ARABIE ENVIRONMENTAL SOLUTIONS

REMEDIATION PLAN

Saltwater Flowline Release

Delhi Field, Richland Parish

Martha Zoe Moore, Charles Dane Moore,
and Melissa Moore Hutchinson
vs.
Denbury Onshore, LLC
Docket No. 43,926-B
5th Judicial District Court
Richland Parish, Louisiana

Prepared for submittal to:
LA Department of Natural Resources
Office of Conservation

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Prepared for:

Veron, Bice, Palermo & Wilson, LLC
721 Kirby Street
Lake Charles, LA 70601

P. O. Box 928
Lake Charles, Louisiana 70602
(337) 436-3248

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EXECUTIVE SUMMARY

Denbury Resources, Inc. (Denbury) operates a saltwater flowline that crosses property owned by the Moore family in the Delhi Gas Field, Richland Parish. The flowline transports saltwater to the DFU 125-1 saltwater injection well, which is not on the Moore property. The release of saltwater affected approximately 26 acres, killing vegetation including trees, shrubs, and forbs (Cork, November 2013).

Arabie Environmental Solutions, LLC (Arabie Environmental) has performed a site investigation of the release site on the Moore tract to document the presence of soil and groundwater contamination due to the release of the salt water. In addition Arabie Environmental has reviewed the results of investigations performed by others on behalf of Denbury.

The property is located in eastern Richland Parish, near Dunn, Louisiana, in the Delhi gas field. The release occurred on the Moore tract, about 2,500 feet south of Ferguson Road. The location of the tract is presented on Figure 1. The flowline right of way is owned by the Moore's and the affected contiguous property is owned by the Moore's. Therefore the release would be considered "on-site" as defined in to Title 43, Part XIX, Chapter 3.

The property is currently the focus of litigation in the case of Martha Zoe Moore, Charles Dane Moore and Melissa Moore Hutchinson vs Denbury Onshore, LLC; Docket No. 43,926-B; 5th Judicial District Court; Richland Parish, Louisiana

The area of the release on the Moore property has been impacted by the saltwater. Natural vegetation in the area has been impacted, soil impacts exceed the Order 29-B pit closure standards, and groundwater has been impacted. The top of the Mississippi River Alluvial Aquifer (MRAA) is less than 10 feet of the surface at some sample locations and samples collected from the top of the MRAA in area of the release revealed elevated chloride concentrations.

The environmental investigations performed at the Moore property included soil borings, soil sampling, and monitor well installation and groundwater sampling. Arabie Environmental developed this remediation plan to satisfy the requirements of Title 43, Part XIX, Chapter 3. No consideration was given to site evaluation using Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation Corrective Action Program (RECAP) since the application of RECAP would require seeking an exception to Order 29-B. Landowner consent is required for the agency to grant the exception and the landowner has not provided such consent.

Arabie Environmental has prepared this plan to evaluate and remediate the environmental damage in accordance with the requirements of the applicable rules and regulations of the Office of Conservation. The plan includes additional investigation of the contaminated aquifer and the removal and offsite disposal of soil that exceeds Order 29-B standards.

1.0 INTRODUCTION

Soil and groundwater investigations to assess impacts from the salt water flowline release were conducted on a tract of land owned by Martha Zoe Moore, Charles Dane Moore, and Melissa Moore Hutchinson (Moore tract). The property is located in eastern Richland Parish, near Dunn, Louisiana, and includes property in the SE/4 of the NE/4 of Section 32 and most of Section 33, Township 4 North, Range 5 East. The release occurred on the Moore tract, about 2,500 feet south of Ferguson Road. The location of the tract is presented on Figure 1. This report presents and evaluates available site information, including plans prepared by others, and presents a Feasible Plan for restoring the Moore tract in compliance with LAC 43:XIX.6.

Michael Pisani & Associates, Inc. (MPA) prepared and submitted a "Remediation Plan" for the saltwater pipeline release dated April 20, 2015. (MPA, April 2015). The Louisiana Department of Natural Resources, Office of Conservation, (LDNR) determined the plan to be deficient and required that the plan be revised. On May 26, 2015, MPA submitted the revised "Feasible Plan for Remediation" (Plan).

A detailed criticism of the MPA Plan is not being provided, however there are some major points that should be noted. MPA claims that there is no "environmental damage" as defined by Louisiana Revised Statute 30:29 (La. R.S. 30:29) because there is no "contamination" as defined by La. R.S. 30:29. The referenced statute defines "contamination" as follows: "*Contamination shall mean the introduction or presence of substances or contaminants into a usable groundwater aquifer, an underground source of drinking water (USDW) or soil in such quantities as to render them unsuitable for their reasonably intended purposes.*"

The aquifer beneath the Moore property is a usable aquifer and it has been contaminated. The limited number of samples collected from the groundwater indicate that in an area where surface impacts are not evident the groundwater chloride concentration is approximately 114 milligrams per liter (mg/L) but samples collected from the area where surface impacts are evident revealed up to 568 mg/L chloride. Groundwater with a chloride concentration of 114 mg/L is generally considered acceptable for irrigation, although detrimental effects on some crops are reported at chloride concentrations of 70 mg/L. However, a chloride concentration of 568 mg/L would not be favorable for irrigation or for consumption. The Environmental Protection Agency (EPA) Secondary Maximum Containment Level (SMCL) is 250 mg/L for chloride.

The soil in areas outside of the visual impacts reveal electrical conductivity (EC) values generally less than 1 millimohs per centimeter (mmhos/cm) and Sodium Adsorption Ratios (SAR) were generally less than 3.00. Values of EC within the visually impacted area are as high as 24.2 mmhos/cm and SAR values were as high as 53.7. In Section 2.0 of MPA's Plan, it is stated "the property surrounding the pipeline right-of-way is currently used for cattle grazing and recreational hunting, and historically had been used for cattle grazing, row crop agriculture, and timber production." Based on a review of the site conditions and laboratory data, it would appear that the release site has been rendered

unsuitable for reasonably intended purposes, such as cattle grazing, row crop agriculture, and timber production.

Another criticism of the MPA Plan is that it offers no actual soil remediation; it only proposes monitoring - for three additional years. The MPA Plan then provides for testing the use of soil amendments. The pipeline release occurred in the spring of 2013. Two years have already transpired with no active soil remediation. Sampling conducted on behalf of Denbury has shown that the released salt water components remain in the soil at concentrations exceeding 29-B standards after two years and that the salt water contaminants have entered the usable aquifer underlying the site. Denbury sampling and analysis conducted in February 2015 documented that contaminants are migrating downward toward the aquifer.

The MPA Plan appears to apply LDEQ RECAP evaluation methods and standards although there is no evidence offered that an exception to the provisions of Order 29-B has been requested in accordance with Title 43, Part XIX, Section 319. The groundwater analytical data for the site show that USDW underlying the site has been impacted by the release. It appears that the MPA Plan is not in compliance with Title 43, Part XIX, Section 611.F.

1.1 FEASIBLE PLAN REQUIREMENTS

Based on the results of investigations performed on the site, corrective action is warranted. A remediation plan is presented for the site at the conclusion of this document.

The following table briefly states the regulatory requirement and the corresponding section of the report that is responsive to the requirement.

TABLE ES-1
Feasible Plan Compliance Cross-Reference

LAC 43:XIX.§609 and §611 Requirements for Plans for Remediation	***Portion of this Plan presenting required information***
§609.A. Plan filed in a timely manner with copies delivered to each party	Transmittal Letter & Plan filed by June 25, 2015 deadline
§609.A. Plan outlines the purpose thereof	Section 1.0
§609.A.1. Statement that a reasonable effort has been made to obtain a complete list of parties	Transmittal Letter
§609.A.2. Statement that Commissioner's Conference has or has not been held, with a list of parties in attendance	Transmittal Letter
§609.A.3. Plat including technical data labeled	Attachment F
§609.A.4. A statement that the plan is to evaluate or remediate the environmental damage in accordance with the requirements of the applicable rules and regulations of the Office of Conservation or, if the plan seeks to apply rules and regulations of another Louisiana state agency/a citation to the specific rules and regulations of that state agency	Executive Summary
§611.B. Sampling and testing shall be performed in accordance with Statewide Order 29-B.	Section 4.0
§611.B. Each plan shall fully delineate the vertical and horizontal extent of the environmental damage.	Section 6.0

LAC 43:XIX.§609 and §611 Requirements for Plans for Remediation	***Portion of this Plan presenting required information***
§611.C. All Statewide Order 29-B sampling shall be in accordance with applicable guidelines as provided in the latest revision of the Department of Natural Resources laboratory procedures manual titled "Laboratory Procedures for Analysis of Exploration and Production Waste"	Section 5.2.4
§611.C. Shall contain a plat showing the physical location from which such samples were obtained.	Attachment F and Figures 4a, 4b, 4c
§611.C.1 In addition, information as to the identity of the person or company taking the samples, a copy of the certification of such person or company taking such samples (if applicable), and documentation showing the method of sampling, the chain of custody and all other such relevant information shall be included.	Section 5.0 and Attachment E
§611.D. All Statewide Order 29-B sample analyses shall be in accordance with applicable regulatory requirements and the latest revision of the Department of Natural Resources laboratory procedures manual titled "Laboratory Procedures for Analysis of Exploration and Production Waste" and shall be performed by a DEQ LELAP accredited laboratory holding current accreditation for each parameter and corresponding test method used.	Section 5.2.4
§609.D.1. All Statewide Order 29-B test results shall also contain a report certified by the testing laboratory including, at a minimum, a description of the testing process or methodology, by whom such testing was conducted, a copy of the laboratory's accreditation to conduct the described test, and all applicable required quality assurance/quality control data.	Section 5.2.4 and Attachment D
§611.E. Each plan shall contain a separate section analyzing the sampling and testing as set forth in C and D above by comparison with the applicable Statewide Order 29-B criteria.	Section 6.1.1 and Table 1

LAC 43:XIX.§609 and §611 Requirements for Plans for Remediation	***Portion of this Plan presenting required information***
§611.F. Plan shall comply with the standards set forth in Statewide Order 29-B.	Section 5.0, 6.0, and 7.0
§611.F. For exceptions to Statewide Order 29-B • Sufficient proof of cause to grant such exception • Sufficient proof that exceptions(s) do not endanger USDWs • Specific citation for standard in lieu of Order 29-B	Not Applicable - No Exception Requested
§611.G.1. All plans shall also contain a chronological work schedule or proposal for a chronological work schedule detailing all activities necessary for its implementation.	Section 7.3
§611.G.2. All plans shall also contain a comprehensive itemized cost basis for each item listed in Paragraph G.1.	Section 7.0 and Attachment G
§611.G.3. A certification of review and approval by signature from an attorney licensed to practice law in Louisiana, or an attorney from another jurisdiction who has been authorized to appear before the commissioner, worded as follows: "I, _____have reviewed the information submitted herewith and hereby attest that to the best of my knowledge, information and belief it is true and correct and is based on scientific data that has been obtained in a manner compliant with all applicable regulations."	Transmittal Letter

1.2 SITE DESCRIPTION AND USE

Denbury has a pipeline right-of-way (ROW) that traverses the Moore tract along the Section 32 and Section 33 border from the north at Ferguson Road, southward approximately one-half mile, where it turns to the west as shown in Figure 2. According to the Work Plan submitted to LDEQ by Cork Environmental Resource Group (Cork), Denbury purchased the Delhi field in 2005 and has operated a six-inch diameter saltwater flowline in the ROW since November 2009.

Some of the property is utilized as pasture for cattle grazing and other portions have been enrolled in United States Department of Agriculture conservation programs. Reasonably expected uses of the Moore tract would include grazing, cropland, timber production, or enrollment in conservation programs.

1.3 PETROLEUM EXPLORATION AND PRODUCTION

The Delhi field was discovered in late 1944 and the first exploration and production (E&P) wells on the investigated tract were permitted in 1946. Oil and gas production in the Delhi Field continued, but declined into the 1990s, until a carbon dioxide and saltwater flooding program was implemented by Denbury in 2009 to enhance hydrocarbon production. Denbury's operations of the Delhi field are ongoing.

According to the Louisiana Department of Natural Resources (LDNR) Strategic Online Natural Resources Information System (SONRIS) database, a total of six E&P wells have been drilled on the Moore property:

- One active water injection well (DELHI HOLT BRYANT SU; DELHI UT #112-1/Serial No. 974136);
- Three plugged and abandoned producing wells (DELHI HOLT BRYANT SU; DELHI UT #112-1/Serial No. 31821, #112-2/Serial No. 32181, #112-4/Serial No. 33739); and
- Two plugged dry holes (O'NEAL & MOORE #1/Serial No. 206353 and W P BEAIRD ET AL #3/Serial No. 32268).

In addition, pits are registered in the SONRIS database for well Serial No.'s 206353 and 974136. Records indicate that the most recent oil and gas production from any well on the property was in 1990.

Figure 3 of this report illustrates E&P well locations based on SONRIS.

1.4 FLOWLINE RELEASE

The following information was obtained from the LDEQ Electronic Data Management System records regarding Agency Interest number 186776.

The spill was reported by a neighboring landowner in March 2013. He reported discolored water and a "gas odor" in Muddy Slough where it crosses Highway 132 about one-half mile south of where the release occurred. A LDEQ representative, Mr. Bradley Osbon, began to investigate and determined that the release was occurring north of Highway 132 and south of Ferguson Road. On March 26, 2013, Mr. Dane Moore contacted the LDEQ about apparent impacts to his property. The LDEQ representative visited the property and discovered, "a large amount of dead vegetation." Further investigation revealed "an injection water line owned by Denbury Resources, Inc., travels through a portion of Mr. Moore's property," and that "the pipeline appeared to have ruptured approximately 2,500 feet south of Ferguson Road. The rupture in the pipeline caused the release of a large quantity of produced salt water and some crude oil (estimated at less than one barrel)." He further remarked that, "the liquids released from the pipeline affected a large area of land and flowed southeast into Muddy Slough causing the discoloration." The flowline right of way is owned by the Moore's and affected contiguous property owned by the Moore's. Therefore the release would be considered "on-site" as defined in to Title 43, Part XIX, Chapter 3.

2.0 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1 GEOLOGY

The SONRIS database interactive map describes the surface geology as, "Braided Stream Terraces – Loess," consisting of "tan to reddish brown massive silt with some clay and minor amounts of very fine sand." The Geologic Map of Louisiana – 1984 further describes the deposits as glacial outwash of the ancestral Arkansas River. The Loess Map of Louisiana appears to indicate the area is overlain by loess of unspecified thickness; however, neither the Geologic Map of Louisiana, nor the SONRIS interactive map depicts loess on the Moore tract. Borings installed on the tract predominantly encountered silty clay and silt loam at the surface to depths as shallow as 8 feet, where the silt and sand of the Alluvial Aquifer was encountered. The veneer of silty clay and silt loam is underlain by thicker alluvial deposits of sands and gravels to depths in excess of 100 feet.

2.2 HYDROGEOLOGY

The shallowest aquifer underlying the Moore property is known as the Mississippi River Alluvial Aquifer (MRAA). Depths to water in cased wells installed on the property and nearby indicate that the MRAA is a water table aquifer in this area.

The MRAA is 100 to 150 feet thick and covers a large portion of northeast and south-central Louisiana. The MRAA consists of fluvial sediments ranging from fine sand to coarse gravels with some clay intervals possible. The sediments generally coarsen downward. The MRAA has the second greatest withdrawal volume of aquifers in Louisiana and it is the principle source of groundwater in northeast Louisiana, including Richland and Franklin Parishes. (Carlson, 2006)

2.3 ADJACENT SITE USES

Property immediately surrounding the area includes wetland/forest and agricultural land. As noted earlier, some areas have been enrolled in CRP and trees have been planted.

2.4 FUTURE LAND USE

Future use of the tract will be a return of the land to viable grazing land and restoration the aquifer to groundwater quality suitable for any potential uses , such as irrigation or public or domestic water supply. Potential future uses would be to utilize the property as cropland or timber land to produce crops, lumber, pulp, biofuels, and biomass, or a wetland/hardwood bottom forest land as part of the WRP, CRP, or other conservation program. The WRP and CRP are voluntary programs offering landowners the opportunity to protect, restore and enhance wetlands on their property while establishing long-term land and wildlife conservation practices and protection. According to the NRCS, approximately 50,000 acres of cropland have been enrolled in WRP in Richland and Franklin Parishes.

3.0 INVESTIGATIONS AND EVALUATIONS BY OTHERS

Soil and limited groundwater investigations were conducted on the tract on behalf of Denbury by Cork Environmental resources Group, Inc. (Cork), MPA, Messeger and Associates, and Dr. Luther Holloway. The analytical results for the samples collected as part of those investigations have been utilized in the development of this plan.

4.0 ARABIE ENVIRONMENTAL INVESTIGATION DESCRIPTION

Arabie Environmental installed and sampled 19 soil borings (M-SB-01 through M-SB-19) and three temporary groundwater monitor wells (MW-01 through MW-03) between September 22 and October 1, 2014. Soil samples were obtained from borings advanced to depths ranging from 7 feet below ground surface (ft. bgs) to 17 (ft. bgs). Groundwater samples were obtained from temporary wells installed by Arabie Environmental. Groundwater samples were obtained from shallow silt and sand of the MRAA.

Sampling and testing conducted by Arabie Environmental was performed in accordance with Order 29-B.

5.0 INVESTIGATION METHODS

5.1 AERIAL PHOTOGRAPHY

Two aerial photographs (http://www.landsat.com/richland-county-louisiana-aerial-photography-2013.html) were reviewed as part of this investigation. The first photograph is from a flight on June 13, 2010. In that photograph there are no apparent indications of a release. The second photograph is from a flight between July 1, 2013 and July 4, 2013 and the impacts from the spill are apparent. The impacts to vegetation appear to encompass over 20 acres.

The aerial photographs are included in Attachment A.

5.2 FIELD ACTIVITIES

Arabie Environmental personnel first visited the Moore tract on April 21, 2014, approximately one year after the release. The activities on that date consisted of inspecting and photographing the areas affected by the spill. The site photographs taken in April 2014 depicting the area affected by the salt water and oil release are included in Attachment B.

Prior to Arabie Environmental inspecting the site, Cork had conducted sampling on the tract. Samples collected by Cork, that Arabie Environmental is aware of, include samples collected in April, May, September, and December 2013. Cork also sampled in January, February, March, and April, 2014 prior to Arabie Environmental's initial site visit. On April 24, 2014 Arabie Environmental began sampling activities by splitting samples with Cork.

Cork installed soil borings using hand augers at 67 locations, collecting samples on one-foot intervals to a total depth of three feet. Arabie Environmental observed the installation of borings SB-42 through SB-48 and SB-54 through SB-67 and collected split samples from each of those borings. Arabie Environmental was not present during collection of other samples collected by Cork. Sample results for most of the Cork sampling events are summarized and used in this report. Sample locations are indicated on Figures 4a, 4b, and 4c.

Between September 22 and October 1, 2014, Arabie Environmental installed and sampled 19 soil borings (M-SB-01 through M-SB-19), installed and sampled three temporary groundwater monitor wells (MW-01 through MW-03), and sampled a public water supply spigot on the property.

Field activities were documented in a bound field logbook. Field procedures implemented during the site investigation are presented in the following sections.

5.2.1 Soil Sample Collection and Field Screening

Soil samples were collected by Arabie Environmental from borings advanced using Geoprobe direct push technology at the direction of Arabie Environmental field personnel. Sample cores were generated for field description, field testing and laboratory testing. Arabie Environmental personnel observed all boring activities, logged soil cores and collected samples for testing at laboratories selected by Arabie Environmental. Logging of soil core descriptions included a lithologic description and identification of any notable features such as wetness, odors, staining, sedimentary structures and/or variations in sand, silt or clay content. Soil boring logs are included in Attachment C.

Once collection of a sampling interval was completed by the drilling crew, the soil core was placed horizontally on a sample table. The sample container or liner was cut to expose the soil core for logging and sampling.

Samples were placed into laboratory supplied sample containers and labeled with a unique identification number. When required by the test method, samples were immediately placed in an ice chest with sufficient ice to cool the sample to four degrees Celsius (°C). At a minimum, the sample label included sample number, date, time, sample location, sampler's name, sample type, analysis to be performed and preservatives used. Clean nitrile gloves were worn during soil sampling to promote sample integrity and dermal protection. Samples selected for laboratory analysis were retained by Arabie Environmental personnel until transported by laboratory personnel to Element Materials Technology (Element) in Lafayette, Louisiana, under standard chain-of-custody procedures.

5.2.2 Groundwater Well Installation and Sampling

Temporary wells were installed at the direction of Arabie Environmental using direct push technology to install 1-inch diameter wells which were P&A'd following sampling. Temporary wells were constructed inside a cased borehole completed using Geoprobe dual tube drilling methods. Wells were composed of pre-pack PVC well screens and PVC casing which was installed as the dual tube casing was withdrawn from the borehole.

Sampling procedures used in the collection of groundwater samples from Arabie Environmental temporary wells are described below:

- Each well was purged until a minimum of three casing volumes had been removed and/or field indicator parameters (pH, specific conductance, temperature, dissolved oxygen, and turbidity) had stabilized after repeated monitoring (flow-thru cell or equivalent), or the well was purged dry. If purged dry, the well was allowed to recharge prior to sampling.
- A peristaltic pump with new tubing was used to collect groundwater samples.
- During collection of samples for volatile organic analysis, the pump flow rate was reduced to minimum flow to decrease the potential for volatilization of dissolved constituents; and
- All groundwater samples were collected into laboratory supplied containers, labeled with a unique identification number, and immediately placed in an ice chest with sufficient ice to cool the sample to 4°C. At a minimum, the sample label included sample number, date, time, sample location, sampler's name, sample type, analysis to be performed and preservatives used. Clean nitrile gloves were worn during sampling to promote sample integrity and dermal protection.

Samples for laboratory analysis were retained by Arabie Environmental personnel until transported by laboratory personnel to Element under standard chain-of-custody procedures.

During the course of the investigation sampling activities conducted by Arabie Environmental, quality assurance/quality control (QA/QC) samples were collected and are included in the laboratory reports. Sample collection QA/QC procedures used during the site investigation activities included split sampling and analysis by two Louisiana accredited laboratories for many soil samples. Evaluation of the split sample results indicates general agreement between the results. Laboratory analysis included matrix spikes and matrix spike duplicates.

5.2.3 Decontamination Procedures

All borehole installation and soil/groundwater sampling equipment employed by Arabie Environmental was decontaminated prior to beginning work and prior to demobilizing from the site. Down-hole sample collection equipment such as dual tubes and push rods were decontaminated between boreholes. Water used in the drilling equipment decontamination process was obtained from a public water supply spigot located on the property. Laboratory analysis of samples from this water supply indicated a chloride concentration of 114 milligram per Liter (mg/L). All sampling equipment was decontaminated after each use. Decontamination was completed using a Liquinox and water solution with a potable/distilled water rinse. When possible, dedicated, single use equipment was used to minimize the potential for cross contamination of samples.

5.2.4 Laboratory Analytical Testing

All laboratory analyses were conducted in accordance with EPA SW-846, Test Methods for Evaluating Solid Waste, other pertinent EPA methods or LDNR analytical methods described in "Laboratory Procedures for Analysis of Exploration and Production Waste." Laboratory analyses were completed by Element (LELAP Certification No. 01997) or their subcontracted laboratories. Laboratory accreditation documents and analytical reports are included on a CD in Attachment D of this report.

In general, soil and groundwater samples were analyzed for the following parameters:

<u>Soil</u>

- Soluble Chloride (Method SW 9253)
- Electrical Conductivity (Method 29-B/E120.1)

Selected soil samples were also analyzed for one or more of the following parameters:

- 29-B Metals (Method SW6010B)
- Mercury (Method 29-B/SW7471A)
- True Total Barium (Method 29-B/SW6010B)

- Sodium Adsorption Ratio (Method 29-B/SW6010B)
- Leachate Chloride (Method 29-B/SW9253)
- Sodium (Method 6010B)
- TPH-Diesel and TPH-Oil (Method 8015B)
- Polycyclic Aromatic Hydrocarbons (Method 8270C)

Groundwater

- Chlorides (Method SW9253)
- Specific Conductance (E120.1)
- TDS (Residue, Filterable) (SM2540C)

Selected groundwater samples were also analyzed for one or more of the following parameters:

- 29-B Metals (Method SW6010B)
- Mercury (Method SW 7470A)
- Additional Priority Pollutant Metals (Method SW6010B)
- Bromide (SW-846 9056A)
- Chloride (Method SW-846 9056A)
- Sulfate (Method SW-846 9056A)
- TPH-Diesel and TPH-Oil (Method SW8015B)
- Sodium (Method 6010B)
- $Radium_{226/228}$ (Water Method 903.0 and 904.0)
- Benzene, Toluene, Ethylbenzene, Xylenes (Method 8021-B)
- Polycyclic Aromatic Hydrocarbons (Method SW8310)
- Alkalinity; Total, Carbonate, Bicarbonate (Method SM2320B)

6.0 INVESTIGATION RESULTS

The extent of soil exceeding Order 29-B standards has been delineated vertically and horizontally, but the extent of groundwater impact has not been delineated.

6.1 Soil

Visual inspection of the area in the vicinity of the spill revealed over twenty acres of impacted area. The areas impacted included dead vegetation and bare soil. Impacted vegetation was observed in pastures, forested areas, and areas of brush.

The sampling and analysis of soils collected in 2014 by both Arabie Environmental and Cork confirmed that the area of visual impacts coincides with areas determined to have elevated levels of salt constituents. In areas that did not appear to be affected, the electrical conductivity (EC) of the soil was less than 1 mmhos/cm, soluble chloride concentrations were generally less than 100 mg/kg, and Sodium Adsorption Ratio (SAR) values were generally less than 3.00. Within the affected area, the EC of the soil was as high as 24.2 mmhos/cm, chloride concentrations were as high as 5,050 mg/kg, and SAR as high as 53.7. The analysis of soil samples from borings as deep as 17 feet, indicate that the spilled salt water has reached that depth.

Soil background calculations were performed for the EC, SAR, and chlorides utilizing methods described in the Louisiana Department Environmental Quality RECAP document. The results of those background calculations result in the following background concentrations:

EC – 0.29 mmhos/cm

SAR – 3.37

Chlorides – 103.77 mg/kg

The background calculations are included in Attachment E.

The total area of impacted soils on the Moore tract is approximately 22.6 acres and the total area of 11.68 acres exceed Order 29-B standards.

6.1.1 Soil Exceeding Order 29-B Pit Closure Standards

For purposes of this remediation plan, figures included in the MPA Plan of May 26, 2015 have been utilized. The applicable Order 29-B soil salinity standards for soil are:

	EC (mmhos/cm)	SAR	ESP (%)
Upland	<4	<12	<15
Elevated Wetland	<8	<14	<25

The areas identified by MPA as exceeding Order 29-B standards are consistent with Arabie Environmental's conclusions. Table 1 presents a tabulation of all soil sampling events (Arabie Environmental, Cork, and MPA) and includes split sample results where split samples were collected. Attachment F includes figures and tables from the MPA report. MPA Figures 21 through 30 present areas and depths that exceed Order 29-B standards. A total of area of over 11.68 acres demonstrate salt impacts exceeding Order 29-B standards.

6.2 Groundwater

Groundwater samples were collected by Arabie Environmental from three monitor wells on the Moore tract. Monitor wells M-MW01 and M-MW03 were installed in the area of

surface impacts. The results from those wells indicated chloride concentrations of 298 and 312 mg/L, respectively. Monitor well M-MW02 was installed just north of the area of surface impacts and the sample from that well indicated 114 mg/L chloride concentration. Table 2 is a tabulation of surface water and groundwater samples collected by Arabie Environmental and Cork.

Arabie Environmental also sampled a public water supply spigot on the property and the sample result was 114 mg/L chlorides.

A review of water wells in the area revealed a number of monitor wells northwest of the Moore tract, indicating a groundwater contamination issue in that area. An old, unused water well is located along the pipeline ROW near the release area. Attachments to the wellhead limit access. The well does not appear to be registered. No further investigation of the groundwater conditions on the Moore tract was conducted but additional investigation is recommended.

7.0 REMEDIATION PLAN

In addition to the regulatory requirements, Arabie Environmental also considered other factors related to remediation such as cost, efficiency of the action, and the time required to complete remediation.

The two primary objectives of the soil and groundwater remediation at the tract are to 1) satisfy the regulatory requirements, and 2) to restore the property, as soon as possible, to conditions such that it can be used for any purpose, now or in the future, that is consistent with any potential use.

The property utilization in the past has included livestock grazing, forest, wetlands, and agricultural cropland. Future potential uses include livestock grazing, cropland, aquaculture, enrollment in the Conservation Reserve Program (CRP), Wetland Reserve Program (WRP), and commercial forest to produce lumber, wood pulp, and biomass for fuel or fuel production.

These objectives are for both the soil and groundwater, as the soil should be returned to conditions to support production of any potential crop, and the groundwater should be maintained or returned to conditions that will protect the soil, protect all groundwater zones, and allow its use for domestic or public water supply and for optimum irrigation.

7.1 GROUNDWATER

Groundwater sampling has documented that an aquifer has been impacted by the release of saltwater. The lateral and vertical extent of that contamination has not been determined. In order to determine the lateral and vertical extent additional monitoring wells are required to establish site specific background and the extent of impacts exceeding background. Shallow and deep monitoring wells are needed to make those determinations.

The groundwater evaluation plan includes the installation and monitoring of eight shallow wells to a depth of 30 feet and three deep wells to a depth of 140 feet. The wells would be sampled immediately upon installation and the results evaluated. The groundwater evaluation cost includes three years of monitoring, but immediate corrective action may be required, depending on the initial findings.

The total cost of the groundwater evaluation is $312,460.15 and a table detailing the cost is included in Attachment G.

7.2 SOIL

The majority of impacted areas on the Moore tract are considered "elevated freshwater wetlands", therefore the parameters included in 313.D.2 are considered applicable standards for the wetland areas.

The American Petroleum Institute's (API) *Remediation of Salt-Affected Soils at Oil and Gas Facilities* was prepared to assist oil and gas industry professionals in dealing with salt affected soils and their remediation. Table 5-1 of the publication lists disadvantages of using chemical amendments (form of land treatment proposed by MPA for Moore if "no action" option does not accomplish remediation) as having a "*high failure rate*" and the need for "*possible multiple treatments.*"

On page 5-10, the API publication states: "*In situ chemical amendment remediation may be selected as the remediation technology if sodium can be displaced from the soil cation exchange sites and salts can be permanently leached to a location below the root zone but above groundwater.*" The areas requiring remediation on the Moore tract have a seasonal high water table of within 0 – 24 inches below the ground surface (USDA, 1986), therefore any land treatment would be within the zone of the seasonal high water table. The assessment has confirmed that salts have already leached into the groundwater aquifers, and the treatment of overlying contaminated soils with chemical amendments and flushing salts downward would only further contribute to the groundwater contamination.

During the spill response operations, two trenches were excavated by Denbury's contractors to aid in the recovery of released materials. One of the remediation tasks would be to backfill those trenches.

The figures prepared by MPA and included in the MPA Plan were utilized to develop this remediation plan and cost estimate. Arabie Environmental's remediation plan includes the excavation of the soil exceeding 29-B standards for EC, ESP, and SAR. The soil would be excavated and transported to Waste Connections White Oak Landfill located near Monroe, Louisiana. The excavated area would be backfilled with appropriate clean fill obtained from off site.

Since the work would be conducted in an area determined to be jurisdictional wetlands, the work would need authorization from the US Army Corps of Engineers (COE). The COE has established a Nationwide Permit for activities such as those planned at the

Moore tract. It should be noted that implementation of the MPA Plan would also require COE authorization and that the previously excavated trenches were excavated in wetland areas.

Soil Remediation Costs

1) COE Notification and Project Planning/Coordination ……...$10,000
2) Backfill Trenches……$10,895
3) Board Road……..$40,000
4) Excavation, Transportation, Disposal, Backfill……..$2,143,188

TOTAL SOIL REMEDIATION……$2,204,083

A cost table detailing the excavation, transportation, disposal, and backfill cost is included in Attachment G.

7.3 SCHEDULE

A schedule has been prepared and would work commence subsequent to the approval of the plan.

- Coordinate wetland restoration plan with USDA/NRCS and submit notification to COE if required –30 days
- Install board road – one week (concurrent with the above task)
- Coordinate with contractors for excavation, transportation, and disposal (three weeks (concurrent with the above tasks)
- Backfill trenches – begin immediately upon receipt of COE authorization
- Excavate, transport, dispose, and backfill – The length of time required for this task can vary depending on weather and how aggressively (i.e. number of trucks) the task is approached. For this estimate of schedule, it was assumed that 24 truckloads of excavated soil would be hauled each day for six day per week schedule. Based on that rate, it would require approximately 90 working days to complete the project.
- Groundwater evaluation – the evaluation could begin immediately upon approval of the plan and the well installations would be complete within 30 days. Initial samples from the groundwater evaluation wells would be collected immediately after installation and a report of those results would be filed within 30 days of sampling. The monitoring would continue for three years.

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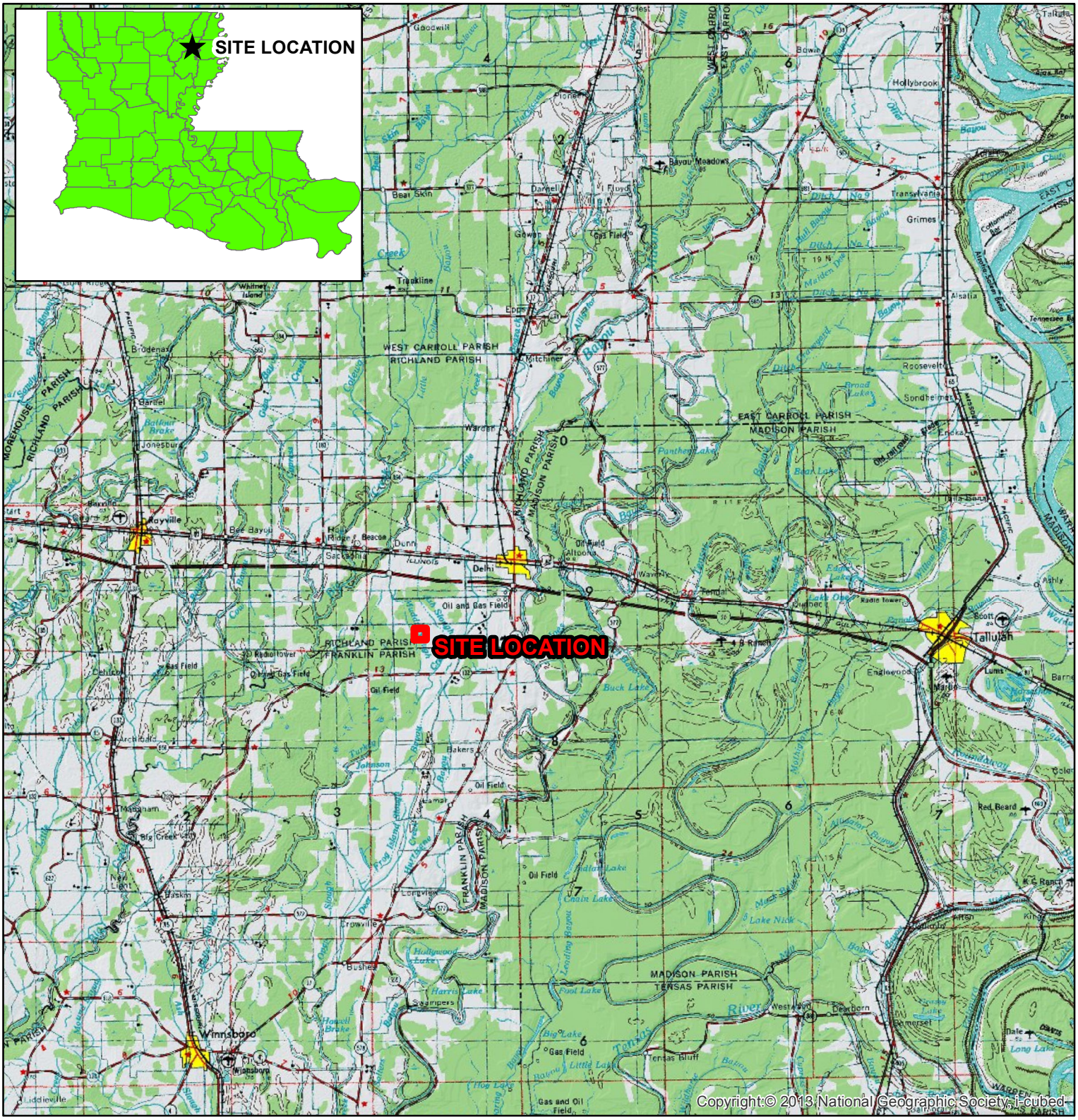
FIGURES

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana



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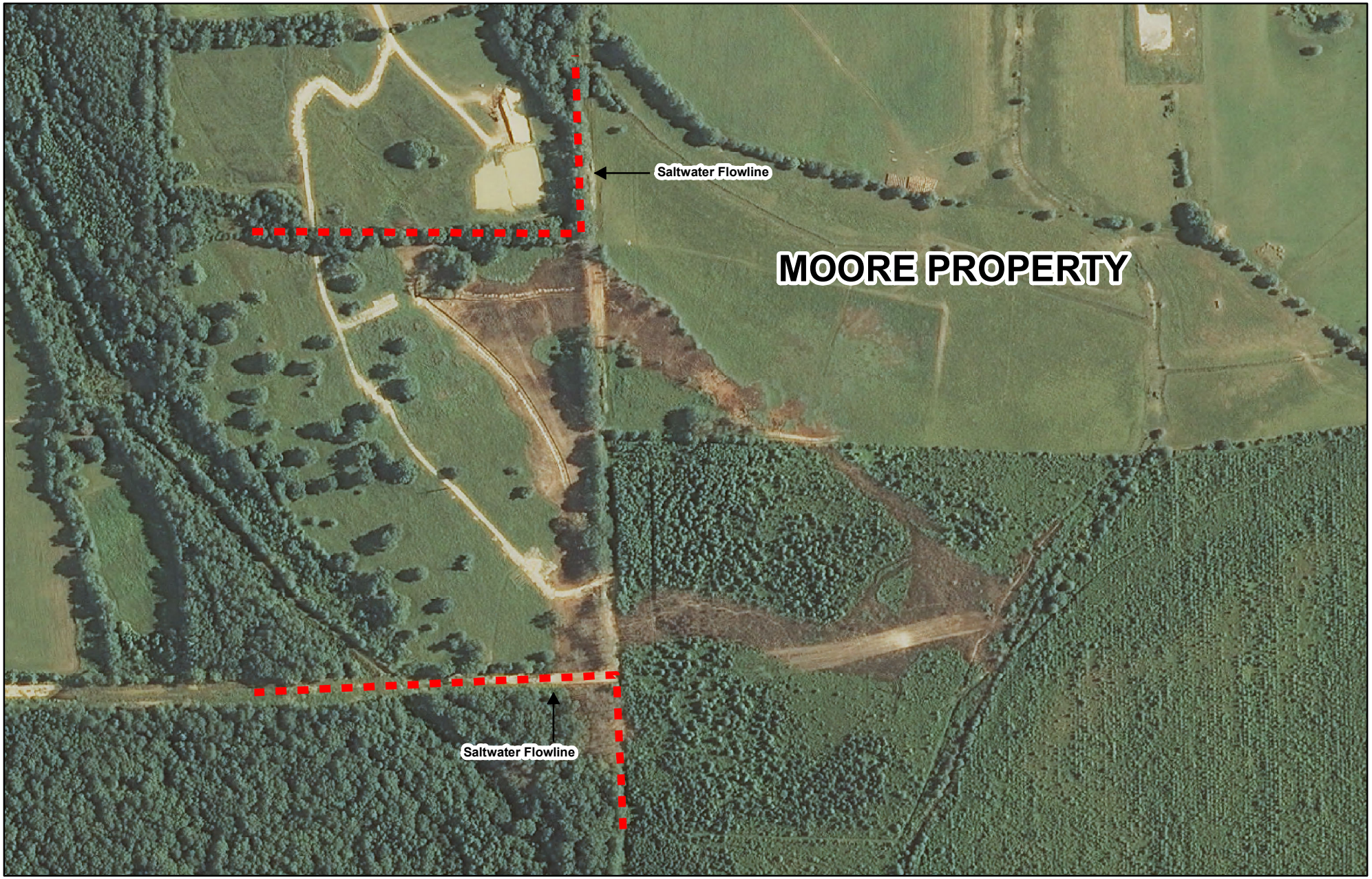
ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

Figure 1
Site Location Map

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:



0 300 600 1,200 Feet

N W E S

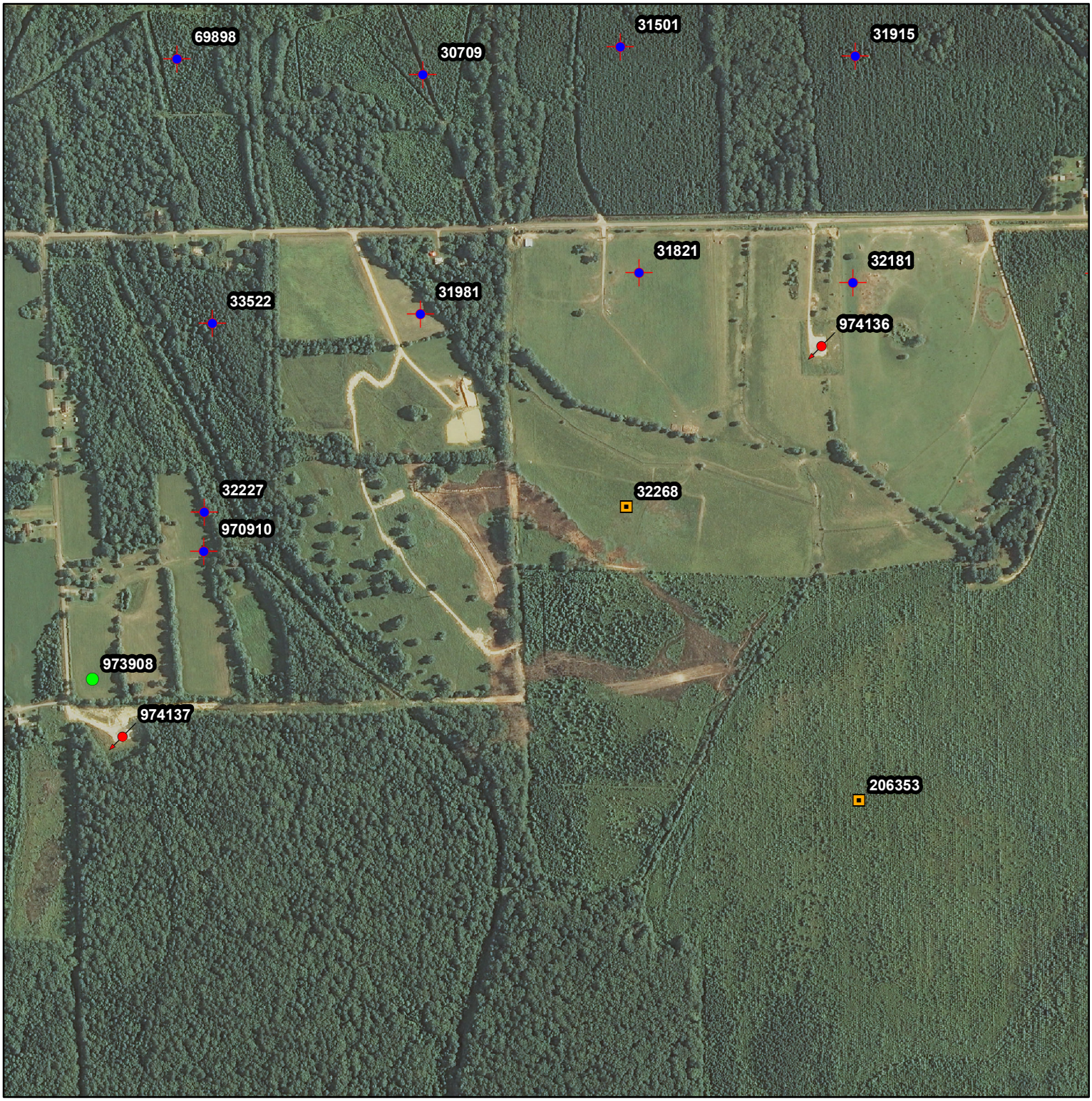
Approximate Property Boundary

ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

Figure 2
Site Map
2013 Aerial Photograph

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:



Oil & Gas Well Location & ID

Well Status

- Permit Expired
- Active Injection
- Active Producing
- Act 404 Orphan Well
- Dry and Plugged
- Plugged and Abandoned

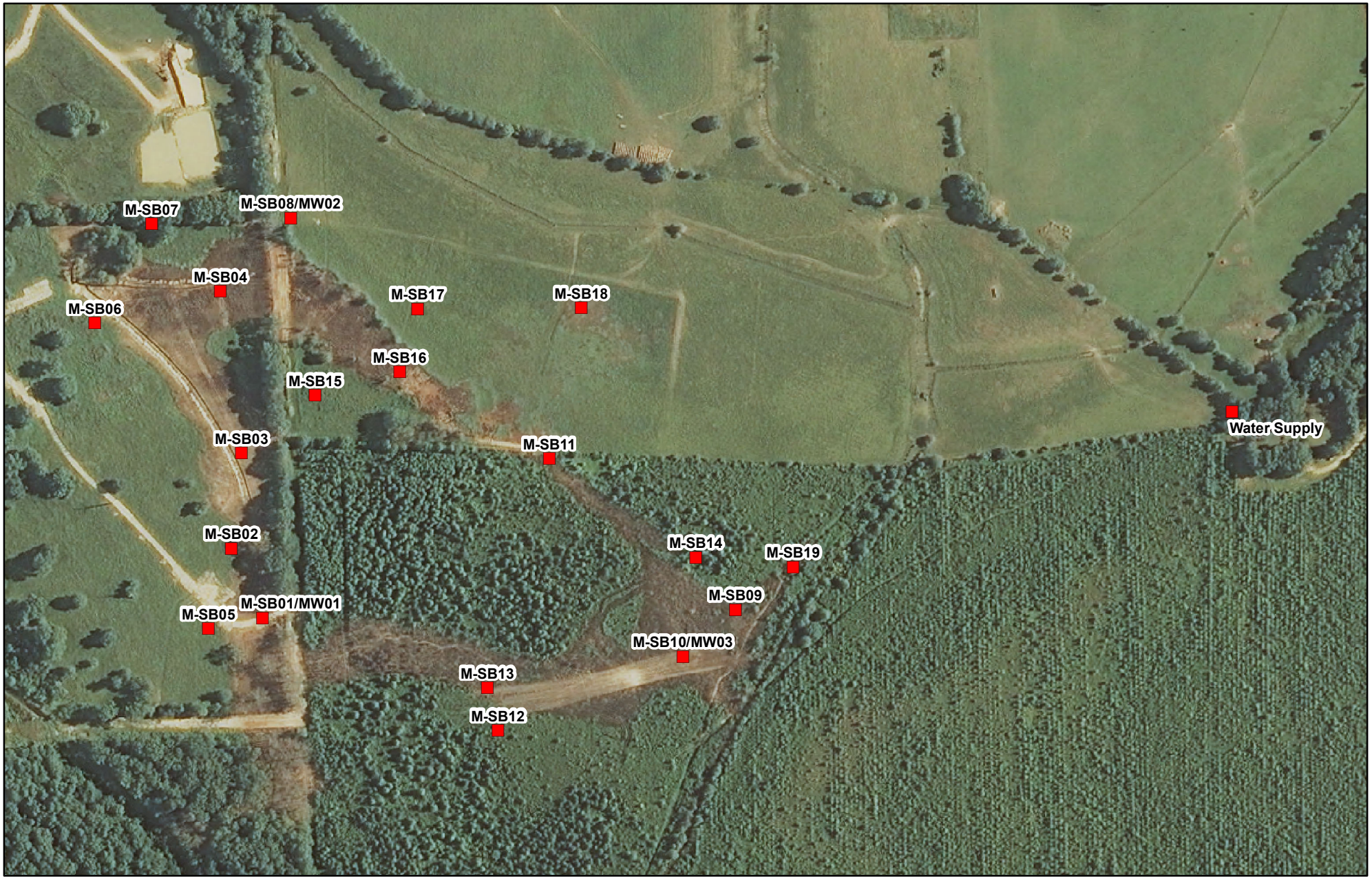
0 800 1,600 3,200 Feet

N W E S

ARABIE ENVIRONMENTAL SOLUTIONS	MARTHA ZOE MOORE, et al VS DENBURY ONSHORE, LLC RICHLAND PARISH, LOUISIANA

Figure 3
Oil & Gas Well Location Map

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:



0 250 500 1,000 Feet

N W E S

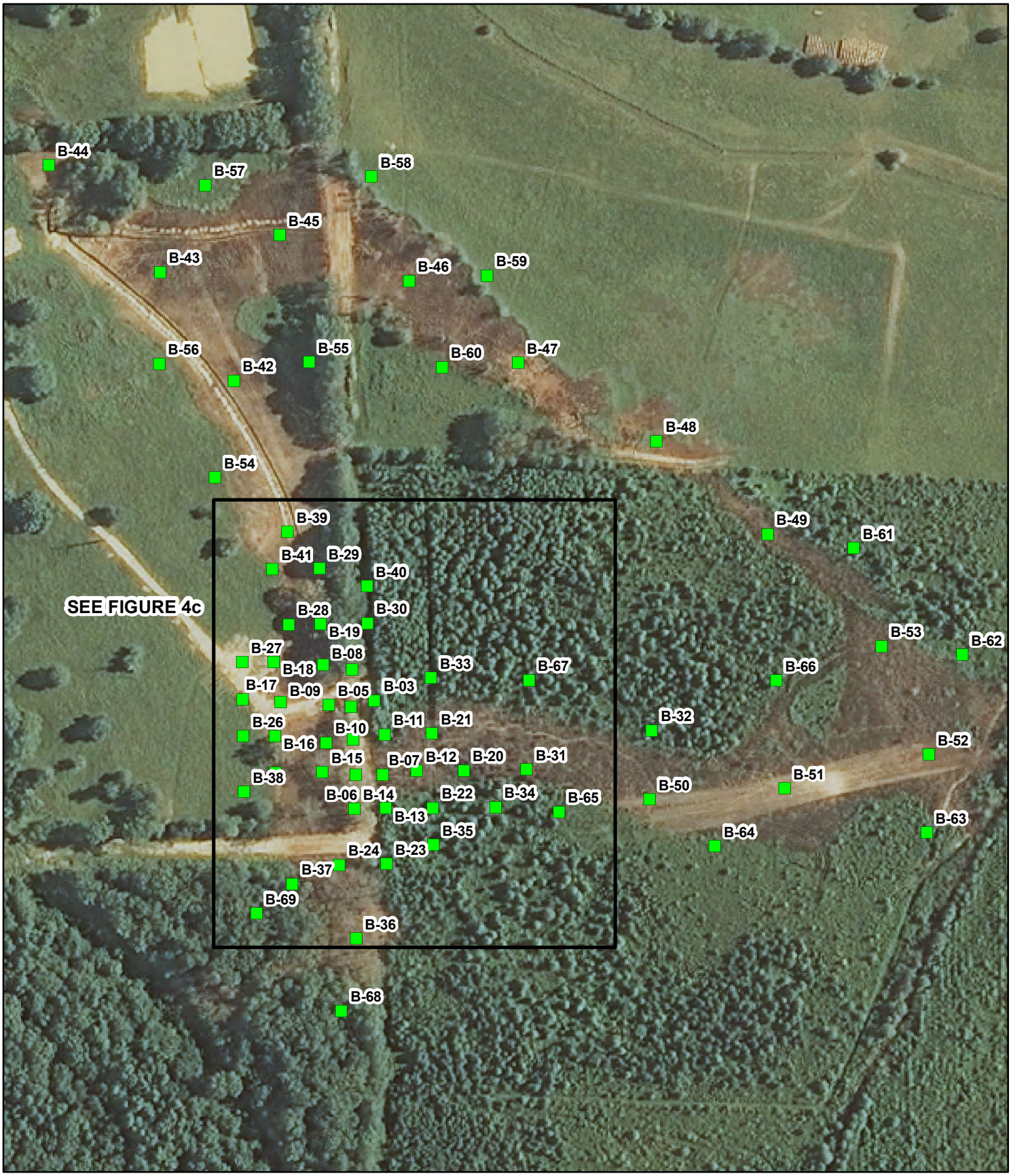
■ AES Sample Location & ID

ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

Figure 4a
AES Sample Location Map
2013 Aerial Photograph

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:



0 200 400 800 Feet

Denbury Sample Location & ID

N W E S

ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

Figure 4b
Denbury Sample Location Map
2013 Aerial Photograph

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:

Feet

0 75 150 300

Denbury Sample Location & ID

N W E S

ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

Figure 4c
Denbury Sample Location Map
2013 Aerial Photograph

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:

TABLES

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana

TABLE 1
COMPREHENSIVE DATA SET
SOIL SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft. BGS)	Sample Collector	LABORATORY RESULTS									
				Electrical Conductivity (mMhos/cm)	Soluble Chlorides (mg/kg)	Sodium Adsorption Ratio	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	ESP %	CEC (meq/100g)	Percent Moisture	Sodium (mg/kg)
Comparative Standard: 29-B			Wetland	8.0	N/A	14	N/A	N/A	N/A	25	N/A	N/A	N/A
			Upland	4.0	N/A	12	N/A	N/A	N/A	15	N/A	N/A	N/A
Cork Sampling Event / Cork Analytical Results													
B-1-1A	12/18/2013	0-1	Cork	5.45	1,150	25.7	2.58	2.50	41.0	8.0	NA	NA	411
B-1-2A		1-2	Cork	21.4	5,050	39.5	19.2	17.7	170	5.2	NA	NA	1,670
B-1-3A	1/22/2014	2-3	Cork	9.31	2,080	17.8	4.66	15.7	56.9	NA	NA	NA	775
B-2-1A	12/18/2013	0-1	Cork	6.06	1,110	19.2	3.90	5.83	42.3	3.2	NA	NA	297
B-2-2A		1-2	Cork	12.3	1,990	25.0	10.7	12.7	85.7	2.9	NA	NA	618
B-2-3A	1/22/2014	2-3	Cork	10.5	NA	27.4	6.75	9.37	77.9	NA	NA	NA	NA
B-3-1A	12/18/2013	0-1	Cork	0.93	122	8.19	<1.00	<1.00	6.56	1.2	NA	NA	<259
B-3-2A		1-2	Cork	1.16	201	8.51	<1.00	<1.00	8.01	1.2	NA	NA	<272
B-4-1A	12/18/2013	0-1	Cork	0.96	141	4.77	<1.00	1.66	5.22	0.9	NA	NA	<252
B-4-2A		1-2	Cork	1.37	241	4.66	1.14	3.40	7.03	0.4	NA	NA	<255
B-5-1A	12/18/2013	0-1	Cork	17.3	2,770	32.8	21.4	11.3	133	12.7	NA	NA	1,130
B-5-2A		1-2	Cork	8.86	1,640	19.0	8.42	10.9	59.1	9.5	NA	NA	689
B-5-3A	1/22/2014	2-3	Cork	2.51	NA	9.74	1.43	3.68	15.6	NA	NA	NA	NA
B-6-1A	1/22/2014	0-1	Cork	6.79	1,200	42.9	2.13	<1.00	53.4	25.6	NA	NA	654
B-6-2A		1-2	Cork	3.41	609	31.6	<1.00	<1.00	25.9	9.7	NA	NA	398
B-6-3A		2-3	Cork	2.30	575	23.8	<1.00	<1.00	17.4	12.1	NA	NA	582
B-7-1A	1/22/2014	0-1	Cork	16.9	2,830	30.6	20.7	7.29	114	20.2	NA	NA	1,370
B-7-2A		1-2	Cork	21.4	5,050	39.5	22.8	12.6	166	22.6	NA	NA	2,360
B-7-3A		2-3	Cork	16.1	3,940	31.1	15.9	13.8	120	15.7	NA	NA	1,720
B-8-1A	1/22/2014	0-1	Cork	4.85	747	24.9	2.43	1.60	35.4	11.0	NA	NA	508
B-8-2A		1-2	Cork	5.79	1,200	28.4	2.05	2.53	43.0	15.5	NA	NA	922
B-8-3A		2-3	Cork	11.2	2,690	10.3	18.1	32.5	52.0	9.1	NA	NA	751
B-9-1A	1/22/2014	0-1	Cork	22.9	3,970	42.0	26.5	10.6	181	31.8	NA	NA	1,870
B-9-2A		1-2	Cork	14.3	3,370	22.7	19.8	16.9	97.2	18.1	NA	NA	1,390
B-9-3A		2-3	Cork	6.75	2,050	15.8	6.81	7.26	41.8	12.2	NA	NA	1,030
B-10-1A	1/22/2014	0-1	Cork	16.2	3,450	28.6	20.3	14.0	118	19.3	NA	NA	1,420
B-10-2A		1-2	Cork	6.53	1,770	8.41	11.7	12.4	29.2	5.5	NA	NA	630
B-10-3A		2-3	Cork	3.19	804	5.24	5.68	6.54	13.0	2.8	NA	NA	286
B-11-1A	2/6/2014	0-1	Cork	1.09	102	9.61	<1.00	<1.00	6.91	1.8	NA	NA	<251
B-11-2A		1-2	Cork	7.30	1,280	26.8	4.62	3.13	52.7	11.3	NA	NA	576
B-11-3A		2-3	Cork	7.88	1,090	34.6	3.48	2.77	61.1	14.0	NA	NA	824
B-12-1A	2/6/2014	0-1	Cork	3.51	436	31.0	1.13	<1.00	28.8	9.9	NA	NA	325
B-12-2A		1-2	Cork	12.9	2,470	33.8	10.5	6.53	98.6	16.2	NA	NA	1,290
B-12-3A		2-3	Cork	10.6	2,190	9.36	21.2	29.4	47.1	6.4	NA	NA	471
B-13-1A	2/6/2014	0-1	Cork	0.32	51	1.62	<1.00	<1.00	1.29	0.7	NA	NA	<256
B-13-2A		1-2	Cork	2.13	309	8.79	1.55	2.51	12.5	1.8	NA	NA	<266
B-13-3A		2-3	Cork	5.27	878	18.4	2.98	4.28	35.1	5.4	NA	NA	282
B-14-1A	2/6/2014	0-1	Cork	1.61	220	11.3	<1.00	<1.00	9.90	2.7	NA	NA	<257
B-14-2A		1-2	Cork	3.95	663	22.9	1.75	1.62	29.7	6.7	NA	NA	698
B-14-3A		2-3	Cork	8.92	1,850	21.5	6.57	9.29	60.6	11.0	NA	NA	831
B-15-1A	2/6/2014	0-1	Cork	2.09	354	24.9	<1.00	<1.00	16.7	24.9	NA	NA	1,170
B-15-2A		1-2	Cork	1.43	350	18.0	<1.00	<1.00	10.1	17.6	NA	NA	833
B-15-3A		2-3	Cork	1.26	193	13.6	<1.00	<1.00	9.16	15.1	NA	NA	574
B-16-1A	2/6/2014	0-1	Cork	8.68	1,140	25.7	7.76	3.57	61.2	19.4	NA	NA	743
B-16-2A		1-2	Cork	5.29	761	11.7	6.54	7.91	31.4	5.3	NA	NA	499
B-16-3A		2-3	Cork	4.08	700	11.3	4.19	6.07	25.6	4.4	NA	NA	399
B-17-1A	2/6/2014	0-1	Cork	0.35	<95	3.40	<1.00	<1.00	2.14	1.2	NA	NA	<258
B-17-2A		1-2	Cork	0.31	54	4.89	<1.00	<1.00	2.14	1.8	NA	NA	<254
B-17-3A		2-3	Cork	0.16	<118	2.11	<1.00	<1.00	<1.00	4.2	NA	NA	<263
B-18-1A	2/6/2014	0-1	Cork	2.62	337	24.7	<1.00	<1.00	19.2	11.1	NA	NA	415
B-18-2A		1-2	Cork	6.37	1,060	26.6	3.75	3.12	49.3	13.9	NA	NA	1,070
B-18-3A		2-3	Cork	8.23	1,460	20.6	7.43	7.80	56.7	19.4	NA	NA	1,070
B-19-1A	2/6/2014	0-1	Cork	5.22	680	25.7	2.44	1.78	37.3	10.5	NA	NA	524
B-19-2A		1-2	Cork	6.39	1,160	18.6	4.75	6.24	43.7	16.8	NA	NA	1,070
B-19-3A		2-3	Cork	6.86	1,550	11.1	6.43	17.0	37.9	12.0	NA	NA	914
B-20-1A	3/10/2014	0-1	Cork	1.99	275	19.8	<1.00	<1.00	14.8	4.2	NA	NA	<269
B-20-2A		1-2	Cork	7.07	1,260	30.9	3.82	2.98	57.1	10.7	NA	NA	622
B-20-3A		2-3	Cork	15.7	2,630	44.9	10.2	7.03	132	15.3	NA	NA	1,330
B-21-1A	3/10/2014	0-1	Cork	24.2	3,850	53.7	19.2	7.48	196	22.0	NA	NA	2,040
B-21-2A		1-2	Cork	20.5	3,140	44.5	18.0	9.05	164	20.5	NA	NA	2,080
B-21-3A		2-3	Cork	14.4	2,590	15.8	21.0	27.6	77.9	11.8	NA	NA	1,150
B-22-1A	3/10/2014	0-1	Cork	0.38	<86	1.58	<1.00	<1.00	1.41	0.5	NA	NA	<252
B-22-2A		1-2	Cork	1.24	181	7.57	<1.00	1.09	7.58	1.6	NA	NA	<258
B-22-3A		2-3	Cork	8.98	1,330	38.3	3.80	3.08	70.9	13.7	NA	NA	752
B-23-1A	3/10/2014	0-1	Cork	<0.10	<94	0.523	<1.00	<1.00	<1.00	0.1	NA	NA	<266
B-23-2A		1-2	Cork	<0.10	<50	1.27	<1.00	<1.00	<1.00	0.6	NA	NA	<277
B-23-3A		2-3	Cork	0.11	<96	1.77	<1.00	<1.00	<1.00	1.8	NA	NA	<294
B-24-1A	3/10/2014	0-1	Cork	4.61	507	28.3	1.88	1.42	36.3	6.2	NA	NA	535
B-24-2A		1-2	Cork	9.09	1,270	9.95	16	21.3	43.0	3.1	NA	NA	566
B-24-3A		2-3	Cork	5.27	823	6.90	9.49	13.7	23.5	2.4	NA	NA	403
B-25-1A	3/10/2014	0-1	Cork	4.76	531	32.3	1.90	<1.00	38.6	6.0	NA	NA	558
B-25-2A		1-2	Cork	7.01	1,270	11.4	9.17	13.0	38.1	3.1	NA	NA	627
B-25-3A		2-3	Cork	4.75	842	10.6	6.34	8.45	28.7	2.8	NA	NA	458
B-26-1A	3/10/2014	0-1	Cork	0.17	<49	2.51	<1.00	<1.00	1.04	0.9	NA	NA	<250
B-26-2A		1-2	Cork	0.18	<52	2.94	<1.00	<1.00	1.12	1.2	NA	NA	<267
B-26-3A		2-3	Cork	0.14	<98	2.21	<1.00	<1.00	<1.00	2.8	NA	NA	<256
B-27-1A	3/10/2014	0-1	Cork	0.22	<84	2.97	<1.00	<1.00	1.25	1.0	NA	NA	<260
B-27-2A		1-2	Cork	0.23	<104	3.64	<1.00	<1.00	1.40	3.1	NA	NA	<254
B-27-3A		2-3	Cork	0.19	<123	3.92	<1.00	<1.00	1.32	5.5	NA	NA	<275
B-28-1A	3/10/2014	0-1	Cork	0.18	<86	2.62	<1.00	<1.00	1.06	1.3	NA	NA	<259
B-28-2A		1-2	Cork	0.39	<106	5.39	<1.00	<1.00	2.59	2.6	NA	NA	<278
B-28-3A		2-3	Cork	1.00	136	10.0	<1.00	<1.00	6.93	5.1	NA	NA	288
B-29-1A	3/10/2014	0-1	Cork	1.46	198	18.2	<1.00	<1.00	10.6	7.5	NA	NA	370
B-29-2A		1-2	Cork	3.29	525	18.9	1.50	2.24	25.8	9.2	NA	NA	757
B-29-3A		2-3	Cork	4.61	855	11.6	4.45	8.54	29.5	4.7	NA	NA	624
B-30-1A	3/10/2014	0-1	Cork	<0.10	<84	0.593	<1.00	<1.00	<1.00	0.3	NA	NA	<257
B-30-2A		1-2	Cork	0.20	<49	1.89	<1.00	<1.00	<1.00	0.6	NA	NA	<279
B-30-3A		2-3	Cork	0.18	<54	2.89	<1.00	<1.00	1.09	1.5	NA	NA	<254

TABLE 1
COMPREHENSIVE DATA SET
SOIL SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft. BGS)	Sample Collector	LABORATORY RESULTS									
				Electrical Conductivity (mMhos/cm)	Soluble Chlorides (mg/kg)	Sodium Adsorption Ratio	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	ESP %	CEC (meq/100g)	Percent Moisture	Sodium (mg/kg)
Comparative Standard: 29-B			Wetland	8.0	N/A	14	N/A	N/A	N/A	25	N/A	N/A	N/A
			Upland	4.0	N/A	12	N/A	N/A	N/A	15	N/A	N/A	N/A
Cork Sampling Event / Cork Analytical Results													
B-31-1A	4/2/2014	0-1	Cork	1.02	106	13.4	<1.00	<1.00	9.03	6.4	NA	NA	385
B-31-2A		1-2	Cork	3.91	669	**27.1**	1.37	1.25	31.1	6.9	NA	NA	631
B-31-3A		2-3	Cork	5.52	880	13.7	4.56	8.18	34.6	6.7	NA	NA	575
B-32-1A	4/2/2014	0-1	Cork	6.60	931	**29.7**	3.71	1.81	49.3	13.7	NA	NA	542
B-32-2A		1-2	Cork	**9.26**	1,670	**22.5**	8.07	8.53	64.8	9.9	NA	NA	945
B-32-3A		2-3	Cork	**9.84**	1,660	**30.8**	6.97	3.48	70.4	10.6	NA	NA	1,010
B-33-1A	4/2/2014	0-1	Cork	0.35	<80	1.95	<1.00	<1.00	1.51	0.8	NA	NA	<271
B-33-2A		1-2	Cork	0.31	<112	5.37	<1.00	<1.00	2.20	3.6	NA	NA	298
B-33-3A		2-3	Cork	0.78	151	8.06	<1.00	<1.00	5.41	4.8	NA	NA	465
B-34-1A	4/2/2014	0-1	Cork	0.38	64	1.73	<1.00	<1.00	1.47	0.5	NA	NA	<255
B-34-2A		1-2	Cork	0.26	<56	2.37	<1.00	<1.00	1.37	0.7	NA	NA	<265
B-34-3A		2-3	Cork	0.26	<54	2.71	<1.00	<1.00	1.43	1.0	NA	NA	<258
B-35-1A	4/2/2014	0-1	Cork	0.38	<84	0.469	<1.00	<1.00	<1.00	0.4	NA	NA	<268
B-35-2A		1-2	Cork	0.73	<89	2.30	<1.00	<1.00	1.88	0.8	NA	NA	<279
B-35-3A		2-3	Cork	0.26	<60	4.19	<1.00	<1.00	1.66	2.2	NA	NA	<259
B-36-1A	4/2/2014	0-1	Cork	2.15	273	**25.6**	<1.00	<1.00	17.4	13.2	NA	NA	693
B-36-2A		1-2	Cork	3.36	473	**37.4**	<1.00	<1.00	29.2	19.8	NA	NA	1,010
B-36-3A		2-3	Cork	**8.32**	1,590	**38.5**	3.32	2.62	66.3	20.9	NA	NA	1,890
B-37-1A	4/2/2014	0-1	Cork	3.33	396	**31.1**	1.22	<1.00	29.2	8.5	NA	NA	515
B-37-2A		1-2	Cork	**8.56**	1,740	**28.6**	5.21	4.81	63.9	14.7	NA	NA	1,240
B-37-3A		2-3	Cork	**12.4**	2,820	**14.1**	15.3	25.5	63.8	7.5	NA	NA	1,020
B-38-1A	4/2/2014	0-1	Cork	0.20	<86	1.18	<1.00	<1.00	<1.00	0.5	NA	NA	<279
B-38-2A		1-2	Cork	0.23	<53	2.01	<1.00	<1.00	1.13	0.7	NA	NA	<272
B-38-3A		2-3	Cork	0.30	<93	2.95	<1.00	<1.00	1.62	1.3	NA	NA	<259
B-39-1A	4/2/2014	0-1	Cork	**23.1**	5,900	**31.9**	29.4	22.2	162	13.7	NA	NA	2,390
B-39-2A		1-2	Cork	4.67	1,010	6.45	10.2	11.8	21.4	1.4	NA	NA	307
B-39-3A		2-3	Cork	1.30	166	5.85	1.49	1.82	7.53	3.4	NA	NA	292
B-40-1A	4/2/2014	0-1	Cork	0.18	<54	1.22	<1.00	<1.00	<1.00	0.4	NA	NA	<250
B-40-2A		1-2	Cork	<0.10	<57	1.01	<1.00	<1.00	<1.00	0.7	NA	NA	<261
B-40-3A		2-3	Cork	<0.10	<97	1.38	<1.00	<1.00	<1.00	1.5	NA	NA	<278
B-41-1A	4/2/2014	0-1	Cork	0.74	<82	5.39	<1.00	<1.00	4.46	1.6	NA	NA	<272
B-41-2A		1-2	Cork	0.17	<46	3.10	<1.00	<1.00	1.06	1.2	NA	NA	<274
B-41-3A		2-3	Cork	<0.10	<93	2.10	<1.00	<1.00	<1.00	1.7	NA	NA	<261
B-49-1A	4/25/2014	0-1	Cork	4.73	536	**21.1**	4.34	2.13	37.9	8.9	NA	NA	585
B-49-2A		1-2	Cork	**8.92**	1,620	**19.2**	10.2	6.75	55.9	4.6	NA	NA	802
B-49-3A		2-3	Cork	2.72	439	8.50	2.95	3.72	15.5	2.7	NA	NA	<300
B-50-1A	4/25/2014	0-1	Cork	4.97	864	13.5	6.26	3.98	30.5	4.2	NA	NA	431
B-50-2A		1-2	Cork	4.83	829	10.3	8.41	6.36	28.1	2.2	NA	NA	449
B-50-3A		2-3	Cork	3.17	604	5.47	6.62	6.64	14.1	1.7	NA	NA	<253
B-51-1A	4/25/2014	0-1	Cork	**9.24**	1,550	**19.4**	10.8	7.32	58.5	10.6	NA	NA	814
B-51-2A		1-2	Cork	7.70	1,410	13.8	11.7	9.98	45.4	2.7	NA	NA	567
B-51-3A		2-3	Cork	3.59	532	5.99	6.76	7.73	16.1	2.1	NA	NA	317
B-52-1A	4/25/2014	0-1	Cork	**11.1**	2,160	**20.1**	14.1	12.5	73.4	7.7	NA	NA	902
B-52-2A		1-2	Cork	**9.84**	1,890	**14.1**	14.6	18.4	57.2	6.9	NA	NA	727
B-52-3A		2-3	Cork	2.67	385	5.23	3.00	5.37	10.7	2.8	NA	NA	<285
B-53-1A	4/25/2014	0-1	Cork	**17.3**	2,730	**30.4**	21.3	10.5	121	19.0	NA	NA	1,370
B-53-2A		1-2	Cork	**12.9**	2,300	**23.4**	18.7	11.8	91.5	9.6	NA	NA	782
B-53-3A		2-3	Cork	3.88	706	11.0	5.55	6.02	26.4	1.3	NA	NA	294
B-68-1A	6/5/2014	0-1	Cork	<0.10	<44	0.485	<1.00	<1.00	<1.00	0.2	NA	NA	<276
B-68-2A		1-2	Cork	<0.10	<47	1.36	<1.00	<1.00	<1.00	0.8	NA	NA	<269
B-68-3A		2-3	Cork	0.29	<90	3.03	<1.00	<1.00	1.64	1.3	NA	NA	<265
B-69-1A	6/5/2014	0-1	Cork	0.14	<79	0.143	<1.00	<1.00	<1.00	0.2	NA	NA	<260
B-69-2A		1-2	Cork	<0.10	<85	0.388	<1.00	<1.00	<1.00	0.3	NA	NA	<271
B-69-3A		2-3	Cork	<0.10	<52	1.11	<1.00	<1.00	<1.00	0.7	NA	NA	<264
SS010917	9/17/2013	Surface	Cork	NA	2,250	NA	NA	NA	NA	NA	NA	NA	1,060
SS020917	9/17/2013	Surface	Cork	NA	2,020	NA	NA	NA	NA	NA	NA	NA	1,290
SS030917	9/17/2013	Surface	Cork	NA	2,260	NA	NA	NA	NA	NA	NA	NA	2,370
SS040917	9/17/2013	Surface	Cork	NA	2,760	NA	NA	NA	NA	NA	NA	NA	1,390
SS050917	9/17/2013	Surface	Cork	NA	1,870	NA	NA	NA	NA	NA	NA	NA	1,320
SS060917	9/17/2013	Surface	Cork	NA	1,680	NA	NA	NA	NA	NA	NA	NA	1,090
SS070917	9/17/2013	Surface	Cork	NA	2,260	NA	NA	NA	NA	NA	NA	NA	1,210
SS080917	9/17/2013	Surface	Cork	NA	3,330	NA	NA	NA	NA	NA	NA	NA	1,700
SS090917	9/17/2013	Surface	Cork	NA	4,540	NA	NA	NA	NA	NA	NA	NA	2,340
SS100917	9/17/2013	Surface	Cork	NA	4,300	NA	NA	NA	NA	NA	NA	NA	2,780
SS110917	9/17/2013	Surface	Cork	NA	3,840	NA	NA	NA	NA	NA	NA	NA	2,430
SS120917	9/17/2013	Surface	Cork	NA	3,010	NA	NA	NA	NA	NA	NA	NA	1,940
SS130917	9/17/2013	Surface	Cork	NA	5,140	NA	NA	NA	NA	NA	NA	NA	3,340
SS140917	9/17/2013	Surface	Cork	NA	4,050	NA	NA	NA	NA	NA	NA	NA	2,230
SS150917	9/17/2013	Surface	Cork	NA	4,500	NA	NA	NA	NA	NA	NA	NA	2,440
SS160917	9/17/2013	Surface	Cork	NA	3,520	NA	NA	NA	NA	NA	NA	NA	1,740
Cork Sampling Event / Arabie and Cork Sample Analytical Results													
B42 (0-1)	4/24/2014	0-1	Arabie	**15.4**	NA	**23.9**	21.8	9.76	95.0	NA	NA	NA	NA
B-42-1A			Cork	**17.0**	3,330	**27.4**	23.7	11.1	114.0	15.7	NA	NA	1,680
B42 (1-2)		1-2	Arabie	**12.1**	NA	11.6	32.8	17.0	57.9	--	NA	NA	--
B-42-2A			Cork	**14.8**	2,950	12.3	39.3	21.1	67.8	9.2	NA	NA	1,200
B42 (2-3)		2-3	Arabie	**7.17**	NA	7.53	19.0	12.8	30.1	NA	NA	NA	NA
B-42-3A			Cork	**9.48**	1,670	9.16	25.8	16.7	42.2	3.5	NA	NA	570
B43 (0-1)	4/24/2014	0-1	Arabie	**11.2**	NA	**18.9**	16.7	9.14	67.8	NA	NA	NA	NA
B-43-1A			Cork	**9.50**	1,920	**21.2**	11.7	6.14	63.5	11.0	NA	NA	1,000
B43 (1-2)		1-2	Arabie	4.32	NA	7.27	8.84	6.25	20.0	NA	NA	NA	NA
B-43-2A			Cork	6.98	1,220	9.45	14.6	9.73	33	2.5	NA	NA	496
B43 (2-3)		2-3	Arabie	2.14	NA	6.18	3.33	2.62	10.6	NA	NA	NA	NA
B-43-3A			Cork	1.54	227	5.18	2.11	1.78	7.22	2.9	NA	NA	<264
B44 (0-1)	4/24/2014	0-1	Arabie	5.27	NA	9.87	10.6	6.10	28.5	NA	NA	NA	NA
B-44-1A			Cork	5.58	976	11.3	10.5	5.91	32.4	3.6	NA	NA	494
B44 (1-2)		1-2	Arabie	4.25	NA	6.54	9.65	7.02	18.9	NA	NA	NA	NA
B-44-2A			Cork	3.91	629	6.38	7.19	5.38	16.0	3.5	NA	NA	381
B44 (2-3)		2-3	Arabie	1.99	NA	5.06	3.50	3.04	9.16	NA	NA	NA	NA
B-44-3A			Cork	1.98	275	5.19	3.19	2.98	9.11	3.0	NA	NA	<260

TABLE 1
COMPREHENSIVE DATA SET
SOIL SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft. BGS)	Sample Collector	LABORATORY RESULTS									
				Electrical Conductivity (mMhos/cm)	Soluble Chlorides (mg/kg)	Sodium Adsorption Ratio	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	ESP %	CEC (meq/100g)	Percent Moisture	Sodium (mg/kg)
Comparative Standard: 29-B			Wetland	8.0	N/A	14	N/A	N/A	N/A	25	N/A	N/A	N/A
			Upland	4.0	N/A	12	N/A	N/A	N/A	15	N/A	N/A	N/A
Cork Sampling Event / Arabie and Cork Sample Analytical Results													
B45 (0-1)	4/24/2014	0-1	Arabie	**11.6**	NA	**27.5**	11.2	5.06	78.6	NA	NA	NA	NA
B-45-1A			Cork	**13.5**	2,530	**31.2**	12.8	5.61	94.5	15.9	NA	NA	1,330
B45 (1-2)		1-2	Arabie	**10.0**	NA	**14.3**	18.2	13.0	56.3	NA	NA	NA	NA
B-45-2A			Cork	**11.3**	2,170	**16.0**	17.6	12.0	61.6	11.5	NA	NA	1,060
B45 (2-3)		2-3	Arabie	7.88	NA	8.99	18.7	15.4	37.1	NA	NA	NA	NA
B-45-3A			Cork	5.80	1,090	8.02	12.0	11.1	27.3	3.4	NA	NA	463
B46 (0-1)	4/24/2014	0-1	Arabie	**12.5**	NA	**23.7**	14.3	8.78	80.6	NA	NA	NA	NA
B-46-1A			Cork	**12.1**	2,340	**25.0**	13.0	7.36	79.6	14.1	NA	NA	852
B46 (1-2)		1-2	Arabie	**8.33**	NA	**14.1**	10.9	10.4	45.9	NA	NA	NA	NA
B-46-2A			Cork	7.68	1,400	**14.5**	9.37	8.96	44.0	2.7	NA	NA	629
B46 (2-3)		2-3	Arabie	0.84	NA	5.23	<1.00	<1.00	4.65	NA	NA	NA	NA
B-46-3A			Cork	0.82	120	4.81	<1.00	<1.00	4.14	2.9	NA	NA	<259
B47 (0-1)	4/24/2014	0-1	Arabie	**8.61**	NA	**15.6**	11.8	7.94	48.9	NA	NA	NA	NA
B-47-1A			Cork	6.79	1,230	**15.8**	8.32	5.63	41.7	2.2	NA	NA	552
B47 (1-2)		1-2	Arabie	6.91	NA	12.0	9.55	9.20	36.8	NA	NA	NA	NA
B-47-2A			Cork	6.36	1,100	13.4	9.13	7.64	38.9	3.8	NA	NA	455
B47 (2-3)		2-3	Arabie	3.77	NA	7.80	5.90	6.31	19.3	NA	NA	NA	NA
B-47-3A			Cork	2.70	370	7.90	3.52	3.53	14.8	2.2	NA	NA	<266
B48 (0-1)	4/24/2014	0-1	Arabie	0.76	NA	7.43	<1.00	<1.00	5.04	NA	NA	NA	NA
B-48-1A			Cork	1.21	160	8.51	1.63	1.02	9.80	1.5	NA	NA	<274
B48 (1-2)		1-2	Arabie	1.61	NA	6.13	2.10	1.31	8.00	NA	NA	NA	NA
B-48-2A			Cork	1.39	190	5.67	1.71	1.15	6.78	2.0	NA	NA	<307
B48 (2-3)		2-3	Arabie	3.29	NA	7.86	5.44	4.01	17.1	NA	NA	NA	NA
B-48-3A			Cork	3.70	452	12.3	4.36	3.62	24.5	0.9	NA	NA	<311
B54 (0-1)	6/5/2014	0-1	Arabie	0.14	<83	1.67	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-54-1A			Cork	0.18	<43	2.36	<1.00	<1.00	1.03	1.5	NA	NA	<278
B54 (1-2)		1-2	Arabie	0.16	<83	2.03	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-54-2A			Cork	0.19	<77	2.55	<1.00	<1.00	1.06	2.6	NA	NA	<262
B54 (2-3)		2-3	Arabie	0.15	<50	1.90	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-54-3A			Cork	0.16	<97	1.85	<1.00	<1.00	<1.00	4.1	NA	NA	<273
B55 (0-1)	6/5/2014	0-1	Arabie	<0.10	<86	0.727	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-55-1A			Cork	0.17	<51	0.91	<1.00	<1.00	<1.00	0.2	NA	NA	<257
B55 (1-2)		1-2	Arabie	<0.10	<97	0.851	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-55-2A			Cork	<0.10	<53	1.03	<1.00	<1.00	<1.00	0.6	NA	NA	<263
B55 (2-3)		2-3	Arabie	<0.10	<49	0.92	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-55-3A			Cork	<0.10	<52	1.00	<1.00	<1.00	<1.00	0.4	NA	NA	<268
B56 (0-1)	6/5/2014	0-1	Arabie	0.14	<85	1.28	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-56-1A			Cork	0.15	<46	1.63	<1.00	<1.00	<1.00	0.6	NA	NA	<264
B56 (1-2)		1-2	Arabie	0.25	<89	2.49	<1.00	<1.00	1.02	NA	NA	NA	NA
B-56-2A			Cork	0.25	<46	3.04	<1.00	<1.00	1.24	1.1	NA	NA	<277
B56 (2-3)		2-3	Arabie	0.21	<97	3.56	<1.00	<1.00	1.12	NA	NA	NA	NA
B-56-3A			Cork	0.21	<46	3.23	<1.00	<1.00	1.11	1.9	NA	NA	<275
B57 (0-1)	6/5/2014	0-1	Arabie	0.11	<96	0.323	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-57-1A			Cork	0.13	<51	0.60	<1.00	<1.00	<1.00	0.2	NA	NA	<275
B57 (1-2)		1-2	Arabie	<0.10	<50	0.544	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-57-2A			Cork	<0.10	<99	0.90	<1.00	<1.00	<1.00	0.5	NA	NA	<270
B57 (2-3)		2-3	Arabie	<0.10	<50	0.55	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-57-3A			Cork	<0.10	<51	1.03	<1.00	<1.00	<1.00	0.8	NA	NA	<256
B58 (0-1)	6/4/2014	0-1	Arabie	0.1	<88	1.13	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-58-1A			Cork	<0.10	<44	0.95	<1.00	<1.00	<1.00	0.6	NA	NA	<272
B58 (1-2)		1-2	Arabie	<0.10	<53	1.04	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-58-2A			Cork	<0.10	<52	1.14	<1.00	<1.00	<1.00	1	NA	NA	<276
B58 (2-3)		2-3	Arabie	<0.10	<54	1.00	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-58-3A			Cork	<0.10	<54	0.93	<1.00	<1.00	<1.00	1.4	NA	NA	<256
B59 (0-1)	6/4/2014	0-1	Arabie	0.17	<87	1.52	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-59-1A			Cork	<0.10	<46	1.32	<1.00	<1.00	<1.00	0.8	NA	NA	<272
B59 (1-2)		1-2	Arabie	<0.10	<52	0.886	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-59-2A			Cork	<0.10	<54	1.12	<1.00	<1.00	<1.00	1.1	NA	NA	<274
B59 (2-3)		2-3	Arabie	<0.10	<52	1.39	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-59-3A			Cork	<0.10	<53	0.93	<1.00	<1.00	<1.00	1.3	NA	NA	<271
B60 (0-1)	6/4/2014	0-1	Arabie	0.13	<83	1.94	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-60-1A			Cork	0.11	<44	1.75	<1.00	<1.00	<1.00	1.2	NA	NA	<272
B60 (1-2)		1-2	Arabie	<0.10	<81	1.67	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-60-2A			Cork	<0.10	<81	1.84	<1.00	<1.00	<1.00	2	NA	NA	<278
B60 (2-3)		2-3	Arabie	0.27	<111	3.92	<1.00	<1.00	1.45	NA	NA	NA	NA
B-60-3A			Cork	<0.10	<99	1.45	<1.00	<1.00	<1.00	4.1	NA	NA	<264
B61 (0-1)	6/4/2014	0-1	Arabie	0.17	<84	2.01	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-61-1A			Cork	0.15	<86	2.47	<1.00	<1.00	<1.00	1.3	NA	NA	<274
B61 (1-2)		1-2	Arabie	0.57	98	4.76	<1.00	<1.00	2.89	NA	NA	NA	NA
B-61-2A			Cork	0.52	67	5.82	<1.00	<1.00	3.05	2	NA	NA	<257
B61 (2-3)		2-3	Arabie	0.5	116	6.88	<1.00	<1.00	2.94	NA	NA	NA	NA
B-61-3A			Cork	0.46	<125	5.43	<1.00	<1.00	2.56	3.1	NA	NA	<272
B62 (0-1)	6/4/2014	0-1	Arabie	0.15	<84	1.47	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-62-1A			Cork	0.15	<74	1.30	<1.00	<1.00	<1.00	0.9	NA	NA	<266
B62 (1-2)		1-2	Arabie	0.18	<86	3.01	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-62-2A			Cork	0.13	<80	2.11	<1.00	<1.00	<1.00	2.7	NA	NA	<276
B62 (2-3)		2-3	Arabie	0.24	<99	3.41	<1.00	<1.00	1.26	NA	NA	NA	NA
B-62-3A			Cork	0.21	<96	3.33	<1.00	<1.00	1.27	4.9	NA	NA	<252
B63 (0-1)	6/4/2014	0-1	Arabie	0.34	<98	5.32	<1.00	<1.00	2.12	NA	NA	NA	NA
B-63-1A			Cork	0.23	<89	3.58	<1.00	<1.00	1.35	4.9	NA	NA	<269
B63 (1-2)		1-2	Arabie	0.83	93	7.55	<1.00	<1.00	4.55	NA	NA	NA	NA
B-63-2A			Cork	1.1	187	8.93	<1.00	<1.00	7.09	3	NA	NA	<273
B63 (2-3)		2-3	Arabie	2.81	547	7.55	2.55	3.35	13	NA	NA	NA	NA
B-63-3A			Cork	2.33	305	6.93	2.25	3.12	11.4	3.7	NA	NA	<274
B64 (0-1)	6/4/2014	0-1	Arabie	0.15	<72	1.88	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-64-1A			Cork	0.16	<73	2.71	<1.00	<1.00	1.00	1.5	NA	NA	<274
B64 (1-2)		1-2	Arabie	0.17	<53	3.29	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-64-2A			Cork	0.13	<88	1.67	<1.00	<1.00	<1.00	2.4	NA	NA	<262
B64 (2-3)		2-3	Arabie	0.29	<115	4.50	<1.00	<1.00	1.65	NA	NA	NA	NA
B-64-3A			Cork	0.30	<108	3.55	<1.00	<1.00	1.79	4.1	NA	NA	<272

TABLE 1
COMPREHENSIVE DATA SET
SOIL SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft. BGS)	Sample Collector	LABORATORY RESULTS									
				Electrical Conductivity (mMhos/cm)	Soluble Chlorides (mg/kg)	Sodium Adsorption Ratio	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	ESP %	CEC (meq/100g)	Percent Moisture	Sodium (mg/kg)
Comparative Standard: 29-B			Wetland	8.0	N/A	14	N/A	N/A	N/A	25	N/A	N/A	N/A
			Upland	4.0	N/A	12	N/A	N/A	N/A	15	N/A	N/A	N/A
Cork Sampling Event / Arabie and Cork Sample Analytical Results													
B65 (0-1)	6/4/2014	0-1	Arabie	0.12	<74	1.44	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-65-1A			Cork	<0.10	<77	1.09	<1.00	<1.00	<1.00	1.0	NA	NA	<254
B65 (1-2)		1-2	Arabie	0.11	<83	1.79	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-65-2A			Cork	<0.10	<83	1.43	<1.00	<1.00	<1.00	2.9	NA	NA	<256
B65 (2-3)		2-3	Arabie	0.28	<119	4.60	<1.00	<1.00	1.58	NA	NA	NA	NA
B-65-3A			Cork	0.27	<117	3.30	<1.00	<1.00	1.59	4.7	NA	NA	<271
B66 (0-1)	6/4/2014	0-1	Arabie	0.21	<79	2.28	<1.00	<1.00	1.17	NA	NA	NA	NA
B-66-1A			Cork	0.11	<68	1.52	<1.00	<1.00	<1.00	1.8	NA	NA	<258
B66 (1-2)		1-2	Arabie	0.2	<90	2.1	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-66-2A			Cork	0.29	<89	2.72	<1.00	<1.00	1.52	2.3	NA	NA	<266
B66 (2-3)		2-3	Arabie	0.72	151	5.08	<1.00	<1.00	3.88	NA	NA	NA	NA
B-66-3A			Cork	0.48	<103	4.05	<1.00	<1.00	2.72	3.1	NA	NA	<276
B67 (0-1)	6/4/2014	0-1	Arabie	<0.10	<84	1.6	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-67-1A			Cork	<0.10	<86	1.19	<1.00	<1.00	<1.00	0.9	NA	NA	<258
B67 (1-2)		1-2	Arabie	<0.10	<107	1.52	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-67-2A			Cork	<0.10	<99	1.07	<1.00	<1.00	<1.00	3.5	NA	NA	<259
B67 (2-3)		2-3	Arabie	<0.10	<130	1.48	<1.00	<1.00	<1.00	NA	NA	NA	NA
B-67-3A			Cork	<0.10	<120	1.56	<1.00	<1.00	<1.00	3.7	NA	NA	<268
Arabie Sampling Event / Arabie Analytical Results													
M-SB01 (0-2)	9/23/2014	0-2	Arabie	6.41	1,090	**25.6**	5.43	2.52	51.1	NA	NA	NA	NA
M-SB01 (3-5)		3-5	Arabie	**8.06**	1,840	**14.8**	10.8	14.1	52.2	NA	NA	NA	NA
M-SB01 (5-7)		5-7	Arabie	3.90	679	12.1	4.83	6.56	28.9	NA	NA	NA	NA
M-SB01 (8-10)		8-10	Arabie	2.68	421	8.87	2.65	3.98	16.2	NA	NA	NA	NA
M-SB01 (10-12)		10-12	Arabie	2.42	473	8.55	2.19	3.66	14.6	NA	NA	NA	NA
M-SB01 (13-15)		13-15	Arabie	3.09	257	8.58	4.35	6.34	19.8	NA	NA	NA	NA
M-SB02 (0-2)	9/23/2014	0-2	Arabie	0.65	92	7.31	<1.00	<1.00	4.07	NA	NA	NA	NA
M-SB02 (5-7)		5-7	Arabie	2.30	351	**14.0**	<1.00	1.55	15.7	NA	NA	NA	NA
M-SB02 (8-10)		8-10	Arabie	1.28	120	12.9	<1.00	<1.00	8.73	NA	NA	NA	NA
M-SB03 (0-2)	9/23/2014	0-2	Arabie	**9.50**	1,690	**22.6**	9.22	8.11	66.6	NA	NA	NA	NA
M-SB03 (3-5)		3-5	Arabie	2.05	678	6.72	2.43	3.25	11.3	NA	NA	NA	NA
M-SB03 (5-7)		5-7	Arabie	1.83	292	8.62	1.65	1.94	11.6	NA	NA	NA	NA
M-SB03 (8-10)		8-10	Arabie	1.00	144	9.22	<1.00	<1.00	6.62	NA	NA	NA	NA
M-SB03 (10-12)		10-12	Arabie	1.49	178	8.87	1.22	1.53	10.4	NA	NA	NA	NA
M-SB04 (0-2)	9/24/2014	0-2	Arabie	**8.97**	1,620	**16.1**	12.7	10.1	54.5	NA	NA	NA	NA
M-SB04 (3-5)		3-5	Arabie	0.61	<104	5.20	<1.00	<1.00	3.92	NA	NA	NA	NA
M-SB04 (5-7)		5-7	Arabie	0.65	<99	6.31	<1.00	<1.00	4.41	NA	NA	NA	NA
M-SB04 (8-10)		8-10	Arabie	1.33	<109	7.40	1.46	1.41	8.87	NA	NA	NA	NA
M-SB04 (10-12)		10-12	Arabie	3.57	<82	8.62	6.32	7.16	22.4	NA	NA	NA	NA
M-SB05 (0-2)	9/24/2014	0-2	Arabie	0.13	<46	2.14	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB05 (3-5)		3-5	Arabie	0.10	<109	1.89	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB05 (5-7)		5-7	Arabie	0.23	<89	3.63	<1.00	<1.00	1.47	NA	NA	NA	NA
M-SB05 (8-10)		8-10	Arabie	0.17	<68	0.952	<1.00	1.95	1.04	NA	NA	NA	NA
M-SB05 (10-12)		10-12	Arabie	0.24	<68	1.34	<1.00	1.96	1.44	NA	NA	NA	NA
M-SB06 (0-2)	9/24/2014	0-2	Arabie	0.36	<47	4.33	<1.00	<1.00	2.21	NA	NA	NA	NA
M-SB06 (3-5)		3-5	Arabie	0.45	<109	7.41	<1.00	<1.00	3.13	NA	NA	NA	NA
M-SB06 (5-7)		5-7	Arabie	0.41	<122	6.36	<1.00	<1.00	2.76	NA	NA	NA	NA
M-SB07 (0-2)	9/24/2014	0-2	Arabie	<0.10	<54	1.14	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB07 (3-5)		3-5	Arabie	0.15	<54	2.51	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB07 (5-7)		5-7	Arabie	0.28	<93	4.80	<1.00	<1.00	1.80	NA	NA	NA	NA
M-SB07 (8-10)		8-10	Arabie	0.15	<80	2.52	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB07 (10-12)		10-12	Arabie	0.31	<72	4.51	<1.00	<1.00	2.05	NA	NA	NA	NA
M-SB08 (0-2)	9/25/2014	0-2	Arabie	<0.10	<98	0.944	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB08 (3-5)		3-5	Arabie	<0.10	<98	1.52	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB08 (5-7)		5-7	Arabie	0.54	99	6.05	<1.00	<1.00	3.45	NA	NA	NA	NA
M-SB08 (8-10)		8-10	Arabie	0.15	<87	1.83	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB08 (10-12)		10-12	Arabie	0.16	<81	1.55	<1.00	<1.00	<1.00	NA	NA	NA	NA
M-SB08 (13-15)		13-15	Arabie	0.24	<73	0.836	<1.00	3.56	1.22	NA	NA	NA	NA
M-SB08 (15-17)		15-17	Arabie	0.41	<71	4.19	<1.00	<1.00	2.83	NA	NA	NA	NA
M-SB09 (0-2)	9/25/2014	0-2	Arabie	**9.17**	1,770	**19.1**	8.74	9.42	57.5	NA	NA	NA	NA
M-SB09 (3-5)		3-5	Arabie	1.33	209	6.83	1.07	1.78	8.15	NA	NA	NA	NA
M-SB09 (5-7)		5-7	Arabie	1.55	<135	6.02	1.91	2.94	9.38	NA	NA	NA	NA
M-SB09 (8-10)		8-10	Arabie	2.20	<144	8.18	1.76	4.86	14.9	NA	NA	NA	NA
M-SB09 (10-12)		10-12	Arabie	3.36	181	10.8	3.23	8.85	26.4	NA	NA	NA	NA
M-SB09 (13-15)		13.0	Arabie	4.21	415	11.4	3.86	12.1	32.2	NA	NA	NA	NA
M-SB10 (0-2)	9/26/2014	0-2	Arabie	7.81	1,210	**19.0**	8.47	7.66	53.9	NA	NA	NA	NA
M-SB10 (3-5)		3-5	Arabie	2.02	339	6.04	2.16	4.02	10.6	NA	NA	NA	NA
M-SB10 (5-7)		5-7	Arabie	4.57	<126	5.49	16.2	17.8	22.6	NA	NA	NA	NA
M-SB10 (8-10)		8-10	Arabie	5.73	<134	7.63	13.7	22.4	32.4	NA	NA	NA	NA
M-SB10 (10-12)		10-12	Arabie	3.28	175	9.34	2.89	7.51	21.3	NA	NA	NA	NA
M-SB10 (13-15)		13-15	Arabie	4.34	375	10.1	4.58	13.0	29.9	NA	NA	NA	NA
M-SB11 (0-2)	9/26/2014	0-2	Arabie	6.08	909	**14.4**	8.18	6.10	38.5	NA	NA	NA	NA
M-SB11 (3-5)		3-5	Arabie	0.95	139	6.24	<1.00	<1.00	5.45	NA	NA	NA	NA
M-SB11 (5-7)		5-7	Arabie	0.21	<108	2.84	<1.00	<1.00	1.51	NA	NA	NA	NA
M-SB11 (8-10)		8-10	Arabie	0.27	<116	3.19	<1.00	<1.00	1.86	NA	NA	NA	NA
M-SB11 (10-12)		10-12	Arabie	0.72	<88	7.23	<1.00	<1.00	5.46	NA	NA	NA	NA
M-SB12 (0-2)	9/29/2014	0-2	Arabie	0.20	<88	2.52	<1.00	<1.00	1.18	NA	NA	9.7	NA
M-SB12 (3-5)		3-5	Arabie	1.07	210	8.22	1.34	1.58	9.94	NA	NA	11.4	NA
M-SB12 (5-7)		5-7	Arabie	2.92	533	9.87	3.76	4.70	20.3	NA	NA	11.6	NA
M-SB12 (8-10)		8-10	Arabie	3.20	622	13.8	3.40	3.97	26.4	NA	NA	13.4	NA
M-SB12 (10-12)		10-12	Arabie	4.21	654	**15.1**	5.07	5.92	35.3	NA	NA	12.4	NA
M-SB13 (0-2)	9/29/2014	0-2	Arabie	4.99	1,040	11.2	8.52	6.28	30.4	NA	NA	14.9	NA
M-SB13 (3-5)		3-5	Arabie	2.45	428	5.21	4.77	4.50	11.2	NA	NA	15.3	NA
M-SB13 (5-7)		5-7	Arabie	2.08	336	6.27	3.27	3.32	11.4	NA	NA	15.0	NA
M-SB13 (8-10)		8-10	Arabie	2.68	396	6.59	4.63	4.62	14.2	NA	NA	14.6	NA
M-SB13 (10-12)		10-12	Arabie	3.31	641	7.45	6.46	6.45	18.9	NA	NA	17.2	NA
M-SB13 (13-15)		13-15	Arabie	3.57	603	**16.4**	7.18	8.17	8.01	NA	NA	20.4	NA

TABLE 1
COMPREHENSIVE DATA SET
SOIL SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft. BGS)	Sample Collector	LABORATORY RESULTS									
				Electrical Conductivity (mMhos/cm)	Soluble Chlorides (mg/kg)	Sodium Adsorption Ratio	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	ESP %	CEC (meq/100g)	Percent Moisture	Sodium (mg/kg)
Comparative Standard: 29-B			Wetland	8.0	N/A	14	N/A	N/A	N/A	25	N/A	N/A	N/A
			Upland	4.0	N/A	12	N/A	N/A	N/A	15	N/A	N/A	N/A
Arabie Sampling Event / Arabie Analytical Results													
M-SB14 (0-2)	9/29/2014	0-2	Arabie	0.13	<49	1.93	<1.00	<1.00	<1.00	NA	NA	11.1	NA
M-SB14 (3-5)		3-5	Arabie	0.10	<108	2.09	<1.00	<1.00	<1.00	NA	NA	15.6	NA
M-SB14 (5-7)		5-7	Arabie	0.11	<83	2.07	<1.00	<1.00	<1.00	NA	NA	11.6	NA
M-SB14 (8-10)		8-10	Arabie	0.25	<106	3.81	<1.00	<1.00	1.72	NA	NA	14.1	NA
M-SB14 (10-12)		10-12	Arabie	0.50	<69	5.76	<1.00	<1.00	3.68	NA	NA	10.0	NA
M-SB15 (0-2)	9/30/2014	0-2	Arabie	<0.10	<51	1.17	<1.00	<1.00	<1.00	NA	NA	14.1	NA
M-SB15 (3-5)		3-5	Arabie	<0.10	<101	1.30	<1.00	<1.00	<1.00	NA	NA	18.3	NA
M-SB15 (5-7)		5-7	Arabie	0.67	<79	3.93	1.56	2.16	5.35	NA	NA	15.3	NA
M-SB15 (8-10)		8-10	Arabie	<0.10	<65	0.790	<1.00	<1.00	<1.00	NA	NA	14.6	NA
M-SB15 (10-12)		10-12	Arabie	<0.10	<69	1.15	<1.00	<1.00	<1.00	NA	NA	16.1	NA
M-SB16 (0-2)	9/30/2014	0-2	Arabie	5.49	980	**15.9**	7.47	6.10	41.5	NA	NA	20.3	NA
M-SB16 (3-5)		3-5	Arabie	1.26	246	5.42	1.39	1.68	6.72	NA	NA	16.3	NA
M-SB16 (5-7)		5-7	Arabie	0.59	160	6.14	<1.00	<1.00	4.03	NA	NA	16.8	NA
M-SB16 (8-10)		8-10	Arabie	0.58	<103	7.62	<1.00	<1.00	4.45	NA	NA	15.4	NA
M-SB16 (10-12)		10-12	Arabie	0.62	<103	6.85	<1.00	<1.00	4.42	NA	NA	15.8	NA
M-SB17 (0-2)	9/30/2014	0-2	Arabie	<0.10	<49	1.10	<1.00	<1.00	<1.00	NA	NA	16.4	NA
M-SB17 (3-5)		3-5	Arabie	<0.10	<100	0.683	<1.00	<1.00	<1.00	NA	NA	17.7	NA
M-SB17 (5-7)		5-7	Arabie	<0.10	<87	1.69	<1.00	<1.00	<1.00	NA	NA	16.6	NA
M-SB17 (8-10)		8-10	Arabie	0.10	<117	1.67	<1.00	<1.00	<1.00	NA	NA	15.8	NA
M-SB17 (10-12)		10-12	Arabie	0.21	<77	5.39	<1.00	<1.00	1.58	NA	NA	14.9	NA
M-SB18 (0-2)	9/30/2014	0-2	Arabie	1.90	299	6.05	2.79	2.37	9.72	NA	NA	19.2	NA
M-SB18 (3-5)		3-5	Arabie	0.73	166	6.24	<1.00	<1.00	4.81	NA	NA	16.1	NA
M-SB18 (5-7)		5-7	Arabie	0.94	<127	7.43	<1.00	<1.00	6.92	NA	NA	16.5	NA
M-SB18 (8-10)		8-10	Arabie	2.28	147	8.01	2.72	4.15	14.8	NA	NA	15.3	NA
M-SB18 (10-12)		10-12	Arabie	2.97	194	9.79	4.13	4.31	20.1	NA	NA	15.9	NA
M-SB19 (0-2)	10/1/2014	0-2	Arabie	4.59	765	**16.7**	6.55	4.42	39.2	NA	NA	16.0	NA
M-SB19 (3-5)		3-5	Arabie	2.90	432	6.67	2.95	6.27	14.3	NA	NA	17.5	NA
M-SB19 (5-7)		5-7	Arabie	1.34	184	7.73	1.00	1.72	9.02	NA	NA	14.5	NA
M-SB19 (8-10)		8-10	Arabie	1.67	105	7.24	1.47	3.28	11.2	NA	NA	16.2	NA
M-SB19 (10-12)		10-12	Arabie	2.42	106	8.25	1.97	5.96	16.4	NA	NA	16.1	NA
M-SB19 (13-15)		13-15	Arabie	3.47	194	7.90	6.87	10.9	23.5	NA	NA	19.7	NA
M-SB19 (15-17)		15-17	Arabie	3.15	210	7.50	5.30	10.5	21.1	NA	NA	19.3	NA
MPA Sampling Event / MPA and Arabie Analytical Results													
B-1-15 (0-1)	2/10/2015	0.0-1.0	Arabie	**4.22**	NA	**26.6**	1.75	2.18	37.3	9.3	24.2	NA	NA
			MPA	**4.23**	NA	**27.0**	1.88	2.16	38.4	8.2	24.8	19.5	NA
B-1-15 (1-2)		1.0-2.0	Arabie	3.90	NA	**29.2**	1.45	1.45	35.2	13.2	21.1	NA	NA
			MPA	**4.52**	NA	**30.8**	1.79	1.82	41.4	10.4	23.8	20.8	NA
B-1-15 (2-3)		2.0-3.0	Arabie	**6.20**	NA	**28.4**	3.17	4.00	53.7	12.2	20.4	NA	NA
			MPA	**4.51**	NA	**26.7**	2.17	2.43	40.5	7.8	24.7	19.2	NA
B-2-15 (0-1)	2/10/2015	0.0-1.0	Arabie	**25.8**	NA	**39.2**	24.0	32.4	208	10.5	20.8	NA	NA
			MPA	**14.6**	NA	**32.5**	11.6	15.9	121	4.8	28.6	20.1	NA
B-2-15 (1-2)		1.0-2.0	Arabie	6.84	NA	**34.2**	3.07	3.34	61.2	11.3	22.9	NA	NA
			MPA	7.11	NA	**32.6**	3.37	4.09	63.1	9.6	23.6	22.1	NA
B-2-15 (2-3)		2.0-3.0	Arabie	5.25	NA	**26.9**	2.37	3.42	45.8	7.5	19.4	NA	NA
			MPA	4.52	NA	**27.4**	1.86	2.37	39.9	5.1	25.4	22.1	NA
B-5-15 (0-1)	2/10/2015	0.0-1.0	Arabie	3.49	NA	**29.2**	1.63	<1.00	31.9	10.9	18.4	NA	NA
			MPA	3.64	NA	**32.5**	1.35	<1.00	32.4	16.7	17.1	24.0	NA
B-5-15 (1-2)		1.0-2.0	Arabie	7.78	NA	**32.1**	5.23	3.73	67.9	16.6	22.5	NA	NA
			MPA	6.51	NA	**26.8**	5.18	4.18	58.0	12.8	24.5	21.9	NA
B-5-15 (2-3)		2.0-3.0	Arabie	7.65	NA	**18.1**	9.17	11.1	57.6	8.2	27.5	NA	NA
			MPA	6.71	NA	**17.9**	8.06	9.28	52.8	8.3	28.1	19.8	NA
B-7-15 (0-1)	2/10/2015	0.0-1.0	Arabie	3.84	NA	**30.4**	1.95	<1.00	35.3	9.5	17.5	NA	NA
			MPA	4.16	NA	**29.2**	2.46	<1.00	37.8	6.7	17.5	23.6	NA
B-7-15 (1-2)		1.0-2.0	Arabie	7.84	NA	**31.9**	6.37	2.53	67.3	14.3	15.4	NA	NA
			MPA	7.48	NA	**27.3**	7.00	2.59	59.7	8.1	13.6	21.8	NA
B-7-15 (2-3)		2.0-3.0	Arabie	7.38	NA	**31.9**	4.43	4.11	66.0	14.1	30.3	NA	NA
			MPA	**8.05**	NA	**37.2**	4.17	3.52	73.0	9.1	29.9	19.5	NA
B-9-15 (0-1)	2/10/2015	0.0-1.0	Arabie	4.15	NA	**20.5**	3.71	1.76	33.8	4.8	15.6	NA	NA
			MPA	3.89	NA	**18.8**	3.78	1.73	31.3	5.4	15.6	25.3	NA
B-9-15 (1-2)		1.0-2.0	Arabie	7.67	NA	**22.8**	8.65	5.93	61.5	7.9	25.9	NA	NA
			MPA	7.72	NA	**23.6**	8.82	5.64	63.5	8.1	21.4	23.0	NA
B-9-15 (2-3)		2.0-3.0	Arabie	4.05	NA	**14.1**	4.50	4.46	29.8	9.0	31.9	NA	NA
			MPA	4.07	NA	**14.2**	4.81	5.01	31.4	5.8	30.6	19.4	NA
B-10-15 (0-1)	2/10/2015	0.0-1.0	Arabie	3.38	NA	**22.5**	2.01	1.34	29.1	6.5	21.8	NA	NA
			MPA	3.06	NA	**22.5**	1.84	1.12	27.3	6.7	21.9	23.8	NA
B-10-15 (1-2)		1.0-2.0	Arabie	3.06	NA	**14.1**	2.88	2.89	24.0	4.0	32.9	NA	NA
			MPA	2.45	NA	13.6	2.23	1.96	19.7	4.8	30.9	23.9	NA
B-10-15 (2-3)		2.0-3.0	Arabie	5.61	NA	7.53	12.4	14.7	27.7	2.3	33.8	NA	NA
			MPA	4.64	NA	6.64	10.2	12.0	22.1	3.0	33.7	20.6	NA
B-11-15 (1-2)	2/10/2015	1.0-2.0	Arabie	0.39	NA	7.15	<1.00	<1.00	3.15	2.5	16.6	NA	NA
			MPA	0.65	NA	9.94	<1.00	<1.00	5.18	2.6	23.1	23.1	NA
B-11-15 (2-3)		2.0-3.0	Arabie	2.70	NA	**26.3**	1.09	<1.00	24.8	6.8	20.5	NA	NA
			MPA	1.80	NA	**18.6**	<1.00	<1.00	15.5	4.4	23.5	24.7	NA
B-12-15 (0-1)	2/10/2015	0.0-1.0	Arabie	0.91	NA	**16.5**	<1.00	<1.00	8.21	11.1	13.9	NA	NA
			MPA	0.97	NA	**18.7**	<1.00	<1.00	8.44	10.8	15.1	22.7	NA
B-12-15 (1-2)		1.0-2.0	Arabie	2.06	NA	**25.3**	<1.00	<1.00	17.4	17.0	23.0	NA	NA
			MPA	1.42	NA	**25.1**	<1.00	<1.00	12.2	10.4	21.4	20.3	NA
B-12-15 (2-3)		2.0-3.0	Arabie	5.44	NA	**32.8**	2.71	1.91	49.8	13.5	27.3	NA	NA
			MPA	6.39	NA	**27.9**	4.75	3.68	57.3	10.2	32.1	19.0	NA
B-20-15 (0-1)	2/10/2015	0.0-1.0	Arabie	0.32	NA	6.11	<1.00	<1.00	2.80	2.4	15.1	NA	NA
			MPA	0.78	NA	6.32	1.37	<1.00	6.41	1.7	15.4	23.5	NA
B-20-15 (1-2)		1.0-2.0	Arabie	0.98	NA	13.9	<1.00	<1.00	7.96	3.5	22.7	NA	NA
			MPA	1.18	NA	11.9	<1.00	<1.00	10.6	2.5	18.9	23.9	NA
B-20-15 (2-3)		2.0-3.0	Arabie	4.71	NA	**31.2**	2.10	1.67	42.8	5.9	21.5	NA	NA
			MPA	3.53	NA	**28.0**	1.58	1.15	32.7	4.7	25.3	25.7	NA

TABLE 1
COMPREHENSIVE DATA SET
SOIL SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft. BGS)	Sample Collector	LABORATORY RESULTS									
				Electrical Conductivity (mMhos/cm)	Soluble Chlorides (mg/kg)	Sodium Adsorption Ratio	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	ESP %	CEC (meq/100g)	Percent Moisture	Sodium (mg/kg)
Comparative Standard: 29-B			Wetland	**8.0**	**N/A**	**14**	**N/A**	**N/A**	**N/A**	**25**	**N/A**	**N/A**	**N/A**
			Upland	**4.0**	**N/A**	**12**	**N/A**	**N/A**	**N/A**	**15**	**N/A**	**N/A**	**N/A**
MPA Sampling Event / MPA and Arabie Analytical Results													
B-21-15 (0-1)	2/10/2015	0.0-1.0	Arabie	1.69	NA	**23.5**	<1.00	<1.00	14.4	6.5	27.5	NA	NA
			MPA	2.02	NA	**25.1**	<1.00	<1.00	17.5	8.0	17.0	23.3	NA
B-21-15 (1-2)		1.0-2.0	Arabie	3.04	NA	**33.0**	<1.00	<1.00	25.2	11.3	15.5	NA	NA
			MPA	3.09	NA	**34.6**	<1.00	<1.00	27.0	11.5	17.5	21.0	NA
B-21-15 (2-3)		2.0-3.0	Arabie	4.63	NA	**33.1**	2.08	1.22	42.4	14.4	18.5	NA	NA
			MPA	4.98	NA	**33.1**	2.48	1.55	47.0	11.8	24.0	20.3	NA
B-31-15 (1-2)	2/10/2015	1.0-2.0	Arabie	0.83	NA	**17.9**	<1.00	<1.00	7.25	11.2	14.0	NA	NA
			MPA	1.06	NA	**23.1**	<1.00	<1.00	9.28	8.6	14.3	21.9	NA
B-32-15 (0-1)	2/10/2015	0.0-1.0	Arabie	0.58	NA	**15.4**	<1.00	<1.00	5.97	9.5	13.8	NA	NA
			MPA	2.09	NA	**12.9**	4.28	<1.00	20.6	3.2	15.6	24.0	NA
B-32-15 (1-2)		1.0-2.0	Arabie	1.34	NA	**23.6**	<1.00	<1.00	11.1	8.7	16.3	NA	NA
			MPA	1.82	NA	**25.8**	<1.00	<1.00	15.7	7.9	17.3	21.4	NA
B-32-15 (2-3)		2.0-3.0	Arabie	4.53	NA	**25.3**	2.70	2.30	40.0	8.8	20.5	NA	NA
			MPA	4.39	NA	**27.7**	2.37	1.76	39.8	5.3	19.7	20.0	NA
B-42-15 (0-1)	2/9/2015	0.0-1.0	Arabie	7.81	NA	**22.0**	10.4	4.74	60.6	7.8	23.4	NA	NA
			MPA	**10.9**	NA	**23.6**	19.9	9.27	90.3	6.5	28.2	23.6	NA
B-42-15 (1-2)		1.0-2.0	Arabie	**12.2**	NA	**14.4**	33.4	18.2	73.3	7.1	28.8	NA	NA
			MPA	**13.1**	NA	**18.4**	31.7	15.7	89.6	6.5	30.9	22.6	NA
B-42-15 (2-3)		2.0-3.0	Arabie	**11.1**	NA	11.1	35.9	23.4	60.7	6.6	35.2	NA	NA
			MPA	**10.0**	NA	9.80	33.4	21.6	51.4	3.2	32.6	18.3	NA
B-43-15 (0-1)	2/9/2015	0.0-1.0	Arabie	6.40	NA	**18.4**	8.97	4.78	48.2	7.2	27.8	NA	NA
			MPA	7.59	NA	**14.7**	12.3	6.98	45.8	3.9	32.2	26.5	NA
B-45-15 (0-1)	2/9/2015	0.0-1.0	Arabie	3.22	NA	**19.3**	2.58	1.23	26.7	5.8	25.9	NA	NA
			MPA	4.78	NA	**18.9**	5.61	2.63	38.3	3.3	25.7	26.4	NA
B-45-15 (1-2)		1.0-2.0	Arabie	6.57	NA	**16.3**	10.3	6.71	47.7	8.7	25.1	NA	NA
			MPA	7.32	NA	**16.5**	12.5	8.15	53.0	3.2	29.5	23.5	NA
B-45-15 (2-3)		2.0-3.0	Arabie	5.16	NA	9.09	11.0	9.57	29.2	2.8	29.6	NA	NA
			MPA	5.11	NA	8.70	11.4	10.3	28.7	2.5	30.9	19.3	NA
B-46-15 (0-1)	2/10/2015	0.0-1.0	Arabie	2.29	NA	**20.9**	1.23	<1.00	20.4	5.5	16.2	NA	NA
			MPA	2.31	NA	**20.4**	1.34	<1.00	20.5	5.4	20.3	21.1	NA
B-46-15 (1-2)		1.0-2.0	Arabie	2.26	NA	**18.7**	1.35	<1.00	19.5	3.9	15.6	NA	NA
			MPA	1.43	NA	**14.5**	1.02	<1.00	12.9	3.8	19.0	21.6	NA
B-47-15 (0-1)	2/10/2015	0.0-1.0	Arabie	6.70	NA	14.0	9.73	8.24	41.9	2.0	17.9	NA	NA
			MPA	5.64	NA	**14.7**	6.93	5.00	35.9	3.0	18.7	22.4	NA
B-49-15 (0-1)	2/10/2015	0.0-1.0	Arabie	3.02	NA	**19.7**	2.28	1.16	25.9	6.3	14.0	NA	NA
			MPA	3.11	NA	**19.0**	2.67	1.30	26.8	6.0	18.4	24.8	NA
B-49-15 (1-2)		1.0-2.0	Arabie	4.86	NA	**20.1**	4.80	2.86	39.3	4.6	15.2	NA	NA
			MPA	4.55	NA	**18.7**	4.59	2.72	35.7	3.0	21.9	21.4	NA
B-51-15 (0-1)	2/10/2015	0.0-1.0	Arabie	4.16	NA	**18.8**	4.24	2.24	33.8	6.1	21.1	NA	NA
			MPA	3.86	NA	**21.0**	3.42	1.75	33.7	6.2	19.8	22.4	NA
B-52-15 (0-1)	2/10/2015	0.0-1.0	Arabie	5.96	NA	**19.1**	6.89	4.99	46.6	7.6	24.0	NA	NA
			MPA	6.21	NA	**18.0**	8.16	6.16	48.2	7.6	29.4	22.3	NA
B-52-15 (1-2)		1.0-2.0	Arabie	6.96	NA	**19.5**	7.74	7.53	54.0	5.7	29.6	NA	NA
			MPA	6.19	NA	**19.1**	6.78	6.00	48.2	10.5	33.2	23.0	NA
B-53-15 (0-1)	2/10/2015	0.0-1.0	Arabie	**16.3**	NA	**34.2**	23.4	11.7	143	4.9	12.4	NA	NA
			MPA	**11.7**	NA	**30.4**	14.9	6.85	100	12.3	14.4	21.6	NA
B-53-15 (1-2)		1.0-2.0	Arabie	**10.9**	NA	**28.7**	13.4	7.06	91.8	5.3	12.3	NA	NA
			MPA	**10.2**	NA	**28.1**	12.8	6.06	86.4	11.4	17.1	20.9	NA
SB-01-15 (0-1)	2/10/2015	0.0-1.0	Arabie	3.11	NA	**18.5**	2.95	<1.00	25.0	11.5	15.3	NA	NA
			MPA	5.08	NA	**17.1**	9.47	1.00	39.2	9.5	18.0	20.9	NA
SB-01-15 (1-2)		1.0-2.0	Arabie	7.53	NA	**29.2**	5.05	4.60	64.1	12.4	29.0	NA	NA
			MPA	7.59	NA	**27.8**	6.83	4.75	66.8	12.7	23.5	28.6	NA
SB-01-15 (2-3)		2.0-3.0	Arabie	**12.5**	NA	**18.7**	19.6	26.9	90.2	6.4	26.6	NA	NA
			MPA	**10.4**	NA	**17.2**	15.5	21.6	74.1	8.9	27.0	21.8	NA
SB-03-15 (0-1)	2/9/2015	0.0-1.0	Arabie	**9.46**	NA	**28.0**	10.8	5.31	79.3	6.4	24.2	NA	NA
			MPA	**9.80**	NA	**28.9**	10.6	5.20	81.3	10.4	21.5	25.7	NA
SB-03-15 (1-2)		1.0-2.0	Arabie	**14.3**	NA	**30.2**	18.9	12.5	120	3.2	31.6	NA	NA
			MPA	**13.9**	NA	**34.2**	18.0	10.3	128	4.0	21.5	23.2	NA
SB-03-15 (2-3)		2.0-3.0	Arabie	**14.9**	NA	**25.0**	24.4	20.7	119	2.2	36.8	NA	NA
			MPA	**13.2**	NA	**22.6**	22.9	20.5	105	6.5	27.1	21.4	NA
SB-03-15-20N (1.5-2.5)		1.5-2.5	Arabie	**8.28**	NA	**45.3**	4.14	2.37	81.7	16.7	29.4	NA	NA
			MPA	**9.92**	NA	**47.4**	5.09	2.93	95.0	16.8	28.0	23.7	NA
SB-09-15 (0-1)	2/10/2015	0.0-1.0	Arabie	**12.6**	NA	**35.7**	13.4	6.77	113	8.6	25.9	NA	NA
			MPA	**8.37**	NA	**30.1**	6.76	3.24	67.4	8.5	35.6	24.8	NA
SB-19-15 (0-1)	2/10/2015	0.0-1.0	Arabie	0.87	NA	12.6	<1.00	<1.00	7.58	7.4	18.8	NA	NA
			MPA	0.89	NA	12.9	<1.00	<1.00	7.84	5.8	25.1	23.9	NA
SB-19-15 (1-2)		1.0-2.0	Arabie	1.30	NA	**15.3**	<1.00	<1.00	10.8	6.4	20.1	NA	NA
			MPA	1.38	NA	**14.1**	<1.00	<1.00	11.1	5.1	26.2	22.4	NA
SB-19-15 (2-3)		2.0-3.0	Arabie	3.22	NA	14.0	3.55	2.81	25.0	4.3	20.9	NA	NA
			MPA	3.31	NA	13.3	3.97	3.56	25.8	3.8	27.9	22.0	NA

Notes:

Ft. BGS = *feet below ground surface*
N/A = *Not Applicable;* **NA** = *Not Analyzed*
mMhos/cm = *milliMhos per centimeter;* **mg/kg** = *milligrams per kilograms or parts per million (ppm);* **meq** = *milliequivalents*
ESP = *Exchangeable Sodium Percentage*
29-B = *Louisiana Department of Natural Resources Office of Conservation*
29-B Elevated Wetland Standard
29-B Upland Standard
Concentrations **bolded** *where detected above comparative standards*

TABLE 1
COMPREHENSIVE DATA SET
SOIL SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft BGS)	Sample Collector	Laboratory Results					
				Benzene (mg/kg)	Ethyl-benzene (mg/kg)	Toluene (mg/kg)	Xylenes (mg/kg)	SPLP Chloride (mg/L)	SPLP Benzene (mg/L)
M-SB01 (0-2)	9/23/2014	0-2	Arabie	<0.0432	<0.270	<0.270	<0.810	NA	NA
B1 (1-2)	9/25/2014	1-2	Arabie	NA	NA	NA	NA	75	NA
B5 (1-2)	8/13/2014	1-2	Arabie	NA	NA	NA	NA	NA	<0.005

Notes:

FT BGS = *feet below ground surface*

mg/kg = *milligrams per kilograms or parts per million (ppm);*

N/A = *Not Applicable;* **NA** = *Not Analyzed*

TABLE 2
COMPREHENSIVE DATA SET
GROUNDWATER SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft BGS)	Sample Collector	Laboratory Analytical Results																							
				Chlorides SW 9253 (mg/L)	Bromide SW 9056 (mg/L)	Chloride/Bromide Ratio	Sulfate (mg/L)	Specific Conductance (umhos/cm)	Total Dissolved Solids (mg/L)	Total Alkalinity (mgCaCO3/L)	TPH-D (mg/L)	TPH-O (mg/L)	TPH-G (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Selenium (mg/L)	Silver (mg/L)	Sodium (mg/L)	Strontium (mg.L)	Zinc (mg/L)	Mercury (mg/L)	Ra226 (pCi/L)	Ra228 (pCi/L)	Combined Radium 226/228 (pCi/L)
Comparative Standards:				**250[a]**	**N/A**	**N/A**	**250[a]**	**N/A**	**500[a]**	**N/A**	**0.15[b]**	**0.15[b]**	**0.15[b]**	**0.01[b]**	**2.0[b]**	**0.005[b]**	**0.10[b]**	**0.015[b]**	**0.050[b]**	**0.018[b]**	**60[b]**	**N/A**	**1.1[b]**	**0.002[b]**	**N/A**	**N/A**	**5[c]**
Cork Sampling Event / Arabie Split Sample Results																											
SW1	4/24/2014	Surface	Arabie	**284**	NA	N/A	NA	NA	NA	NA	**0.21**	**0.21**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW2	4/24/2014	Surface	Arabie	227	NA	N/A	NA	NA	NA	NA	**0.53**	**0.51**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW3	4/24/2014	Surface	Arabie	248	NA	N/A	NA	NA	NA	NA	**0.19**	<0.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arabie Sampling Event																											
M-MW01	10/1/2014	15-25	Arabie	**298**	2.48	120.16	43.9	1,940	**1,020**	458	<0.14	<0.12	<0.15	<0.010	0.136	<0.005	<0.010	<0.010	0.025	<0.005	NA	0.427	<0.010	<0.0002	0.712	2.755	3.467
M-MW02	10/1/2014	15-25	Arabie	114	0.497	229.38	35.2	1,220	**623**	442	<0.13	<0.12	<0.15	<0.010	0.189	<0.005	<0.010	<0.010	<0.020	<0.005	NA	0.287	<0.010	<0.0002	0.959	0.705	1.664
M-MW03	10/1/2014	19-29	Arabie	**312**	2.07	150.72	149	2,050	**1,060**	390	<0.14	<0.12	<0.15	<0.010	0.354	<0.005	<0.010	<0.010	0.022	<0.005	NA	0.430	<0.010	<0.0002	0.734	0.988	1.722
Water Supply	10/1/2014	--	Arabie	114	NA	N/A	NA	945	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cork Sampling Event / Cork Sample Results																											
B-1-GW	12/11/2013	--	Cork	**568**	NA	N/A	NA	2,720	NA	NA	NA	NA	NA	<0.010	0.206	<0.005	0.025	<0.010	<0.020	<0.005	224	NA	0.016	<0.0002	NA	NA	N/A

Sample ID / Well ID	Sample Date	Screened Interval (Ft BGS)	Sample Collector	Laboratory Analytical Results																			
				Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	Xylenes (mg/L)	2-Methyl naphthalene (mg/L)	Acenaph thene (mg/L)	Acenaph thylene (mg/L)	Anthra cene (mg/L)	Benzo(a) anthra cene (mg/L)	Benzo(a) pyrene (mg/L)	Benzo(b) fluoran thene (mg/L)	Benzo(k) fluoran thene (mg/L)	Chrysene (mg/L)	Dibenz (a,h) anthracene (mg/L)	Fluoran thene (mg/L)	Fluorene (mg/L)	Indeno (1,2,3-cd) pyrene (mg/L)	Naph-thalene (mg/L)	Phenan-threne (mg/L)	Pyrene (mg/L)
Comparative Standard: RECAP				**0.005[b]**	**0.7[b]**	**1[b]**	**10[b]**	**0.00062[b]**	**0.037[b]**	**0.1[b]**	**0.043[b]**	**0.0078[b]**	**0.0002[b]**	**0.0048[b]**	**0.0025[b]**	**0.0016[b]**	**0.0025[b]**	**0.15[b]**	**0.024[b]**	**0.0037[b]**	**0.01[b]**	**0.18[b]**	**0.018[b]**
Cork Sampling Event / Arabie Split Sample Results																							
M-MW01	10/1/2014	15-25	Arabie	<0.005	<0.005	<0.010	<0.050	<0.000515	<0.00103	<0.00103	<0.000515	<0.000515	<0.000155	<0.000515	<0.000515	<0.000515	<0.00103	<0.00103	<0.000515	<0.000515	<0.00103	<0.00103	<0.00103
M-MW02	10/1/2014	15-25	Arabie	<0.005	<0.005	<0.010	<0.050	<0.000515	<0.00103	<0.00103	<0.000515	<0.000515	<0.000155	<0.000515	<0.000515	<0.000515	<0.00103	<0.00103	<0.000515	<0.000515	<0.00103	<0.00103	<0.00103
M-MW03	10/1/2014	19-29	Arabie	<0.005	<0.005	<0.010	<0.050	<0.000521	<0.00104	<0.00104	<0.000521	<0.000521	<0.000156	<0.000521	<0.000521	<0.000521	<0.00104	<0.00104	<0.000521	<0.000521	<0.00104	<0.00104	<0.00104
Cork Sampling Event / Cork Sample Results																							
B-1-GW	12/11/2013	--	Cork	<0.005	<0.005	<0.005	<0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Ft BGS = *Feet Below Ground Surface*
N/A = *Not Applicable;* **NA** = *Not Analyzed*
mg/L = *milligrams per Liter;* **umhos/cm** = *Micromhos per centimeter;* **mg/CaCO3/L** = *milligrams Calcium carbonate per Liter;* **pCi/L** = *picocuries per Liter*
TPH = *Total Petroleum Hydrocarbons;* **TPH-D** = *Diesel range TPH;* **TPH-O** *Oil range TPH;* **TPH-G** = *Gasoline range*
[a] = *US EPA Primary or Secondary Drinking Water Standard or Advisory*
[b] = *Groundwater Screening Standards listed in the Louisiana Department of Environmental Quality Risk Evaluation / Corrective Action Program*
[c] = *U.S. EPA - MCL, Total Radium 226/228 less than 5 pCi/l*
Concentrations **bolded** *where detected above comparative standards*

TABLE 2
COMPREHENSIVE DATA SET
GROUNDWATER SAMPLE ANALYTICAL DATA SUMMARY
MOORE, et al VS DENBURY LLC
Sections 32 and 33, T-17N, R-07E
Richland Parish, Louisiana

Sample ID	Sample Date	Sample Interval (Ft BGS)	Laboratory Analytical Results			
			Chlorides SW 9253 (mg/L)	Specific Conductance (umhos/cm)	TPH-D (mg/L)	TPH-O (mg/L)
Comparative Standards:			**250[a]**	**N/A**	**0.15[b]**	**0.15[b]**
Cork Sampling Event / Arabie Split Sample Results						
SW1	4/24/2014	Surface	**284**	NA	**0.21**	**0.21**
SW2	4/24/2014	Surface	227	NA	**0.53**	**0.51**
SW3	4/24/2014	Surface	248	NA	**0.19**	<0.14
Arabie Sampling Event						
Water Supply	10/1/2014	--	114	945	NA	NA

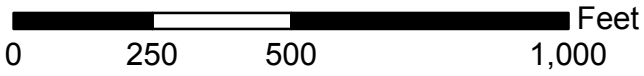
Notes:

Ft BGS = *Feet Below Ground Surface*
N/A = *Not Applicable;* **NA** = *Not Analyzed*
mg/L = *milligrams per Liter;* **umhos/cm** = *Micromhos per centimeter*
TPH = *Total Petroleum Hydrocarbons;* **TPH-D** = *Diesel range TPH;*
TPH-O *Oil range TPH*
[a]= *US EPA Primary or Secondary Drinking Water Standard or Advisory*
[b]= *Groundwater Screening Standards listed in the Louisiana Department of Environmental Quality Risk Evaluation/Corrective Action Progi*
Concentrations **bolded** *where detected above comparative standards*

ATTACHMENT A

AERIAL PHOTOGRAPHS

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana



ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

2010 Aerial Photograph
(photograph taken 6/13/2010)

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:

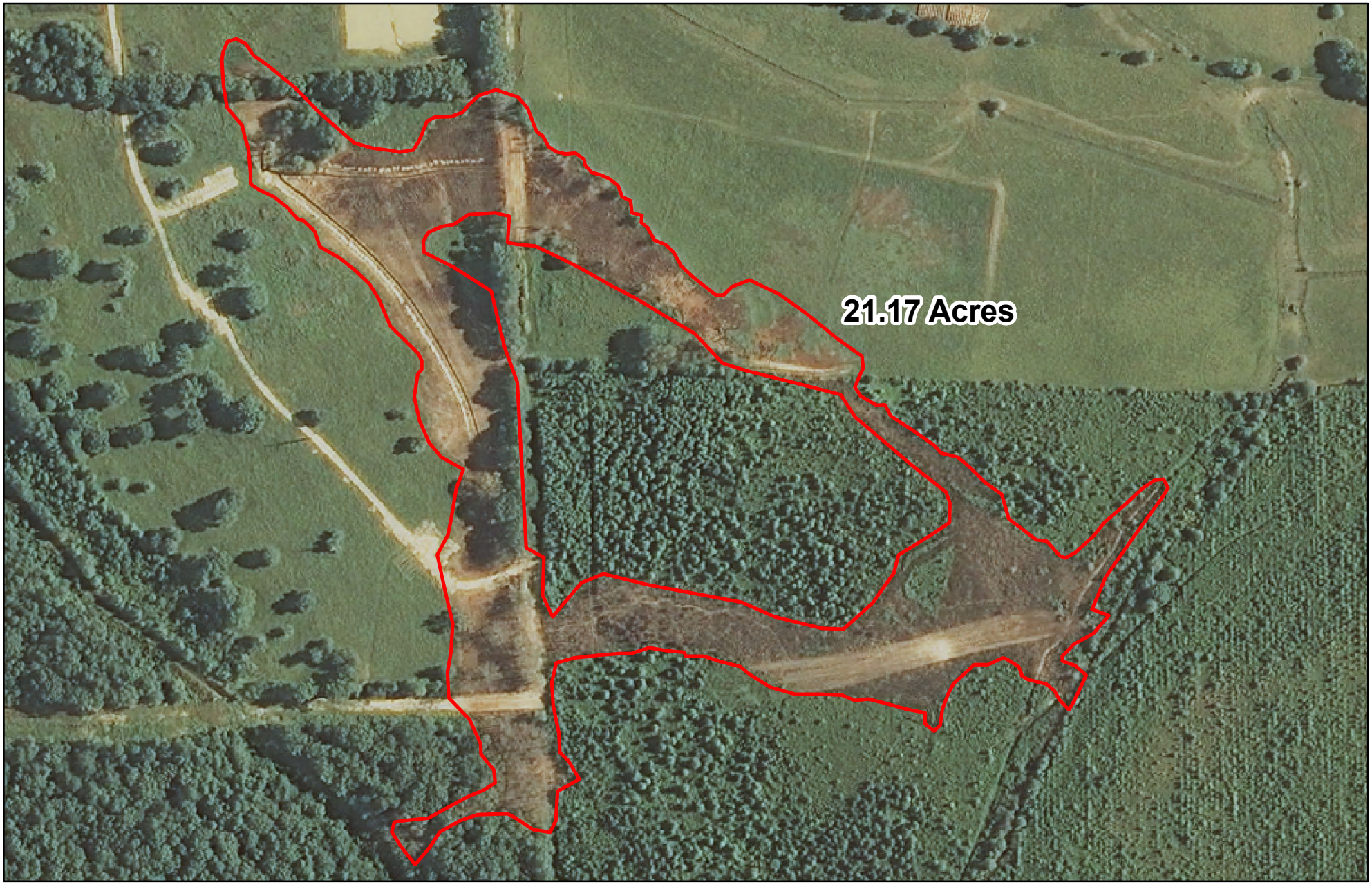
0 250 500 1,000 Feet

ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

2013 Aerial Photograph
(photograph taken 7/1-4/2013)

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:



0 250 500 1,000 Feet

ARABIE ENVIRONMENTAL SOLUTIONS

MARTHA ZOE MOORE, et al
VS
DENBURY ONSHORE, LLC
RICHLAND PARISH, LOUISIANA

2013 Aerial Photograph
(photograph taken 7/1-4/2013)

Drawn By: JRK	Date: 06/23/15	AES Project # 11301
Checked By: AA	Date: 06/24/15	Revised:

ATTACHMENT B

SITE PHOTOGRAPHS

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana

Moore vs Denbury
April, 21, 2014
Eastern Portion of Spill Area

Photograph 1

Photograph 2

Moore vs Denbury
April, 21, 2014
Eastern Portion of Spill Area

Photograph 3

Photograph 4

Moore vs Denbury
April, 21, 2014
Eastern Portion of Spill Area

Photograph 5

Photograph 6

Moore vs Denbury
April, 21, 2014
Eastern Portion of Spill Area

Photograph 7

Photograph 8

Moore vs Denbury
April, 21, 2014
Eastern Portion of Spill Area

Photograph 9

Photograph 10

ATTACHMENT C

SOIL BORING LOGS

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B42
Date Drilled: 04/24/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635233.156

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587382.242

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	CL		SILTY CLAY; Light brownish gray, w/roots, saturated, few faint orange mottles	
				CL		SILTY CLAY; Light brownish gray, faint orange mottling & roots, very fine Fe nodules, saturated	
				CL		SILTY CLAY; Light brownish gray, w/roots, saturated, trace very fine grained sand	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B43
Date Drilled: 04/24/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635188.952

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587447.258

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	CL		SILTY CLAY; Light brownish gray, few orange mottles, distinct oxidized root channels	
				CL		SILTY CLAY; Few orange mottles, saturated, more firm w/depth	
				CL		SILTY CLAY; Light brownish gray, few orange mottles	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B44
Date Drilled: 04/24/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635122.451

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587511.224

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM		NM		NOT LOGGED	
						NOT LOGGED	
						NOT LOGGED	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B45
Date Drilled: 04/24/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635260.431

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587469.336

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	CL		SILTY CLAY; Light brownish gray, roots, saturated, few fine Fe nodules	
				CL		SILTY CLAY; Light brownish gray, very fine Fe nodules, saturated, more firm w/depth	
				CL		SILTY CLAY; Light grayish brown, more firm, saturated, few orange mottles	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B46
Date Drilled: 04/24/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635337.928

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587441.962

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	CL		SILTY CLAY; Light grayish brown, Fe, orange mottling, distinct oxidized root channels, saturated, trace very fine grained sand	
				CL		SILTY CLAY; Light grayish brown, fine Fe nodules, rootlets, oxidized root channels, saturated	
				CL		SILTY CLAY; Light grayish brown, saurated, few orange mottles	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B47
Date Drilled: 04/24/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635403.298

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587392.802

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	CL		SILTY CLAY; Light brownish gray, saturated, few fine Fe nodules	
				CL		SILTY CLAY; Light grayish brown, Fe nodules, distinct, oxidized root channels, saturated, more firm w/depth	
				CL		SILTY CLAY; Light grayish brown, saurated, few fine Fe nodules, fine roots	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B48
Date Drilled: 04/24/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635486.022

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587345.953

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	CL		CLAY LOAM & SILTY CLAY; Grayish brown, organic, roots	
				CL		SILTY CLAY; Grayish brown, few fine Fe nodules, roots	
				CL		SILTY CLAY; Grayish brown, roots, softer, wet	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B54
Date Drilled: 06/05/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635221.828

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587324.111

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML		SILT LOAM; Yellowish gray, moist, increased CLAY content w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B55
Date Drilled: 06/05/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635278.191

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587393.293

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML		SILT LOAM; Brown to yellowish brown, increasing CLAY content w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B56
Date Drilled: 06/05/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635188.387

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587392.377

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML		SILT LOAM; Brown to yellowish brown, increasing CLAY content w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B57
Date Drilled: 06/05/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635215.994

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587499.127

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML		SILT LOAM; Brown to yellowish brown, increased CLAY content w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B58
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635315.461

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587504.386

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML/CL		SILT LOAM to SILTY CLAY; Brown to yellowish brown, friable, firm, w/increased CLAY content w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B59
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635384.600

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587445.000

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML		SILT LOAM to CLAYEY SILT; Brown to yellowish brown, many Fe nodules w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B60
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635357.647

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587390.346

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML/CL		Brown to yellowish brown SILT LOAM to brownish gray SILTY CLAY	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B61
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635604.110

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587282.043

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML/CL		SILT LOAM to SILTY CLAY; Brown & yellowish brown, friable, firm w/depth, (???)	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B62
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635669.030

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587218.413

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML/CL		SILT LOAM to SILTY CLAY; Browninsh gray, moist, tight w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B63
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635647.695

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587111.751

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML/CL		SILT LOAM to SILTY CLAY; Brownish gray, w/Fe staining, soft, moist	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B64
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635520.880

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587103.674

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML/CL		SILT LOAM to SILTY CLAY; Grayish brown, roots	
				CL		SILTY CLAY; Grayish brown, roots, Fe stains	
				CL		SILTY CLAY; Grayish brown, w/orange mottling, firm	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B65
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635427.743

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587124.057

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML		SILT LOAM; Brown, roots throughout	
				ML		SILT LOAM ; Gray, w/ orange mottling	
				ML/CL		SILT LOAM to SILTY CLAY; Light brownish gray, more firm w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B66
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635557.672

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587202.793

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML/CL		SILT LOAM to SILTY CLAY; Brownish gray, roots, Fe staining	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301 / MOORE
Borehole No: B67
Date Drilled: 06/04/2014
Total Depth: 3 FT BGS

Drilling Method: HAND AUGER
Drilled By: N/A
Logged By: J MCDANIEL
UTM Easting: 635409.712

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 387203.073

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		NM	NM	ML		SILT LOAM; Brown, roots throughout	
				ML		SILT LOAM ; Yellowish brown,green mottles, roots	
				ML/CL		SILT LOAM to SILTY CLAY; yellowish brown, gray mottles, firm, CLAY increasing w/depth	
-5							
-10							
-15							
-20							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB01
Date Drilled: 09/23/14
Total Depth: 25 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635281.725

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587190.739

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		3.25	1.13	ML		From 0-0.35': CLAYEY SILT; Brown, w/organic & roots, soft, moist	
			5.23	ML		From 0.35-2.2': CLAYEY SILT; Gray, soft, moist, sour odor	
			2.30	CL		From 2.2-3.25': SILTY CLAY; Brown, very SILTY, Fe staining/nodules, firm, low moisture	
-5		5.0	2.29	ML		From 5-10': CLAYEY SILT; Light grayish brown, very fine Fe nodules/staining, w/few CLAYEY lenses, firm, low moisture	
			1.55				
			1.87				
-10		5.0	1.50	CL		From 10-13.2': SILTY CLAY; Grayish brown to light olive gray, scattered Fe & Ca nodules to 12.9', increasing SILT content	
			1.10				
			0.36	ML		From 13.2-14.2': SILT; Firm, low moisture	
				SM		From 14.2-15': SILTY SAND; Light brown, very fine grained, bedded, dry	
-15		4.6	0.20	ML/SM		From 15-19.6': SANDY SILT grading to SILTY SAND w/depth; light yellowish brown to light brown, very fine grained, moist throughout	
			0.06				
			0.03				
-20		4.1	NM	SM		From 20-24.1': SILTY SAND; brown, very fine grained, SAND coarsening w/depth, wet	M-MW01 15-25'
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB02
Date Drilled: 09/23/14
Total Depth: 20 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635255.647

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587249.067

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		2.0	0.05	ML		From 0-0.4': SILT loam; Dark brown, w/orgaincs & roots, moist	
			0.89	ML		From 0.4-2': CLAYEY SILT; Light reddish brown, gray mottled, very fine Fe nodules, friable, firm	
-5		4.8	0.93	ML		From 5-7': CLAYEY SILT; Reddish brown, very CLAYEY, very fine Fe nodules, firm, low moisture	
			1.86	CL		From 7-8.2': SILTY CLAY; Reddish brown, firm, low moisture	
			0.13	CL		From 8.2-9': SILTY CLAY; Brown, increased SILT content w/depth	
				SM		From 9-9.8': SILTY SAND; Very fine grained, slightly moist	
-10		4.8	NM	ML/SM		From 10-14.8': SANDY SILT grading to SILTY SAND; Brown, very fine grained, moist	
-15		4.7	0.09	SM		From 15-19.7': SILTY SAND; Light brown to brown, very fine grained, moist, coarsening w/depth	
			0.11				
			0.16				
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project:	11301	**Drilling Method:**	GEOPROBE DUAL TUBE	**Section/Township/Range:**	
Borehole No:	M-SB03	**Drilled By:**	DEVONIAN GROUP		S-32 & 33, T-17N, R-9E
Date Drilled:	09/23/14	**Logged By:**	J MCDANIEL	**Parish:**	RICHLAND **State:** LA
Total Depth:	15 FT BGS	**UTM Easting:**	635263.812	**UTM Northing:**	3587328.512

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.6	2.65	CL		From 0-0.3': SILTY CLAY; Grayish brown, w/roots	
			1.10	ML		From 0.3-3.5': SILT & CLAYEY SILT; Brownish gray, firm, low moisture	
			1.58	CL		From 3.5-4.6': SILTY CLAY; Grayish brown, Fe nodules, firm, low moisture	
-5		5.0	1.29	CL		From 5-10': SILTY CLAY; Grayish brown, Fe & Mn, firm, low moisture	
			1.09				
			1.11				
-10		4.8	1.57	CL		From 10-14.2': SILTY CLAY; Grayish brown, firm, low moisture, Ca nodules @ 12.3-12.5'	
			1.16				
			0.05				
				ML		From 14.2-14.7': CLAYEY SILT; Brown, soft	
-15				SM		From 14.7-14.8': SILTY SAND; Brown, very fine grained, moist	
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB04
Date Drilled: 09/24/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635246.106

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587463.930

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		5	1.33	CL		From 0-0.3': SILTY CLAY; Brown, w/roots & organic, soft, moist	
			0.77	ML		From 0.3-5': SILT and CLAYEY SILT; Grayish brown, low moisture	
			1.00				
-5		5	0.31	CL		From 5-10': SILTY CLAY; Grayish brown, scattered Fe, firm, low moisture	
			0.86				
			1.70				
-10		3.9	1.24	CL		From 10-11.2': SILTY CLAY; Reddish brown, firm	
			0.91	ML		From 11.2-12': CLAYEY SILT; Reddish brown, trace very fine grained SAND	
				CL		From 12-12.25': SILTY CLAY; Brown, very firm, sharp contact	
			0.04	SM		From 12.25-13.9': SILTY SAND; Light brown, very fine grained, bedded, moist	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB05
Date Drilled: 09/24/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635236.290

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587181.905

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.2	0	ML		From 0-4.2': CLAYEY SILT; Reddish brown, gray mottled, Fe & increased CLAY w/depth	
			0.02				
			0.25				
-5		5	0.42	ML		From 5-7.1': CLAYEY SILT; Reddish brown, w/weak gray mottling, Fe & Mn, firm, low moisture	
			0.89	CL		From 7.1-9.3': SILTY CLAY; Reddish brown, firm, low moisture	
			0.06	ML		From 9.3-10': SILT; Reddish brown, w/very fine grained SAND	
-10		4.3	NM	ML/SM		From 10-13.5': SANDY SILT grading to SILTY SAND; Light reddish brown, very fine grained, dry	
				CL		From 13.5-13.7': SILTY CLAY Lense; brown	
				SM		From 13.7-14.3': SILTY SAND; Very fine grained, moist	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB06
Date Drilled: 09/24/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635141.523

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587437.589

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.4	0.02	ML		From 0-4.4': CLAYEY SILT; Light gray, w/orange mottling to light reddish brown, w/Fe nodules, friable, dry, increased CLAY content w/depth	
			0.43				
			0.46				
-5		5	NM	ML		From 5-6.4': CLAYEY SILT; Light reddish brown, Fe	
				CL		From 6.4-7.7': SILTY CLAY; Light reddish brown, Fe & Mn, firm, low moisture	
				ML		From 7.7-8.6': CLAYEY SILT; Light reddish brown	
				SM		From 8.6-10.0': SILTY SAND; Reddish brown, very fine grained, moist	
-10		4.2	0.47	SM		From 10-10.3': SILTY SAND; Same as above	
				CL		From 10.3-10.7': SILTY CLAY Lense, firm	
				ML/SM		From 10.7-11.5': SANDY SILT to SILTY SAND; Moist to wet @ 11.2-11.4'	
			0.07	CL		From 11.5-11.6': CLAY Lens; Brown, firm	
			0.09	SM		From 11.6-14.2': SILTY SAND; Light reddish brown, very fine grained, more coarse w/depth, CLAY lense @ 13.5-13.7'	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB07
Date Drilled: 09/24/14
Total Depth: 20 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635188.780

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587520.134

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.4	0.00	ML		From 0-4.4': CLAYEY SILT; Brown to light reddish brown, friable, dry, light gray color @ 2.8-3.2'	
			0.01				
			0.08				
-5		4.5	0.03	ML		From 5-9.5': CLAYEY SILT; Light reddish brown, friable, dry	
			0.14				
			0.02				
-10		4.4	NM	CL		From 10-10.9': SILTY CLAY; Light reddish brown, friable, dry	
				ML/SM		From 10.9-14.4': SILT grading to SILTY SAND; Light brown, very fine grained, slightly moist @ bottom	
-15		4.2	NM	SM		From 15-17.2': SILTY SAND; Light brown, very fine grained, dry	
				CL		From 17.2-17.6': CLAY; Brown, firm	
				SM		From 17.2-19.4': SILT to SAND; very fine grained, firm, CLAY lens @ 18.7-18.8', wet @ 18.2-18.5'	
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB08
Date Drilled: 09/25/14
Total Depth: 30 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J WHITSON
UTM Easting: 635305.152

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587524.948

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.7	0.00	ML/CL		From 0-4.7': CLAYEY SILT to SILTY CLAY; Light reddish brown, dry-crumbly	
			0.05				
			0.14				
-5		5.0	0.13	ML		From 5-10': CLAYEY SILT; Light reddish brown, dry, SILT content increasing w/depth	
			0.25				
			0.21				
-10		4.5	1.15	ML		From 10-10.6': CLAYEY SILT; Brown, firm, dry	
				CL/ML		From 10.6-11.5': Alternating CLAY & SILT layers	
			0.02	ML		From 11.5-14.5': SANDY SILT; Light brown, dry	
			0.13				
-15		4.2	0.07	ML/SM		From 15-19.2': SANDY SILT; Light brown, increasing SAND w/depth, becoming wet @ 18.3'	
			0.02				
			0.46				
-20		4.6	0.36	ML/SM		From 20-24.6': SANDY SILT grading to SILTY SAND w/depth; Brown, saturated throughout	M-MW02 15-25'
			0.44				
			0.29				
-25		4.7	0.12	SW		From 25-29.7': SAND; Brown, saturated, SILTY SAND lense @ 27.6-28', CLAY inclusion @ 27.3'	
			0.06				
			0.04				
-30							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB09
Date Drilled: 09/25/14
Total Depth: 20 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635676.785

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587197.840

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.2	3.19	ML		From 0-0.25': CLAYEY SILT; Brown, w/organic, roots	
			1.90	CL		From 0.25-2.4': SILTY CLAY; Grayish brown to brownish gray, few orange mottles, firm, low moisture	
			1.01	ML		From 2.4-4.2': CLAYEY SILT; Brownish gray, Ca & Fe, firm, low moisture	
-5		5.0	NM	CL		From 5-10': SILTY CLAY; Light olive gray, Mn & Fe throughout, abundant @ 5.6-6.4', firm, low moisture	
-10		5.0	2.59	CL		From 10-15': SILTY CLAY; Light olive gray, w/Fe & Mn, to dense, brown SILTY CLAY @ 14.4', trace very fine Ca nodules throughout, firm, low moisture	
			2.78				
			2.58				
-15		5.0	NM	ML		From 15-16.6': SILT & CLAYEY SILT; Reddish brown w/gray mottling, wet to saturated	
				CL		From 16.6-16.9': CLAY lense; Brown, firm	
				SM		From 16.9-17.2': SILTY SAND; Reddish brown, very fine grained	
				CL		From 17.2-19.6': CLAY to SILTY CLAY; Reddish brown, firm, low moisture, increased SILT w/depth	
-20				SM		From 19.6-20': SILTY SAND; Brown, very fine grained, moist	
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB10
Date Drilled: 09/26/14 & 9/30/14
Total Depth: 30 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL & J KING
UTM Easting: 635632.968

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587158.732

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.2	3.19	ML		From 0-0.25': CLAYEY SILT; Brown, w/organic, roots	
			1.90	CL		From 0.25-2.4': SILTY CLAY; Grayish brown to brownish gray, few orange mottles, firm, low moisture	
			1.01	ML		From 2.4-4.2': CLAYEY SILT; Brownish gray, Ca & Fe, firm, low moisture	
-5		5.0	NM	CL		From 5-10': SILTY CLAY; Light olive gray, Mn & Fe throughout, abundant @ 5.6-6.4', firm, low moisture	
-10		5.0	2.59	CL		From 10-15': SILTY CLAY; Light olive gray, w/Fe & Mn, to dense, brown SILTY CLAY @ 14.4', trace very fine Ca nodules throughout, firm, low moisture	
			2.78				
			2.58				
-15		5.0	NM	ML		From 15-16.6': SILT & CLAYEY SILT; Reddish brown w/gray mottling, wet to saturated	
				CL		From 16.6-16.9': CLAY lense; Brown, firm	
				SM		From 16.9-17.2': SILTY SAND; Reddish brown, very fine grained	
				CL		From 17.2-19.6': CLAY to SILTY CLAY; Reddish brown, firm, low moisture, increased SILT w/depth	
-20				SM		From 19.6-20': SILTY SAND; Brown, very fine grained, moist	
		5.0	NM	ML		From 20-20.4': SILT w/minor CLAY & SAND; Brown, moist	
				CL		From 20.4-23.2': SILTY CLAY; Gray, soft, moist to wet w/depth	
				SW		From 23.2-23.6': SAND lens; Brown, wet	M-MW03 19-29'
				ML		From 23.6-25': SANDY SILT; Gray, wet	
-25		5.0	NM	SW		From 25-30': SAND w/minor SILT content; Brown, grains coarsen w/depth, wet	
-30							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: 11301
Borehole No: M-SB11
Date Drilled: 09/26/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J MCDANIEL
UTM Easting: 635521.367

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587324.045

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.1	1.59	ML		From 0-0.25': CLAYEY SILT; Brown, w/roots, organic	
			1.95	ML		From 0.25-4.1': CLAYEY SILT; grayish brown, increasing CLAY content w/depth	
			0.47				
-5		5.0	0.62	CL		From 5-10': SILTY CLAY; Grayish brown, abundant Fe & Mn, firm, low moisture	
			0.67				
			0.79				
-10		5.0	NM	CL		From 10-14.2': SILTY CLAY; Grayish brown, reddish brown @ 13.2-13.6'	
				SM		From 14.2-15': SAND; Brown, very SILTY, very fine grained, moist	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB12
Date Drilled: 09/29/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J KING
UTM Easting: 635478.225

Section/Township/Range: S 32 & 33, T 17N, R 9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587096.935

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.2	0.02	ML		From 0-1': Alternating SILT/SILTY CLAY; Tan-brown, grass @ top of core	
			0.30	CL		From 1-4.2': SILTY CLAY; Tan-light brown, Fe nodules, firm, dry crumbles	
			0.66				
-5		5.0	0.64	CL		From 5-7.5': SILTY CLAY; Light Brown-brown, Fe Nodules, firm, low moisture	
			1.18	CL		From 7.5-10': SILTY CLAY; Brown, w/orange staining, Fe nodules, low moisture, less SILT content	
			2.00				
-10		5.0	2.55	CL		From 10-11.9': SILTY CLAY; Brown, w/orange staining, Fe nodules, low moisture	
			2.50	SW/CL		From 11.9-15': Alternating fine grained SAND; Brown, dry & SILTY CLAY; Dark brown, firm, low moisture, Clay lenses @ 12.4-12.8' & 14.4-14.6', Moist SAND @ bottom of core (2")	
			1.78				
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB13
Date Drilled: 09/29/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J KING
UTM Easting: 635469.252

Section/Township/Range: S 32 & 33, T 17N, R 9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587132.821

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.5	0.26	CL		From 0-1.1': SILTY CLAY; Brown, very SILTY, dry crumbles, organics @ top of core	
			1.93	CL		From 1.1-4.5': SILTY CLAY; Brown-gray, firm, low moisture, intervals of increased SILT, Fe nodules @ 3.8'	
			1.86				
-5		5.0	1.82	CL		From 5-10': SILTY CLAY; Brown-gray, orange staining, firm, low moisture, low SILT content	
			2.16				
			2.17				
-10		5.0	2.22	CL		From 10-13': CLAY/SILTY CLAY; Dark brown-gray, w/black & red staining, firm, low moisture	
			1.92				
				ML		From 13-13.4': CLAYEY SILT; Brown, dry	
			2.75	CL		From 13.4-14.5': SILTY CLAY; Gray-brown, firm, low moisture, increased SILT content, Ca nodules @ 14.4'	
-15				SW		From 14.5-15': SAND; Tan, very fine grained, dry	
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB14
Date Drilled: 09/29/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J KING
UTM Easting: 635643.345

Section/Township/Range: S 32 & 33, T 17N, R 9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587241.818

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.1	0.01	CL		From 0-2.1': SILTY CLAY; Light brown, dry crumbles, grass @ top of core	
			0.07	CL		From 2.1-4.1': SILTY CLAY; Brown, w/orange staining, Fe nodules, firm	
			0.46				
-5		5.0	0.28	CL		From 5-10": SILTY CLAY; Brown, w/orange staining, Fe nodules, firm, low moisture, decreased SILT content @ 8.5'	
			0.23				
			1.07				
-10		4.3	0.13	CL		From 10-11': SILTY CLAY; Brown, firm, dry, low moisture	
			0.33	ML		From 11-12.7': CLAYEY SILT/SILT; Alternating layers, Brown, low moisture	
			0.01	ML		From 12.7-14.3': SANDY SILT; Brown, very fine grained, dry, small clay layer @ 13.4'	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB15
Date Drilled: 09/30/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J KING
UTM Easting: 635325.263

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587377.226

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.5	0.12	CL		From 0-1': SILTY CLAY; Orange-brown, dry, crumbles	
			0.10	CL		From 1-4.5': SILTY CLAY; Light brown, w/orange-dark brown mottling, firm, dry	
			0.55				
-5		5.0	0.12	CL		From 5-5.8': SILTY CLAY; Brown, firm, dry, crumbles	
			0.14	CL		From 5.8-10': SILTY CLAY; Brown, SILT content increasing w/depth	
			0.14				
-10		3.8	0.12	ML		From 10-13': SILT w/fine grained SAND; Brown, damp, SAND content increasing w/depth	
			0.10				
			0.55	CL		From 13-13.4': CLAY; Red-brown, firm	
				ML		From 13.4-13.8': SANDY SILT; Brown, saturated	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB16
Date Drilled: 09/30/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J KING
UTM Easting: 635396.197

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587396.499

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		3.9	2.05	CL		From 0-0.5': SILTY CLAY; Dark brown, w/organics, firm	
				CL		From 0.5-1.7': SILTY CLAY; Gray-brown, w/brown mottling, soft	
			1.28	CL		From 1.7-3.9': SILTY CLAY; Gray-brown, w/orange mottling, firm, increasing SILT content w/depth	
			0.95				
-5		5.0	1.04	CL		From 5-10': SILTY CLAY; Light gray-brown, w/orange & dark brown mottling, firm	
			1.09				
			0.92				
-10		5.0	0.92	CL		From 10-14.2': SILTY CLAY; Gray-brown, w/orange & dark brown mottling, firm, SILT content increasing w/depth	
			1.41				
			0.91				
				ML/SM		From 14.2-15': SANDY SILT to SILTY SAND; Brown, moist	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project:	MOORE - 11301	**Drilling Method:**	GEOPROBE DUAL TUBE	**Section/Township/Range:**	
Borehole No:	M-SB17	**Drilled By:**	DEVONIAN GROUP		S 32 & 33, T 17N, R 9E
Date Drilled:	09/30/14	**Logged By:**	J KING	**Parish:**	RICHLAND **State:** LA
Total Depth:	15 FT BGS	**UTM Easting:**	635411.020	**UTM Northing:**	3587449.248

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.4	0.05	CL		From 0-0.6': SILTY CLAY; Orange-brown, dry, crumbles	
			0.05	CL		From 0.6-4.4': SILTY CLAY; Brown, w/orange-dark brown mottling, firm, dry	
			0.24				
-5		5.0	0.35	CL		From 5-10': SILTY CLAY; Brown, w/orange & dark brown mottling, firm, SILT content increasing w/depth	
			0.60				
			1.36				
-10		4.0	0.74	CL/ML		From 10-11.6': SILTY CLAY grading to CLAYEY SILT; Brown, firm	
			1.16	CL ML CL		From 11.6-11.9': CLAY; Brown, firm	
			0.02	SW		From 11.9-12.1': SILT; Brown, damp	
						From 12.1-12.3': CLAY; Brown, firm	
						From 12.3-14': SILT to fine grained SAND; Light brown	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB18
Date Drilled: 09/30/14
Total Depth: 15 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J KING
UTM Easting: 635547.916

Section/Township/Range: S 32 & 33, T 17N, R 9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587449.855

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		5.0	0.44	CL		From 0-5': SILTY CLAY; Gray-brown, firm	
			1.66				
			1.42				
-5		5.0	1.43	CL		From 5-10': SILTY CLAY; Brown, w/orange & brown mottling, firm	
			2.04				
			2.44				
-10		5.0	2.60	CL		From 10-14': CLAY, w/minor SILT content; Brown-gray, w/dark brown & orange mottling, firm	
			2.74				
			2.73	SM		From 14-15': SILTY SAND; Light brown, damp	
-15							
-20							
-25							

ARABIE ENVIRONMENTAL SOLUTIONS, INC.

Project: MOORE - 11301
Borehole No: M-SB19
Date Drilled: 10/01/14
Total Depth: 20 FT BGS

Drilling Method: GEOPROBE DUAL TUBE
Drilled By: DEVONIAN GROUP
Logged By: J KING
UTM Easting: 635724.690

Section/Township/Range: S-32 & 33, T-17N, R-9E
Parish: RICHLAND **State:** LA
UTM Northing: 3587233.589

Depth (ft)	Sample Interval	Recovery (feet)	Field Conductivity (mmhos/cm)	USCS	Lithology	Description of Stratum	Screened Interval
0		4.2	0.59	ML		From 0-0.5': CLAYEY SILT; Light brown, dry, crumbles	
			1.86	CL		From 0.5-4.2': SILTY CLAY; Light brown, firm, dry, more CLAY content w/depth	
			1.86				
-5		5.0	1.88	CL		From 5-10"; SILTY CLAY; Light brown, w/orange & dark brown mottling, firm, SILT pockets @ ~6.1'	
			2.02				
			2.27				
-10		5.0	2.45	CL		From 10-15': SILTY CLAY; Light brown, w/ orange & dark staining, minor SILT pockets throughout, firm	
			2.61				
			2.53				
-15		5.0	2.13	CL/ML		From 15-16.4': SILTY CLAY to CLAYEY SILT; Light brown, firm, dry	
			NM	ML		From 16.4-20': CLAYEY SILT, w/fine grained SAND; Brown, wet, saturated, SAND content increasing w/depth	
-20							
-25							

ATTACHMENT D

LABORATORY ANALYTICAL REPORTS
ON CD

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana

ATTACHMENT E

BACKGROUND CALCULATIONS

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana

Electrical Conductivity

Calculation of Background Soil Conditions

Electrical Conductivity
Calculate mean background EC

		Sample ID
0.14	mmhos/cm	B54 (0-1)
0.18	mmhos/cm	B-54-1A
0.16	mmhos/cm	B54 (1-2)
0.19	mmhos/cm	B-54-2A
0.15	mmhos/cm	B54 (2-3)
0.16	mmhos/cm	B-54-3A
0.1	mmhos/cm	B55 (0-1)
0.17	mmhos/cm	B-55-1A
0.1	mmhos/cm	B55 (1-2)
0.1	mmhos/cm	B-55-2A
0.1	mmhos/cm	B55 (2-3)
0.1	mmhos/cm	B-55-3A
0.14	mmhos/cm	B56 (0-1)
0.15	mmhos/cm	B-56-1A
0.25	mmhos/cm	B56 (1-2)
0.25	mmhos/cm	B-56-2A
0.21	mmhos/cm	B56 (2-3)
0.21	mmhos/cm	B-56-3A
0.11	mmhos/cm	B57 (0-1)
0.13	mmhos/cm	B-57-1A
0.1	mmhos/cm	B57 (1-2)
0.1	mmhos/cm	B-57-2A
0.1	mmhos/cm	B57 (2-3)
0.1	mmhos/cm	B-57-3A
0.1	mmhos/cm	B58 (0-1)
0.1	mmhos/cm	B-58-1A
0.1	mmhos/cm	B58 (1-2)
0.1	mmhos/cm	B-58-2A
0.1	mmhos/cm	B58 (2-3)
0.1	mmhos/cm	B-58-3A
0.17	mmhos/cm	B59 (0-1)
0.1	mmhos/cm	B-59-1A
0.1	mmhos/cm	B59 (1-2)
0.1	mmhos/cm	B-59-2A
0.1	mmhos/cm	B59 (2-3)
0.1	mmhos/cm	B-59-3A
0.13	mmhos/cm	B60 (0-1)
0.11	mmhos/cm	B-60-1A
0.1	mmhos/cm	B60 (1-2)
0.1	mmhos/cm	B-60-2A
0.27	mmhos/cm	B60 (2-3)
0.1	mmhos/cm	B-60-3A
0.17	mmhos/cm	B61 (0-1)
0.15	mmhos/cm	B-61-1A
0.57	mmhos/cm	B61 (1-2)
0.52	mmhos/cm	B-61-2A
0.5	mmhos/cm	B61 (2-3)
0.46	mmhos/cm	B-61-3A
0.15	mmhos/cm	B62 (0-1)
0.15	mmhos/cm	B-62-1A
0.18	mmhos/cm	B62 (1-2)
0.13	mmhos/cm	B-62-2A
0.24	mmhos/cm	B62 (2-3)
0.21	mmhos/cm	B-62-3A
0.15	mmhos/cm	B64 (0-1)
0.16	mmhos/cm	B-64-1A
0.17	mmhos/cm	B64 (1-2)
0.13	mmhos/cm	B-64-2A
0.29	mmhos/cm	B64 (2-3)

Electrical Conductivity

Calculate mean background EC

		Sample ID			
0.3	mmhos/cm	B-64-3A			
0.12	mmhos/cm	B65 (0-1)			
0.1	mmhos/cm	B-65-1A			
0.11	mmhos/cm	B65 (1-2)			
0.1	mmhos/cm	B-65-2A			
0.28	mmhos/cm	B65 (2-3)			
0.27	mmhos/cm	B-65-3A			
0.21	mmhos/cm	B66 (0-1)			
0.11	mmhos/cm	B-66-1A			
0.2	mmhos/cm	B66 (1-2)			
0.29	mmhos/cm	B-66-2A			
0.72	mmhos/cm	B66 (2-3)			
0.48	mmhos/cm	B-66-3A			
0.1	mmhos/cm	B67 (0-1)			
0.1	mmhos/cm	B-67-1A			
0.1	mmhos/cm	B67 (1-2)			
0.1	mmhos/cm	B-67-2A			
0.1	mmhos/cm	B67 (2-3)			
+ 0.1	mmhos/cm	B-67-3A	0.176923	0.122393	0.299316
14	/ n				

0.18	n=	78	

Calculate background variance

0.14	-	0.18	=	-0.037 ^2	0.001
0.18	-	0.18	=	0.003 ^2	0.000
0.16	-	0.18	=	-0.017 ^2	0.000
0.19	-	0.18	=	0.013 ^2	0.000
0.15	-	0.18	=	-0.027 ^2	0.001
0.16	-	0.18	=	-0.017 ^2	0.000
0.10	-	0.18	=	-0.077 ^2	0.006
0.17	-	0.18	=	-0.007 ^2	0.000
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.14	-	0.18	=	-0.037 ^2	0.001
0.15	-	0.18	=	-0.027 ^2	0.001
0.25	-	0.18	=	0.073 ^2	0.005
0.25	-	0.18	=	0.073 ^2	0.005
0.21	-	0.18	=	0.033 ^2	0.001
0.11	-	0.18	=	-0.067 ^2	0.004
0.13	-	0.18	=	-0.047 ^2	0.002
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.17	-	0.18	=	-0.007 ^2	0.000
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.13	-	0.18	=	-0.047 ^2	0.002
0.11	-	0.18	=	-0.067 ^2	0.004
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.27	-	0.18	=	0.093 ^2	0.009
0.10	-	0.18	=	-0.077 ^2	0.006

Electrical Conductivity

Calculate background variance

0.17	-	0.18	=	-0.007 ^2	0.000
0.15	-	0.18	=	-0.027 ^2	0.001
0.52	-	0.18	=	0.343 ^2	0.118
0.50	-	0.18	=	0.323 ^2	0.104
0.46	-	0.18	=	0.283 ^2	0.080
0.15	-	0.18	=	-0.027 ^2	0.001
0.15	-	0.18	=	-0.027 ^2	0.001
0.18	-	0.18	=	0.003 ^2	0.000
0.13	-	0.18	=	-0.047 ^2	0.002
0.24	-	0.18	=	0.063 ^2	0.004
0.15	-	0.18	=	-0.027 ^2	0.001
0.16	-	0.18	=	-0.017 ^2	0.000
0.17	-	0.18	=	-0.007 ^2	0.000
0.13	-	0.18	=	-0.047 ^2	0.002
0.29	-	0.18	=	0.113 ^2	0.013
0.30	-	0.18	=	0.123 ^2	0.015
0.12	-	0.18	=	-0.057 ^2	0.003
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.28	-	0.18	=	0.103 ^2	0.011
0.27	-	0.18	=	0.093 ^2	0.009
0.27	-	0.18	=	0.093 ^2	0.009
0.21	-	0.18	=	0.033 ^2	0.001
0.11	-	0.18	=	-0.067 ^2	0.004
0.20	-	0.18	=	0.023 ^2	0.001
0.72	-	0.18	=	0.543 ^2	0.295
0.48	-	0.18	=	0.303 ^2	0.092
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
0.10	-	0.18	=	-0.077 ^2	0.006
					0.98 /n-1

0.01 variance n-1= 77

Calculate background standard deviation

0.11 sqareroot of variance

Evaluate distribution of background data using CV test

0.11 / 0.18

0.64 (CV>1 unacceptable)

Calculate upper limit of background data

BG = 0.18 + 0.11

0.29 mmhos/cm Background Concentration

Sodium Adsorption Ratio

Calculation of Background Soil Conditions

Sodium Adsorption Ratio
Calculate mean background SAR

	Sample ID
1.67	B54 (0-1)
2.36	B-54-1A
2.03	B54 (1-2)
2.55	B-54-2A
1.9	B54 (2-3)
1.85	B-54-3A
0.727	B55 (0-1)
0.914	B-55-1A
0.851	B55 (1-2)
1.03	B-55-2A
0.916	B55 (2-3)
1	B-55-3A
1.28	B56 (0-1)
1.63	B-56-1A
2.49	B56 (1-2)
3.04	B-56-2A
3.56	B56 (2-3)
3.23	B-56-3A
0.323	B57 (0-1)
0.601	B-57-1A
0.544	B57 (1-2)
0.898	B-57-2A
0.552	B57 (2-3)
1.03	B-57-3A
1.13	B58 (0-1)
0.949	B-58-1A
1.04	B58 (1-2)
1.14	B-58-2A
1	B58 (2-3)
0.933	B-58-3A
1.52	B59 (0-1)
1.32	B-59-1A
0.886	B59 (1-2)
1.12	B-59-2A
1.39	B59 (2-3)
0.929	B-59-3A
1.94	B60 (0-1)
1.75	B-60-1A
1.67	B60 (1-2)
1.84	B-60-2A
3.92	B60 (2-3)
1.45	B-60-3A
2.01	B61 (0-1)
2.47	B-61-1A
4.76	B61 (1-2)
5.82	B-61-2A
6.88	B61 (2-3)
5.43	B-61-3A
1.47	B62 (0-1)
1.3	B-62-1A
3.01	B62 (1-2)
2.11	B-62-2A
3.41	B62 (2-3)
3.33	B-62-3A
1.88	B64 (0-1)
2.71	B-64-1A
3.29	B64 (1-2)
1.67	B-64-2A
4.5	B64 (2-3)

Sodium Adsorption Ratio

Calculate mean background SAR

	Sample ID
3.55	B-64-3A
1.44	B65 (0-1)
1.09	B-65-1A
1.79	B65 (1-2)
1.43	B-65-2A
4.6	B65 (2-3)
3.3	B-65-3A
2.28	B66 (0-1)
1.52	B-66-1A
2.1	B66 (1-2)
2.72	B-66-2A
5.08	B66 (2-3)
4.05	B-66-3A
1.6	B67 (0-1)
1.19	B-67-1A
1.52	B67 (1-2)
1.07	B-67-2A
1.48	B67 (2-3)
+ 1.56	B-67-3A
162 / n	

2.08	n=	78

Calculate background variance

1.67	-	2.08	=	-0.411 ^2	0.169
2.36	-	2.08	=	0.279 ^2	0.078
2.03	-	2.08	=	-0.051 ^2	0.003
2.55	-	2.08	=	0.469 ^2	0.220
1.90	-	2.08	=	-0.181 ^2	0.033
1.85	-	2.08	=	-0.231 ^2	0.053
0.73	-	2.08	=	-1.354 ^2	1.833
0.91	-	2.08	=	-1.167 ^2	1.362
1.03	-	2.08	=	-1.051 ^2	1.105
0.92	-	2.08	=	-1.165 ^2	1.357
1.00	-	2.08	=	-1.081 ^2	1.169
1.28	-	2.08	=	-0.801 ^2	0.642
1.63	-	2.08	=	-0.451 ^2	0.203
2.49	-	2.08	=	0.409 ^2	0.167
3.04	-	2.08	=	0.959 ^2	0.920
3.56	-	2.08	=	1.479 ^2	2.187
0.32	-	2.08	=	-1.758 ^2	3.091
0.60	-	2.08	=	-1.480 ^2	2.191
0.54	-	2.08	=	-1.537 ^2	2.363
0.90	-	2.08	=	-1.183 ^2	1.400
0.55	-	2.08	=	-1.529 ^2	2.338
1.03	-	2.08	=	-1.051 ^2	1.105
1.13	-	2.08	=	-0.951 ^2	0.905
0.95	-	2.08	=	-1.132 ^2	1.282
1.14	-	2.08	=	-0.941 ^2	0.886
1.00	-	2.08	=	-1.081 ^2	1.169
0.93	-	2.08	=	-1.148 ^2	1.318
1.52	-	2.08	=	-0.561 ^2	0.315
1.32	-	2.08	=	-0.761 ^2	0.579
0.89	-	2.08	=	-1.195 ^2	1.428
1.12	-	2.08	=	-0.961 ^2	0.924
1.39	-	2.08	=	-0.691 ^2	0.478
1.94	-	2.08	=	-0.141 ^2	0.020
1.75	-	2.08	=	-0.331 ^2	0.110
1.67	-	2.08	=	-0.411 ^2	0.169
1.84	-	2.08	=	-0.241 ^2	0.058
3.92	-	2.08	=	1.839 ^2	3.382
1.45	-	2.08	=	-0.631 ^2	0.398

Sodium Adsorption Ratio

Calculate background variance

2.01	-	2.08	=	-0.071 ^2	0.005
2.47	-	2.08	=	0.389 ^2	0.151
5.82	-	2.08	=	3.739 ^2	13.980
6.88	-	2.08	=	4.799 ^2	23.030
5.43	-	2.08	=	3.349 ^2	11.215
1.47	-	2.08	=	-0.611 ^2	0.373
1.30	-	2.08	=	-0.781 ^2	0.610
3.01	-	2.08	=	0.929 ^2	0.863
2.11	-	2.08	=	0.029 ^2	0.001
3.41	-	2.08	=	1.329 ^2	1.766
1.88	-	2.08	=	-0.201 ^2	0.040
2.71	-	2.08	=	0.629 ^2	0.396
3.29	-	2.08	=	1.209 ^2	1.462
1.67	-	2.08	=	-0.411 ^2	0.169
4.50	-	2.08	=	2.419 ^2	5.851
3.55	-	2.08	=	1.469 ^2	2.158
1.44	-	2.08	=	-0.641 ^2	0.411
1.09	-	2.08	=	-0.991 ^2	0.982
1.43	-	2.08	=	-0.651 ^2	0.424
4.60	-	2.08	=	2.519 ^2	6.345
3.30	-	2.08	=	1.219 ^2	1.486
3.30	-	2.08	=	1.219 ^2	1.486
2.28	-	2.08	=	0.199 ^2	0.040
1.52	-	2.08	=	-0.561 ^2	0.315
2.10	-	2.08	=	0.019 ^2	0.000
5.08	-	2.08	=	2.999 ^2	8.994
4.05	-	2.08	=	1.969 ^2	3.877
1.60	-	2.08	=	-0.481 ^2	0.231
1.60	-	2.08	=	-0.481 ^2	0.231
1.19	-	2.08	=	-0.891 ^2	0.794
1.07	-	2.08	=	-1.011 ^2	1.022
1.48	-	2.08	=	-0.601 ^2	0.361
1.48	-	2.08	=	-0.601 ^2	0.361
1.56	-	2.08	=	-0.521 ^2	0.272
					127.11 /n-1

1.65 variance n-1= 77

Calculate background standard deviation

1.28 sqareroot of variance

Evaluate distribution of background data using CV test

1.28 / 2.08

0.62 (CV>1 unacceptable)

Calculate upper limit of background data

BG = 2.08 + 1.28

3.37 Background Concentration

Soluble Chloride

Calculation of Background Soil Conditions

Soluble Chloride
Calculate mean background Chloride

		Sample ID
83	mg/kg	B54 (0-1)
43	mg/kg	B-54-1A
83	mg/kg	B54 (1-2)
77	mg/kg	B-54-2A
50	mg/kg	B54 (2-3)
97	mg/kg	B-54-3A
86	mg/kg	B55 (0-1)
51	mg/kg	B-55-1A
97	mg/kg	B55 (1-2)
53	mg/kg	B-55-2A
49	mg/kg	B55 (2-3)
52	mg/kg	B-55-3A
85	mg/kg	B56 (0-1)
46	mg/kg	B-56-1A
89	mg/kg	B56 (1-2)
46	mg/kg	B-56-2A
97	mg/kg	B56 (2-3)
46	mg/kg	B-56-3A
96	mg/kg	B57 (0-1)
51	mg/kg	B-57-1A
50	mg/kg	B57 (1-2)
99	mg/kg	B-57-2A
50	mg/kg	B57 (2-3)
51	mg/kg	B-57-3A
88	mg/kg	B58 (0-1)
44	mg/kg	B-58-1A
53	mg/kg	B58 (1-2)
52	mg/kg	B-58-2A
54	mg/kg	B58 (2-3)
54	mg/kg	B-58-3A
87	mg/kg	B59 (0-1)
46	mg/kg	B-59-1A
52	mg/kg	B59 (1-2)
54	mg/kg	B-59-2A
52	mg/kg	B59 (2-3)
53	mg/kg	B-59-3A
83	mg/kg	B60 (0-1)
44	mg/kg	B-60-1A
81	mg/kg	B60 (1-2)
81	mg/kg	B-60-2A
111	mg/kg	B60 (2-3)
99	mg/kg	B-60-3A
84	mg/kg	B61 (0-1)
86	mg/kg	B-61-1A
98	mg/kg	B61 (1-2)
67	mg/kg	B-61-2A
116	mg/kg	B61 (2-3)
125	mg/kg	B-61-3A
84	mg/kg	B62 (0-1)
74	mg/kg	B-62-1A
86	mg/kg	B62 (1-2)
80	mg/kg	B-62-2A
99	mg/kg	B62 (2-3)
96	mg/kg	B-62-3A
72	mg/kg	B64 (0-1)
73	mg/kg	B-64-1A
53	mg/kg	B64 (1-2)
88	mg/kg	B-64-2A
115	mg/kg	B64 (2-3)

Soluble Chloride

Calculate mean background Chloride

		Sample ID
108	mg/kg	B-64-3A
74	mg/kg	B65 (0-1)
77	mg/kg	B-65-1A
83	mg/kg	B65 (1-2)
83	mg/kg	B-65-2A
119	mg/kg	B65 (2-3)
117	mg/kg	B-65-3A
79	mg/kg	B66 (0-1)
68	mg/kg	B-66-1A
90	mg/kg	B66 (1-2)
89	mg/kg	B-66-2A
151	mg/kg	B66 (2-3)
103	mg/kg	B-66-3A
84	mg/kg	B67 (0-1)
86	mg/kg	B-67-1A
107	mg/kg	B67 (1-2)
99	mg/kg	B-67-2A
130	mg/kg	B67 (2-3)
+ 120	mg/kg	B-67-3A
6178	/ n	

79.21 n= 78

Calculate background variance

83.00	-	79.21	=	3.795 ^2	14.401
43.00	-	79.21	=	-36.205 ^2	1310.811
83.00	-	79.21	=	3.795 ^2	14.401
77.00	-	79.21	=	-2.205 ^2	4.863
50.00	-	79.21	=	-29.205 ^2	852.940
97.00	-	79.21	=	17.795 ^2	316.657
86.00	-	79.21	=	6.795 ^2	46.170
51.00	-	79.21	=	-28.205 ^2	795.529
53.00	-	79.21	=	-26.205 ^2	686.709
49.00	-	79.21	=	-30.205 ^2	912.350
52.00	-	79.21	=	-27.205 ^2	740.119
85.00	-	79.21	=	5.795 ^2	33.581
46.00	-	79.21	=	-33.205 ^2	1102.581
89.00	-	79.21	=	9.795 ^2	95.940
46.00	-	79.21	=	-33.205 ^2	1102.581
97.00	-	79.21	=	17.795 ^2	316.657
96.00	-	79.21	=	16.795 ^2	282.068
51.00	-	79.21	=	-28.205 ^2	795.529
50.00	-	79.21	=	-29.205 ^2	852.940
99.00	-	79.21	=	19.795 ^2	391.837
50.00	-	79.21	=	-29.205 ^2	852.940
51.00	-	79.21	=	-28.205 ^2	795.529
88.00	-	79.21	=	8.795 ^2	77.350
44.00	-	79.21	=	-35.205 ^2	1239.401
52.00	-	79.21	=	-27.205 ^2	740.119
54.00	-	79.21	=	-25.205 ^2	635.298
54.00	-	79.21	=	-25.205 ^2	635.298
87.00	-	79.21	=	7.795 ^2	60.760
46.00	-	79.21	=	-33.205 ^2	1102.581
52.00	-	79.21	=	-27.205 ^2	740.119
54.00	-	79.21	=	-25.205 ^2	635.298
52.00	-	79.21	=	-27.205 ^2	740.119
83.00	-	79.21	=	3.795 ^2	14.401
44.00	-	79.21	=	-35.205 ^2	1239.401
81.00	-	79.21	=	1.795 ^2	3.222
81.00	-	79.21	=	1.795 ^2	3.222
111.00	-	79.21	=	31.795 ^2	1010.914
99.00	-	79.21	=	19.795 ^2	391.837

Soluble Chloride

Calculate background variance

84.00	-	79.21	=	4.795 ^2	22.991
86.00	-	79.21	=	6.795 ^2	46.170
67.00	-	79.21	=	-12.205 ^2	148.965
116.00	-	79.21	=	36.795 ^2	1353.863
125.00	-	79.21	=	45.795 ^2	2097.170
84.00	-	79.21	=	4.795 ^2	22.991
74.00	-	79.21	=	-5.205 ^2	27.093
86.00	-	79.21	=	6.795 ^2	46.170
80.00	-	79.21	=	0.795 ^2	0.632
99.00	-	79.21	=	19.795 ^2	391.837
72.00	-	79.21	=	-7.205 ^2	51.914
73.00	-	79.21	=	-6.205 ^2	38.504
53.00	-	79.21	=	-26.205 ^2	686.709
88.00	-	79.21	=	8.795 ^2	77.350
115.00	-	79.21	=	35.795 ^2	1281.273
108.00	-	79.21	=	28.795 ^2	829.145
74.00	-	79.21	=	-5.205 ^2	27.093
77.00	-	79.21	=	-2.205 ^2	4.863
83.00	-	79.21	=	3.795 ^2	14.401
119.00	-	79.21	=	39.795 ^2	1583.632
117.00	-	79.21	=	37.795 ^2	1428.452
117.00	-	79.21	=	37.795 ^2	1428.452
79.00	-	79.21	=	-0.205 ^2	0.042
68.00	-	79.21	=	-11.205 ^2	125.555
90.00	-	79.21	=	10.795 ^2	116.529
151.00	-	79.21	=	71.795 ^2	5154.504
103.00	-	79.21	=	23.795 ^2	566.196
84.00	-	79.21	=	4.795 ^2	22.991
84.00	-	79.21	=	4.795 ^2	22.991
86.00	-	79.21	=	6.795 ^2	46.170
99.00	-	79.21	=	19.795 ^2	391.837
130.00	-	79.21	=	50.795 ^2	2580.119
130.00	-	79.21	=	50.795 ^2	2580.119
120.00	-	79.21	=	40.795 ^2	1664.222
					46467.41 /n-1

603.47 variance n-1= 77

Calculate background standard deviation

24.57 sqareroot of variance

Evaluate distribution of background data using CV test

24.57 / 79.21

0.31 (CV>1 unacceptable)

Calculate upper limit of background data

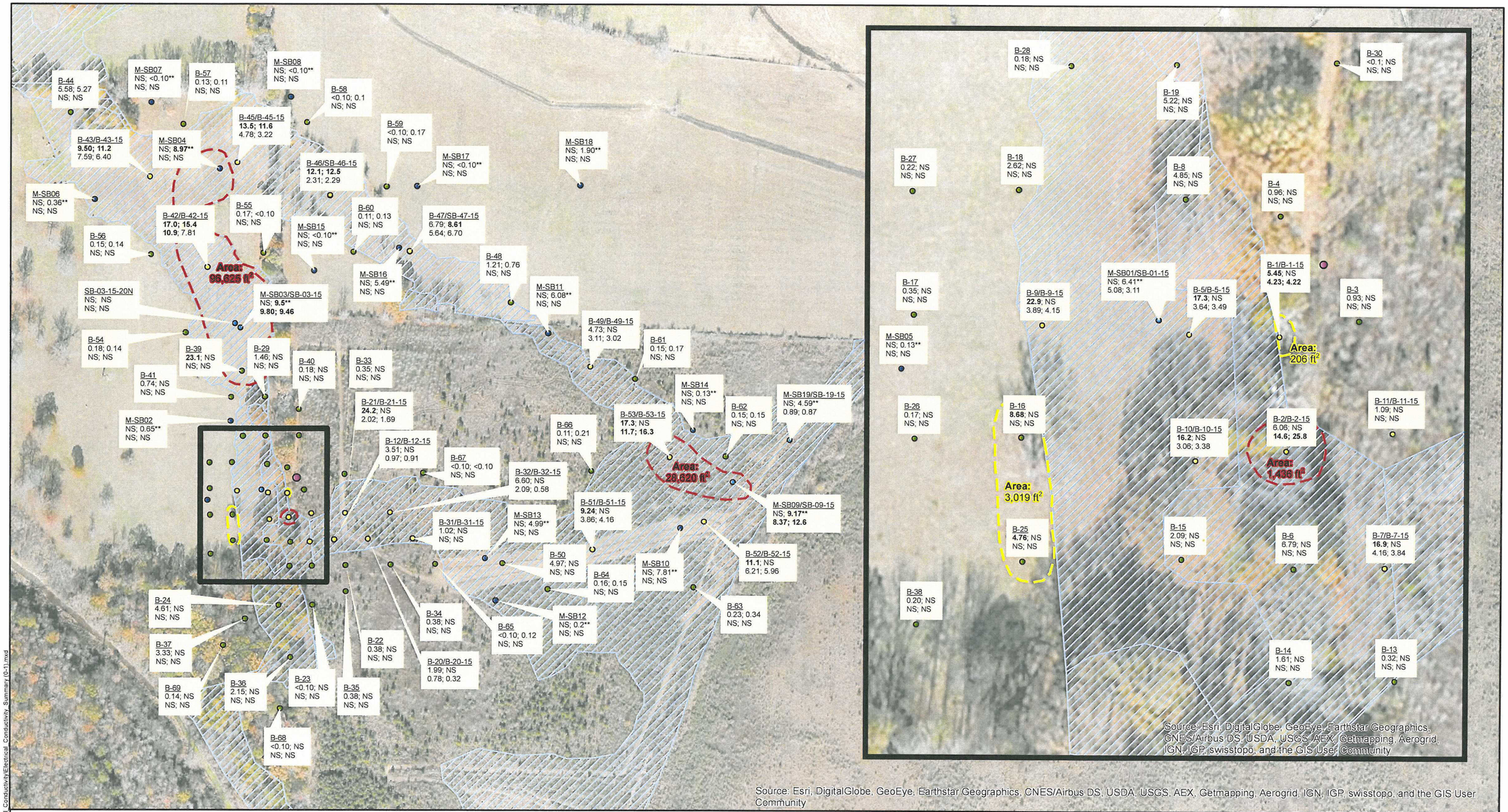
BG = 79.21 + 24.57

103.77 mg/kg Background Concentration

ATTACHMENT F

FIGURES AND TABLES
FROM MPA FEASIBLE PLAN REPORT
MAY 26, 2015

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana



Notes:
Values reported in mmhos/cm
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend

- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate EC Wetland Standard Exceedance Area
- Approximate EC Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

N

Figure 21
EC Results - 0 to 1 Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

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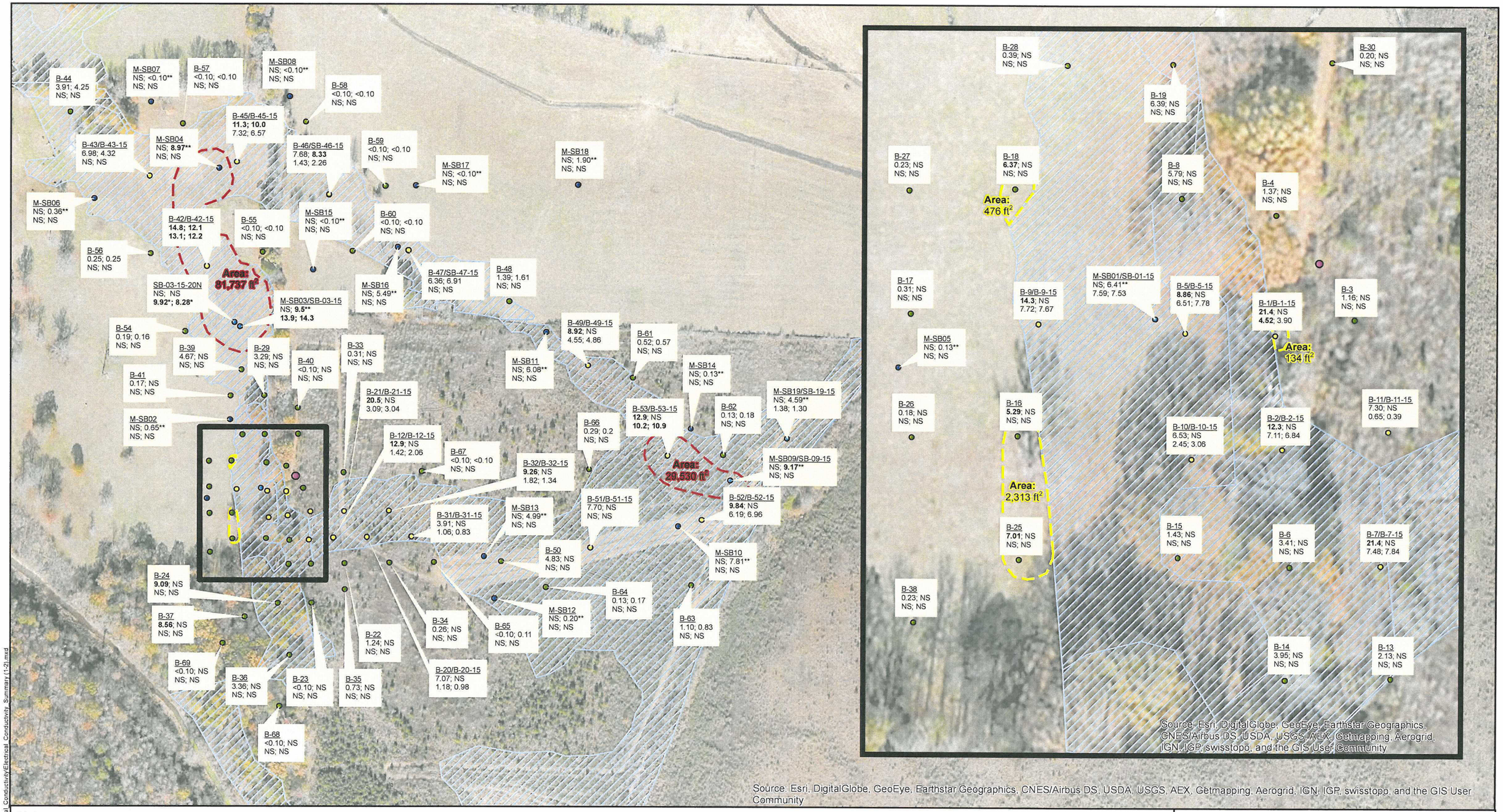


Notes:
Values reported in mmhos/cm
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend

- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate EC Wetland Standard Exceedance Area
- Approximate EC Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

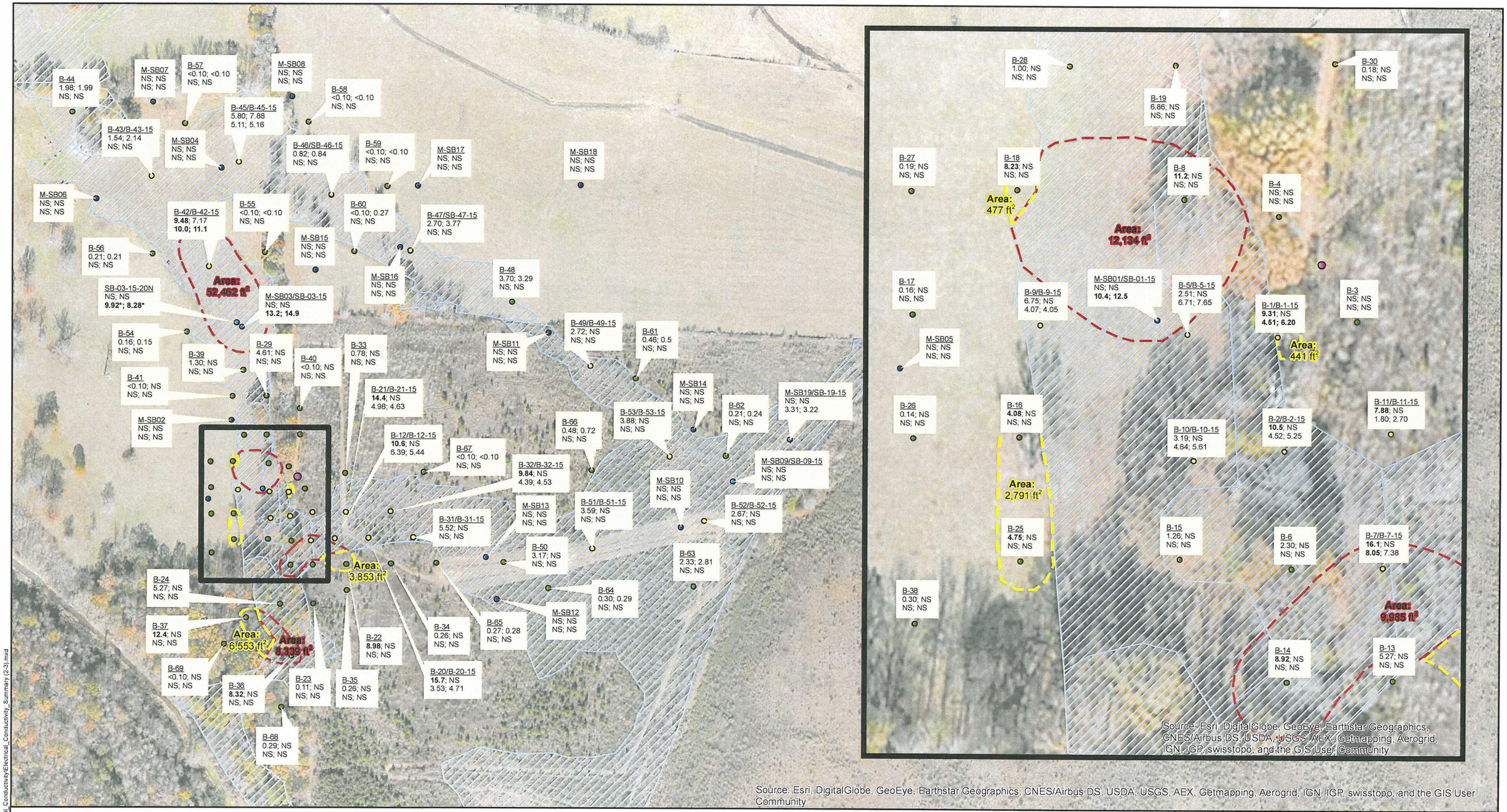
N

Figure 22
EC Results - 1 to 2 Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

Path: C:\GIS\145-02_Denbury\Maps\Electrical_Conductivity\Electrical_Conductivity_Summary (1-2).mxd



Notes:
Values reported in mmhos/cm
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend

- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate EC Wetland Standard Exceedance Area
- Approximate EC Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

N

Figure 23
EC Results - 2 to 3-Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

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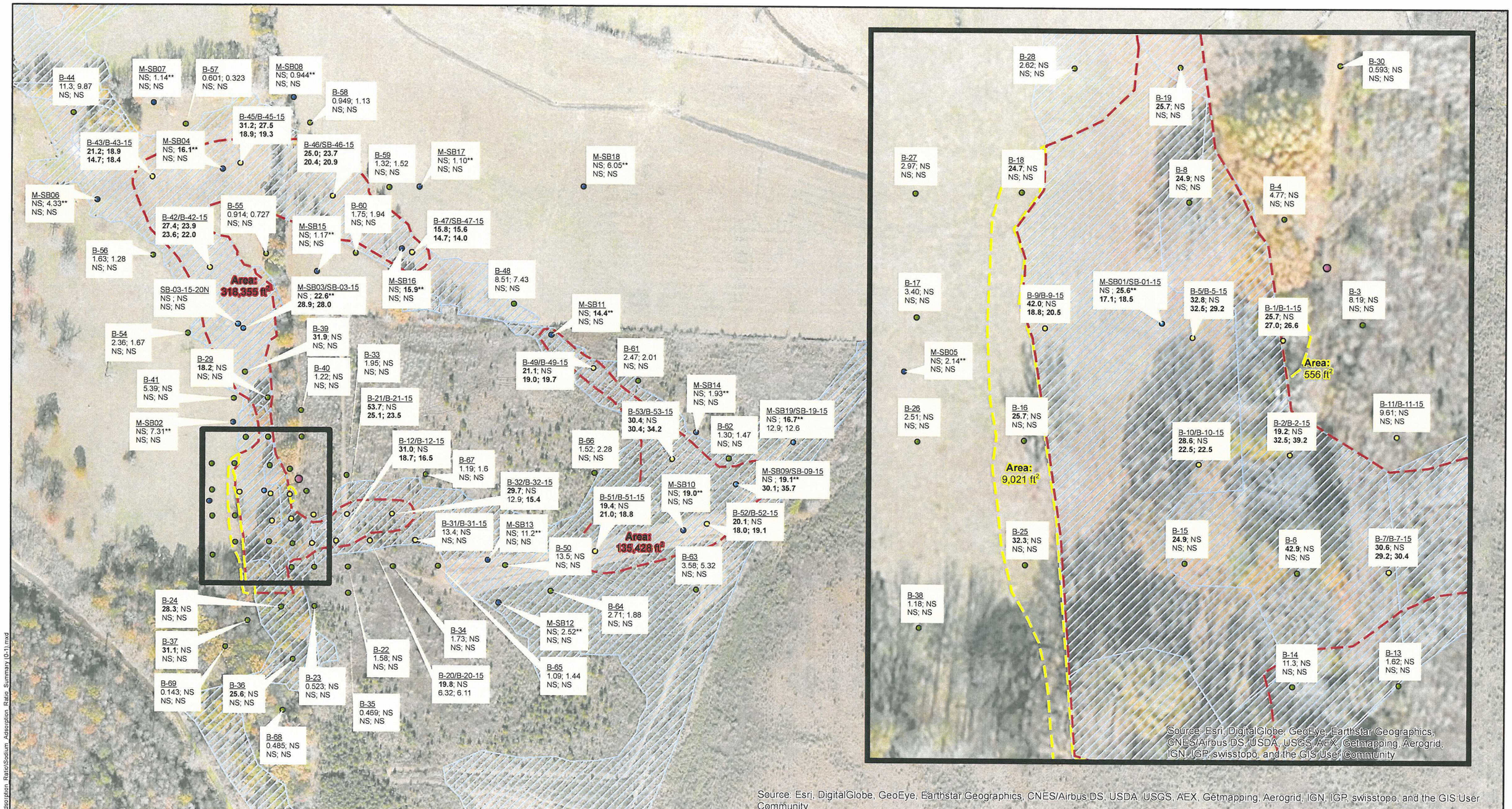

Notes:
Reported values are unitless
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend
- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate SAR Wetland Standard Exceedance Area
- Approximate SAR Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

N

Figure 24
SAR Results - 0 to 1-Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

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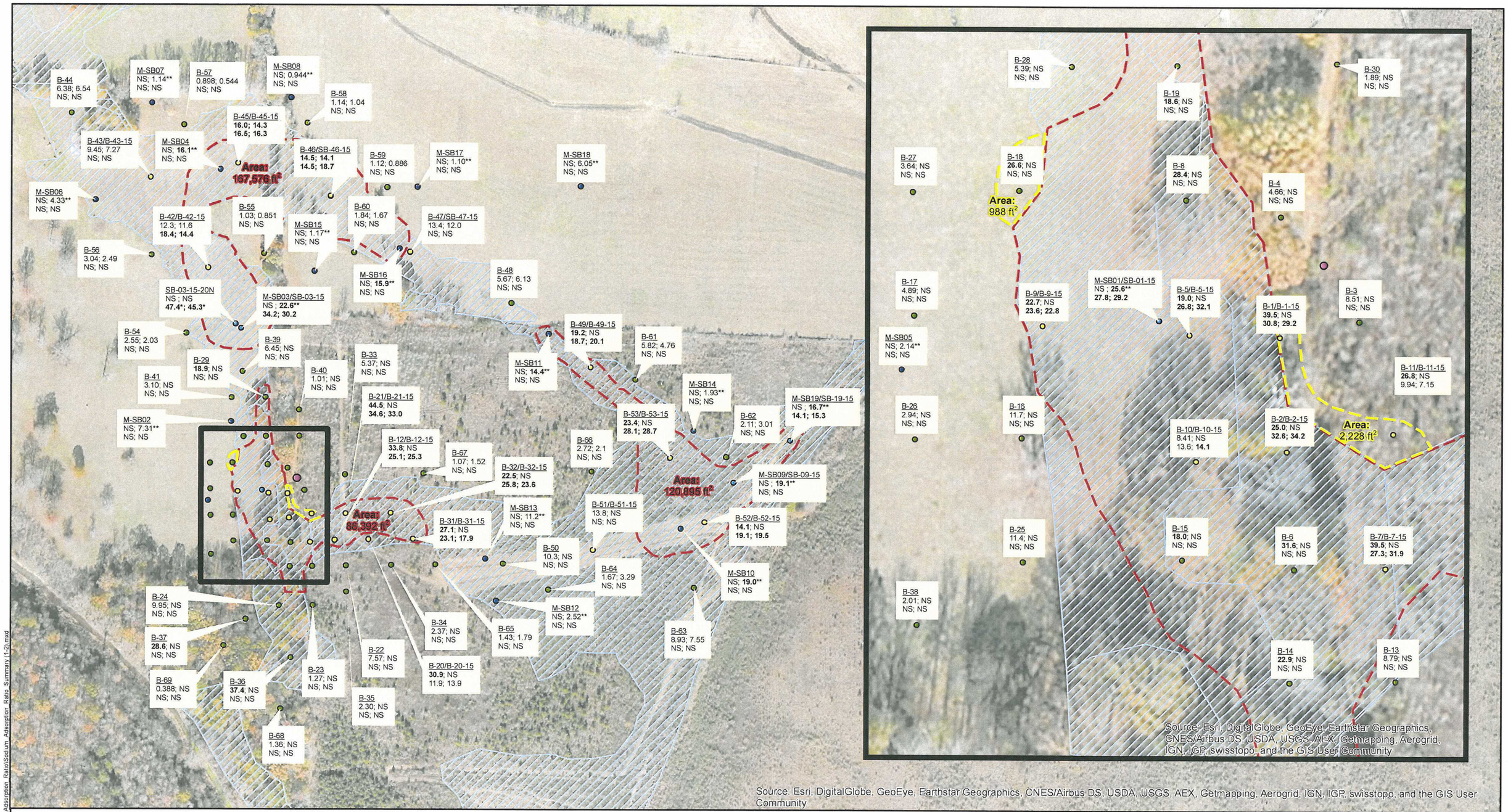

Notes:
Reported values are unitless
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend

- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate SAR Wetland Standard Exceedance Area
- Approximate SAR Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

N

Figure 25
SAR Results - 1 to 2 Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

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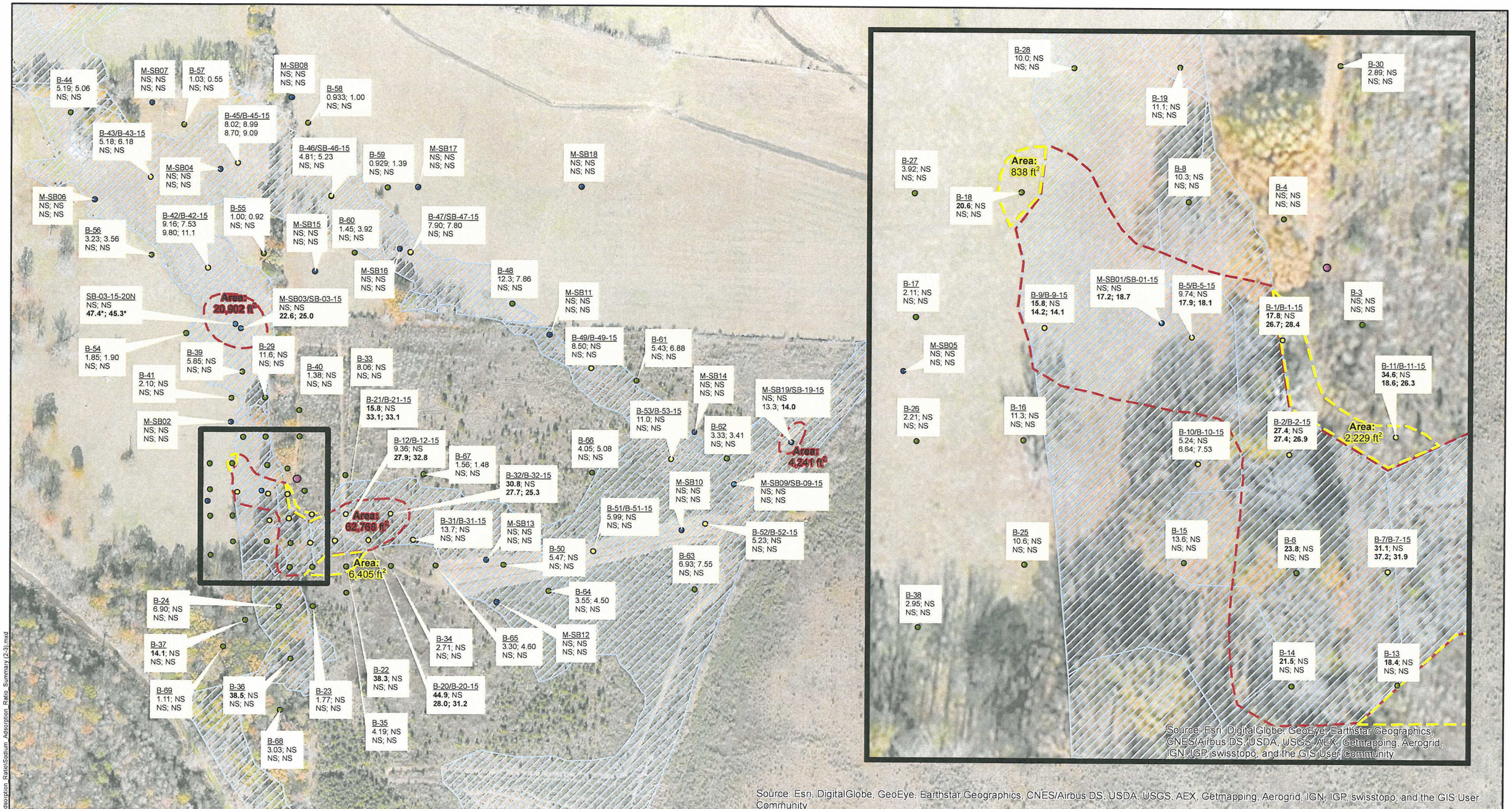

Notes:
Reported values are unitless
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend
- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate SAR Wetland Standard Exceedance Area
- Approximate SAR Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

N

Figure 26
SAR Results - 2 to 3-Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

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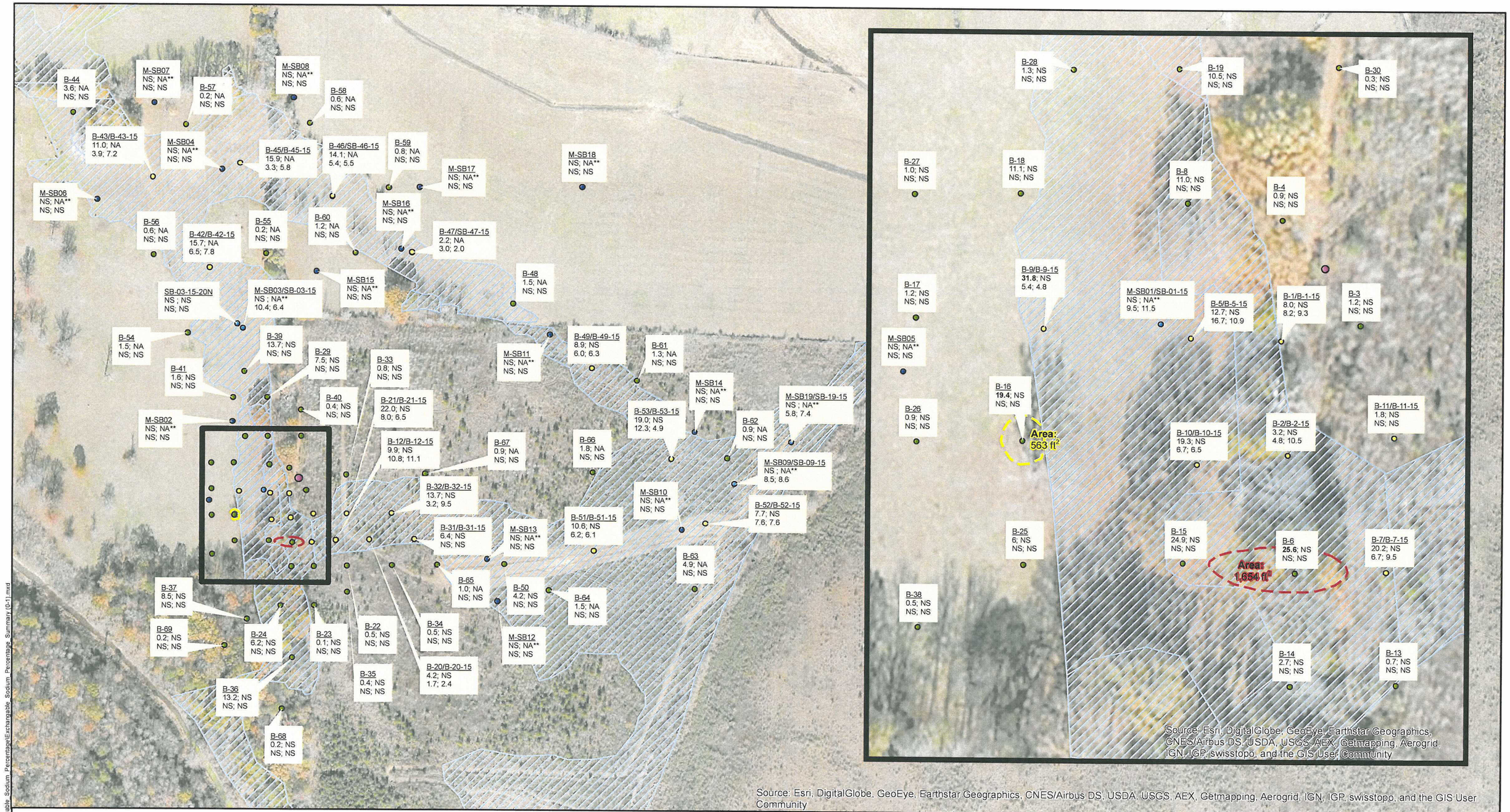


Notes:
Units reported as percentage
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend

- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate ESP Wetland Standard Exceedance Area
- Approximate ESP Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

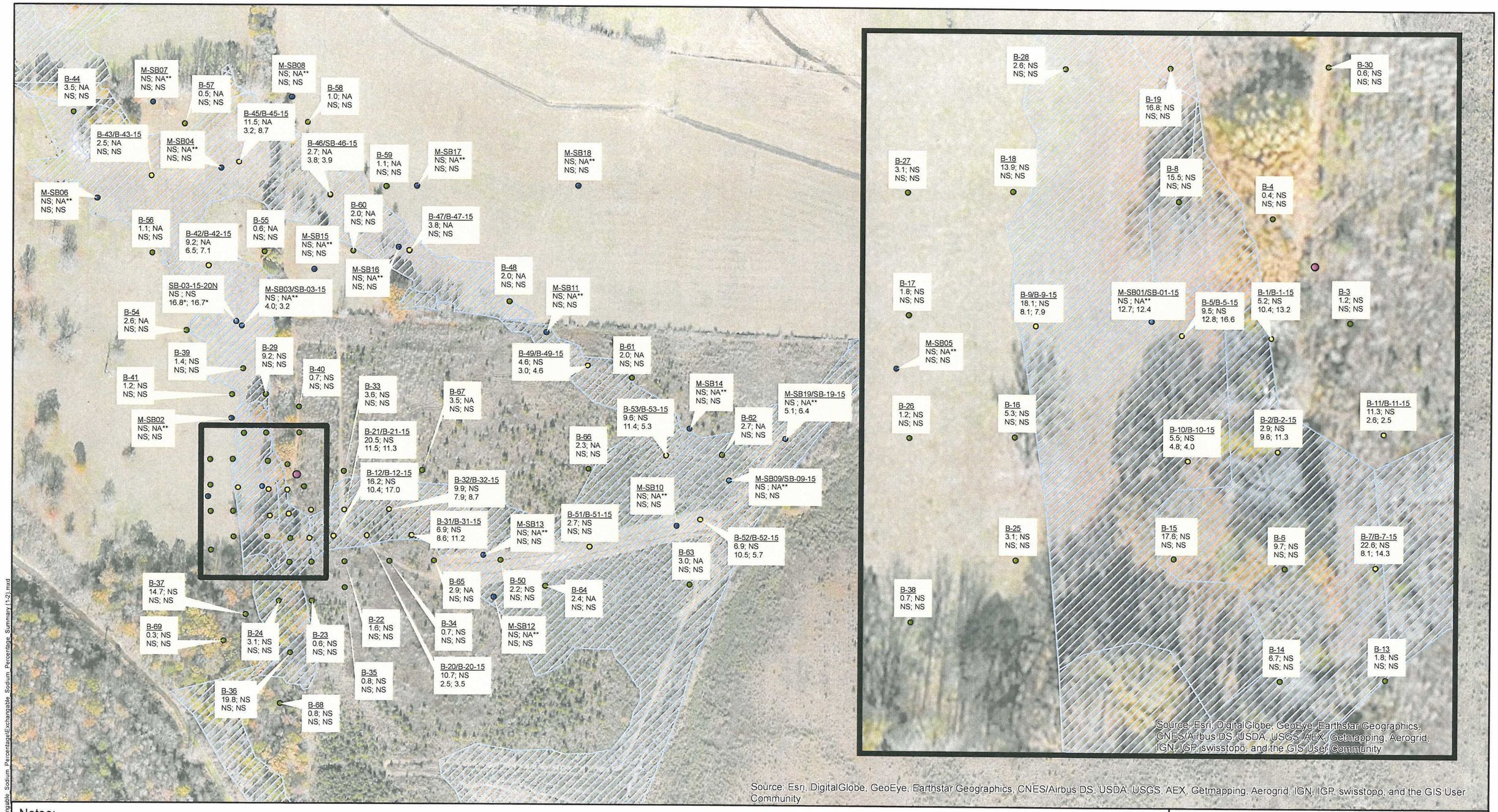
N

Figure 27
ESP Results - 0 to 1-Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

Path: C:\GIS\145-02_Denbury\Maps\Exchangable_Sodium_Percentage\Exchangable_Sodium_Percentage_Summary (0-1).mxd



Notes:
Units reported as percentage
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend
- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate ESP Wetland Standard Exceedance Area
- Approximate ESP Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

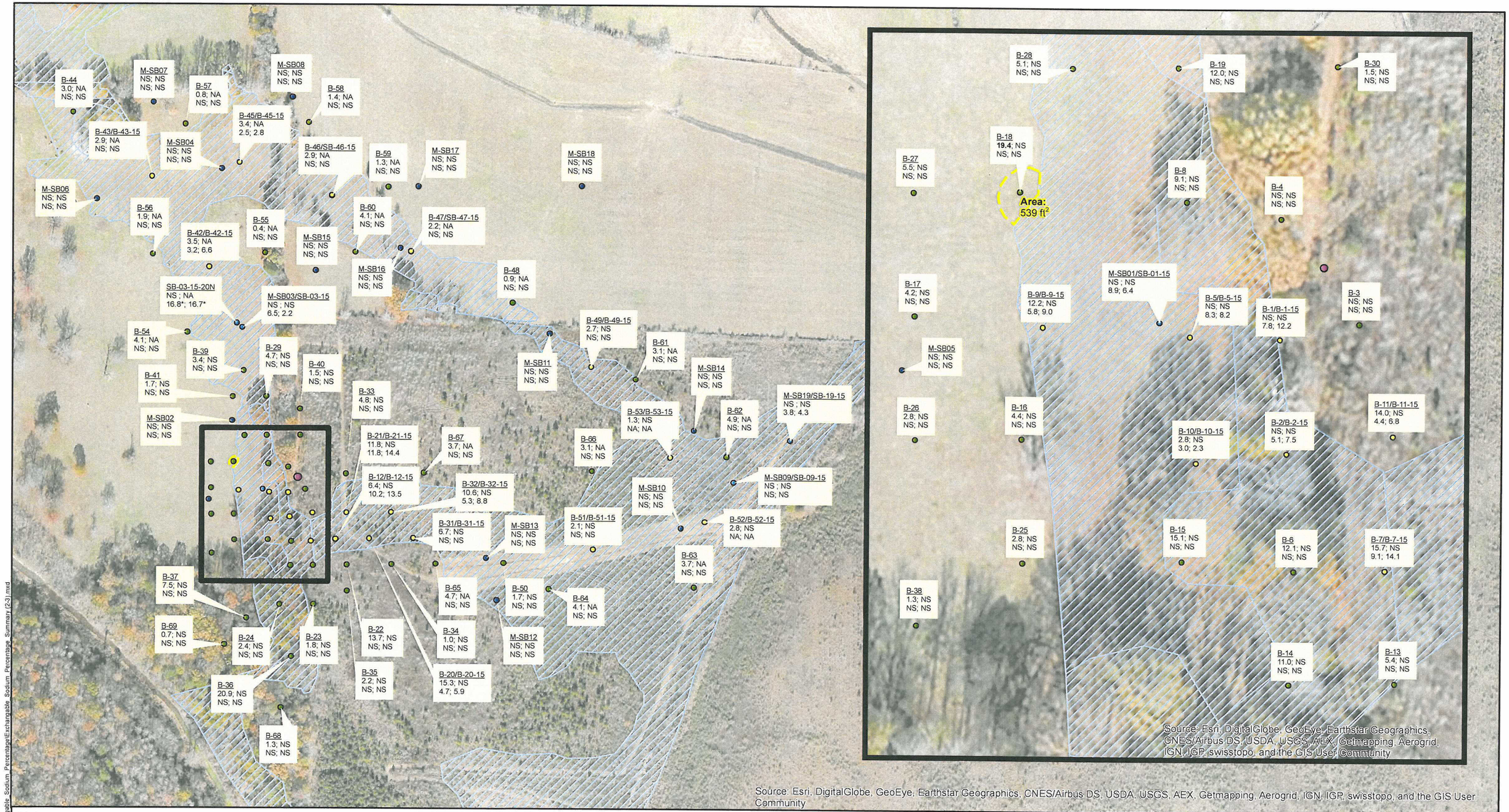
N

Figure 28
ESP Results - 1 to 2-Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

Path: C:\GIS\145-02_Denbury\Maps\Exchangable_Sodium_Percentage\Exchangable_Sodium_Percentage_Summary (1-2).mxd



Notes:
Units reported as percentage
NS = Not Sampled; NA = Not Analyzed
Bold values exceed LDNR 29-B Upland or Wetland Standard, where applicable
*Sample collected from 1.5 to 2.5 foot interval
**Sample collected from 0 to 2 foot interval

0 250 500 1,000 Feet

Legend
- Cork Sampling Location
- AES Sampling Location
- Resampled Cork Sampling Location
- Resampled AES Sampling Location
- Release Location
- Approximate ESP Wetland Standard Exceedance Area
- Approximate ESP Upland Standard Exceedance Area
- Wetlands

Sample Name/Resample Name
Cork Sample Result; AES Sample Result
MPA Resample Result; AES Resample Result

N

Figure 29
ESP Results - 2 to 3-Foot Interval
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

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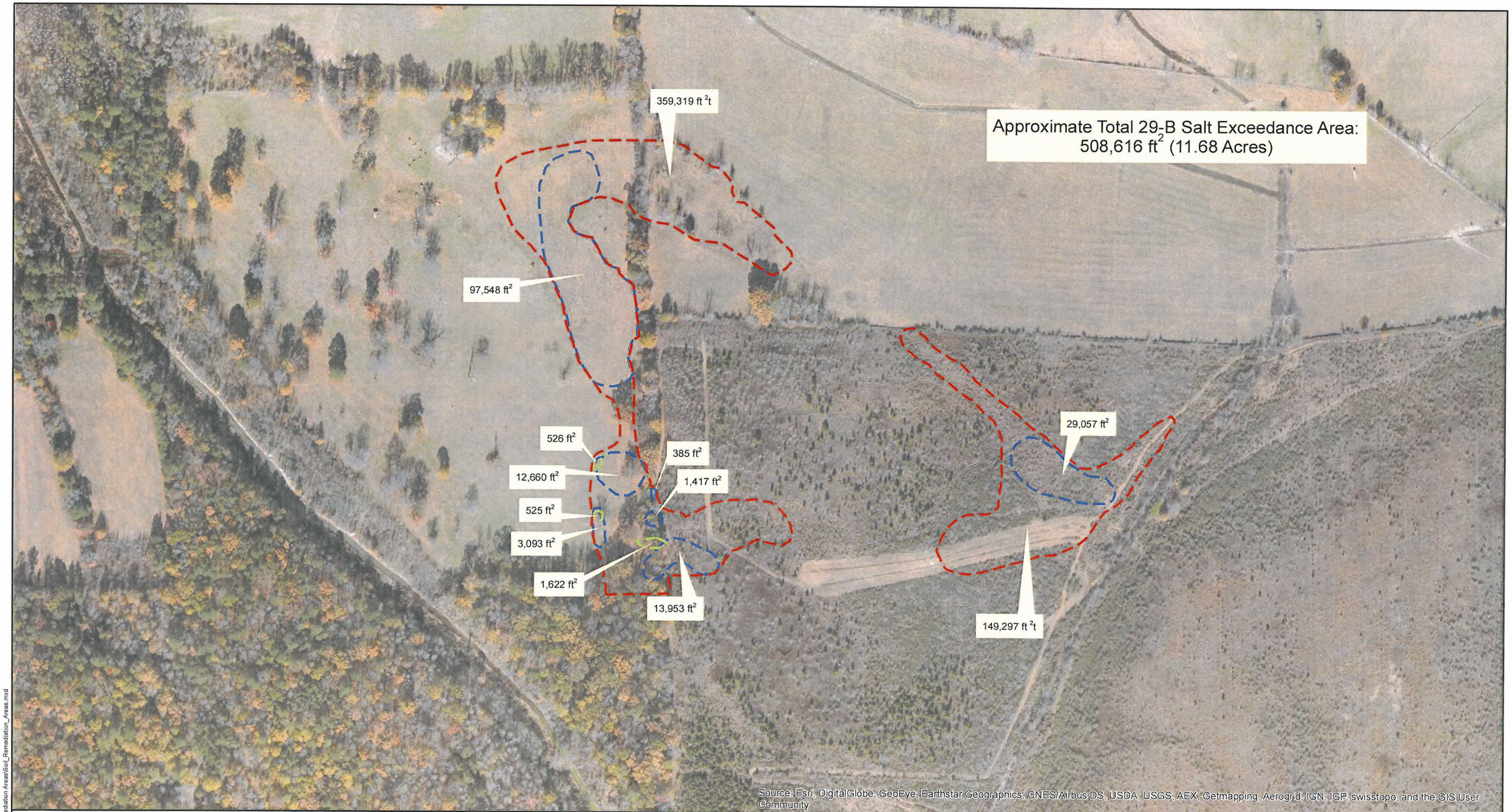

Notes:
Basemap imagery via ArcGIS Online

0 250 500 1,000 Feet

Legend

- Approximate SAR Exceedance Area
- Approximate ESP Exceedance Area
- Approximate EC Exceedance Area

N

Figure 30
29-B Salt Exceedance Areas
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: SAW	Drawn: SAW	Checked: DGA	Date: 4/10/2015	Project: 145-02

Path: C:\GIS\145-02_Denbury\Maps\Soil Remediation Areas\Soil_Remediation_Areas.mxd

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-1-15						B-2-15					
			Sample Depth (ft)	0-1		1-2		2-3		0-1		1-2		2-3	
	LDNR 29-B Standards		*Area Type*	Upland						Wetland					
			Sample Date	02/10/15						02/10/15					
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	4.23	4.22	4.52	3.90	4.51	6.20	14.6	25.8	7.11	6.84	4.52	5.25
Exchangeable Sodium Percentage	15	25	%	8.2	9.3	10.4	13.2	7.8	12.2	4.8	10.5	9.6	11.3	5.1	7.5
Sodium Absorption Ratio	12	14	Unitless	27.0	26.6	30.8	29.2	26.7	28.4	32.5	39.2	32.6	34.2	27.4	26.9
Soluble Calcium	NS	NS	meq/L	1.88	1.75	1.79	1.45	2.17	3.17	11.6	24.0	3.37	3.07	1.86	2.37
Soluble Magnesium	NS	NS	meq/L	2.16	2.18	1.82	1.45	2.43	4.00	15.9	32.4	4.09	3.34	2.37	3.42
Soluble Sodium	NS	NS	meq/L	38.4	37.3	41.4	35.2	40.5	53.7	121	208	63.1	61.2	39.9	45.8
Cation Exchange Capacity	NS	NS	meq/100g	24.8	24.2	23.8	21.1	24.7	20.4	28.6	20.8	23.6	22.9	25.4	19.4
Percent Moisture	NS	NS	%	19.5	NA	20.8	NA	19.2	NA	20.1	NA	22.1	NA	22.1	NA

NOTES:

< = Non-detect at limit shown

NA = Not analyzed, NS - No standard, NR - Not reported

Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-5-15						B-7-15					
			Sample Depth (ft)	0-1		1-2		2-3		0-1		1-2		2-3	
	LDNR 29-B Standards		*Area Type*	Wetland						Wetland					
			Sample Date	02/10/15						02/10/15					
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	3.64	3.49	6.51	7.78	6.71	7.65	4.16	3.84	7.48	7.84	8.05	7.38
Exchangeable Sodium Percentage	15	25	%	16.7	10.9	12.8	16.6	8.3	8.2	6.7	9.5	8.1	14.3	9.1	14.1
Sodium Absorption Ratio	12	14	Unitless	32.5	29.2	26.8	32.1	17.9	18.1	29.2	30.4	27.3	31.9	37.2	31.9
Soluble Calcium	NS	NS	meq/L	1.35	1.63	5.18	5.23	8.06	9.17	2.46	1.95	7.00	6.37	4.17	4.43
Soluble Magnesium	NS	NS	meq/L	<1.00	<1.00	4.18	3.73	9.28	11.1	<1.00	<1.00	2.59	2.53	3.52	4.11
Soluble Sodium	NS	NS	meq/L	32.4	31.9	58.0	67.9	52.8	57.6	37.8	35.3	59.7	67.3	73.0	66.0
Cation Exchange Capacity	NS	NS	meq/100g	17.1	18.4	24.5	22.5	28.1	27.5	17.5	17.5	13.6	15.4	29.9	30.3
Percent Moisture	NS	NS	%	24.0	NA	21.9	NA	19.8	NA	23.6	NA	21.8	NA	19.5	NA

NOTES:

< = Non-detect at limit shown

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Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-9-15						B-10-15					
			Sample Depth (ft)	0-1		1-2		2-3		0-1		1-2		2-3	
	LDNR 29-B Standards		*Area Type*	Wetland						Wetland					
			Sample Date	02/10/15						02/10/15					
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	3.89	4.15	7.72	7.67	4.07	4.05	3.06	3.38	2.45	3.06	4.64	5.61
Exchangeable Sodium Percentage	15	25	%	5.4	4.8	8.1	7.9	5.8	9.0	6.7	6.5	4.8	4.0	3.0	2.3
Sodium Absorption Ratio	12	14	Unitless	18.8	20.5	23.6	22.8	14.2	14.1	22.5	22.5	13.6	14.1	6.64	7.53
Soluble Calcium	NS	NS	meq/L	3.78	3.71	8.82	8.65	4.81	4.50	1.84	2.01	2.23	2.88	10.2	12.4
Soluble Magnesium	NS	NS	meq/L	1.73	1.76	5.64	5.93	5.01	4.46	1.12	1.34	1.96	2.89	12.0	14.7
Soluble Sodium	NS	NS	meq/L	31.3	33.8	63.5	61.5	31.4	29.8	27.3	29.1	19.7	24.0	22.1	27.7
Cation Exchange Capacity	NS	NS	meq/100g	15.6	15.6	21.4	25.9	30.6	31.9	21.9	21.8	30.9	32.9	33.7	33.8
Percent Moisture	NS	NS	%	25.3	NA	23.0	NA	19.4	NA	23.8	NA	23.9	NA	20.6	NA

NOTES:

< = Non-detect at limit shown

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Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-11-15				B-12-15					
			Sample Depth (ft)	1-2		2-3		0-1		1-2		2-3	
	LDNR 29-B Standards		*Area Type*	Upland				Wetland					
			Sample Date	02/10/15				02/10/15					
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	0.65	0.39	1.80	2.70	0.97	0.91	1.42	2.06	6.39	5.44
Exchangeable Sodium Percentage	15	25	%	2.6	2.5	4.4	6.8	10.8	11.1	10.4	17.0	10.2	13.5
Sodium Absorption Ratio	12	14	Unitless	9.94	7.15	18.6	26.3	18.7	16.5	25.1	25.3	27.9	32.8
Soluble Calcium	NS	NS	meq/L	<1.00	<1.00	<1.00	1.09	<1.00	<1.00	<1.00	<1.00	4.75	2.71
Soluble Magnesium	NS	NS	meq/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	3.68	1.91
Soluble Sodium	NS	NS	meq/L	5.18	3.15	15.5	24.8	8.44	8.21	12.2	17.4	57.3	49.8
Cation Exchange Capacity	NS	NS	meq/100g	23.1	16.6	23.5	20.5	15.1	13.9	21.4	23.0	32.1	27.3
Percent Moisture	NS	NS	%	23.1	NA	24.7	NA	22.7	NA	20.3	NA	19.0	NA

NOTES:

< = Non-detect at limit shown

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Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-20-15						B-21-15						B-31-15	
			Sample Depth (ft)	0-1		1-2		2-3		0-1		1-2		2-3		1-2	
	LDNR 29-B Standards		*Area Type*	Wetland						Wetland						Wetland	
			Sample Date	02/10/15						02/10/15						02/10/15	
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	0.78	0.32	1.18	0.98	3.53	4.71	2.02	1.69	3.09	3.04	4.98	4.63	1.06	0.83
Exchangeable Sodium Percentage	15	25	%	1.7	2.4	2.5	3.5	4.7	5.9	8.0	6.5	11.5	11.3	11.8	14.4	8.6	11.2
Sodium Absorption Ratio	12	14	Unitless	6.32	6.11	11.9	13.9	28.0	31.2	25.1	23.5	34.6	33.0	33.1	33.1	23.1	17.9
Soluble Calcium	NS	NS	meq/L	1.37	<1.00	<1.00	<1.00	1.58	2.10	<1.00	<1.00	<1.00	<1.00	2.48	2.08	<1.00	<1.00
Soluble Magnesium	NS	NS	meq/L	<1.00	<1.00	<1.00	<1.00	1.15	1.67	<1.00	<1.00	<1.00	<1.00	1.55	1.22	<1.00	<1.00
Soluble Sodium	NS	NS	meq/L	6.41	2.80	10.6	7.96	32.7	42.8	17.5	14.4	27.0	25.2	47.0	42.4	9.28	7.25
Cation Exchange Capacity	NS	NS	meq/100g	15.4	15.1	18.9	22.7	25.3	21.5	17.0	27.5	17.5	15.5	24.0	18.5	14.3	14.0
Percent Moisture	NS	NS	%	23.5	NA	23.9	NA	25.7	NA	23.3	NA	21.0	NA	20.3	NA	21.9	NA

NOTES:

< = Non-detect at limit shown

NA = Not analyzed, NS - No standard, NR - Not reported

Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-32-15						B-42-15					
			Sample Depth (ft)	0-1		1-2		2-3		0-1		1-2		2-3	
	LDNR 29-B Standards		*Area Type*	Wetland						Wetland					
			Sample Date	02/10/15						02/09/15					
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	2.09	0.58	1.82	1.34	4.39	4.53	10.9	7.81	13.1	12.2	10.0	11.1
Exchangeable Sodium Percentage	15	25	%	3.2	9.5	7.9	8.7	5.3	8.8	6.5	7.8	6.5	7.1	3.2	6.6
Sodium Absorption Ratio	12	14	Unitless	12.9	15.4	25.8	23.6	27.7	25.3	23.6	22.0	18.4	14.4	9.80	11.1
Soluble Calcium	NS	NS	meq/L	4.28	<1.00	<1.00	<1.00	2.37	2.70	19.9	10.4	31.7	33.4	33.4	35.9
Soluble Magnesium	NS	NS	meq/L	<1.00	<1.00	<1.00	<1.00	1.76	2.30	9.27	4.74	15.7	18.2	21.6	23.4
Soluble Sodium	NS	NS	meq/L	20.6	5.97	15.7	11.1	39.8	40.0	90.3	60.6	89.6	73.3	51.4	60.7
Cation Exchange Capacity	NS	NS	meq/100g	15.6	13.8	17.3	16.3	19.7	20.5	28.2	23.4	30.9	28.8	32.6	35.2
Percent Moisture	NS	NS	%	24.0	NA	21.4	NA	20.0	NA	23.6	NA	22.6	NA	18.3	NA

NOTES:

< = Non-detect at limit shown

NA = Not analyzed, NS - No standard, NR - Not reported

Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-43-15		B-45-15						B-49-15				B-51-15	
			Sample Depth (ft)	0-1		0-1		1-2		2-3		0-1		1-2		0-1	
	LDNR 29-B Standards		*Area Type*	Wetland		Wetland						Wetland				Wetland	
			Sample Date	02/09/15		02/09/15						02/10/15				02/10/15	
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	7.59	6.40	4.78	3.22	7.32	6.57	5.11	5.16	3.11	3.02	4.55	4.86	3.86	4.16
Exchangeable Sodium Percentage	15	25	%	3.9	7.2	3.3	5.8	3.2	8.7	2.5	2.8	6.0	6.3	3.0	4.6	6.2	6.1
Sodium Absorption Ratio	12	14	Unitless	14.7	18.4	18.9	19.3	16.5	16.3	8.70	9.09	19.0	19.7	18.7	20.1	21.0	18.8
Soluble Calcium	NS	NS	meq/L	12.3	8.97	5.61	2.58	12.5	10.3	11.4	11.0	2.67	2.28	4.59	4.80	3.42	4.24
Soluble Magnesium	NS	NS	meq/L	6.98	4.78	2.63	1.23	8.15	6.71	10.3	9.57	1.3	1.16	2.72	2.86	1.75	2.24
Soluble Sodium	NS	NS	meq/L	45.8	48.2	38.3	26.7	53.0	47.7	28.7	29.2	26.8	25.9	35.7	39.3	33.7	33.8
Cation Exchange Capacity	NS	NS	meq/100g	32.2	27.8	25.7	25.9	29.5	25.1	30.9	29.6	18.4	14.0	21.9	15.2	19.8	21.1
Percent Moisture	NS	NS	%	26.5	NA	26.4	NA	23.5	NA	19.3	NA	24.8	NA	21.4	NA	22.4	NA

NOTES:

< = Non-detect at limit shown

NA = Not analyzed, NS - No standard, NR - Not reported

Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	B-52-15				B-53-15				SB-01-15					
			Sample Depth (ft)	0-1		1-2		0-1		1-2		0-1		1-2		2-3	
	LDNR 29-B Standards		*Area Type*	Wetland				Wetland				Wetland					
			Sample Date	02/10/15				02/10/15				02/10/15					
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	6.21	5.96	6.19	6.96	11.7	16.3	10.2	10.9	5.08	3.11	7.59	7.53	10.4	12.5
Exchangeable Sodium Percentage	15	25	%	7.6	7.6	10.5	5.7	12.3	4.9	11.4	5.3	9.5	11.5	12.7	12.4	8.9	6.4
Sodium Absorption Ratio	12	14	Unitless	18.0	19.1	19.1	19.5	30.4	34.2	28.1	28.7	17.1	18.5	27.8	29.2	17.2	18.7
Soluble Calcium	NS	NS	meq/L	8.16	6.89	6.78	7.74	14.9	23.4	12.8	13.4	9.47	2.95	6.83	5.05	15.5	19.6
Soluble Magnesium	NS	NS	meq/L	6.16	4.99	6.00	7.53	6.85	11.7	6.06	7.06	1.00	<1.00	4.75	4.60	21.6	26.9
Soluble Sodium	NS	NS	meq/L	48.2	46.6	48.2	54.0	100	143	86.4	91.8	39.2	25.0	66.8	64.1	74.1	90.2
Cation Exchange Capacity	NS	NS	meq/100g	29.4	24.0	33.2	29.6	14.4	12.4	17.1	12.3	18.0	15.3	23.5	29.0	27.0	26.6
Percent Moisture	NS	NS	%	22.3	NA	23.0	NA	21.6	NA	20.9	NA	20.9	NA	28.6	NA	21.8	NA

NOTES:

< = Non-detect at limit shown

NA = Not analyzed, NS - No standard, NR - Not reported

Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	SB-03-15						SB-03-15-20N		SB-09-15	
			Sample Depth (ft)	0-1		1-2		2-3		1.5-2.5		0-1	
	LDNR 29-B Standards		*Area Type*	Wetland						Wetland		Wetland	
			Sample Date	02/09/15						02/09/15		02/10/15	
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	9.80	9.46	13.9	14.3	13.2	14.9	9.92	8.28	8.37	12.6
Exchangeable Sodium Percentage	15	25	%	10.4	6.4	4.0	3.2	6.5	2.2	16.8	16.7	8.5	8.6
Sodium Absorption Ratio	12	14	Unitless	28.9	28.0	34.2	30.2	22.6	25.0	47.4	45.3	30.1	35.7
Soluble Calcium	NS	NS	meq/L	10.6	10.8	18.0	18.9	22.9	24.4	5.09	4.14	6.76	13.4
Soluble Magnesium	NS	NS	meq/L	5.20	5.31	10.3	12.5	20.5	20.7	2.93	2.37	3.24	6.77
Soluble Sodium	NS	NS	meq/L	81.3	79.3	128	120	105	119	95.0	81.7	67.4	113
Cation Exchange Capacity	NS	NS	meq/100g	21.5	24.2	21.5	31.6	27.1	36.8	28.0	29.4	35.6	25.9
Percent Moisture	NS	NS	%	25.7	NA	23.2	NA	21.4	NA	23.7	NA	24.8	NA

NOTES:

< = Non-detect at limit shown

NA = Not analyzed, NS - No standard, NR - Not reported

Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 1
Soil Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

			Sample ID	SB-19-15						SB-46-15				SB-47-15	
			Sample Depth (ft)	0-1		1-2		2-3		0-1		1-2		0-1	
	LDNR 29-B Standards		*Area Type*	Wetland						Wetland				Wetland	
			Sample Date	02/09/15						02/10/15				02/10/15	
29-B Parameters	**Upland**	**Elevated Wetland**	**Units**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**	**MP&A**	**AES**
Electrical Conductivity	4	8	mmhos/cm	0.89	0.87	1.38	1.30	3.31	3.22	2.31	2.29	1.43	2.26	5.64	6.70
Exchangeable Sodium Percentage	15	25	%	5.8	7.4	5.1	6.4	3.8	4.3	5.4	5.5	3.8	3.9	3.0	2.0
Sodium Absorption Ratio	12	14	Unitless	12.9	12.6	14.1	15.3	13.3	14.0	20.4	20.9	14.5	18.7	14.7	14.0
Soluble Calcium	NS	NS	meq/L	<1.00	<1.00	<1.00	<1.00	3.97	3.55	1.34	1.23	1.02	1.35	6.93	9.73
Soluble Magnesium	NS	NS	meq/L	<1.00	<1.00	<1.00	<1.00	3.56	2.81	<1.00	<1.00	<1.00	<1.00	5.00	8.24
Soluble Sodium	NS	NS	meq/L	7.84	7.58	11.1	10.8	25.8	25.0	20.5	20.4	12.9	19.5	35.9	41.9
Cation Exchange Capacity	NS	NS	meq/100g	25.1	18.8	26.2	20.1	27.9	20.9	20.3	16.2	19.0	15.6	18.7	17.9
Percent Moisture	NS	NS	%	23.9	NA	22.4	NA	22.0	NA	21.1	NA	21.6	NA	22.4	NA

NOTES:

< = Non-detect at limit shown

NA = Not analyzed, NS - No standard, NR - Not reported

Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable

Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable

MP&A samples analyzed by Element

AES samples analyzed by Element

Table 2
Groundwater Data
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Units	RECAP Screening Standard (unless noted)	Sample ID	B-1 GW	M-MW01	M-MW02	M-MW03
			Sample Date	12/11/2013	10/1/2014	10/1/2014	10/1/2014
			Screen Interval	16-26'	15-25'	15-25'	19-29'
			Sampled By	Cork	AES	AES	AES
BTEX							
Benzene	mg/L	0.005		<0.005	NA	NA	NA
Toluene	mg/L	1.0		<0.005	NA	NA	NA
Ethylbenzene	mg/L	0.7		<0.005	NA	NA	NA
Xylenes	mg/L	10		<0.015	NA	NA	NA
TPH							
TPH-D	mg/L	0.15		NA	<0.14	<0.13	<0.14
TPH-O	mg/L	0.15		NA	<0.12	<0.12	<0.12
TPH-G	mg/L	0.15		NA	<0.15	<0.15	<0.15
TPH Fractions							
C10-C12 Aromatics	mg/L	0.15		<0.102	NA	NA	NA
C12-C16 Aromatics	mg/L	0.15		<0.102	NA	NA	NA
C16-C21 Aromatics	mg/L	0.15		<0.102	NA	NA	NA
C21-C35 Aromatics	mg/L	0.15		<0.122	NA	NA	NA
C10-C12 Aliphatics	mg/L	0.15		<0.102	NA	NA	NA
C12-C16 Aliphatics	mg/L	0.15		<0.102	NA	NA	NA
C16-C35 Aliphatics	mg/L	7.3		<1.02	NA	NA	NA
PAHs							
Acenapthene	mg/L	0.037		<0.001	NA	NA	NA
Acenaphthylene	mg/L	0.1		<0.005	NA	NA	NA
Anthracene	mg/L	0.043		<0.0005	NA	NA	NA
Benzo(a)anthracene	mg/L	0.0078		<0.0005	NA	NA	NA
Benzo(a)pyrene	mg/L	0.0002		<0.00015	NA	NA	NA
Benzo(b)fluoranthene	mg/L	0.0048		<0.0005	NA	NA	NA
Benzo(k)fluoranthene	mg/L	0.0025		<0.0005	NA	NA	NA
Chrysene	mg/L	0.0016		<0.0005	NA	NA	NA
Debenz(a,h)anthracene	mg/L	0.0025		<0.001	NA	NA	NA
Fluoranthene	mg/L	0.15		<0.01	NA	NA	NA
Fluorene	mg/L	0.024		<0.0005	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/L	0.0037		<0.0005	NA	NA	NA
2-Methylnapthalene	mg/L	0.00062		<0.0005	NA	NA	NA
Naphthalene	mg/L	0.01		<0.001	NA	NA	NA
Phenanthrene	mg/L	0.18		<0.001	NA	NA	NA
Pyrene	mg/L	0.018		<0.001	NA	NA	NA
Metals							
Mercury	mg/L	0.002		<0.0002	<0.0002	<0.0002	<0.0002
Arsenic	mg/L	0.01		<0.01	<0.010	<0.010	<0.010
Barium	mg/L	2.0		0.206	0.136	0.189	0.354
Cadmium	mg/L	0.005		<0.005	<0.005	<0.005	<0.005
Chromium	mg/L	0.1		0.025	<0.010	<0.010	<0.010
Lead	mg/L	0.015		<0.010	<0.010	<0.010	<0.010
Selenium	mg/L	0.05		<0.020	0.025	<0.020	0.022
Silver	mg/L	0.018		<0.005	<0.005	<0.005	<0.005
Strontium	mg/L	NS		NA	0.427	0.287	0.430
Zinc	mg/L	1.1		0.016	<0.010	<0.010	<0.010
Other Parameters							
Electrical Conductivity	mmhos/cm	NS		2.72	1.94	1.22	2.05
Sodium Adsorption Ratio	unitless	NS		4.88	NA	NA	NA
Chlorides	mg/L	250[1]		**568**	**298**	114	**312**
Sodium	mg/L	60[1]		**224**	NA	NA	NA
Bromides	mg/L	NS		NA	2.48	0.497	2.07
Sulfate	mg/L	250[1]		NA	43.9	35.2	149
Total Dissolved Solids	mg/L	500[1]		NA	**1,020**	**623**	**1,060**
Total Alkalinity	mg $CaCO_3$/L	NS		NA	458	442	390
Radium-226	pCi/L	NS		NA	0.712	0.959	0.734
Radium-228	pCi/L	NS		NA	2.755	0.705	0.988
Combined Radium 226/228	pCi/L	5[1]		NA	3.467	1.664	1.722

Notes:
NA = Not Analyzed, NS = No Standard
[1] = US EPA Primary of Secondary Drinking Water Standard or Advisory
Bold values exceed the listed standard

Table 3
Electrical Conductivity in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	0-1									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	12/18/2013	5.45	NS	5.45	2/10/2015	4.23	4.22	4.23	-1.23	-22.5%
B-2/B-2-15	Wetland	12/18/2013	6.06	NS	6.06	2/10/2015	14.6	25.8	20.2	14.14	233.3%
B-5/B-5-15	Wetland	12/18/2013	17.3	NS	17.3	2/10/2015	3.64	3.49	3.57	-13.74	-79.4%
B-7/B-7-15	Wetland	1/22/2014	16.9	NS	16.9	2/10/2015	4.16	3.84	4.00	-12.90	-76.3%
B-9/B-9-15	Wetland	1/22/2014	22.9	NS	22.9	2/10/2015	3.89	4.15	4.02	-18.88	-82.4%
B-10/B-10-15	Wetland	1/22/2014	16.2	NS	16.2	2/10/2015	3.06	3.38	3.22	-12.98	-80.1%
B-11/B-11/15	Upland	2/6/2014	1.09	NS	1.09	2/10/2015	NS	NS	-	-	-
B-12/B-12-15	Wetland	2/6/2014	3.51	NS	3.51	2/10/2015	0.97	0.91	0.94	-2.57	-73.2%
B-20/B-20-15	Wetland	3/10/2014	1.99	NS	1.99	2/10/2015	0.78	0.32	0.55	-1.44	-72.4%
B-21/B-21-15	Wetland	3/10/2014	24.2	NS	24.2	2/10/2015	2.02	1.69	1.86	-22.35	-92.3%
B-31/B-31-15	Wetland	4/2/2014	1.02	NS	1.02	2/10/2015	NS	NS	-	-	-
B-32/B-32-15	Wetland	4/2/2014	6.60	NS	6.60	2/10/2015	2.09	0.58	1.34	-5.27	-79.8%
B-42/B-42-15	Wetland	4/24/2014	17.0	15.4	16.2	2/9/2015	10.9	7.81	9.36	-6.85	-42.3%
B-43/B-43-15	Wetland	4/24/2014	9.50	11.2	10.4	2/9/2015	7.59	6.40	7.00	-3.36	-32.4%
B-45/B-45-15	Wetland	4/24/2014	13.5	11.6	12.6	2/9/2015	4.78	3.22	4.00	-8.55	-0.68
B-46/SB-46-15	Wetland	4/24/2014	12.1	12.5	12.3	2/10/2015	2.31	2.29	2.30	-10.00	-81.3%
B-47/SB-47-15	Wetland	4/24/2014	6.79	8.61	7.70	2/10/2015	5.64	6.70	6.17	-1.53	-19.9%
B-49/B-49-15	Wetland	4/25/2014	4.73	NS	4.73	2/10/2015	3.11	3.02	3.07	-1.67	-35.2%
B-51/B-51-15	Wetland	4/25/2014	9.24	NS	9.24	2/10/2015	3.86	4.16	4.01	-5.23	-56.6%
B-52/B-52-15	Wetland	4/25/2014	11.1	NS	11.1	2/10/2015	6.21	5.96	6.09	-5.02	-45.2%
B-53/B-53-15	Wetland	4/25/2014	17.3	NS	17.3	2/10/2015	11.7	16.3	14.0	-3.30	-19.1%
M-SB01/SB-01-15	Wetland	9/23/2014	NS	6.41	6.41	2/10/2015	5.08	3.11	4.10	-2.32	-36.1%
M-SB03/SB-03-15	Wetland	9/23/2014	NS	9.5	9.5	2/9/2015	9.80	9.46	9.63	0.13	1.4%
M-SB09/SB-09-15	Wetland	9/25/2014	NS	9.17	9.17	2/10/2015	8.37	12.6	10.49	1.32	14.3%
M-SB19/SB-19-15	Wetland	10/1/2014	NS	4.59	4.59	2/9/2015	0.89	0.87	0.88	-3.71	-80.8%
								Average:		-5.53	-40.3%

Notes:
Electrical conductivity reported in mmhos/cm
NS = Not Sampled
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 3
Electrical Conductivity in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	1-2									
Sample ID	Area Type	Date	Cork	AES	Average	Date	MP&A	AES	Average	Change	% Change
B-1/B-1-15	Upland	12/18/2013	21.4	NS	21.4	2/10/2015	4.52	3.90	4.21	-17.19	-80.3%
B-2/B-2-15	Wetland	12/18/2013	12.3	NS	12.3	2/10/2015	7.11	6.84	6.98	-5.33	-43.3%
B-5/B-5-15	Wetland	12/18/2013	8.86	NS	8.86	2/10/2015	6.51	7.78	7.15	-1.72	-19.4%
B-7/B-7-15	Wetland	1/22/2014	21.4	NS	21.4	2/10/2015	7.48	7.84	7.66	-13.74	-64.2%
B-9/B-9-15	Wetland	1/22/2014	14.3	NS	14.3	2/10/2015	7.72	7.67	7.70	-6.61	-46.2%
B-10/B-10-15	Wetland	1/22/2014	6.53	NS	6.53	2/10/2015	2.45	3.06	2.76	-3.78	-57.8%
B-11/B-11/15	Upland	2/6/2014	7.30	NS	7.3	2/10/2015	0.65	0.39	0.52	-6.78	-92.9%
B-12/B-12-15	Wetland	2/6/2014	12.9	NS	12.9	2/10/2015	1.42	2.06	1.74	-11.16	-86.5%
B-20/B-20-15	Wetland	3/10/2014	7.07	NS	7.07	2/10/2015	1.18	0.98	1.08	-5.99	-84.7%
B-21/B-21-15	Wetland	3/10/2014	20.5	NS	20.5	2/10/2015	3.09	3.04	3.07	-17.44	-85.0%
B-31/B-31-15	Wetland	4/2/2014	3.91	NS	3.91	2/10/2015	1.06	0.83	0.95	-2.97	-75.8%
B-32/B-32-15	Wetland	4/2/2014	9.26	NS	9.26	2/10/2015	1.82	1.34	1.58	-7.68	-82.9%
B-42/B-42-15	Wetland	4/24/2014	14.8	12.1	13.5	2/9/2015	13.1	12.2	12.7	-0.80	-5.9%
B-43/B-43-15	Wetland	4/24/2014	6.98	4.32	5.65	2/9/2015	NS	NS	-	-	-
B-45/B-45-15	Wetland	4/24/2014	11.3	10.0	10.7	2/9/2015	7.32	6.57	6.95	-3.71	-34.8%
B-46/SB-46-15	Wetland	4/24/2014	7.68	8.33	8.01	2/10/2015	1.43	2.26	1.85	-6.16	-77.0%
B-47/SB-47-15	Wetland	4/24/2014	6.36	6.91	6.64	2/10/2015	NS	NS	-	-	-
B-49/B-49-15	Wetland	4/25/2014	8.92	NS	8.92	2/10/2015	4.55	4.86	4.71	-4.22	-47.3%
B-51/B-51-15	Wetland	4/25/2014	7.70	NS	7.7	2/10/2015	NS	NS	-	-	-
B-52/B-52-15	Wetland	4/25/2014	9.84	NS	9.84	2/10/2015	6.19	6.96	6.58	-3.27	-33.2%
B-53/B-53-15	Wetland	4/25/2014	12.9	NS	12.9	2/10/2015	10.2	10.9	10.6	-2.35	-18.2%
M-SB01/SB-01-15	Wetland	9/23/2014	NS	6.41	6.41	2/10/2015	7.59	7.53	7.56	1.15	17.9%
M-SB03/SB-03-15	Wetland	9/23/2014	NS	9.50	9.5	2/9/2015	13.9	14.3	14.1	4.60	48.4%
M-SB09/SB-09-15	Wetland	9/25/2014	NS	9.17	9.17	2/10/2015	NS	NS	-	-	-
M-SB19/SB-19-15	Wetland	10/1/2014	NS	4.59	4.59	2/9/2015	1.38	1.30	1.34	-3.25	-70.8%
								Average:		-5.64	-49.5%

Notes:
Electrical conductivity reported in mmhos/cm
NS = Not Sampled
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 3
Electrical Conductivity in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	2-3									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	1/22/2014	9.31	NS	9.31	2/10/2015	4.51	6.20	5.36	-3.96	-42.5%
B-2/B-2-15	Wetland	1/22/2014	10.5	NS	10.5	2/10/2015	4.52	5.25	4.89	-5.62	-53.5%
B-5/B-5-15	Wetland	1/22/2014	2.51	NS	2.51	2/10/2015	6.71	7.65	7.18	4.67	186.1%
B-7/B-7-15	Wetland	1/22/2014	16.1	NS	16.1	2/10/2015	8.05	7.38	7.72	-8.39	-52.1%
B-9/B-9-15	Wetland	1/22/2014	6.75	NS	6.75	2/10/2015	4.07	4.05	4.06	-2.69	-39.9%
B-10/B-10-15	Wetland	1/22/2014	3.19	NS	3.19	2/10/2015	4.64	5.61	5.13	1.94	60.7%
B-11/B-11/15	Upland	2/6/2014	7.88	NS	7.88	2/10/2015	1.80	2.70	2.25	-5.63	-71.4%
B-12/B-12-15	Wetland	2/6/2014	10.6	NS	10.6	2/10/2015	6.39	5.44	5.92	-4.69	-44.2%
B-20/B-20-15	Wetland	3/10/2014	15.7	NS	15.7	2/10/2015	3.53	4.71	4.12	-11.58	-73.8%
B-21/B-21-15	Wetland	3/10/2014	14.4	NS	14.4	2/10/2015	4.98	4.63	4.81	-9.60	-66.6%
B-31/B-31-15	Wetland	4/2/2014	5.52	NS	5.52	2/10/2015	NS	NS	-	-	-
B-32/B-32-15	Wetland	4/2/2014	9.84	NS	9.84	2/10/2015	4.39	4.53	4.46	-5.38	-54.7%
B-42/B-42-15	Wetland	4/24/2014	9.48	7.17	8.33	2/9/2015	10.0	11.1	10.6	2.23	26.7%
B-43/B-43-15	Wetland	4/24/2014	1.54	2.14	1.84	2/9/2015	NS	NS	-	-	-
B-45/B-45-15	Wetland	4/24/2014	5.80	7.88	6.84	2/9/2015	5.11	5.16	5.14	-1.71	-24.9%
B-46/SB-46-15	Wetland	4/24/2014	0.82	0.84	0.83	2/10/2015	NS	NS	-	-	-
B-47/SB-47-15	Wetland	4/24/2014	2.70	3.77	3.24	2/10/2015	NS	NS	-	-	-
B-49/B-49-15	Wetland	4/25/2014	2.72	NS	2.72	2/10/2015	NS	NS	-	-	-
B-51/B-51-15	Wetland	4/25/2014	3.59	NS	3.59	2/10/2015	NS	NS	-	-	-
B-52/B-52-15	Wetland	4/25/2014	2.67	NS	2.67	2/10/2015	NS	NS	-	-	-
B-53/B-53-15	Wetland	4/25/2014	3.88	NS	3.88	2/10/2015	NS	NS	-	-	-
M-SB01/SB-01-15	Wetland	9/23/2014	NS	NS	-	2/10/2015	10.4	12.5	11.45	-	-
M-SB03/SB-03-15	Wetland	9/23/2014	NS	NS	-	2/9/2015	13.2	14.9	14.05	-	-
M-SB09/SB-09-15	Wetland	9/25/2014	NS	NS	-	2/10/2015	NS	NS	-	-	-
M-SB19/SB-19-15	Wetland	10/1/2014	NS	NS	-	2/9/2015	3.31	3.22	3.27	-	-
								Average:		-3.88	-19.2%
								Average of all samples:		-5.19	-38.9%

Notes:
Electrical conductivity reported in mmhos/cm
NS = Not Sampled
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 4
Sodium Adsorption Ratio in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	0-1									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	12/18/2013	25.7	NS	25.7	2/10/2015	27.0	26.6	26.8	1.10	4.3%
B-2/B-2-15	Wetland	12/18/2013	19.2	NS	19.2	2/10/2015	32.5	39.2	35.9	16.65	86.7%
B-5/B-5-15	Wetland	12/18/2013	32.8	NS	32.8	2/10/2015	32.5	29.2	30.9	-1.95	-5.9%
B-7/B-7-15	Wetland	1/22/2014	30.6	NS	30.6	2/10/2015	29.2	30.4	29.8	-0.80	-2.6%
B-9/B-9-15	Wetland	1/22/2014	42.0	NS	42	2/10/2015	18.8	20.5	19.7	-22.35	-53.2%
B-10/B-10-15	Wetland	1/22/2014	28.6	NS	28.6	2/10/2015	22.5	22.5	22.5	-6.10	-21.3%
B-11/B-11-15	Upland	2/6/2014	9.61	NS	9.61	2/10/2015	NS	NS	-	-	-
B-12/B-12-15	Wetland	2/6/2014	31.0	NS	31	2/10/2015	18.7	16.5	17.6	-13.40	-43.2%
B-20/B-20-15	Wetland	3/10/2014	19.8	NS	19.8	2/10/2015	6.32	6.11	6.22	-13.59	-68.6%
B-21/B-21-15	Wetland	3/10/2014	53.7	NS	53.7	2/10/2015	25.1	23.5	24.3	-29.40	-54.7%
B-31/B-31-15	Wetland	4/2/2014	13.4	NS	13.4	2/10/2015	NS	NS	-	-	-
B-32/B-32-15	Wetland	4/2/2014	29.7	NS	29.7	2/10/2015	12.9	15.4	14.2	-15.55	-52.4%
B-42/B-42-15	Wetland	4/24/2014	27.4	23.9	25.7	2/9/2015	23.6	22.0	22.8	-2.85	-11.1%
B-43/B-43-15	Wetland	4/24/2014	21.2	18.9	20.1	2/9/2015	14.7	18.4	16.6	-3.50	-17.5%
B-45/B-45-15	Wetland	4/24/2014	31.2	27.5	29.4	2/9/2015	18.9	19.3	19.1	-10.25	-34.9%
B-46/SB-46-15	Wetland	4/24/2014	25.0	23.7	24.4	2/10/2015	20.4	20.9	20.7	-3.70	-15.2%
B-47/SB-47-15	Wetland	4/24/2014	15.8	15.6	15.7	2/10/2015	14.7	14.0	14.4	-1.35	-8.6%
B-49/B-49-15	Wetland	4/25/2014	21.1	NS	21.1	2/10/2015	19.0	19.7	19.4	-1.75	-8.3%
B-51/B-51-15	Wetland	4/25/2014	19.4	NS	19.4	2/10/2015	21.0	18.8	19.9	0.50	2.6%
B-52/B-52-15	Wetland	4/25/2014	20.1	NS	20.1	2/10/2015	18.0	19.1	18.6	-1.55	-7.7%
B-53/B-53-15	Wetland	4/25/2014	30.4	NS	30.4	2/10/2015	30.4	34.2	32.3	1.90	6.3%
M-SB01/SB-01-15	Wetland	9/23/2014	NS	25.6	25.6	2/10/2015	17.1	18.5	17.8	-7.80	-30.5%
M-SB03/SB-03-15	Wetland	9/23/2014	NS	22.6	22.6	2/9/2015	28.9	28.0	28.5	5.85	25.9%
M-SB09/SB-09-15	Wetland	9/25/2014	NS	19.1	19.1	2/10/2015	30.1	35.7	32.9	13.80	72.3%
M-SB19/SB-19-15	Wetland	10/1/2014	NS	16.7	16.7	2/9/2015	12.9	12.6	12.8	-3.95	-23.7%
								Average:		-4.35	-11.4%

Notes:
Sodium adsorption ratio is unitless
NS = Not Sampled
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 4
Sodium Adsorption Ratio in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	1-2									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	12/18/2013	39.5	NS	39.5	2/10/2015	30.8	29.2	30.0	-9.50	-24.1%
B-2/B-2-15	Wetland	12/18/2013	25.0	NS	25.0	2/10/2015	32.6	34.2	33.4	8.40	33.6%
B-5/B-5-15	Wetland	12/18/2013	19.0	NS	19.0	2/10/2015	26.8	32.1	29.5	10.45	55.0%
B-7/B-7-15	Wetland	1/22/2014	39.5	NS	39.5	2/10/2015	27.3	31.9	29.6	-9.90	-25.1%
B-9/B-9-15	Wetland	1/22/2014	22.7	NS	22.7	2/10/2015	23.6	22.8	23.2	0.50	2.2%
B-10/B-10-15	Wetland	1/22/2014	8.41	NS	8.41	2/10/2015	13.6	14.1	13.9	5.44	64.7%
B-11/B-11-15	Upland	2/6/2014	26.8	NS	26.8	2/10/2015	9.94	7.15	8.55	-18.26	-68.1%
B-12/B-12-15	Wetland	2/6/2014	33.8	NS	33.8	2/10/2015	25.1	25.3	25.2	-8.60	-25.4%
B-20/B-20-15	Wetland	3/10/2014	30.9	NS	30.9	2/10/2015	11.9	13.9	12.9	-18.00	-58.3%
B-21/B-21-15	Wetland	3/10/2014	44.5	NS	44.5	2/10/2015	34.6	33.0	33.8	-10.70	-24.0%
B-31/B-31-15	Wetland	4/2/2014	27.1	NS	27.1	2/10/2015	23.1	17.9	20.5	-6.60	-24.4%
B-32/B-32-15	Wetland	4/2/2014	22.5	NS	22.5	2/10/2015	25.8	23.6	24.7	2.20	9.8%
B-42/B-42-15	Wetland	4/24/2014	12.3	11.6	12.0	2/9/2015	18.4	14.4	16.4	4.45	37.2%
B-43/B-43-15	Wetland	4/24/2014	9.45	7.27	8.36	2/9/2015	NS	NS	-	-	-
B-45/B-45-15	Wetland	4/24/2014	16.0	14.3	15.2	2/9/2015	16.5	16.3	16.4	1.25	8.3%
B-46/SB-46-15	Wetland	4/24/2014	14.5	14.1	14.3	2/10/2015	14.5	18.7	16.6	2.30	16.1%
B-47/SB-47-15	Wetland	4/24/2014	13.4	12.0	12.7	2/10/2015	NS	NS	-	-	-
B-49/B-49-15	Wetland	4/25/2014	19.2	NS	19.2	2/10/2015	18.7	20.1	19.4	0.20	1.0%
B-51/B-51-15	Wetland	4/25/2014	13.8	NS	13.8	2/10/2015	NS	NS	-	-	-
B-52/B-52-15	Wetland	4/25/2014	14.1	NS	14.1	2/10/2015	19.1	19.5	19.3	5.20	36.9%
B-53/B-53-15	Wetland	4/25/2014	23.4	NS	23.4	2/10/2015	28.1	28.7	28.4	5.00	21.4%
M-SB01/SB-01-15	Wetland	9/23/2014	NS	25.6	25.6	2/10/2015	27.8	29.2	28.5	2.90	11.3%
M-SB03/SB-03-15	Wetland	9/23/2014	NS	22.6	22.6	2/9/2015	34.2	30.2	32.2	9.60	42.5%
M-SB09/SB-09-15	Wetland	9/25/2014	NS	19.1	19.1	2/10/2015	NS	NS	-	-	-
M-SB19/SB-19-15	Wetland	10/1/2014	NS	16.7	16.7	2/9/2015	14.1	15.3	14.7	-2.00	-12.0%
								Average:		-1.22	3.7%

Notes:
Sodium adsorption ratio is unitless
NS = Not Sampled
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 4
Sodium Adsorption Ratio in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	2-3									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	1/22/2014	17.8	NS	17.8	2/10/2015	26.7	28.4	27.6	9.75	54.8%
B-2/B-2-15	Wetland	1/22/2014	27.4	NS	27.4	2/10/2015	27.4	26.9	27.2	-0.25	-0.9%
B-5/B-5-15	Wetland	1/22/2014	9.74	NS	9.74	2/10/2015	17.9	18.1	18.0	8.26	84.8%
B-7/B-7-15	Wetland	1/22/2014	31.1	NS	31.1	2/10/2015	37.2	31.9	34.6	3.45	11.1%
B-9/B-9-15	Wetland	1/22/2014	15.8	NS	15.8	2/10/2015	14.2	14.1	14.2	-1.65	-10.4%
B-10/B-10-15	Wetland	1/22/2014	5.24	NS	5.24	2/10/2015	6.64	7.53	7.09	1.85	35.2%
B-11/B-11-15	Upland	2/6/2014	34.6	NS	34.6	2/10/2015	18.6	26.3	22.5	-12.15	-35.1%
B-12/B-12-15	Wetland	2/6/2014	9.36	NS	9.36	2/10/2015	27.9	32.8	30.4	20.99	224.3%
B-20/B-20-15	Wetland	3/10/2014	44.9	NS	44.9	2/10/2015	28.0	31.2	29.6	-15.30	-34.1%
B-21/B-21-15	Wetland	3/10/2014	15.8	NS	15.8	2/10/2015	33.1	33.1	33.1	17.30	109.5%
B-31/B-31-15	Wetland	4/2/2014	13.7	NS	13.7	2/10/2015	NS	NS	-	-	-
B-32/B-32-15	Wetland	4/2/2014	30.8	NS	30.8	2/10/2015	27.7	25.3	26.5	-4.30	-14.0%
B-42/B-42-15	Wetland	4/24/2014	9.16	7.53	8.35	2/9/2015	9.80	11.1	10.45	2.11	25.2%
B-43/B-43-15	Wetland	4/24/2014	5.18	6.18	5.68	2/9/2015	NS	NS	-	-	-
B-45/B-45-15	Wetland	4/24/2014	8.02	8.99	8.51	2/9/2015	8.70	9.09	8.90	0.39	4.6%
B-46/SB-46-15	Wetland	4/24/2014	4.81	5.23	5.02	2/10/2015	NS	NS	-	-	-
B-47/SB-47-15	Wetland	4/24/2014	7.90	7.80	7.85	2/10/2015	NS	NS	-	-	-
B-49/B-49-15	Wetland	4/25/2014	8.50	NS	8.50	2/10/2015	NS	NS	-	-	-
B-51/B-51-15	Wetland	4/25/2014	5.99	NS	5.99	2/10/2015	NS	NS	-	-	-
B-52/B-52-15	Wetland	4/25/2014	5.23	NS	5.23	2/10/2015	NS	NS	-	-	-
B-53/B-53-15	Wetland	4/25/2014	11.0	NS	11.0	2/10/2015	NS	NS	-	-	-
M-SB01/SB-01-15	Wetland	9/23/2014	NS	NS	-	2/10/2015	17.2	18.7	18.0	-	-
M-SB03/SB-03-15	Wetland	9/23/2014	NS	NS	-	2/9/2015	22.6	25.0	23.8	-	-
M-SB09/SB-09-15	Wetland	9/25/2014	NS	NS	-	2/10/2015	NS	NS	-	-	-
M-SB19/SB-19-15	Wetland	10/1/2014	NS	NS	-	2/9/2015	13.3	14.0	13.7	-	-
								Average:		2.34	35.0%
								Average of all samples:		-1.67	4.8%

Notes:
Sodium adsorption ratio is unitless
NS = Not Sampled
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 5
Exchangeable Sodium Percentage in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	0-1									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	12/18/2013	8.0	NS	8	2/10/2015	8.2	9.3	8.8	0.75	9.4%
B-2/B-2-15	Wetland	12/18/2013	3.2	NS	3.2	2/10/2015	4.8	10.5	7.7	4.45	139.1%
B-5/B-5-15	Wetland	12/18/2013	12.7	NS	12.7	2/10/2015	16.7	10.9	13.8	1.10	8.7%
B-7/B-7-15	Wetland	1/22/2014	20.2	NS	20.2	2/10/2015	6.7	9.5	8.1	-12.10	-59.9%
B-9/B-9-15	Wetland	1/22/2014	31.8	NS	31.8	2/10/2015	5.4	4.8	5.1	-26.70	-84.0%
B-10/B-10-15	Wetland	1/22/2014	19.3	NS	19.3	2/10/2015	6.7	6.5	6.6	-12.70	-65.8%
B-11/B-11-15	Upland	2/6/2014	1.8	NS	1.8	2/10/2015	NS	NS	-	-	-
B-12/B-12-15	Wetland	2/6/2014	9.9	NS	9.9	2/10/2015	10.8	11.1	11.0	1.05	10.6%
B-20/B-20-15	Wetland	3/10/2014	4.2	NS	4.2	2/10/2015	1.7	2.4	2.1	-2.15	-51.2%
B-21/B-21-15	Wetland	3/10/2014	22.0	NS	22.0	2/10/2015	8.0	6.5	7.3	-14.75	-67.0%
B-31/B-31-15	Wetland	4/2/2014	6.4	NS	6.4	2/10/2015	NS	NS	-	-	-
B-32/B-32-15	Wetland	4/2/2014	13.7	NS	13.7	2/10/2015	3.2	9.5	6.4	-7.35	-53.6%
B-42/B-42-15	Wetland	4/24/2014	15.7	NA	15.7	2/9/2015	6.5	7.8	7.2	-8.55	-54.5%
B-43/B-43-15	Wetland	4/24/2014	11.0	NA	11.0	2/9/2015	3.9	7.2	5.6	-5.45	-49.5%
B-45/B-45-15	Wetland	4/24/2014	15.9	NA	15.9	2/9/2015	3.3	5.8	4.6	-11.35	-71.4%
B-46/SB-46-15	Wetland	4/24/2014	14.1	NA	14.1	2/10/2015	5.4	5.5	5.5	-8.65	-61.3%
B-47/SB-47-15	Wetland	4/24/2014	2.2	NA	2.2	2/10/2015	3.0	2.0	2.5	0.30	13.6%
B-49/B-49-15	Wetland	4/25/2014	8.9	NS	8.9	2/10/2015	6.0	6.3	6.2	-2.75	-30.9%
B-51/B-51-15	Wetland	4/25/2014	10.6	NS	10.6	2/10/2015	6.2	6.1	6.2	-4.45	-42.0%
B-52/B-52-15	Wetland	4/25/2014	7.7	NS	7.7	2/10/2015	7.6	7.6	7.6	-0.10	-1.3%
B-53/B-53-15	Wetland	4/25/2014	19.0	NS	19.0	2/10/2015	12.3	4.9	8.6	-10.40	-54.7%
M-SB01/SB-01-15	Wetland	9/23/2014	NS	NA	-	2/10/2015	9.5	11.5	10.5	-	-
M-SB03/SB-03-15	Wetland	9/23/2014	NS	NA	-	2/9/2015	10.4	6.4	8.4	-	-
M-SB09/SB-09-15	Wetland	9/25/2014	NS	NA	-	2/10/2015	8.5	8.6	8.6	-	-
M-SB19/SB-19-15	Wetland	10/1/2014	NS	NA	-	2/9/2015	5.8	7.4	6.6	-	-
								Average:		-6.31	-29.8%

Notes:
Exchangeable sodium percentage reported in percent
NS = Not Sampled
NA = Not Analyzed
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 5
Exchangeable Sodium Percentage in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	1-2									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	12/18/2013	5.2	NS	5.2	2/10/2015	10.4	13.2	11.8	6.60	126.9%
B-2/B-2-15	Wetland	12/18/2013	2.9	NS	2.9	2/10/2015	9.6	11.3	10.5	7.55	260.3%
B-5/B-5-15	Wetland	12/18/2013	9.5	NS	9.5	2/10/2015	12.8	16.6	14.7	5.20	54.7%
B-7/B-7-15	Wetland	1/22/2014	22.6	NS	22.6	2/10/2015	8.1	14.3	11.2	-11.40	-50.4%
B-9/B-9-15	Wetland	1/22/2014	18.1	NS	18.1	2/10/2015	8.1	7.9	8.0	-10.10	-55.8%
B-10/B-10-15	Wetland	1/22/2014	5.5	NS	5.5	2/10/2015	4.8	4.0	4.4	-1.10	-20.0%
B-11/B-11-15	Upland	2/6/2014	11.3	NS	11.3	2/10/2015	2.6	2.5	2.6	-8.75	-77.4%
B-12/B-12-15	Wetland	2/6/2014	16.2	NS	16.2	2/10/2015	10.4	17.0	13.7	-2.50	-15.4%
B-20/B-20-15	Wetland	3/10/2014	10.7	NS	10.7	2/10/2015	2.5	3.5	3.0	-7.70	-72.0%
B-21/B-21-15	Wetland	3/10/2014	20.5	NS	20.5	2/10/2015	11.5	11.3	11.4	-9.10	-44.4%
B-31/B-31-15	Wetland	4/2/2014	6.9	NS	6.9	2/10/2015	8.6	11.2	9.9	3.00	43.5%
B-32/B-32-15	Wetland	4/2/2014	9.9	NS	9.9	2/10/2015	7.9	8.7	8.3	-1.60	-16.2%
B-42/B-42-15	Wetland	4/24/2014	9.2	NA	9.2	2/9/2015	6.5	7.1	6.8	-2.40	-26.1%
B-43/B-43-15	Wetland	4/24/2014	2.5	NA	2.5	2/9/2015	NS	NS	-	-	-
B-45/B-45-15	Wetland	4/24/2014	11.5	NA	11.5	2/9/2015	3.2	8.7	6.0	-5.55	-48.3%
B-46/SB-46-15	Wetland	4/24/2014	2.7	NA	2.7	2/10/2015	3.8	3.9	3.9	1.15	42.6%
B-47/SB-47-15	Wetland	4/24/2014	3.8	NA	3.8	2/10/2015	NS	NS	-	-	-
B-49/B-49-15	Wetland	4/25/2014	4.6	NS	4.6	2/10/2015	3.0	4.6	3.8	-0.80	-17.4%
B-51/B-51-15	Wetland	4/25/2014	2.7	NS	2.7	2/10/2015	NS	NS	-	-	-
B-52/B-52-15	Wetland	4/25/2014	6.9	NS	6.9	2/10/2015	10.5	5.7	8.1	1.20	17.4%
B-53/B-53-15	Wetland	4/25/2014	9.6	NS	9.6	2/10/2015	11.4	5.3	8.4	-1.25	-13.0%
M-SB01/SB-01-15	Wetland	9/23/2014	NS	NA	-	2/10/2015	12.7	12.4	12.6	-	-
M-SB03/SB-03-15	Wetland	9/23/2014	NS	NA	-	2/9/2015	4.0	3.2	3.6	-	-
M-SB09/SB-09-15	Wetland	9/25/2014	NS	NA	-	2/10/2015	NS	NS	-	-	-
M-SB19/SB-19-15	Wetland	10/1/2014	NS	NA	-	2/9/2015	5.1	6.4	5.8	-	-
								Average:		-2.09	4.9%

Notes:
Exchangeable sodium percentage reported in percent
NS = Not Sampled
NA = Not Analyzed
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

Table 5
Exchangeable Sodium Percentage in Resampled Locations
Martha Zoe Moore, et al. vs. Denbury Onshore, LLC
Richland Parish, Louisiana

	Sample Depth	2-3									
Sample ID	**Area Type**	**Date**	**Cork**	**AES**	**Average**	**Date**	**MP&A**	**AES**	**Average**	**Change**	**% Change**
B-1/B-1-15	Upland	1/22/2014	NA	NS	-	2/10/2015	7.8	12.2	10.0	-	-
B-2/B-2-15	Wetland	1/22/2014	NA	NS	-	2/10/2015	5.1	7.5	6.3	-	-
B-5/B-5-15	Wetland	1/22/2014	NA	NS	-	2/10/2015	8.3	8.2	8.3	-	-
B-7/B-7-15	Wetland	1/22/2014	15.7	NS	15.7	2/10/2015	9.1	14.1	11.6	-4.10	-26.1%
B-9/B-9-15	Wetland	1/22/2014	12.2	NS	12.2	2/10/2015	5.8	9.0	7.4	-4.80	-39.3%
B-10/B-10-15	Wetland	1/22/2014	2.8	NS	2.8	2/10/2015	3.0	2.3	2.7	-0.15	-5.4%
B-11/B-11-15	Upland	2/6/2014	14.0	NS	14.0	2/10/2015	4.4	6.8	5.6	-8.40	-60.0%
B-12/B-12-15	Wetland	2/6/2014	6.4	NS	6.4	2/10/2015	10.2	13.5	11.9	5.45	85.2%
B-20/B-20-15	Wetland	3/10/2014	15.3	NS	15.3	2/10/2015	4.7	5.9	5.3	-10.00	-65.4%
B-21/B-21-15	Wetland	3/10/2014	11.8	NS	11.8	2/10/2015	11.8	14.4	13.1	1.30	11.0%
B-31/B-31-15	Wetland	4/2/2014	6.7	NS	6.7	2/10/2015	NS	NS	-	-	-
B-32/B-32-15	Wetland	4/2/2014	10.6	NS	10.6	2/10/2015	5.3	8.8	7.1	-3.55	-33.5%
B-42/B-42-15	Wetland	4/24/2014	3.5	NA	3.5	2/9/2015	3.2	6.6	4.9	1.40	40.0%
B-43/B-43-15	Wetland	4/24/2014	2.9	NA	2.9	2/9/2015	NS	NS	-	-	-
B-45/B-45-15	Wetland	4/24/2014	3.4	NA	3.4	2/9/2015	2.5	2.8	2.7	-0.75	-22.1%
B-46/SB-46-15	Wetland	4/24/2014	2.9	NA	2.9	2/10/2015	NS	NS	-	-	-
B-47/SB-47-15	Wetland	4/24/2014	2.2	NA	2.2	2/10/2015	NS	NS	-	-	-
B-49/B-49-15	Wetland	4/25/2014	2.7	NS	2.7	2/10/2015	NS	NS	-	-	-
B-51/B-51-15	Wetland	4/25/2014	2.1	NS	2.1	2/10/2015	NS	NS	-	-	-
B-52/B-52-15	Wetland	4/25/2014	2.8	NS	2.8	2/10/2015	NS	NS	-	-	-
B-53/B-53-15	Wetland	4/25/2014	1.3	NS	1.3	2/10/2015	NS	NS	-	-	-
M-SB01/SB-01-15	Wetland	9/23/2014	NS	NS	-	2/10/2015	8.9	6.4	7.7	-	-
M-SB03/SB-03-15	Wetland	9/23/2014	NS	NS	-	2/9/2015	6.5	2.2	4.4	-	-
M-SB09/SB-09-15	Wetland	9/25/2014	NS	NS	-	2/10/2015	NS	NS	-	-	-
M-SB19/SB-19-15	Wetland	10/1/2014	NS	NS	-	2/9/2015	3.8	4.3	4.1	-	-
								Average:		-2.36	-11.6%
								Average of all samples:		-3.85	-12.6%

Notes:
Exchangeable sodium percentage reported in percent
NS = Not Sampled
NA = Not Analyzed
Yellow highlighted values exceed LDNR 29-B Upland Standard, where applicable
Orange highlighted values exceed LDNR 29-B Elevated Wetland Standard, where applicable
AES Samples M-SB01, M-SB03, M-SB09, and M-SB19 sampled from 0 to 2 feet

ATTACHMENT G

COST ESTIMATES

Martha Zoe Moore, et al vs Denbury Onshore, LLC
Docket No. 43,926-B 5th Judicial District Court
Richland Parish, Louisiana

GROUNDWATER

ARABIE ENVIRONMENTAL SOLUTIONS, LLC
P.O. Box 928
Lake Charles, Louisiana 70602
Phone: 337.436.3248
Fax: 337.436.3641

Project No.: 11301
Date: 6/25/2015
Page: 1

Site:
Martha Z. Moore, et al vs. Denberry Onshore
626. Acres, Section 33, Township 17 North, Range 09 East
Richland Parish, LA

Prepared for:
James Welsh, Commissioner of Conservation
Louisiana Department of Natural Resources
617 N. 3rd Street
Baton Rouge, Louisiana 70802

1. Shallow Monitor Well Installation and Sampling Event

Site time, mobilization, and coordination to install, log, develop and sample groundwater from 8 shallow groundwater monitoring wells. The monitor wells will be installed to the upper portion of the MRAA, developed and sampled. Wells will be installed for permanent use and registered with the LDNR. (3 days install, 1 day develop, 2 days sample)

Item	Rate	Unit	Quantity	Use Factor	Price
FIELD					
Sr. Engineer	$145.00	Hour	1	1	$145.00
Geologist	$120.00	Hour	2	6	$1,440.00
Sr. Environmental Scientist	$98.00	Hour	10	6	$5,880.00
Environmental Scientist	$82.00	Hour	10	6	$4,920.00
Mileage	$0.575	Mile	500	1	$287.50
Water Level Probe	$15.00	Day	2	1	$30.00
YSI Multimeter	$45.00	Day	6	1	$270.00
Peristaltic Pump	$45.00	Day	6	1	$270.00
Miscellaneous Tubing & Supplies	$200.00	Lump Sum	1	1	$200.00
			Subtotal		**$13,442.50**
DRILLER SERVICES					
Shallow Monitor Wells (8 wells to 20 feet bgs)					
Geoprobe Rig & Crew	$ 1,850.00	Day	3	1.1	$ 6,105.00
Mob/Demob	$ 800.00	Lump Sum	1	1.1	$ 880.00
One-Inch PVC Well Materials	$ 3.50	Foot	160	1.1	$ 616.00
Five-foot by One-inch Pre-pack PVC Well Screens	$ 175.00	Each	16	1.1	$ 3,080.00
ATV	$ 150.00	Day	3	1.1	$ 495.00
Surface Completions (well protector & ballards)	$ 300.00	Well	8	1.1	$ 2,640.00
Air-lift Well Development	$ 100.00	Well	8	1.1	$ 880.00
per diem	$ 405.00	Day	3	1.1	$ 1,336.50
Aquifer Testing and Analysis	$ 1,500.00	Day	4	1	$ 6,000.00
IDW Handling - Soil and Well Development Water	$ 2,000.00	Lump Sum	1	1	$ 2,000.00
			Subtotal		**$24,032.50**
LABORATORY					
Aqueous					
Chloride	$30.00	Sample	8	1.1	$264.00
Specific Conductance	$10.00	Sample	8	1.1	$88.00
TDS	$25.00	Sample	8	1.1	$220.00
			Total		**$572.00**
				Total	**$38,047.00**

ARABIE ENVIRONMENTAL SOLUTIONS, LLC
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Lake Charles, Louisiana 70602
Phone: 337.436.3248
Fax: 337.436.3641

Project No.: 11301
Date: 6/25/2015

Site:
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Richland Parish, LA

Prepared for:
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Louisiana Department of Natural Resources
617 N. 3rd Street
Baton Rouge, Louisiana 70802

2. Deep Monitor Well Installation and Sampling Event

Site time, mobilization, and coordination to install, log and samplegroundwater from 3 deep groundwater monitoring wells. The monitor wells will be installed to the lower portion of the MRAA, developed and sampled. Wells will be installed for permanent use and registered with the LDNR. (5 days install & develop, 2 days sample)

Item	Rate	Unit	Quantity	Use Factor	Price
FIELD					
Sr. Engineer	$145.00	Hour	2	1	$290.00
Geologist	$120.00	Hour	2	7	$1,680.00
Sr. Environmental Scientist	$98.00	Hour	10	7	$6,860.00
Environmental Scientist	$82.00	Hour	10	7	$5,740.00
Mileage	$0.575	Mile	500	2	$575.00
Water Level Probe	$15.00	Day	2	1	$30.00
YSI Multimeter & Flow-through Cell	$45.00	Day	2	1	$90.00
Peristaltic Pump	$45.00	Day	2	1	$90.00
Miscellaneous Tubing & Supplies	$200.00	Lump Sum	1	1	$200.00
			Subtotal		**$15,555.00**
DRILLER SERVICES					
Deep Monitor Wells (3 two-inch by 140 feet wells)					
Sonic Rig & Crew	$ 4,950.00	Day	5	1.1	$ 27,225.00
Mob/Demob	$ 1,500.00	Lump Sum	1	1.1	$ 1,650.00
Two-inch PVC Well Materials	$ 15.00	Foot	140	3.3	$ 6,930.00
Surface Completions (well protector & ballards)	$ 600.00	Well	3	1.1	$ 1,980.00
Skidsteer	$ 375.00	Day	5	1.1	$ 2,062.50
Water Truck	$ 750.00	Day	5	1.1	$ 4,125.00
Air-lift Well Development	$ 150.00	Well	3	1.1	$ 495.00
per diem	$ 350.00	Day	5	1.1	$ 1,925.00
Layover	$ 750.00	Day	2	0	$ -
IDW Handling - Soil and Well Development Water	$ 3,000.00	Lump Sum	1	1.1	$ 3,300.00
			Subtotal		**$49,692.50**
LABORATORY					
Aqueous					
Chloride	$30.00	Sample	3	1.1	$99.00
Specific Conductance	$10.00	Sample	3	1.1	$33.00
TDS	$25.00	Sample	3	1.1	$82.50
			Total		**$214.50**
				Total	**$65,462.00**

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3. Survey Well Elevations

Costs Adopted from MPA plan. Licensed surveyor costs to establish well locations and top-of-casing and ground elevations.

Item	Rate	Unit	Quantity	Use Factor	Price
SURVEYOR					
Survey	$2,800.00	Lump Sum	1	1.1	$3,080.00
			Subtotal		**$3,080.00**

Total **$3,080.00**

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4. Groundwater Monitoring

Three years of quarterly groundwater monitoring of 8 shallow and 3 deep wells. The first monitoring event costs are included in well installation.

Item	Rate	Unit	Quantity	Use Factor	Price
REPORTING					
Sr. Engineer	$145.00	Hour	2	12	$3,480.00
Geologist	$120.00	Hour	10	12	$14,400.00
Sr. Environmental Scientist	$98.00	Hour	40	12	$47,040.00
Technical Assistant	$60.00	Hour	20	12	$14,400.00
			Subtotal		**$79,320.00**
FIELD					
Sr. Engineer	$145.00	Hour	2	11	$3,190.00
Geologist	$120.00	Hour	4	11	$5,280.00
Sr. Environmental Scientist	$98.00	Hour	50	11	$53,900.00
Environmental Scientist	$82.00	Hour	50	11	$45,100.00
Mileage	$0.575	Mile	500	11	$3,162.50
Water Level Probe	$15.00	Day	5	11	$825.00
YSI Multimeter & Flow-through Cell	$45.00	Day	5	11	$2,475.00
Peristaltic Pump	$45.00	Day	5	11	$2,475.00
Miscellaneous Tubing & Supplies	$200.00	Lump Sum	1	11	$2,200.00
			Subtotal		**$118,607.50**
LABORATORY					
Aqueous					
Chloride	$30.00	Sample	11	11.11	$3,666.30
Specific Conductance	$10.00	Sample	11	11.11	$1,222.10
TDS	$25.00	Sample	11	11.11	$3,055.25
			Total		**$7,943.65**
				Total	**$205,871.15**

ARABIE ENVIRONMENTAL SOLUTIONS, LLC
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Fax: 337.436.3641

Project No.: 11301
Date: 6/25/2015

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SUMMARY OF COSTS

Task	Cost
1. Shallow Monitor Well Installation and Sampling Event	$38,047.00
2. Deep Monitor Well Installation and Sampling Event	$65,462.00
3. Survey Well Elevations	$3,080.00
4. Groundwater Monitoring	$205,871.15
Grand Total	**$312,460.15**

SOIL

Martha Zoe Moore, et al VS Denbury Onshore, LLC

Richland Parish, Louisiana

LDNR FEASIBLE PLAN , June 2015

EXCAVATION, TRANSPORTATION, DISPOSAL, & BACKFILL

Excavation Volume (cubic yards)	Tons (1.5/cubic yard)	Excavation $5.00 per cubic yard	Transportation $20.00 per ton	Disposal $16.00 per ton	Backfill $15.00 per cubic yard	Total Cost	Total Cost per Cubic Yard	Total Cost per Ton
28,962	43,443	$144,810	$868,860	$695,088	$434,430	**$2,143,188**	**$74**	**$49**

Overburden, Excavation and Backfill

Excavation Volume (cubic yards)	Excavation $4.00 per cubic yard	Backfill $4.00 per cubic yard	Total Cost	Total Cost per Cubic Yard
0	$0.00	$0.00	**$0.00**	**$8.00**

Total Cost	$2,143,188

Martha Zoe Moore, et al VS Denbury Onshore, LLC

Richland Parish, Louisiana

EXCAVATION, TRANSPORTATION, DISPOSAL, & BACKFILL

Calculations for Excavation

Excavation Volume

This value is determined by the defined extents of contamination in both area and depth.

Conversion to Tons

This value is calculated by taking the given bulk density: 1.78 grams/cubic centimeter
Converting this to kilograms/cubic meter yields 1780 kg / m^3
Using the conversion factor from the National Institute of Standards and Technology* yields; 3000 pounds/cubic yard
This value is then divided into the pounds/ton value of 2000 to produce the tons per cubic yard- 1.5 tons/$yard^3$

Excavation Cost

The cost of excavation is based on quotes from the contractor.

Transportation Cost

Based on the transport trip cost $380.00 divided by the tons per load 20
will yield the cost of transportation for each ton: $19.00

Disposal Cost

Based on quoted rates per barrel: which is converted to per $yard^3$ via this factor: 4.808
to produce the per cubic yard cost: This cost is then processed with the tons/$yards^3$ factor above
to produce disposal cost per ton $16.00

Backfill

The cost of backfill is based on quotes from the supplier.

Total Cost

Total cost is base on the sum of all listed costs.

Total Cost per Cubic Yard

Based on the total cost divided by the total volume being excavated in cubic yards.

Total Cost per Ton

Based on the total cost divided by the total volume being excavated of in tons.

**Guide for the Use of the International System of Units* , National Institute of Standards and Technology