

### 3.0 AFFECTED ENVIRONMENT

The project study area boundary for the LA 70 Bypass defines the geographic area discussed in this chapter (see **Figure 1** in Chapter 1.1). While the study area includes a linear strip of land south of LA 70, no bypass alternatives were developed south of LA 70 due to potential impacts to wetlands and instability and subsidence concerns associated with salt dome activities. All agency correspondence noted in this chapter are included as **Appendix A** in chronological order, unless stated otherwise.

#### 3.1 Project Setting

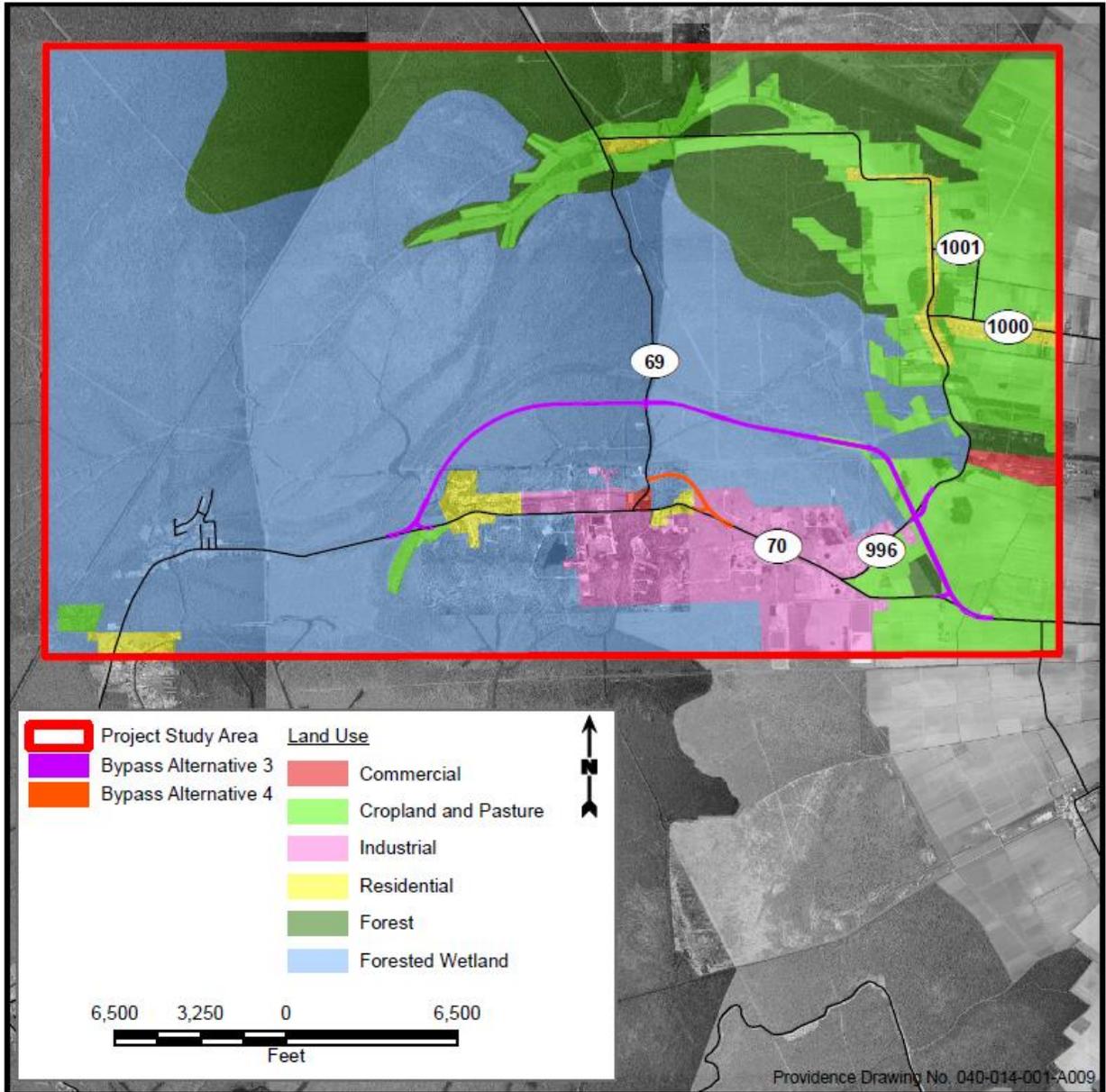
The proposed project is in the northern portion of Assumption Parish, which is located in south Louisiana, with Bayou Lafourche and the Mississippi River to the east, Belle River and the Atchafalaya River to the west, and United States Highway 90 to the south. Assumption Parish's history is tied to Native Americans, agriculture, and periods of French and Spanish settlement. The Chitimacha tribe, considered to be the largest of the tribes in the parish, was virtually replaced by French and Spanish settlers by the mid-1800s. Trapping and sugarcane farming supported early settlers, who built sugar plantations that continue to bring visitors from all over the state and beyond to Assumption Parish. Sugarcane remains one of the parish's most profitable enterprises ("About Assumption Parish," 2011).

Due to its location between the Mississippi River, Bayou Lafourche, and the Atchafalaya River, Assumption Parish is uniquely suited not only to agricultural, but also industrial pursuits and ecotourism. In addition to its surviving historic plantation homes, the parish boasts the oldest church in the state of Louisiana. Built in 1793, the Church of the Assumption of the Blessed Virgin Mary is located in Plattenville on the east bank of Bayou Lafourche ("About Assumption Parish," 2011 and "Church History," 2014). Petroleum and agricultural related industries including marine fabrication and sugar processing support the parish's population. There is a nature trail in Bayou L'Ourse, Elm Hall Wildlife Management Area southwest of Napoleonville and east of north Lake Verret, and numerous lakes and bayous between Pierre Part/Belle River and Lake Verret ("Destination Louisiana," 2014).

#### 3.2 Land Use and Development Trends

The project study area encompasses approximately 20,419 acres in Assumption Parish. Current land use is represented in **Figure 4**. As demonstrated in the figure, predominant land use in the vicinity of the project is forested wetlands, cropland/pasture, or industrial related to mineral resources (brine mining and injections wells).

**FIGURE 4  
LAND USE**



*Land Use Land Cover Data obtained from the USGS data set and modified based on aerial investigations. Base map provided by CB&I on 4/15/14.*

### **3.3 Community Facilities and Services**

#### ***Schools***

There are no schools located directly adjacent to any of the highways in the study area. However, LA 70 is utilized to transport high school students from Pierre Part to Assumption Parish High School in Napoleonville, Louisiana.

#### ***Day Cares***

No day care facilities were observed in the study area.

#### ***Libraries***

No libraries were observed or listed for the project study area.

#### ***Parks and Recreation Areas***

No public parks were observed within the project area boundaries. However, a private recreation facility, No Problem Race Park, is located off of LA 996 and is partially contained in the project study area. No Problem Race Park is a 200-acre multi-use sports complex that sponsors drag and road racing. The facility also leases garages, recreational vehicle parking, campgrounds, and concessions. Cajun Cabins and Sportsman Landing, located at 1491 LA 70 along Bayou Corne, provide cabins for overnight guests and boat launch facilities.

#### ***Houses of Worship and Cemeteries***

No churches were observed or listed for the project study area. However, St. Martins Cemetery is located in the project study area adjacent to Dugas Road.

#### ***Police and Fire***

No police or fire stations were observed or listed for the project study area.

#### ***Hospitals***

No hospitals are located on or adjacent to LA 70 in the study area.

#### ***Public Transportation***

No public transportation facilities are located off of LA 70 in the project study area.

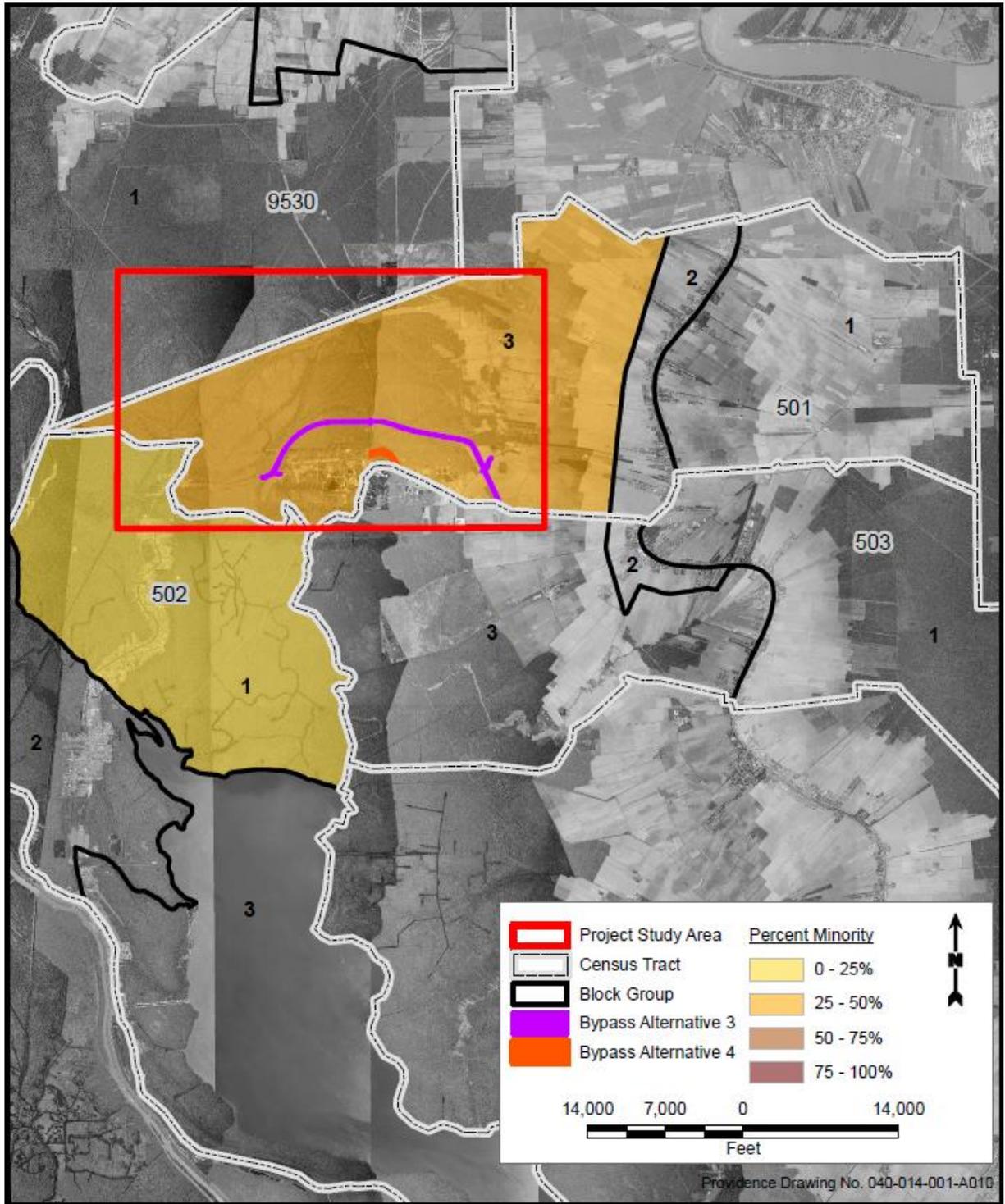
### **3.4 Community Demographic**

Community demographic information was obtained from the United States Census Bureau's (USCB) 2010 Census and the 2008-2012 American Community Survey (ACS) 5-Year Estimates. A majority of the project study area falls within Census Tract 501, Block Group 3 and Census Tract 502, Block Group 1 in Assumption

Parish. The remainder of the project study area is in Census Tract 503, Block Group 3 and Census Tract 9530, Block Group 1. However, demographic data was not obtained for these two tracts because the residential areas are outside of the project study area.

In accordance with the Federal Highway Administration (FHWA) Order 6640.23A and the United States Department of Transportation (DOT) Order 5610.2(a), a minority means a person who is Black, Asian American, American Indian/Alaskan Native, Native Hawaiian/Other Pacific Islander, or Hispanic (regardless of race). Therefore, the total population minus the "white alone" population was used to determine the minority population. **Figure 5** and **Table 3-1** provide details on the minority population present in the block groups that comprise the project study area. **Table 3-2** provided demographic data for these tracts relating to housing units, educational attainment, age groups, and language spoken. This data was available on the USCB's American Fact Finder (AFF) website and is the most recent data currently available for the project study area.

**FIGURE 5  
MINORITY DATA**



*The minority data for Census Tract 503, Block Group 3 and Census Tract 9530, Block Group 1 are not included because the residential areas are primarily located outside the project study area. Minority data obtained from USCB, 2010 Census Summary File 1 (SF1) 100-Percent Data, Table P9. Base map provided by CB&I on 4/15/14.*

TABLE 3-1  
POPULATION DATA

Census Tracts within the Project Study Area <sup>(1)</sup>	Block Groups within the Study Area	Subject	Total Population (all races)	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races	Hispanic <sup>(2)</sup>	Minority Calculation
Tract 501	3	Number	978	731	210	4	4	0	0	4	25	247
		Percent	-	74.7%	21.5%	0.4%	0.4%	0.0%	0.0%	0.4%	2.6%	25.3%
Tract 502	1	Number	2,336	2,265	9	18	12	0	0	12	20	71
		Percent	-	97.0%	0.4%	0.8%	0.5%	0.0%	0.0%	0.5%	0.9%	3.0%

**NOTES:**

1. Since all Hispanics regardless of race are considered a minority, the population with Hispanic ethnicity is identified in this column, and all the other race categories do not include Hispanic ethnicity.
2. Data was not obtained for Census Tracts 503 and 9530 because the residential areas are located outside the project study area.

Source: USCB, 2010 Census Summary File, 100-Percent Data, Table P9: Hispanic or Latino, and Not Hispanic or Latino by Race

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**TABLE 3-2  
DEMOGRAPHIC DATA**

Census Tracts within the Project Study Area	Tract 501		Tract 502	
	Estimate	Percent	Estimate	Percent
<b>Housing Data</b>				
Total housing units	1,664	-	2,875	-
Occupancy status				
Occupied housing units	1,324	79.6%	2,344	81.5%
Vacant housing units	340	20.4%	531	18.5%
<b>Tenure</b>				
Occupied housing units	1,324	-	2,344	-
Owner occupied	1,035	78.2%	2,101	89.6%
Renter occupied	289	21.8%	243	10.4%
<b>Educational Attainment</b>				
Population 25 years and over	2,368	-	3,931	-
Less than 9th grade	352	14.9%	937	23.8%
9th to 12th grade, no diploma	277	11.7%	451	11.5%
High school graduate (includes equivalency)	1,014	42.8%	1,775	45.2%
Some college, no degree	430	18.2%	356	9.1%
Associate's degree	139	5.9%	189	4.8%
Bachelor's degree	139	5.9%	131	3.3%
Graduate or professional degree	17	0.7%	92	2.3%
No diploma or equivalency	629	26.6%	1,388	35.3%
High school graduate (includes equivalency) or higher	1,739	73.4%	2,543	64.7%
<b>Age Groups</b>				
Total Population	3,568	-	5,445	-
0-9 years	464	13.0%	547	10.0%
10-19 years	550	15.4%	506	9.3%
20-24 years	186	5.2%	461	8.5%
25-44 years	972	27.2%	1,226	22.5%
45-64 years	918	25.7%	1,784	32.8%
65 years and over	478	13.4%	921	16.9%
<b>Language Spoken at Home</b>				
Population 5 years and over	3,313	-	5,274	-
English only	2,773	83.7%	3,534	67.0%
Language other than English	540	16.3%	1,740	33.0%

**NOTES:**

1. Although the ACS produces population demographic and housing unit estimates, it is the USCB Population Estimates Program that produces and disseminates the official intercensal estimates of the population for the nation, states, counties, cities, and towns and estimates of housing units for states and counties.
2. An estimated margin of error was given for each category and is available on the AFF website.
3. Data was not obtained for Census Tracts 503 and 9530 because the residential areas are located outside the project study area.

Sources: USCB, 2008-2012 ACS 5-Year Estimates, Table DP02, DP04, and DP05.

### 3.5 Employment and Economic Trends

Of the parish's approximate population of 23,000 people, the labor force is approximately 18,000 individuals earning an average salary of \$33,676 ("Economy"). The parish's economy is rooted in agricultural, with sugar related industries supporting a large number of employees. The school board and other parish community services such as police employ the highest number of individuals ("Economy"). Fabrication and chemical industries including McDermott and Dow Grand Bayou utilize the parish's labor force to support their ventures. Recreational interests including fishing and hunting also provide employment and tax dollars to the parish. Located in Belle Rose, No Problem Race Park is a multi-use sports park featuring drag and road racing events as well as camping, garages, and food outlets that brings visitors and tax dollars to the parish.

**Table 3-3** provides economic and employment details as reported by the USCB ACS 2012 5-Year Estimates for the census tracts that make up the project study area.

**TABLE 3-3  
EMPLOYMENT AND ECONOMIC STATUS**

Location	Tract 501		Tract 502	
	Estimate	Percent	Estimate	Percent
<b>Employment Status</b>				
Population 16 years and over	2,658	-	4,623	-
In labor force	1,494	56.2%	2,647	57.3%
Civilian labor force	1,494	56.2%	2,647	57.3%
Employed	1,356	51.0%	2,367	51.2%
Unemployed	138	5.2%	280	6.1%
Armed Forces	0	0.0%	0	0.0%
Not in labor force	1,164	43.8%	1,976	42.7%
<b>Occupation</b>				
Civilian employed population 16 years and over	1,356	-	2,367	-
Management, business, science, and arts occupations	301	22.2%	610	25.8%
Service occupations	164	12.1%	147	6.2%
Sales and office occupations	184	13.6%	495	20.9%
Natural resources, construction, and maintenance occupations	330	24.3%	439	18.5%
Production, transportation, and material moving occupations	377	27.8%	676	28.6%
<b>Industry</b>				
Civilian employed population 16 years and over	1,356	-	2,367	-
Agriculture, forestry, fishing, hunting, and mining	143	10.5%	97	4.1%
Construction	233	17.2%	521	22.0%
Manufacturing	241	17.8%	227	9.6%
Wholesale trade	72	5.3%	34	1.4%
Retail trade	35	2.6%	175	7.4%
Transportation, warehousing, and utilities	102	7.5%	179	7.6%
Information	0	0.0%	126	5.3%
Finance and insurance, and real estate and rental and leasing	20	1.5%	112	4.7%
Professional, scientific, management, administrative, and waste management	26	1.9%	353	14.9%
Educational services, health care, and social assistance	269	19.8%	355	15.0%
Arts, entertainment, recreation, accommodation, and food services	86	6.3%	75	3.2%
Other services, except public administration	66	4.9%	78	3.3%
Public administration	63	4.6%	35	1.5%
<b>Income and Benefits (in 2012 inflation-adjusted dollars)</b>				
Total households	1,324	-	2,344	-
Median household income (dollars)	31,680	-	47,261	-
Mean household income (dollars)	57,753	-	57,330	-
With earnings	837	63.2%	1,615	2.8%
With Social Security	518	39.1%	895	38.2%
With retirement income	167	12.6%	415	17.7%
With Supplemental Security Income	155	11.7%	287	12.2%
With cash public assistance income	56	4.2%	37	1.6%
With Food Stamp/SNAP benefits in the past 12 months	305	23.0%	327	14.0%

**NOTES:**

1. An estimated margin of error was given for each category and is available on the AFF website.
2. Data was not obtained for Census Tracts 503 and 9530 because the residential areas are located outside the project study area.

Source: USCB, 2008-2012 ACS 5-Year Estimates, Table DP03: Selected Economic Characteristics

### 3.6 Environmental Justice Analysis

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), specifies actions to be taken on a range of issues that are intended to promote nondiscrimination in federal actions to provide minority and low-income communities equal access to public information regarding a federal action, and to provide an opportunity for public participation in the evaluation of a federal action in matters relating to human health and the environment. The FHWA Order 6640.23A and the DOT Order 5610.2(a) establishes policies and procedures for these agencies to use in complying with Executive Order 12898. As discussed in Chapter 3.4, the term “minority” is defined as a person who is Black, Asian American, American Indian/Alaskan Native, Native Hawaiian/Other Pacific Islander, or Hispanic (regardless of race). “Low-Income” is defined as a person whose median household income is at or below the United States Department of Health and Human Services poverty guidelines.

A demographic profile for the census tracts comprising the project study area was prepared to answer the following questions posed by Executive Order 12898:

- Does the potentially affected community include minority and/or low-income populations?
- Are the environmental impacts likely to fall disproportionately on minority and/or low-income members of the community and/or tribal resources?

The population/minority and poverty data obtained from the USCB AFF website are summarized in **Tables 3-1** and **3-4** and illustrated on **Figures 5** (see Chapter 3.4) and **6**. Based on the data found, Census Tracts 501 and 502 do not support a low-income or minority population. Data was not obtained for Census Tracts 503 and 9530 because residential areas are located outside the project study area.

**TABLE 3-4  
POVERTY STATUS IN THE PAST 12 MONTHS**

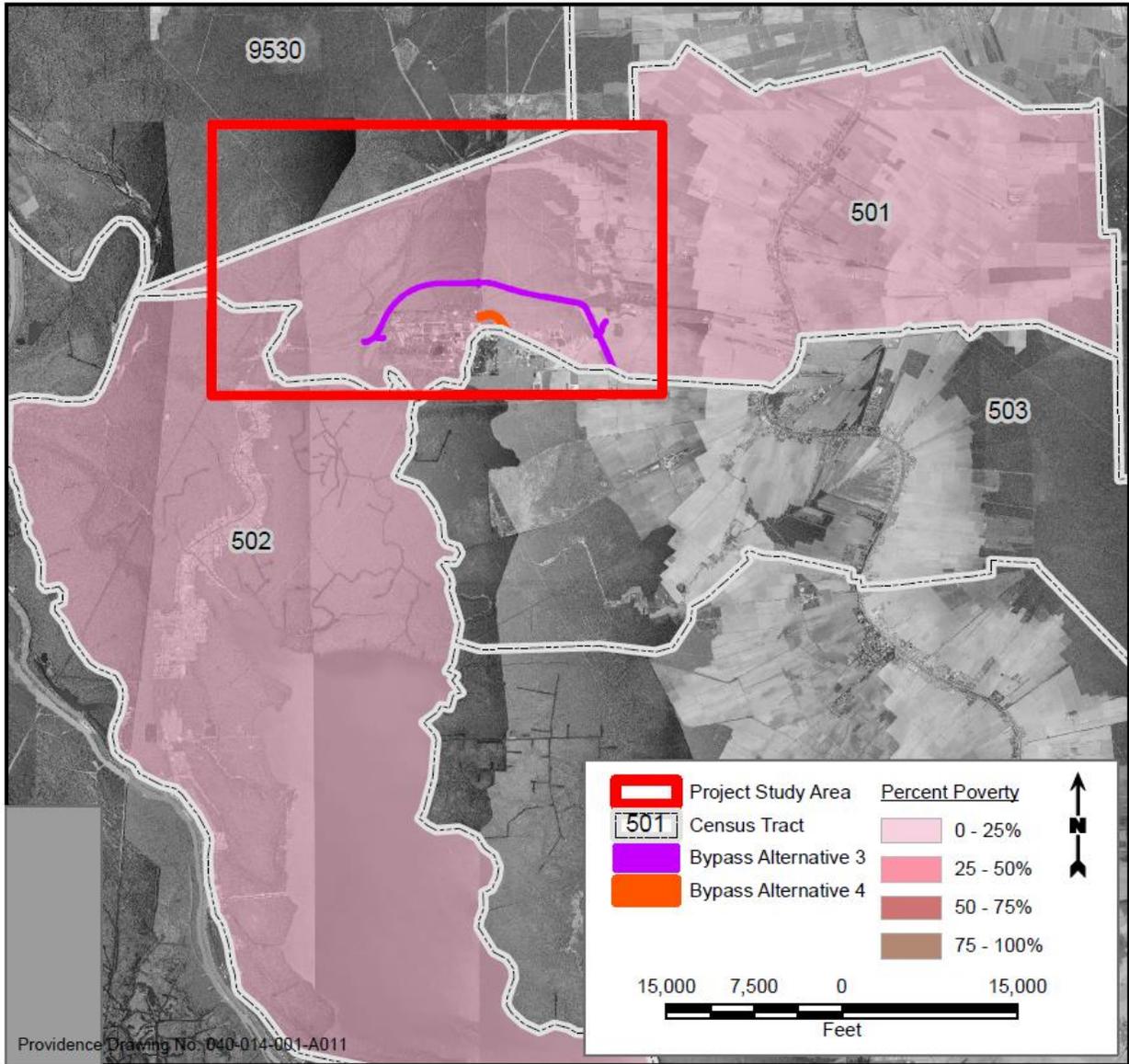
Census Tracts within the Project Study Area	Subject	Population for whom Poverty Status is Determined <sup>(1)</sup>
Tract 501	Total Population Status Determined	3,568
	Below Poverty Level	777
	Percent Below Poverty Level	21.8%
Tract 502	Total Population Status Determined	5,445
	Below Poverty Level	678
	Percent Below Poverty Level	12.5%

**NOTES:**

1. An estimated margin of error was given for each category and is available on the AFF website.
2. Data was not obtained for Census Tracts 503 and 9530 because residential areas are located outside the project study area.

Source: USCB, 2008-2012 ACS 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months

**FIGURE 6  
POVERTY DATA**



The poverty data for Census Tracts 503 and 9530 are not included because the residential areas are primarily located outside the project study area. Poverty data obtained from the USCB, 2006-2010 ACS 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months. Base map provided by CB&I on 4/15/14.

### 3.7 Public Lands and Recreation

The project study area does not support any state parks or wildlife management areas, nor does it support any federally protected lands, such as wildlife refuges or national parks. There are no parish or community parks located in the project study area. This information was confirmed with the USFWS *Information, Planning, and Conservation System* database. Privately-owned parks and recreation areas are further discussed in Chapter 3.2. A letter from the LDWF received on

December 4, 2013 confirms there are no state or federal parks, wildlife refuges, or wildlife management areas located in or within a quarter mile of the project area.

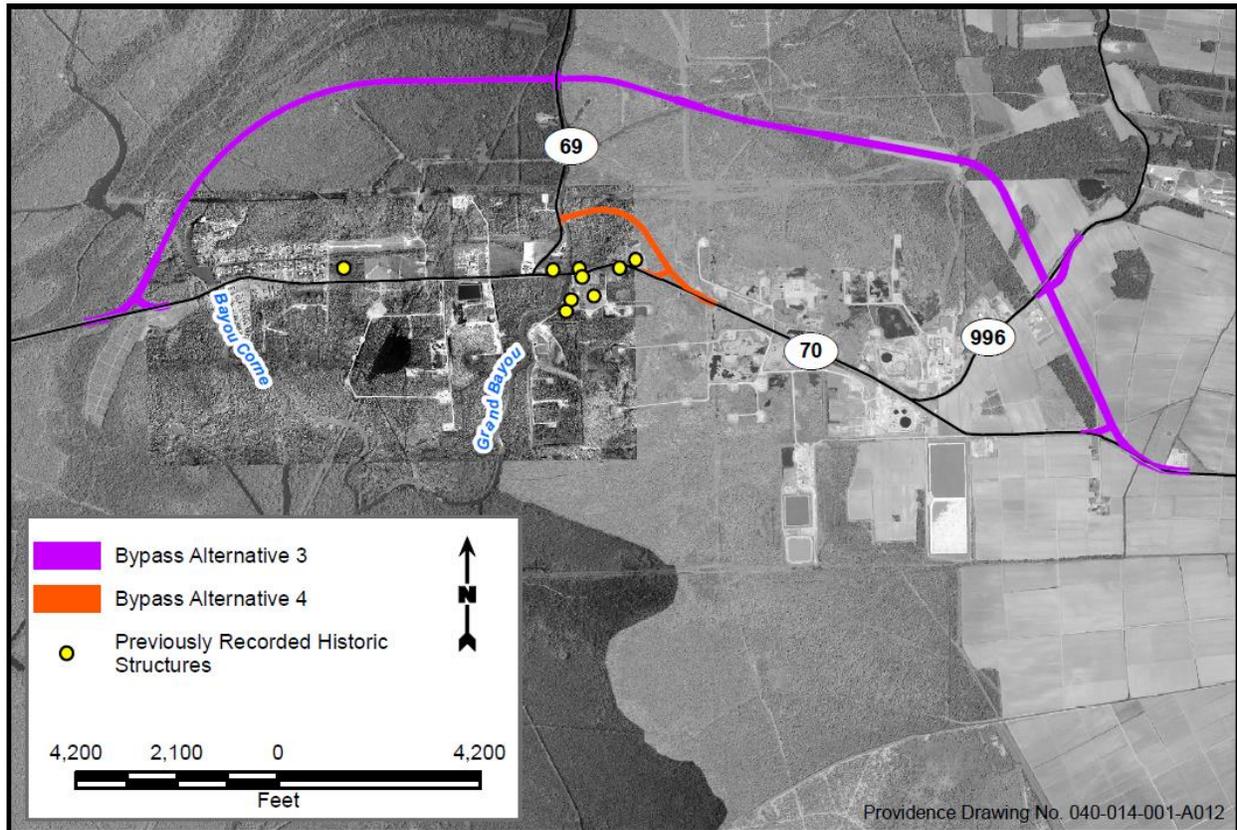
### **3.8 Cultural Resources**

A preliminary cultural resources assessment was conducted for the project study area using the Louisiana Department of Cultural, Recreation, and Tourism's (LDCRT's) Louisiana Cultural Resources Map Geographic Information System (GIS) database and the National Register of Historic Places (NRHP) database for previously recorded historic structures and archeological sites and properties. Based on this preliminary search, nine archeological sites were found within the project study area. For confidentiality reasons, these archeological sites are not allowed to be shown on a figure. The previously recorded historic structures can be seen in **Figure 7**.

The State Historic Preservation Officer's (SHPO's) response, dated December 20, 2013, stated no known historic properties will be affected by this project. Correspondence with the Jena Band of Choctaw Indians, dated December 30, 2013, stated they had no concerns at the time of the letter. However, if any culturally significant artifacts are discovered, their office should be contacted immediately. The Choctaw Nation of Oklahoma was also contacted, and a letter dated December 27, 2013 stated Assumption Parish is outside of their historic area of interest in Louisiana.

TRC Environmental Corporation (TRC) performed a Phase I cultural resource investigation on the two build alternatives, which is described in further detail in Chapter 4.9.

**FIGURE 7  
CULTURAL RESOURCES**



*Archeological sites were found in the Project Study Area; however they are not displayed due to confidentiality reasons. Historical Structures information was obtained from TRC on 6/3/14. Base map provided by CB&I on 4/15/14.*

### 3.9 Section 4(f) and or 6(f) Properties

Title 49 United States Code (USC) Section 303, previously Section 4(f) of the DOT Act of 1966, and 23 Code of Federal Regulations (CFR) 774 state that the DOT and the FHWA, agencies may not approve the use of land from significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites. However, a taking may be approved if a determination is made that there is no feasible and prudent alternative to the use of the land and the action includes all possible planning to minimize harm to the property resulting from use. The FHWA determines the application of Section 4(f) unless the federal, state, or local officials having jurisdiction over the land determines that the entire site is not significant. In the absence of a determination, the Section 4(f) land is presumed to be significant. The Safety, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, Section 6009 simplified the process and approval for projects that have only *de minimis* impacts. No publicly owned parks, recreational areas, or wildlife and waterfowl refuges were found in the project study area. As mentioned in Chapter 3.7, a letter from LDWF received on December 4, 2013 confirms there are no wildlife refuges in the project study area. The United States Department of the Interior (DOI), National Park Service's (NPS's) Land and Water Conservation Fund (LWCF) provides grants to state and

local governments for the acquisition and development of public outdoor recreation areas and facilities. Section 6(f) of the Land Water Conservation Act (CFR Title 36, Chapter 1, Part 59) requires the acquisition of Section 6(f) lands and facilities be coordinated with the DOI. Typically, replacement in kind is required for acquisition of Section 6(f) lands and facilities. The identification of Section 6(f) properties in the project area was conducted through written consultation with the LDCRT Office of State Parks and the NPS's LWCF website.

A search conducted through the NPS's LWCF website revealed that three LWCF grants have been issued for parks and recreation facilities in Assumption Parish since 1980. None of the facilities listed are in or adjacent to the project study area. The cultural resources report searched for properties meeting the criteria for Section 4(f) or 6(f) lands, and one site, Belle River Recreation Complex of Pierre Part, was identified within the project study area. Correspondence with the LDCRT dated May 27, 2014 concurs with the findings that the Belle River Recreation Complex is the only LWCF grant property located in the project study area.

### **3.10 Visual Environment**

The visual environment of the project study area in Assumption Parish primarily consists of forested wetlands, commercial enterprise (Gator Gold Casino and Truck Stop), agricultural ventures, subsurface mining/injection facilities, and residential areas.

### **3.11 Geology/Topography**

According to the USDA's *Soil Survey of Assumption Parish*, Assumption Parish lies in south-central Louisiana entirely within the Mississippi River alluvial plain. The parish's elevation is highest near the natural levees of Bayou Lafourche (23 feet above mean sea level [MSL]) and lowest in the swamps associated with Lake Verret (sea level). More than 60 percent of the area of Assumption Parish is water or flooded wetlands. There are two notable physiographic features, including natural levees and back swamps.

The project study area has elevations ranging from two-feet below MSL to sixteen feet above MSL. Most of the project area has an elevation of 2 feet above MSL.

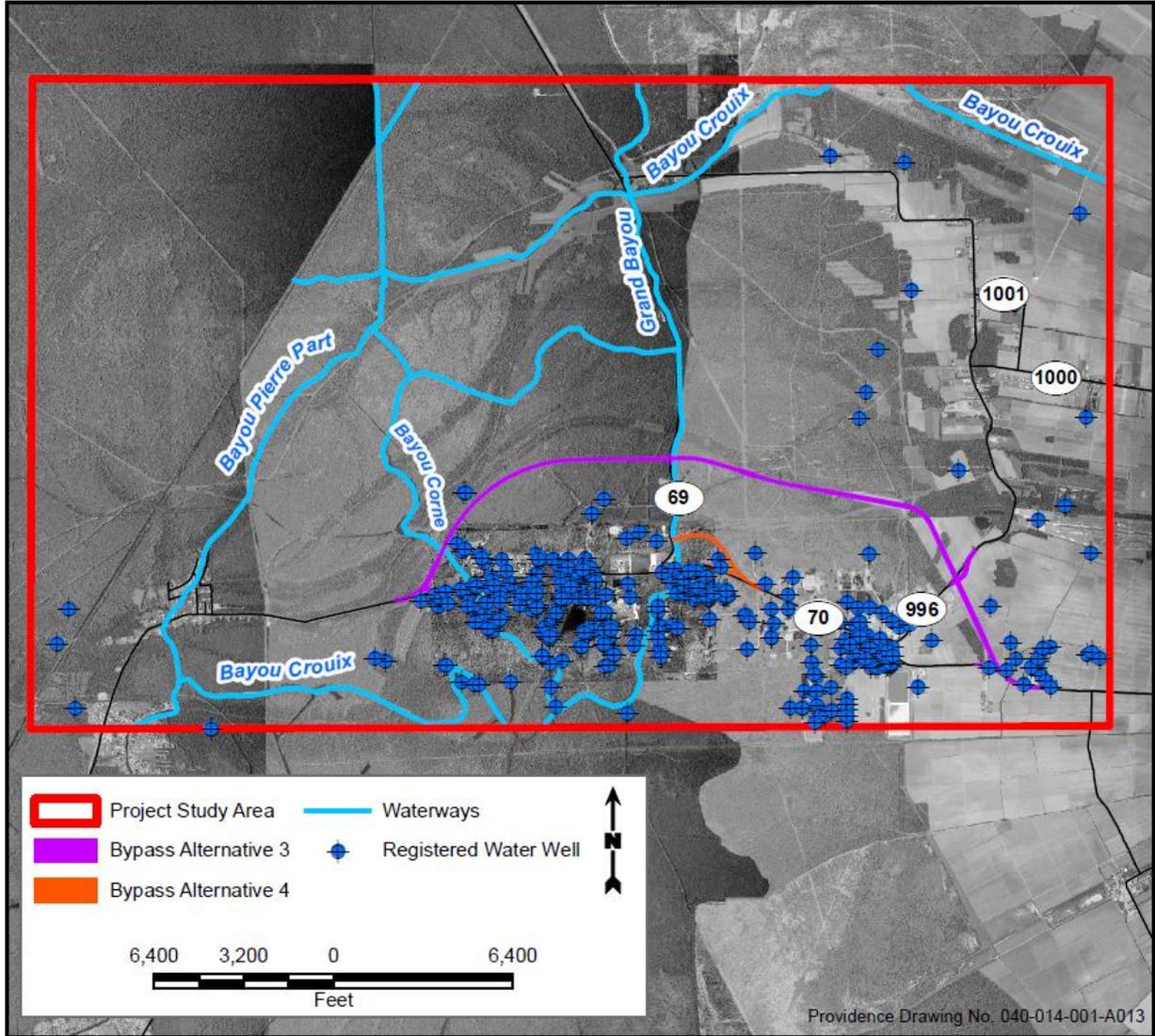
### **3.12 Water Resources**

#### **3.12.1 Surface Water**

In 2010, 12.4 million gallons per day of surface water was withdrawn in Assumption Parish. Bayou Lafourche and Lake Verret accounts for over 97% of the surface water withdraws (Prakken and Lovelace, 2014). Surface water exists in the study area in wetlands and also includes Bayou Corne, Grand Bayou, and Bayou Choupique. **Figure 8** shows area water resources. Water quality in the study area is affected by both naturally occurring conditions and point source and nonpoint source discharges. Point sources include mainly industrial and sewer discharges. Nonpoint

sources may include storm water runoff, industrial discharges, landscape maintenance activities, forestry activities, agricultural discharges, and natural sources.

**FIGURE 8  
WATER RESOURCES**



Registered water wells obtained from the LDNR SONRIS water well server as of 12/2/14. Base map provided by CB&I on 4/15/14.

The following subsegments of the Terrebonne Water Quality Basin drain the project study area:

- Subsegment 120206, which consists of Grand Bayou and Little Grand Bayou from headwaters to Lake Verret
- Subsegment 120201, which consists of Lower Grand River and Belle River from Bayou Sorrel Lock to Lake Palourde

According to the *2012 Louisiana Water Quality Inventory: Integrated Report - Fulfilling the Requirements of the Federal Clean Water Act Sections 305(b) and 303(d)*, designated uses for both subsegments are primary contact recreation, secondary contact recreation, and fish and wildlife propagation. Subsegment 120201 is meeting its designated use for all designated uses. Subsegment 120206 is meeting its designated use for secondary contact recreation but not for primary contact recreation, or fish and wildlife propagation. Suspected causes of impairment for Subsegment 120206 include municipal point source discharges, natural sources, on-site treatment systems (septic systems and similar decentralized systems), unpermitted discharge (domestic waste), and unknown sources. Neither subsegment is included in Louisiana's 2012 303(d) list of impaired water bodies.

As a result of the sinkhole, surface water and groundwater quality is being monitored daily by multiple entities including Acadian Gas, Chevron, Crosstex, Dow Chemical, K/D/S Promix, Occidental Chemical, and Texas Brine to determine long term effects of the sinkhole. All companies are monitoring wells in the area. Acadian Gas and Chevron are also monitoring gas withdrawal, and Texas Brine is monitoring sinkhole containment, shallow gas, and salt dome stability and conducting berm inspection. Since February 2013, the sinkhole has been contained by an earthen berm system. According to Texas Brine, approximately 5,274 water samples have been taken, and sinkhole surface water quality has improved along with a decrease in dissolved constituents in bayou and swamp water ("Response Progress and Priorities: Fact Sheet," 2014). This is further discussed in Chapter 4.12.

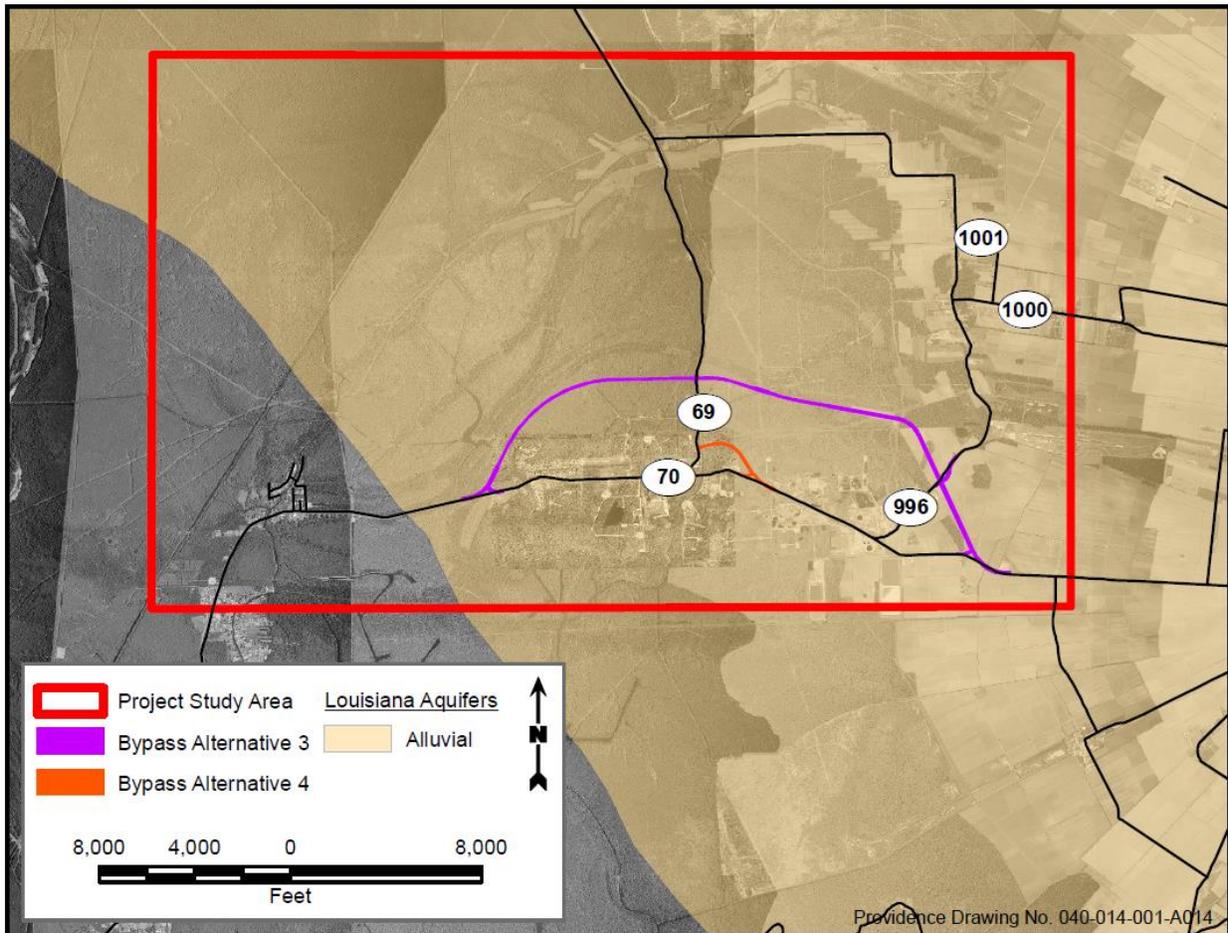
### **3.12.2 Groundwater**

According to the United States Environmental Protection Agency (USEPA), a Sole Source Aquifer (SSA) is an aquifer that would normally supply at least 50 percent of the drinking water for a particular community or area where no viable alternative drinking water sources exist. The project study area is not located above a designated SSA. Correspondence received from the USEPA's SSA Program dated December 12, 2013 confirms that no review under the SSA program is required.

The project study area is located over the Mississippi River Alluvial Aquifer (MRAA). According to the United States Geological Survey (USGS), this portion of the aquifer is not considered fresh groundwater due to the

chloride concentrations exceeding 250 milligrams per liter. Portions of the eastern end of the alternative have an approximate altitude of 100 and 199 feet base of fresh groundwater, which contains 250 milligrams of chlorine or less. However, groundwater withdrawn in the area is not used for public water supply. In 2010, 9.03 million gallons per day of groundwater was withdrawn in Assumption Parish. Over 95% of the groundwater was for industrial use, and less than 5% was withdrawn for rural domestic, general irrigation, and aquaculture (Prakken and Lovelace, 2014). **Figure 9** demonstrates the limits of area aquifers and aquifer recharge potential.

**FIGURE 9  
AQUIFERS AND RECHARGE POTENTIAL**



*A search for Sole Source Aquifers (SSA) was performed, and no SSAs were found in the project study area. Aquifer data comprised of Recharge Potential of Louisiana Aquifers, LDEQ (1999). Base map provided by CB&I on 4/15/14.*

A Public Water System (PWS) is any water system that provides water to at least 25 people for at least 60 days annually. A search was performed using the LDNR’s Strategic Online Natural Resources Information System (SONRIS) databases for PWS wells located within the project study area. The SONRIS database includes all water wells registered with the DOTD. All water wells identified are shown in **Figure 8** (see Chapter 3.12.1) and are detailed in **Table 3-5**. This search was conducted on December 2, 2014; it is possible that additional wells have been drilled but are not registered.

There are no PWS wells within the project study area. A letter from the LDNR dated December 19, 2013 confirms that there are water wells in the vicinity of the project area.

**TABLE 3-5  
REGISTERED WATER WELLS IN THE PROJECT STUDY AREA**

Well Type	Quantity
Monitor	261
Plugged and Abandoned Industrial	41
Unknown	18
Plugged and Abandoned Recovery	16
Plugged and Abandoned Rig Supply	15
Industrial	12
Oil/Gas Well Rig Supply	10
Industrial Chemical Manufacturing	8
Plugged and Abandoned Monitor	5
Environmental Recovery	3
Destroyed Domestic	2
Heat Pump Hole	2
Irrigation	2
Piezometer	2
Plugged and Abandoned Domestic	2
Plugged and Abandoned Piezometer	2
Aquaculture	1
Domestic	1
Industrial Petroleum Refining	1
Plugged and Abandoned	1
<b>TOTAL</b>	<b>405</b>

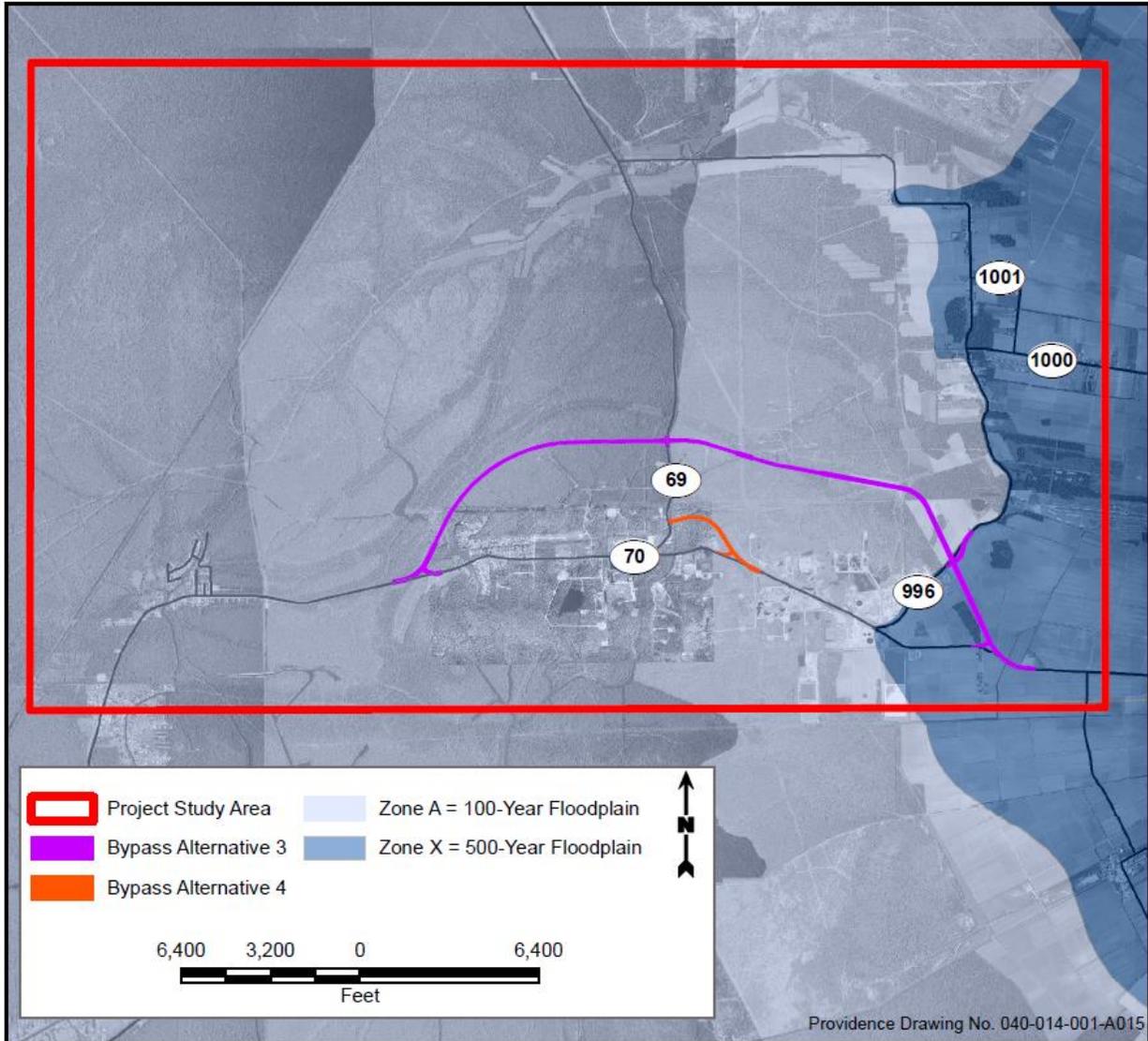
**3.12.3 Observation Relief Wells (ORWs)**

Of the 261 monitor wells identified in **Table 3-5**, 60 are ORWs located in the project study area. The collapse of the brine cavern that led to the formation of the sinkhole also created pathways from deeper formations allowing natural gas to release into the MRAA. The MRAA is composed of sand and gravel beginning 100 feet below the ground surface. Natural gas has migrated into the surface soils above the MRAA within a two-square-mile area around the collapsed cavern and sinkhole. Shallow ORWs were installed in an effort to vent the gas. State and local agencies expressed concern regarding the water quality of the MRAA. According to the Texas Brine *ORW Fact Sheet*, dated June 2014, ORW's are being utilized to target aquifer gas accumulations. A total of 51 ORW's have been installed, and 26 are currently connected to flare lines. A total of 32 million cubic feet of gas has been vented to date. Texas Brine provided another update on December 18, 2014 showing 53 ORWs now exist, and a total of 37.5 million cubic feet of gas has been vented to date (“Response Progress and Priorities: Fact Sheet”).

### 3.13 Floodplains

Federal Emergency Management (FEMA) Flood Insurance Rate Maps (FIRMS) were used to determine the extent of the 100-year floodplain in the project study area. **Figure 10** shows the 100-year floodplain consisting of 17,590 acres within the project study area.

**FIGURE 10  
FLOODPLAINS**

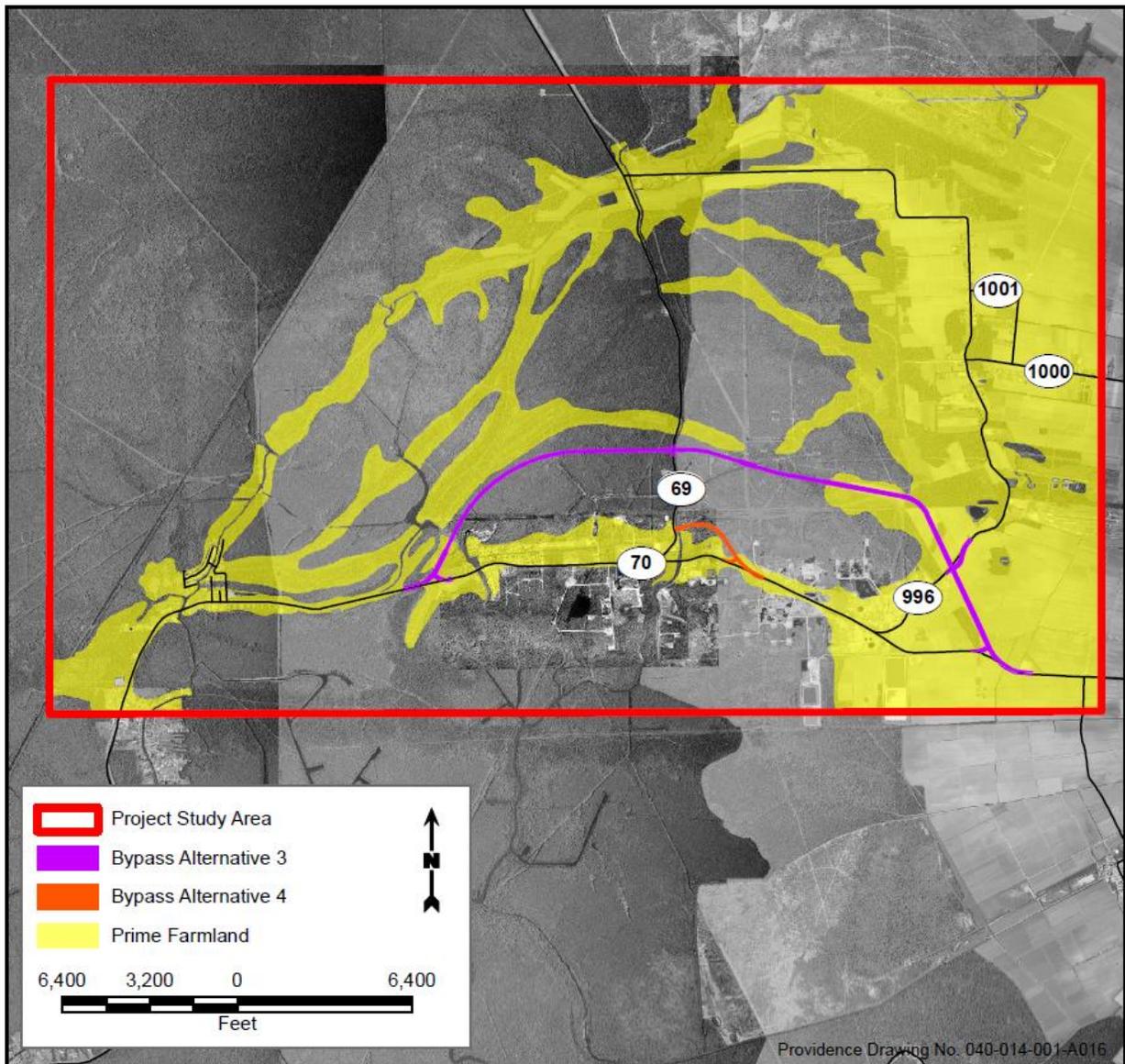


*The Q3 Flood Data was obtained from the Flood Insurance Rate Maps (FIRMS) published by FEMA. Base map provided by CB&I on 4/15/14.*

### 3.14 Farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Per preliminary correspondence from the Natural Resources Conservation Service (NRCS) dated December 12, 2013, prime farmland may be affected by the project. However, no impacts to NRCS projects are anticipated. **Figure 11** show prime farmland data obtained from the NRCS Web Soil Survey within the project study area.

**FIGURE 11  
PRIME FARMLANDS**



*Soils data obtained from the NRCS data-server as of 6/11/09. Base map provided by CB&I on 4/15/14.*

### 3.15 Noise

According to the FHWA's Highway Traffic Noise: Analysis and Abatement Guidance, sound is when an object moves and the movement causes vibrations of the molecules in the air to move in waves. We hear what we call sound when the vibration reaches our ears. Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. Sound pressure levels used to measure the intensity of sound are described in terms of decibels (dB). Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear. Therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting decibels (dBA). Generally, when the sound level exceeds the mid-60 dBA range, outdoor conversation in normal tones at a distance of three feet becomes difficult.

Because traffic sound levels are never constant due to the changing number, type, and speed of vehicles, a single value is used to represent the average or equivalent steady-state sound level (Leq). For traffic noise assessment purposes, Leq is typically evaluated over the worst one-hour period and is defined as Leq(h).

The FHWA has established noise abatement criteria (NAC) for various land use activity categories that can be used to determine when a traffic noise impact would be expected to occur. The DOTD's noise policy defines traffic noise levels as "approaching" when the noise level is at least 1 dBA below the FHWA NAC. The DOTD policy also states a 10 dBA increase over existing levels is a substantial increase. In accordance with current FHWA noise regulations, the Traffic Noise Model (TNM) version 2.5 computer program was used to predict the noise levels associated with the proposed build alternatives including the existing, design year no-build, and design year build conditions. One hundred and thirteen noise receivers were used in the models. The traffic noise analysis is detailed further in Chapter 4.15, and a complete copy of the analysis is contained in **Appendix C**.

### 3.16 Air Quality

Air quality is measured by the type and level of pollutants in the air. The 1990 Clean Air Act Amendment requires the USEPA to set National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for pollutants considered harmful to public health and the environment. The USEPA has set NAAQS for six principal pollutants, which are called "criteria" pollutants as shown in **Table 3-6** (USEPA, NAAQS). In addition to criteria air pollutants for which there are NAAQS, the USEPA regulates air toxics which mostly originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories, refineries) (USEPA, *Pollutants and Sources*, 2013).

TABLE 3-6  
CRITERIA POLLUTANTS

Pollutant Name	Chemical Abbreviation
Ozone	O <sub>3</sub>
Carbon Monoxide	CO
Particulate Matter	PM
Nitrogen Dioxide	NO <sub>2</sub>
Sulfur Dioxide	SO <sub>2</sub>
Lead	Pb

Highway agencies are required to consider the impacts of transportation improvement projects on a regional level in the Transportation Conformity analysis and at a statewide level in the State Implementation Plan (USEPA, Transportation Conformity, 2011) for those areas that are not in attainment with current standards. The proposed project is located in Assumption Parish in Louisiana, which is currently designated as attainment or unclassifiable for all NAAQS (USEPA, “Current Nonattainment,” 2014). An air quality conformity analysis to conform to the State Implementation Plan for attainment and maintenance of the NAAQS is not required.

A solicitation of view (SOV) response from the Louisiana Department of Environmental Quality (LDEQ) dated March 10, 2014 confirms that Assumption Parish is classified as an attainment parish with the NAAQs for all criteria air pollutants and has no general conformity obligations. An air quality analysis was conducted for the bypass build alternatives and is detailed in Chapter 4.16. The full report can be found in **Appendix D**.

### 3.17 Hazardous Materials

A survey of a one mile radius of the project study area was conducted to identify sites that contain or potentially contain hazardous or toxic materials and/or wastes. Environmental Data Resource, Inc. (EDR) was contracted to provide a search of the project study area, using the standard American Society for Testing and Materials (ASTM) format for Phase I Environmental Site Assessments (ESAs). The EDR report included regulatory agency record reviews, including a search of federal and state environmental compliance databases. A list of 74 orphan wells was included in the EDR report. Public data sources were exhausted, and based on this search, it was determined that none of the 74 orphan sites were located near the alternatives. Field reconnaissance was conducted to confirm the EDR data.

The database search and regulatory agency records review were conducted to determine what, if any, information, release reporting, or registrations exist, or have been applied for, which might reveal a potential for contamination, indicate the possible presence of contamination, or assist in identifying recognized

environmental conditions in connection with the project study area. This procedure includes the examination of standard environmental record sources identified within Section 8.2.1 of ASTM Standard Practice E 1527-13, along with other appropriate agencies as deemed necessary. The databases searched include: Federal ASTM E 1527-13 Databases, Federal ASTM E 1527-13 Supplemental Databases, and State ASTM E 1527-13 Databases. Two types of sites were considered to be of particular interest for this project:

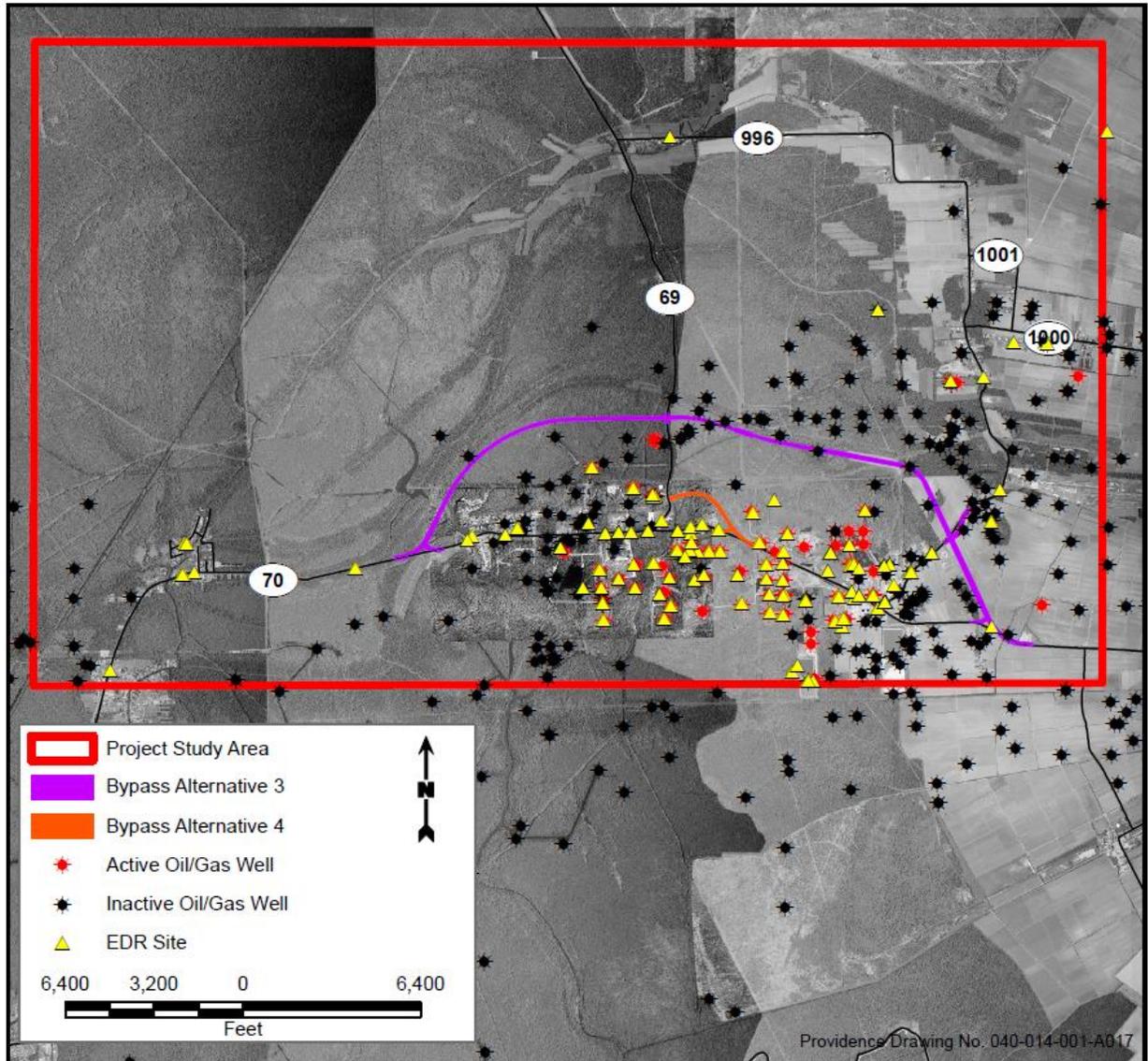
- Sites where hazardous materials or wastes are generated, stored, handled, or disposed
- Sites containing underground storage tanks (USTs)

These sites, should they be contaminated, have the potential to directly impact the project study area if located in the existing or proposed ROW, or indirectly through migration of contamination off site and into the project ROW.

### **3.17.1 Hazardous Waste Sites**

Hazardous waste is defined by 42 USC § 6903 as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.” Federal and state databases were used to identify known hazardous waste sites. Potential hazardous waste sites in the search area identified by the EDR Report are shown on **Figure 12**. All efforts were made to avoid these sites during line and grade development. A copy of the EDR report can be found in the Phase I ESA (see **Appendix E**).

**FIGURE 12  
POTENTIAL ENVIRONMENTAL LIABILITY SITES**



*Environmental liability sites obtained from EDR shapefile as of 12/19/13. Oil and gas well data obtained from the LDNR SONRIS oil and gas well server as of 12/2/14. Base map provided by CB&I on 4/15/14.*

Two Resource Conservation and Recovery Act - Small Quantity Generators are located within the boundary of the project study area. Nine Conditionally Exempt Small Quantity Generators were identified in the search area, and of those, eight are in the project study area.

The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. Thirty-three records were noted in the project study area.

The Toxic Chemical Release Inventory System database identifies facilities that release toxic chemicals to the air, water, and land in reportable quantities. One facility was identified in the project study area.

The Toxic Substances Control Act (TSCA) identifies importers and manufacturers of chemical substances on the TSCA Chemical Substance Inventory list. Three TSCA sites are located in the project study area.

The Solid Waste Facilities/Landfill Sites contains a list of solid waste disposal facilities or landfills within the state. One site was identified in the project study area.

The SPILLS is a database of spills and/or releases, to land, reported to the Emergency Response Section of the LDEQ. This list revealed nine sites in the project study area. Of these, five have an open incident status.

EDR has compiled a list of potential gas stations, gasoline stations, filling stations, auto, automobile repair, auto service stations, and service stations sites. This list comprises “High Risk Historical Records.” Nine sites falling in this category were found within the project study area.

### **3.17.2 USTs**

USTs are defined as any one or a combination of tanks used to contain regulated substances, the volume of which, including connecting underground pipes, is ten percent or more beneath the surface of the ground. The LDEQ requires by law that all USTs within the state be registered. The data search queried UST records maintained by the LDEQ.

The preliminary EDR report identified 17 UST sites in the search area, all of which are in the project study area. Of these, eight are removed USTs, eight are open, and one is closed. No Leaking USTs or Historical Incident Leaking USTs were identified in the project study area.

### **3.17.3 Oil and Gas Wells**

A letter from the LDNR dated December 19, 2013 confirms the presence of oil and gas wells in the vicinity of the project area associated with sinkhole monitoring activity. It was stated that most of the information concerning oil, gas, and injection wells can be obtained through the LDNR’s SONRIS database. A search was performed on the SONRIS database on December 2, 2014 to determine the location of oil and gas wells in the project study area. There are 336 oil and gas wells located in the project study area, as shown in **Figure 12** (see Chapter 3.17.1). **Table 3-7** provides information relative to well type and status of these wells.

**TABLE 3-7  
REGISTERED OIL AND GAS WELLS IN THE PROJECT STUDY AREA**

Well Type	Quantity
Plugged and Abandoned Dry Hole	118
Plugged and Abandoned Oil Producer	47
Plugged and Abandoned Gas/Condensate Producer	37
Brine Supply Wells	34
Permit Expired/No Product Code	29
Plugged and Abandoned Producer	29
Storage Cavity Wells-- LPG	20
Producing Well (Oil)	4
Unknown	4
Producing Well (Gas & Condensate)	2
Salt Water Disposal Wells--Conventional	2
Shut-in Dry Hole--Future Utility	2
Storage Cavity Wells--Gas	2
Educational/Service Company Wells	1
Orphan Well	1
Plugged and Abandoned Dry Gas Producer	1
Shut-in Dry Hole--No Future Utility	1
Shut-in Productive Wells--Future Utility (Oil)	1
Temporarily Abandoned Well	1
<b>Total</b>	<b>336</b>

A secondary search was also performed for oil and gas wells in the EDR Underground Injection Control (UIC) database. Within the one mile search area, seventy-four UIC's were found. Of these seventy-four, six are plugged and abandoned wells, sixty-six are active injection wells, six are dry and plugged wells, and one has approval to be constructed.

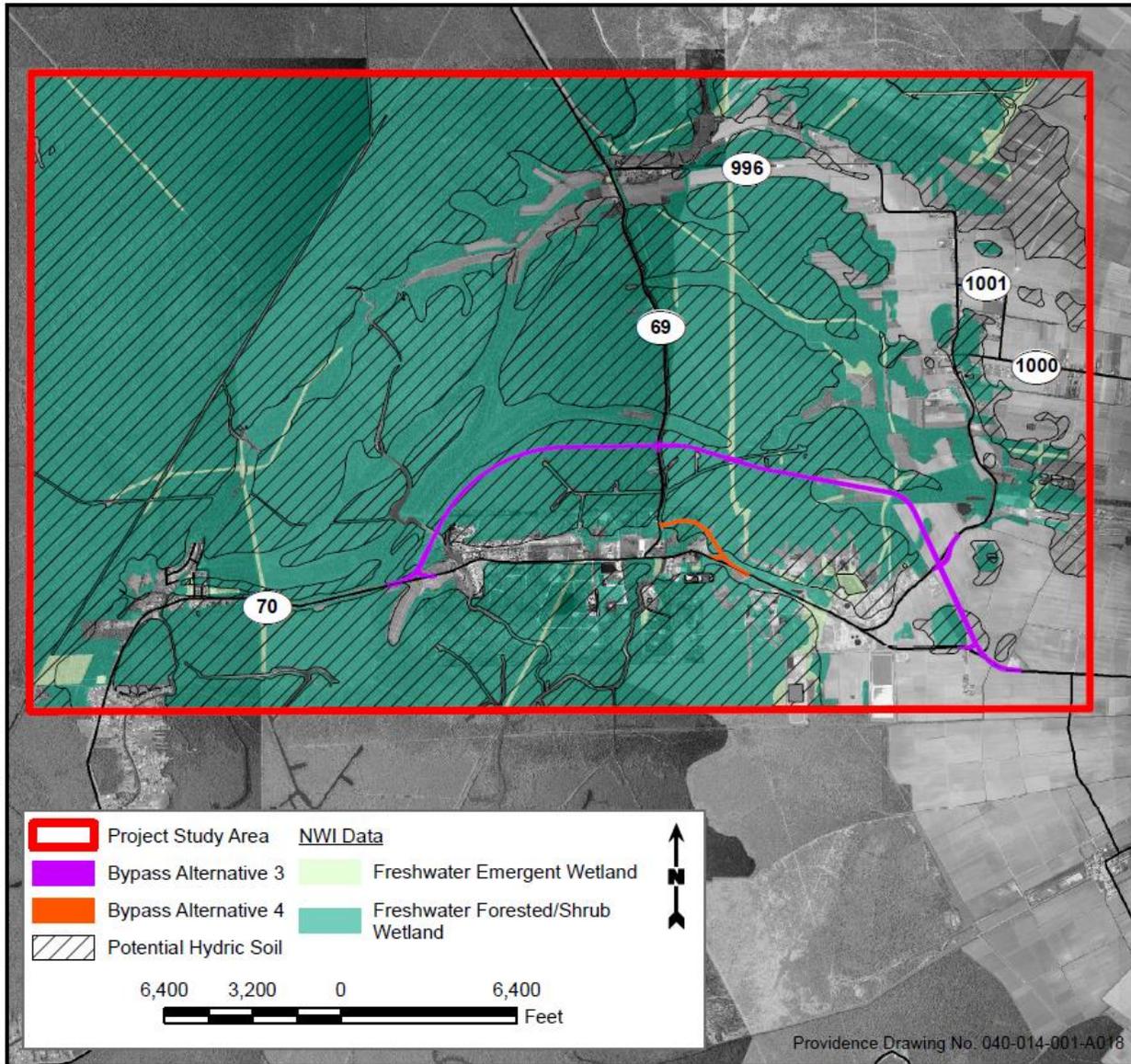
### 3.18 Wetlands

Wetlands are defined jointly by the United States Army Corps of Engineers (USACE) and the USEPA as “those areas that are inundated or saturated by surface or groundwater, at a frequency and duration sufficient to support, and that under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (40 CFR 230.3 and 33 CFR 328.3). In compliance with Executive Order 11990, a preliminary desktop wetland investigation was conducted on the proposed study area using soils data and local knowledge. **Figure 13** demonstrates the location of potential wetlands and hydric soils in the project study area based on National Wetlands Inventory (NWI) data. Wetlands are potentially present where hydric soils exist.

Wetlands potentially present in the project area have been observed to be primarily comprised of cypress-tupelo swamp and bottomland hardwood forested wetlands. According to NWI data, 608.42 acres of the project study area are classified as

Freshwater Emergent Wetland, 20,212.96 acres are Freshwater Forested/Shrub Wetland, and 9.86 acres are Other Waters. Field investigations were required to accurately delineate the site. The results of the wetland analysis are discussed in Chapter 4.18, and the full analysis is included as **Appendix F**.

**FIGURE 13  
POTENTIAL WETLANDS AND HYDRIC SOILS**



*NWI Data from the USFWS, Division of Habitat and Resource Conservation, as of 5/1/14. Potential hydric soils data obtained from Soil Survey Geographic Database (SSURGO), dated 2009. Base map provided by CB&I on 4/15/14.*

### 3.19 Coastal Zone

The project study area is located within Assumption Parish, Louisiana. All of Assumption Parish falls within the bounds of Louisiana's Coastal Zone Boundary. As required by Section 307 of the Coastal Zone Management Act of 1972. The DOTD completed the online SOV process for the LDNR on November 25, 2013. Correspondence with the LDNR Office of Coastal Management dated December 4, 2013 confirms a LDNR Coastal Use Permit (CUP) will be required for the proposed project.

### 3.20 Rivers and Scenic Streams

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve rivers throughout the country demonstrating "outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations". According to the Wild and Scenic Rivers System's website, there is only one waterway in Louisiana protected under this program, Saline Bayou, and it is located in LaSalle Parish ("Saline Bayou, Louisiana," 2014).

The NPS's Nationwide Rivers Inventory "is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more outstanding remarkable natural or cultural values judged to be of more than local or regional significance". According to the NPS's Nationwide Rivers Inventory webpage, there are 11 free-flowing Louisiana Segments. However, none are located in Assumption Parish.

The Louisiana Natural and Scenic River Act of 1970 established the Louisiana Natural and Scenic River System. According to LDWF's Scenic Rivers webpage, there are no Louisiana designated scenic streams in Assumption or Iberville Parishes. There is one scenic river in Ascension Parish, but is not near the project study area. A letter from LDWF dated December 4, 2013 addressing regulated resources in the project study area confirmed that there are no scenic streams within the project study area.

### 3.21 Wildlife

Wildlife present in the project study area include those expected to be present in wetland environments adjacent to the project study area. Alligators, snapping turtles, beavers, nutria, otters, hogs, raccoons, squirrels, deer, rabbits, wading birds, song birds, and raptors (eagles, osprey, owls, hawks, etc.) would be expected to be present in and around the project study area. Recreationally and commercially important fish including buffalo, crappie (sac-a-lait), other sunfish, bass, catfish, and gar would also be expected (LDWF, "Elm Hall," 2013). A letter from LDWF was received on December 4, 2013 stating there are no wildlife refuges or wildlife management areas in the project study area or nearby, and they reserve comment for the permit public notice period.

### 3.22 Threatened and Endangered Species

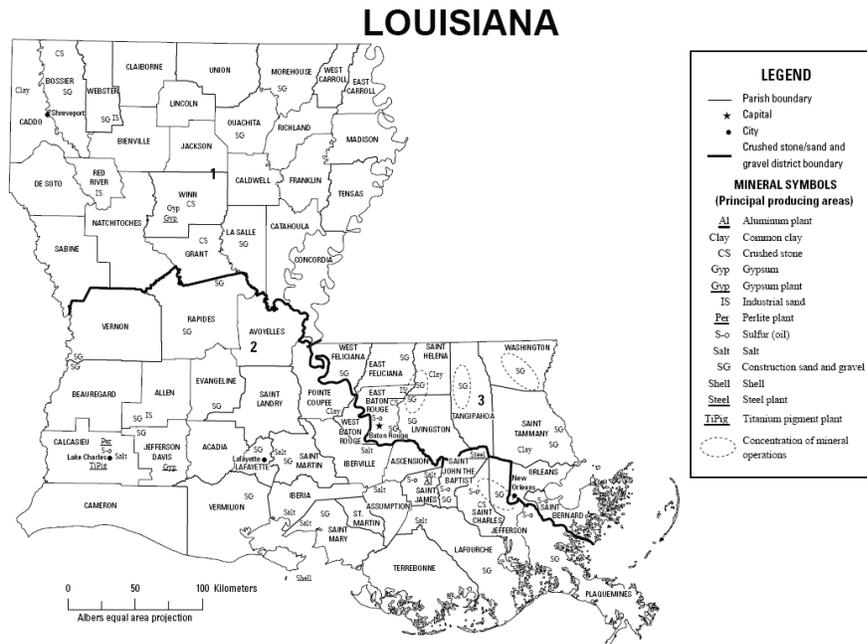
The Endangered Species Act of 1973 allows the USFWS to manage threatened and endangered species and their ecosystems. According to the USFWS *Information, Planning, and Conservation System*, there are no threatened or endangered species or protected habitats listed for the project study area or Assumption Parish. This information has been confirmed through correspondence with the USFWS and LDWF, both dated December 4, 2013.

### 3.23 Unique and Environmentally Sensitive Areas

The DOTD Engineering Directives and Standards Treatment of Significant Trees in DOTD Right-of-Way (EDSM No: I.1.1.21) defines significant trees as a live oak, red oak, white oak, magnolia, or cypress that is considered aesthetically important, has a diameter at breast height of 18 inches, and having a form that separates it from the surrounding vegetation or is considered historic. A substantial wetland environment exists in the project study area that may contain significant trees. Several potential significant trees were observed during the wetlands site visit.

### 3.24 Mineral Resources

Mineral resources information for the project study area was obtained by researching the LDNR’s SONRIS database and USGS publicly available data. The USGS 2009 Minerals Yearbook for Louisiana included the picture below illustrating principal mineral producing areas. Salt was listed as a mineral resource in Assumption Parish.

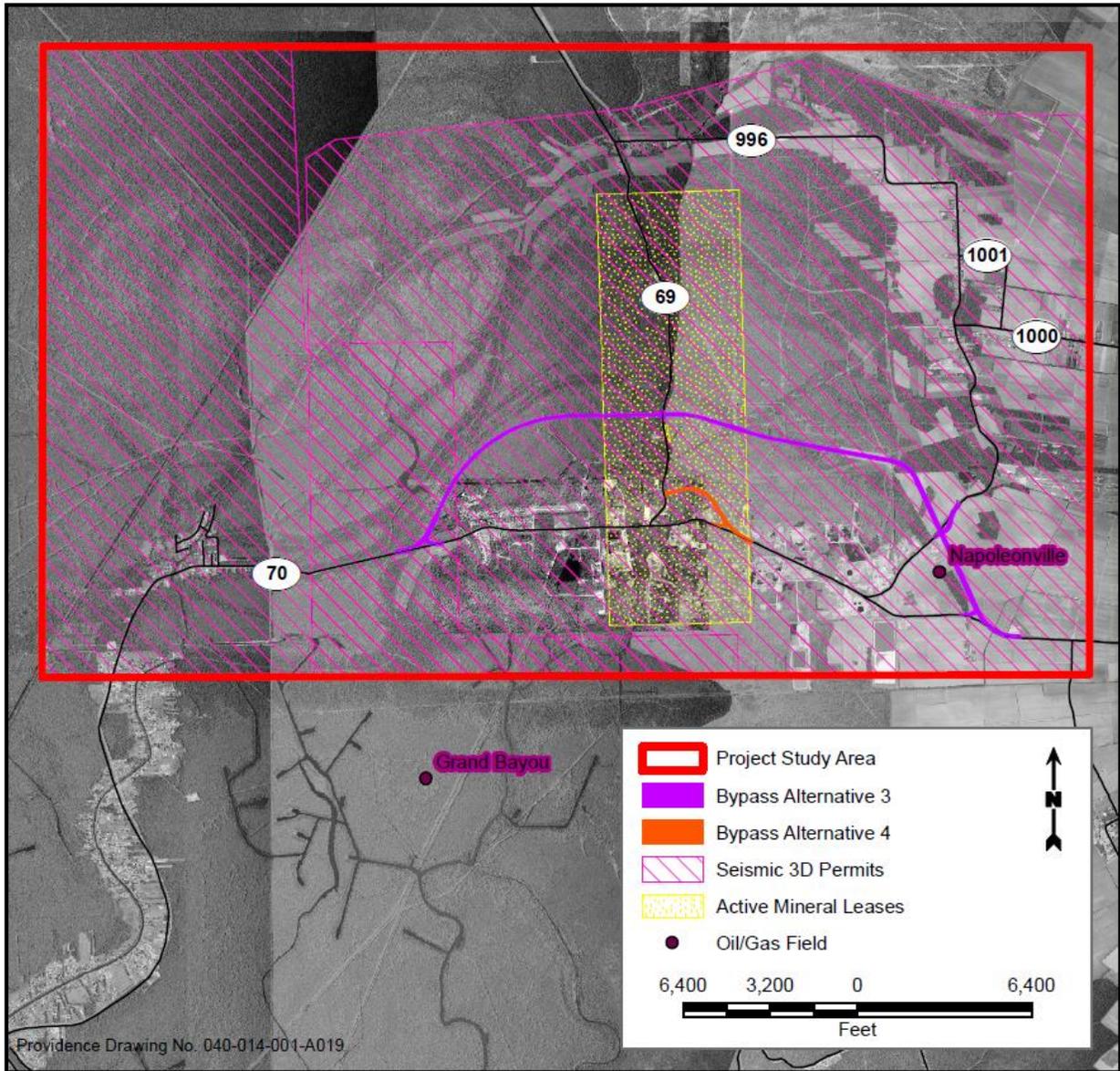


Source: Louisiana Geological Survey/U.S. Geological Survey (2009).

Based on data obtained from the LDNR's SONRIS database, Assumption Parish supports one of 28 mapped salt domes within Louisiana's Coastal Zone Boundary. The Napoleonville Salt Dome supports both brine production and storage caverns for natural gas and liquid petroleum gas. Within the dome, there are 20 storage caverns and 33 brine mining caverns. The Napoleonville Salt Dome also supports 23 storage wells and 35 brining mining wells. Activities associated with the salt dome are managed by private entities in compliance with state regulations.

Active mineral leases in the project study area were researched through the State Mineral and Energy Board of the State of Louisiana, the entity that issues leases for the purpose of exploring, prospecting, and/or drilling for and producing oil, gas, and any other liquid or gaseous minerals in solution and produced with oil and gas. Lease terms exclude free sulphur, potash, lignite, sale, and other solid minerals. There is one active mineral lease (oil and gas) in the eastern half of the study area and two Seismic 3D permits that cover the entirety of the project study area. There is also one Oil and Gas field, the Napoleonville Gas Field, located in the eastern portion of the project study area (see **Figure 14**).

**FIGURE 14  
MINERAL RESOURCE**



*Active Mineral Leases, Seismic 3D Permits, and Oil/Gas Fields obtained from the LDNR SONRIS data set as of 12/16/14. Base map provided by CB&I on 4/15/14.*