



Gulf of Mexico

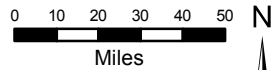


Figure 1 Site Location

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**


Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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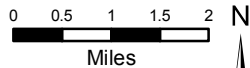




**Legend**

 Section 16 Township 15 S Range 01 E

Notes:  
USGS Topographic Map  
Approximate Section Lines



**Figure 2 - USGS Topographic Map**

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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**Legend**



Section 16 Township 15 S Range 01 E

LIDAR

Elevation (ft MSL)



5.4

-0.95

0 250 500 750 1,000



Feet



Figure 3 - Elevation Model

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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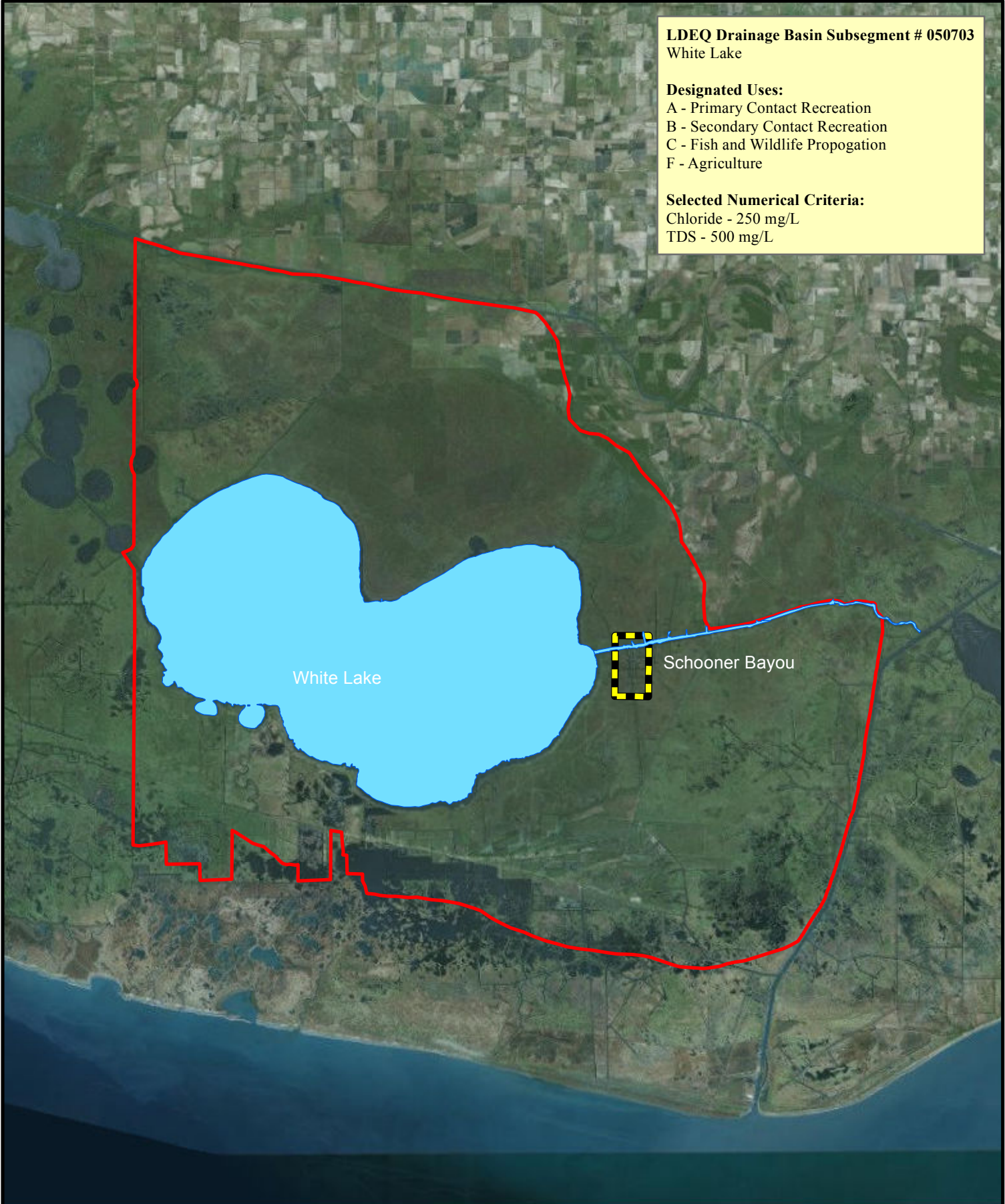
**LDEQ Drainage Basin Subsegment # 050703**  
White Lake

**Designated Uses:**

- A - Primary Contact Recreation
- B - Secondary Contact Recreation
- C - Fish and Wildlife Propagation
- F - Agriculture

**Selected Numerical Criteria:**




- Chloride - 250 mg/L
- TDS - 500 mg/L



White Lake

Schooner Bayou

**Legend**

-  Section 16 Township 15 S Range 01 E
-  Drainage Basin Subsegment
-  Surface Water Feature

Subsegment data from LDEQ (<http://www.deq.louisiana.gov/portal>).  
Imagery basemap via ArcGIS Online.

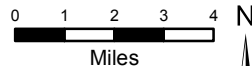


Figure 4 - LDEQ Drainage Basin Subsegment

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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
Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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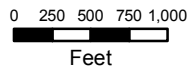




Digital Q3 flood data provided by FEMA (<http://msc.fema.gov>)  
 Imagery basemap via ArcGIS Online

**Legend**

-  Section 16 Township 15 S Range 01 E
-  Annual 1% Flood Chance (100-year Floodplain)
-  Annual 0.2% Flood Chance (500-year Floodplain)
-  Outside of 1% and 0.2% Annual Flood Chance
-  Undetermined Flood Chance



**Figure 5 - FEMA 100-Year Floodplain**

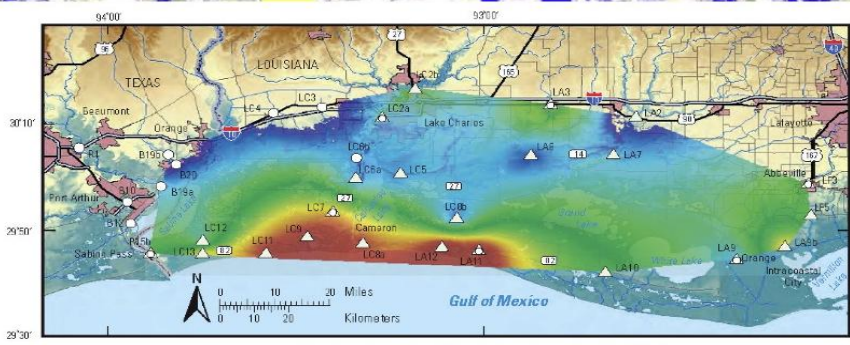
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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Storm-surge depth, in feet

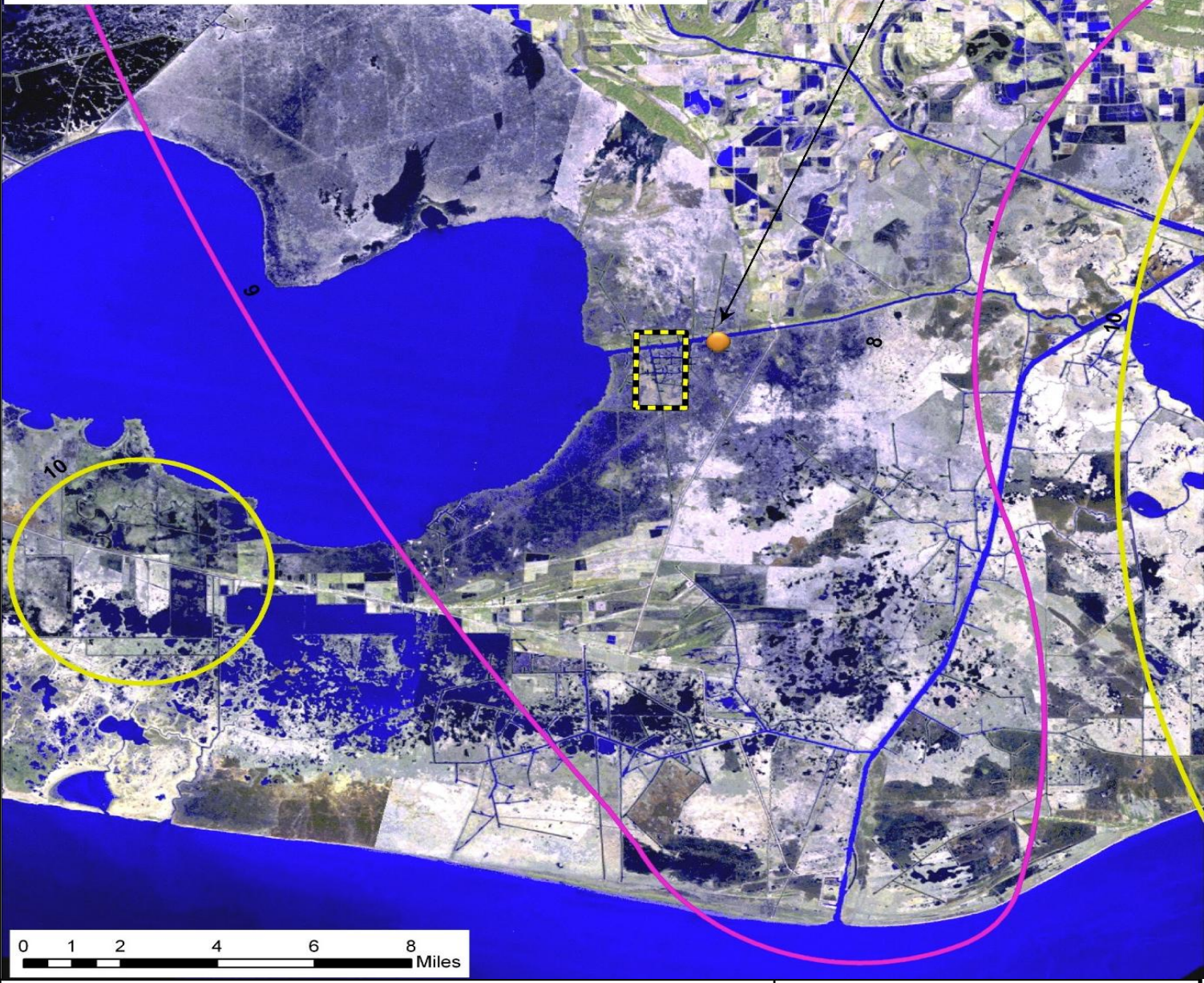
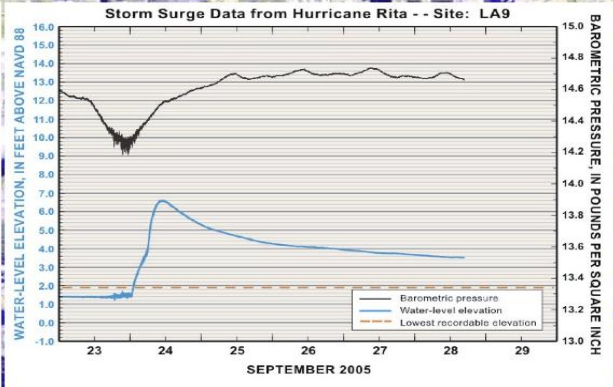
Land-surface elevation, in feet above the North America Vertical Datum of 1988 (NAVD 88)

Greater than 13  
12  
11  
10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
0

Greater than 30  
0

Data-collection site and identifier, by sensor type

LC6h □ Barometric pressure  
LC5 △ Water level  
LC7 △ Barometric pressure and water level



**Legend**

Section 16 Township 15 S Range 01 E

Hurricane Rita Surge Elevation (ft, MSL)

9 10 11 12

0 1 2 4 6 8 Miles

N

**Figure 6 - Hurricane Rita Storm Surge Map**

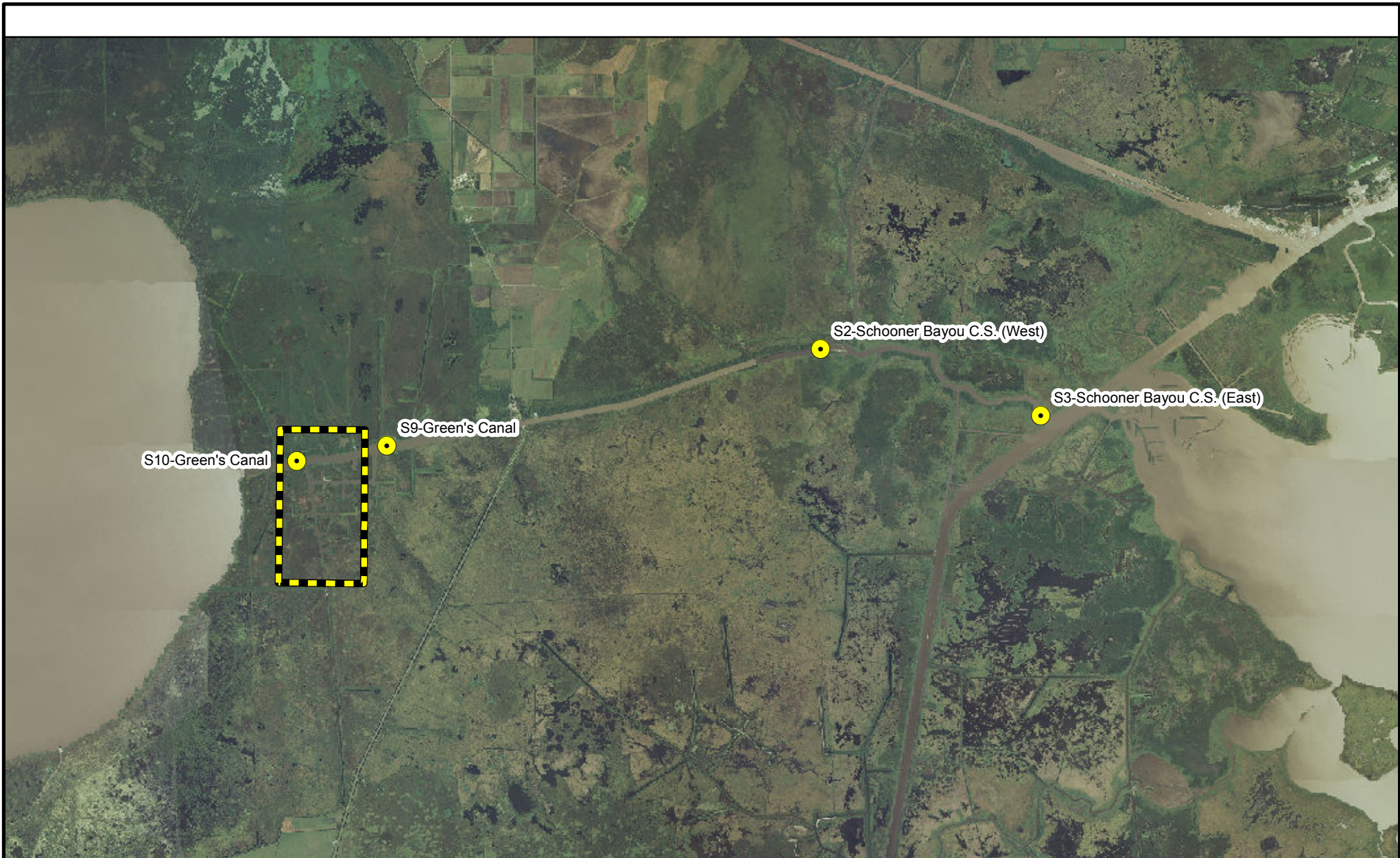
East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

**MICHAEL PISANI & ASSOCIATES, INC.**


Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS Drawn: DAM Checked: LRC Date: 9/30/2015 Project: 07-47

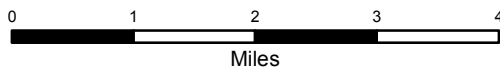




**Legend**

 US Army Corps of Engineers Surface Water Monitoring Station

 Property Line (Section 16)



**Figure 7 - US Army Corps of Engineers  
Surface Water Monitoring Locations**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Environmental Consulting Services

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Designed: JCS

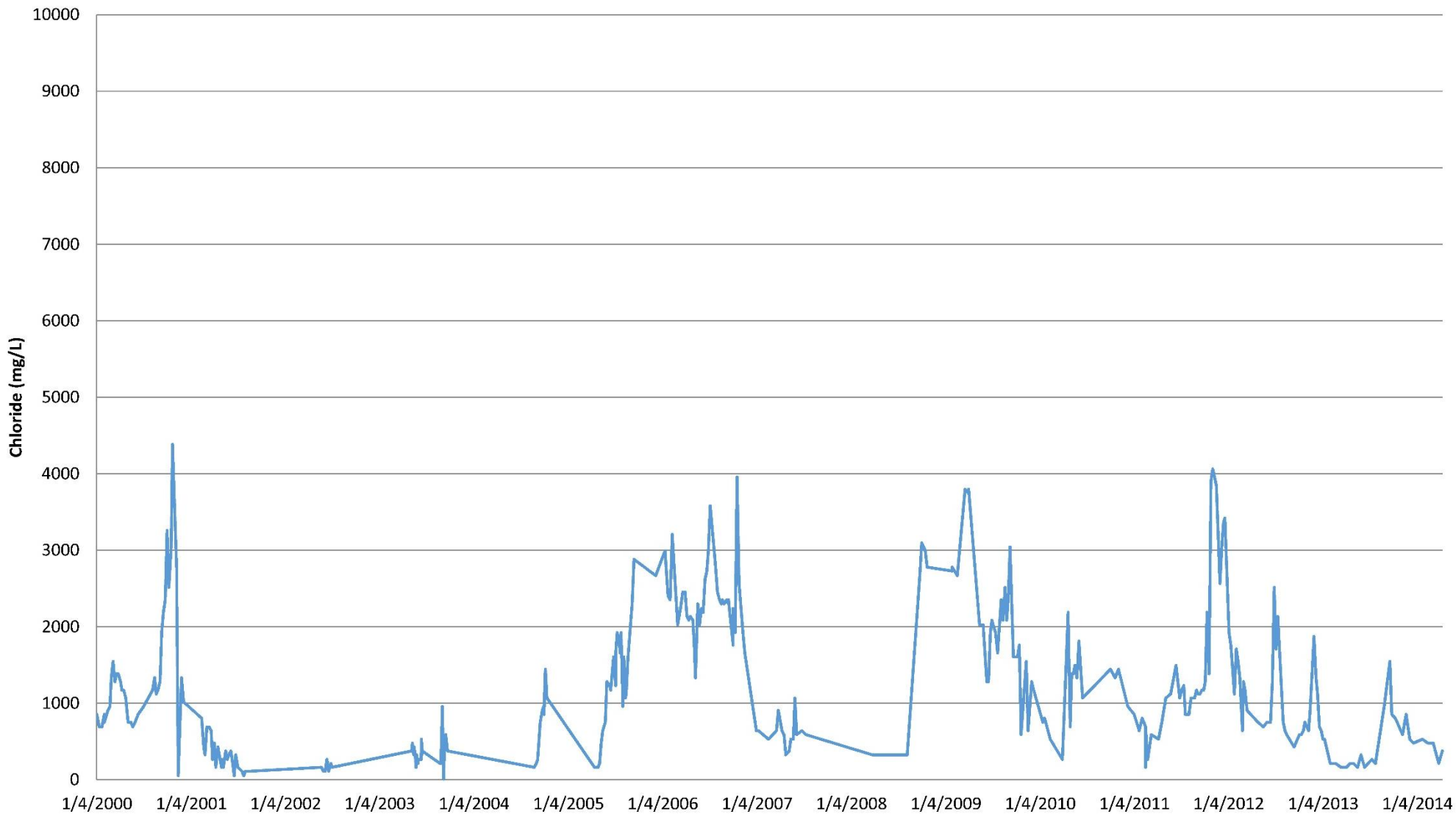
Drawn: MMH

Checked: LRC

Date: 9/30/2015

Project: 07-47





Legend



Figure 8 - US Corps - S10 Green's Canal  
Chloride Trend Chart

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Environmental Consulting Services

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Designed: JCS

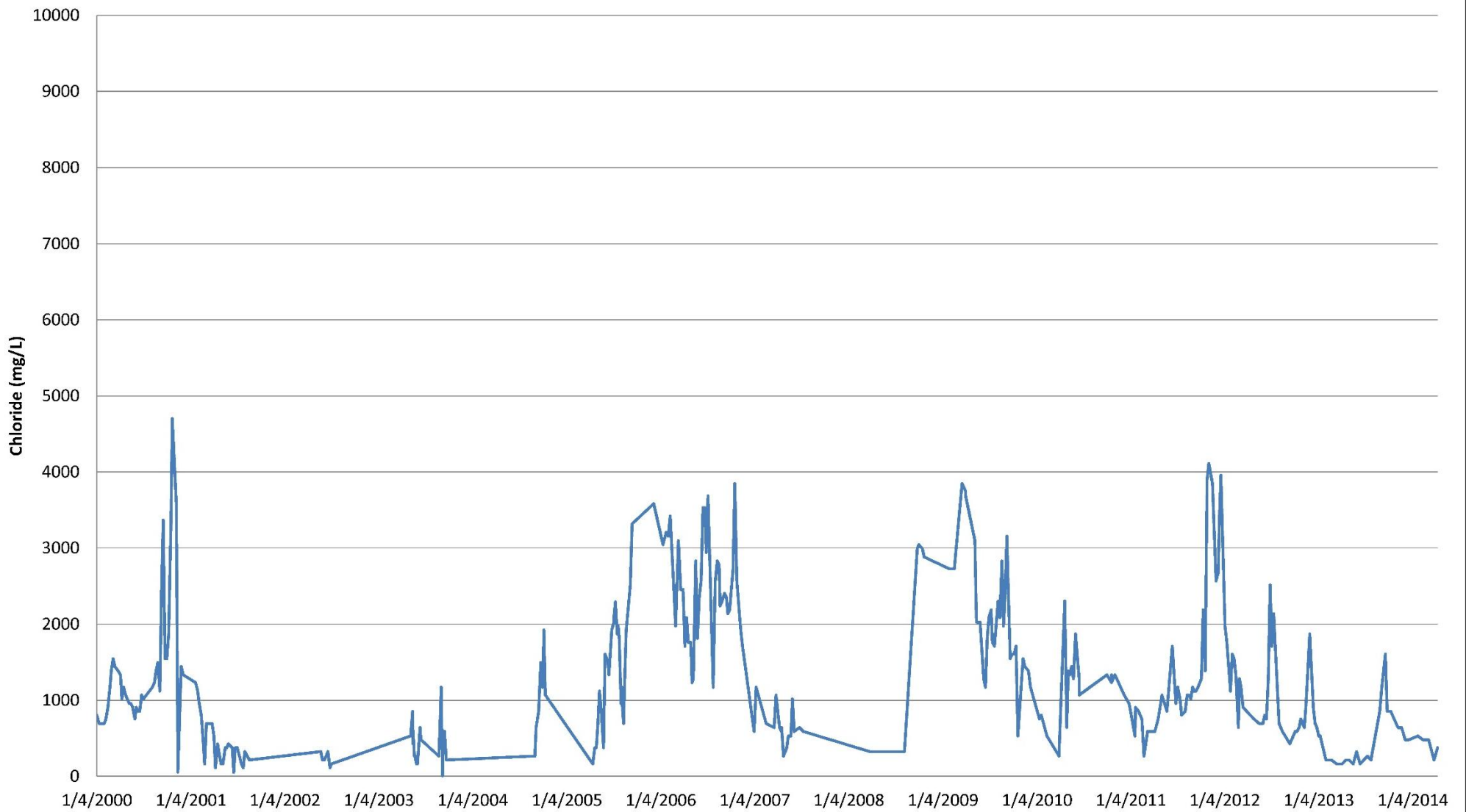
Drawn: MMH

Checked: LRC

Date: 9/30/2015

Project: 07-47





Legend



Figure 9 - US Corps - S9 Green's Canal  
Chloride Trend Chart

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Environmental Consulting Services

Baton Rouge, Louisiana    New Orleans, Louisiana    Houston, Texas

Designed: JCS

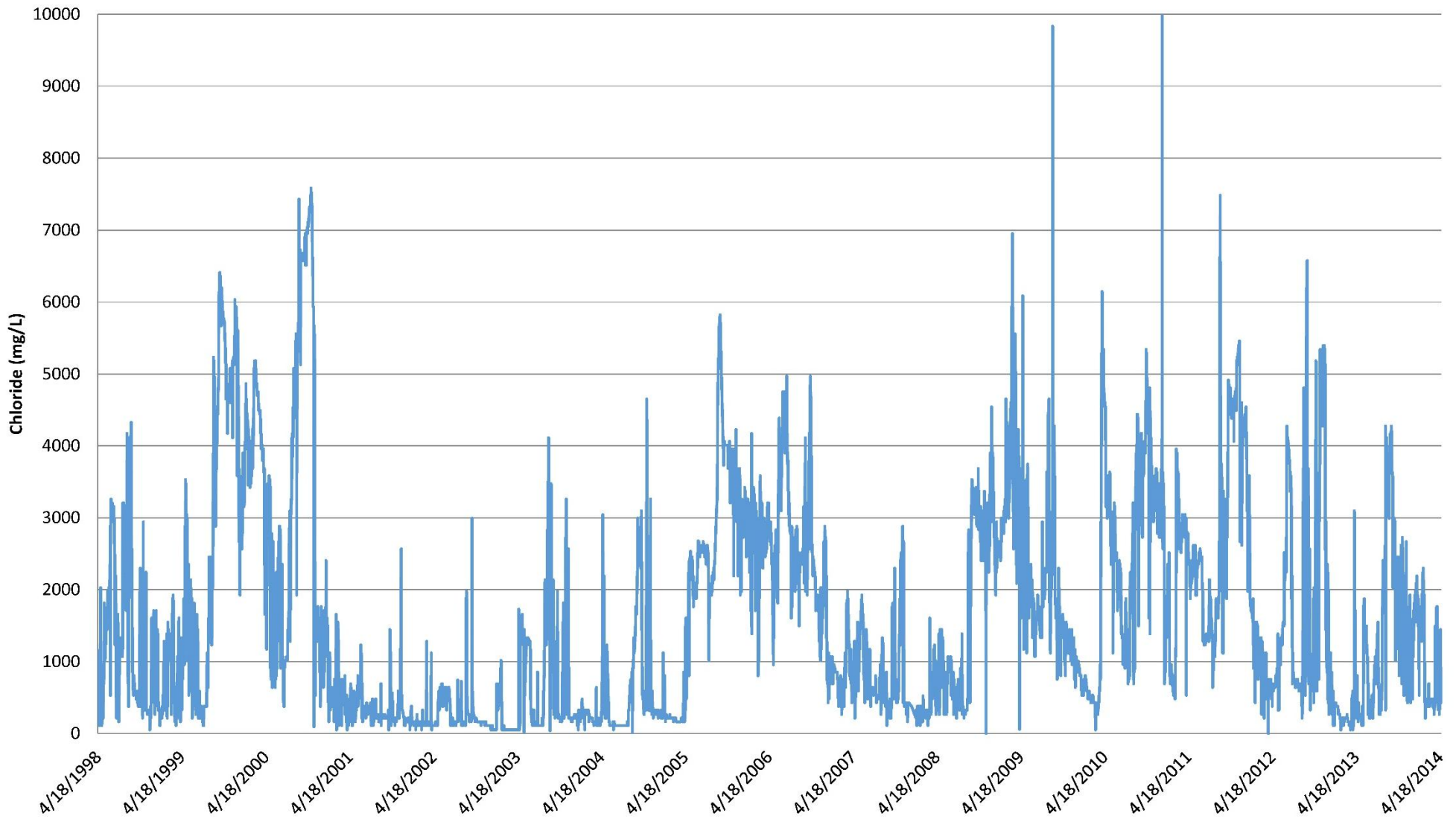
Drawn: MMH

Checked: LRC

Date: 9/30/2015

Project: 07-47





Legend



Figure 10 - US Corps - S3 Schooner Bayou Control Structure (East) Chloride Trent Chart

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS

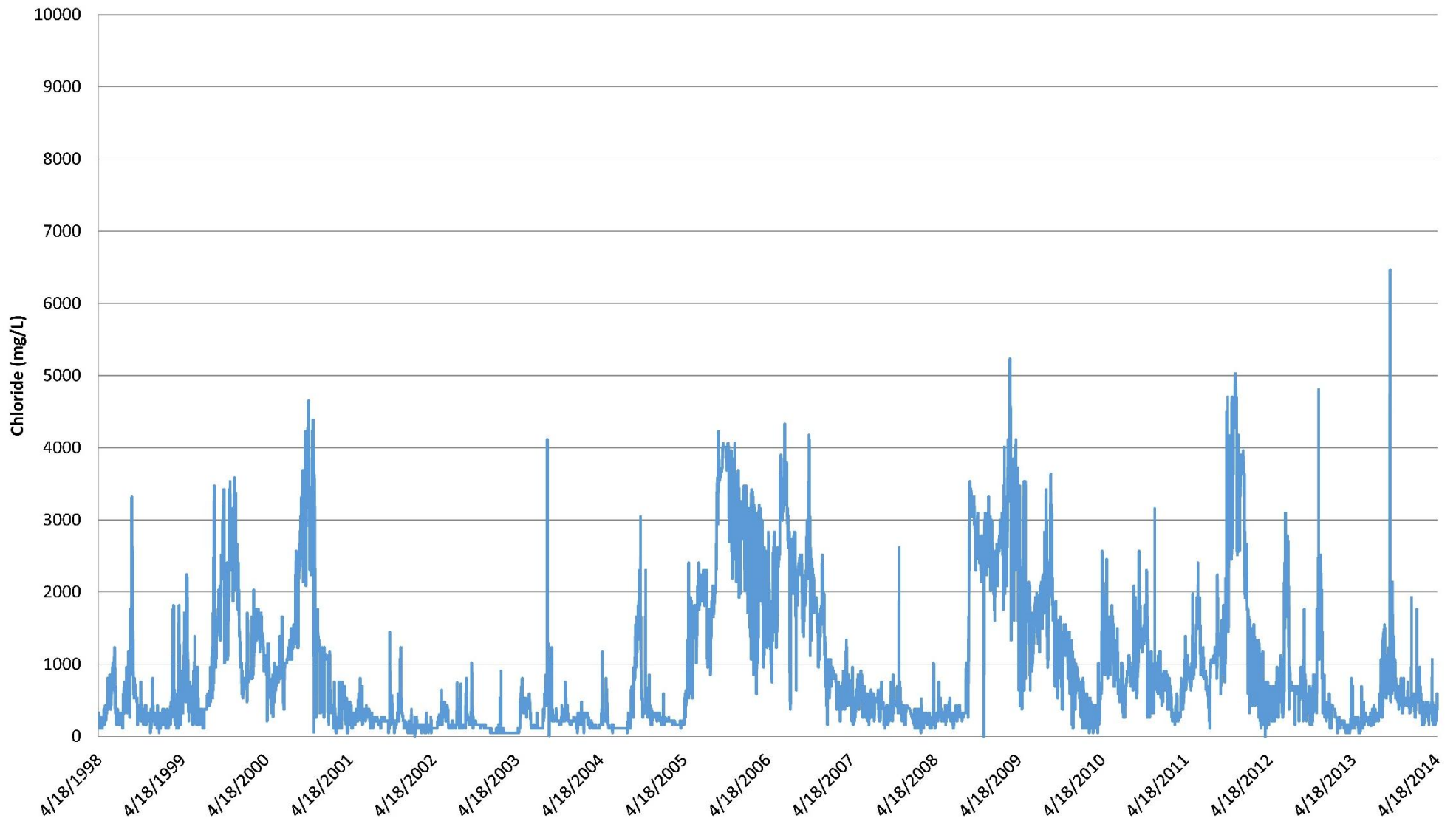
Drawn: MMH

Checked: LRC

Date: 9/30/2015

Project: 07-47





Legend



Figure 11 - US Corps - S2 Schooner Bayou Control Structure (West) Chloride Trend Chart

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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Drawn: MMH

Checked: LRC

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Project: 07-47









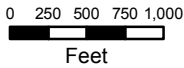
Soil data from USDA Soil Data Mart (<http://soildatamart.nrcs.usda.gov>)  
 Imagery basemap via ArcGIS Online.

**Legend**

 Section 16 Township 15 S Range 01 E

**Soil Type**

-  Water
-  Allemands Mucky Peat
-  Aquents, Frequently Flooded
-  Larose Mucky Clay



**Figure 12 - USDA Surface Soil Types**

*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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# Vegetation Types in Coastal Louisiana in 2007

By Charles E. Sasser<sup>1</sup>, Jenneke M. Visser<sup>2</sup>, Edmond Mouton<sup>3</sup>, Jeb Linscombe<sup>2</sup>, and Steve B. Hartley<sup>3</sup>

### Methodology

There are numerous datasets available to conduct analyses of marsh change in coastal Louisiana. Most prior studies have used either National Wetlands Inventory data or vegetation type maps produced by O'Neil in 1997, Chabreck and others in 1988, Chabreck and Linscombe in 1978, 1986, and 1997, and Linscombe and Chabreck in 2001. During the summer and fall of 2007, the U.S. Geological Survey (USGS), the Louisiana State University Agricultural Center, and the Louisiana Department of Wildlife and Fisheries (LDWF) Far and Sinking Division jointly completed an aerial survey to collect data on 2007 vegetation types in coastal Louisiana. The current map presents the data collected in this effort.

The 2007 aerial survey was conducted from a 206 F4U Jet Ranger helicopter using techniques developed over the last thirty years while conducting similar vegetation surveys. Transsects Brown were oriented in a north-south direction and spaced 1.87 m (3 km) apart. Sampling sites were located at a spacing of 0.3 miles (0.5 km) along these transects. Transsects covered coastal marshes from the Texas State line to the Mississippi State line and from the

northern extent of fresh marshes to the southern end of saline (saltwater) marshes on the beaches of the Gulf or of coastal bays. Navigation along these transects and to each sampling site was accomplished by using Global Positioning System (GPS) technology and geographic information system (GIS) software operating on a ruggedized laptop, a procedure that was established during the 1997 vegetation survey by Chabreck and Linscombe.

At the surveyor marked each sampling station, dominant plant species were listed and their abundance classified. Based on species composition and abundance each marsh sampling station was assigned a marsh type: fresh, intermediate, brackish, or saline (salinity marsh) (Sasser and others, 1998, 2005, 2002). The data generated from the survey were later delineated by using the same base maps that were used to map the data collected during the 1997 (Chabreck and Linscombe) and 2001 (Linscombe and Chabreck, et al.) surveys. Determinations of marsh boundaries usually followed natural levees, bayous, or other features that impede or restrict water flow.

### References

Chabreck, R.H., and Linscombe, G., 1978. Vegetative type map of the Louisiana coastal marshes. Baton Rouge, Louisiana: Department of Wildlife and Fisheries.

Chabreck, R.H., and Linscombe, G., 1988. Vegetative type map of the Louisiana coastal marshes. Baton Rouge, Louisiana: Department of Wildlife and Fisheries, set of 10 maps.

Chabreck, R.H., and Linscombe, G., 1997. Vegetative type map of the Louisiana coastal marshes. Baton Rouge, Louisiana: Department of Wildlife and Fisheries.

Chabreck, R.H., Palustrano, A.W., Jr., and James, T., 1968. Vegetative type map of the Louisiana coastal marshes. Baton Rouge, Louisiana: Department of Wildlife and Fisheries.

Linscombe, G., and Chabreck, R., [ed.]. *Task III—Coastwide aerial survey, brown marsh 2001 assessment*. Salt marsh dieback in Louisiana—Brown marsh data information management system, accessed June 4, 2008, on <http://www.marshwatch.usgs.gov>.

O'Neil, T., 1999. *The marshes in Louisiana coastal marshes*. New Orleans, Louisiana: Wildlife and Fisheries Commission, 28 p.

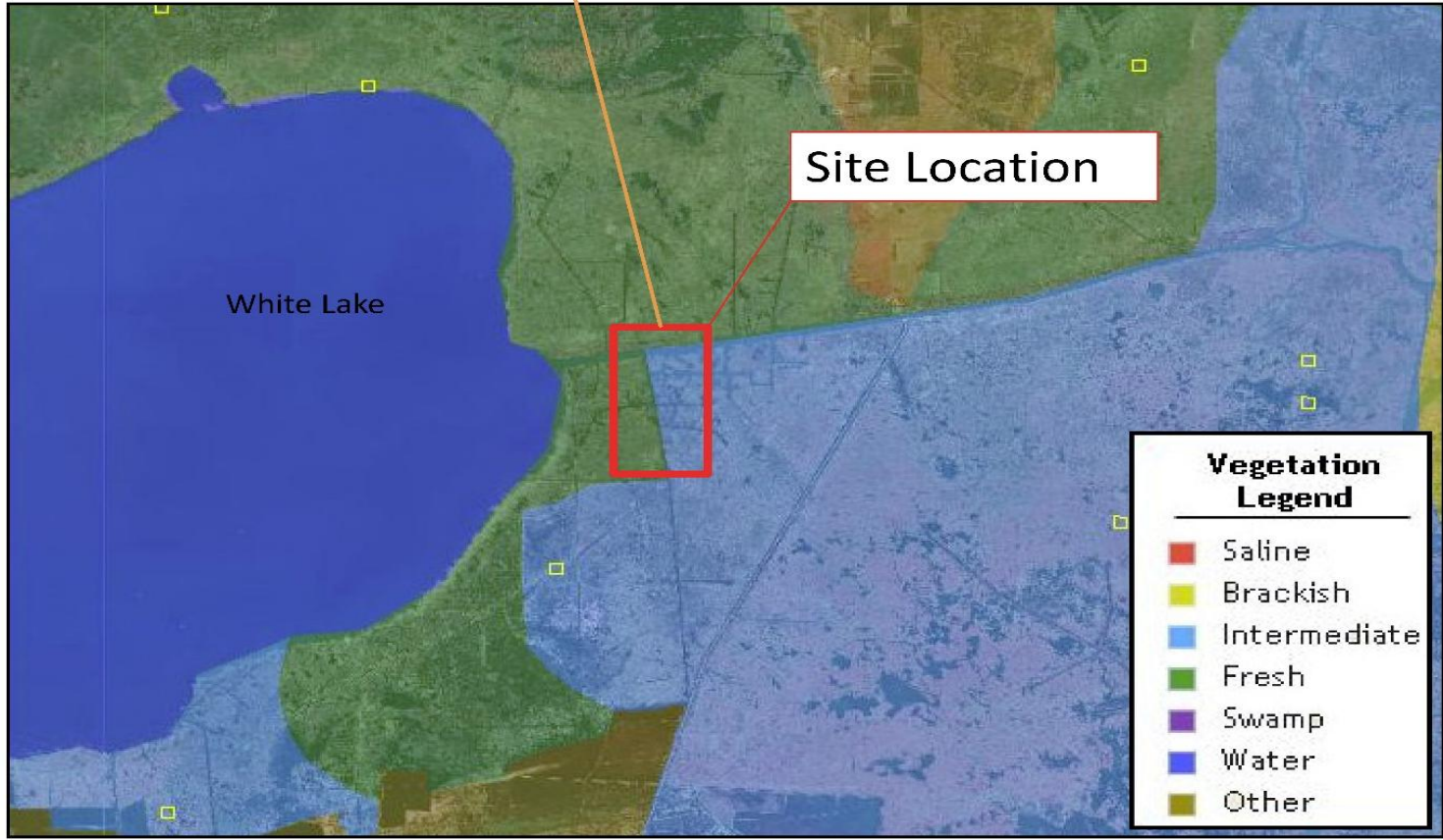
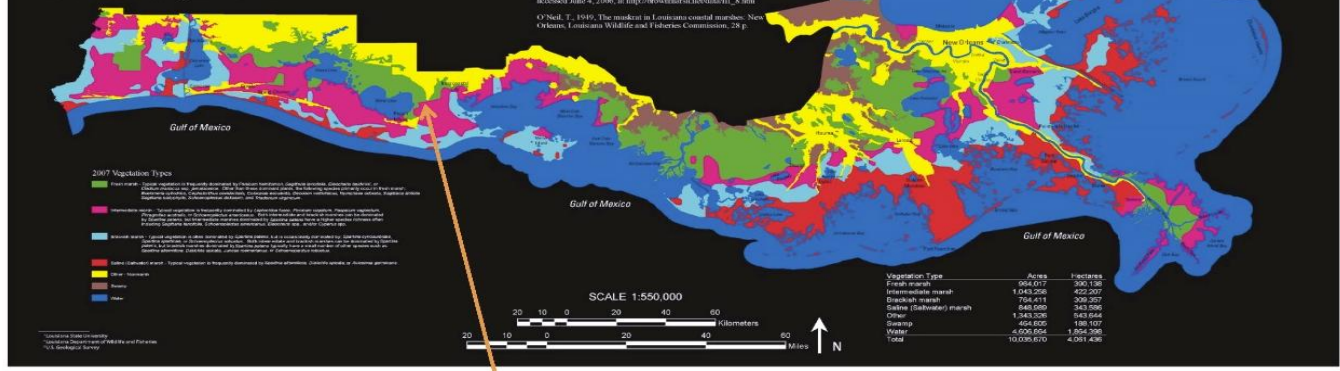
Visser, J.M., Sasser, C.E., Chabreck, R.H., and Linscombe, R.G., 1998. Marsh vegetation types of the Mississippi River Deltaic Plain. *Estuaries* 21: 818-828.

Visser, J.M., Sasser, C.E., Chabreck, R.H., and Linscombe, R.G., 2005. Marsh vegetation types of the Chenier Plain, Louisiana, USA. *Estuaries* 28: 318-327.

Visser, J.M., Sasser, C.E., Chabreck, R.H., and Linscombe, R.G., 2002. The impact of a severe drought on the vegetation of a subtropical estuary. *Estuaries* 25: 184-195.



**Figure 13**  
Sasser, C.E., Visser, J.M., Mouton, Edmond, Linscombe, Jeb, and Hartley, S.B., 2008. Vegetation types in coastal Louisiana in 2007. U.S. Geological Survey Open-File Report 2008-1224, 1 sheet, scale 1:500,000.



SourceUSGS



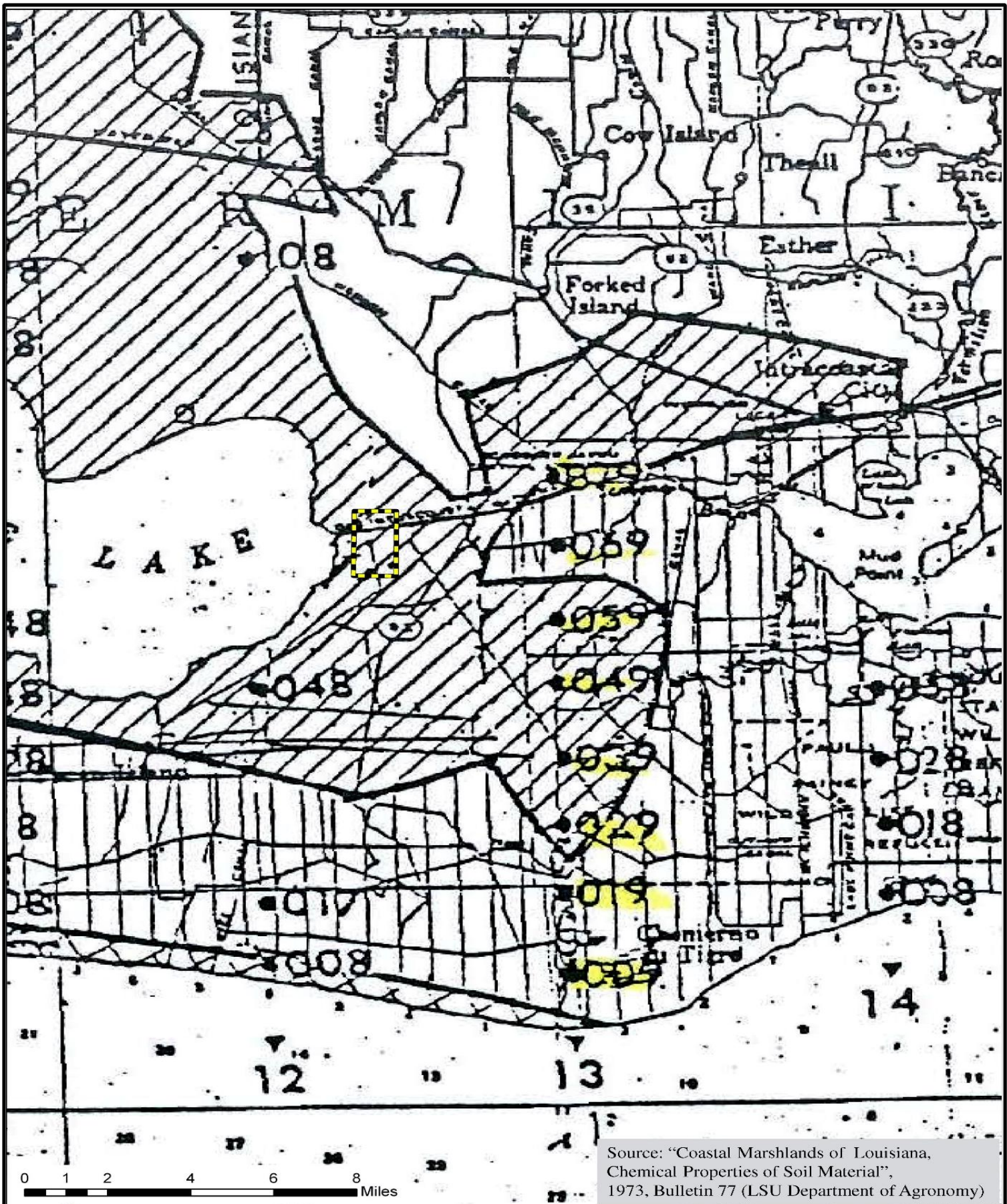
Figure 13 - Vegetation Map

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas





Source: "Coastal Marshlands of Louisiana, Chemical Properties of Soil Material", 1973, Bulletin 77 (LSU Department of Agronomy)

**Legend**

 Section 16 Township 15 S Range 01 E



**Figure 14 - Soil Salinity Transect**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

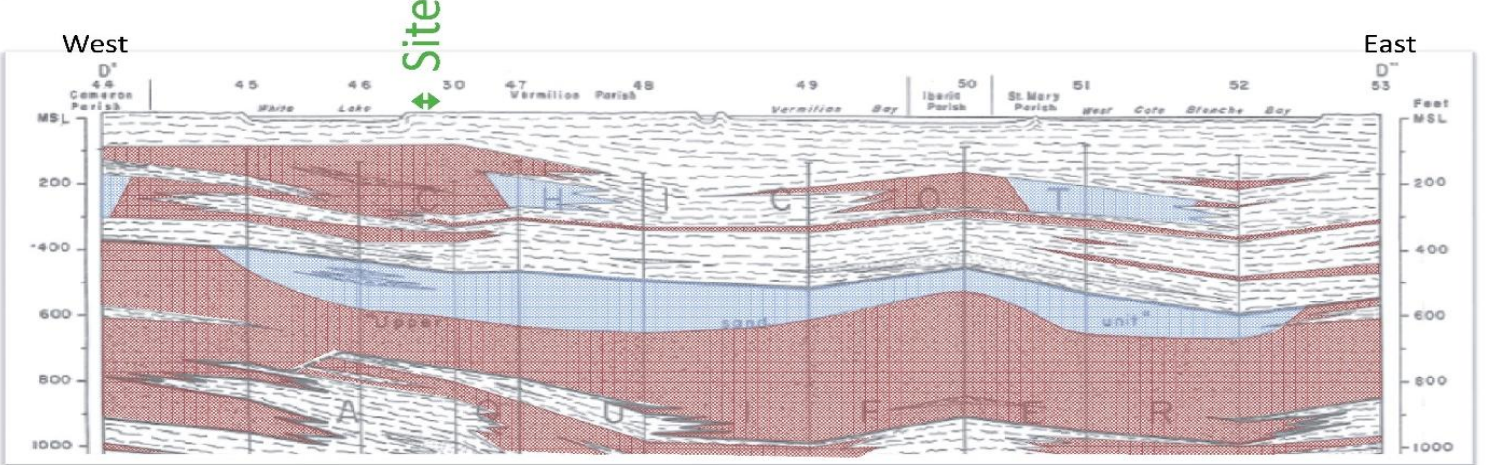
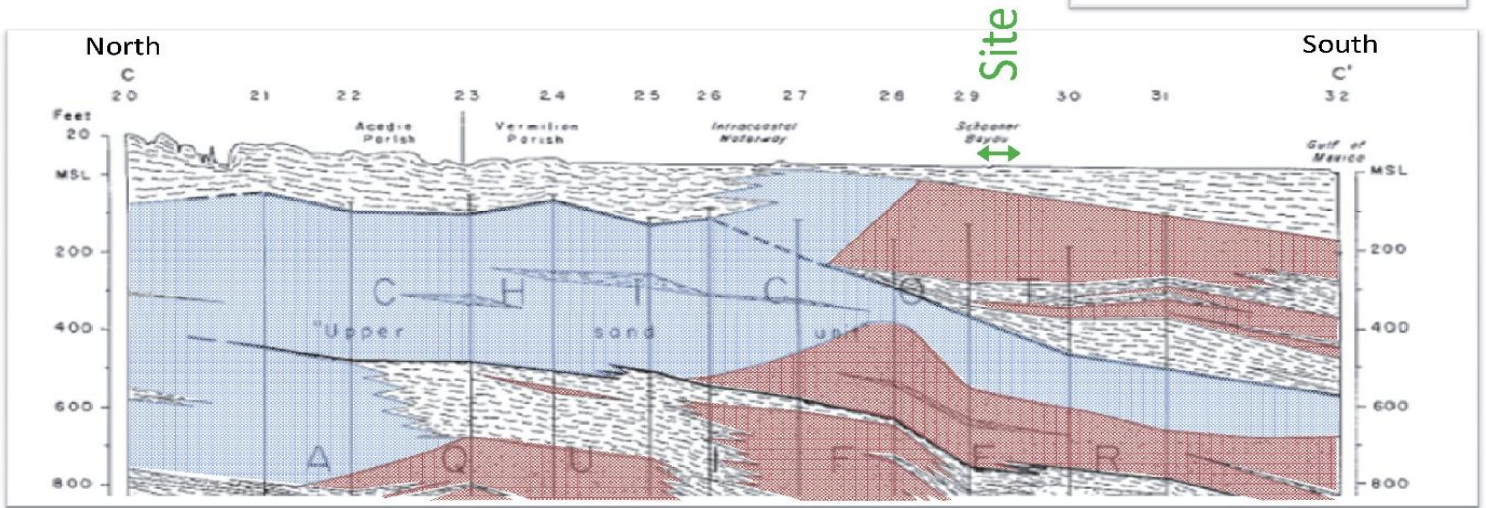
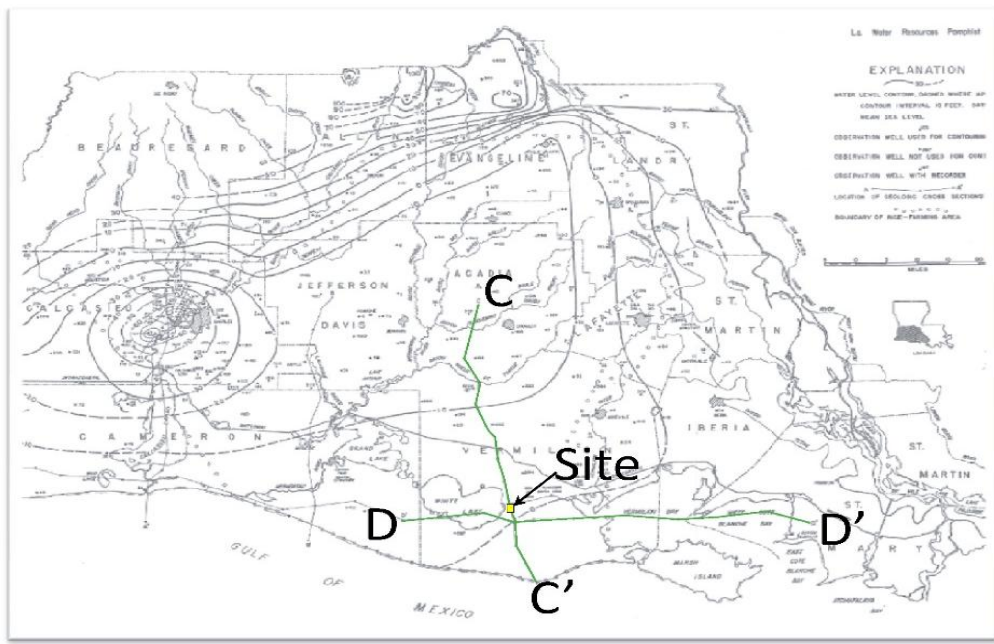
Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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Note: original drawing modified with color for illustrative purposes.

Source: *Ground Water Conditions in Southwestern Louisiana, 1961 & 1962 (With a Discussion of the Chicot Aquifer in the Coastal Area)*, Water Resources Pamphlet No. 12. — [Published by LA Geological Survey and LA Dept. of Public Works]



Figure 16 - Regional Geologic Cross Sections

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

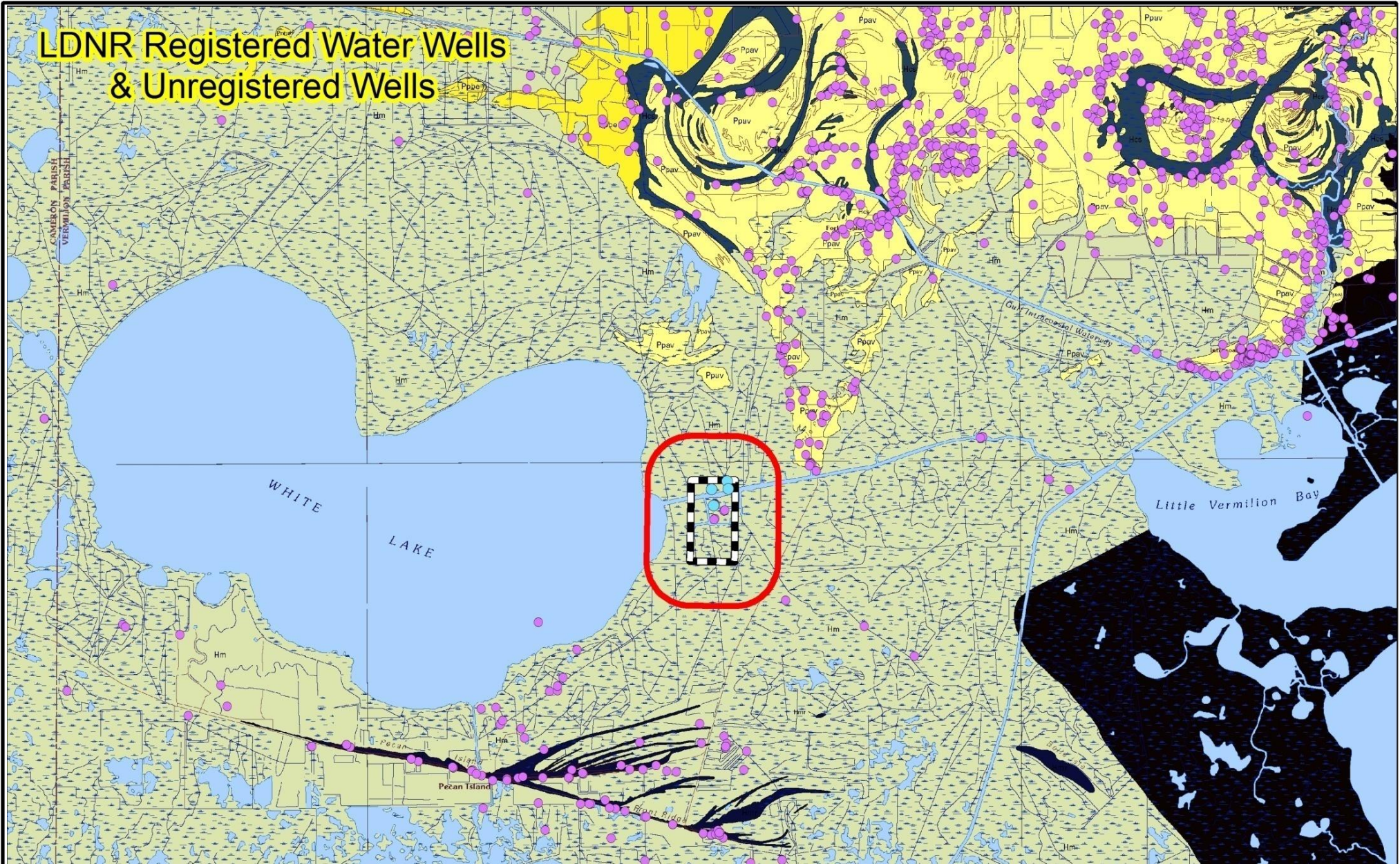
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# LDNR Registered Water Wells & Unregistered Wells



- Legend**
- Registered Water Well
  - Unregistered Water Well
  - 1 Mile Radius of Property
  - Property (Section 16)



Figure 17 - LDNR Registered Water Wells Regional Area

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Environmental Consulting Services

Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS

Drawn: MMH






Checked: LRC

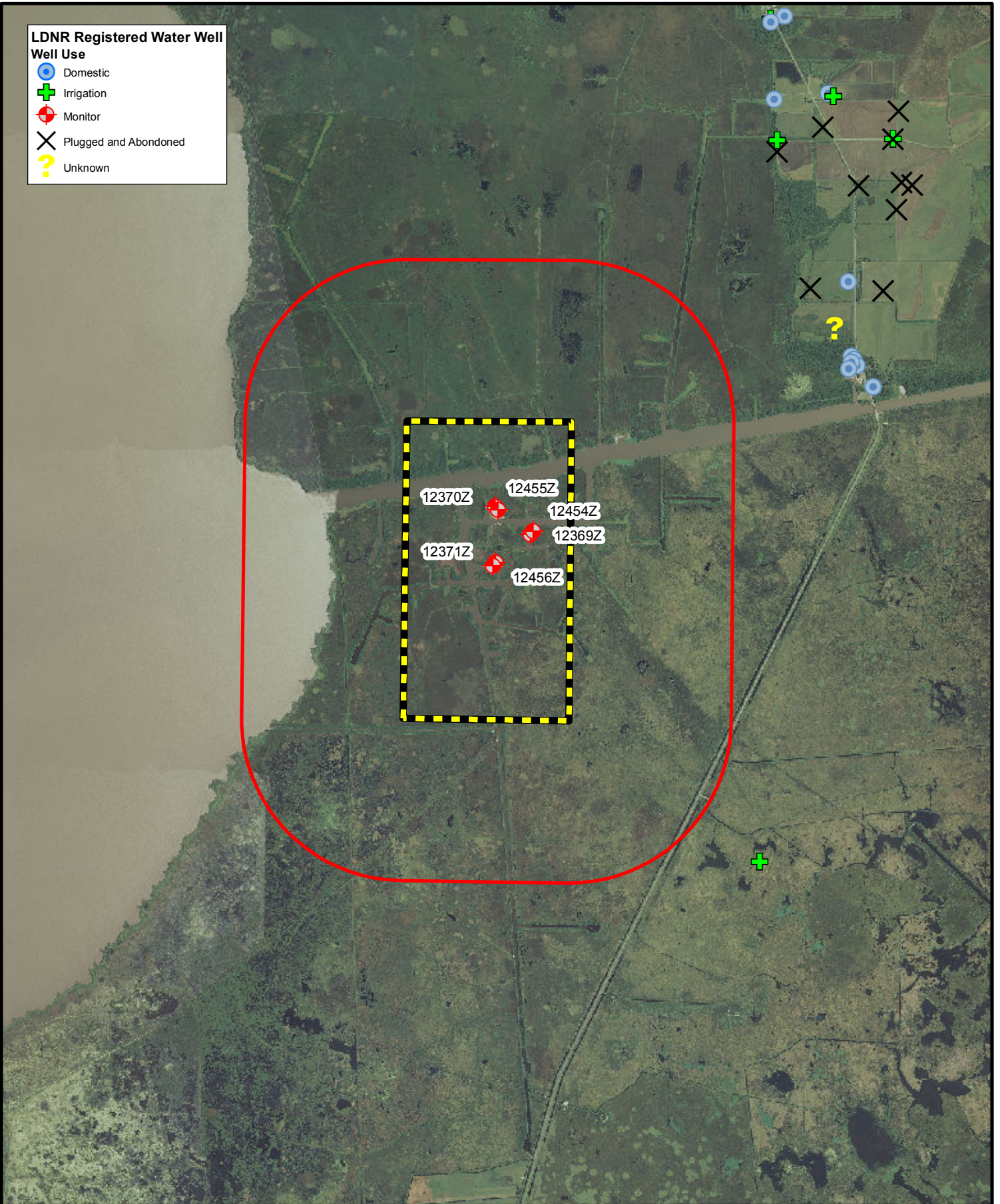
Date: 9/30/2015

Project: 07-47





**LDNR Registered Water Well**  
**Well Use**

-  Domestic
-  Irrigation
-  Monitor
-  Plugged and Abandoned
-  Unknown



**Legend**

-  Section 16 Township 15 S Range 01 E
-  1 Mile Buffer

Note:  
 1) Water well data from LDNR SONRIS database  
 2) Imagery from 2013 USDA Aerial

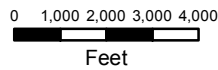


Figure 18 - LDNR Registered Water Wells

*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

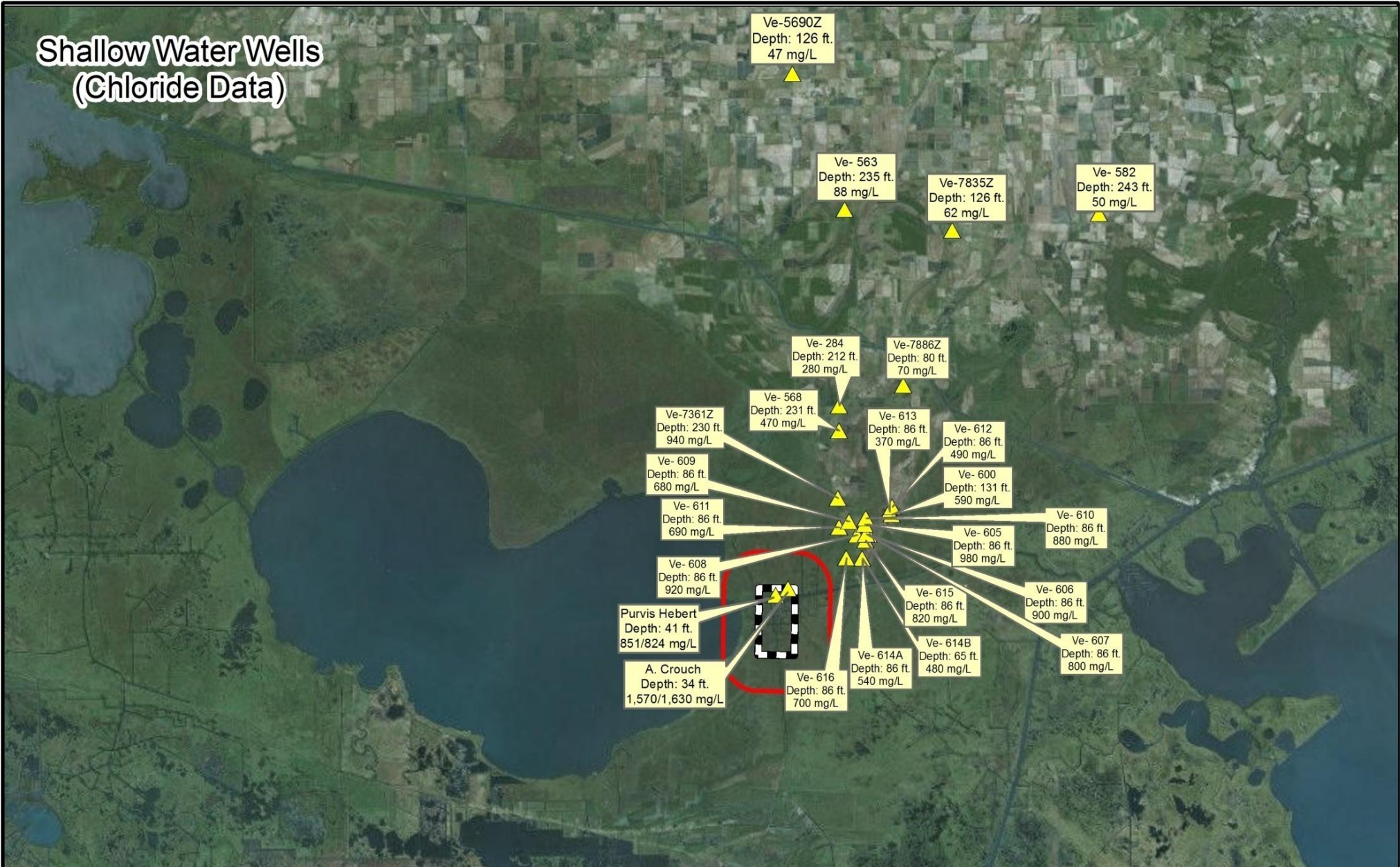
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# Shallow Water Wells (Chloride Data)



**Legend**



-  Property (Section 16)
-  1 Mile Radius of Property



Figure19 - USGS Chloride Data  
Shallow Water Wells

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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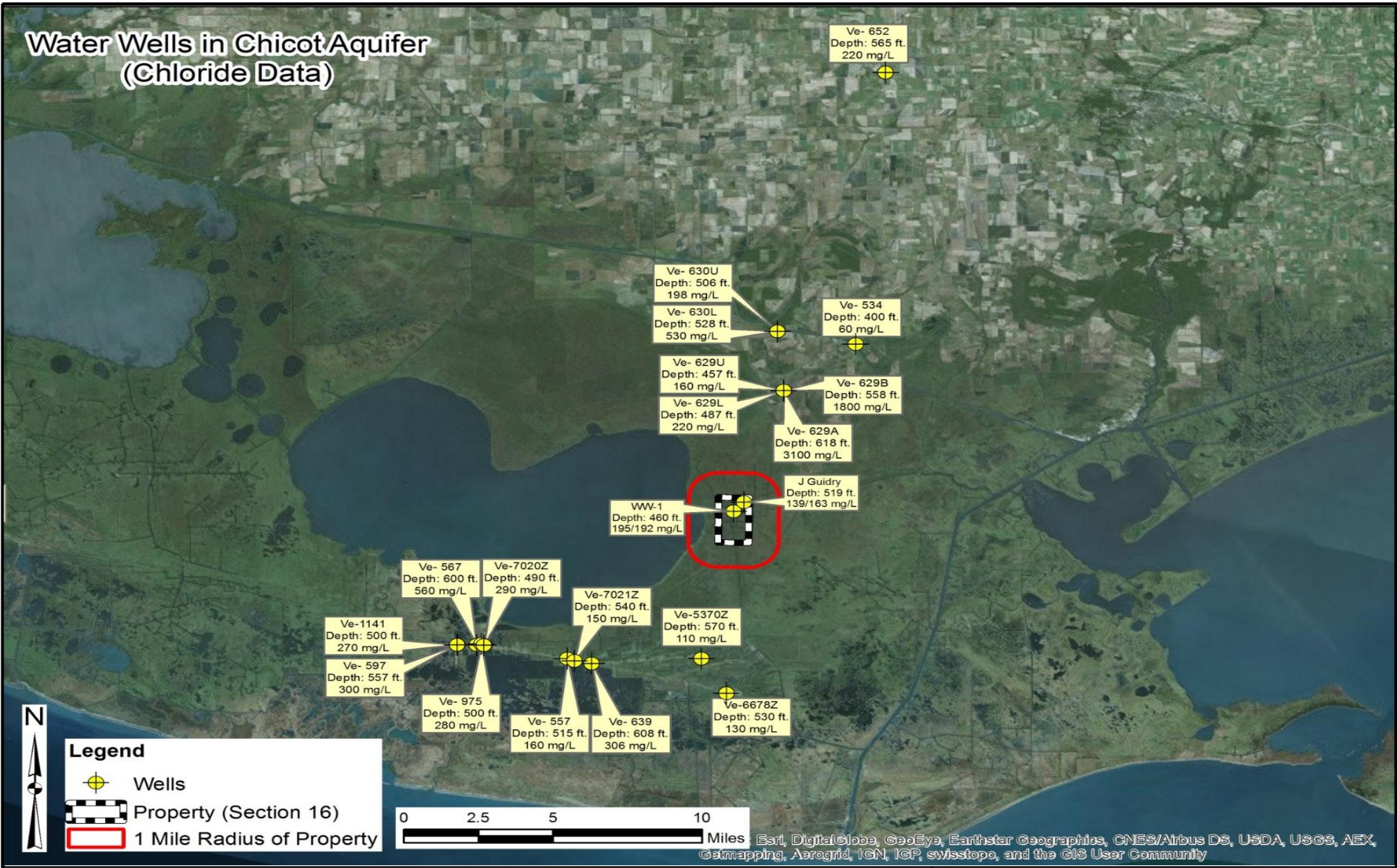
Environmental Consulting Services

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# Water Wells in Chicot Aquifer (Chloride Data)



Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend



Figure 20 - USGS Chloride Data - Chicot Aquifer

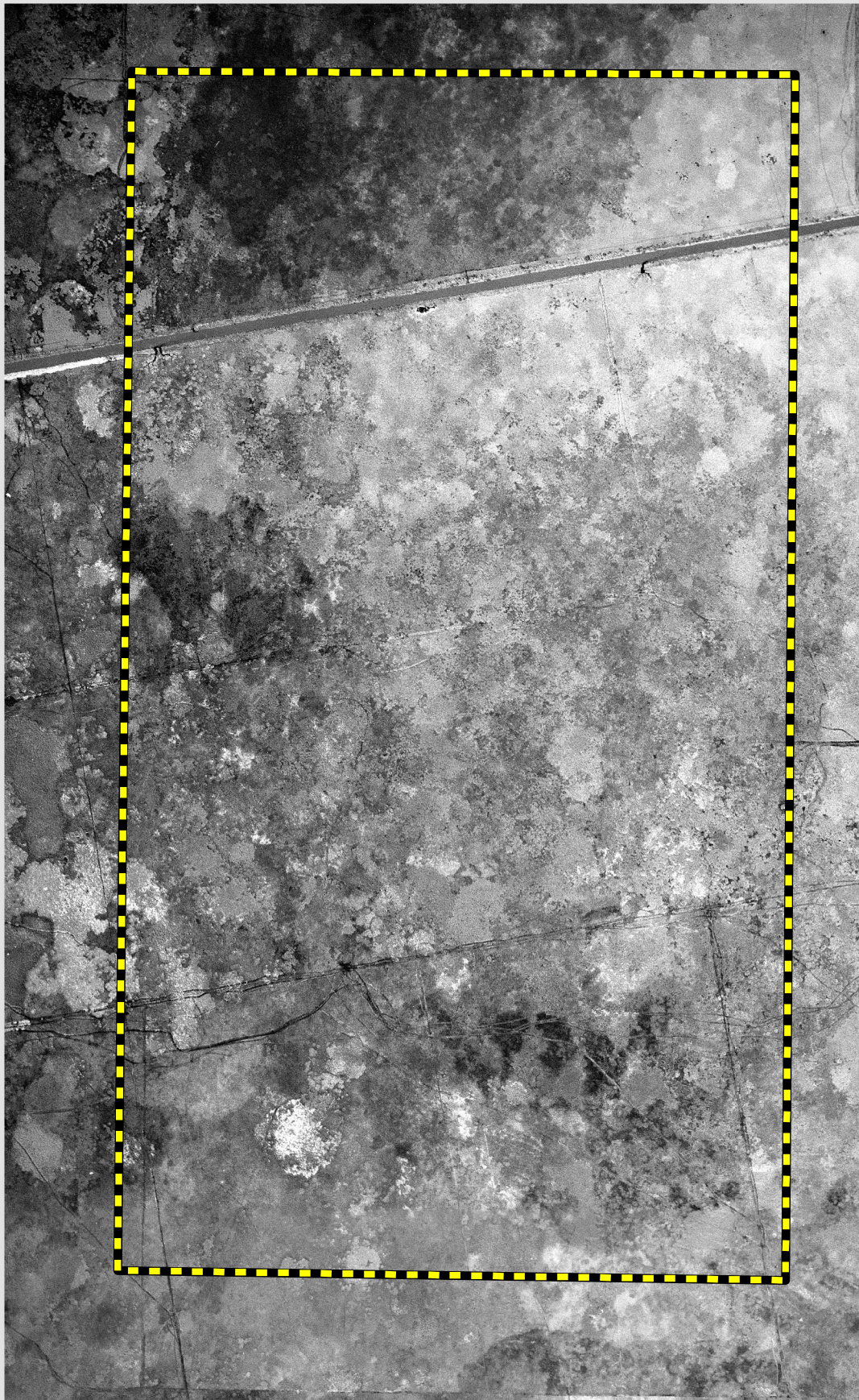
East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

**MICHAEL PISANI & ASSOCIATES, INC.**  
Environmental Consulting Services


Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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**Legend**

 Section 16 Township 15 S Range 01 E

0 250 500 750 1,000  
Feet



**Figure 21 - 1935 Aerial Photograph**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Source: P2 Energy Solutions

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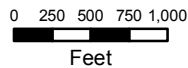


**Legend**



Section 16 Township 15 S Range 01 E

Source: P2 Energy Solutions



**Figure 22 - 1955 Aerial Photograph**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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**Legend**



Section 16 Township 15 S Range 01 E

0 250 500 750 1,000



Feet

N



Figure 23 - 1965 Aerial Photograph

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Source: P2 Energy Solutions

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**Legend**



Section 16 Township 15 S Range 01 E

0 250 500 750 1,000



Feet

N



**Figure 24 - 1979 Aerial Photograph**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

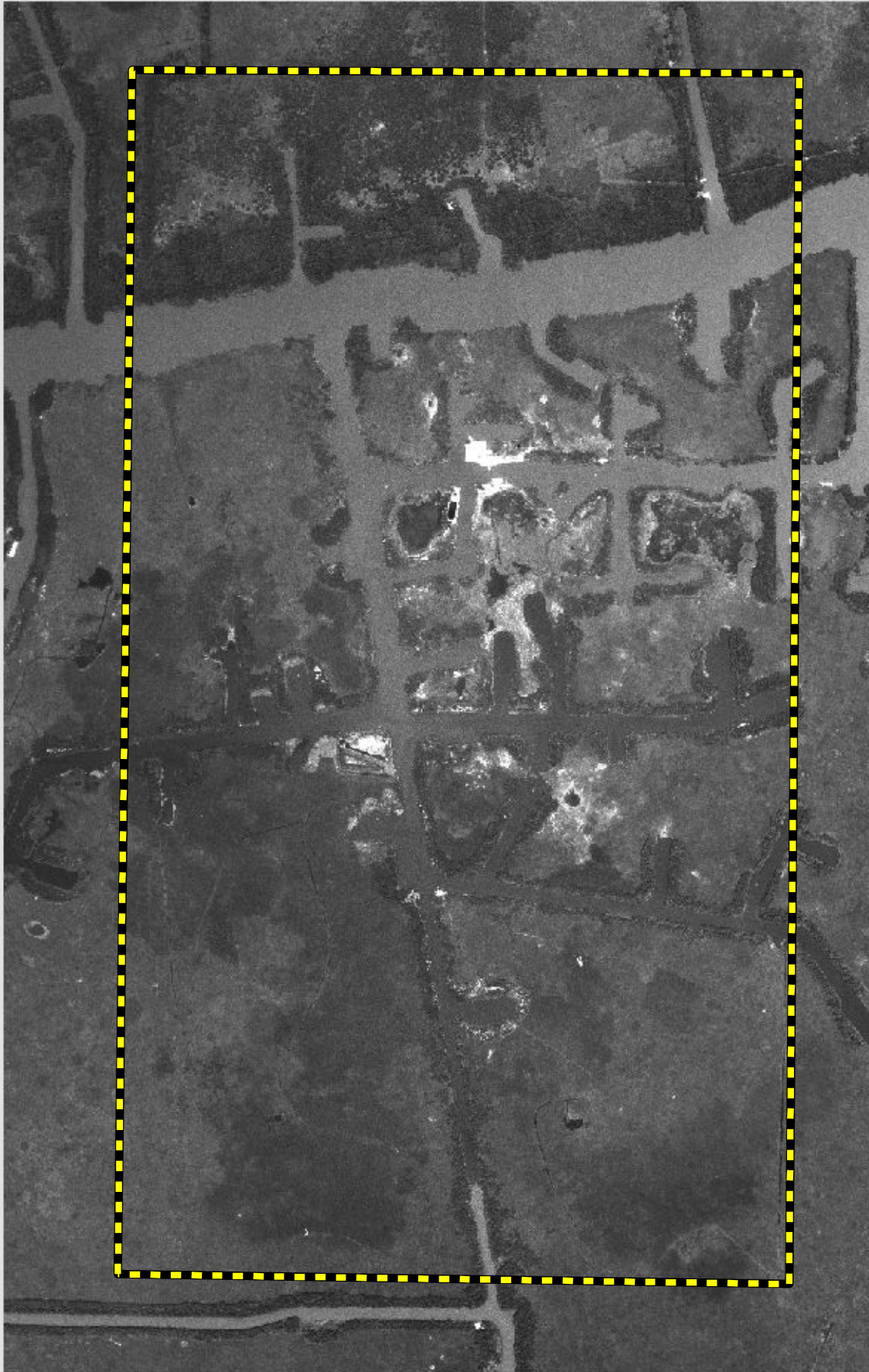
**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas


Source: P2 Energy Solutions

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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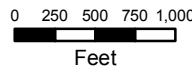




**Legend**

 Section 16 Township 15

Source: P2 Energy Solutions



N



**Figure 25 - 1985 Aerial Photograph**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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**Legend**



Section 16 Township 15 S Range 01 E

Source: P2 Energy Solutions

0 250 500 750 1,000



Feet

N



Figure 26 - 1987 Aerial Photograph

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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**Legend**



Section 16 Township 15 S Range 01 E

0 250 500 750 1,000

Feet

N



**Figure 27 - 1998 Aerial Photograph**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Source: <http://atlas.lsu.edu/rasterdown.html>

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**Legend**



Section 16 Township 15 S Range 01 E

0 250 500 750 1,000



Feet

N



**Figure 28 - 2008 Aerial Photograph**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Source: <http://www.lacoast.gov/maps/2008doqq>

Designed: JCS Drawn: DAM Checked: LRC Date: 9/30/2015 Project: 07-47





**Legend**



Section 16 Township 15 S Range 01 E

0 250 500 750 1,000



Feet

N



**Figure 29 - 2013 Aerial Photograph**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

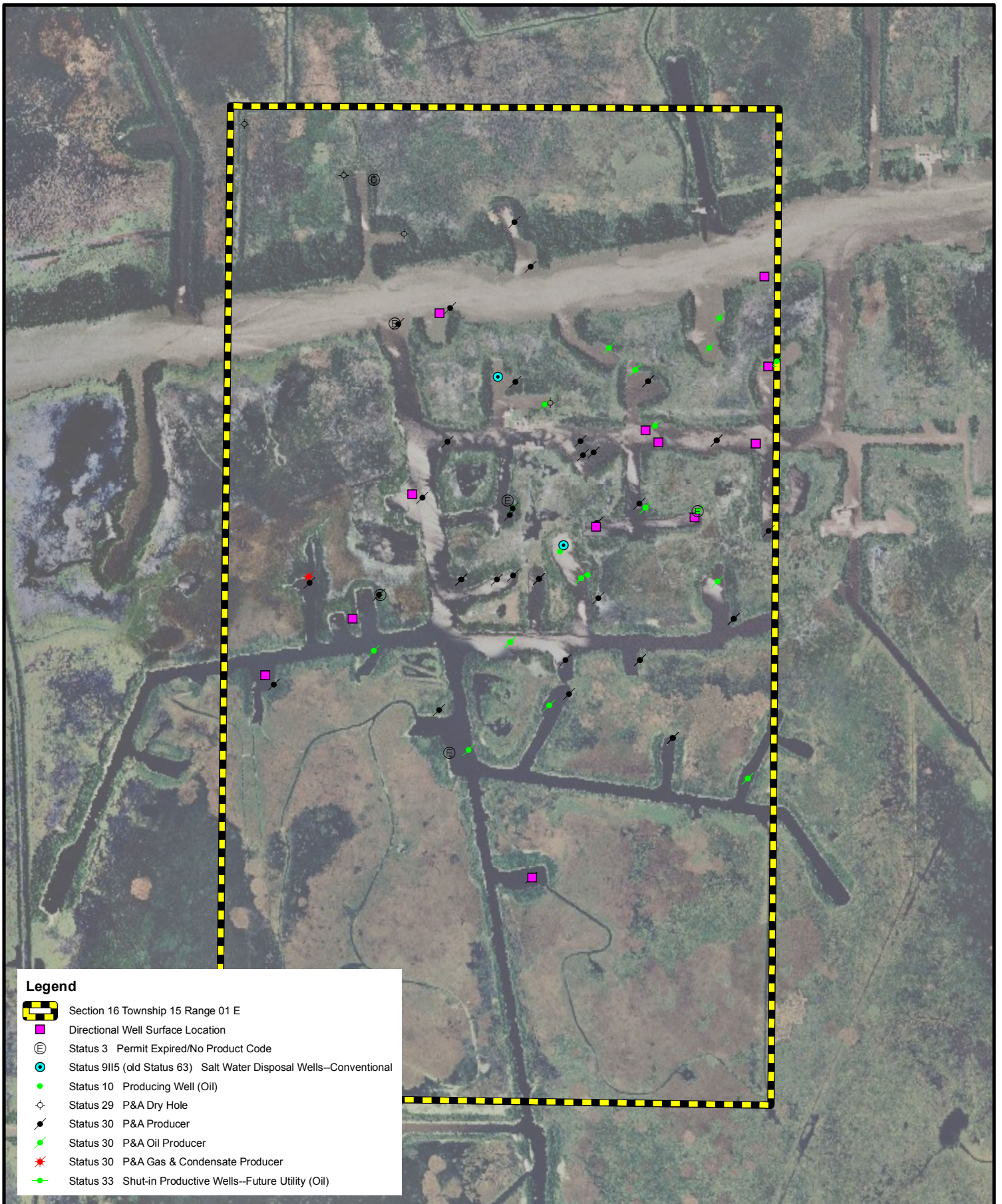
**MICHAEL PISANI & ASSOCIATES, INC.**

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







Source: 2013 USDA Aerial

Designed: JCS | Drawn: DAM | Checked: LRC | Date: 9/30/2015 | Project: 07-47





**Legend**

-  Section 16 Township 15 Range 01 E
-  Directional Well Surface Location
-  Status 3 Permit Expired/No Product Code
-  Status 9115 (old Status 63) Salt Water Disposal Wells--Conventional
-  Status 10 Producing Well (Oil)
-  Status 29 P&A Dry Hole
-  Status 30 P&A Producer
-  Status 30 P&A Oil Producer
-  Status 30 P&A Gas & Condensate Producer
-  Status 33 Shut-in Productive Wells--Future Utility (Oil)

Note:  
 1) Oil & gas well data from LDNR SONRIS database (<http://sonris.com>).  
 2) Imagery basemap via ArcGIS Online.

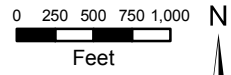


Figure 30 - Registered Oil & Gas Wells

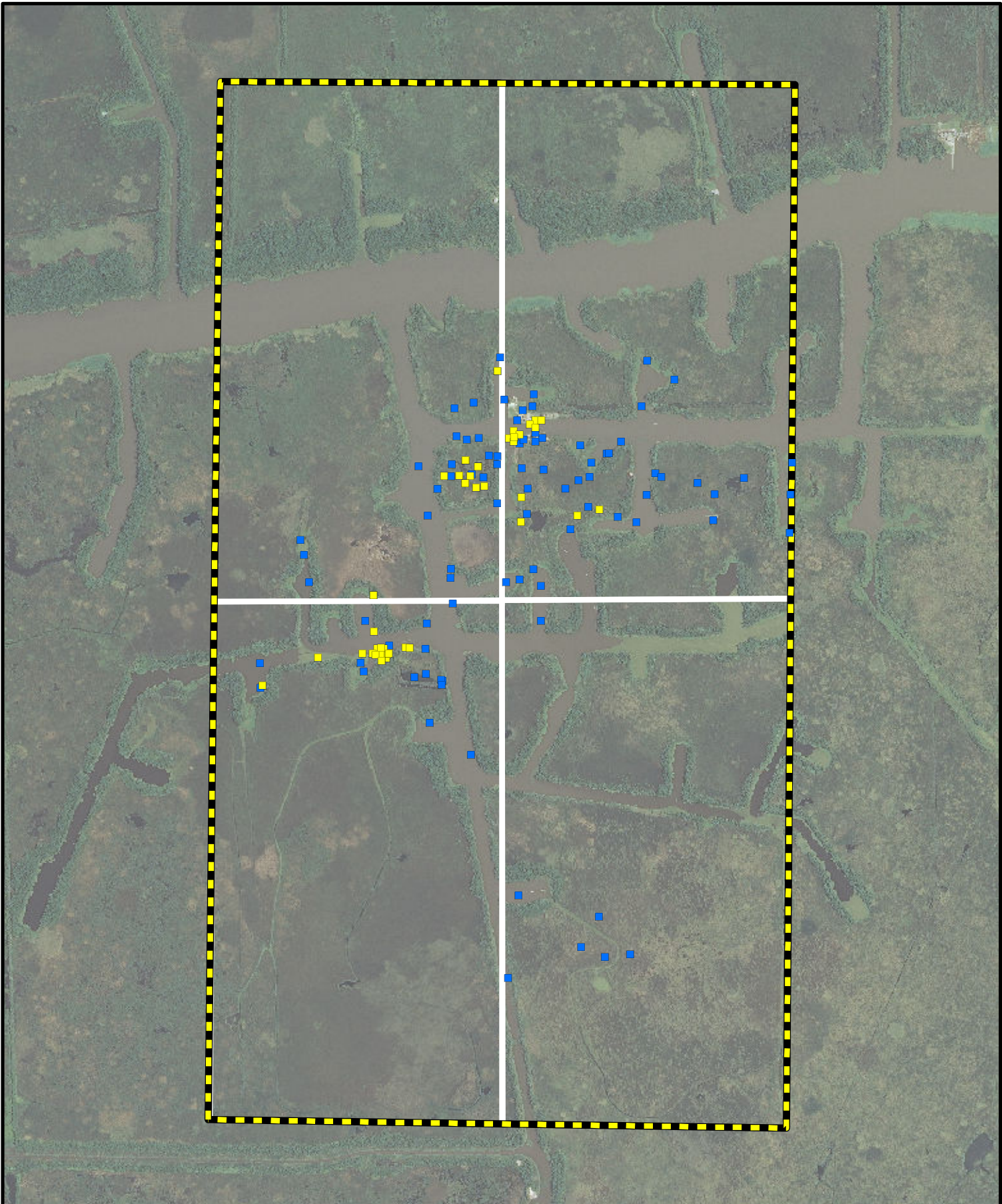
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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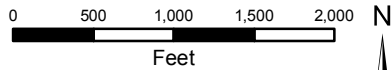
Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

-  Section 16 Township 15 S Range 01 E
-  ICON Sample Locations
-  MP&A Sample Locations



**Figure 31 - Soil/Sediment Sample Locations**

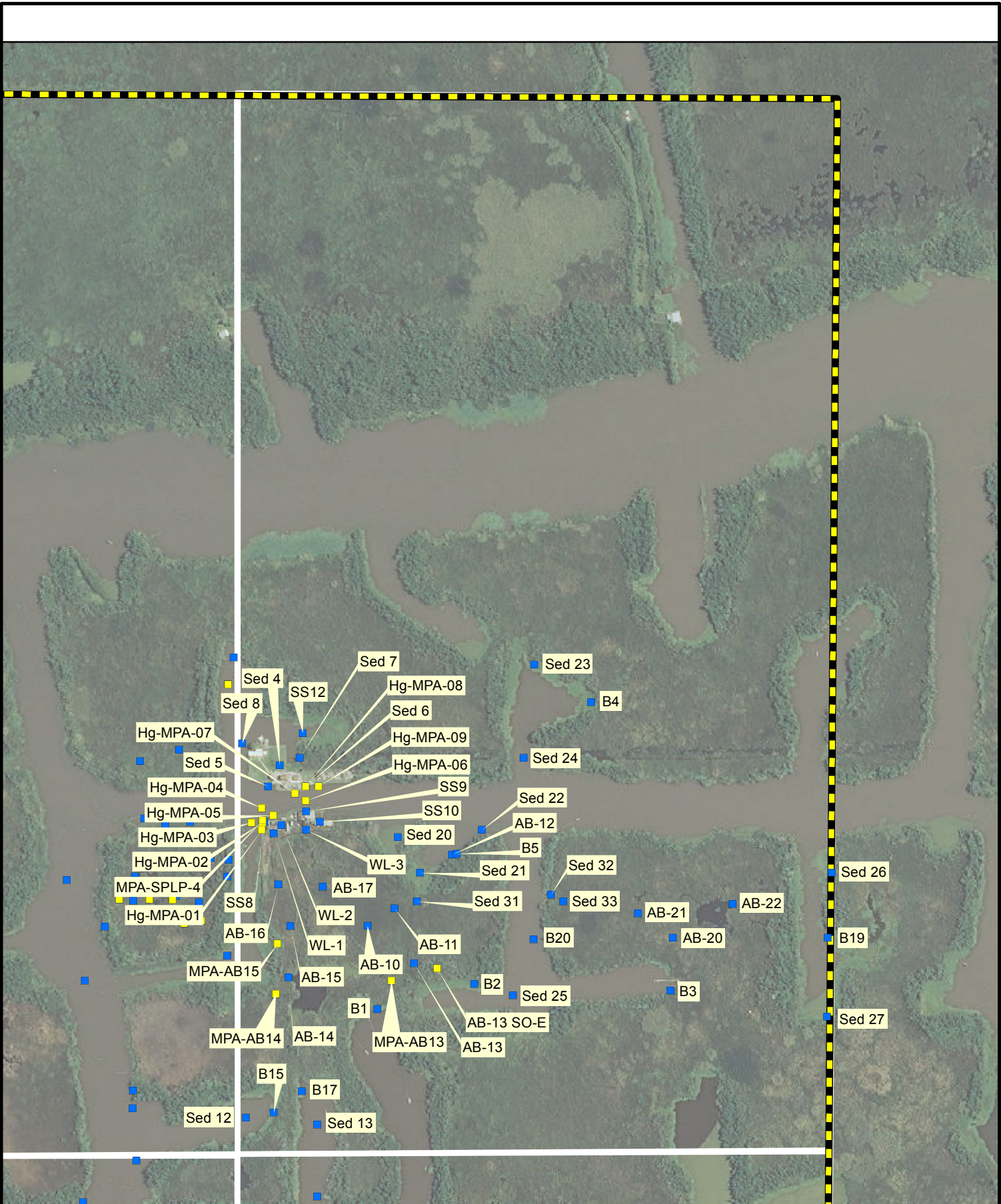
*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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**Legend**



Section 16 Township 15 S Range 01 E



ICON Sample Locations



MP&A Sample Locations



Figure 32 - Soil/Sediment Sample Locations  
Northeast Quadrant

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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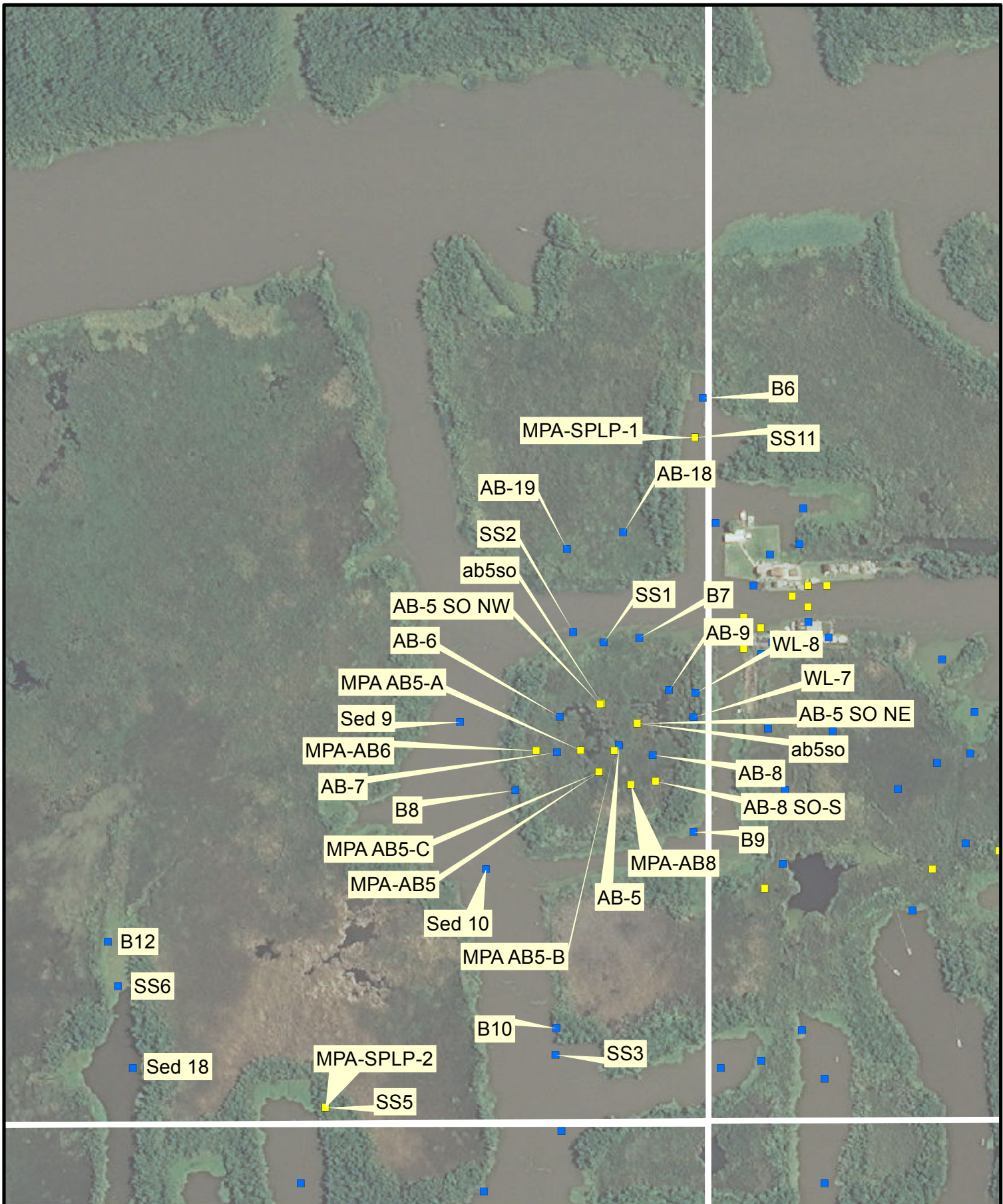


Figure 33 - Soil/Sediment Sample Locations  
Northwest Quadrant




*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

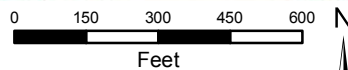
**MICHAEL PISANI & ASSOCIATES, INC.**

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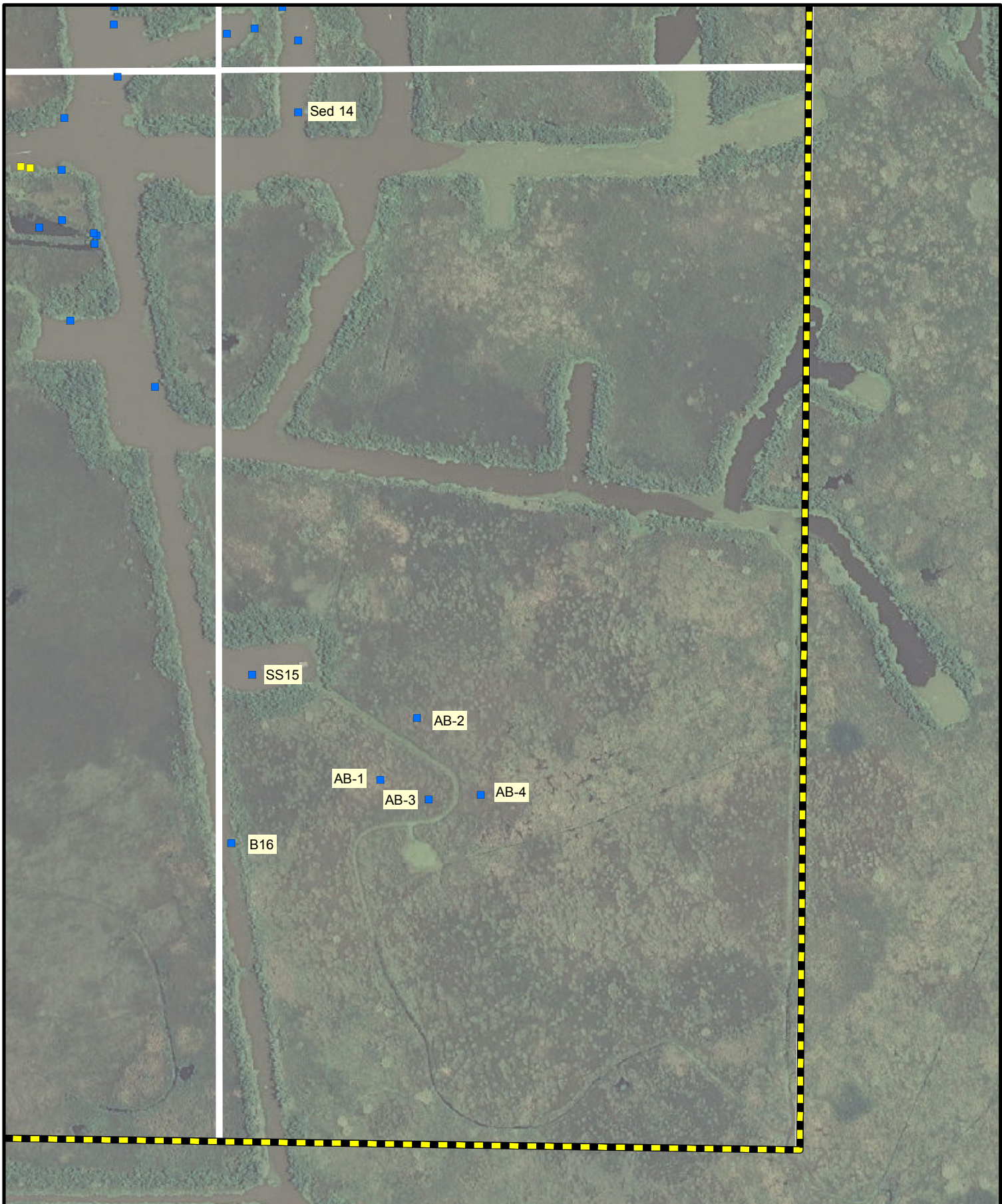
Designed: JCS Drawn: DAM Checked: LRC Date: 9/30/2015 Project: 07-47

**Legend**




-  Section 16 Township 15 S Range 01 E
-  ICON Sample Locations
-  MP&A Sample Locations







**Legend**

-  Section 16 Township 15 S Range 01 E
-  ICON Sample Locations
-  MP&A Sample Locations

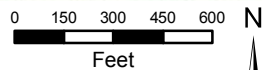


Figure 34 - Soil/Sediment Sample Locations  
Southeast Quadrant

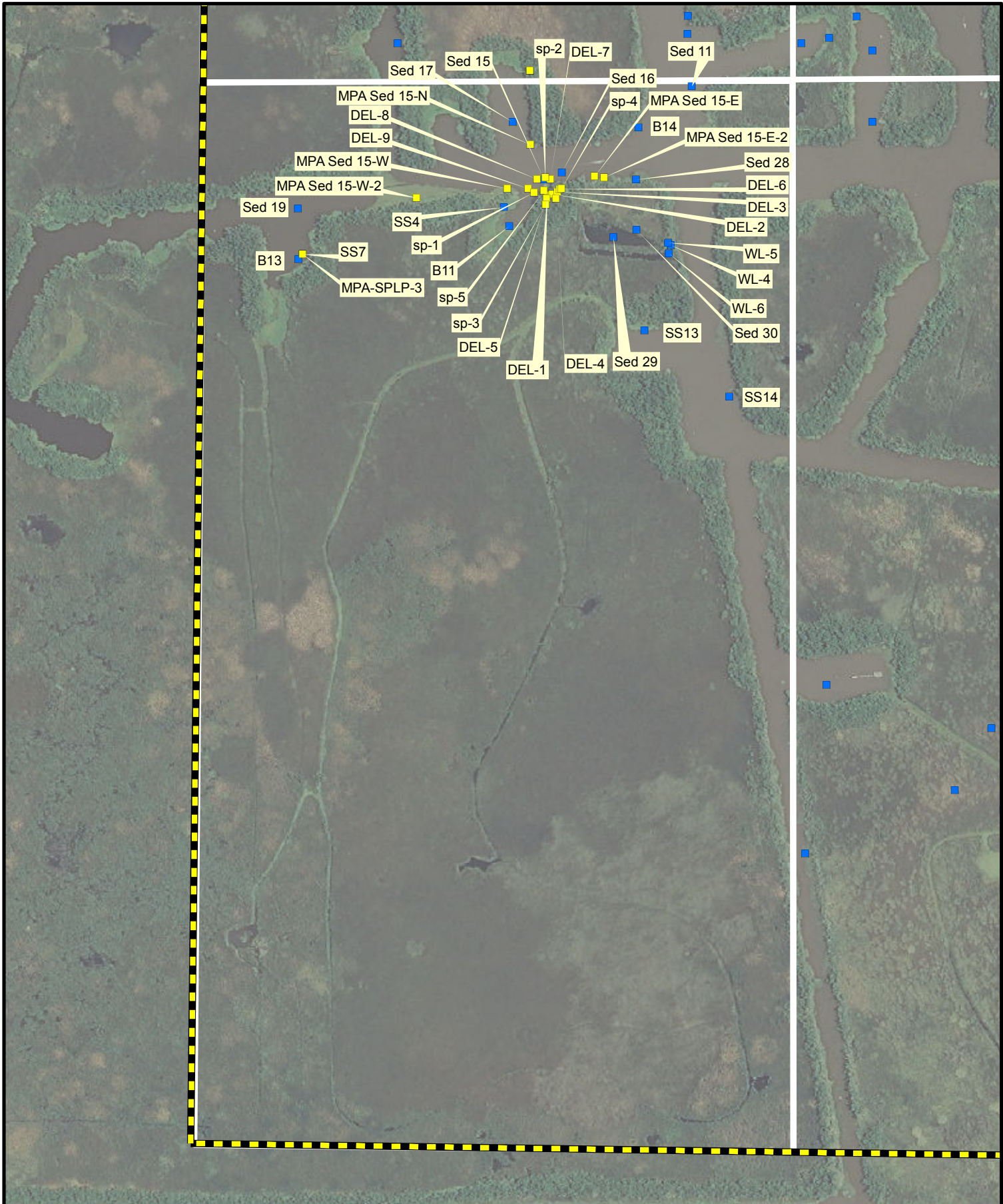
*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

-  Section 16 Township 15 S Range 01 E
-  ICON Sample Locations
-  MP&A Sample Locations

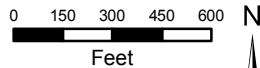


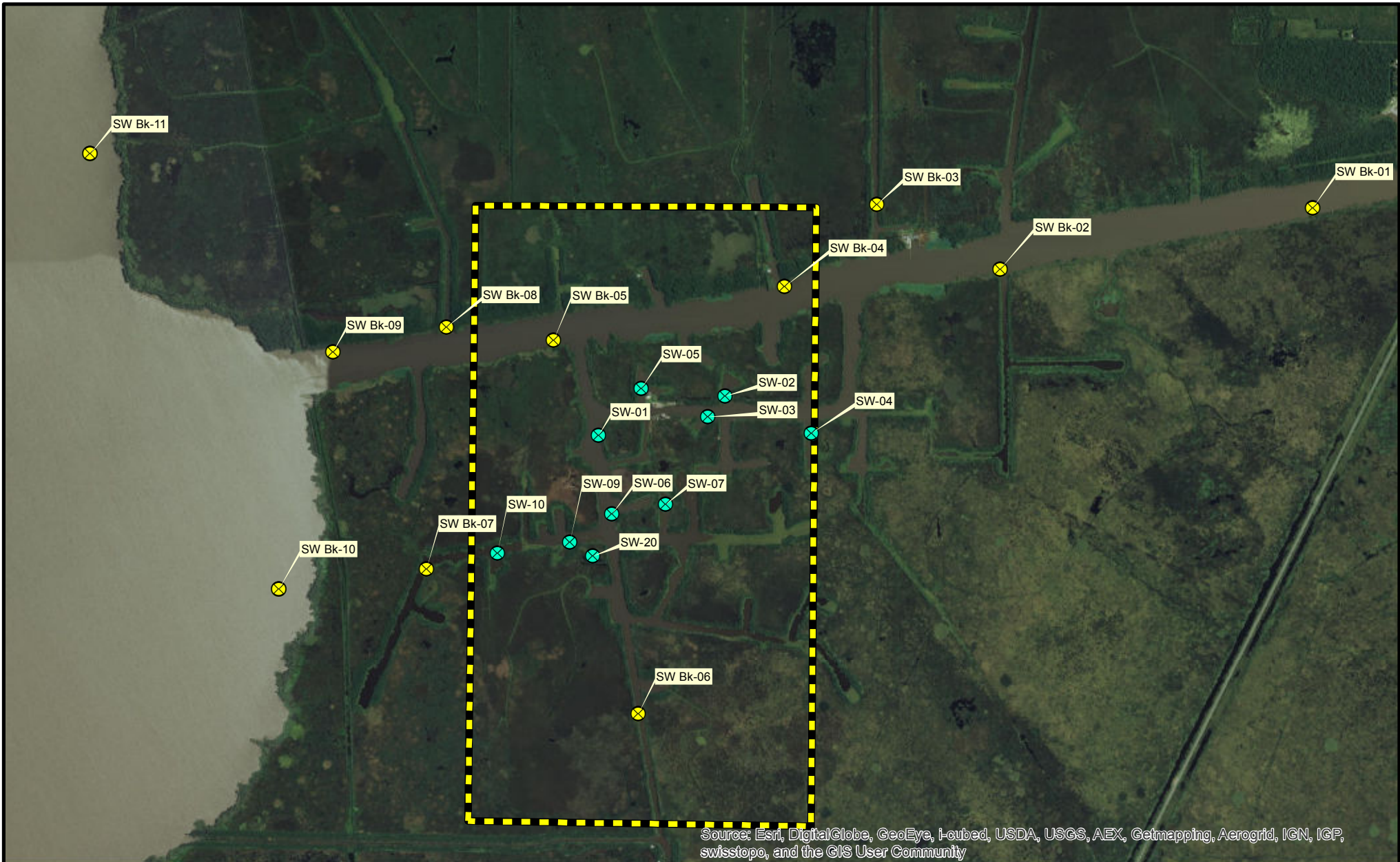
Figure 35 - Soil/Sediment Sample Locations  
Southwest Quadrant

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*




**MICHAEL PISANI & ASSOCIATES, INC.**

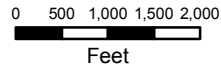
Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas





**Legend**

-  Section 16 Township 15 S Range 01 E
-  MP&A/ICON Surface Water Sample Location
-  MP&A Reference Surface Water Sample Location



**Figure 36 - Surface Water Sample Locations**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Baton Rouge, Louisiana    New Orleans, Louisiana    Houston, Texas

Designed: JCS

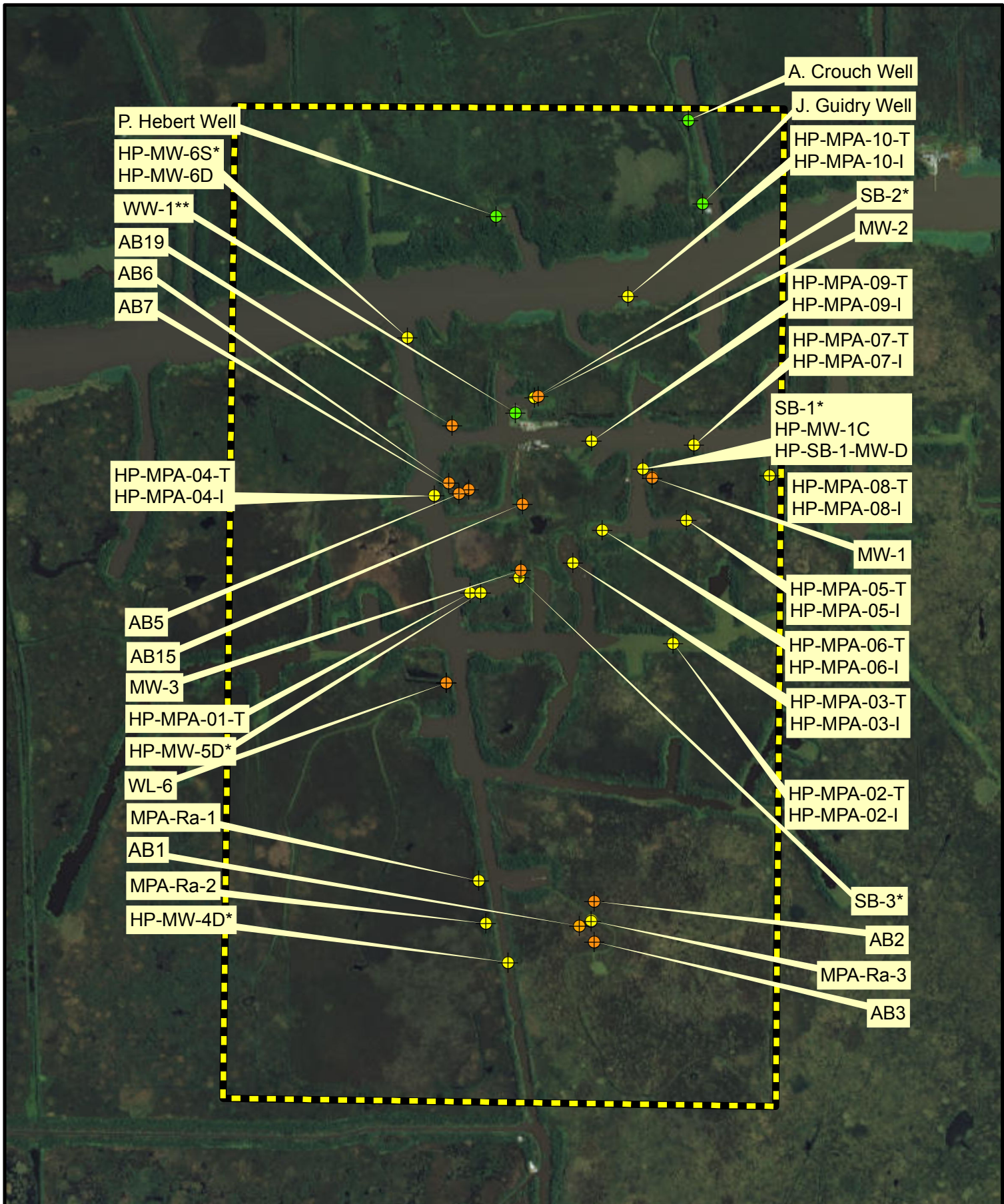
Drawn: DAM

Checked: LRC

Date: 9/30/2015

Project: 07-47





**Legend**

Section 16 Township 15 S Range 01 E

MP&A Sample Location

ICON Sample Location

Existing Water Well; Upper Sand of Chicot Aquifer

\* Soil borings identified as MPA-SB-#  
 \*\* Also referred to as AWW1

Source: 2013 Aerial from ESRI

0 250 500 750 1,000

Feet

N



**Figure 37 - Groundwater Sample Locations**

*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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**Legend**

- Former\_Pit\_Sampling\_Locations
- Tank Battery B: South Pit
- Completed Pit Remediation Area

Source: 2013 USDA Aerial



**Figure 38 - Former Pit Sampling Locations**

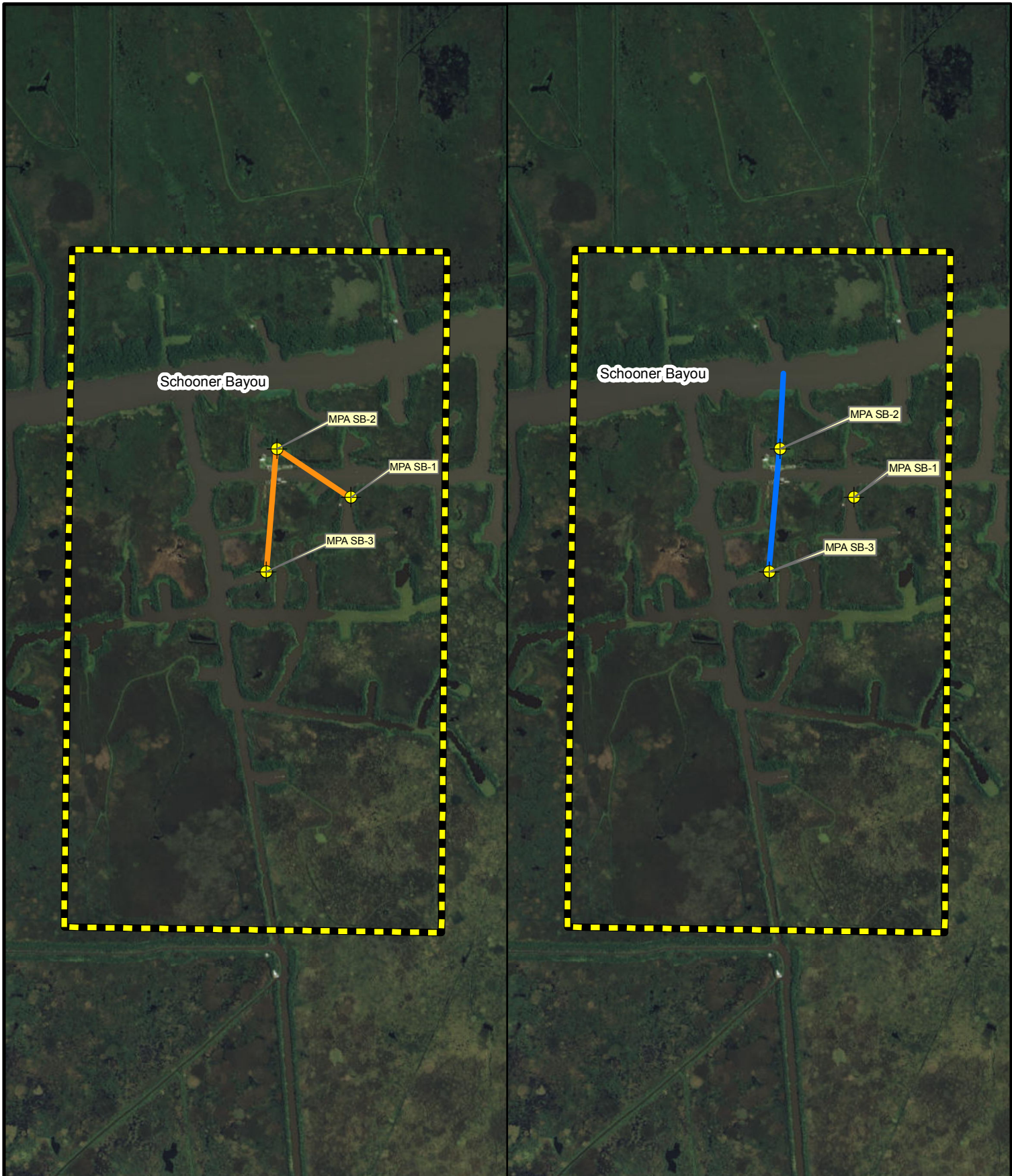
*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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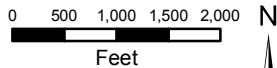
Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

-  Section 16 Township 15 S Range 01 E
-  West-East Cross Section Location
-  South-North Cross Section Location
-  MP&A Well Location



**Figure 39 - Cross Section Locations**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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West

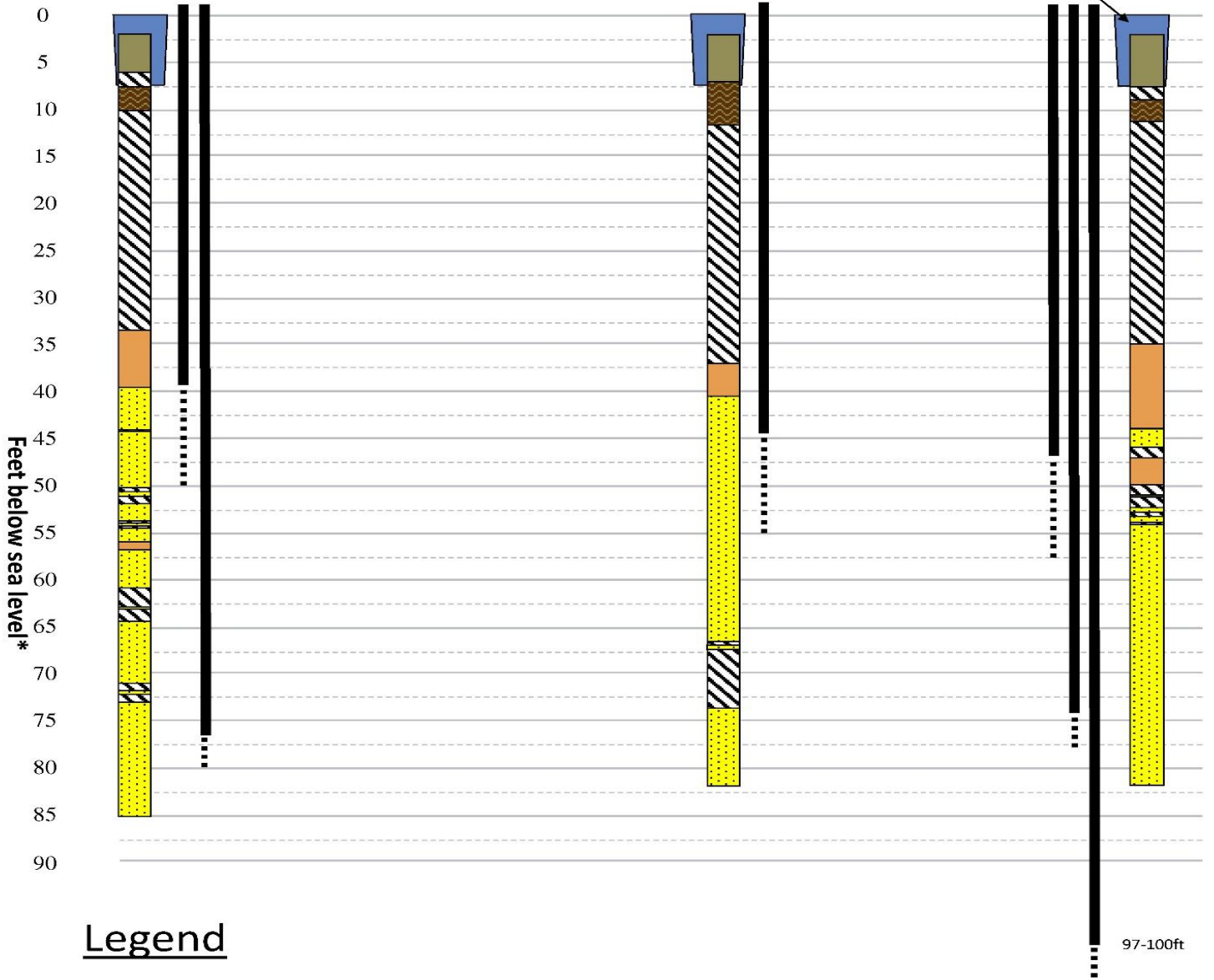
East

SB-3

SB-2

Access canal typically excavated to 8ft

SB-1



**Legend**


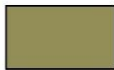





-  Surface Water
-  Loose Sediment
-  Peat
-  Clay
-  Silt
-  Sand
-  Monitor Well  
(horizontal position Not to scale)

Figure 40 - MP&A Geologic Cross Section W-E

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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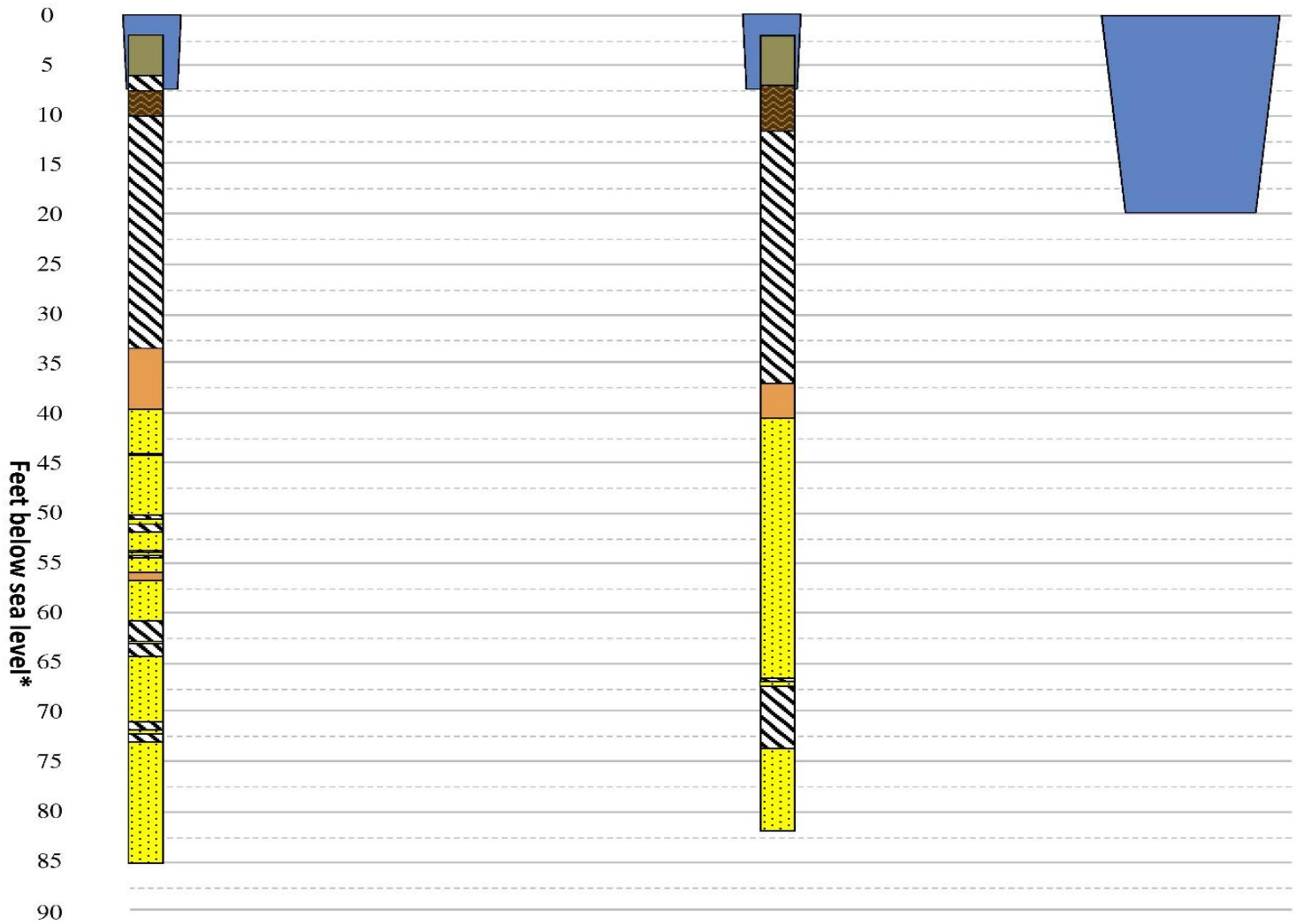
South

North




SB-3

SB-2

Schooner Bayou  
Canal Bottom Measured at  
17 ft below surface



Legend

-  Surface Water
-  Loose Sediment
-  Peat




-  Clay
-  Silt
-  Sand

Figure 41 - MP&A Geologic  
Cross Section S-N

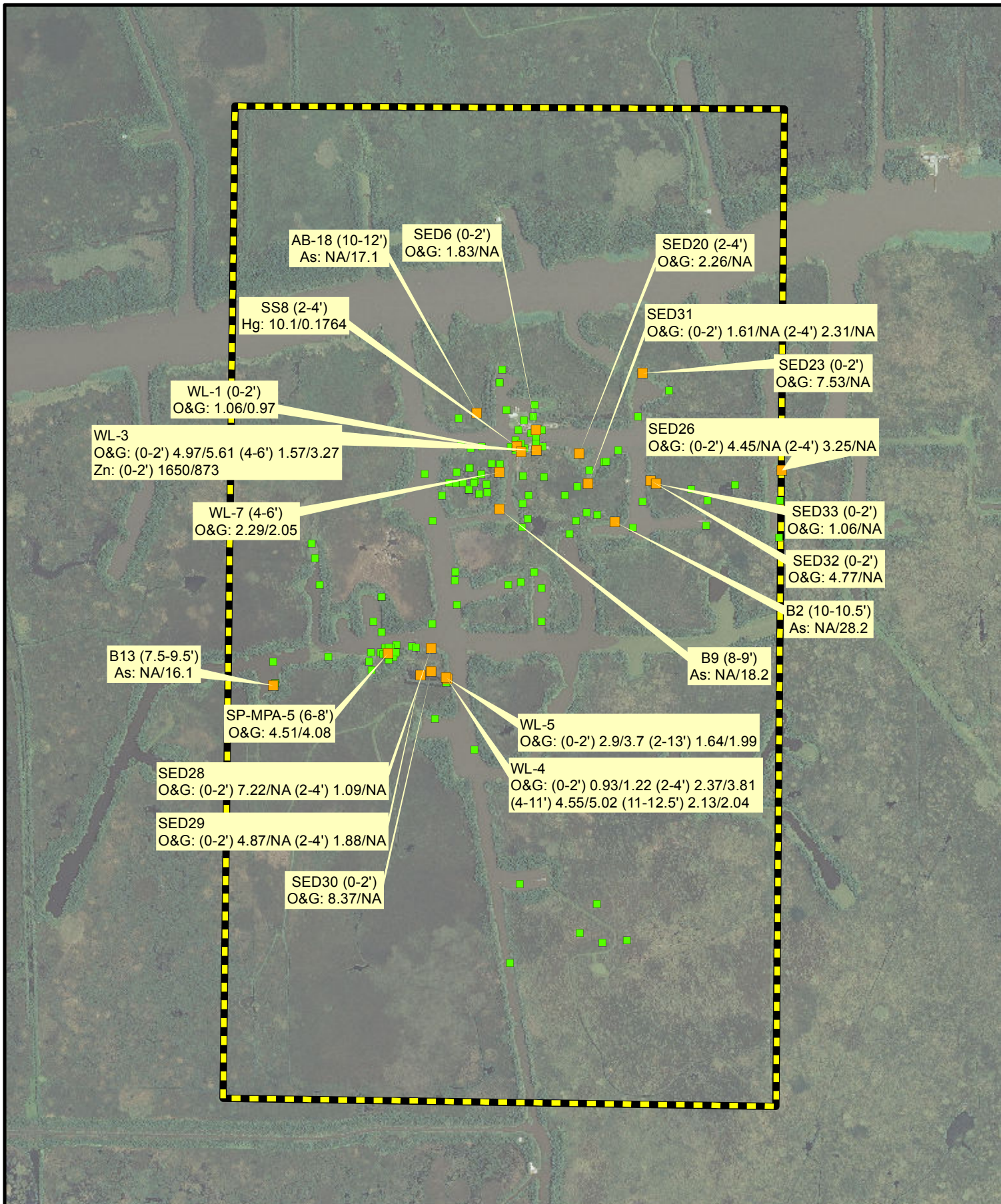
*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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AB-18 (10-12')  
As: NA/17.1

SS8 (2-4')  
Hg: 10.1/0.1764

WL-1 (0-2')  
O&G: 1.06/0.97

WL-3  
O&G: (0-2') 4.97/5.61 (4-6') 1.57/3.27  
Zn: (0-2') 1650/873

WL-7 (4-6')  
O&G: 2.29/2.05

B13 (7.5-9.5')  
As: NA/16.1

SP-MPA-5 (6-8')  
O&G: 4.51/4.08

SED28  
O&G: (0-2') 7.22/NA (2-4') 1.09/NA

SED29  
O&G: (0-2') 4.87/NA (2-4') 1.88/NA

SED30 (0-2')  
O&G: 8.37/NA

SED6 (0-2')  
O&G: 1.83/NA

SED20 (2-4')  
O&G: 2.26/NA

SED31  
O&G: (0-2') 1.61/NA (2-4') 2.31/NA

SED23 (0-2')  
O&G: 7.53/NA

SED26  
O&G: (0-2') 4.45/NA (2-4') 3.25/NA

SED33 (0-2')  
O&G: 1.06/NA

SED32 (0-2')  
O&G: 4.77/NA




B2 (10-10.5')  
As: NA/28.2

B9 (8-9')  
As: NA/18.2

WL-5  
O&G: (0-2') 2.9/3.7 (2-13') 1.64/1.99

WL-4  
O&G: (0-2') 0.93/1.22 (2-4') 2.37/3.81  
(4-11') 4.55/5.02 (11-12.5') 2.13/2.04

**Legend**

-  Section 16 Township 15 S Range 01 E
-  Soil/Sediment Exceedance
-  Soil/Sediment Sample Location

Notes:  
 29-B Exceedances: MP&A result / ICON result  
 NA- Not Applicable to sample  
 O&G- HEM O&G (%)  
 As-Arsenic (mg/kg-wet)  
 Hg-Mercury (mg/kg-wet)  
 Zn-Zinc (mg/kg-wet)  
 Source: USDA 2013 Aerial

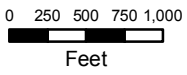


Figure 42 - Statewide 29-B Standard Exceedances Soil/Sediment

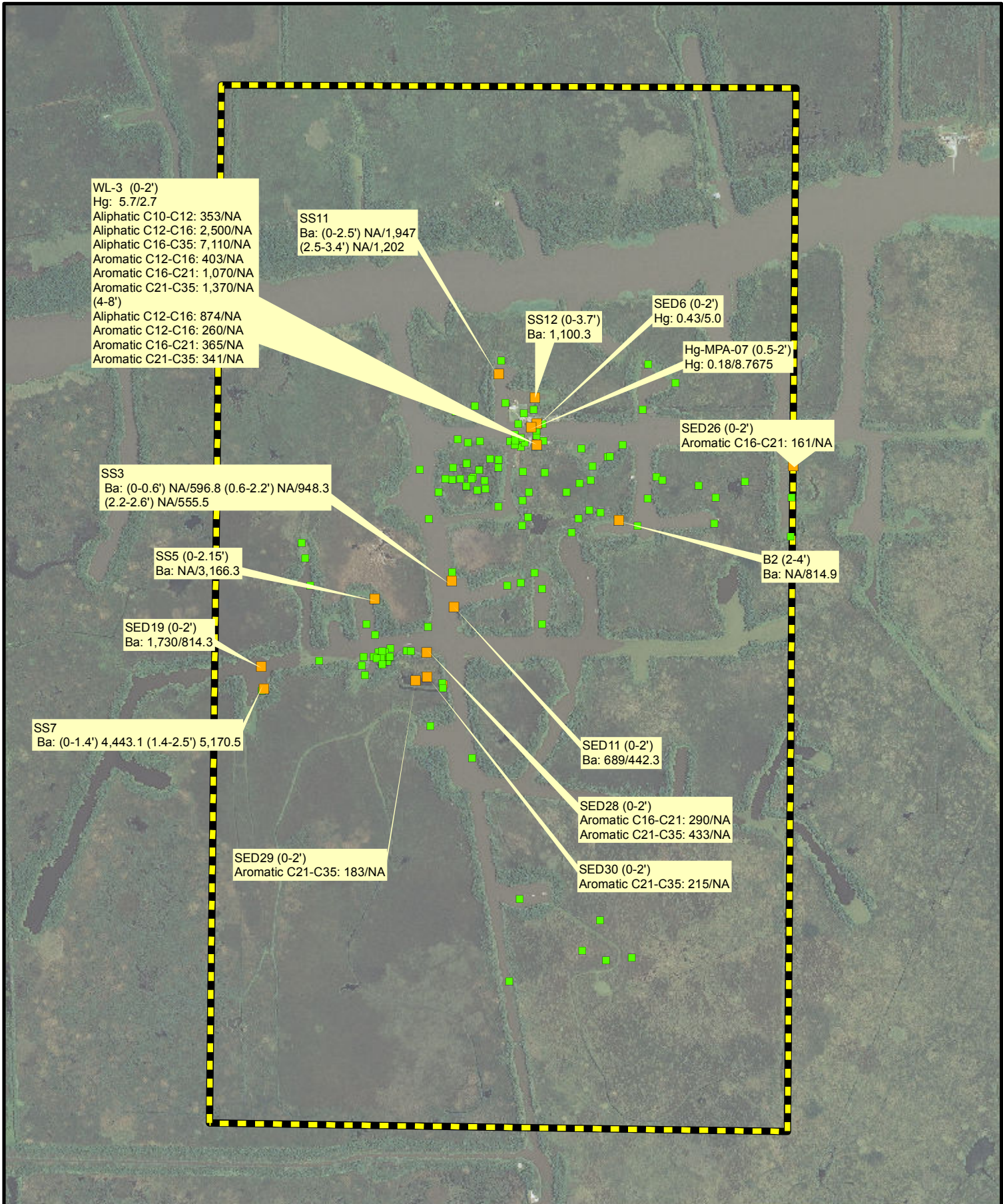
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

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Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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WL-3 (0-2')  
 Hg: 5.7/2.7  
 Aliphatic C10-C12: 353/NA  
 Aliphatic C12-C16: 2,500/NA  
 Aliphatic C16-C35: 7,110/NA  
 Aromatic C12-C16: 403/NA  
 Aromatic C16-C21: 1,070/NA  
 Aromatic C21-C35: 1,370/NA  
 (4-8')  
 Aliphatic C12-C16: 874/NA  
 Aromatic C12-C16: 260/NA  
 Aromatic C16-C21: 365/NA  
 Aromatic C21-C35: 341/NA

SS11  
 Ba: (0-2.5') NA/1,947  
 (2.5-3.4') NA/1,202

SS12 (0-3.7')  
 Ba: 1,100.3

SED6 (0-2')  
 Hg: 0.43/5.0

Hg-MPA-07 (0.5-2')  
 Hg: 0.18/8.7675

SED26 (0-2')  
 Aromatic C16-C21: 161/NA

SS3  
 Ba: (0-0.6') NA/596.8 (0.6-2.2') NA/948.3  
 (2.2-2.6') NA/555.5

SS5 (0-2.15')  
 Ba: NA/3,166.3

B2 (2-4')  
 Ba: NA/814.9

SED19 (0-2')  
 Ba: 1,730/814.3

SS7  
 Ba: (0-1.4') 4,443.1 (1.4-2.5') 5,170.5

SED11 (0-2')  
 Ba: 689/442.3

SED28 (0-2')  
 Aromatic C16-C21: 290/NA  
 Aromatic C21-C35: 433/NA

SED29 (0-2')  
 Aromatic C21-C35: 183/NA

SED30 (0-2')  
 Aromatic C21-C35: 215/NA

**Legend**



Section 16 Township 15 S  
Range 01 E



Soil/Sediment Exceedance



Soil/Sediment Sample Location

Notes:  
 RECAP Exceedances: MP&A result / ICON result  
 NA- Not analyzed  
 Ba-Barium (mg/kg-wet)  
 Hg-Mercury (mg/kg-wet)  
 Source: USDA 2013 Aerial

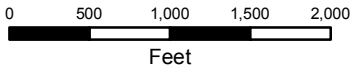


Figure 43 - RECAP Direct Contact Screening Standard Exceedances - Soil/Sediment

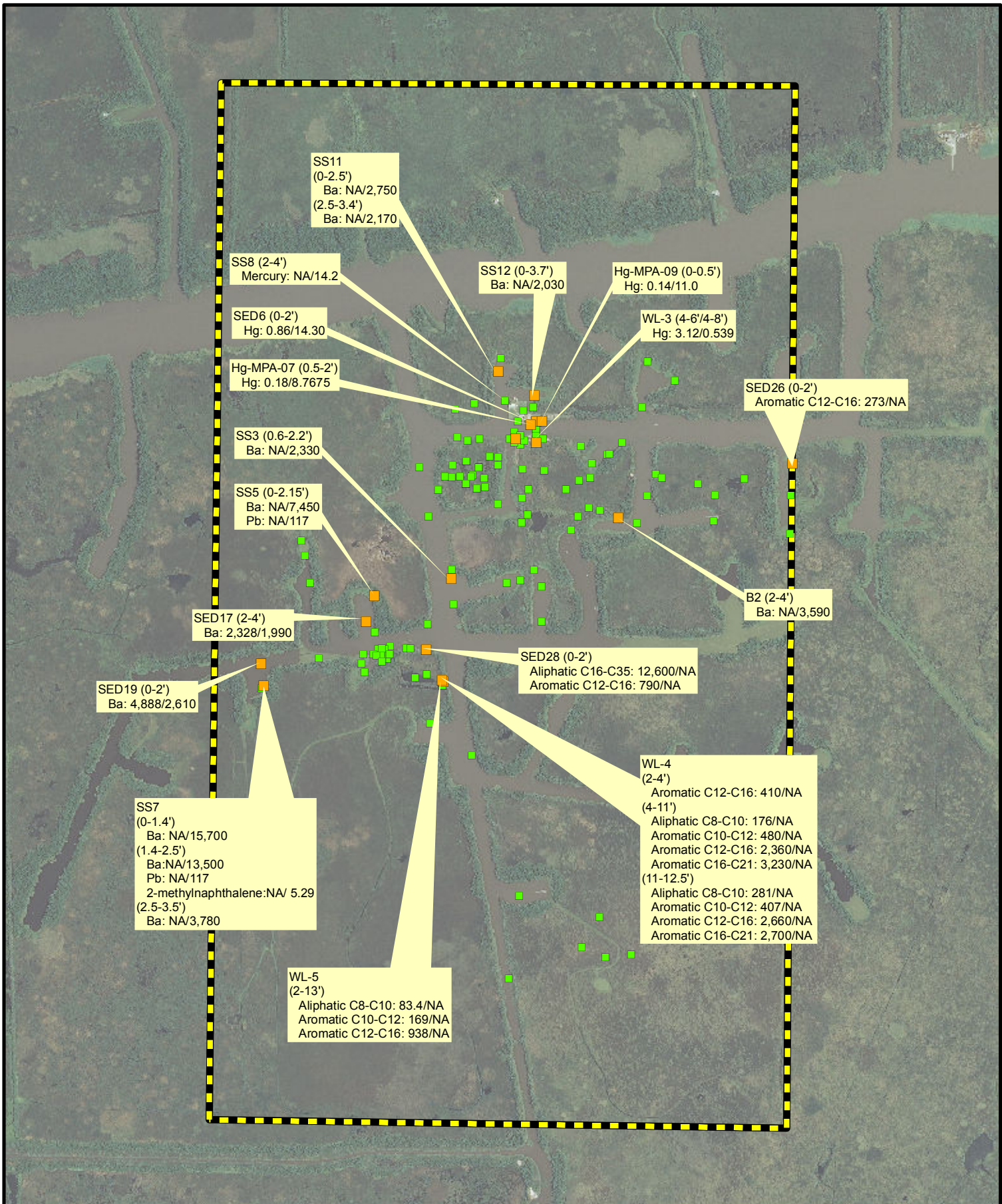
East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS Drawn: TGC Checked: LRC Date: 9/30/2015 Project: 07-47





SS11 (0-2.5')  
Ba: NA/2,750  
(2.5-3.4')  
Ba: NA/2,170

SS8 (2-4')  
Mercury: NA/14.2

SS12 (0-3.7')  
Ba: NA/2,030

Hg-MPA-09 (0-0.5')  
Hg: 0.14/11.0

SED6 (0-2')  
Hg: 0.86/14.30

WL-3 (4-6'/4-8')  
Hg: 3.12/0.539

Hg-MPA-07 (0.5-2')  
Hg: 0.18/8.7675

SED26 (0-2')  
Aromatic C12-C16: 273/NA

SS3 (0.6-2.2')  
Ba: NA/2,330

SS5 (0-2.15')  
Ba: NA/7,450  
Pb: NA/117

B2 (2-4')  
Ba: NA/3,590

SED17 (2-4')  
Ba: 2,328/1,990

SED28 (0-2')  
Aliphatic C16-C35: 12,600/NA  
Aromatic C12-C16: 790/NA




SED19 (0-2')  
Ba: 4,888/2,610

WL-4 (2-4')  
Aromatic C12-C16: 410/NA  
(4-11')  
Aliphatic C8-C10: 176/NA  
Aromatic C10-C12: 480/NA  
Aromatic C12-C16: 2,360/NA  
Aromatic C16-C21: 3,230/NA  
(11-12.5')  
Aliphatic C8-C10: 281/NA  
Aromatic C10-C12: 407/NA  
Aromatic C12-C16: 2,660/NA  
Aromatic C16-C21: 2,700/NA

SS7 (0-1.4')  
Ba: NA/15,700  
(1.4-2.5')  
Ba: NA/13,500  
Pb: NA/117  
2-methylnaphthalene: NA/ 5.29  
(2.5-3.5')  
Ba: NA/3,780

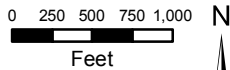
WL-5 (2-13')  
Aliphatic C8-C10: 83.4/NA  
Aromatic C10-C12: 169/NA  
Aromatic C12-C16: 938/NA

**Legend**

-  Section 16 Township 15 S Range 01 E
-  Soil/Sediment Exceedance
-  Soil/Sediment Sample Location

Notes:  
 RECAP Exceedances: MP&A result / ICON result  
 NA- Not Analyzed  
 Ba-Barium  
 Hg-Mercury  
 Pb-Lead  
 Source: USDA 2013 Aerial

**All concentrations mg/kg-dry weight**



**Figure 44 - RECAP Groundwater Protection Screening Standard Exceedances - Soil/Sediment**

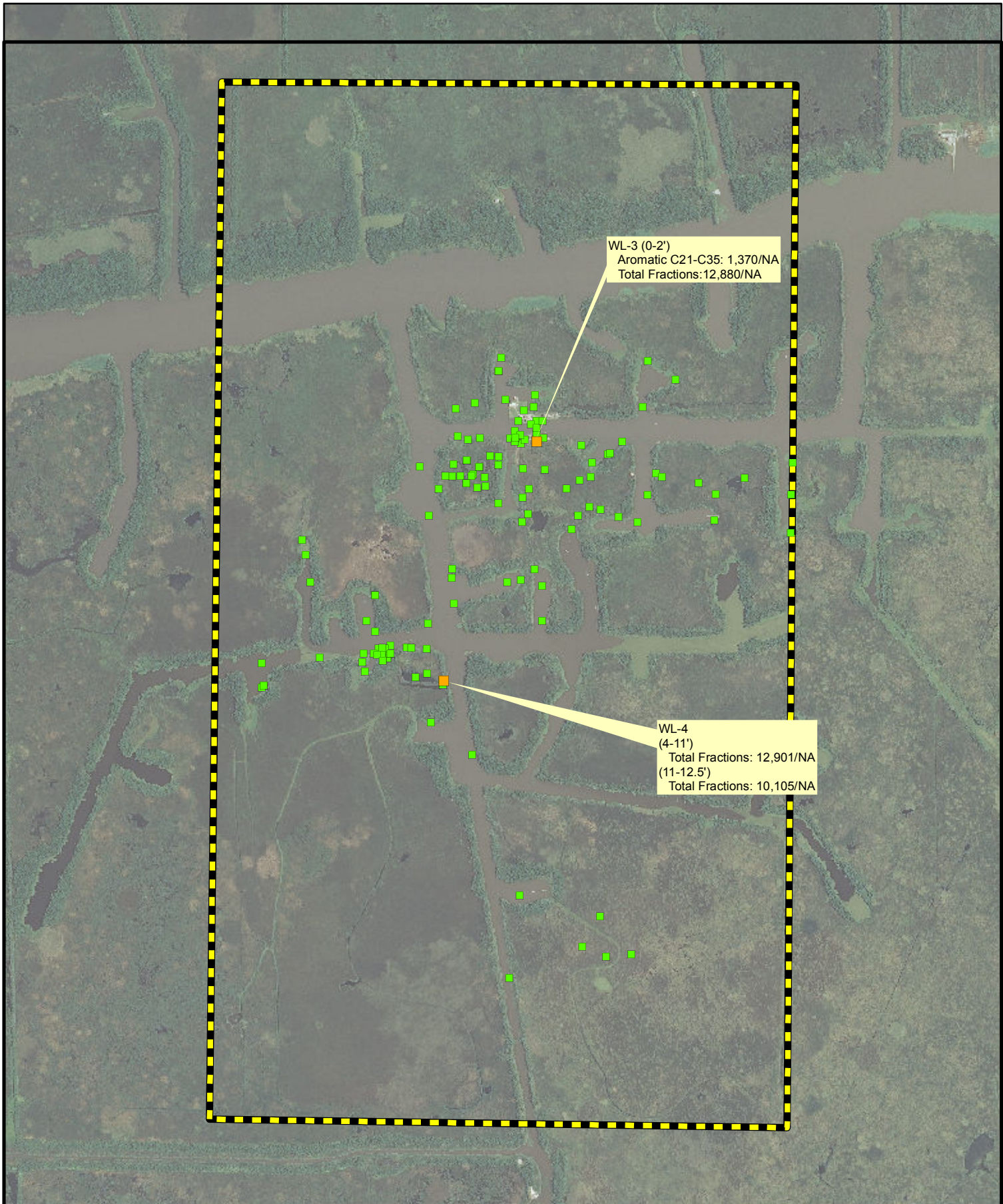
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
 Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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WL-3 (0-2')  
 Aromatic C21-C35: 1,370/NA  
 Total Fractions: 12,880/NA

WL-4  
 (4-11')  
 Total Fractions: 12,901/NA  
 (11-12.5')  
 Total Fractions: 10,105/NA

**Legend**

-  Section 16 Township 15 S  
Range 01 E
-  Soil/Sediment Exceedance
-  Soil/Sediment Sample Location

Notes:  
 RECAP Exceedances: MP&A result / ICON result  
 NA- Not Analyzed  
 Total Fractions- A sum of all TPH fraction results  
 (mg/kg-wet)  
 Source: USDA 2013 Aerial

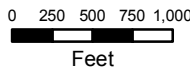


Figure 45 - RECAP MO-3 Standard Exceedances - Soil/Sediment

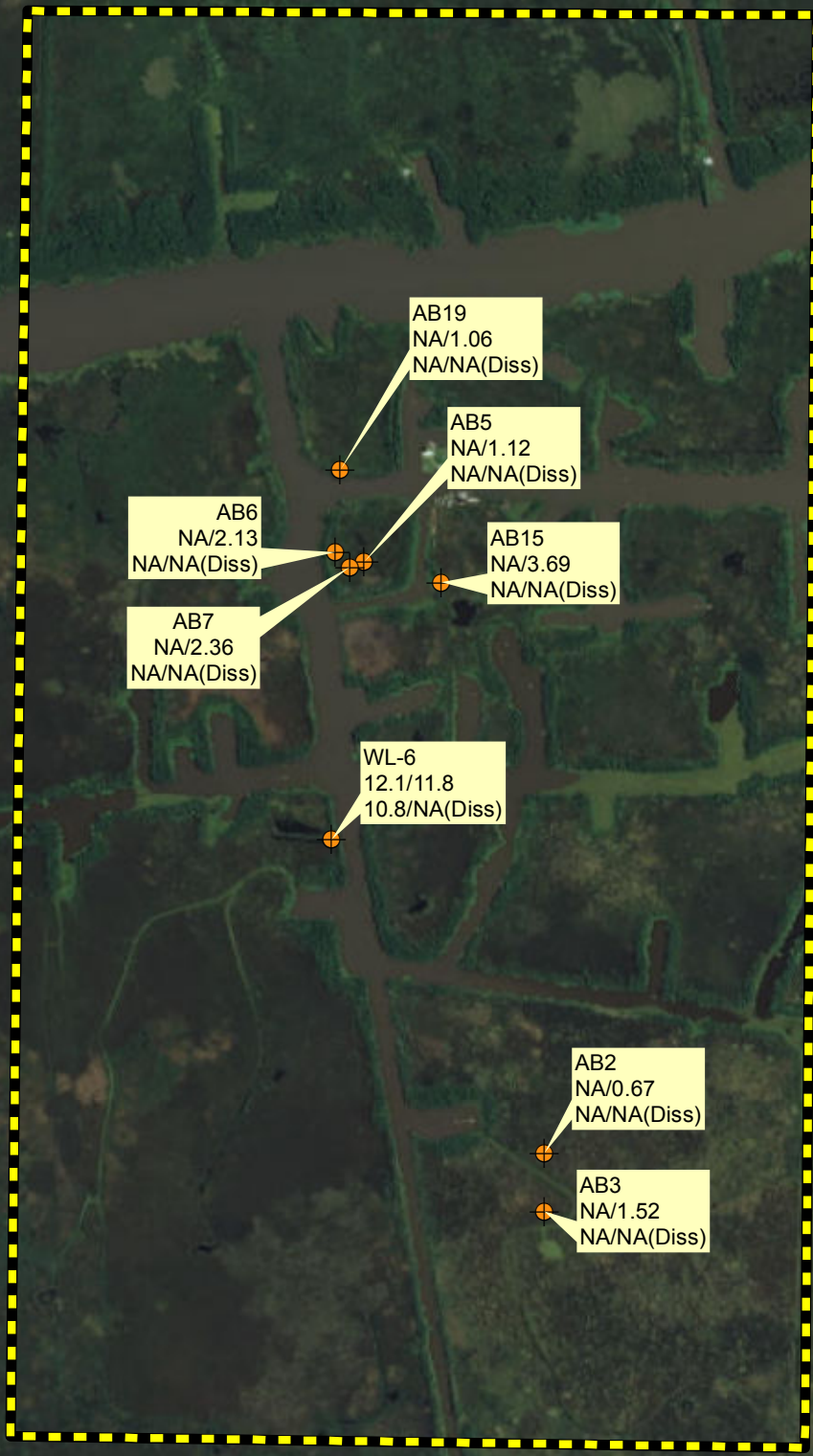
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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 Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

Section 16 Township 15 S Range 01 E

ICON Sample Location

**Notes:**

Labels show MP&A result (mg/L)/ICON result (mg/L)

(Diss) Refers to dissolved results

NA - Not analyzed

Source: 2013 Aerial from ESRI

0 250 500 750 1,000

Feet

N



Figure 46 - Groundwater Barium Concentrations  
Peat Zone

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS Drawn: TGC Checked: LRC Date: 9/30/2015 Project: 07-47





**Legend**

Section 16 Township 15 S Range 01 E

ICON Sample Location

Notes:  
 Labels show MP&A result (mg/L)/ICON result (mg/L)  
 NA- Not analyzed  
 Source: 2013 Aerial from ESRI

0 250 500 750 1,000  
 Feet



Figure 47 - Groundwater Chloride Concentrations  
 Peat Zone

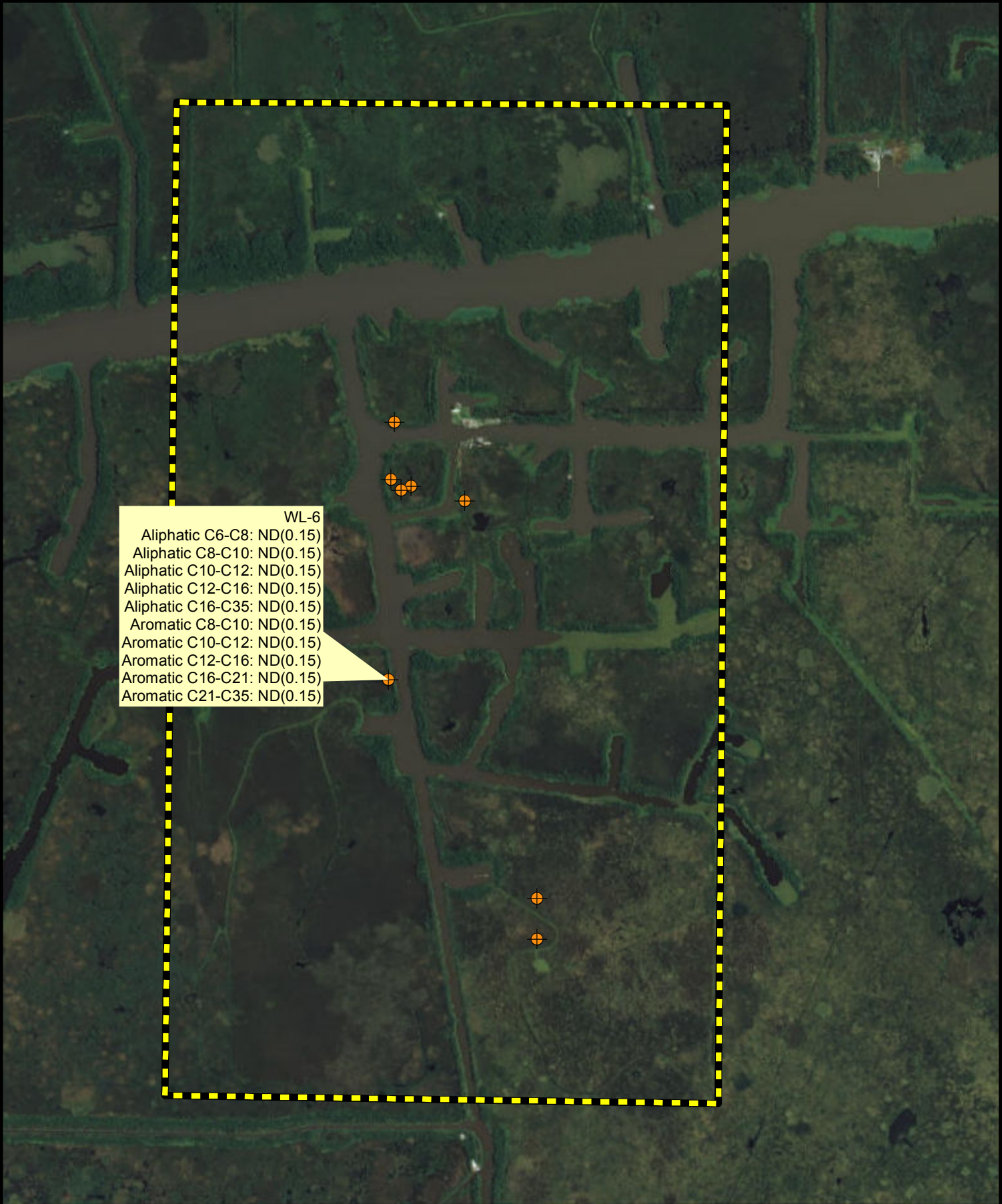
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
 Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas



Designed: JCS Drawn: TGC Checked: LRC Date: 9/30/2015 Project: 07-47



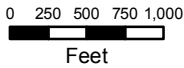


**WL-6**  
 Aliphatic C6-C8: ND(0.15)  
 Aliphatic C8-C10: ND(0.15)  
 Aliphatic C10-C12: ND(0.15)  
 Aliphatic C12-C16: ND(0.15)  
 Aliphatic C16-C35: ND(0.15)  
 Aromatic C8-C10: ND(0.15)  
 Aromatic C10-C12: ND(0.15)  
 Aromatic C12-C16: ND(0.15)  
 Aromatic C16-C21: ND(0.15)  
 Aromatic C21-C35: ND(0.15)

**Legend**

-  Section 16 Township 15 S Range 01 E
-  ICON Sample Location

Notes:  
 Labels show MP&A result (mg/L)  
 NA - Not analyzed  
 ND - Not detected (detection limit)  
 Source: 2013 Aerial from ESRI



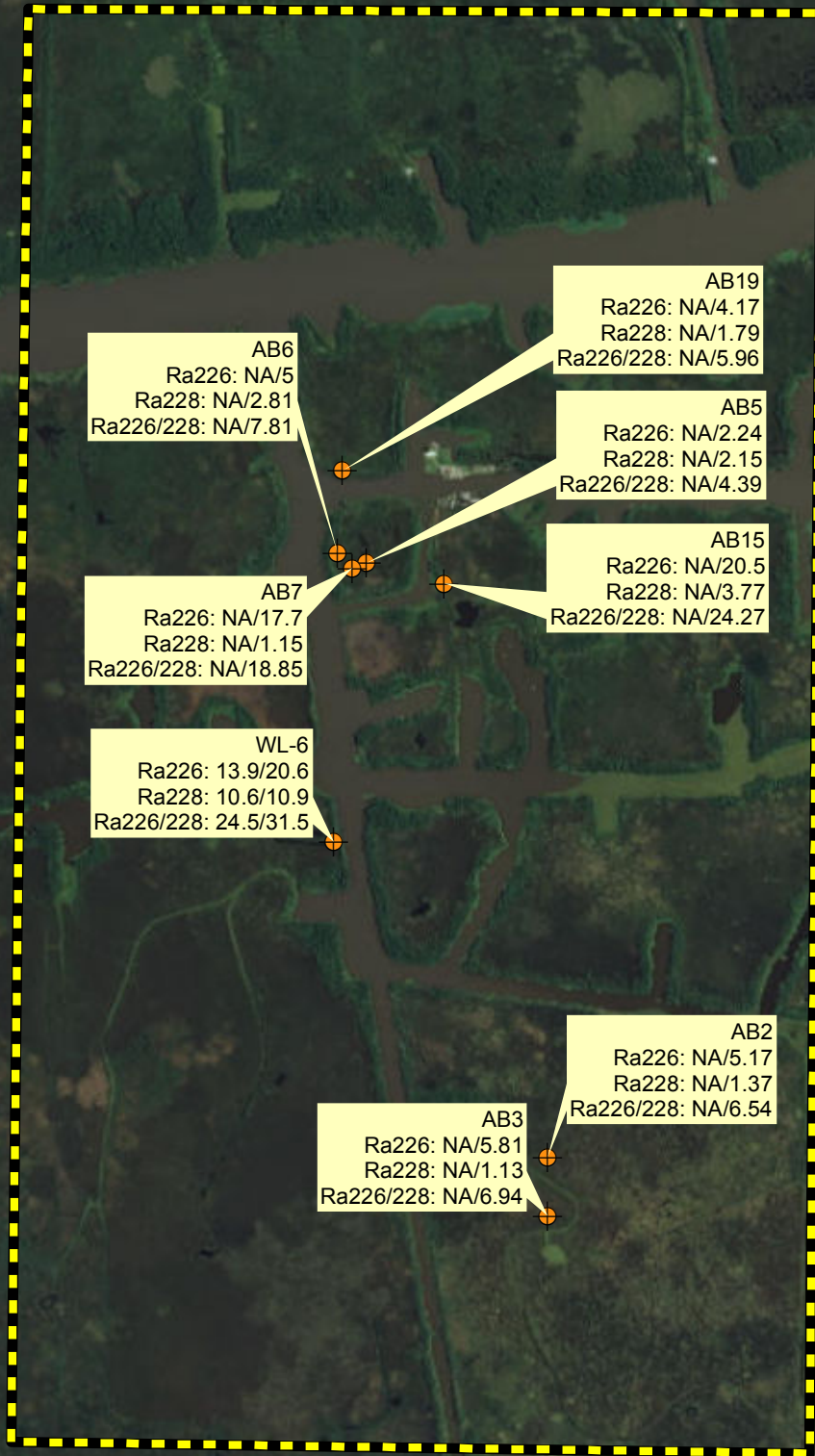
**Figure 48 - Groundwater TPH Fractions Peat Zone**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas





**Legend**

- Section 16 Township 15 S Range 01 E
- ICON Sample Location

Notes:  
 Labels show MP&A result (pCi/L) / ICON result (pCi/L)  
 NA- Not analyzed  
 Source: 2013 Aerial from ESRI

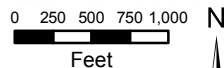


Figure 49 - Groundwater Radium Concentrations Peat Zone

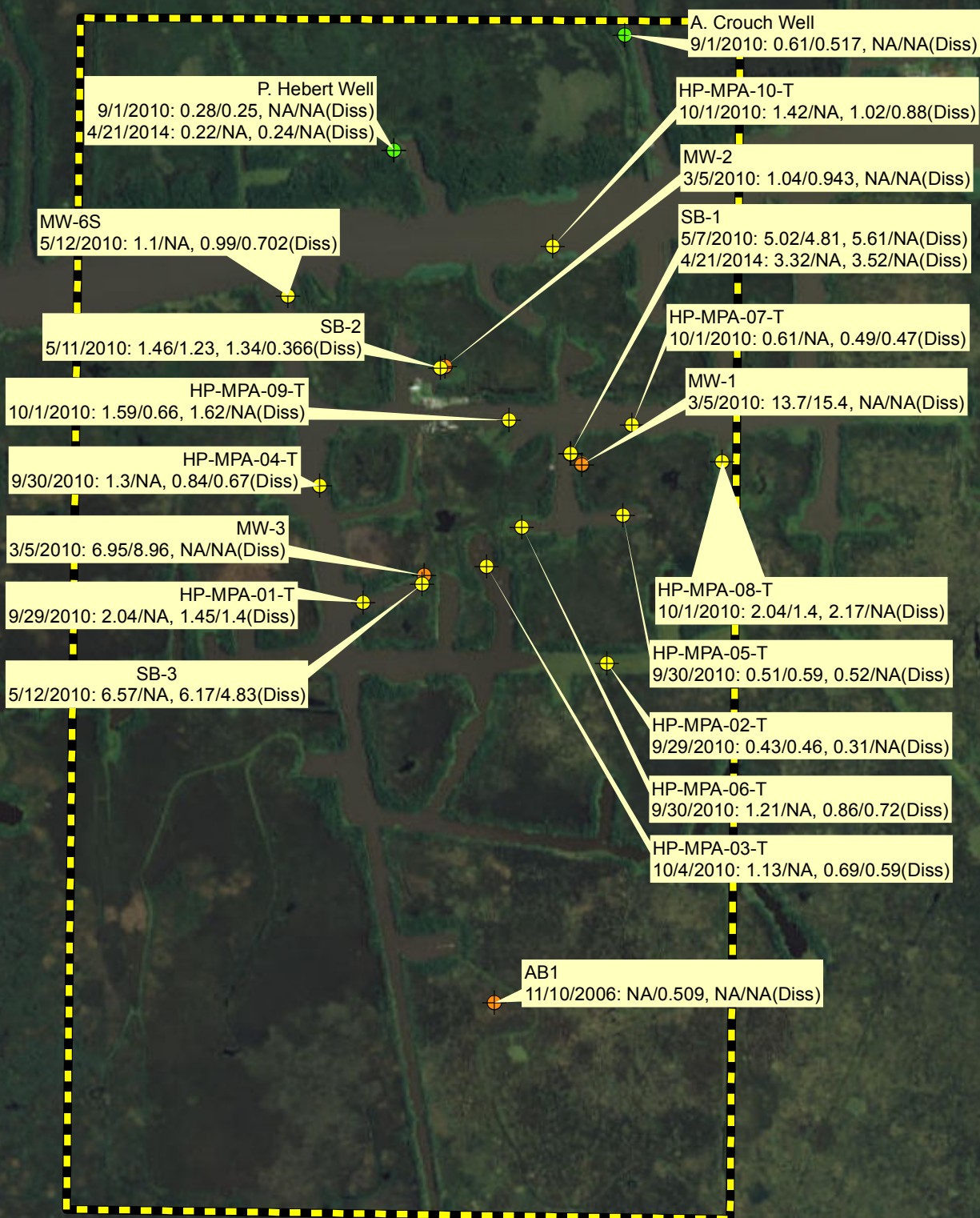
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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P. Hebert Well  
 9/1/2010: 0.28/0.25, NA/NA(Diss)  
 4/21/2014: 0.22/NA, 0.24/NA(Diss)

A. Crouch Well  
 9/1/2010: 0.61/0.517, NA/NA(Diss)

HP-MPA-10-T  
 10/1/2010: 1.42/NA, 1.02/0.88(Diss)

MW-6S  
 5/12/2010: 1.1/NA, 0.99/0.702(Diss)

MW-2  
 3/5/2010: 1.04/0.943, NA/NA(Diss)

SB-1  
 5/7/2010: 5.02/4.81, 5.61/NA(Diss)  
 4/21/2014: 3.32/NA, 3.52/NA(Diss)

SB-2  
 5/11/2010: 1.46/1.23, 1.34/0.366(Diss)

HP-MPA-07-T  
 10/1/2010: 0.61/NA, 0.49/0.47(Diss)

HP-MPA-09-T  
 10/1/2010: 1.59/0.66, 1.62/NA(Diss)

MW-1  
 3/5/2010: 13.7/15.4, NA/NA(Diss)

HP-MPA-04-T  
 9/30/2010: 1.3/NA, 0.84/0.67(Diss)

MW-3  
 3/5/2010: 6.95/8.96, NA/NA(Diss)

HP-MPA-08-T  
 10/1/2010: 2.04/1.4, 2.17/NA(Diss)

HP-MPA-01-T  
 9/29/2010: 2.04/NA, 1.45/1.4(Diss)

HP-MPA-05-T  
 9/30/2010: 0.51/0.59, 0.52/NA(Diss)

SB-3  
 5/12/2010: 6.57/NA, 6.17/4.83(Diss)

HP-MPA-02-T  
 9/29/2010: 0.43/0.46, 0.31/NA(Diss)

HP-MPA-06-T  
 9/30/2010: 1.21/NA, 0.86/0.72(Diss)

HP-MPA-03-T  
 10/4/2010: 1.13/NA, 0.69/0.59(Diss)

AB1  
 11/10/2006: NA/0.509, NA/NA(Diss)

- Legend**
- Section 16 Township 15 S Range 01 E
  - ICON Sample Location
  - MP&A Sample Location
  - Existing Water Well

Notes:  
 Labels show MP&A result (mg/L)/ICON result (mg/L)  
 (Diss) Refers to dissolved results  
 NA - Not analyzed  
 Source: 2013 Aerial from ESRI

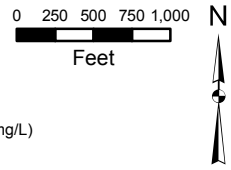


Figure 50 - Groundwater Barium Concentrations  
 40 foot zone

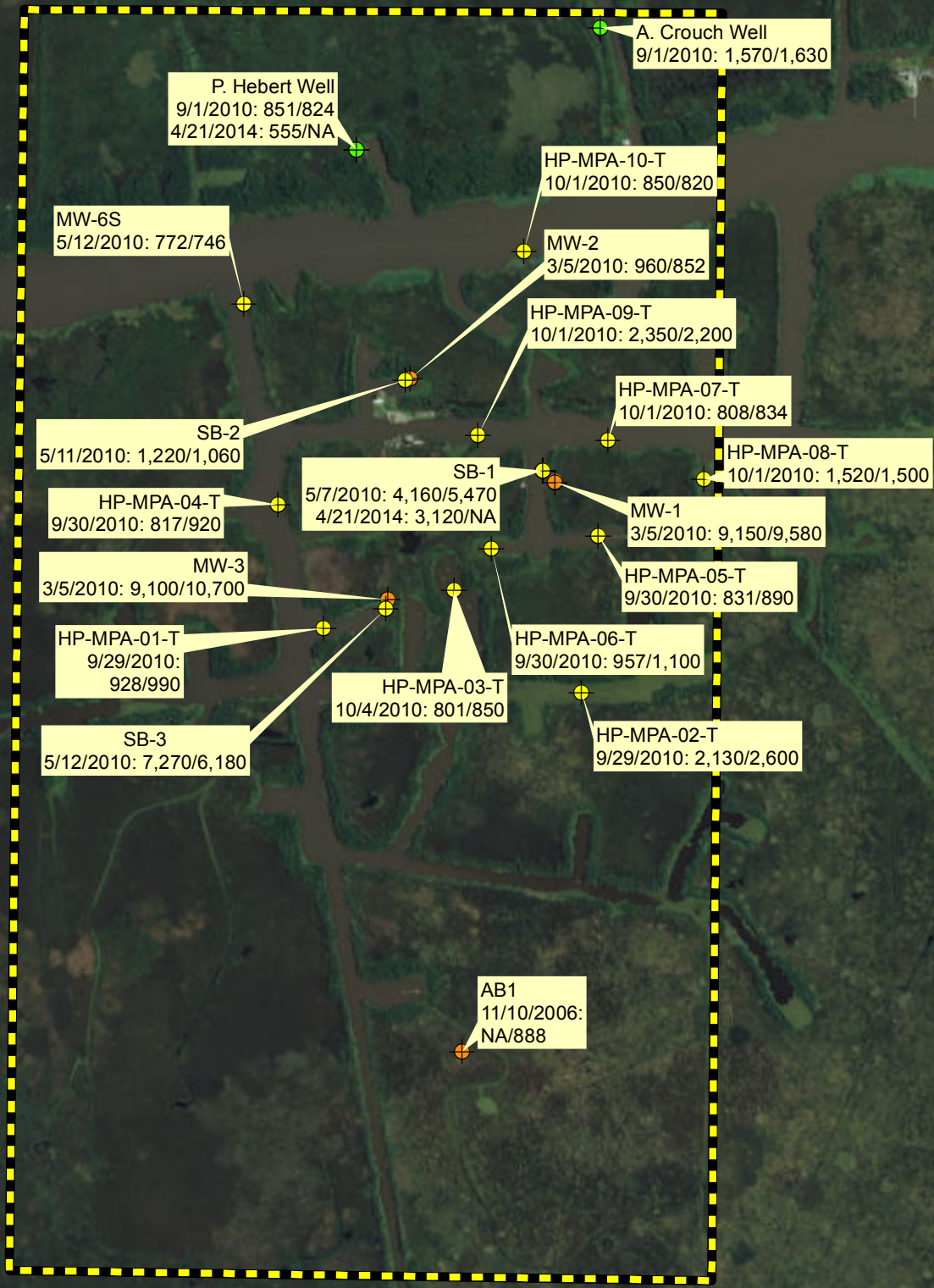
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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 Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

- Section 16 Township 15 S Range 01 E
- ICON Sample Location
- MP&A Sample Location
- Existing Water Well

Notes: Labels show MP&A result (mg/L)/ICON result (mg/L)  
 NA- Not analyzed  
 Source: 2013 Aerial from ESRI

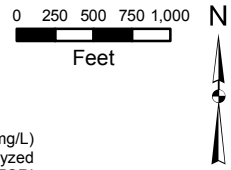


Figure 51 - Groundwater Chloride Concentrations  
 40 foot zone

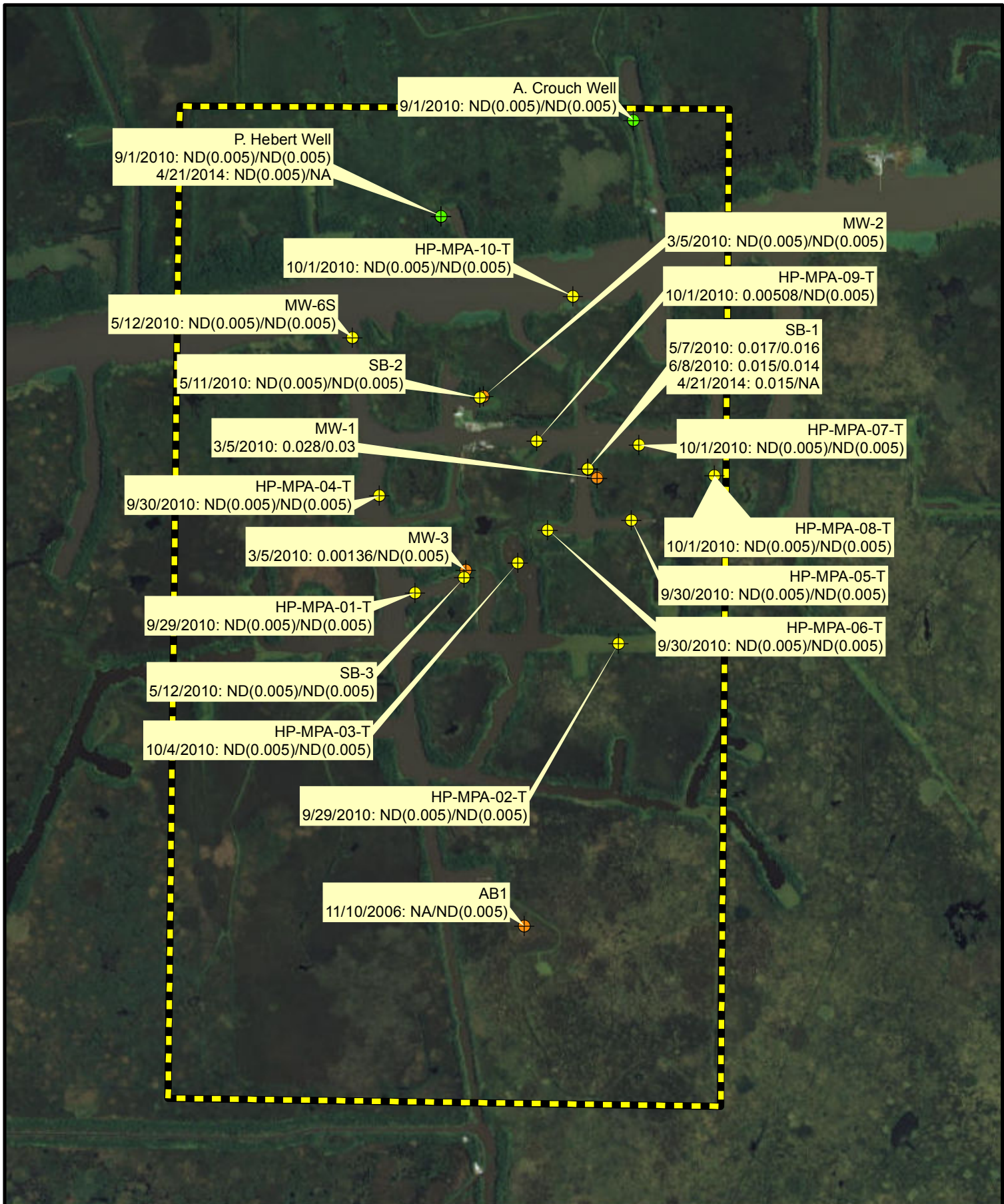
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

- Section 16 Township 15 S Range 01 E
- ICON Sample Location
- MP&A Sample Location
- Existing Water Well

0 250 500 750 1,000  
Feet

**Notes:**  
 Labels show MP&A result (mg/L)/ICON result (mg/L)  
 NA - Not analyzed  
 ND - Not detected (Detection limit in parentheses)  
 Source: 2013 Aerial from ESRI

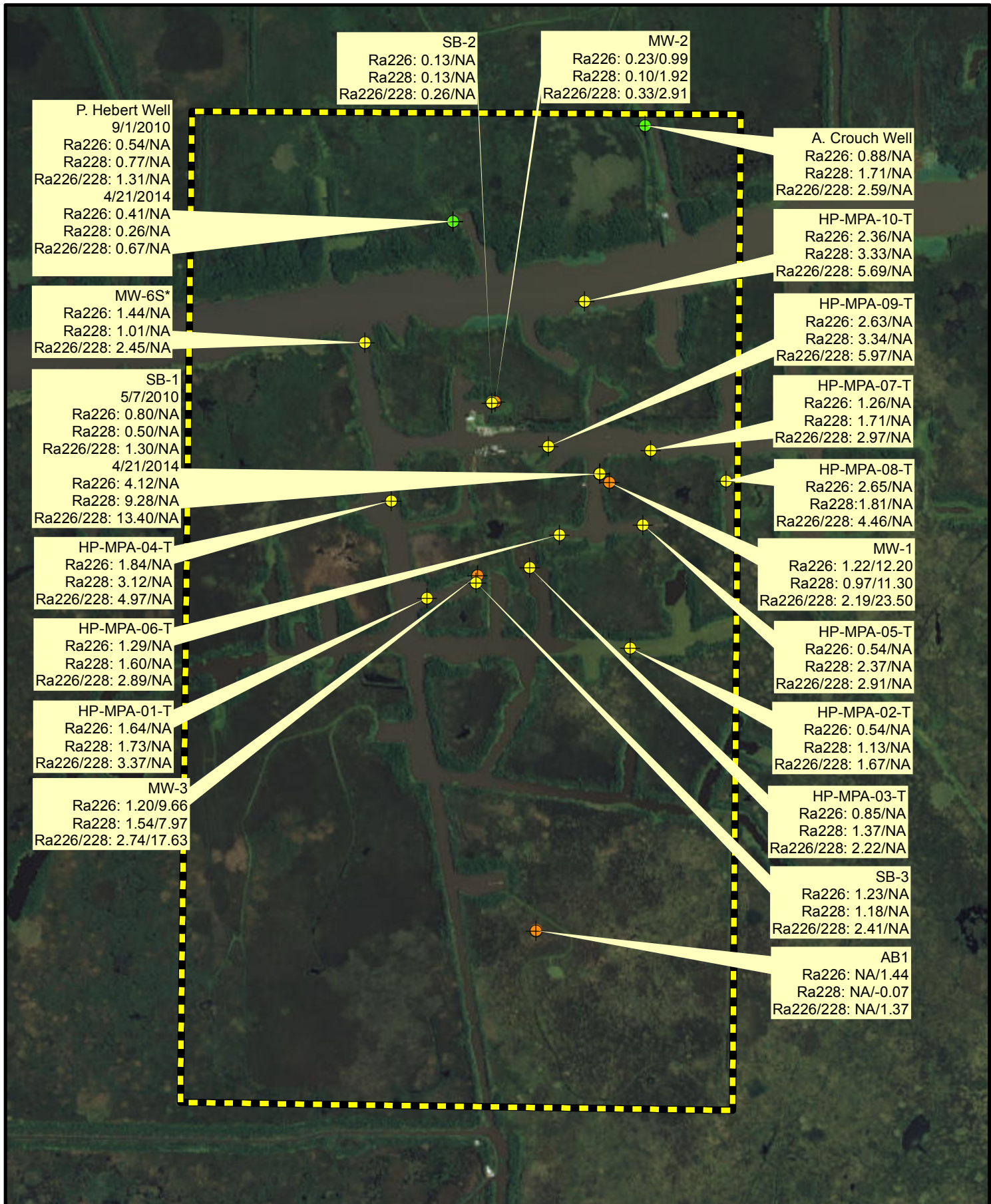
**Figure 52 - Groundwater Benzene Concentrations  
40 foot zone**

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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

Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

- Section 16 Township 15 S Range 01 E
- ICON Sample Location
- MP&A Sample Location
- Existing Water Well

Notes:  
 Labels show combined total Ra226/Ra228  
 MP&A results (pCi/L)/ICON results (pCi/L)  
 \* Indicates dissolved radionuclide analyses  
 (where total results unavailable)  
 NA - Not analyzed  
 Source: 2013 Aerial from ESRI

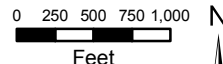


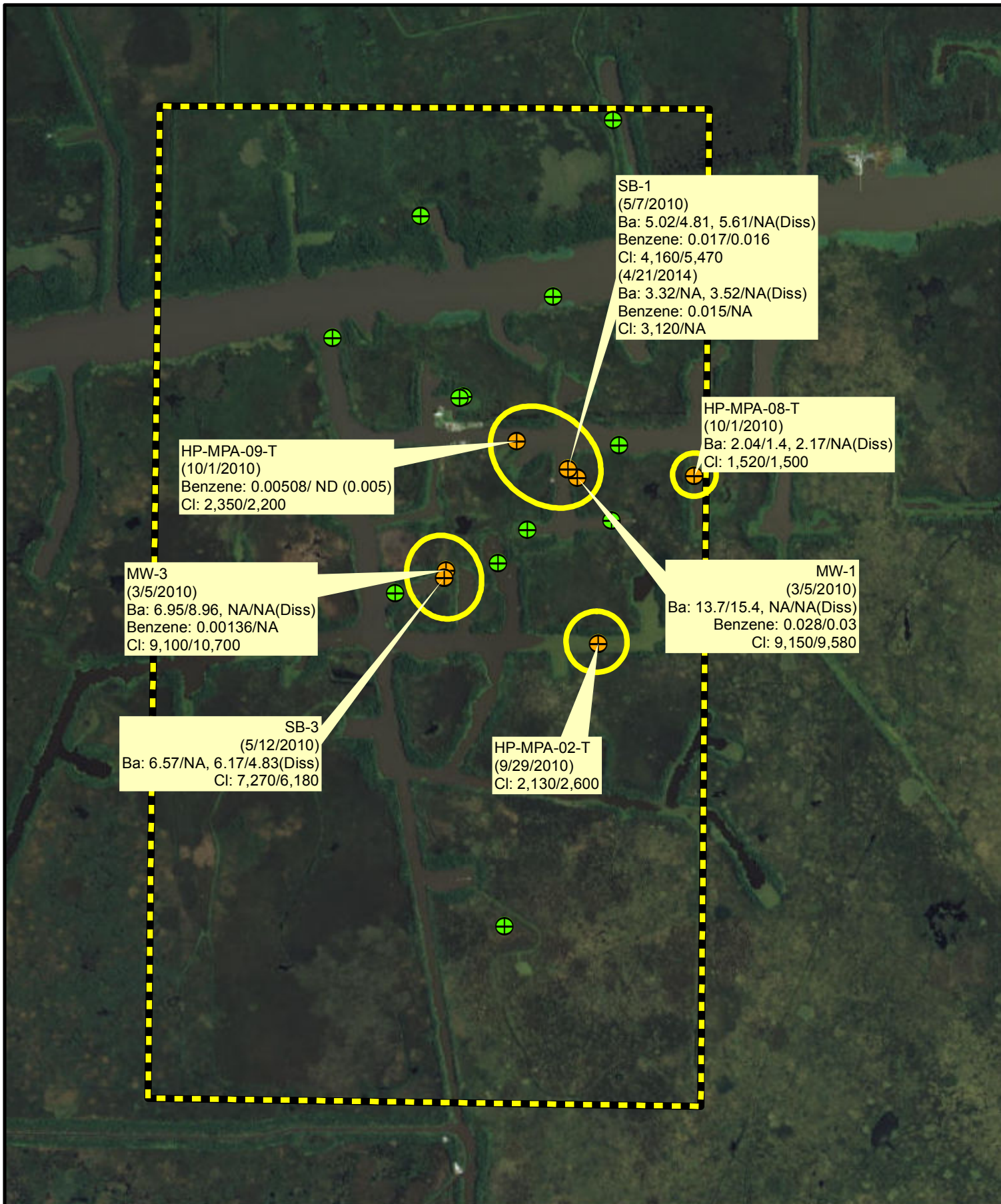
Figure 53 - Groundwater Radium Concentrations  
40 foot zone

*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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SB-1  
(5/7/2010)  
Ba: 5.02/4.81, 5.61/NA(Diss)  
Benzene: 0.017/0.016  
Cl: 4,160/5,470  
(4/21/2014)  
Ba: 3.32/NA, 3.52/NA(Diss)  
Benzene: 0.015/NA  
Cl: 3,120/NA

HP-MPA-08-T  
(10/1/2010)  
Ba: 2.04/1.4, 2.17/NA(Diss)  
Cl: 1,520/1,500

HP-MPA-09-T  
(10/1/2010)  
Benzene: 0.00508/ ND (0.005)  
Cl: 2,350/2,200

MW-1  
(3/5/2010)  
Ba: 13.7/15.4, NA/NA(Diss)  
Benzene: 0.028/0.03  
Cl: 9,150/9,580

MW-3  
(3/5/2010)  
Ba: 6.95/8.96, NA/NA(Diss)  
Benzene: 0.00136/NA  
Cl: 9,100/10,700

SB-3  
(5/12/2010)  
Ba: 6.57/NA, 6.17/4.83(Diss)  
Cl: 7,270/6,180

HP-MPA-02-T  
(9/29/2010)  
Cl: 2,130/2,600

**Legend**

- Section 16 Township 15 S Range 01 E
- Groundwater Exceedance (40 foot zone)
- Groundwater Sampling Location (40 foot zone)
- RECAP AOI

Notes:  
There are no risk-based standards for chloride.  
Labels show MP&A result (mg/L)/ICON result (mg/L)  
(Diss) Refers to dissolved results  
NA - Not analyzed  
ND- Not detected (detection limit)  
Source: 2013 Aerial from ESRI

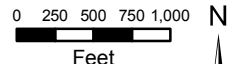


Figure 54 - RECAP GW2 Standard Exceedances Groundwater (40 foot zone)

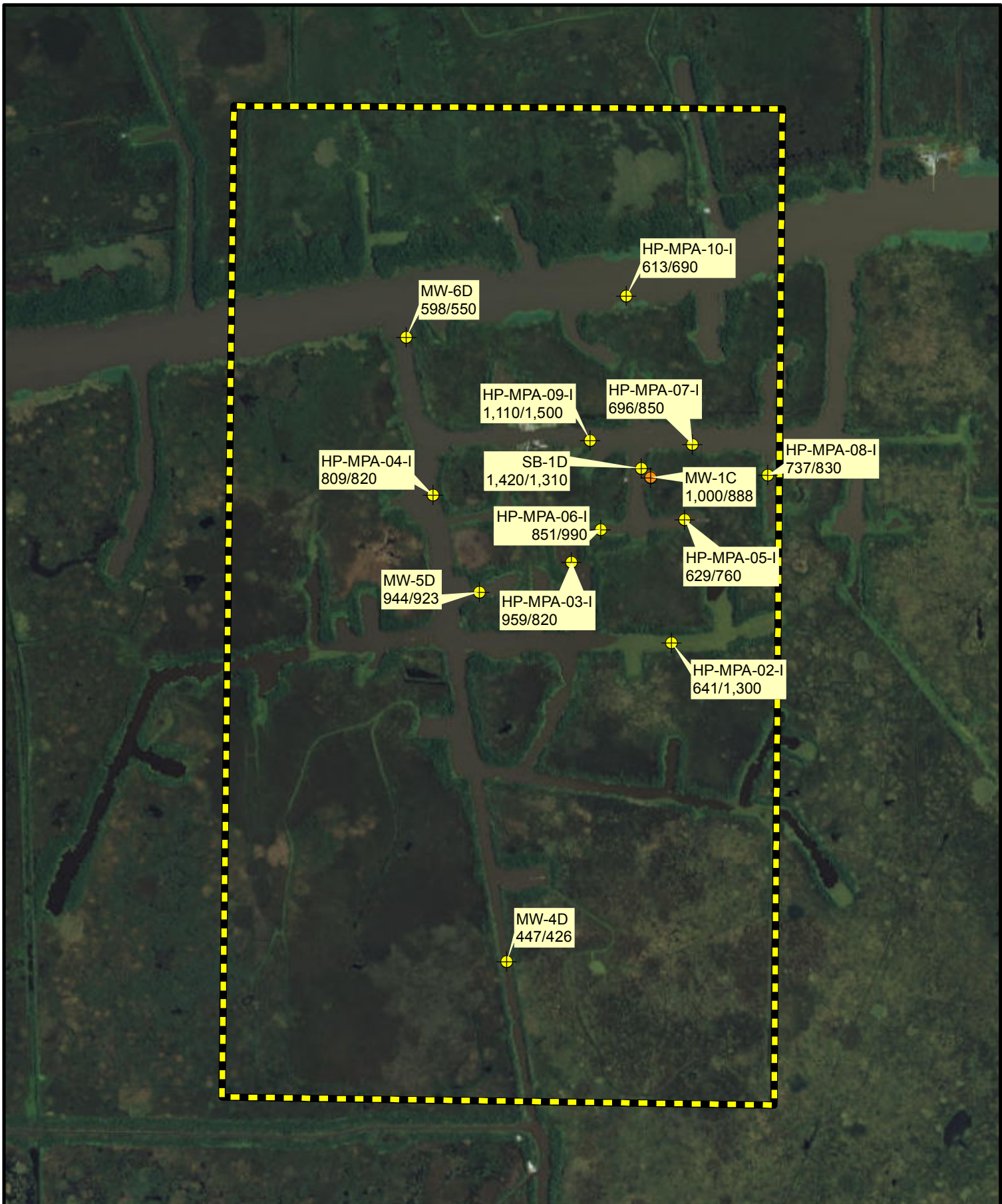
*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

Section 16 Township 15 S Range 01 E

ICON Sample Location

MP&A Sample Location

Notes: Labels show MP&A result (mg/L)/ICON result (mg/L)  
Source: 2013 Aerial from ESRI

0 250 500 750 1,000

Feet



Figure 55 - Groundwater Chloride Concentrations  
70 to 90 foot zone

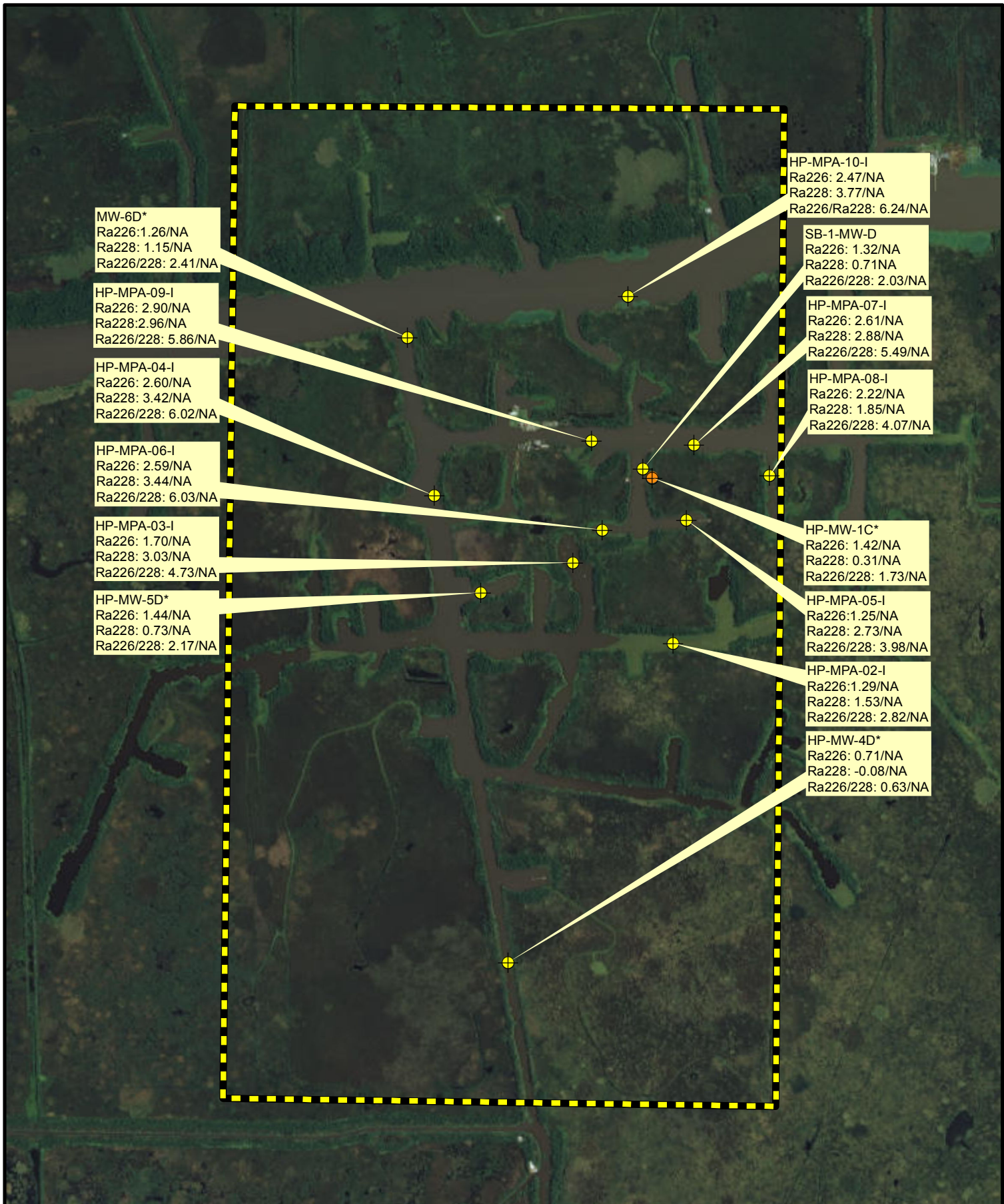
*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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MW-6D\*  
 Ra226: 1.26/NA  
 Ra228: 1.15/NA  
 Ra226/228: 2.41/NA

HP-MPA-09-I  
 Ra226: 2.90/NA  
 Ra228: 2.96/NA  
 Ra226/228: 5.86/NA

HP-MPA-04-I  
 Ra226: 2.60/NA  
 Ra228: 3.42/NA  
 Ra226/228: 6.02/NA

HP-MPA-06-I  
 Ra226: 2.59/NA  
 Ra228: 3.44/NA  
 Ra226/228: 6.03/NA

HP-MPA-03-I  
 Ra226: 1.70/NA  
 Ra228: 3.03/NA  
 Ra226/228: 4.73/NA

HP-MW-5D\*  
 Ra226: 1.44/NA  
 Ra228: 0.73/NA  
 Ra226/228: 2.17/NA

HP-MPA-10-I  
 Ra226: 2.47/NA  
 Ra228: 3.77/NA  
 Ra226/Ra228: 6.24/NA

SB-1-MW-D  
 Ra226: 1.32/NA  
 Ra228: 0.71/NA  
 Ra226/228: 2.03/NA

HP-MPA-07-I  
 Ra226: 2.61/NA  
 Ra228: 2.88/NA  
 Ra226/228: 5.49/NA

HP-MPA-08-I  
 Ra226: 2.22/NA  
 Ra228: 1.85/NA  
 Ra226/228: 4.07/NA

HP-MW-1C\*  
 Ra226: 1.42/NA  
 Ra228: 0.31/NA  
 Ra226/228: 1.73/NA

HP-MPA-05-I  
 Ra226: 1.25/NA  
 Ra228: 2.73/NA  
 Ra226/228: 3.98/NA

HP-MPA-02-I  
 Ra226: 1.29/NA  
 Ra228: 1.53/NA  
 Ra226/228: 2.82/NA

HP-MW-4D\*  
 Ra226: 0.71/NA  
 Ra228: -0.08/NA  
 Ra226/228: 0.63/NA

**Legend**

Section 16 Township 15 S Range 01 E

ICON Sample Location

MP&A Sample Location

0 250 500 750 1,000

Feet



Notes:  
 Labels show total MP&A result (pCi/L)/ICON result (pCi/L)  
 \* Indicates dissolved radionuclide results  
 (where total results unavailable)  
 NA- Not analyzed  
 Source: 2013 Aerial from ESRI

Figure 56 - Groundwater Radium Concentrations  
 70 to 90 foot zone

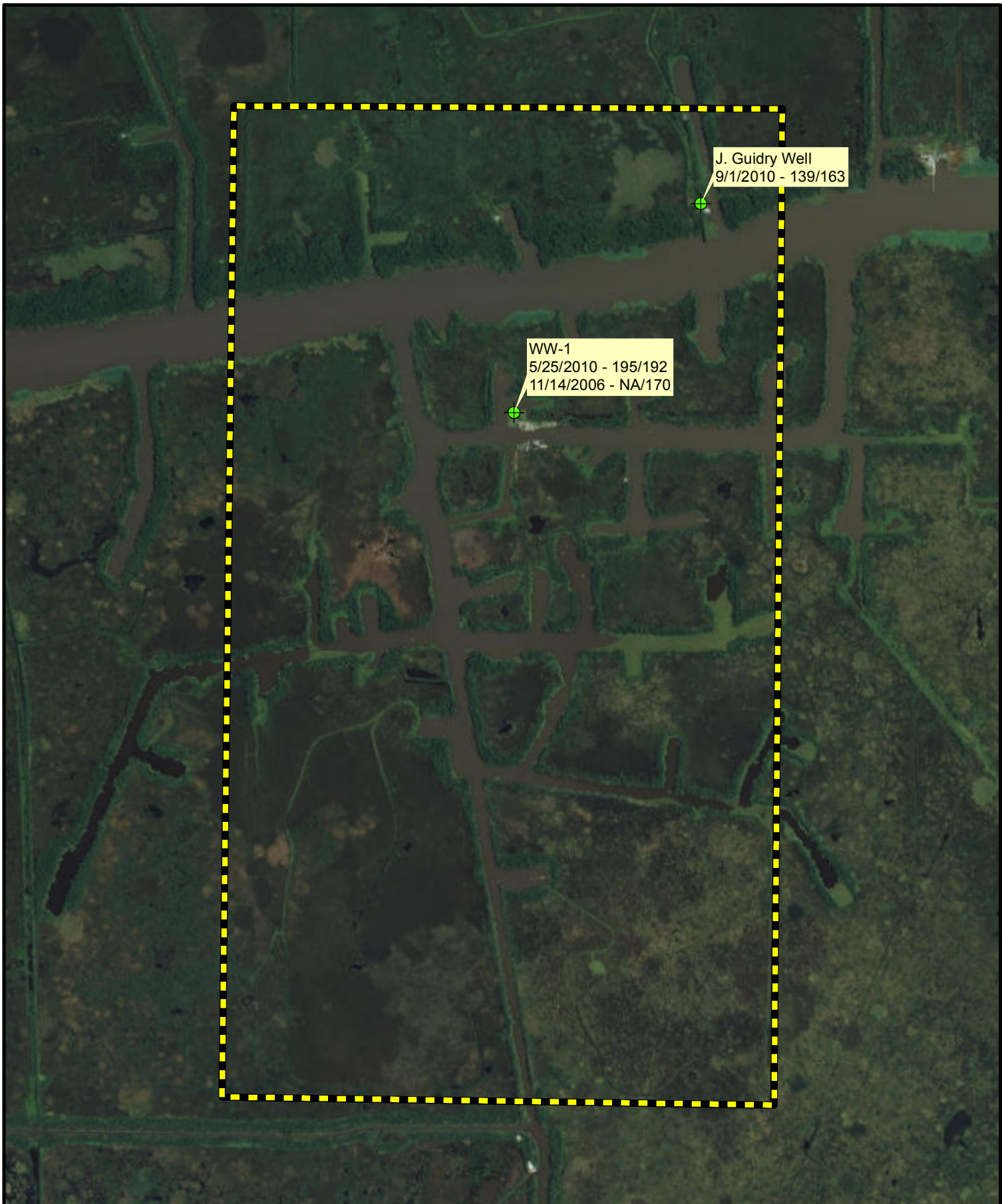
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

**MICHAEL PISANI & ASSOCIATES, INC.**



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 Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS Drawn: TGC Checked: LRC Date: 10/1/2015 Project: 07-47





**Legend**

-  Section 16 Township 15 S Range 01 E
-  Existing Water Well

Notes: Labels show MP&A result (mg/L)/ICON result (mg/L)  
 NA - Not analyzed  
 Source: 2013 Aerial from ESRI

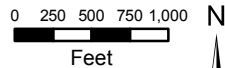


Figure 57 - Groundwater Chloride Concentrations  
 Upper Sand of the Chicot Aquifer

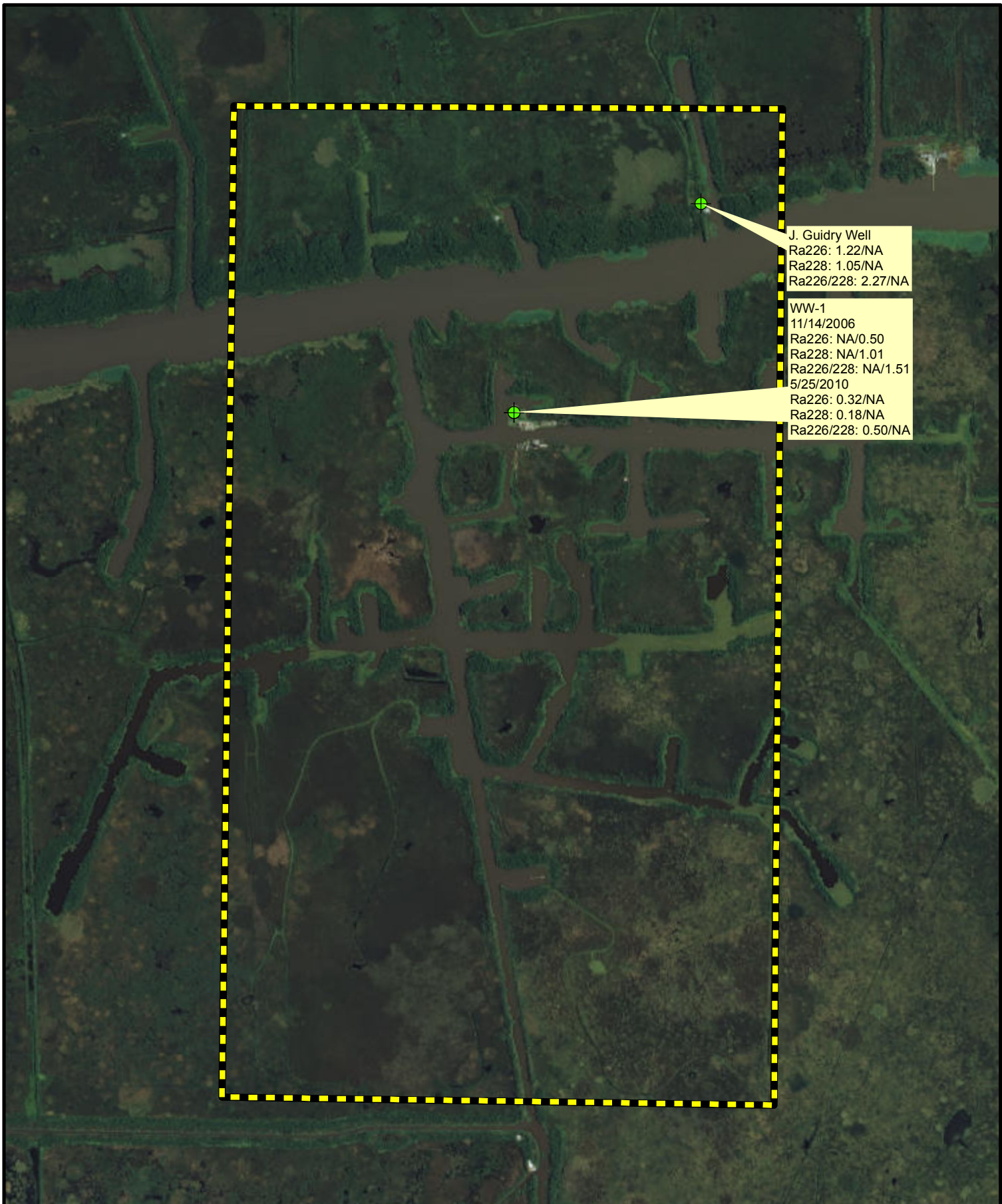
*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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J. Guidry Well  
 Ra226: 1.22/NA  
 Ra228: 1.05/NA  
 Ra226/228: 2.27/NA

WW-1  
 11/14/2006  
 Ra226: NA/0.50  
 Ra228: NA/1.01  
 Ra226/228: NA/1.51  
 5/25/2010  
 Ra226: 0.32/NA  
 Ra228: 0.18/NA  
 Ra226/228: 0.50/NA

**Legend**

-  Section 16 Township 15 S Range 01 E
-  Existing Water Well

Notes: Labels show combined total Ra226/Ra228  
 MP&A result (pCi/L)/ICON result (pCi/L)  
 NA - Not analyzed  
 Source: 2013 Aerial from ESRI

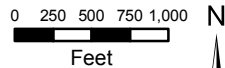


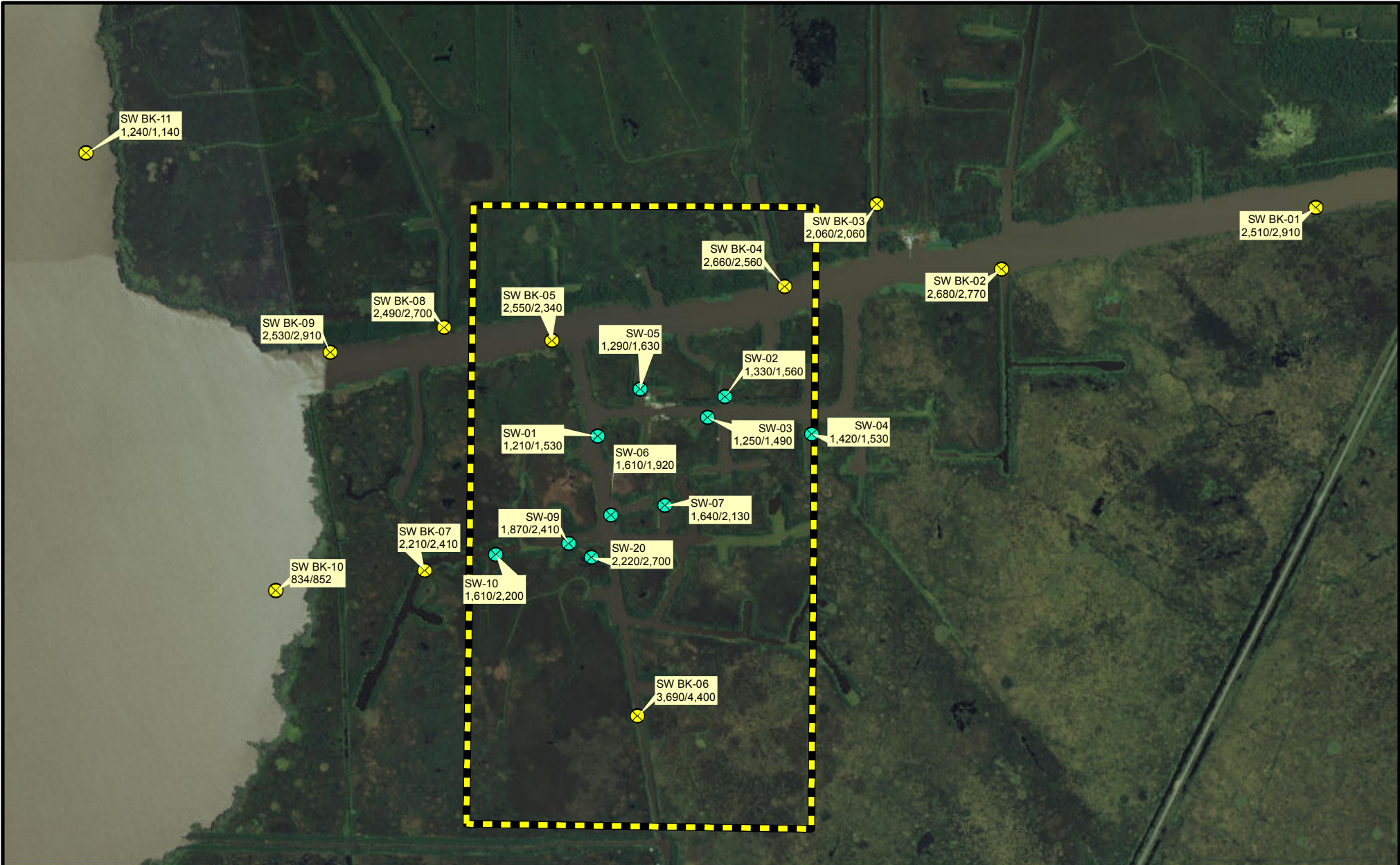
Figure 58 - Groundwater Radium Concentrations  
 Upper Sand of the Chicot Aquifer

*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*




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Environmental Consulting Services  
 Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas





**Legend**

-  Section 16 Township 15 S Range 01 E
-  MP&A Sample Location
-  ICON Sample Location

Notes:  
 1. Labels show MP&A result (mg/L)/ICON result (mg/L)  
 Source:  
 2013 Aerial from ESRI

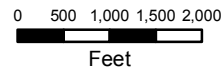


Figure 59 - Surface Water Chloride Concentrations

East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana

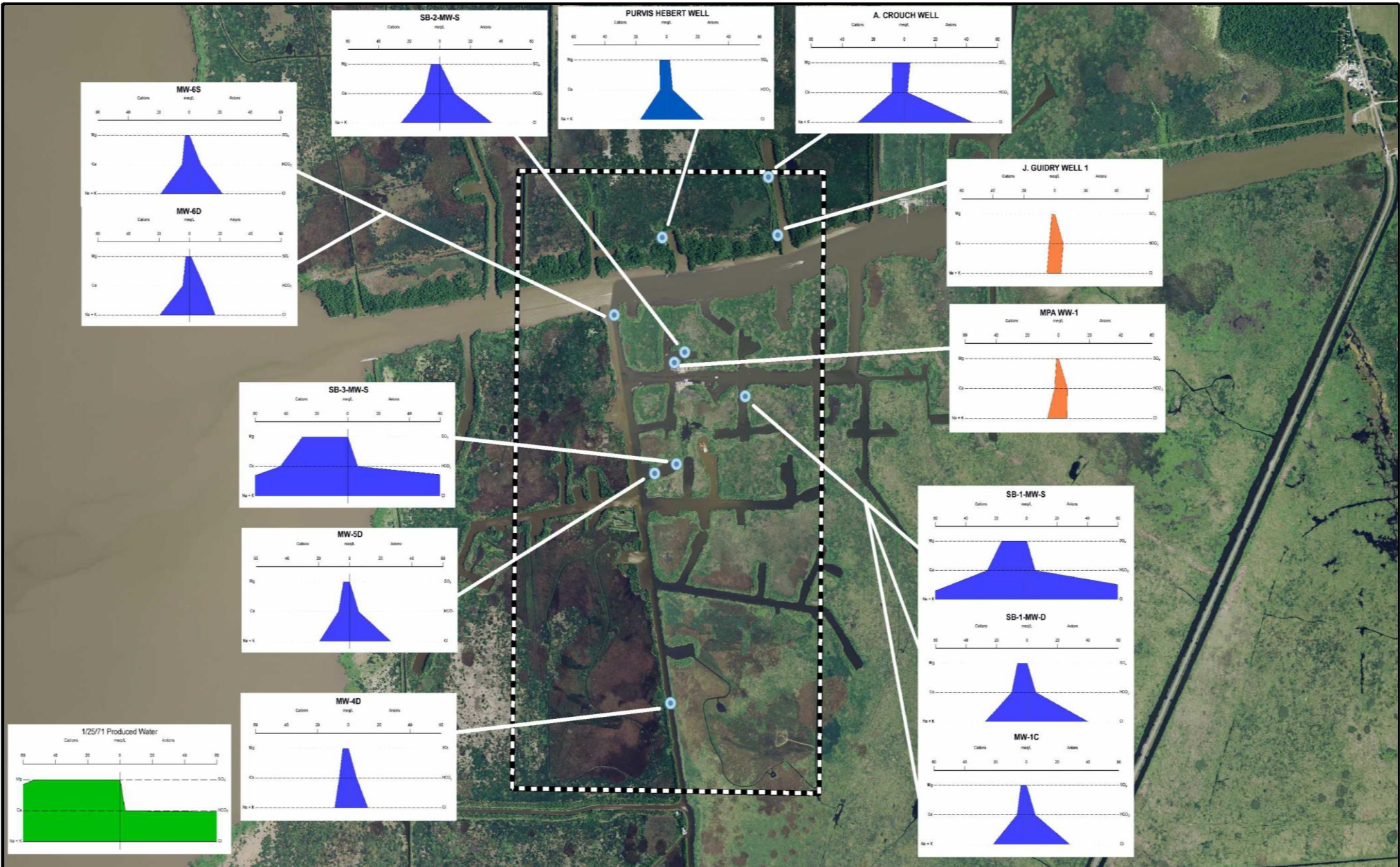
**MICHAEL PISANI & ASSOCIATES, INC.**

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Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: TGC	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

Ground Water Sampling Location  
 Section 16

Note:

1. Stiff diagrams generated by RockWare AqQA v.1.0
2. Produced water diagram based on produced water sample collected on January 25, 1971 from VPSB "A" 13 Lease "R" MWF Zone (3/2/71 Petroleum Laboratories, Inc. lab report, Bates C1074021 0008574).
3. 2010 aerial from USDA

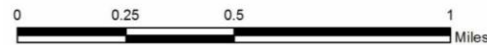


Figure 60 - Stiff Diagrams - Groundwater Quality

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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Environmental Consulting Services

Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS

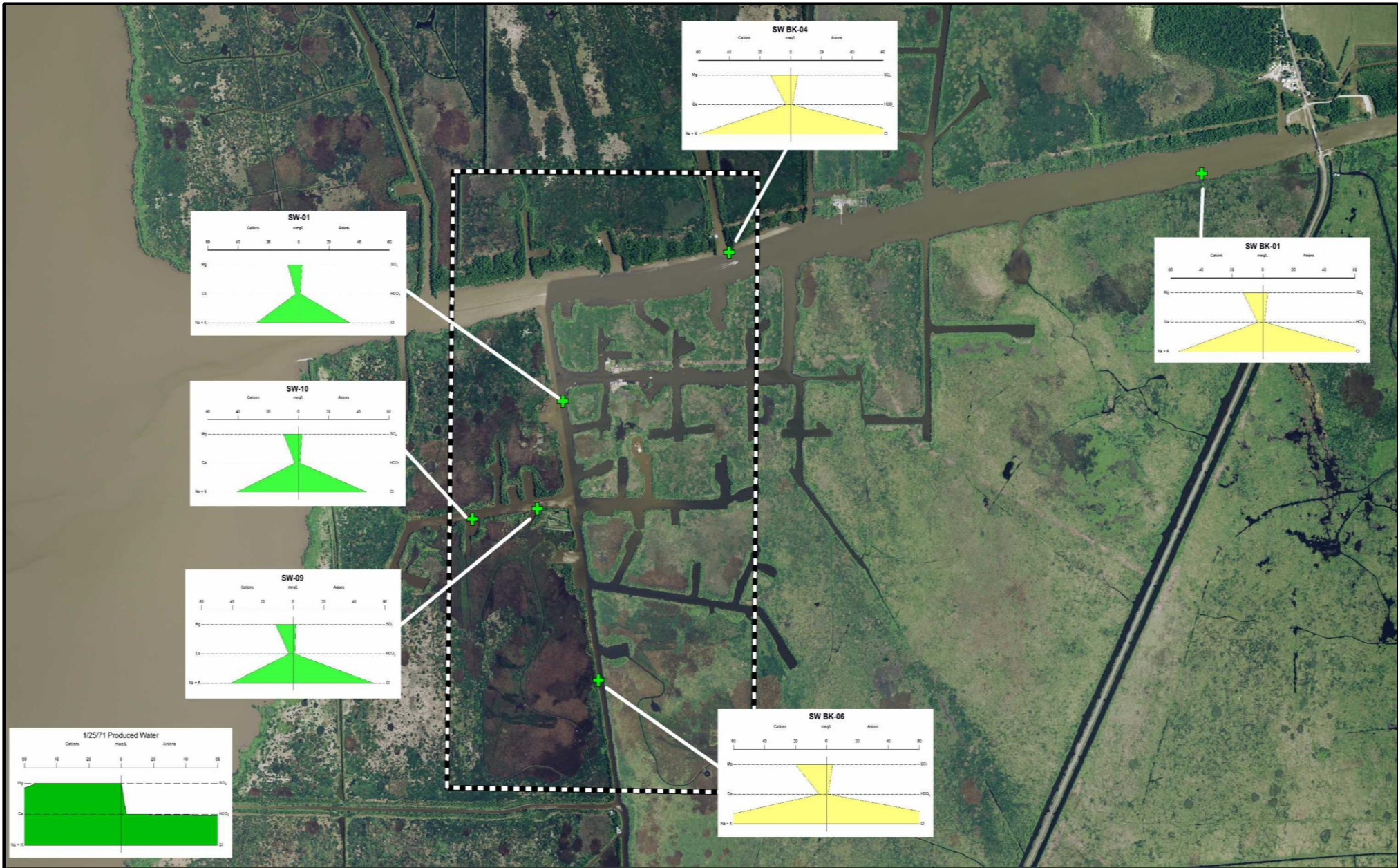
Drawn: MMH

Checked: LRC

Date: 9/30/2015

Project: 07-47





**Legend**

Surface Water Sampling Location

Section 16

Note:

1. Stiff diagrams generated by RockWare AqQA v.1.0
2. Average bicarbonate alkalinity from SW-06 & SW-109 (SW-09 Dup) used in generation of diagrams for SW-01, SW-09 & SW-10.
3. Average bicarbonate alkalinity from SW BK-02, SW BK-05 & SW BK-07 used in generation of diagrams for SW BK-01, SW BK-04 & SW BK-06.
4. Produced water diagram based on produced water sample collected on January 25, 1971 from VPSB "A" 13 Lease "R" MWF Zone (3/2/71 Petroleum Laboratories, Inc. lab report, Bates C1074021 0008574).
5. 2010 aerial from USDA



Figure 61 - Stiff Diagrams - Surface Water Quality

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

**MICHAEL PISANI & ASSOCIATES, INC.**  
Environmental Consulting Services

Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS

Drawn: MMH

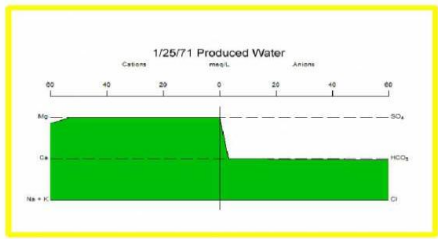
Checked: LRC

Date: 9/30/2015

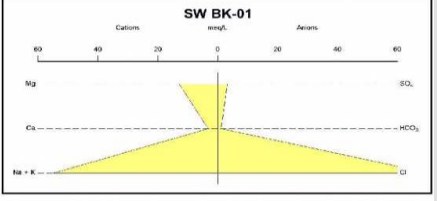
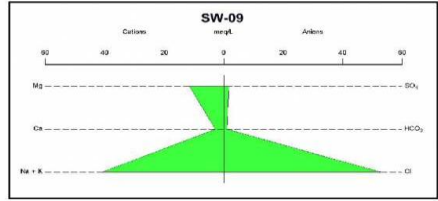
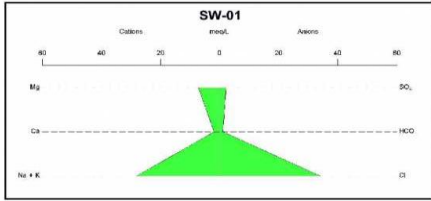
Project: 07-47



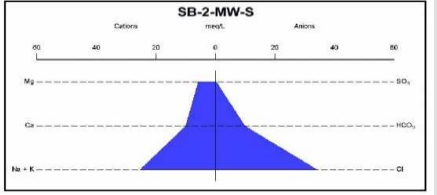
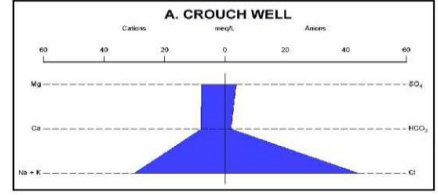
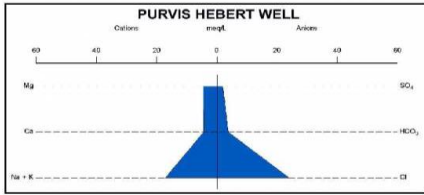
Increasing Depth



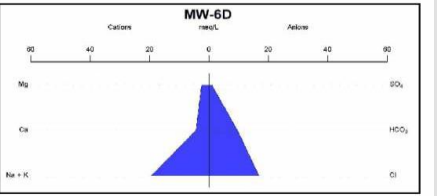
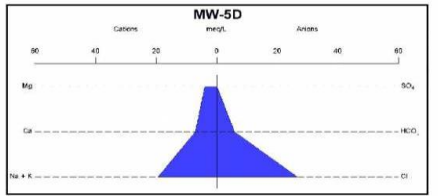
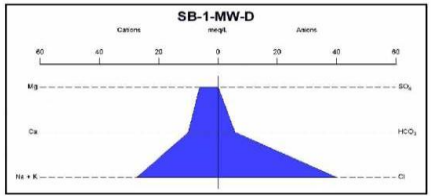
Surface Water



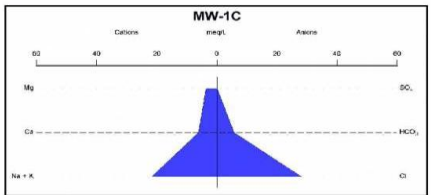
Shallow Wells (34-52 ft.)



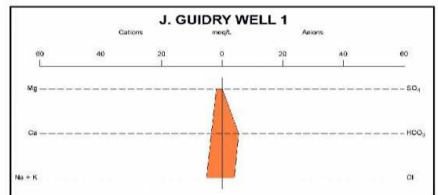
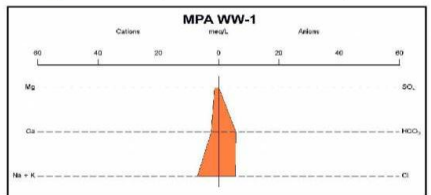
Intermediate Wells (72-77 ft.)



Intermediate Wells (97-100 ft.)



Deep Wells (470 ft., 519 ft.)



- Note:
1. Stiff diagrams generated by RockWare AqQA v. 1.0
  2. Average bicarbonate alkalinity from SW-06 & SW-109 (SW-09 Dup) used in generation of diagrams for SW-01 & SW-09.
  3. Average bicarbonate alkalinity from SW BK-02, SW BK-05 & SW BK-07 used in generation of diagram for SW BK-01.
  4. Produced water diagram based on produced water sample collected on January 25, 1971 from VPSB "A" 13 Lease "R" MWF Zone (3/2/71 Petroleum Laboratories, Inc. lab report, Bates C1074021 0008574).

Figure 62 - Stiff Diagrams - By Depth

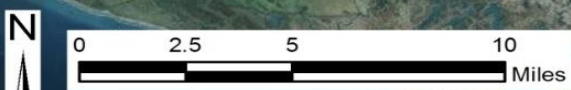
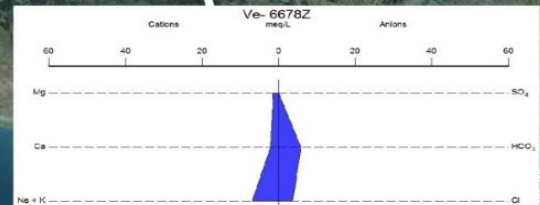
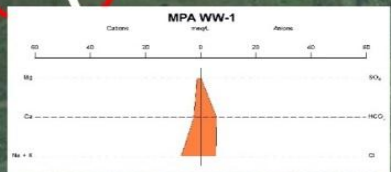
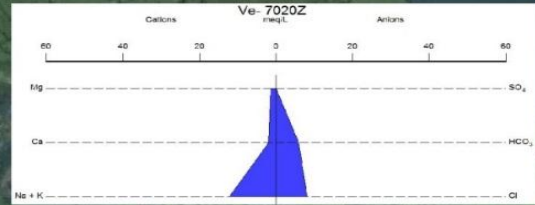
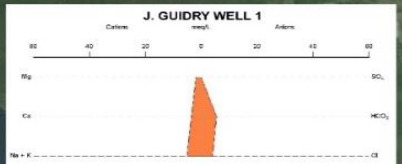
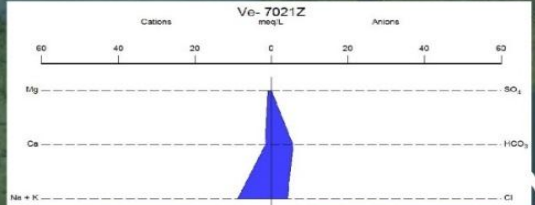
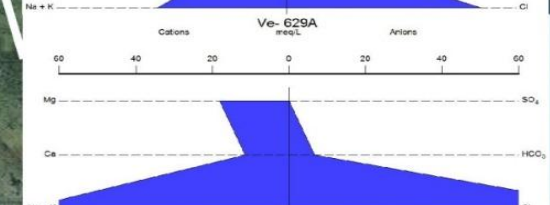
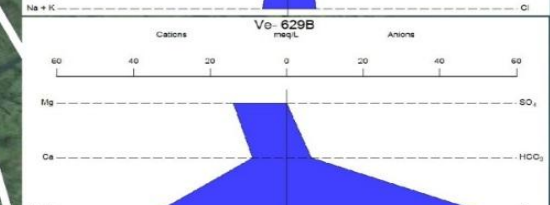
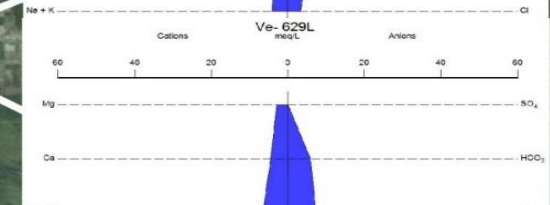
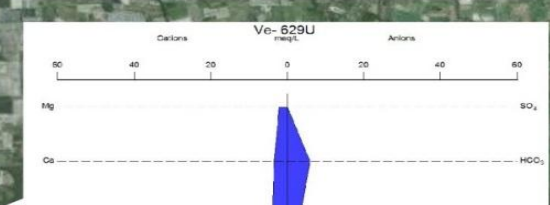
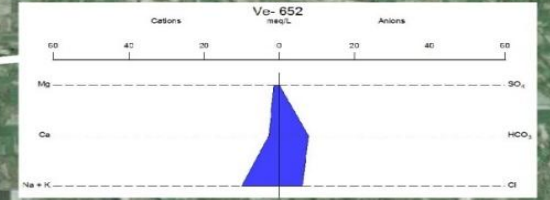
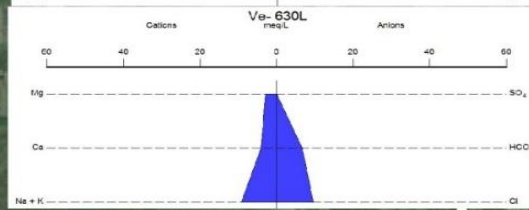
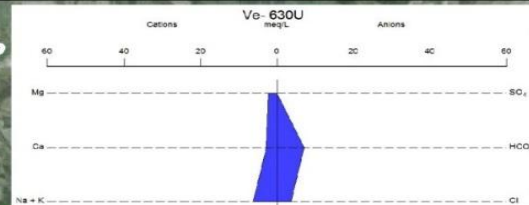
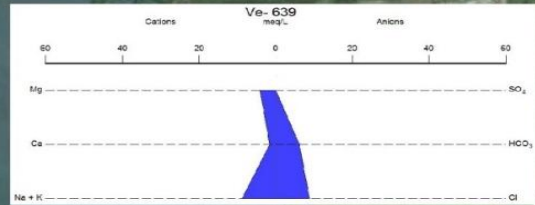
East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

**MICHAEL PISANI & ASSOCIATES, INC.**

Environmental Consulting Services  
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas



# Water Wells in Chicot Aquifer (Stiff Diagrams)



**Legend**  
 Property (Section 16)  
 1 Mile Radius of Property

Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Topo, and the GIS User Community

Legend



Figure 63 - Stiff Diagrams  
Water Wells in Chicot Aquifer

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

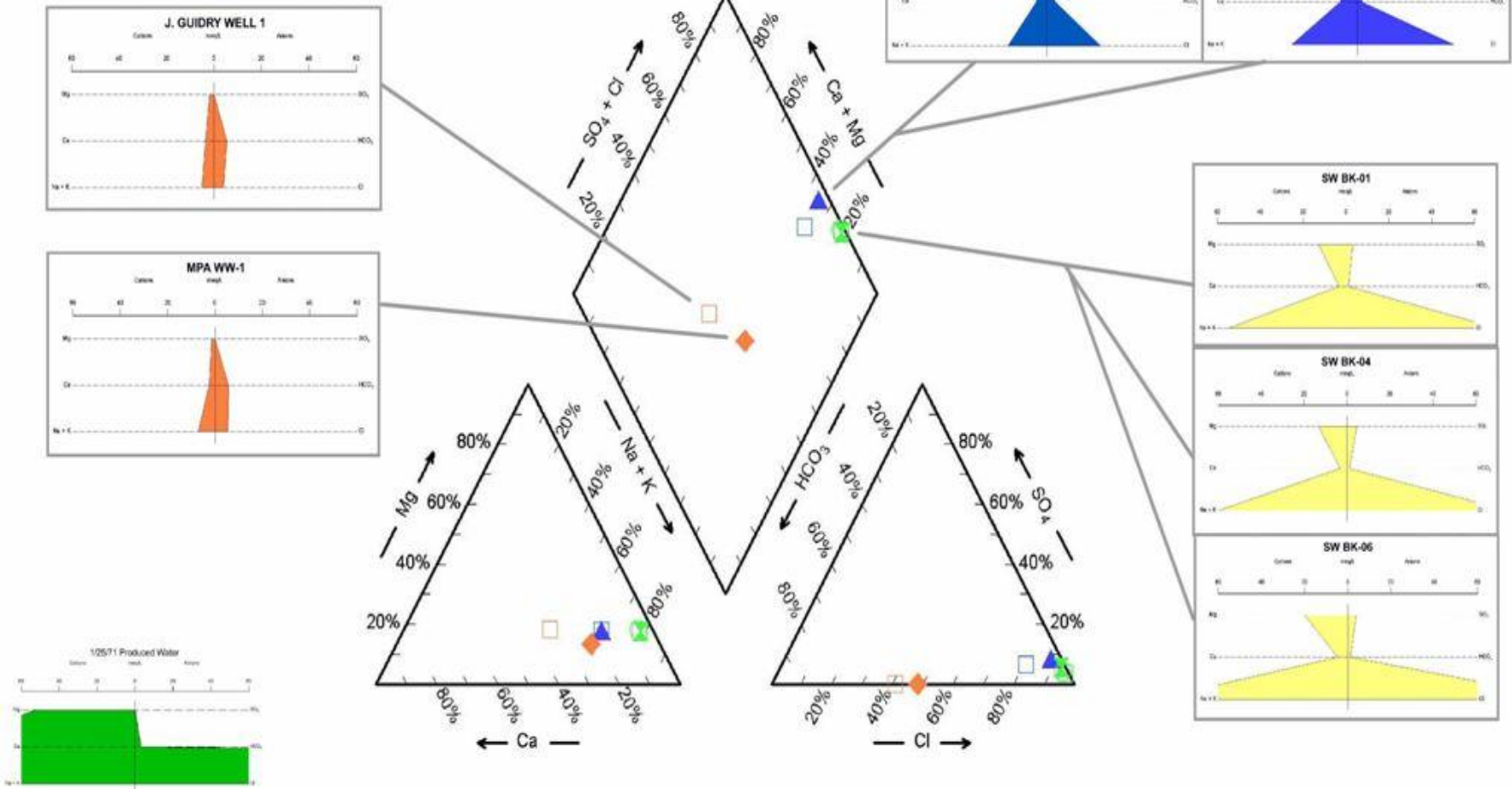
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Environmental Consulting Services

Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: MMH	Checked: LRC	Date: 9/30/2015	Project: 07-47
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# Piper Diagram



## Legend

- Note:
- Piper diagram & stiff diagrams generated by RockWare AgQA v. 1.0
  - Average bicarbonate alkalinity from SW BK-02, SW BK-05 & SW BK-07 used in generation of diagrams for SW BK-01, SW BK-04 & SW BK-06.
  - Produced water diagram based on produced water sample collected on January 25, 1971 from VPSB 'A' 13 Lease 'R' MWF Zone (3/2/71 Petroleum Laboratories, Inc. lab report, Bates C1074021 0008574).

Figure 64 - Piper Diagram

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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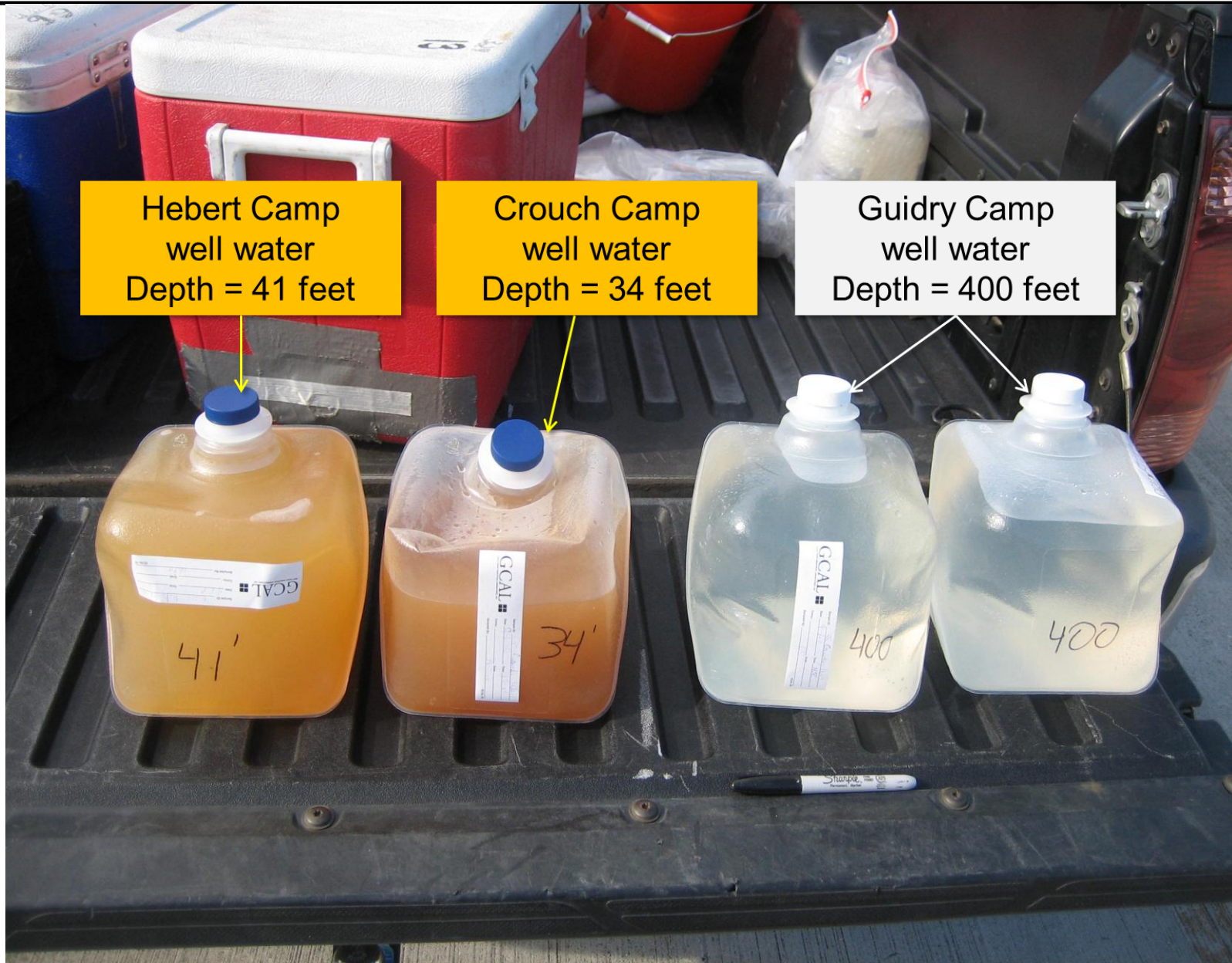


Figure 65 - Photographs of Camp Well Water Quality

East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana

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Drawn: MMH

Checked: LRC



Date: 9/30/2015

Project: 07-47





**Legend**

-  Tank Battery B Pit Extent
-  ICON Sample Location

Source: P2 Energy Solutions  
Note: 1979 Aerial Photograph

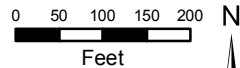


Figure 66 - Proposed Tank Battery B  
Pit Re-closure Area

*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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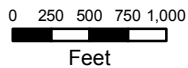
Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

-  Section 16 Township 15 S Range 01 E
-  MP&A Existing Monitoring Well
-  MP&A Proposed Monitoring Well



Source: 2013 USDA Aerial

Figure 67 - Proposed Groundwater Monitoring Locations

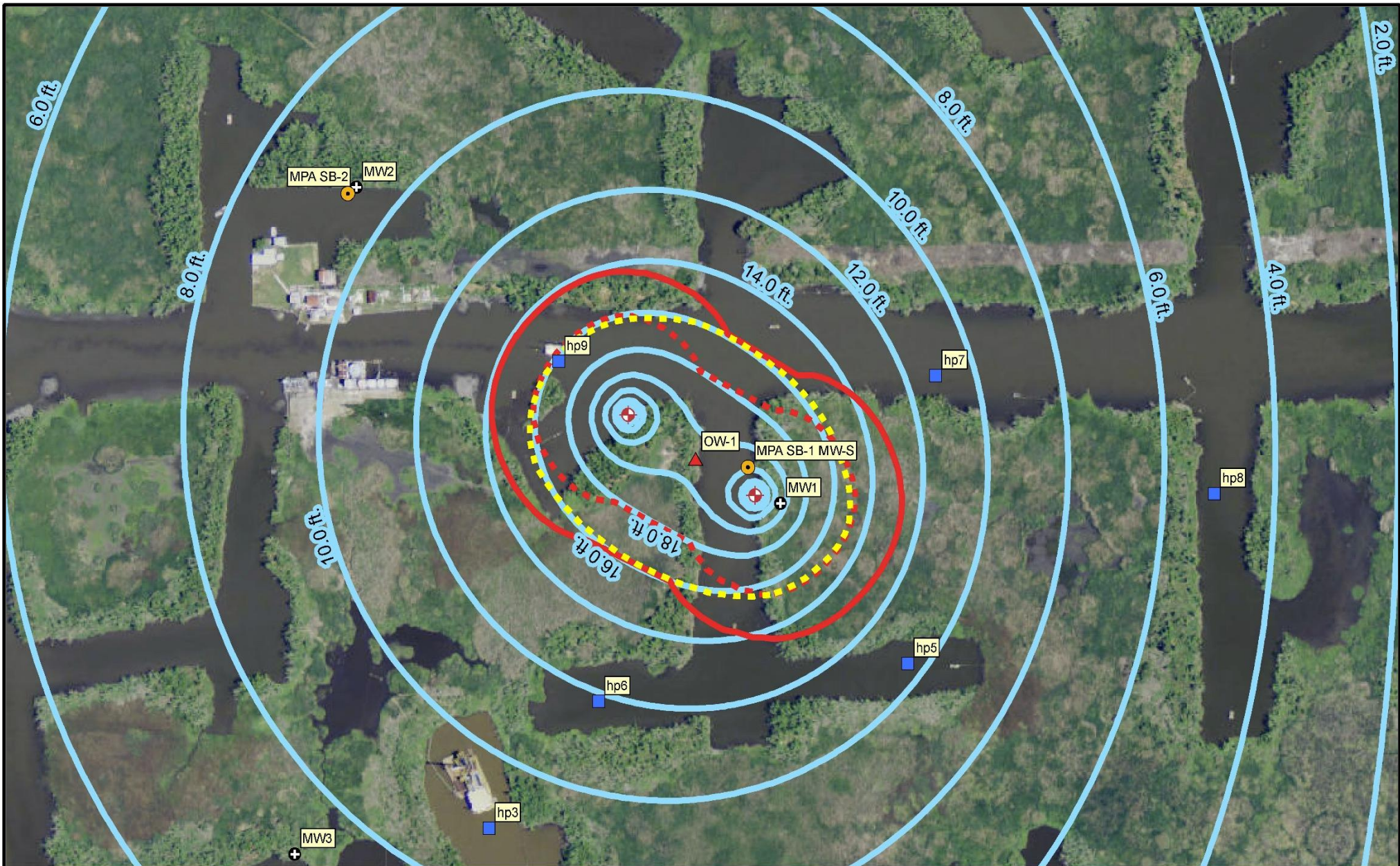
*East White Lake Oil & Gas Field  
Vermilion Parish, Louisiana*

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Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47
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**Legend**

- ◆ Proposed Recovery Well
- ▲ Proposed Observation Well
- Existing MP&A Monitoring Well
- ⊕ Existing ICON Monitoring Well
- MP&A Temporary Well
- 1 Year Capture Zone
- 2 Year Capture Zone
- 2 ft. Modeled Drawdown Contour
- Estimated Benzene Plume

Notes:  
 2010 digital orthophoto from USDA.  
 Aquifer thickness assumed to be 35 ft.  
 Hydraulic conductivity assumed to be 6 ft/day  
 Hydraulic gradient assumed to be 0.00044 to the West  
 Recovery Well pumping rate set at 25 GPM per well  
 Capture zone modeled for 1 year



**Figure 68 - Estimated Groundwater Remediation Area/Capture Zone**

*East White Lake Oil & Gas Field  
 Vermilion Parish, Louisiana*

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