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F I N A L   R E P O R T

# **Cultural Resources Assessment**

## **The Dow Chemical Company**

### **Light Hydrocarbon 9 (LHC-9) Unit Project**

#### **Freeport, Brazoria County, Texas**

**Prepared for:**

**The Dow Chemical Company**

2301 North Brazosport Boulevard, Freeport, TX 77541

AND

**U.S. Environmental Protection Agency - Region 6**

1445 Ross Avenue, Dallas, TX 75202

**Prepared by:**



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**February 2014**



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2301 North Brazosport Boulevard, Freeport, TX 77541

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1445 Ross Avenue, Dallas, TX 75202

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**February 13, 2014**

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## Executive Summary

The Dow Chemical Company (Dow) has owned and operated an integrated chemical manufacturing complex (Dow Freeport Site) in Freeport, Brazoria County, Texas since 1940. The complex consists of four major plants: Oyster Creek, Plant A, Plant B, and Stratton Ridge (Dow 2013).

Dow proposes to construct a new ethylene production unit (Light Hydrocarbon 9 (LHC-9)) within Oyster Creek. LHC-9 will use ethane and propane as feed stocks. A new 78-mile 12-inch pipeline will be constructed between Mont Belvieu and Freeport, Texas to supply ethane to the proposed LHC-9 unit. The primary products produced at the LHC-9 facility (ethylene and propylene) will be used as feed stock for other existing units at the Dow Freeport Site or transported via pipeline to existing underground storage caverns at Stratton Ridge.

Dow has determined that the proposed project will require a Prevention of Significant Deterioration (PSD) permit issued by the U.S. Environmental Protection Agency (USEPA) for Greenhouse Gas (GHG) emissions. The USEPA Region 6 has determined that the project is subject to the provisions of Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended). Section 106 of the NHPA requires federal agencies take into account the effect that an undertaking will have on historic properties. Historic properties are those listed in, or eligible for inclusion in, the National Register of Historic Places (NRHP) and may include archeological sites, buildings, structures, sites, objects, and districts.

Dow has retained the services of URS Corporation (URS) to conduct a desktop cultural resources assessment for the construction of the proposed LHC-9 project. The purpose of this study is to assess the potential of the proposed development to adversely affect historic properties as required under the Section 106 regulations in these areas. This assessment supplements other desktop and field studies that Dow has performed for other pipeline and ancillary studies (HRA Gray and Pape 2012, 2013a-e).

Due to the industrial landscape and the lack of known cultural resources in the vicinity, the primary Area of Potential Effects (APE) for this aspect of the project is limited to locations where ground disturbing activities will occur. These locations are the LHC-9 construction areas, an associated wastewater pipeline and a construction laydown area. Due to the level of existing disturbance, URS archaeologists deemed that field and subsurface investigations throughout the APE were not warranted. The other aspects of the LHC-9 project assessed by HRA Gray and Pape also found that the project either lacks historic properties at project locations or that it has been designed to fully avoid impacts to identified cultural resources.

Based on these data, URS recommend that a finding of No Historic Properties Present or Affected be applied to this undertaking.

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## 1.0 Project Background

The Dow Chemical Company (Dow) has owned and operated an integrated chemical manufacturing complex (Dow Freeport Site) in Freeport, Brazoria County, Texas since 1940. The complex consists of four major plants: Oyster Creek, Plant A, Plant B, and Stratton Ridge (Dow 2013).

Dow proposes to construct a new ethylene production unit (Light Hydrocarbon 9 (LHC-9)) within Oyster Creek. LHC-9 will use ethane and propane as feed stocks. A new 78-mile 12-inch pipeline will be constructed between Mont Belvieu and Freeport, Texas to supply ethane to the proposed LHC-9 unit. The primary products produced at the LHC-9 facility (ethylene and propylene) will be used as feed stock for other existing units at the Dow Freeport Site or transported via pipeline to existing underground storage caverns at Stratton Ridge (Figure 1).

Dow has determined that the proposed project will require a Prevention of Significant Deterioration (PSD) permit issued by the U.S. Environmental Protection Agency (USEPA) for Greenhouse Gas (GHG) emissions. The USEPA Region 6 has determined that the project is subject to the provisions of Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended). Section 106 of the NHPA requires federal agencies take into account the effect that an undertaking will have on historic properties. Historic properties are those listed in, or eligible for inclusion in, the National Register of Historic Places (NRHP) and may include archeological sites, buildings, structures, sites, objects, and districts.

Dow has retained the services of URS Corporation (URS) to conduct a desktop cultural resources assessment for the construction of the proposed LHC-9 project. The purpose of this study is to assess the potential of the proposed development to adversely affect historic properties as required under the Section 106 regulations in these areas. This assessment supplements other desktop and field studies that Dow has performed for other pipeline and ancillary studies (HRA Gray and Pape 2012, 2013a-e).

A historic property is defined as any district, archeological site, building, structure, or object that is either listed, or eligible for listing, in the National Register of Historic Places (NRHP). Under this regulatory definition, other cultural resources may be present within a project's total Area of Potential Effect (APE) but are not to be considered historic properties if they do not meet the eligibility requirements for listing in the NRHP. To be considered eligible for the NRHP, a property must meet one of the four following criteria (36 CFR 60.4): (a) they are associated with events that have made a significant contribution to the broad patterns of our history; (b) they are associated with the lives of persons significant in our past; (c) they embody the distinctive

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characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) they have yielded, or may be likely to yield, information important in prehistory or history.

## **1.1 Project Location and Facilities**

The proposed LHC-9 unit will be located entirely within the Oyster Creek Plant of the Dow Freeport Site, approximately 0.3 miles northwest of State Highway 523 and 0.5 miles southwest of State Highway 332 (Figure 1). The site is located on the Freeport United States Geological Survey (USGS) Quad, at 28.9779° north latitude and -95.3495° west longitude. The LHC-9 unit will be constructed within the OC-2 block of the plant. The OC-2 block is an approximate 35-acre site, located along the southern boundary of Oyster Creek plant that formerly maintained Dow's Chlor-Alkali, Unit II which was decommissioned and demolished in 2012 (Figures 2 and 3).

In addition to the LHC-9 unit installation, multiple feedstock and product pipelines will be installed for LHC-9 operations (Figure 1). A new 78-mile pipeline will connect the Dow Complexes in Mount Belvieu, Texas City, and Freeport in order to supply ethane to the proposed LHC-9 Unit. Feedstock and product storage will be located within Stratton Ridge. Two pipelines will transport ethane and ethylene to and from LHC-9 and Stratton Ridge. A new 8" wastewater connection line will be installed to connect LHC-9 to existing 24" twin headers that direct process wastewater to the wastewater treatment plant in Plant B. All of the proposed pipelines, and associated facilities (e.g. metering stations, pumps, process valving, etc.) will be located within the existing plant boundaries and pipeline and utility rights-of-way.

### **1.1.1 LHC-9 Process and Operations**

The LHC-9 Process is comprised of a new ethylene cracking/production unit and associated feedstock and product pipelines required for unit operation and storage. Descriptions of these components are provided below.

#### **1.1.1 LHC-9**

The role of the cracking system is to convert saturated hydrocarbons into ethylene, propylene, butenes, and butadiene. The conversion takes place in the presence of dilution steam by rapidly raising the hydrocarbon/dilution steam temperature to cracking temperatures. The extreme temperature acts to destabilize the structure of the hydrocarbon molecule and initiate the rearrangement of the hydrocarbon molecular bonds. LHC-9 will include new steam cracking

furnaces, recovery equipment, utilities, refrigeration, cooling tower, and treatment systems. The new process will include installation of the following equipment:

- Eight new ethylene cracking furnaces;
- One pressure-assisted flare;
- One low-pressure flare;
- One cooling tower;
- Two backup diesel generators;
- Several new storage tanks are included in the proposed plant. These tanks will store materials such as ammonia, quench water, compressor wash oil, caustic, spent caustic, sulfuric acid, and various water and process additives; and
- Additional maintenance, startup, and shutdown (MSS) emissions associated with the periodic clean-out of the new and modified process equipment.

### 1.1.2 Associated Pipelines

Multiple feedstock and product pipelines will be installed for LHC-9 operations and will be located within the existing pipeline and utility rights-of-way (ROW; Figure 1). A new 78-mile 12-inch pipeline (SOW#1) will be constructed between Mont Belvieu, Texas and Freeport, Texas to supply ethane to the proposed LHC-9 unit. The pipeline will commence in Mont Belvieu, Texas and travels 42-miles crossing into Harris County, the Houston Ship Channel, and then into Galveston County to Texas City and then travels southwest for 36-miles into Brazoria County and terminates at Stratton Ridge. A new pump station (Winfree Pump Station) will be constructed in Mont Belvieu and connect to three (3) new 10-inch ethane pipelines that will extend from Winfree Pump Station to surrounding Mont Belvieu facilities (SOW #3) that will supply ethane to the system. A new metering skid will be installed at Dow's Cedar Bayou Metering Station, approximately 4 miles south of the Winfree Pump Station.

Feedstock and product lines will be installed between LHC-9 and Stratton Ridge for processing and storage. There will be four pipelines for ethane/ethylene storage within Stratton Ridge (SOW # 5, #9, #10, and #12). Multiple metering facilities and pump stations will be constructed within the Stratton Ridge Area boundary to support the safe and efficient transport of ethane and ethylene products to and from LHC-9 (SOW 4, 6, 7, 8, 13, 14, and 15). Two (2) 5.2-miles, 12-inch pipelines will transport ethane and ethylene to and from LHC-9 and Stratton Ridge (SOW



#11 and #16). A 50-foot operations ROW will be maintained along the pipeline route for pipeline access and maintenance.

In conjunction with U.S. Army Corps of Engineers (USACE) Section 10/404 wetland permitting requirements, Dow had retained the services of HRA Gray and Pape, LLC, to conduct cultural resources surveys for these associated pipelines (HRA Gray and Pape 2012, 2013a-e).

## **1.2 Construction Information**

The LHC-9 unit will be constructed within the OC-2 Block of Oyster Creek Plant, an approximate 35-acre site, located along the southern boundary of Oyster Creek plant that formerly maintained Dow's Chlor-Alkali, Unit II which was decommissioned and demolished in 2012 (Figure 2). Construction of the LHC-9 project is scheduled to start in January 2014. The LHC-9 Unit is expected to be in service by January 2017.

### **1.2.1 LHC-9**

LHC-9 construction will consist of site preparation and LHC-9 process unit installation. Because the OC-2 Block previously housed a process unit, the ground surface in the majority of the construction area is comprised of concrete, caliche, or previously disturbed soils. This area is shown on Figure 2 and also in Photos 1 to 4 and 8 to 10. Site preparation will include excavation down to 6 feet for the removal of remaining concrete slabs for the former process. Existing pilings that were installed to depths of 35-40 feet will remain in place. Additional pilings will be installed to depths of 35-40 feet for the new process unit. Clean soil will be brought in from an approved borrow site to elevate the site approximately 4 feet above grade. Multiple utility and process pipelines will be installed within Oyster Creek for unit operations and will include aboveground lines (ranging from 3 to 76-inches) to be installed on existing and new pipe racks and underground lines (ranging from 8 to 96-inches) connecting to other process units. Underground pipelines will require trenching to depths of 3 to 15 feet below grade.

Construction of the LHC-9 process will also require the relocation of an existing plant road (OC-2), an associated levee, and a roadside drainage ditch that is part of Oyster Creek's stormwater drainage infrastructure (Photos 5 to 7). Site preparation activities to relocate the existing roadway, levee, and roadside drainage ditch will include the demolition of the levee and roadway, and filling of the drainage channel. The new roadway will be constructed on top of the replacement levee and will require the placement of suitable levee (clay, etc.) and roadbed (asphalt, gravel, caliche, etc.) materials. Excavation will be required to construct a new roadside drainage ditch.

New construction of the proposed ethylene cracking furnace (LHC-9), associated infrastructure, and auxiliary equipment will be located in an area approximately 230 feet by 350 feet (1.8 acres), which is currently a deconstructed area from the previous Chlor-Alkali Unit (II). This area is shown on Figure 2 and also in Photos 1 to 4 and 8 to 10. The LHC-9 construction area includes an existing levee and road (Photos 5 to 7); these will be shifted slightly, to the southwestern boundary shown in Figure 2, in order to provide enough space to site the project furnaces.

Although the proposed project will require the erection of new project equipment and modification to existing process units, physical ground disturbance will be limited to the construction of the proposed furnace site and all pipeline construction will be restricted to existing rights-of-way.

### **1.2.2 Associated Pipelines and Facilities**

All of the proposed pipelines, and associated appurtenances (e.g. metering stations, pumps, process valving, etc.) will be located within either the existing plant boundaries or within existing pipeline ROWs (Figures 1 to 3). The ethane and ethylene pipelines will be co-located with other underground pipelines in an existing, previously cleared ROW that is maintained (mowed and kept clear of woody vegetation) for operations and maintenance. No land disturbing activities will take place outside of the existing ROW for either pipeline construction or operations. The pipeline will be installed, except as detailed below, utilizing standard open-cut (trenching) methods within a 100-foot-wide temporary construction corridor. Standard, open-cut pipeline construction procedures include staking of the right-of-way; clearing and grading; trenching; pipe stringing, bending, and welding; lowering the pipe into the trench; backfilling the trench; hydrostatic testing of the pipeline; and restoration of the right-of-way. All temporary workspace will be restored as close to its original state as possible and in accordance with applicable permits. Post-construction, a 50-foot-wide permanent easement will be maintained above the pipeline for maintenance.

In addition to standard techniques, the pipelines will be installed using horizontal directional drilling (HDD) at major waterbody crossings along the proposed corridor to minimize environmental impacts (Figure 1). The following major waterbodies will be crossed using HDD:

- 
- Austin Bayou,
  - Basford Bayou,
  - Bastrop Bayou and tributary,
  - Brazoria National Wildlife Refuge Canal,
  - Big Slough,
  - Cedar Bayou,
  - Chocolate Bayou,
  - Clear Lake,
  - Dickinson Bayou,
  - Galveston County Diversion Canal,
  - San Jacinto River (Houston Ship Channel) ,
  - Halls Bayou,
  - Highland Bayou and tributary,
  - Highland Bayou Diversion Canal,
  - Moses Bayou,
  - New Bayou and tributary,
  - Persimmon Bayou,
  - Pine Gully,
  - Tabbs Bay,
  - Taylor Bayou,
  - Unnamed drainage channel adjacent to Moses Lake,
  - An unnamed drainage channel adjacent to Trinity Bay, and
  - Willow Bayou.

The HDD method involves drilling a pilot hole under the waterbody and banks, then enlarging the hole through successive ream borings with progressively larger bits until the hole is large enough to accommodate a pre-welded segment of pipe. Pipe sections long enough to span the entire crossing would be staged and welded along the construction work area on the opposite side of the waterbody and then pulled through the drilled hole.

The San Jacinto River/Houston Ship Channel HDD crossing will require routing the 12” ethane pipeline through Spillman Island, a U.S. Army Corps of Engineers regulated dredge material placement area. The pipeline will be installed through Spillman Island utilizing open-cut method, described above. The pipeline would then be installed by HDD across the Shipping Channel. First to the east side off Hogg Island and then by a second HDD to the mainland at an existing pipeline ROW located south of Baytown, Texas. The pipeline would be installed within existing pipeline and utility ROWs on Spillman Island and Hogg Island.

Cultural resources field studies for these associated pipelines and facilities are reported separately (HRA Gray and Pape 2012, 2013a-e).

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### 1.2.3 Construction Laydown Areas

Dow will utilize a temporary laydown area, located approximately 1.0-mile west of Oyster Creek on State Highway 332, during construction of the proposed project. The approximate 39-acre site is currently being developed in association with other Dow projects that are currently underway, and will be subsequently used for LHC-9 construction. As this area will be utilized during the construction phase of the project, it will be included in the project's Action Area. The construction laydown area will be previously converted from pastureland to a graded area with an aggregate base. The laydown area is shown on Figure 4 and in Photos 19 to 21.

### 1.3 Area of Potential Effects for Section 106

The project's direct and indirect Area of Potential Effects (APE) for Section 106 of the NHPA is defined as follows:

- 1) The direct APE is limited to the areas where physical actions will cause ground disturbance. This includes activities related to: excavation, grading and preparing of ground surfaces; building construction; infrastructure installation; directional drilling and open cut trenching for pipeline installation; and all related physical activities. The direct APE is described more fully for each project activity in the sections above.
- 2) The indirect APE includes potential visual, vibrational and other secondary types of effects that could impact historic resources. Based on the project activities, there is no significant indirect APE for the undertaking because these effects would be very localized and limited to non-historic industrial buildings and infrastructure comparable to what is proposed in the undertaking.

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## 2.0 LHC-9 Unit Area Environmental Characteristics

### 2.1 Geology and Ecoregion

The regional landscape strongly influences the preservation and subsequent identification of any archeological materials that may have been deposited within the proposed project areas. The project area is located in Brazoria County, which occupies approximately 1,503 square miles (961, 920 ac) in southeastern Texas (Crenwelge 1981:1). Brazoria County is associated with three drainage basins: the Brazos River Basin, the Coastal Basin, and the San Jacinto River Basin (U.S. Geological Survey 2013a).

The county is situated in the Western Gulf Coast section of the Coastal Plain Physiographic Province of North America, and specifically the Floodplains and Low Terraces ecoregion (Griffith et al. 2004). The Floodplains and Low Terraces are situated at elevations between 5 and 200 feet above mean sea level, with a local relief of 5 to 25 feet. They are comprised of approximately 1,743 square miles, and are characterized by large river floodplains with sloughs, natural levees, and associated alluvial low terraces. Low gradient streams are also present (Griffith et al. 2007:77). The major geological landscape in the project area is the Alluvium Formation, Qal, from the Holocene Era. It is found on the lagoon side of barrier islands along the coast, representing wind-tidal-flat sands and clays (U.S. Geological Survey 2013b).

### 2.2 Soils

Within the LHC-9 Unit construction area there are four general soil series (Crenwelge et al. 1981; Table 1 and Figure 5). One soil type, Surfside clay is associated with 80.27% of the total 34.28 acres for the LHC-9 facility; the remaining 19.73% is associated with water. Two soil types are associated with the 38.97 acres that comprise the construction laydown area; these are Surfside clay (89.53%) and Morey silt loam (10.47%). Three soil types are located within the pipeline corridor; these are Surfside clay, Velasco clay, and Ijam clay. They account for 65.15%, 17.45%, and 7.02% of the area crossed by the pipeline, while water accounts for 10.39%.

**Table 1: LHC-9 Unit Facility Soil Characteristics (Crenwelge et al. 1981)**

Symbol	Soil Name	Landform	Slope	Drainage	Description
21	Ijam clay	Marsh	0.8	Very poorly drained	0-9 in; dark grayish brown clay with yellowish brown mottles; 9-69 in; light brownish gray clay with yellowish brown and gray mottles
29	Morey silt loam	Agricultural pasture	0.2	Poorly drained	0-11 in; very dark gray silt loam 11-36 in; very dark gray and dark gray silty clay 36-60 in; grayish brown (upper part) and gray (lower part) clay
39	Surfside clay	Marshes	0.2	Poorly drained	0-14 in; very dark gray clay 14-32 in; dark gray clay 32-72 in; dark reddish brown clay
42	Velasco clay	Marshes	0.1	Very poorly drained	0-8 in; dark reddish brown clay 8-30 in; dark brown clay 30-65 in; mottled brown, gray, and red clays
W	Water	n/a	n/a	n/a	n/a

Wastewater Pipeline Connection			
Symbol	Soil Name		Percentage
21	Ijam clay		7.02%
39	Surfside clay		65.15%
42	Velasco clay		17.45%
W	Water		10.39%
Total =			100.00%

LHC-9 Unit			
Symbol	Soil Name	Acres	Percentage
39	Surfside clay	27.52	80.27%
W	Water	6.763	19.73%
Total =		34.28	100.00%

Construction Laydown Area			
Symbol	Soil Name	Acres	Percentage
29	Morey silt loam	4.082	10.47%
39	Surfside clay	34.88	89.53%
Total =		38.97	100.00%

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### **2.3 Current Land Use**

Due to the abundant water resources and close proximity to the coast, the proposed project will exist on and near altered areas including ranches, industrialized areas mixed with residential subdivisions, and areas for recreation. The floodplains and low terraces ecoregion is characterized by deciduous forests and woodlands, agricultural fields with corn, cotton, grain sorghum, and pecan orchards, pastures, and forested wetlands (Griffith et al. 2007:77).

### **2.4 Climate**

Brazoria County is characterized by a humid subtropical climate with short, mild winters and long hot summers. The average temperature is 78°F, while the average rainfall is approximately 50 inches. The most rainfall occurs between April and September from afternoon thunderstorms, particularly during the summer months. Snowfall is extremely infrequent, averaging 0.02 inches a year in Brazoria County. The average humidity is 80%, with the months of March through May having the highest humidity (Crenwelge et al. 1981:1-2; World Media Group, L.L.C. 2013).

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### 3.0 Cultural Resources Records Review and Findings

This section includes a brief overview of the history of the Dow LHC-9 facility area and a review of Native American tribes with a vested interest in Harris County. It also includes a review of known archaeological sites and other cultural resources within a 1.0 mile search radius of the LHC-9 facility project area and a summary of field investigations that were conducted for the LHC-9 pipelines.

#### 3.1 History of Brazoria County

The first recorded European exploration of Brazoria County by Europeans occurred in 1528 when the Spanish explorer Álvar Núñez Cabeza de Vaca landed on the Isle of Mal Hado and crossed nearby Oyster Creek and the Brazos River, as well as Old Caney Creek and the San Bernard River. The next recorded expedition involved Spanish soldiers from Coahuila, Mexico who were looking for the LaSalle expedition in 1689. Finally, the explorer Joaquin de Orobio y Basterra passed through around 1727 on his way to Trinity River in search of French trespassers. Despite these recorded expeditions, the area was not settled by the Spanish government (Kleiner 2013a).

Land along the Brazos River was settled by members of Stephen F. Austin's Old Three Hundred during the 1820s; 89 of the 300 grants were located in present day Brazoria County. Initial settlements in the county were old Velasco, East Columbia, Columbia, and Brazoria. The region was originally part of the San Felipe District, but was reassigned to the Victoria District when the former was divided in 1826. In 1832, the Brazoria Municipality was formed with Brazoria as the capital (Kleiner 2013a).

By 1834, despite a flood and a cholera epidemic, the population of Brazoria Municipality had reached 2,100 residents. The largest settlement was Brazoria with 500 residents, followed by old Velasco with 100, and Bolivar with 50. Around this time, the municipality was renamed Columbia, and the government was moved to the town of Columbia. It was also reduced in size when land was reallocated to neighboring Matagorda Municipality (Kleiner 2013a).

Columbia Municipality played an important part in Stephen F. Austin's Texas Revolution. In addition to providing troops for their cause, the first provisional governor of the Republic of Texas, Henry Smith, was from the future Brazoria County. After the Battle of San Jacinto on April 21, 1836 and the Mexican surrender, Santa Ana signed the Treaty of Velasco on May 14, 1836 at old Velasco, the Republic's temporary capital (Kleiner 2013a).



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Brazoria County was organized on March 24, 1836 by the Republic of Texas; Texas entered the Union as a state on December 29, 1845. During the remainder of the antebellum period, the county prospered thanks to sugarcane and cotton. In fact, Brazoria County sugar production constituted almost 75% of the entire Texas crop produced in 1857. Other agricultural avenues included cattle, oranges, and lemons (Kleiner 2013a).

County residents overwhelmingly supported succession, and eagerly supported the Confederate cause. The towns of Velasco and Quintana, located on the coast, withstood Union attacks early on in the war, but the county witnessed little action despite the Union presence. Although the population increased by only 400 individuals between 1860 and 1870, an influx of Northerners, immigrants, and former Confederate soldiers caused the population to reach 9,774 by 1880. During Reconstruction, the economy of the region continued to focus on sugar and cotton as its main exports, but also looked to foodstuffs such as corn, grain, potatoes, and fruit (Kleiner 2013a).

The early twentieth century witnessed a shift to cattle-raising, dairy, and cotton as well as the beginning of the utilization of natural resources in the region. Additional agricultural pursuits included corn, truck farming, figs, poultry, pecans, and rice. Rice was so successful that in 1948, Brazoria County lead the country in rice production with a crop valued at \$10 million. In regards to natural resources, the West Columbia oilfield began production in 1901, and Brazoria began in 1902. This expanded to sulphur mining in 1912; it was so successful that by 1930 the Freeport Sulphur Company was mining 2,000 tons of sulfur per day between Bryan Mound and Hoskins Mound (Kleiner 2013a).

Years of intensive sulfur extraction eventually depleted the resources at Bryan Mound. With the construction of their Freeport plant in 1939, the Dow Chemical Company became a major employer in the region and paved the way for the Brazosport industrial and port community. During the 1950s, numerous companies producing chemical fertilizers opened in the vicinity due to the proximity of the Dow plant. The county population grew along with the economy during this time; in 1940, the county boasted 27,069 residents and by 1950 had risen to 46,413 (Kleiner 2013a).

Agriculture and industry have continued to shape the economic growth of Brazoria County. In the last 60 years, livestock, poultry, shrimping, cotton, soybeans, and grain have been integral parts of the agricultural economy of Brazoria County. The chemical industry, mineral extraction, and oil production have also played an important part in the local economy. Magnesium extraction from seawater was conducted at the towns of Freeport and Velasco. The economy has

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helped to increase the local population; in 1982 there were 182,244 residents, and by 2000 that number had increased to 241,767 (Kleiner 2013a).

### **3.2 Local History**

Records indicate that 38 men from Stephen F. Austin's Old Three Hundred landed in the vicinity of the original town of Velasco during the early 1820s. The town itself was not founded until 1831, when the Mexican government established a customs port at the site. The following year, the town was the site of the Battle of Velasco on June 26, when group of colonists revolted and challenged the commander of the Mexican fort at Velasco, Domingo de Ugartechea. The colonists prevailed and Ugartechea surrendered on June 29 and returned to Mexico (Texas State Historical Association 2013; Weir 2013).

By 1835, a mail route running from San Felipe to Velasco was created, and a small community consisting of a customhouse, salt works, and trading posts had developed just upstream from the coast. The following year, after the Battle of San Jacinto, Velasco was temporarily made the capital of the Republic of Texas by President David G. Burnet. It was here that the Treaty of Velasco was signed between the Republic and the Mexican general Antonio López de Santa Anna (Weir 2013).

Although the town functioned mainly as a resort for the wealthy plantation owners of the region in the ensuing decades, it also served as an important port for the region. The town boasted warehouses, a seminary for young ladies, a school for young men, hotels, a post office, boardinghouses, wharves, and a customhouse. The town declined slightly with the opening of an intracoastal canal to Galveston Bay in 1856 (Weir 2013).

Confederate soldiers defended the port during the Civil War, ensuring the trading of cotton for necessary supplies from Europe. The local economy did not recover well after the war, since it had previously been dependent on the wealth of the local planter class who visited the popular resort town. In 1875, a devastating hurricane struck the coast, destroying almost all of Velasco. Nine years later, only 50 people lived in Velasco, where the only businesses were a general store and a boat builder's shop (Weir 2003).

A new town was established four miles upriver in 1891, complete with a new post office. On July 7, the port was reopened by the United States Secretary of the Treasury. In just one year, the town had 136 businesses, 167 residences, an electric light plant, and a planing mill. By 1900, there were several churches, a lighthouse, hotels, a bank, a cottonseed oil mill, several cotton gins, general stores, two newspapers, and two railways into town. Unfortunately, Velasco was devastated by the Galveston Hurricane of 1900 and forced to rebuild (Weir 2003).

The town recovered extremely slowly. In 1914, there were only 1,000 recorded residents in the town, with a single fish and oyster plant operating. During the Great Depression, the town's population fell to approximately 400 individuals and 12 businesses. When the Brazos River was diverted during the late 1930s, large vessels once again make it upriver, greatly aiding the economy of Velasco and nearby Freeport. The population began to rise in conjunction with the industrialization of the area, reaching 900 residents when the town was incorporated in 1940. When the town merged with nearby Freeport in 1957, there were approximately 4,000 recorded residents (Weir 2003).

Although the town of Freeport has had a post office since 1898, it was not formally established until 1912, when it was founded by the Freeport Sulphur Company. The extensive sulphur mines in the area spurred the community's growth and soon it was the headquarters of the Houston and Brazos Valley Railway, and home to a hotel, bank, fish and oyster plant, a church, and storage tanks for the Freeport and Mexico Oil Company. By 1917, the town was incorporated (Kleiner 2013b).

The town's population reached 3,500 in 1929, and ten years later had grown to 4,100 with 75 businesses operating. The town's population fell to approximately 2,500 residents by 1950 even though the number of businesses increased to 135. Despite these numbers, Freeport began to grow in the last half of the 1940s, primarily due to the construction of the Dow Chemical Company plant in 1939 which prompted additional industrialization in the area. In fact, by 1952 the town population had reached 6,000 residents. In 1957, the nearby town of Velasco was incorporated into Freeport. This brought the total population of the town to over 11,000 with 280 businesses. By the early 1980s there were approximately 13,400 residents and over 500 businesses, and as of 2000, there were 12,708 residents and over 650 businesses (Kleiner 2013b).

### **3.3 Native American Tribal Interests**

A records review of the Texas Historical Commission's (THC) online "Guidelines for Tribal Consultation" database was conducted to determine what Native American Tribes may have an interest in Brazoria County, Texas. The Comanche Nation of Oklahoma and the Tonkawa Tribe of Oklahoma are specifically identified on the Texas Historical Commission dataset as including Brazoria County in their area of interest. Nineteen additional tribes have a known interest in Texas, but their territorial extent is not listed (Table 2).

**Table 2: Native American Tribes with Possible Territorial Interest in the Project Area**

Alabama-Coushatta Tribe of Texas	Kialegee Tribal Town	Seminole Nation of Oklahoma
Alabama-Quassarte Tribe Town	Kickapoo Traditional Tribe of Texas	Thlopthlocco Tribal Town
Apache Tribe of Oklahoma	Kickapoo Tribe of Oklahoma	Tunica-Biloxi Tribe
Caddo Nation	Kiowa Tribe of Oklahoma	United Keetoowah Band of Cherokee Indians
Cherokee Nation of Oklahoma	Mescalero Apache Tribe	Wichita and Affiliated Tribes
Coushatta Tribe of Louisiana	Poarch Band of Creek Indians	
The Delaware Nation	Quapaw Tribe of Oklahoma	

**3.4 Previous Cultural Resources Investigations**

**3.4.1 LHC-9 Unit Expansion Facility, Wastewater Line and Laydown Yard**

A review of cultural resources available on the online Texas Archaeological Sites Atlas and National Register of Historic Places websites was conducted on February 15, 2013, to identify any previously recorded archaeological sites or National Register properties (NRHP) within a 1.0 mile search radius of these three LHC-9 project areas. It was determined that no known historic properties as defined under Section 106 guidelines will be affected by the LHC-9 Unit construction.

Three historical markers are present within the search radius as are four previously conducted archaeological surveys (Figure 6). No known archaeological sites, historic buildings, National Historic Landmarks are located within one mile of the planned facility undertakings. The closest archaeological site (41BO122), a fenced cemetery with a historical marker, is located outside the eastern boundary of Plant B across the Dow Wastewater Canal and lies approximately 1400 feet west of the 1.0 mile record review radius.

The Velasco Cemetery (Site 41BO122) was dedicated in 1891 by the Brazos Investment Company as the only public cemetery in the county with the exception of a slave cemetery in Clute. In 1967 a historic state marker was erected for the 2.5 acre cemetery, which is maintained by the Velasco Cemetery Association. A total of 47 individuals are interred on the premises; the earliest burials are from 1893 and the last was a newborn in 1958. No dates were known for two of the interments (Texas Archaeological Sites Atlas 2011; Find-A-Grave 2013).

The closest property listed on the National Register of Historic Places is approximately 6 miles to the east of the Dow Oyster Creek sub-complex. The Durazno Plantation is designated as a historic district and dates from the 1840s. The Texas Archeological Site Atlas also records three

cultural resources surveys associated with the Vicksburg Army Corps of Engineers within the 1.0 mile search area encircling the project area (Figure 6). These reports were submitted to the Texas Historical Commission in 1976 (SUR COE-VD 02/76), 1985 (SUR COE-VD 10/85), and 1999 (SUR COE-VD 07/99). No additional data on the nature of these investigations and/or the results of these surveys are available on the Texas Archaeological Sites Atlas.

The three historical markers within the 1.0 mile search radius designate the Site of the Town of Old Velasco, the Velasco Lodge No. 757, and Velasco Methodist Church. None of these features still exist, they simply commemorate their past existence. The first marker designates the site of original Velasco town, and was erected in 1969 in front of the Velasco Elementary School (Marker No. 9606). It commemorates the original landing place of the members of Stephen F. Austin's Old Three Hundred that held the original grants in the region in 1821. The second marker is for the Velasco Lodge No. 757 Ancient Free and Accepted Masons (Marker No. 9609), which was chartered on December 8, 1893. The original lodge located at Old Velasco on the Gulf was destroyed during the Galveston Hurricane of 1900. The state marker was placed in 1994 to commemorate the structure. The third marker (Marker No. 9610) was erected at the site of the Velasco Methodist Church in 1988. The current church was built in 1932 after it was destroyed by a hurricane (Texas Archaeological Sites Atlas 2011).

### **3.5 Cultural Resources Studies Conducted for Other LHC-9 Components**

As noted in Section 1.1.2 above, Dow has completed a number of cultural resources investigations for a number of pipelines and ancillary facilities that are associated with the LHC-9 Unit project. These studies are described in detail within the separate reports generated for this work (HRA Gray and Pape 2012, 2013a-d). In late 2013, HRA Gray and Pape (2013e) summarized the above reports into a single volume that was reviewed and approved by the Texas Historical Commission. A summary of the survey results is presented here, but the reader is directed to the primary documents for complete details on the methodology used and findings.

#### **3.5.1 78 Mile Ethane Pipeline (SOW #1)**

HRA Gray and Pape conducted Phase I cultural resources inventory studies for this ethane pipeline that included systematic pedestrian survey and shovel testing within a 200 foot wide survey corridor. In the initial stage that examined 37 miles of proposed SOW#1 pipeline (HRA Gray and Pape 2012), two new archaeological sites (41BO239 and 41BO240), two new isolated artifact finds (Isolate 739-045-ISO-01 and 739-019-ISO-01) and one historic structure (739-080-HSS-01) were identified. Up to three previously recorded cultural resources are plotted on the Texas Archeological Site Atlas as being within or adjacent to this portion of the proposed

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pipeline project area (Sites 41BO161, 41BO162, and 41GV67). Each of these three site areas were systematically examined, with no evidence found of their actually being within the project area.

**Site 41BO239**

Located in Brazoria County on the south bank of Bastrop Bayou within the existing cleared pipeline corridor, the site is a Native American Late Prehistoric era scatter of stone tool and animal bone fragments (HRA Gray and Pape 2012). Evidence of erosion, dredging and disturbance from previous pipeline construction was observed. It was assessed as being not eligible for listing on the National Register of Historic Places (NRHP). It is not a historic property protected under Section 106 regulations, does not require further evaluation, and will not be a project concern.

**Site 41BO240**

Also located in Brazoria County on the south bank of Bastrop Bayou, it is a Native American Late Prehistoric era site composed of buried shell and pottery fragments that extends to the bayou's bank (HRA Gray and Pape 2012). It lies well outside of the anticipated LHC-9 pipeline construction area. It was assessed as being not eligible for listing on the National Register of Historic Places (NRHP). It is not a historic property protected under Section 106 regulations, lies outside of the pipeline construction area and does not require further evaluation.

**Isolate 739-045-ISO-01**

The sole artifact located at this location was a single flake from prehistoric Native American stone tool manufacturing activities. The location is in Brazoria County on the north edge of an existing pipeline corridor, within a grassy upland area near the north bank of New Bayou (HRA Gray and Pape 2012). Further testing at the location found no evidence of additional artifacts. It does not meet the state guidelines for being an archaeological site. As such, it is not a historic property protected under Section 106 regulations and does not require further evaluation.

**Isolate 739-019-ISO-01**

A single fragment of a mussel or other freshwater bivalve was recovered from a shovel test at this location, near the south bank of Bastrop Bayou, adjacent to its confluence with another small drainage (HRA Gray and Pape 2012). It is presumed to possibly be of cultural origin but could also be from natural deposition. It will be avoided during pipeline construction by directional drilling. As an isolate it does not meet the state guidelines for being an archaeological site. As

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such, it is not a historic property protected under Section 106 regulations and does not require further evaluation.

#### **Structure 739-080-HSS-01**

This was identified as a former cattle shelter, built circa 1960. It was viewed outside of the pipeline construction corridor in the Green Lakes Oil Field south of Hitchcock in Galveston County. It was found to be damaged by storms and lacked walls and a foundation. It was assessed as being not eligible for listing on the National Register of Historic Places (NRHP). It is not a historic property protected under Section 106 regulations, lies outside of the pipeline construction area and does not require further evaluation.

#### **Structure 739-189-HSS-01**

This structure was identified outside of the current pipeline right-of-way, but within the survey corridor on the north side of Dickinson Bayou; historic topographic maps from 1929 show a structure at this location. The building is a residential, wood-framed structure displaying a cross-gabled roof. The vertical wood siding on the structure appears original, but all of the windows and doors have been replaced with modern equivalents. It was assessed as being not eligible for listing on the National Register of Historic Places (NRHP) due to the extensive exterior alterations. It is not considered a historic property protected under Section 106 regulations and it lies outside of the proposed pipeline construction area; this resource does not require further evaluation.

#### **Sites 41BO162, 41BO161, and 41GV67**

These three sites are plotted on the Texas Archeological Site Atlas system as being within or adjacent to the proposed pipeline corridor in Brazoria County. The three sites are described in site records as being thin deposits of shell or shell middens, related to possible Prehistoric era Native American subsistence activities. Each of the plotted locations was systematically examined in an attempt to relocate the shell remains, with no evidence found that they lay within the project corridor (HRA Gray and Pape 2012). One reason is that these sites may be incorrectly plotted on the state records. They also note that the recorded locations of sites 41BO162 and 41BO161 have been impacted by past pipeline activities and erosion, while the location of Site 41GV67 is now an artificial water channel which could have destroyed the site. As no evidence of the three sites was identified at their plotted locations and their locations will be avoided through the use of horizontal directional drilling, they are not project concerns.

In a second stage, further Phase I cultural resources inventory field studies were conducted for the remaining portion of the 78 mile pipeline (HRA Gray and Pape 2013a). This investigation

included a combination of analysis of archaeological site potential within the corridor, windshield survey, systematic pedestrian survey and shovel testing within a 200 foot wide survey corridor. The study identified six previously recorded cultural resources plotted on the Texas Archeological Site Atlas as being within or adjacent to the proposed pipeline project area (41HR408, 41HR682, 41HR683, 41HR687, 41HR827, and 41HR1036). The investigation did not find evidence of three of the recorded sites (relocated two of these sites within the corridor (41HR827 and 41HR1036), identified two new archaeological sites (currently assigned temporary site numbers) and noted three locations with high archaeological site potential (including one landform where previously recorded site 41HR408 is plotted) that were not surveyed but which will be avoided through the use of horizontal directional drilling.

The following cultural resource discussions, focusing on Sites 41HR827, 41HR1036, 41HR682, and 41HR683 and Shell Concentrations 1 and 2, are all associated with the proposed pipeline crossing of the Shipping Channel Hogg Island (Figure 7). The current design plans call for a HDD to extend from Spillman Island (a regulated dredge material placement area) eastward underneath the Shipping Channel at an approximate depth of 150 ft (45.7 m). At this point it will exit onto a small workspace on Hogg Island, well to the west of Site 41HR682. Another HDD will be placed extending from Hogg Island eastward to the eastern shoreline of the San Jacinto River, reaching an approximate maximum depth of 55 ft (16.7 m) below surface. The exit for this HDD will be located well east of Site 41HR47. The use of the HDDs will avoid any impacts to the above archaeological sites; summary discussions concerning the six cultural resources located on Hogg Island are presented below, as described in the enclosed HRA Gray and Paper reports (2013a-e).

#### **Site 41HR827**

Located in the north-central portion of Hogg Island in Harris County, the site is a Native American Prehistoric era shell midden (HRA Gray and Pape 2013a,e). No other types of artifacts were recovered during the systematic pedestrian survey and shovel testing process. The examined portion of the site was assessed as being not eligible for listing on the National Register of Historic Places (NRHP). It is not a historic property protected under Section 106 regulations. Under the current project plans, the site will be avoided by the use of horizontal directional drilling.

#### **Site 41HR1036**

This is a historic road crossing the west side of Hogg Island. It originally crossed Tabbs Bay using a timber causeway (HRA Gray and Pape 2013a). The survey relocated a portion of the



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road as a concrete road bed at the north edge of an existing pipeline corridor. The effect of subsidence was noted. The examined portion of the site was assessed as being not eligible for listing on the National Register of Historic Places (NRHP). It is not a historic property protected under Section 106 regulations. Under the current project plans, the site will be avoided by the use of horizontal directional drilling.

### **Shell Concentration 1 (Hogg Island Temporary Site 1)**

This location was identified as a berm consisting of several layers of shell that parallels the north and east portions of the southern half of Hogg Island. No cultural artifacts were found in association with this feature. Historic maps and records indicate that this portion of Hogg Island was historically modified in the early to mid-twentieth century by the addition of dredge for use in placing roads and structures for resource extraction (HRA Gray and Pape 2013a). The shell concentration was assessed as being not eligible for listing on the National Register of Historic Places (NRHP). It is not a historic property protected under Section 106 regulations. Under the current project plans, the shell concentration will be avoided by the use of horizontal directional drilling.

### **Shell Concentration 2 (Hogg Island Temporary Site 2)**

This shell concentration was identified as deposit of buried clam and oyster shells that is located near the west shoreline in the northern portion of Hogg Island. No cultural artifacts were found in association with this feature. As with Temporary Site 1, it was noted as being historically higher than other portions of the island and was interpreted as being a possible former natural berm or levee. The shell concentration was assessed as being not eligible for listing on the National Register of Historic Places (NRHP). It is not a historic property protected under Section 106 regulations. Under the current project plans, the shell concentration will be avoided by the use of horizontal directional drilling.

### **Site 41HR682**

This is a previously recorded cultural resources composed of clam and oyster shell plotted as being on the north and east shorelines on the southern portion of Hogg Island. It is possible that this site is associated with the site above designated Temporary Site 1, given their proximity in location (HRA Gray and Pape 2013a). The field investigation found that the plotted site boundary was associated with a nearly submerged sand and clay beach that could not be fully explored. As noted above, historic evidence indicates this portion of the island was dramatically altered by dredge deposition in the first half of the twentieth century. Under the current project plans, the site will be avoided by the use of horizontal directional drilling.

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**Site 41HR683**

This is a previously recorded shell midden of clam and oyster shell, plotted as being on the north and east shorelines on the northern half of Hogg Island. Like Site 41HR682, the field investigation could not explore the plotted location as it was located within a nearly submerged sand and clay beach. Under the current project plans, the site will be avoided by the use of horizontal directional drilling.

**Site 41HR687**

This site is plotted on the Texas Archeological Site Atlas system as being within or adjacent to the proposed pipeline corridor on the west bank of Cedar Bayou in Harris County. It was described in site records as being a shell midden that was threatened by the anticipated effects of mechanical dredging and widening of the bayou, as well as natural subsidence and erosion. Survey efforts at the location found no evidence of the midden within the pipeline construction corridor (HRA Gray and Pape 2013a). The surveyor's note that the site may have been destroyed by the effects mentioned in the site record, or that it eroded into Cedar Bayou. As no evidence of the site was identified at their plotted locations and its location will be avoided through the use of horizontal directional drilling, it is not a project concern.

**Site 41HR47**

This site is plotted on the Texas Archeological Site Atlas system as being located within the proposed pipeline right-of-way along the north bank of the San Jacinto River, near Tabbs Bay (HRA Gray and Pape 2013e). The site was identified through eroded cutbank deposits which contained *Rangia* shell and a single sherd of prehistoric pottery (i.e., grog-tempered Baytown Plain). Additional delineation shovel tests excavated at the site encountered historic materials, including glass fragments, round nails, a rifle cartridge, small brick fragments and unidentifiable metal items; an additional piece of sandy paste, Goose Creek Plain prehistoric pottery was also collected. Given the intermixing of the historic and prehistoric materials, as well as the extensive evidence of disturbance caused by access road construction and erosion, the site may represent a former shell road and/or shell midden. Under the current project plans, the site will be avoided by the use of horizontal directional drilling which will exit 295 ft (90 m) east of the eastern San Jacinto River shoreline.

**Site 41HR408 and Un-surveyed High Potential Areas**

This site is plotted on the Texas Archeological Site Atlas system as being within or adjacent to the proposed pipeline corridor near the east bank of Tabbs Bay in Harris County. It was described in site records as being a historic homestead. Survey efforts were not conducted at this

location and two other landforms determined to have high archaeological site potential: the east bank of Cedar Bayou, and a small natural drainage located about 0.9 miles east of Cedar Bayou (HRA Gray and Pape 2013a). These areas were not field-examined as all three will be avoided through the use of horizontal directional drilling, therefore there will not be any potential impacts to cultural resources.

### 3.5.2 Other Pipelines and Ancillary Facilities (SOW #3-#16)

The other aspects of the LHC-9 Unit project area which Dow has completed cultural resources field and / or record review investigations include the following:

- Two 12'' 5.2 mile ethane and ethylene pipelines (SOW #11 and #16);
- Three 10'' 1.5 mile ethane pipelines (SOW #3);
- One 12'' 1.2 mile ethane pipeline (SOW#5);
- One 16'' 0.75 mile brine pipeline (SOW #9);
- One 12'' 1.7 mile ethane pipeline (SOW #10);
- One 8'' 0.05 mile ethane pipeline (SOW #12); and
- Winfree pump station (SOW #2);
- Two new ethane pumps (SOW #4);
- Four new ethane meter stations (SOW #6 and #7);
- Two metering facilities at a well with the well head instrumentation (SOW #8);
- One new ethylene storage well drying and carbon dioxide removal facility (SOW #15); and
- Cedar Bayou meter station (SOW #13).

The full results for these planned project activities are presented in other reports (HRA Gray and Pape 2013b-e). A summary is presented below.

Phase I cultural resources field studies involving pedestrian survey and shovel testing were conducted at the Winfree pump station in Chambers County (SOW #2). No known or new cultural resources concerns were identified at these components (HRA Gray and Pape 2013b).

A records review and assessment of the project to impact known or unrecorded historic properties as defined in the NRHP were also conducted for the three ethane supply pipelines located in Chambers County (SOW #3). Portions of the ethane supply pipeline routes were also physically surveyed during the previous Winfree pump station (SOW #3) investigation. No known or new cultural resources concerns were identified at these components (HRA Gray and Pape 2013c).

A combination of records review, assessment of project landforms to assess whether known or unrecorded sites could be impacted by the LHC-9 project, pedestrian survey and shovel testing was performed at the remaining LHC-9 project components (HRA Gray and Pape 2013d). This includes the remaining ethane, ethylene and brine pipelines (SOW #5, #9, #10, #11, #12 and #16), as well as the ethane pumps, meter stations and facilities, and the ethylene storage well drying and carbon dioxide removal facility (SOW #4, #6, #7, #8, #13 and #15). Only two potential project concerns were identified. Known archaeological sites (41BO159 and 41BO160) were identified as being located within or adjacent to the proposed ethane and ethylene pipeline components (SOW #11 and #16). The plotted locations of both site areas were examined, with no evidence found of their actually being within the project area.

#### **Sites 41BO159 and 41BO160**

Both of these sites are plotted on the Texas Archeological Site Atlas system as being within or directly adjacent to the proposed SOW #11 and #16 pipeline corridor in Brazoria County. They are mapped on the east side of Oyster Creek, north of the Dow complex that will house the proposed LHC-9 Unit. The two sites are described in the Texas Archeological Site Atlas record as being middens of shell and Native American prehistoric ceramics that were exposed on low ridges above Oyster Creek. Pedestrian survey efforts at both locations found no evidence of the middens being within the pipeline construction corridor (HRA Gray and Pape 2013d). As no evidence of the two sites was identified at their plotted locations and both locations will be avoided through the use of horizontal directional drilling, they are not project concerns.

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## 4.0 Assessment of Potential impacts to Historic Properties

The LHC-9 Unit facility and wastewater pipeline project components area is fully located within the confines of the active Dow Oyster Creek Facility. As shown in the attached photographs and aerial maps, there are numerous existing industrial buildings, flares, furnaces, cooling towers, tanks, and other infrastructure within this extensive facility. The history of Dow Texas Operations in Freeport goes back to the early portion of the twentieth century (Dow 2013), so some of these buildings and structures are 50 years old. However, this being an active operating industrial facility, there is a constant process of demolition and construction in relation to upgrades. The previous Chlor-Alkali, Unit II facility upon which the LHC-9 furnaces, flares and towers will be sited is an example. None of the existing industrial buildings have been identified as having particular local, state or national historic significance and therefore do not meet the criteria of evaluation for being listed on the NRHP.

Because of the industrial landscape that surrounds the proposed LHC-9 Unit construction zone and the lack of known cultural resources in the vicinity, the Area of Potential Effects (APE) for this aspect of the project is limited to locations where ground disturbing activities would occur. These locations are the facility construction areas, associated wastewater pipeline and the laydown yard shown in Figures 2 to 4. There is no indirect visual effect that can result from the undertaking, as there are no historic properties within one mile of the activity areas. The proposed towers, furnaces, flares, etc. are in-keeping with the current landscape and will have a maximum height that is less than existing surrounding structures.

Given the level of extensive industrial development covering the proposed construction area, field and subsurface investigations throughout the APE were not deemed warranted by URS archaeologists meeting Secretary of Interior qualifications. The existing environment indicates the APE lacks the potential to contain undisturbed archeological resources that would meet the Section 106 criteria of being eligible for listing on the National Register of Historic Places. The main construction zone shown in Figure 2 was previously the site of Dow's Chlor-Alkali, Unit II facility. Prior excavations, infill, grading, and demolition activities have fully impacted the top portions of the ground surface, where archaeological materials would be expected. The same is true for the proposed construction laydown area. The area will be previously converted from pastureland to a graded area with an aggregate base for use as a laydown area for other approved Dow project that are underway (Figure 4). The wastewater pipeline (Figures 2 and 3) will traverse through the developed industrial site for the majority of its length. The water crossing shown in Photo 11 is a formed man-made channel of the Dow barge canal, and will utilize a

horizontal directional drill using an eroded work space on the channel bank. The wastewater will emit at the outfall locations shown in Photos 13 to 15, which use an existing pipeline that will not require land-altering activities that could impact cultural resources.

Other aspects of the LHC-9 project, including the 78 mile ethane pipeline, nine smaller ethane, ethylene and brine pipelines and appurtenant facilities such as pump stations, meter stations and an ethylene storage well facility have been analyzed in depth separately (HRA Gray and Pape 2012, 2013a-e). The project either lacks historic properties at these locations or the project has been designed to fully avoid impacts to identified cultural resources.

Based on these data, it is the opinion of URS that the proposed LHC-9 Unit Installation project will not impact any historic properties that are eligible for inclusion in the National Register of Historic Places, as defined under Section 106 guidelines. We therefore recommend that a finding of No Historic Properties Present or Affected be applied to this undertaking.

## 5.0 References

- Crenwelge, G. W., J. D. Crout, E. L. Griffin, M. L. Golden, and J. K. Baker  
 1981 *Soil Survey of Brazoria County, Texas*. USDA Soil Conservation Service.
- Dow Chemical Company, L.P.  
 2013 “History of Texas Ops.” (<http://www.dow.com/texas/freeport/about/history.htm>), accessed February 28, 2013
- Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, and J.A., Rogers  
 2007 *Ecoregions of Texas*, U.S. Environmental Protection Agency, Corvallis, Oregon.
- Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D.  
 2004 *Ecoregions of Texas* (color poster with map, descriptive text, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:2,500,000).
- HRA Gray and Pape  
 2012 Cultural Resources Survey of 37 Miles for the Proposed Dow 12-Inch PDH-1 Freeport to Texas City Pipeline Project in Brazoria and Galveston Counties, Texas. Draft Report for Texas Antiquities Code Permit # 6246, on file Dow Chemical Company.
- 2013a *Results of Cultural Resources Survey and Review along Approximately 42 Miles for the Proposed Dow LHC-9, 12” Pipeline in Galveston, Harris, and Chambers County, Texas (SOW #1)*. January 14 Letter Report, on file Dow Chemical Company.
- 2013b *Results of Cultural Resources Surveys Completed at the Location of the Proposed Dow Winfree Pump Station in Chambers County, Texas (SOW #2)*. January 14 Letter Report, on file Dow Chemical Company.
- 2013c *Results of Cultural Resources Review for the Locations of 3 Proposed Dow Ethane Supply Pipelines in Mont Belvieu, Chambers County, Texas (SOW #3)*. January 14 Letter Report, on file Dow Chemical Company.
- 2013d *Results of Cultural Resources Review and Pedestrian Survey for the Locations of Proposed Dow Ethane Pipelines and Associated Components between Freeport and Stratton Ridge; Brazoria County, Texas (SOW Nos. 4 through 16)*. February 14 Letter Report, on file Dow Chemical Company.
- 2013e *Cultural Resources Survey Within 79 Miles for the Proposed Dow 12-Inch MSR Ethane Pipeline Project in Brazoria, Galveston, Harris, and Chambers Counties, Texas*. Draft Report, on file Dow Chemical Company.
- Kleiner, Diana J.  
 2013a “Brazoria County,” *Handbook of Texas Online*. Electronic document, [www.tshaonline.org/handbook/online/articles/hcb12](http://www.tshaonline.org/handbook/online/articles/hcb12), accessed February 22, 2013. Published by the Texas State Historical Association.

---

Kleiner, Diana J.

2013b “Freeport, TX (Brazoria County),” *Handbook of Texas Online*. Electronic document, [www.tshaonline.org/handbook/online/articles/her03](http://www.tshaonline.org/handbook/online/articles/her03), accessed February 22, 2013. Published by the Texas State Historical Association.

Texas State Historical Association.

2013 "Velasco, Battle of," *Handbook of Texas Online* (<http://www.tshaonline.org/handbook/online/articles/qfv01>), accessed February 25, 2013. Published by the Texas State Historical Association.

U.S. Geological Survey

2013a *Texas Water Science Center: Texas Real-time Sites by Basin*. <http://tx.usgs.gov/infodata/basins.html>, accessed March 1, 2013.

2013b *Mineral Resources On-Line Spatial Data*. <http://mrdata.usgs.gov/geology/state/>, accessed March 1, 2013.

Weir, Merle

2013 “Velasco, TX”, *Handbook of Texas Online* (<http://www.tshaonline.org/handbook/online/articles/hvv07>), accessed February 25, 2013. Published by the Texas State Historical Association.

World Media Group, LLC.

2013 *Brazoria County Weather*. Electronic document, <http://www.usa.com/brazoria-county-tx-weather.htm>. Accessed on February 28, 2013.



**Figures**

**Figure 1 - Project Overview**

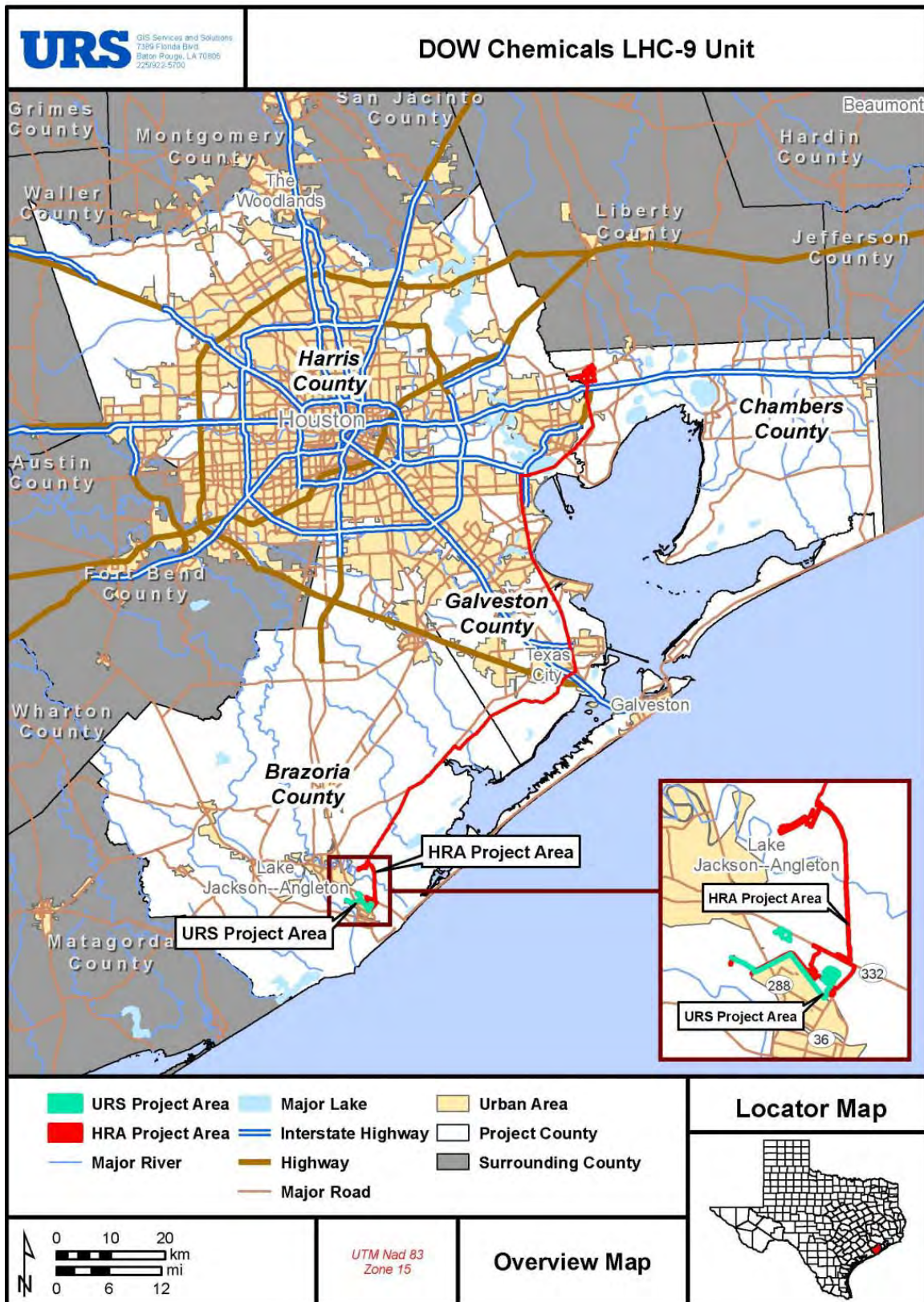


Figure 2 - Aerial Map Showing LHC-9 Unit Area and Wastewater Line

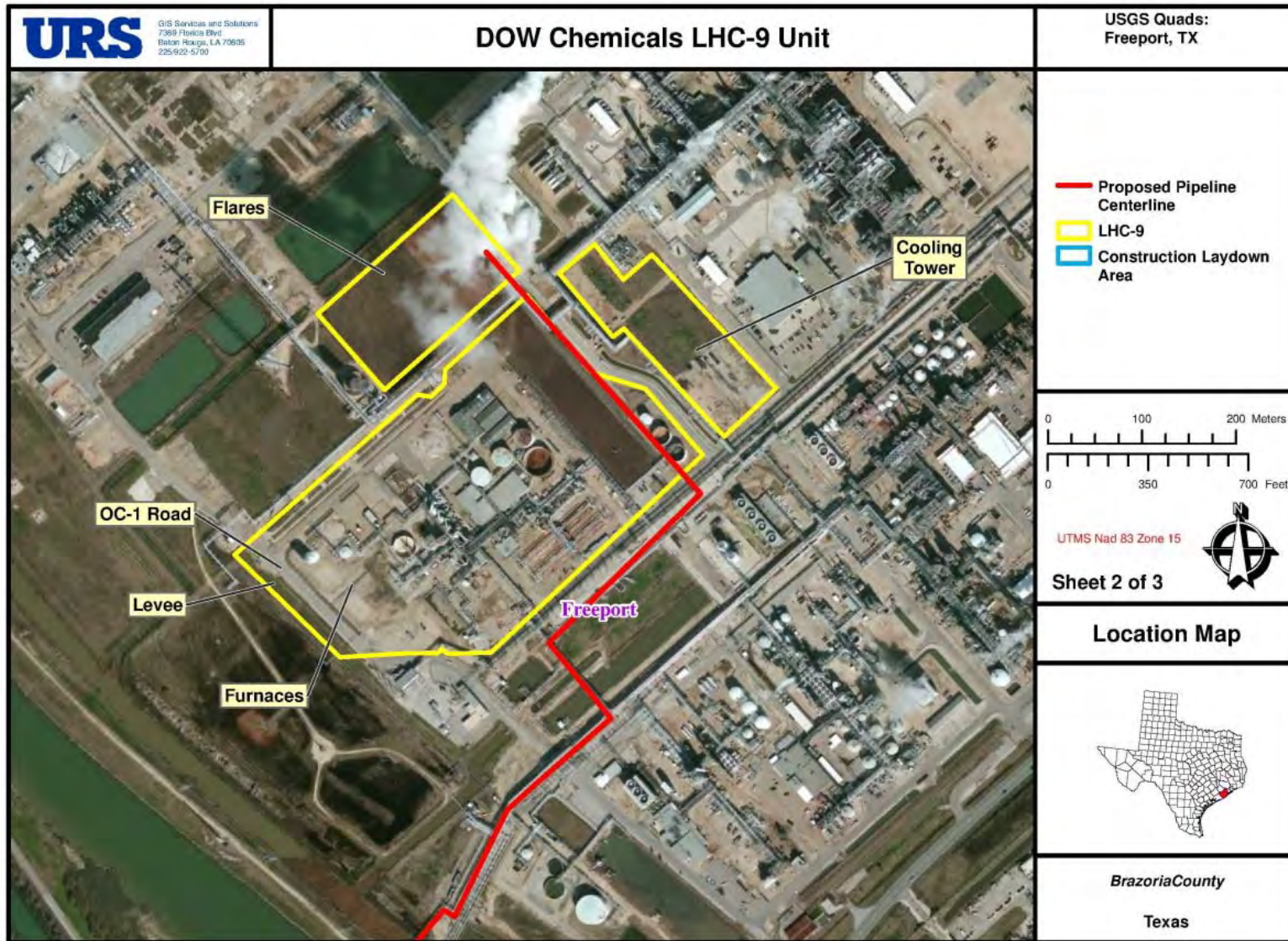


Figure 3 - Aerial Map Showing Continuance of LHC-9 Wastewater Line

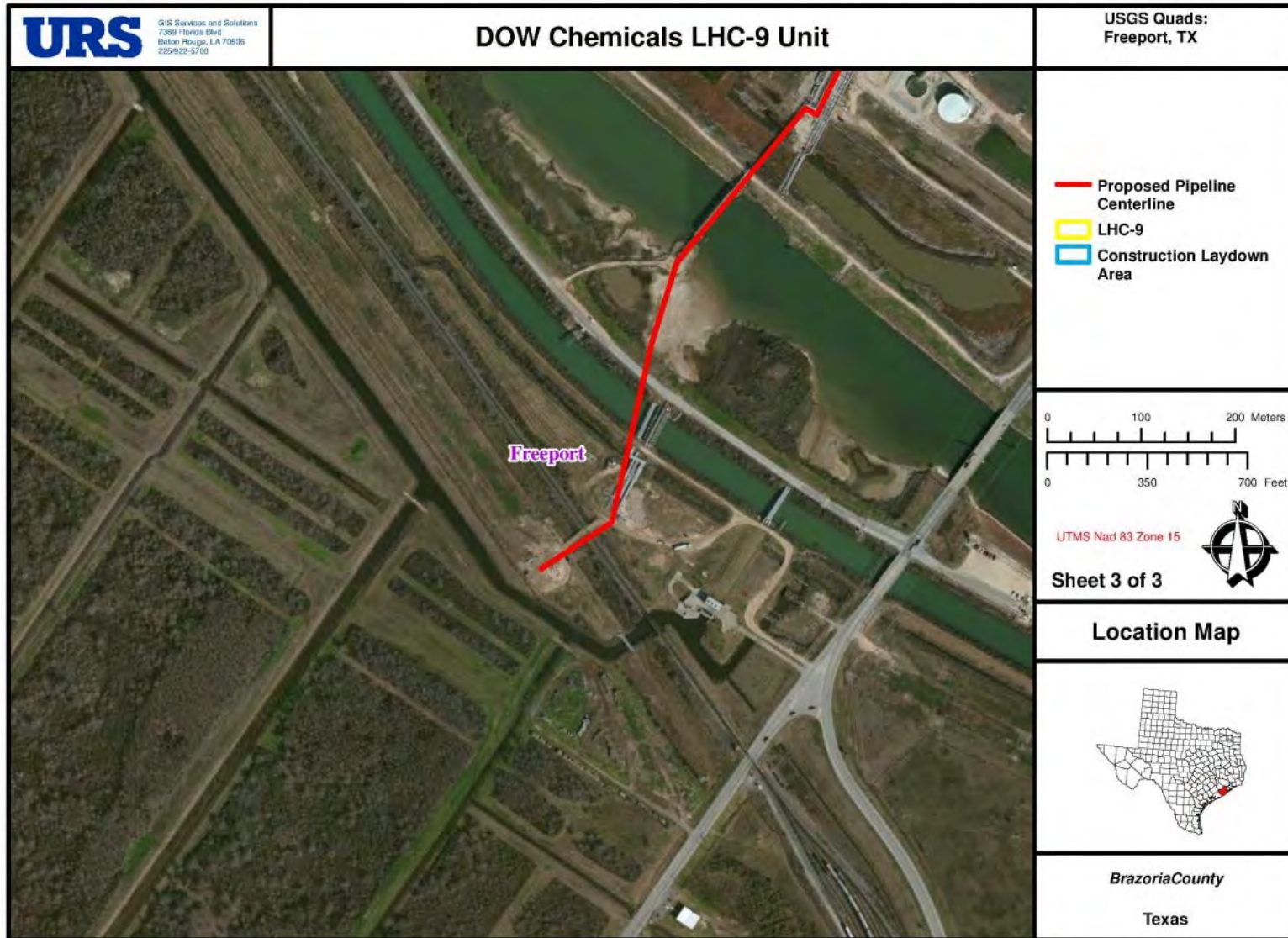


Figure 4 - Aerial Map Showing Proposed Laydown Yard

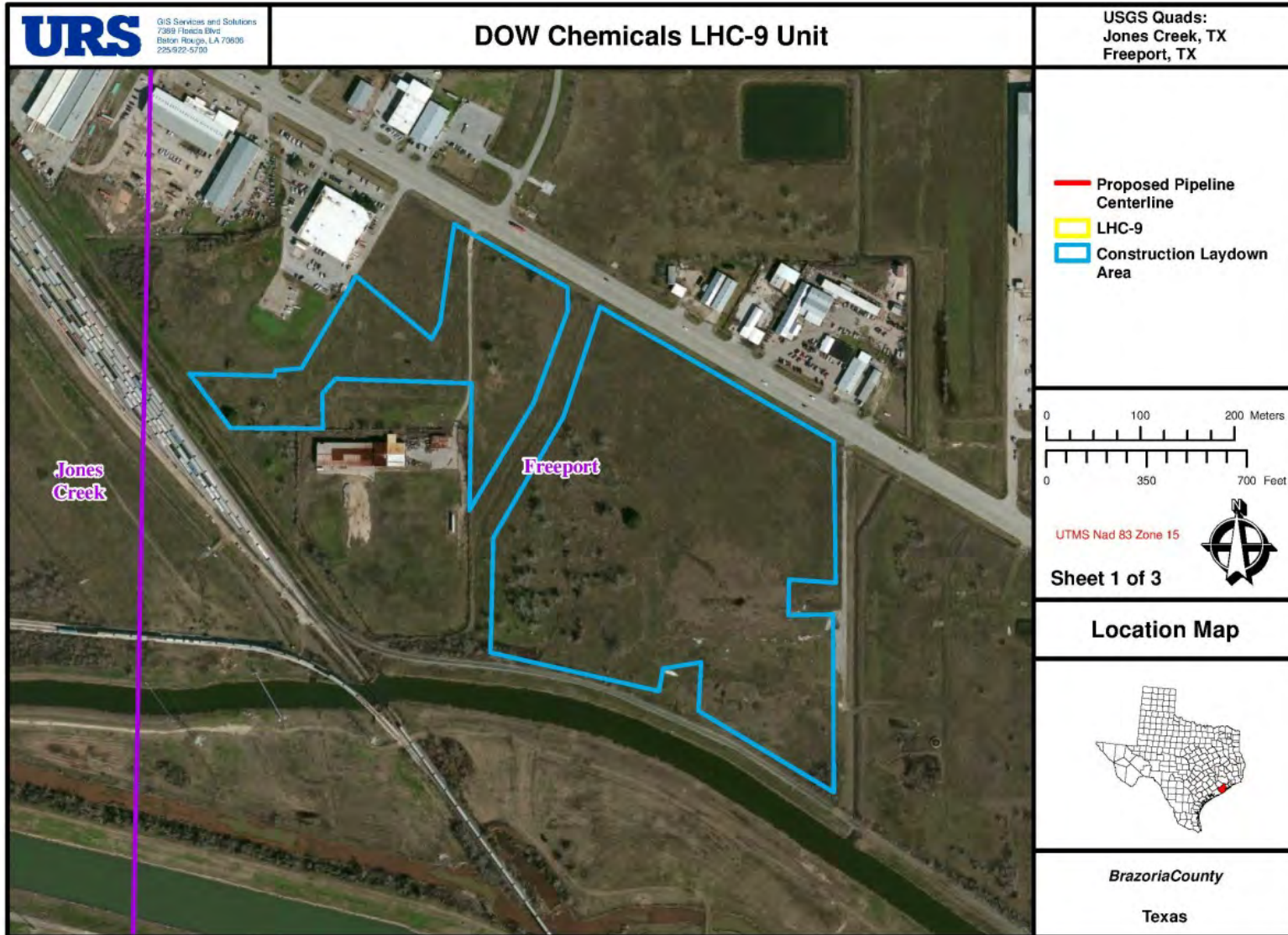


Figure 5 - Soils Map

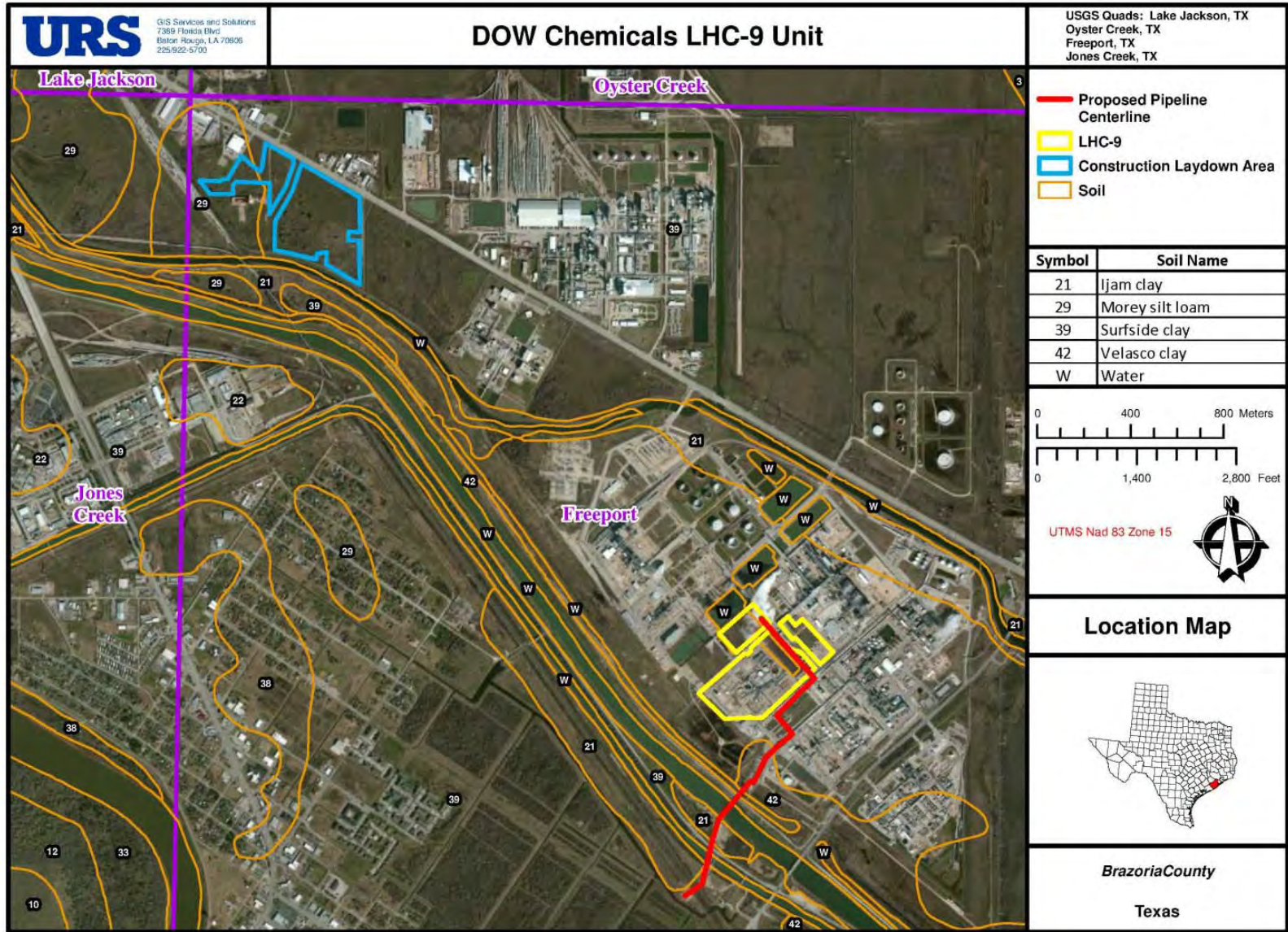


Figure 6 – Previous Investigations Map

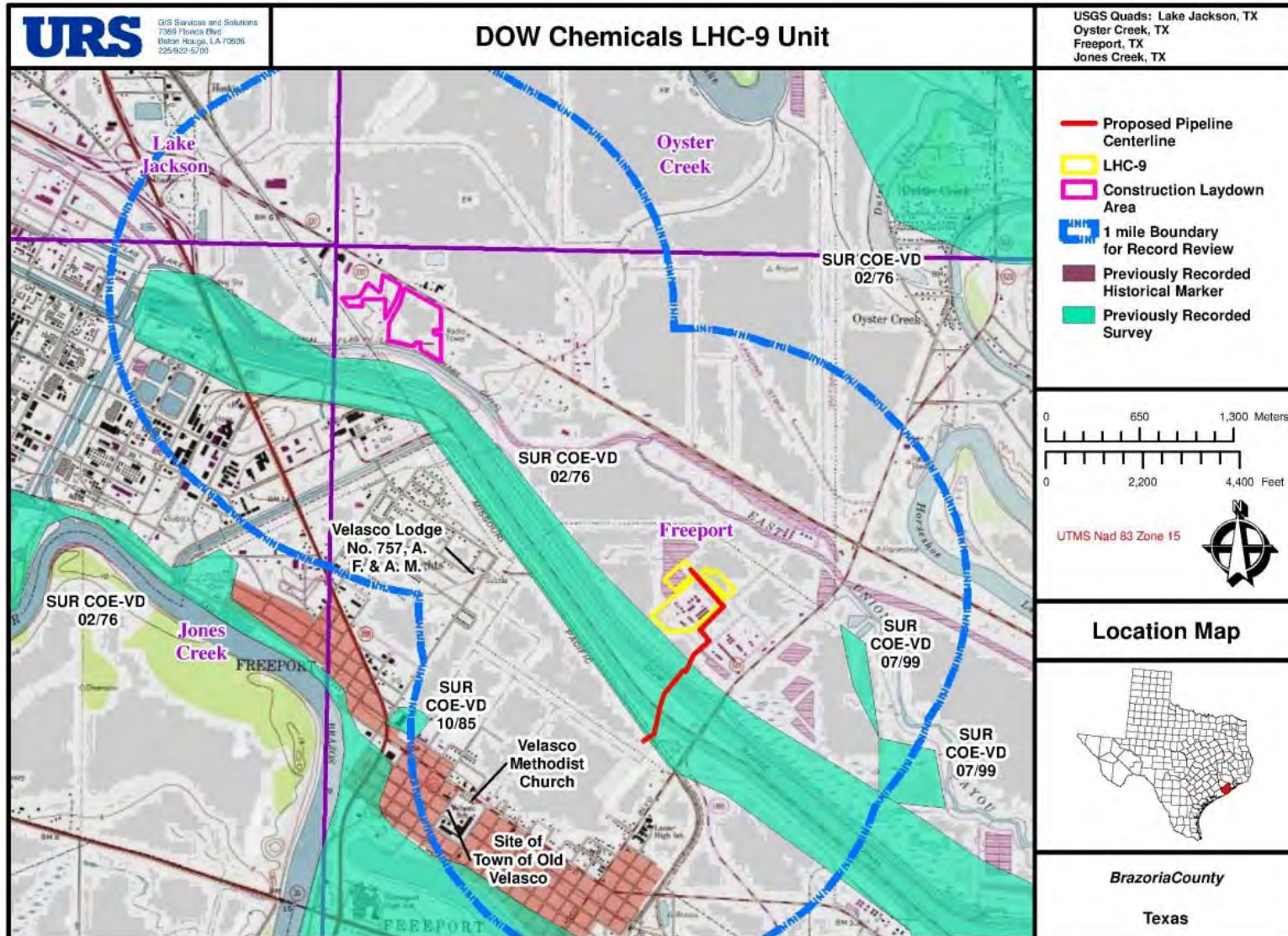
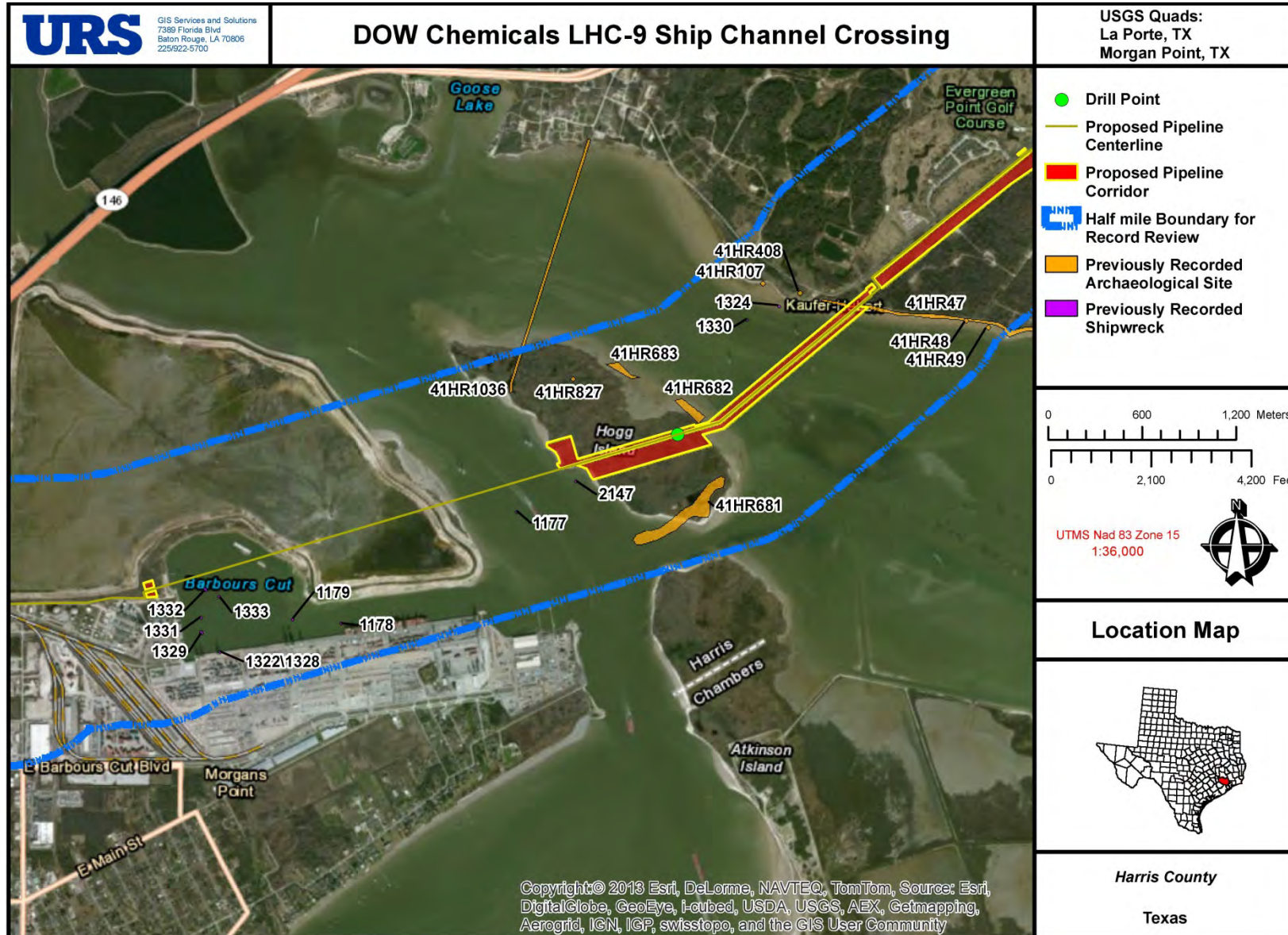



Figure 7 – LHC-9 Houston Shipping Channel Crossing





**Photographic Log**

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<b>Client Name:</b> The Dow Chemical Company		<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.</b> 41569339
<b>Date</b> 2/22/2013	<b>Photo No.</b> 1		
<b>Direction Photo Taken:</b> NE			
<b>Description:</b> LHC-9 Project Site			

<b>Date</b> 2/22/2013	<b>Photo No.</b> 2		
<b>Direction Photo Taken:</b> NE			
<b>Description:</b> Southern boundary of LHC-9 site looking Northeast toward adjacent LHC-8 unit.			

<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 3
<b>Direction Photo Taken:</b>  N	

**Description:**  
Southern boundary of LHC-9 site looking North toward adjacent flare system.



<b>Date</b> 2/22/2013	<b>Photo No.</b> 4
<b>Direction Photo Taken:</b>  E	


**Description:**  
Southern boundary of LHC-9 site looking East toward adjacent process units.



<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 5	
<b>Direction Photo Taken:</b> SE		
<b>Description:</b> Southern boundary of LHC-9 site looking East along access road and levee. Access Road (OC 1) and Levee will be relocated south for citing of the LHC-9 Furnaces.		

<b>Date</b> 2/22/2013	<b>Photo No.</b> 6	
<b>Direction Photo Taken:</b> SW		
<b>Description:</b> Southern boundary of LHC-9 site looking South at adjacent pipeline ROW and Dow Barge Canal levee.		

<b>Client Name:</b> The Dow Chemical Company		<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
<b>Date</b> 2/22/2013	<b>Photo No.</b> 7		
<b>Direction Photo Taken:</b> W			
<b>Description:</b> Southern boundary of LHC-9 site looking West along access road (OC 1) and levee.			

<b>Date</b> 2/22/2013	<b>Photo No.</b> 8		
<b>Direction Photo Taken:</b> NE			
<b>Description:</b> View of the LHC-9 Site. The site previously maintained the Chlor-Alkali, Unit II which was decommissioned and demolished. The site maintains some of the former pilings and concrete slabs from the former process unit.			

<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 9
<b>Direction Photo Taken:</b> SW	


<b>Description:</b> LHC-9 Multi-Point Ground Flare Site.
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 10
<b>Direction Photo Taken:</b> NE	

<b>Description:</b> LHC-9 Cooling Tower Site.
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<b>Client Name:</b> The Dow Chemical Company		<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
<b>Date</b> 2/22/2013	<b>Photo No.</b> 11		
<b>Direction Photo Taken:</b>  NE			
<b>Description:</b>  LHC-9 Wastewater line will be routed over the Dow Barge Canal utilizing an existing pipe rack (left), then directionally drilled under Canal Road and Wastewater Canal terminating at an existing pipeline ROW.  Directional drill site.			

<b>Date</b> 2/22/2013	<b>Photo No.</b> 12		
<b>Direction Photo Taken:</b>  S			
<b>Description:</b>  View of pipeline interconnects and ROW south of the Wastewater Canal.			

<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 13
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**Direction Photo Taken:**  
  
N



**Description:**  
  
Outfall 202. Effluent discharge from LHC-9 will be piped to the Plant B WWTP then discharged from Outfall 202 to the Brazos River via Outfall 002.

<b>Date</b> 2/22/2013	<b>Photo No.</b> 14
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**Direction Photo Taken:**  
  
N



**Description:**  
  
Outfall 002.



<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 15
<b>Direction Photo Taken:</b>  SE	

**Description:**  
  
Outfall 002 at the Brazos River.



<b>Date</b> 2/22/2013	<b>Photo No.</b> 16
<b>Direction Photo Taken:</b>  NW	

**Description:**  
  
Wastewater Canal at Outfall 901. Cooling tower blow down and Regeneration water will be discharged to the Wastewater Canal via Outfall 901. The Wastewater Canal flows southwest to the Brazos River via Outfall 001.



<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 17
<b>Direction Photo Taken:</b>  NE	



**Description:**  
  
Wastewater Canal at  
Outfall 001.

<b>Date</b> 2/22/2013	<b>Photo No.</b> 18
<b>Direction Photo Taken:</b>  S	



**Description:**  
  
Outfall 001 at the Brazos  
River.

<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 19
<b>Direction Photo Taken:</b>  SE	

**Description:**

Proposed construction laydown area located west of the Dow Oyster Creek Plant on State Highway 332.

Site is currently being developed in association with other Dow Plant expansion projects that are currently underway, and will be subsequently used for LHC-9 construction.



<b>Date</b> 2/22/2013	<b>Photo No.</b> 20
<b>Direction Photo Taken:</b>  S	

**Description:**

View of construction laydown area. Site observations indicate that the site was previously used as pastureland.



<b>Client Name:</b> The Dow Chemical Company	<b>Site Location:</b> LHC-9 Unit Installation	<b>Project No.:</b> 41569339
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<b>Date</b> 2/22/2013	<b>Photo No.</b> 21
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**Direction Photo Taken:**  
  
SW

**Description:**  
  
View of adjacent property to construction laydown area. Site observations indicate that the site was previously used as pastureland.



**Letter of Concurrence  
Texas Historical Commission  
LHC-9 Pipeline Survey**

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TEXAS HISTORICAL COMMISSION  
*real places telling real stories*

December 11, 2013

Tony Scott  
HRA Gray & Pape, LLC.  
1428 West Alabama Street  
Houston, Texas 77006

Re: Project review:  
Draft Report: Cultural Resources Survey within 79 Miles for the Proposed DOW 12-Inch MSR  
Ethane Pipeline Project in Brazoria, Galveston, Harris, and Chambers Counties, Texas

Dear Mr. Scott:

Thank you for allowing us to review the report referenced above. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Jeff Durst, has completed its review. After reviewing the documentation, we concur that previously recorded site 41HR47 will not be impacted by construction due to the use of Horizontal Directional Drilling and previously recorded sites 41HR827 and 41HR1036 will not be impacted due to the new alignment of the project route. Additionally, we concur that newly recorded sites 41BO239 and 41BO240 are ineligible for inclusion in the National Register of Historic Places (NRHP) based on the lack of buried deposits, cultural features, or temporally diagnostic materials.

The draft report that you have submitted is accepted and this project may proceed without further consultation with this office, provided that no significant archeological deposits are encountered during construction and development of the property.

Thank you for your cooperation in this Texas Antiquities review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If we may be of further assistance, please call Jeff Durst of our staff at 512/463-8884.**

Sincerely,



for  
Mark Wolfe, State Historic Preservation Officer

MW/jjd



US EPA ARCHIVE DOCUMENT

**Resumes**

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## Robert J. Lackowicz, M.A.

*Cultural Resources Manager*

### Areas of Expertise

Section 106 / National Historic Preservation Act (NHPA) Compliance  
State and Federal Agency Coordination  
Disaster Recovery Projects - Housing and Urban Development (HUD) Community Development Block Grant (CDBG) and Federal Emergency Management Agency (FEMA)  
Phase I, II, and III Cultural Resources Studies  
Natural Gas and Product Pipeline Studies  
Federal Energy Regulatory Commission (FERC) - Third Party Review  
Transportation Corridor Studies  
Hydroelectric Transmission Line Corridors and Facilities  
Project Management  
Technical Writing

### Years of Experience

With URS: 5.5 Years  
With Other Firms: 17 Years

### Education

MA/Anthropology/1996/ Trent University  
BA/Anthropology/1991/ Memorial University

### Overview

Mr. Lackowicz has over 20 years of cultural resource management experience, with the last 10 years involving projects within Alabama, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, and Texas. He has overseen thousands of individual Section 106 architectural history and archaeological studies for HUD CDBG-funded residential post-Hurricane Katrina disaster recovery programs in Mississippi, for parcels in the City of Galveston, Southeast Texas Regional Planning Commission, and Lower Rio Grande Valley Development Council of Texas, and also in a nine-county area of New Jersey that was impacted by Hurricane Sandy. He has also supervised architectural salvage and archaeological monitoring activities conducted by FEMA in New Orleans after Katrina and developed Section 106 compliance plans for U.S. Army Corps of Engineers (USACE) levee restoration projects in the New Orleans metropolitan area. He has conducted the full range of archaeological studies (Phase I/II/III and monitoring) and produced planning documents for federal, state and Canadian regulators. His other work includes Section 106 assessments for private companies involving FERC-regulated pipelines, and independent technical reviews on behalf of the Federal Energy Regulatory Commission and the U.S. Department of State to ensure Section 106 compliance of proposed natural gas pipeline and liquefied natural gas facilities in Texas and an international pipeline crossing seven Plains and Midwestern states.

### DISASTER RECOVERY PROJECT EXPERIENCE

**Cultural Resources and Field Inspection Manager, New Jersey Dept. Of Environmental Protection, Hurricane Sandy Disaster Recovery CDBG Programs, 2013-current:** Mr. Lackowicz is overseeing NHPA compliance for HUD CDBG-funded Hurricane Sandy disaster recovery programs in nine counties of New Jersey. He directs SOI-qualified Section 106 staff from multiple URS offices on submittals to the State Historic Preservation Office and DEP. He also oversees the digital data collection and upload of environmental and cultural resources data for all application sites assessed by URS staff based in New Jersey.

**Cultural Resources Manager, Mississippi Development Authority (MDA) Housing and Small Rental Disaster Recovery Programs, 2008-current:** Mr. Lackowicz is the lead for URS and the state's Mississippi Development Authority ensuring NHPA and HUD compliance for multiple CDBG-funded Hurricane Katrina disaster recovery programs in more than 12 counties. These include National Flood Insurance Program required elevation projects for single family residences, rehabilitation and reconstruction projects (Alternative Housing, Long-Term Workforce Housing and Neighborhood Home Programs), and rental unit rehabilitation projects (Small Rental Assistance and Neighborhood Rental Restoration Programs). Over its course he has directed dozens of





*Robert J. Lackowicz*

architectural history and archaeological staff from multiple URS offices on thousands of individual application projects involving Phase I and Phase II level studies. He developed Programmatic Agreements and Memoranda of Agreements for each MDA program and was the state's point of contact for negotiations involving the Advisory Council on Historic Preservation, the National Trust for Historic Preservation, the State Historical Preservation Office and Native American Tribes. He also co-developed a GIS-based archaeological sensitivity model that was used to determine field evaluation requirements.

**Cultural Resources Manager, City of Galveston, Texas, Rounds 1 and 2 Hurricane Ike Disaster Recovery Housing Program, 2012-current:**

Mr. Lackowicz is the cultural resources program lead for URS and the City of Galveston for National Historic Preservation Act compliance and agency coordination. He led the development of the Programmatic Agreement between state and local agencies that guides HUD and National Historic Preservation Act compliance for the program. He oversees cultural resources staff from several offices that implement hundreds of architectural history and archaeological studies needed for individual project compliance. He has also identified and negotiated with state and federal agencies the resolution of Adverse Effects that occurred prior to URS becoming the City's program administrator.

**Cultural Resources Manager, Texas General Land Office, Round 2 Disaster Recovery Housing Programs, Southeast Texas and Lower Rio Grande Valley, 2012-current:**

Mr. Lackowicz is overseeing NHPA compliance for the HUD CDBG-funded Hurricane Rita residential disaster recovery programs in the Southeast Texas Regional Planning Commission area of Jefferson, Orange and Hardin Counties, and in the Lower Rio Grande Development Council area of Cameron, Willacy and Hidalgo Counties. He directs architectural history and archaeological staff from multiple URS offices on the review and reporting for hundreds of individual application projects.

**Cultural Resource Manager, Historic Landscape Planning Study, New Orleans United States Corps of Engineers (USACE), 2011-2012:**

Cultural Resources Manager overseeing planning study to inventory historic elements for New Orleans SELA sewerage infrastructure improvements in the Claiborne Avenue and Napoleon Avenue development corridors (Orleans Parish).

**Cultural Resource Manager, Hurricane Protection Studies, New Orleans United States Corps of Engineers (USACE), 2007-2008:**

Principal and Senior Project Manager overseeing development of post-Katrina Section 106 management plans for the West Bank of New Orleans, and USACE Independent Environmental Review (IER) levee repair and restoration projects (St. Charles, Jefferson, Orleans, and St. Bernard Parishes).



*Robert J. Lackowicz*

**PIPELINE AND ENERGY PROJECT EXPERIENCE**

**Cultural Resource Manager, Carbon Dioxide Sequestration and Enhanced Oil Recovery in Southeast Texas for NRG Energy, 2011-12:**  
Phase I cultural resource study for proposed 80 mile pipeline to capture and inject carbon dioxide into mature oil field for enhanced recovery operations.

**Cultural Resource Manager, Carbon Dioxide Sequestration and Enhanced Oil Recovery in Southeast Texas for Air Products and Chemicals, 2011:**  
Phase I cultural resources study for 13 mile pipeline to capture and inject carbon dioxide into mature oil field for enhanced recovery operations.

**Cultural Resource Manager, North Main and North Main Loop System Abandonment and Replacement Program, Various Counties and Parishes in Alabama, Mississippi and Louisiana for Southern Natural Gas Company, 2007-2010:**  
Phase IA desktop and Phase I cultural resources field studies associated with pipeline abandonment and replacement activities along the North Main and North Main Loop natural gas systems. All projects were FERC-permitted and included preparation of Resource Report 4.

**Senior Technical Reviewer for U.S. State Dept., Phase 1&2 TransCanada Keystone and Cushing Extension Pipelines, 2007-2008:**  
Senior Technical Reviewer for Entrix and U.S. State Department, determining Section 106 compliance for the United States portion of this oil pipeline from Canada (North Dakota, South Dakota, Missouri, Nebraska, Illinois, Kansas and Oklahoma) and author of cultural resource sections of the Environmental Impact Statement. Pipeline evaluated was Phase 1/2 lines constructed in 2008/2009, not proposed Phase 4 Keystone XL line.

**Cultural Resource Manager, Elba Island III Liquefied Natural Gas Terminal Expansion, and Elba Express Natural Gas Pipeline and Facilities in Georgia and South Carolina for Southern Natural Gas Company, 2006-2007:**  
Phase I cultural resources studies and preparer of Resource Report 4 for FERC-permitted 187 mile long natural gas pipeline and liquefied natural gas facility project.

**Cultural Resource Manager, Natural Gas Pipeline and Facilities in Texas and Oklahoma for Gulf South / Boardwalk, 2007:**  
Phase I cultural resources studies for Phase I cultural resources studies associated with FERC-permitted 137 mile long new natural gas pipeline in Texas and 37 mile natural gas pipeline in Bryan County, Oklahoma for the Gulf Crossing Pipeline project.

**Senior Technical Reviewer for FERC, Sempra Port Arthur LNG Facility, Jefferson County, Texas, 2006:**  
Senior Technical Reviewer for third party EIS determining Section 106 compliance for the proposed pipeline and liquefied natural gas facility, authoring the cultural resource sections of the Environmental Impact Statement.



## Lauren B. Poche, M.A.

*Historian/Archaeology Lab Supervisor*

### Areas of Expertise

Section 106 Compliance  
Phase I, II, and III Cultural  
Resources Surveys  
Phase I, II, and III Cultural  
Material Analysis  
National Register of Historic  
Places Application Preparation  
Archival and Historic Research  
Data Management and  
Coordination

### Years of Experience

With URS: 5 Years  
With Other Firms: 5.5 Years

### Education

MA/History – Public  
History/2012/ Southeastern  
Louisiana University  
BA/Anthropology –  
Archaeology/2002/Millersville  
University of Pennsylvania

### Registration/Certification

Asbestos Training, 2008  
CPR  
First Aid/Bloodborne Pathogens

### Overview

Ms. Poche has over ten years of cultural resource management experience within the Northeast, Mid-Atlantic, Southeast, and Midwest. She holds a Master of Arts in History from Southeastern Louisiana University in Hammond, Louisiana, where she concentrated on Public History, Southern History, and Louisiana History, with an emphasis on sugar plantations and mills.

Ms. Poche currently acts as a Historian, and Archaeology Laboratory Supervisor/Analyst. As the laboratory supervisor, her main responsibilities include analysis of prehistoric and historic period artifacts, taking and preparing artifact photos, and preparing artifact discussions and tables for reports. Her additional responsibilities include database creation and management, preparation of collections for turnover to state and federal agencies, and the management of lab staff. Ms. Poche has lead or assisted in the preparation of collections for turnover to Alabama, Arkansas, Florida, Georgia, Louisiana, Maryland, Michigan, Mississippi, Pennsylvania, Texas, Virginia, West Virginia, and Puerto Rico. She also has experience with preparing several collections for the National Park Service from sites in the Mid-Atlantic and Northeast.

Ms. Poche also conducts background research on project areas, historical research including chain of title research, prepares historical period chapters for reports, and supervises field projects. She has acted as field supervisor in Georgia, Kansas, Louisiana, and Texas and as a field archaeologist in Connecticut, Florida, Georgia, Kansas, Louisiana, Maryland, Mississippi, New Jersey, Pennsylvania, Tennessee, and Virginia. Project types she has worked on include golf courses, highway and road expansions, military base expansion, pipelines, subdivisions, urban expansion, and levee improvements.

### Project Specific Experience

**Historian/Archaeology Laboratory Supervisor/Field Supervisor, Phase II and Phase III Investigations, Nucor Steel Louisiana, LLC, St. James Parish, Louisiana, 2010-2013:** Ms. Poche conducted historic background research, artifact analysis, prepared the report discussions, and photographed notable artifacts for several localities located on three sites situated on the Nucor Steel Louisiana, LLC property in St. James Parish. Ms. Poche also supervised a portion of the backhoe excavation of a large nineteenth century sugar mill on the property, in addition to the damage assessment of a 15 acre parcel immediately adjacent to the Mississippi River.

**Historian/Archaeology Laboratory Supervisor, Priority Areas 2, 3, and 12 Joint Readiness Training Center, Fort Polk, Vernon Parish, Louisiana, 2013:** Ms. Poche conducted historical research on the project area, and prepared the historic period chapter in the report. She also conducted the artifact analysis, prepared the artifact discussion and photographs, and prepared the collection for turnover to the base. (Contract # W912QR-08-D-0011)

**Historian/Archaeology Laboratory Supervisor, Dyno Nobel Louisiana, LLC at Cornerstone Chemical's Fortier Manufacturing Complex, Waggaman, Jefferson Parish, Louisiana, 2013:** Ms. Poche conducted archival and historical research on the project area, and prepared the historic period chapter in the report. She also conducted the artifact analysis for the historic



period artifacts, prepared the artifact discussion and photographs, and supervised the curation of the collection.

**Historian/Archaeology Laboratory Supervisor, Proposed Leaching and Separation Plants, Avalon Rare Metals, Inc., Geismar, Ascension Parish, Louisiana, 2013:** Ms. Poche conducted archival and historical research on the project area, and prepared the historic period chapter in the report. She also conducted the artifact analysis for the historic period artifacts, prepared the artifact discussion and photographs, and supervised the curation of the collection.

**Historian/Archaeology Laboratory Supervisor, NRG Petro-Nova 80 Mile Pipeline Project, Fort Bend, Wharton, and Jackson Counties Texas, 2012:** Ms. Poche was responsible conducting historic research and preparing the discussion on the history of the study area. She also conducted the artifact analysis and report discussions for six archaeological sites identified during the course of the project.

**Historian, SELA Historic Landscape Planning Study – Right-of-Way on Jefferson Avenue from South Claiborne Avenue to Constance Street and Prytania Avenue from Jefferson Avenue to Nashville Avenue, Orleans Parish, Louisiana, 2012-2013:** Ms. Poche conducted archival and historic research for the portion of Jefferson Avenue between South Claiborne Avenue and Constance Street as well as Prytania Street between Jefferson Avenue and Nashville Avenue. She also prepared the discussions focusing on the vegetation types, encaustic tiling, historic granite and slate curbing, and lighting units present along the entirety of the project area. (Contract # W912P8-09-D-0041)

**Historian, SELA Historic Landscape Planning Study – Right-of-Way on Napoleon Avenue from South Claiborne Avenue to Constance Street, Orleans Parish, Louisiana, 2011-2012:** Ms. Poche conducted archival and historic research for the portion of Napoleon Avenue between Carondelet Street and Constance Street, in addition to preparing the historic discussion for this area. She also prepared the discussions focusing on the vegetation types, encaustic tiling, historic granite curbing, and lighting units present along the entirety of the project area. (Contract # W912P8-09-D-0041)

**Historian/Archaeology Laboratory Supervisor, Enbridge Energy Proposed 35.2 Mile Long Line 79, Ingham, Jackson, and Washtenaw Counties, Michigan, 2011-2012:** Ms. Poche conducted historical research and prepared the historical discussions for the project area and adjacent communities. In addition to this, she also conducted the artifact analysis, and prepared the artifact discussions and photographs for the report.

**Historian/Archaeology Laboratory Supervisor, Main Street, LLC - Phase III Investigations, Louisiana, 2011-2012:** Ms. Poche was responsible for conducting archival and chain of title research for the study area, as well as preparing discussion on the history of the property located in downtown Baton Rouge. She conducted also the artifact analysis of over 6,500 historic artifacts collected from the site, prepared the artifact discussions and photographs for the report. In addition to this, Ms. Poche prepared the state catalog sheets, field paperwork, and photographs for turnover to the State of Louisiana.

## **Chronology**

5/2008-Present: URS Corporation, Baton Rouge, Louisiana



10/2002-05/2008: R. Christopher Goodwin & Associates, Frederick, Maryland  
and New Orleans, Louisiana offices

**Contact Information**

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Baton Rouge, LA 70806  
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