested parties are hereby notified that a permit application has been received by the New Orleans District of the U.S. Army Corps of Engineers pursuant to: Section 10 of the Rivers and Harbors Act of March 3, 1899 (30 Stat. 1151; 33 U.S.C. 403); and/or Section 404 of the Clean Water Act (86 Stat. 816; 33 U.S.C. 1344).

Application has also been made to the Louisiana Department of Environmental Quality for a Water Quality Certification (WQC) in accordance with statutory authority contained in La. R.S. 30:2074(A)(3) and provisions of Section 401 of the Clean Water Act (P.L. 95-217; 33 U.S.C. 1341).

3-D SEISMIC SURVEY IN ST. MARY AND TERREBONNE PARISHES

Name of Applicant: Seismic Exchange, Inc., c/o DESCO Environmental Consultants, LP, 26902 Nichols Sawmill Road, Magnolia, Texas 77355

Location of Work: An approximately 430.63 square mile area central to a point about Lat 29.28451°, Lon -91.12144°, within HUCs 08080101-Atchafalaya and 08090302-West Central Louisiana Coastal, approximately 35 miles south of Morgan City, Louisiana, in St. Mary and Terrebonne Parishes, as shown on the attached drawings. Due to the large file size, the 61 larger scale Grid Pages, as referenced on the Grid Page Guide, are available separately upon request. The table below contains a list of townships, ranges, and sections encompassed by the project area.

	R 11 E	R 12 E	R 13 E	R 14 E	R 15 E
T 18 S		32-35		31-36	31
T 19 S		1-5, 9-15, 22-28, 32-36	19-36	All	
T 20 S	1, 12-14, 19-29, 32-36	All	All	All	
T 21 S	1-4, 10-13	1-18, 20-26	1-30, 34-36	All	6-7, 18-19, 30-33
T 22 S			1-3	1-12	4-6, 7-9

Character of Work: Conduct a 3-D seismic survey to obtain subsurface imaging for the discovery of hydrocarbon resources. Drilling operations would be required to install approximately 20,672 4-inch diameter by 150-foot deep shot holes to be located at approximately 440 feet intervals along parallel transect lines spaced approximately 1,320 feet apart. Motion sensing devices (geophones or receivers) would be deployed at approximately 220 feet intervals along parallel transect lines spaced approximately 1,980 feet apart. Up to approximately 14,136.86 cubic yards of native earthen material would be displaced through drilling operations and water pit excavations, with approximately 4,214.3 cubic yards being temporarily stockpiled and used to backfill the water pit excavations. The requirement for compensatory mitigation for adverse impacts to wetlands resulting from the proposed project would be determined after one full growing season following completion of the project.

The comment period for the Department of the Army (DA) permit application and the Louisiana Department of Environmental Quality WQC will close **20 days** from the date of this joint public notice. Written comments, including suggestions for modifications or objections to the proposed work, stating reasons thereof, are being solicited from anyone having interest in this DA permit and WQC request and must be mailed, so as to be received before or by the last day of the comment period. Letters concerning the DA permit application must reference the applicant's name and the DA Permit Number, and be mailed to the U.S. Army Corps of Engineers at the address above. Similar letters concerning the WQC must reference the applicant's name and the WQC Number and be mailed to the Louisiana Department of Environmental Quality at the address above. Individuals or parties may request an extension of time in which to comment on the proposed work by writing or e-mailing the Project Manager listed above. Any request must be specific and substantively supportive of the requested extension, and received by this office prior to the end of the initial comment period. The Section Chief will review the request and the requestor will be promptly notified of the decision to grant or deny the request. If granted, the time extension will be continuous to the initial comment period and, inclusive of the initial comment period, will not exceed a total of 30 calendar days.

The application for this proposed project is on file with the Louisiana Department of Environmental Quality and may be examined weekdays between 8:00 a.m. and 4:30 p.m. Copies may be obtained upon payment of costs of reproduction.

Corps of Engineers Permit Criteria

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among these being: conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

The U.S. Army Corps of Engineers is soliciting comments from the public, federal, state, and local agencies and officials, Indian Tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the U.S. Army Corps of Engineers to determine whether to make, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

No properties listed on the National Register of Historic Places are known to be near the proposed work. The possibility exists that the proposed work may damage or destroy presently unknown archeological, scientific, prehistoric, or historical sites or data. Issuance of this public notice solicits input from the State Archeologist and State Historic Preservation Officer regarding potential impacts to cultural resources.

Portions of the proposed work appear to be located within areas designated by the U.S. Department of Interior as critical habitat for the threatened piping plover (*Charadrius melodus*). Our initial determination is that the proposed activity, if conducted in compliance with terms and conditions of a duly authorized permit, is not likely to adversely affect the piping plover or its critical habitat. We are requesting U.S. Fish and Wildlife Service concurrence with this determination in accordance with applicable consultation provisions of the ESA.

This notice initiates the Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. The applicant's proposal would result in the destruction or alteration of approximately 2.0 acres of EFH utilized by various life stages of red drum and penaeid shrimp. Our initial determination is that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service.

If the proposed work involves deposits of dredged or fill material into navigable waters, the evaluation of the probable impacts will include the application of guidelines established by the Administrator of the U.S. Environmental Protection Agency. Also, a certification that the proposed activity will not violate applicable water quality standards will be required from the Louisiana Department of Environmental Quality before a permit is issued.

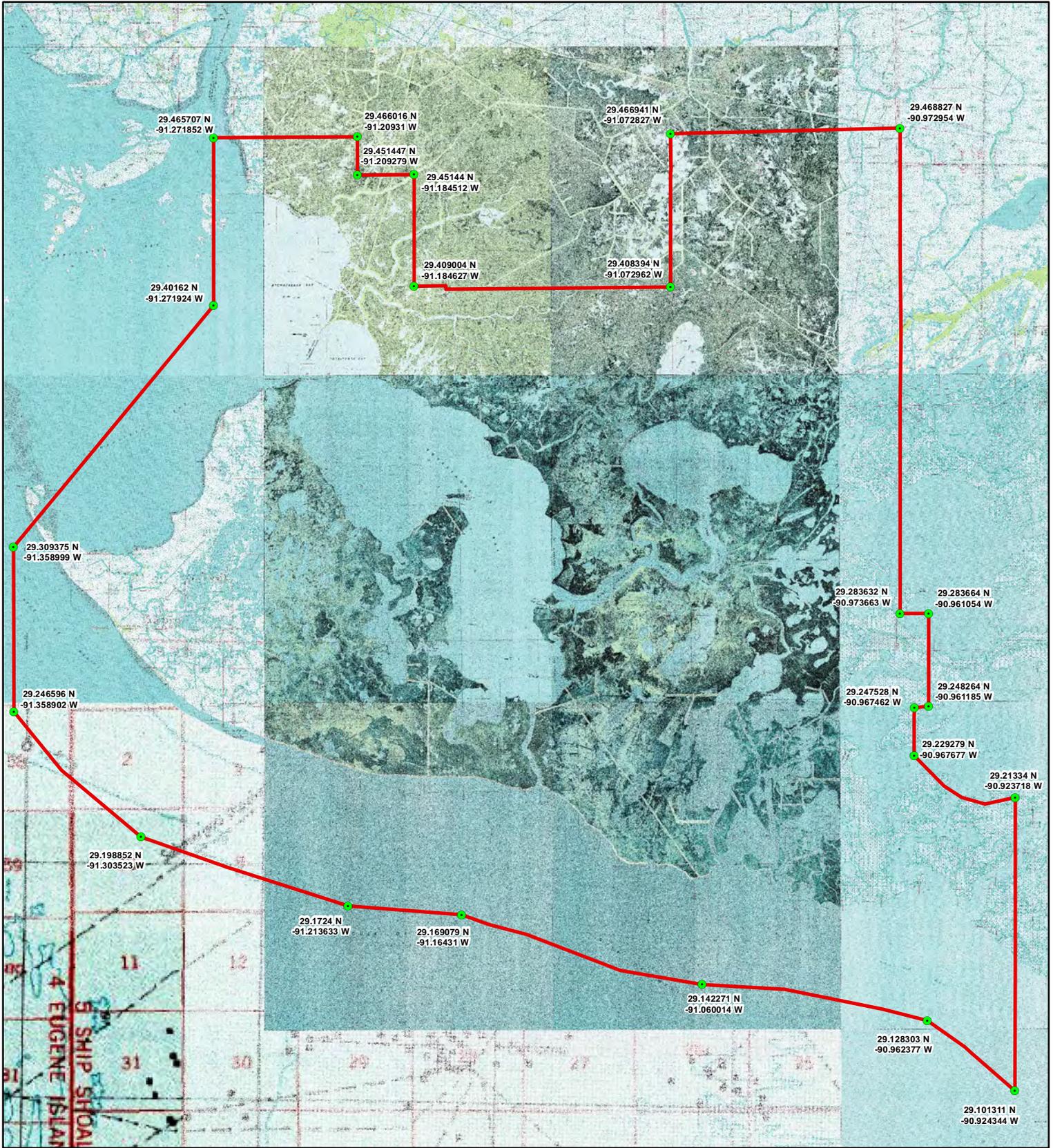
The applicant has certified that the proposed activity described in the application complies with and will be conducted in a manner that is consistent with the Louisiana Coastal Resources Program. The Department of the Army permit will not be issued unless the applicant receives approval or a waiver of the Coastal Use Permit by the Louisiana Department of Natural Resources.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

You are requested to communicate the information contained in this notice to any other parties whom you deem likely to have interest in the matter.

Darrell S. Barbara
Chief, Western Evaluation Section
Regulatory Branch

Enclosure



Legend

- Corner Coordinates
- CTS 3D Project Outline 2/19/2014

Project Outline

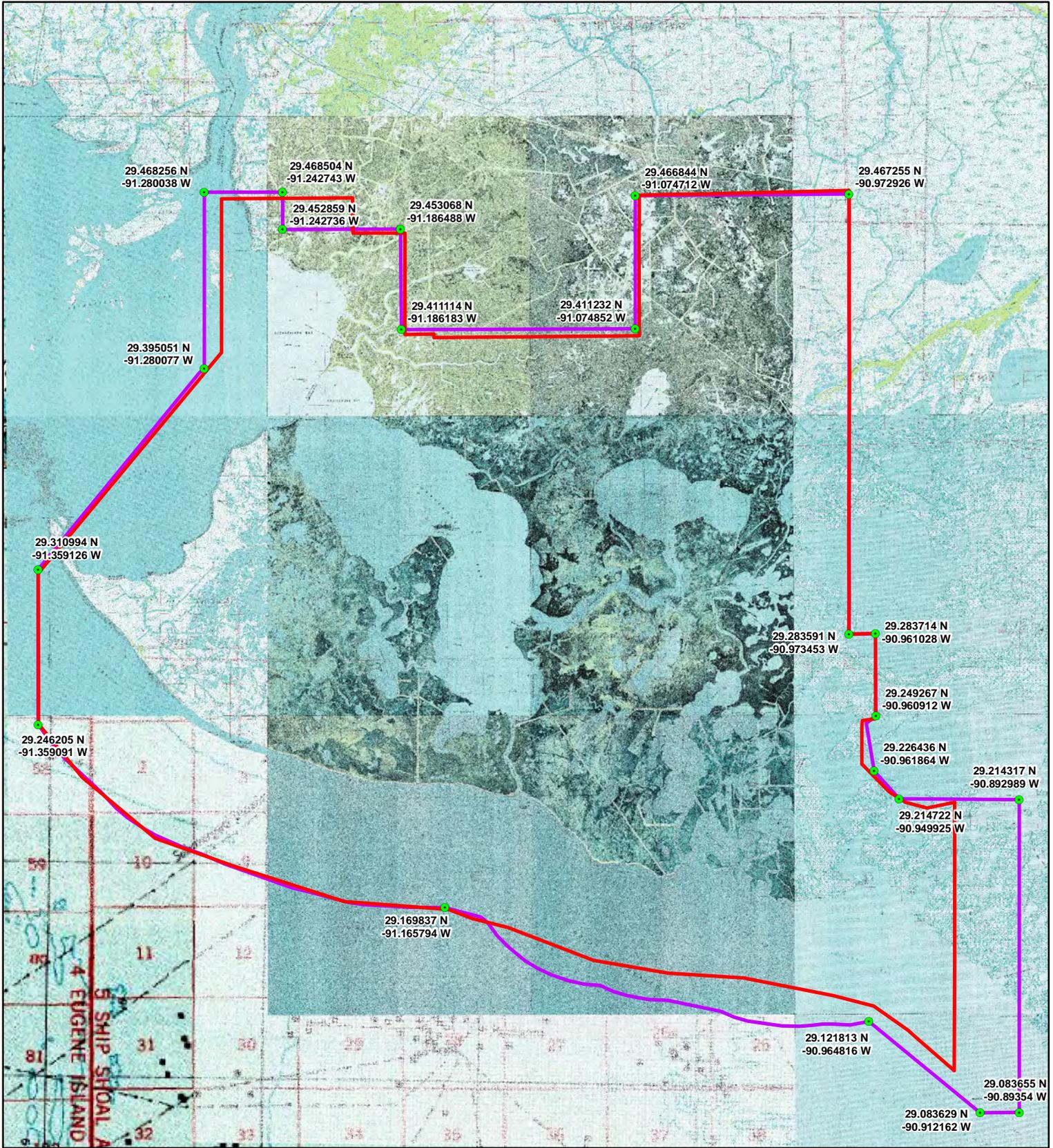
CTS 3D

St. Mary & Terrebonne Parishes, Louisiana

Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
 Map Datum: NAD 1927 State Plane Louisiana South, US Foot
 Map Date: February 20, 2014

1:219,529

Project Location



- Legend**
- Corner Coordinates
 - New CTS 3D Project Outline 2/19/2014
 - Original CTS 3D Project Outline

Modified Project Outline

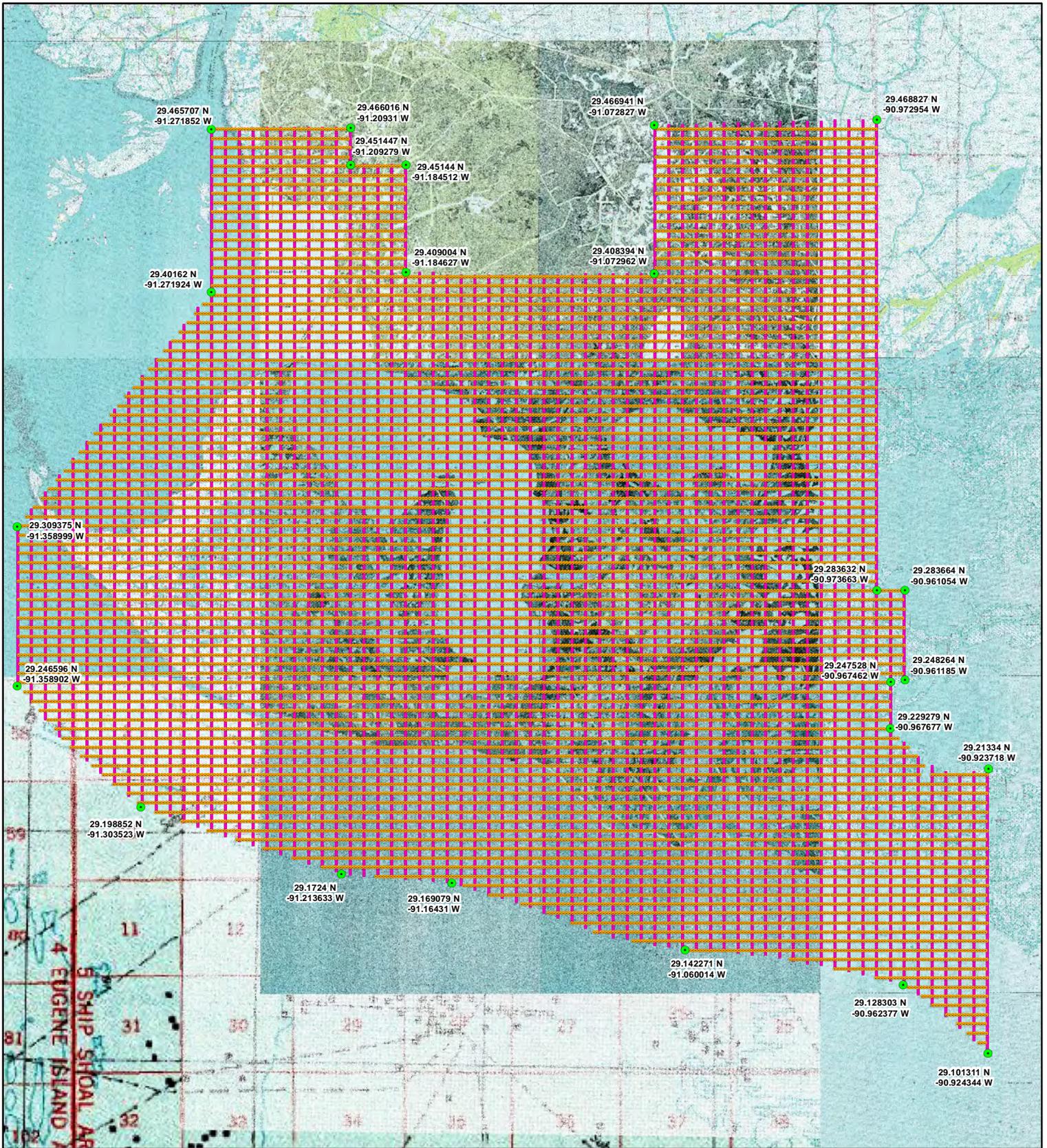
CTS 3D

St. Mary & Terrebonne Parishes, Louisiana

Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
 Map Datum: NAD 1927 State Plane Louisiana South, US Foot
 Map Date: February 20, 2014



Project Location



Legend

- Corner Coordinates
- Pre-Plot Source Points 02/19/2014
- Pre-Plot Receiver Points 02/19/2014

Project Pre-Plot Locations
CTS 3D
St. Mary & Terrebonne Parishes, Louisiana

Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
 Map Datum: NAD 1927 State Plane Louisiana South, US Foot
 Map Date: February 20, 2014

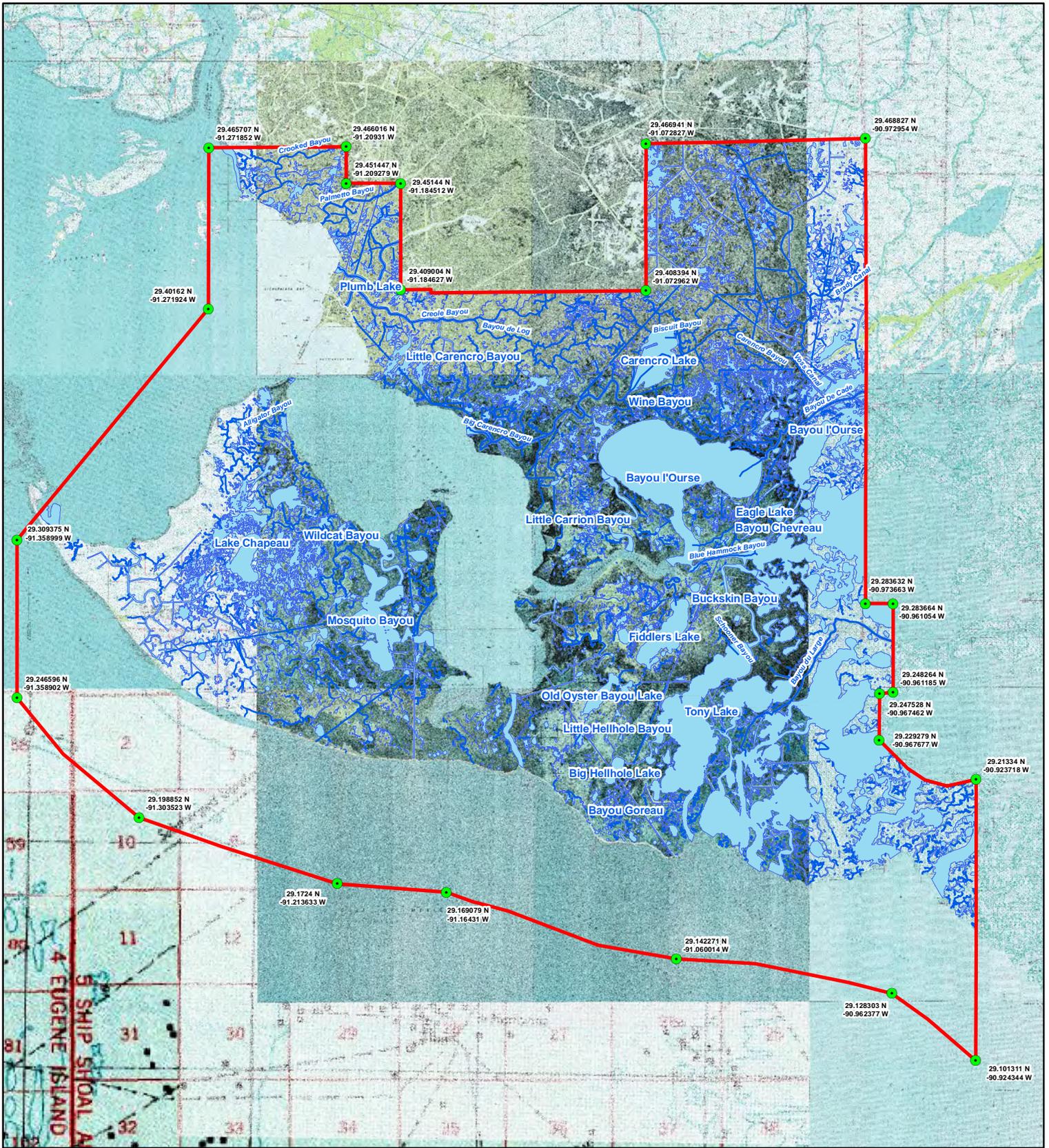
Scale: 0 1.25 2.5 5 7.5 Miles

Scale: 1:225,501

SEI SEISMIC EXCHANGE

DESCO

Project Location



Legend

- Corner Coordinates
- CTS 3D Project Outline
- Waterways
- Waterbodies

Waters within Project Area

CTS 3D

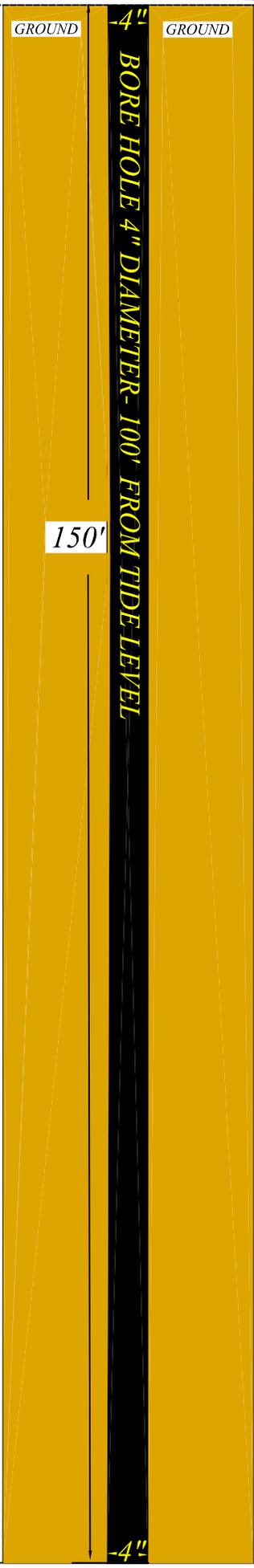
St. Mary & Terrebonne Parishes, Louisiana

Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
 Map Datum: NAD 1927 State Plane Louisiana South, US Foot
 Map Date: February 21, 2014

0 1.25 2.5 5 7.5 Miles

1:228,867

Project Location



EXISTING GROUND

A. MEAN HIGH WATER (MHW)
AND MEAN LOW WATER (MLW)
OF ALL WATER BODIES ON
WHICH WORK WILL OCCUR.

CROSS SECTION VIEW OF BOREHOLE IN MARSH

Seismic Exchange, Inc.
Dallas • Denver • Houston • New Orleans • Oklahoma City

CTS 3-D
GEOPHYSICAL SURVEY

SHOT HOLE
ON MARSH

By: Pope's Mapping Services, Inc. DATE: 12/17/13

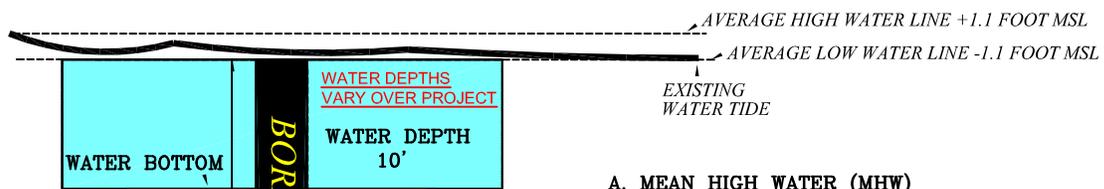
No material discharged
at surface while drilling
due to soft nature of
native soil conditions.

DEPTH OF HOLE WILL BE 100'
FROM TIDE LEVEL.

DIAGRAM BASED ON LOW TIDE
LEVEL AT -1.1' MSL



SCALE



A. MEAN HIGH WATER (MHW)
AND MEAN LOW WATER (MLW)
OF ALL WATER BODIES ON
WHICH WORK WILL OCCUR.

CROSS SECTION VIEW OF BOREHOLE IN WATER

Seismic Exchange, Inc.
Dallas • Denver • Houston • New Orleans • Oklahoma City
CTS 3-D
GEOPHYSICAL SURVEY

SHOT HOLE
IN WATER

By: Pope's Mapping Services, Inc. DATE: 12/17/13

150'

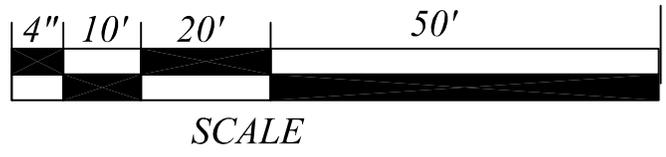
BORE HOLE 4" DIAMETER - 100' FROM TIDE LEVEL

No material discharged
at surface while drilling
due to soft nature of
native soil conditions.

DEPTH OF HOLE WILL BE 100'
FROM TIDE LEVEL.

WATER DEPTHS WILL VARY IN
PROJECT FROM 0' TO 10' DUE
TO PROJECT SIZE.

DIAGRAM BASED ON WATER
DEPTH OF 10' MSL (IN LOW TIDE).



-4"

Plan View of Shothole in Marsh CTS 3D Seismic Survey

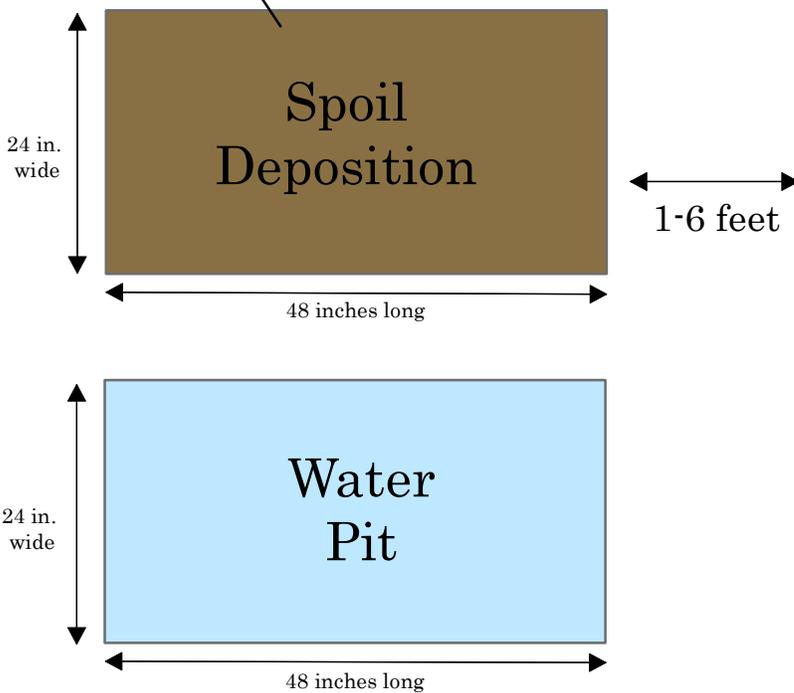
St. Mary and Terrebonne Parishes, Louisiana

Aluminum Marsh Buggy Drill

25 feet maximum workspace

The 25 foot maximum width includes the 14 foot wide airboat drill, up to 6 feet between the drill and water pit, a 4 foot wide water pit and 1 foot, for workspace variability.

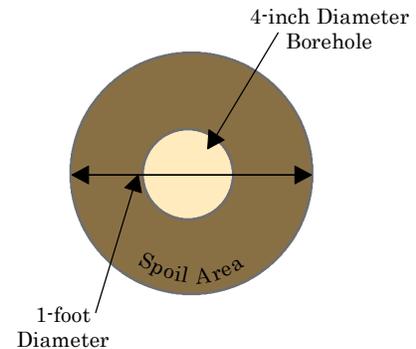
0.465 cubic yards of native material.
(To be returned to water pit after drilling.)



Marsh Buggy Drill ROW

12-14 feet

24 feet maximum workspace



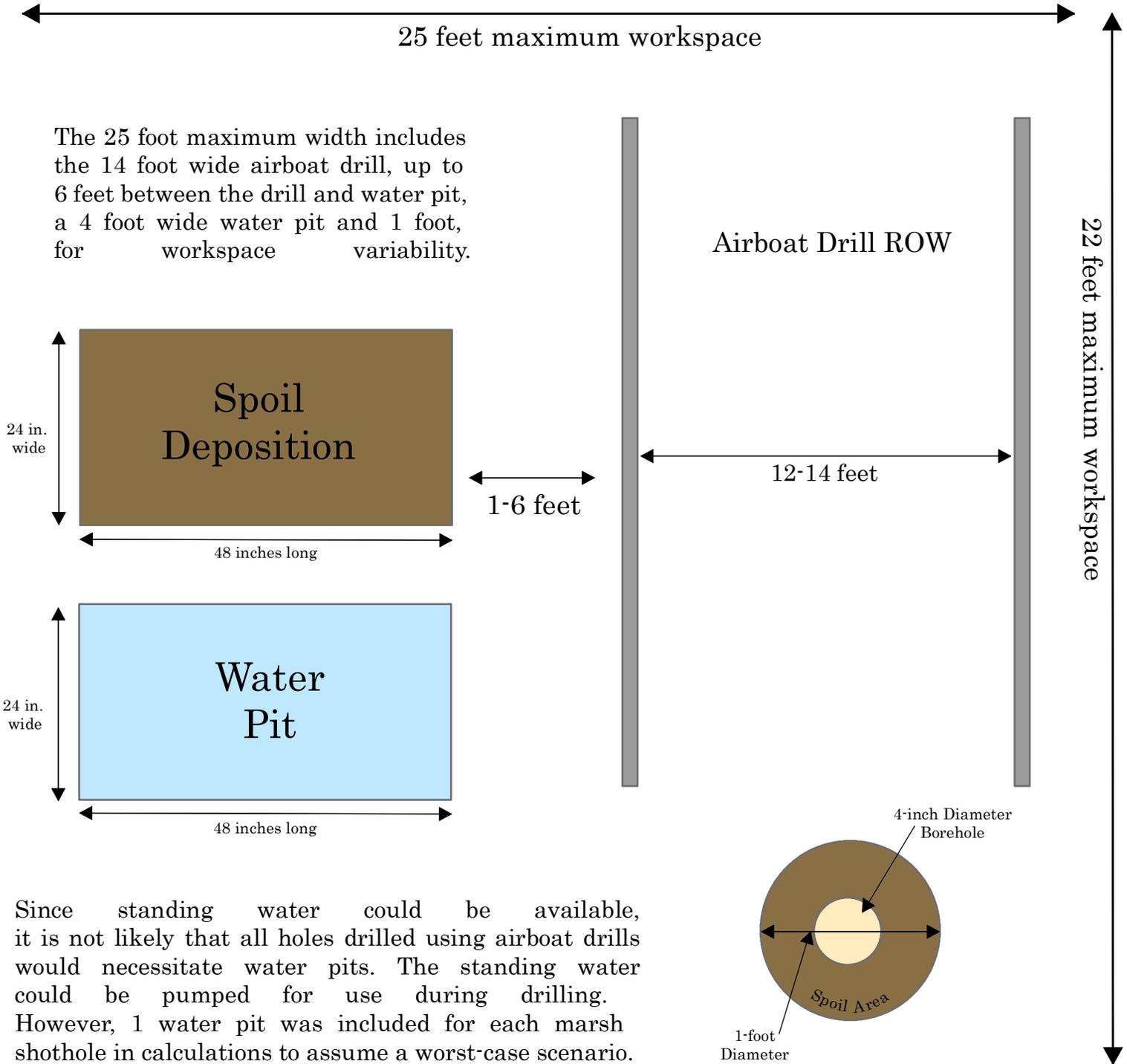
Since standing water could be available, it is not likely that all holes drilled using airboat drills would necessitate water pits. The standing water could be pumped for use during drilling. However, 1 water pit was included for each land/marsh shothole in calculations to assume a worst-case scenario

NOT TO SCALE

Plan View of Shothole in Marsh CTS 3D Seismic Survey

St. Mary and Terrebonne Parishes, Louisiana

Airboat Drill



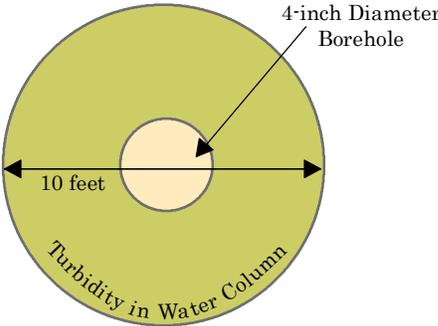
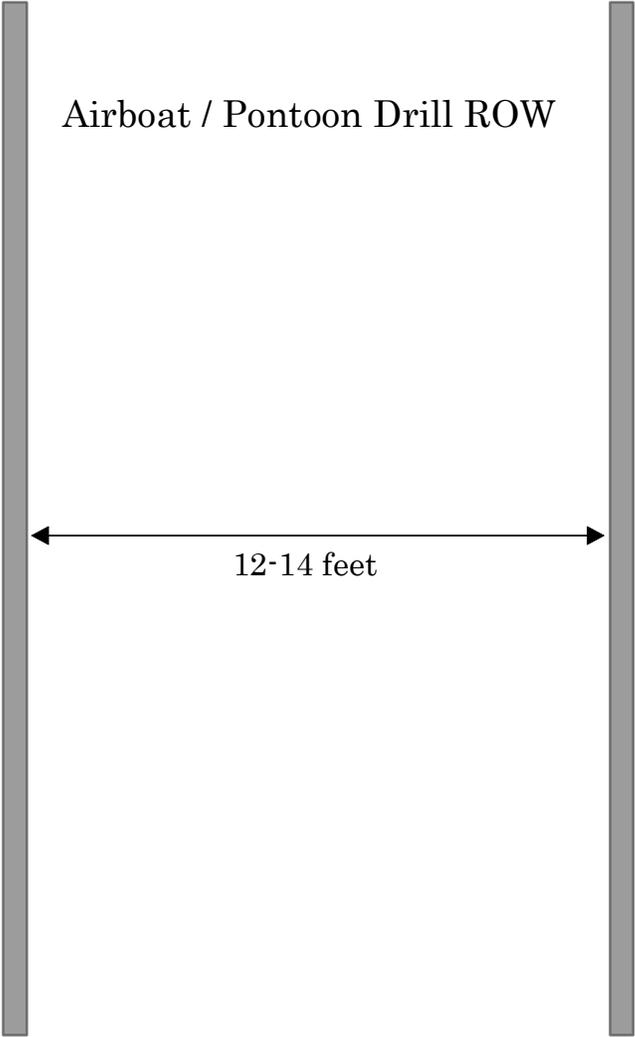
Since standing water could be available, it is not likely that all holes drilled using airboat drills would necessitate water pits. The standing water could be pumped for use during drilling. However, 1 water pit was included for each marsh shothole in calculations to assume a worst-case scenario.

NOT TO SCALE

Plan View of Shothole in Open Water

CTS 3D Seismic Survey

St. Mary and Terrebonne Parishes, Louisiana



No Water Pits are Necessary in Open Water Areas

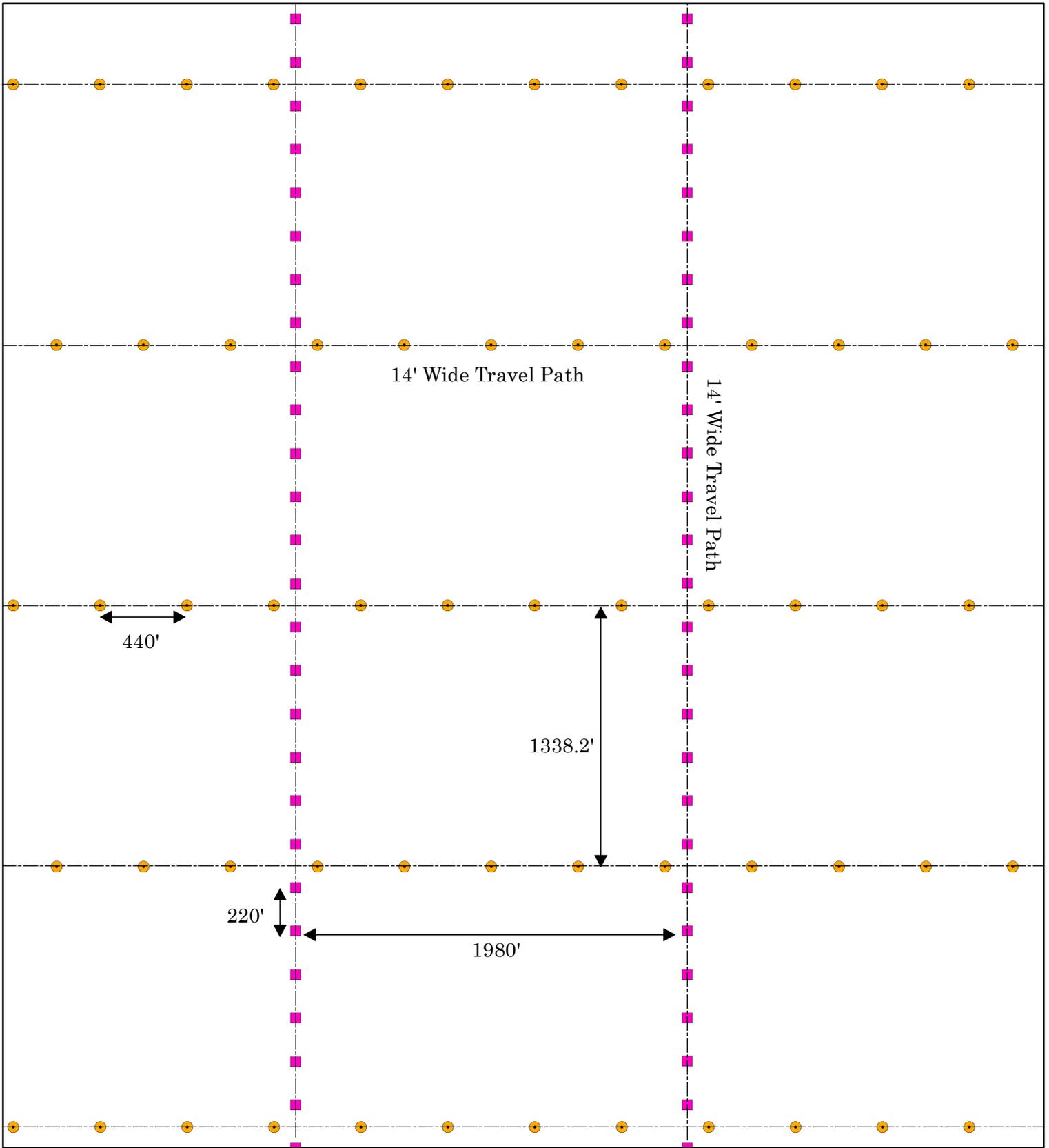
NOT TO SCALE



CTS 3D Seismic Survey

St. Mary and Terrebonne Parishes, Louisiana

Point Number	Longitude (Decimal Degrees) NAD 1927	Latitude (Decimal Degrees) NAD 1927	Longitude (Degrees, Minutes, Seconds) NAD 1927	Latitude (Degrees, Minutes, Seconds) NAD 1927
1	-90.972954	29.468827	90° 58' 22.636" W	29° 28' 7.777" N
2	-90.973663	29.283632	90° 58' 25.186" W	29° 17' 1.075" N
3	-90.961054	29.283664	90° 57' 39.795" W	29° 17' 1.190" N
4	-90.961185	29.248264	90° 57' 40.267" W	29° 14' 53.752" N
5	-90.967677	29.229279	90° 58' 3.637" W	29° 13' 45.406" N
6	-90.923718	29.21334	90° 55' 25.386" W	29° 12' 48.025" N
7	-90.924344	29.101311	90° 55' 27.637" W	29° 6' 4.720" N
8	-90.962377	29.128303	90° 57' 44.555" W	29° 7' 41.889" N
9	-91.060014	29.142271	91° 3' 36.049" W	29° 8' 32.177" N
10	-91.16431	29.169079	91° 9' 51.516" W	29° 10' 8.684" N
11	-91.213633	29.1724	91° 12' 49.080" W	29° 10' 20.641" N
12	-91.303523	29.198852	91° 18' 12.682" W	29° 11' 55.866" N
13	-91.358902	29.246596	91° 21' 32.046" W	29° 14' 47.745" N
14	-91.358999	29.309375	91° 21' 32.398" W	29° 18' 33.749" N
15	-91.271924	29.40162	91° 16' 18.927" W	29° 24' 5.832" N
16	-91.271852	29.465707	91° 16' 18.666" W	29° 27' 56.546" N
17	-91.20931	29.466016	91° 12' 33.515" W	29° 27' 57.659" N
18	-91.209279	29.451447	91° 12' 33.404" W	29° 27' 5.211" N
19	-91.184512	29.45144	91° 11' 4.242" W	29° 27' 5.183" N
20	-91.184627	29.409004	91° 11' 4.658" W	29° 24' 32.416" N
21	-91.072962	29.408394	91° 4' 22.664" W	29° 24' 30.218" N
22	-91.072827	29.466941	91° 4' 22.176" W	29° 28' 0.989" N
23	-90.967462	29.247528	90° 58' 2.862" W	29° 14' 51.102" N



Legend

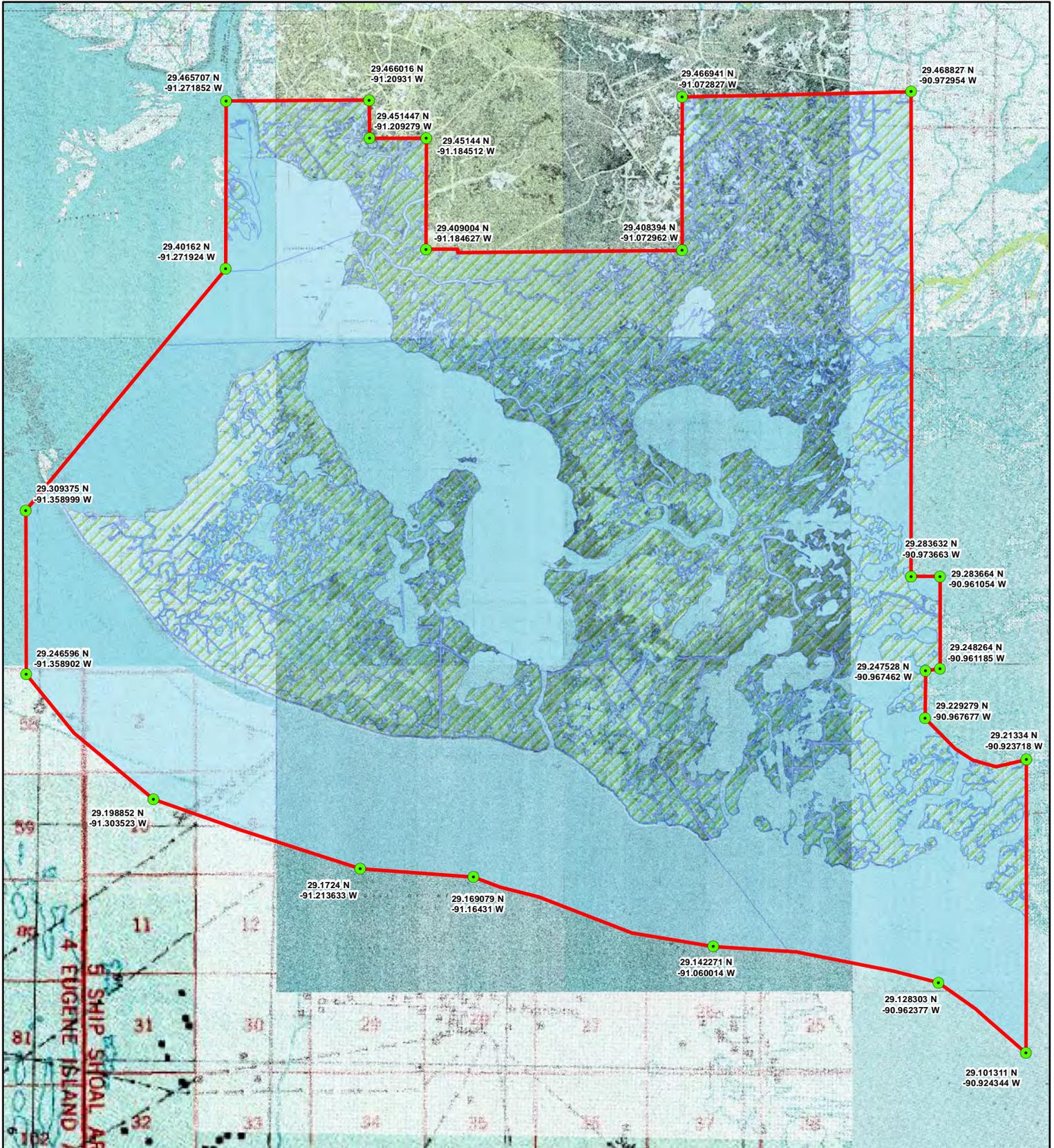
- Pre-Plot Source Points
- Pre-Plot Receiver Points
- Approx. 14' Travel Path

Travel Path Diagram
CTS 3D

St. Mary & Terrebonne Parishes, Louisiana

Map Datum: NAD 1927 State Plane Louisiana South, US Foot
Map Date: February 21, 2014





Legend

- CTS 3D Project Outline 02/19/2014
- NWI Data (USFWS)
- Open Water
- Wetland

Wetlands within Project Area

CTS 3D

St. Mary & Terrebonne Parishes, Louisiana

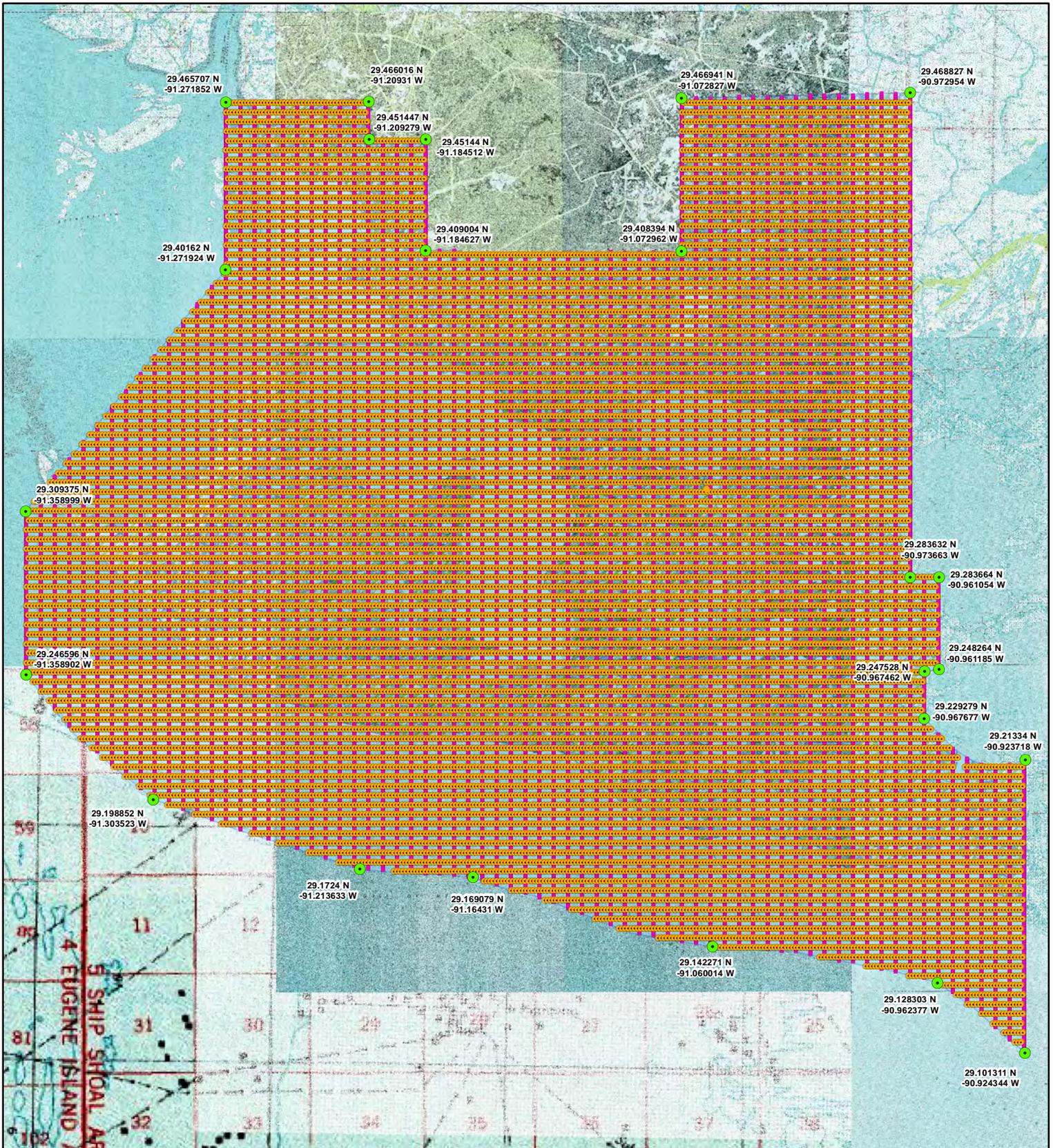
Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
 Map Datum: NAD 1927 State Plane Louisiana South, US Foot
 Map Date: February 20, 2014



North Arrow
1:220,000



Project Location



- Legend**
- CTS 3D Project Outline 02/19/2014
 - Pre-Plot Source Points 02/19/2014
 - Pre-Plot Receiver Points 02/19/2014
 - NWI Data (USFWS)**
 - Open Water
 - Wetland

**Wetlands within Project Area
with Pre-Plot Locations
CTS 3D**

St. Mary & Terrebonne Parishes, Louisiana

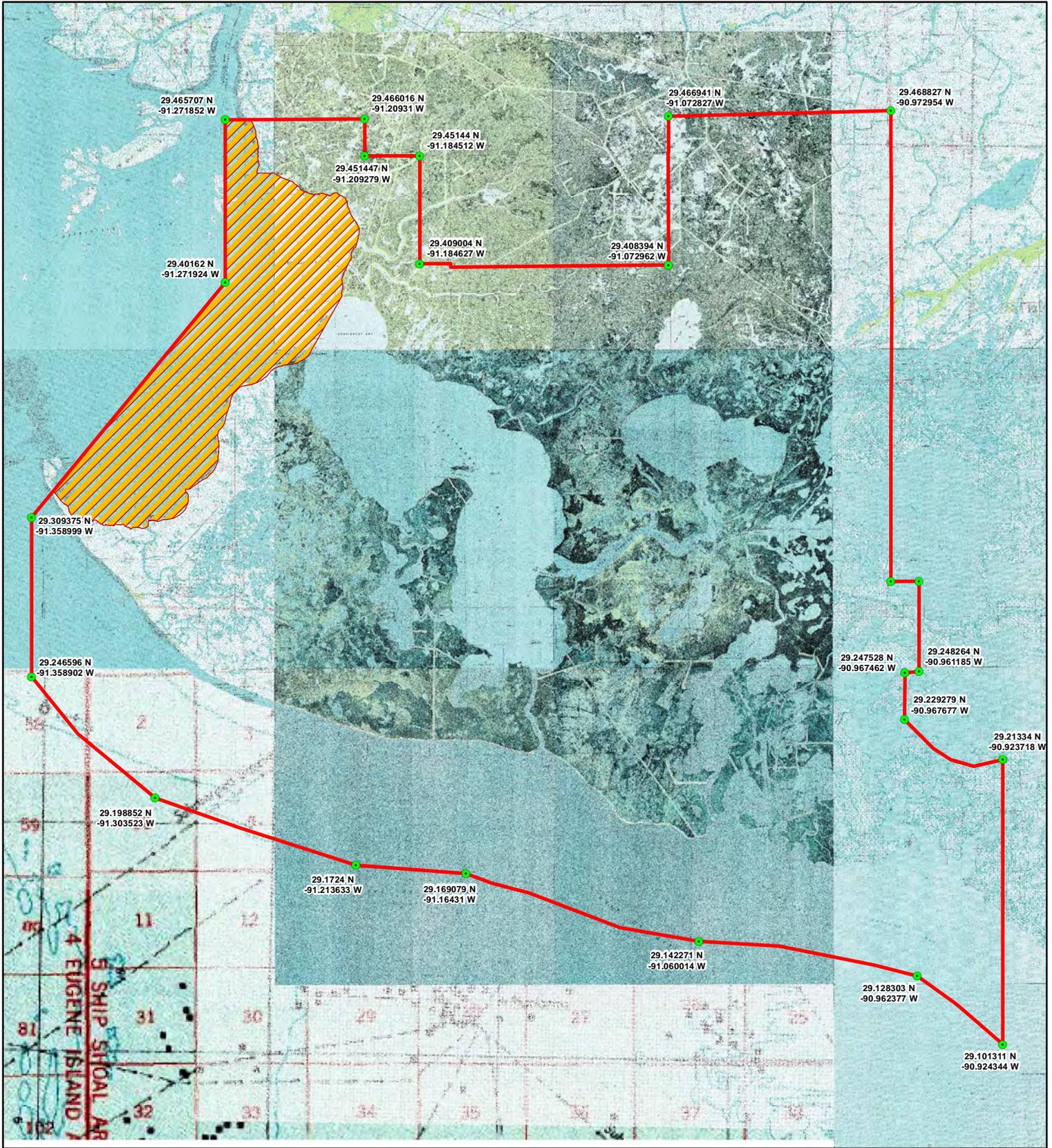
Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
Map Datum: NAD 1927 State Plane Louisiana South, US Foot
Map Date: February 20, 2014



↑ N
1:220,000



Project Location



- Legend**
- Corner Coordinates
 - ▭ CTS 3D Project Outline 02/20/2014
 - ▨ Atchafalaya Delta WMA (Atlas)



Project Outline with Public Lands

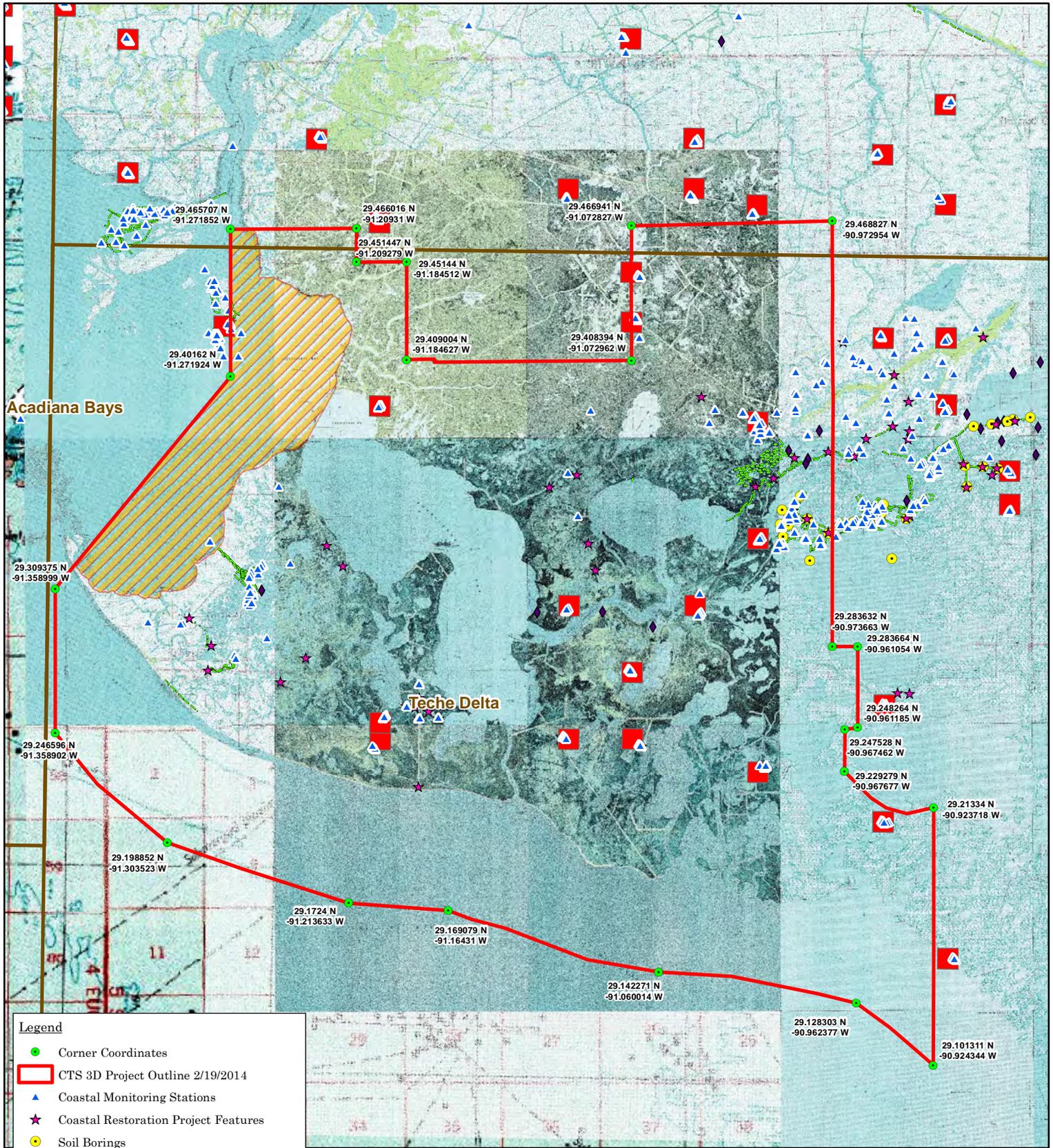
CTS 3D

St. Mary & Terrebonne Parishes, Louisiana

Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
 Map Datum: NAD 1927 State Plane Louisiana South, US Foot
 Map Date: February 20, 2014



Project Location



Legend

- Corner Coordinates
- CTS 3D Project Outline 2/19/2014
- ▲ Coastal Monitoring Stations
- ★ Coastal Restoration Project Features
- Soil Borings
- ◆ Vegetative Plantings
- Coastal Restoration Project Feature Lines
- Coastal Reference Monitoring System Sites
- BICM Regions
- Atchafalaya Delta WMA (Atlas)

Project Outline with SONRIS
Coastal Protection and Restoration Data
CTS 3D

St. Mary & Terrebonne Parishes, Louisiana

Map Base: 1:24K DRG Topos from <http://datagateway.nrcs.usda.gov/>
 Map Datum: NAD 1927 State Plane Louisiana South, US Foot
 Map Date: February 20, 2014

N
1:250,000



Project Location



Seismic Exchange Inc.'s CTS 3D Project Description

Seismic Exchange, Inc. (SEI) is proposing to conduct a 430.63 square mile 3D seismic survey project in St. Mary and Terrebonne Parishes, LA in the forthcoming months. The purpose of this survey is to provide a high-resolution image of the subsurface geological features that will allow the client to effectively evaluate the hydrocarbon reserves underlying the project area.

The proposed 3D survey requires the deployment of motion sensing devices (geophones or receivers), which would be deployed at regular intervals (220 feet), with spacing between receiver lines of 1,980 feet. The survey design would also incorporate a *Pentolite* energy source, which would be placed at regular intervals in a staggered diagonal pattern. The attached maps show the location of the project area, as well as source and receiver point locations.

The charge depth and configuration of shotholes within the project area consists of single, 150 foot holes drilled at intervals of 440 feet along each source line. Source line spacing is 1,320 feet. Each source location would be loaded with an 11 pound charge of *Pentolite* and holes on land would be plugged in accordance with state regulations for the prevention of commingling of surface and ground water.

The parameters of the 3D seismic survey are as follows:

1. Types of equipment to be used:
 - Aluminum Marsh Buggy Drills (wetlands)
 - Airboats Drills (wetlands and open water)
 - Airboats for Survey and Recording Crews (wetlands and open water)
 - Small Jack-up Rigs mounted with drills (open water)
 - Flatboat (layout, troubleshooting, pickup, and support in open water)
 - Ski barges for support (open water)
 - Quarter boats for crews (open water)
 - Tug boat to move quarter boat (open water)
 - Equipment spud barges (open water)
 - Aluminum pontoons for Recording Equipment
 - Helicopter and Helicopter Barge
 - Barges to hold water, fuel, and explosives (open water)
 - Self Propelled Recorder Barge (open water)
 - Boats of various sizes to move personnel
2. Diameter of drill holes: 4 inches
3. Size of energy charge: 11 pounds of *Pentolite*
4. Depth of drill holes: 150 feet

5. 440 feet between source points
6. 1,320 feet between source lines
7. 220 feet between receiver points
8. 1,980 feet between receiver lines

Specifications of equipment proposed for use within the project area are contained in the table below.

Type of Equipment	Length	Width	Draft	Weight
Airboats	15'	7'	6-8"	2,000 lbs
Flat Bottom Boat/Ski Barge	32'	10'	3'	10,000 lbs
Aluminum Marsh Buggy Drill	24'	14'	0 to 3'	20,000 lbs
Airboat Drill	22'	14'	0 to 2'	8,000 lbs
Aluminum Pontoon Drill	30'	11'6"	1'	12,000 lbs
Shallow Draft Lift Boat	43'	14'	3'	39,000 lbs
V Bottom Boat	26'	6'6"	2'	5,000 lbs
Tug Boats	56.1'	20'	5.5-6'	62 tons
Quarterboats (2)	120'	30'	3'	215-264 tons
Equipment Barges	110'	30'	3'	187-198 tons
Flat Boats	30'	10'	1.5'	10,000 lbs

Townships, ranges, and sections encompassed by the project area are included in the table below.

Township and Range Information for Lands within the CTS 3D Project Area					
	R 11 E	R 12 E	R 13 E	R 14 E	R 15 E
T 18 S		32-35		31-36	31
T 19 S		1-5, 9-15, 22-28, 32-36	19-36	All	
T 20 S	1, 12-14, 19-29, 32-36	All	All	All	
T 21 S	1-4, 10-13	1-18, 20-26	1-30, 34-36	All	6-7, 18-19, 30-33
T 22 S			1-3	1-12	4-6, 7-9

This project is mostly water, waterways, and waterbodies present include the Gulf of Mexico, Atchafalaya Bay, Fourleague Bay, Bay Junop, Caillou Bay, Lost Lake, Little Bayou, and Lost Lake Pass.

Surveying on the CTS 3D project is scheduled to begin in April 1, 2014 and would consist of survey crews marking the proposed sites for source holes and locations of

geophones. This would be accomplished using GPS, inertial, and/or conventional surveying methods. Very minimal cutting/trimming of vegetation, if any, would be required along the lines. Cutting would be limited to the minimum amount necessary to accomplish objectives. Surveying would be accomplished with airboats in wetland areas. Airboats would move over slightly with each pass that is made along source and receiver lines in order to minimize the likelihood of compaction. Impacts from surveying operations generally consist of flattening or killing of vegetation along the seismic lines; however, the vegetation usually remains rooted and recovers within one to two growing seasons.

Drilling would tentatively begin in April 15, 2014, and would be accomplished using the above-listed equipment. Equipment selection would be based on site conditions at the time of survey. SEI would utilize equipment best suited for each habitat type in order to minimize impacts (i.e. airboats and marsh buggy drills would be utilized in wetlands, pontoon drills would be utilized in open water areas, etc.). During the drilling phase of operations, drills would maneuver from source point to source point along the lines, utilizing the path of least resistance. Drills and support equipment would utilize open water areas to the extent possible and would move over slightly with each pass that is made along source lines and access routes in wetland areas in order to minimize the likelihood of compaction and damage to vegetation. No mechanized clearing would be conducted ahead of the drilling equipment. Small trees, shrubs, and herbaceous vegetation may be impacted in the paths of the drills; however, impacts are generally minimal, and drill paths usually recover naturally in one to two growing seasons.

One single hole would be drilled at each source point location, loaded with an 11 pound charge of *Pentolite*, and holes on land would be plugged with bentonite (natural clay) for the prevention of commingling of surface and ground water. The diameter of a drilled hole is approximately 4 inches. Because of the soft nature of the substrate present within wetland and open water areas within the CTS 3D, very little material is discharged at the surface of the hole. As the hole is drilled, the majority of the displaced material is compacted either outside the perimeter of the hole or downward toward the bottom of the hole. Approximately 0.48 cubic yards of native soil would be displaced in this manner during the drilling of each hole; however, as soon as the drill pipe is removed from the hole, the surrounding material collapses back into the hole column, naturally filling it in.

Approximately 11,575 holes of the 20,672 holes proposed in the CTS 3D project area would be located in open water; therefore, a total of 5,556 cubic yards of material would potentially be displaced in the manner described above as a result of drilling holes in open water. There are approximately 9,063 holes proposed for location in wetland areas (marsh); therefore, a total of 4,350.24 cubic yards of material would potentially be displaced in the manner described above as a result of drilling holes in wetland/marsh areas. Cross-sectional diagrams of typical shotholes in open water and marsh areas are attached for the project file. Material that is displaced at the surface of the hole in wetland areas would likely cover an area that is approximately one foot in diameter (0.78 square feet); therefore, 0.163 acres would potentially be filled as a result of operations in wetland areas. Acreage of fill in open water areas would be extremely difficult to

approximate, as material displaced from the hole causes temporary turbidity within the water column and then settles out in an unknown area which is highly variable, dependent on conditions and water quality parameters. For this reason, no acreage of fill was included in the permit application for open water areas.

If water is not readily available for drilling in wetland areas, water pits may have to be excavated to help facilitate drilling. Should the excavation of water pits become necessary, the pits would be approximately 24 inches wide, by 48 inches long, and 24 inches deep. The pits would be dug using backhoes mounted on either drilling or support equipment (i.e. airboats or marsh buggies). Approximately 0.465 cubic yards of native material would be excavated from each water pit; however, this material would be returned to the pit upon completion of the hole and the area would be returned as near to pre-project grade as possible. Pits would only be necessary in wetland/marsh areas; therefore, the maximum amount of native soil that would be excavated from and then returned to pits is 4,214.295 cubic yards (0.465 cubic yards x 9,063 holes in wetland/marsh areas). This figure was added to the amount of material displaced from shot holes in wetland areas to get the volume of material excavated in wetlands. If water is readily available for drilling at the source hole location, a pit would not be necessary; therefore, the figure provided is high.

The table below provides information on the volumes of material that could potentially be excavated from upland, wetland, and open water areas, the amount of fill (native soil) that could potentially be deposited in upland, wetland, and open water areas, and the acreages of uplands and wetlands that could potentially be affected by excavation and/or fill. Each drill hole and water pit (wetland locations) excavated will affect 0.48 and 0.465 cubic yards of soil respectively. Only approximately 0.000002 acres of surface area is affected by the excavation of each 4 inch diameter drill hole, approximately 0.00018 acres of surface area is affected by the excavation of each 24 inch x 48 inch water pit, and the area affected by the deposition of drill cuttings around each hole in uplands and wetlands is approximately 0.0012 and 0.000018 acres of surface area respectively.

Habitat Type	Number of Source Points (Pre-Plot) in each Habitat Type	Cubic Yards of Native Soil Excavated from Drill Holes and Water Pits	Acres Affected by Excavation of Shot holes and Water Pits	Cubic Yards of Fill Material (Native Soil)	Acres Affected by Fill Material (Native Soil)
Wetlands	9,063	8,564.54	1.65	8,564.54	0.163
Uplands	34	16.32	0.000068	16.32	0.041
Open Water	11,575	5,556	0.023	5,556	N/A
Totals	20,672	14,136.86	1.67	14,136.86	0.204

Drilling would be followed by recording operations, which are scheduled to begin in early July 2014. Recording operations would be supported by helicopter to minimize impacts. Helicopters would lower cache bags containing equipment along the receiver lines, and crews would deploy this equipment along the lines. Equipment would consist of hydrophones/geophones, and data recording boxes. Once enough equipment is laid out to complete a recording patch, the recording crew would proceed with operations.

The charge in each source hole would be remotely detonated, one at a time, and the resulting energy wave recorded. Crew members would travel through the area, hook a shooting pack up to each electronic detonating wire (cap), and detonate each charge.

Clean-up would be conducted in conjunction with operations. After charges are detonated and recording is completed in each swath (area between two receiver lines), all equipment, trash, and flagging would be completely picked up from the area and placed in cache bags for removal by helicopter.

It is estimated that approximately ten months will be required to complete operations within the entire project area. However, there will not be a constant presence in any one area for the duration of the project. Operations typically progress either from east to west or west to east, and as lines are completed on one side of the recording patch, equipment is picked up and moved to the other side.

The Office of Coastal Protection and Restoration (OCPR) identified sixteen Coastwide Reference Monitoring System (CRMS) sites within the project area. These sites will be surrounded by a 200 meter by 200 meter square buffer zone for avoidance and protection. No operations would be conducted within the buffer zone. Should any more sites be discovered during the course of the survey, they would receive the same protection.

According to information obtained from the Louisiana Department of Wildlife and Fisheries (LDWF) Oyster Lease Survey Section online database, there are a total of 111 oyster leases within the project area. A letter and copy of the permit application were sent to each of these leaseholders to inform them of proposed operations in the area. SEI will secure agreements with each of these leaseholders prior to conducting any activities associated with the CTS 3D within the leased areas.

SEI will offset operations in accordance with agency recommendations for the protection of cultural resources and threatened and endangered species; therefore, project operations are not likely to adversely affect cultural resources or threatened and endangered species.

SEI's CTS 3D seismic survey encompasses designated critical habitat for wintering piping plovers. Units LA-2 and LA-3, shown on the attached map, are located within the project boundaries. Spring to fall activity in these areas should be decreased during operations since it is wintering habitat. For protection of critical habitat within Unit LA-3, SEI would offset source points completely from the shoreline of Point Au Fer Island and the small island at the northwest tip of Point Au Fer Island. No equipment will travel through designated critical habitat in these areas. Equipment, such as geophones, batteries, and data recording boxes may be laid out in this habitat along receiver lines; however, the equipment would be laid out by crews on foot. Foot traffic only would be permitted in designated critical habitat. This being the case, project operations should have "no effect" on critical habitat within Unit LA-3.

SEI would minimize the likelihood of water bottom disturbance by selecting equipment best suited to the conditions of the habitat in which they are working at the time of

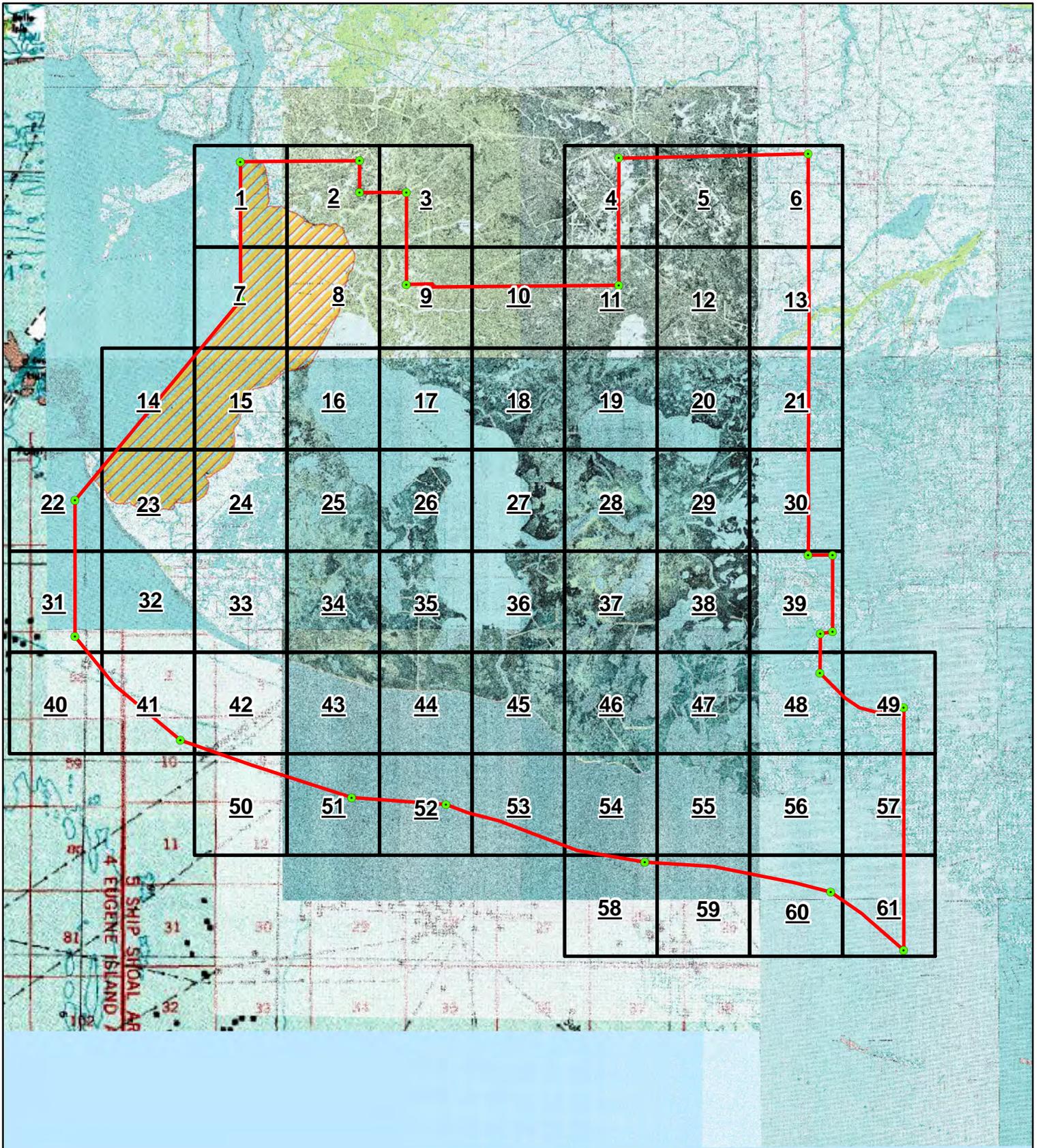
survey. For example, airboats and airboat drills would be utilized in shallow water and wetland habitats, marsh buggy drills would be used in wetland areas that can support the weight of the equipment (typically areas containing dense vegetation and no to low water levels), pontoon drills would be utilized in deeper open water areas, and propeller-driven vessels would be utilized in open water areas that are deep enough to facilitate their use based on the draft of the vessel. No dredging would be necessary for placement of the quarterboats or equipment barges, nor would it be necessary to facilitate passage of equipment. Quarterboats and barges would be located in areas that are deep enough to allow for their mobilization and demobilization based on the required drafts of the tug boats necessary to move them and the boats/barges themselves.

Because SEI cannot limit their operational timeframes to periods of high tide, tide levels would be factored into equipment selection. SEI will be using a combination of airboats, marsh buggies, and propeller-driven boats to accomplish objectives. This equipment will be onsite and equipment adjustments can be made, as necessary, based on water depths and habitat conditions (i.e. an area that could be accessed by propeller driven boats on one day may have to be accessed by airboats the next due to fluctuations in water levels).

A portion of the Atchafalaya Delta Wildlife Management Area (ADWMA) is also encompassed within the project area. SEI has initiated discussions with LDWF regarding drilling in these areas. SEI will receive permission to drill on the exposed land areas with a light-weight aluminum marsh buggies with one pass if SEI is unable to find a waterway to drill the shot holes.

SEI will coordinate with LDWF to determine if any vessel restrictions are applicable to oyster seed grounds or other sensitive areas. In a letter dated February 14, 2014, LDWF waived the necessity for any waterbottom assessment within the ADWMA. A waterbottom assessment will be conducted in the required areas of the public oyster seed grounds in Bay Junop and Lake Mechant. Operations will not occur within the Calliou Lake (Sister Lake) public seed grounds.

Project impacts are expected to be minimal and temporary in nature.



<p>Legend</p> <ul style="list-style-type: none"> ● Corner Coordinates Grid Pages CTS 3D Project Outline 02/19/2014 Atchafalaya Delta WMA (Atlas) 	<h3 style="margin: 0;">Grid Page Guide</h3> <p style="margin: 5px 0 0 0;">CTS 3D</p> <p style="margin: 0 0 0 0;"><i>St. Mary & Terrebonne Parishes, Louisiana</i></p> <p style="font-size: small; margin: 0 0 0 0;">Map Base: 1:24K DRG Topos from http://datagateway.nrcs.usda.gov/ Map Datum: NAD 1927 State Plane Louisiana South, US Foot Map Date: February 20, 2014</p>	<div style="text-align: center;"> 1:262,000 </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 10px;"> <div style="font-size: x-small;"> </div> </div> <div style="text-align: center; margin-top: 5px;"> Project Location </div>
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