II. ENVIRONMENTLLY SENSITIVE AREA FACTORS

ENVIRONMENTALLY SENSITIVE AREAS

Study research suggests that there are a number of environmental factors that influence the location of an oil refinery facility in the Delta region. During the Level I evaluation, highly sensitive national environmental areas including national parks and national wilderness areas were considered.

During the Level II evaluation, historic regions and historic districts, Indian reservations, local parks and forest areas, and designated woodlands were identified in the remaining counties and parishes in the DRA region. There is a justified concern about locating an oil refinery facility near an environmentally sensitive area, such as national and state parks, national monuments, streams and lakes, and historic districts. Based upon this review, environmentally sensitive areas proved to be a critical factor in the site selection process because it is not possible to mitigate most of the environmental impacts resulting from an oil refinery facility in these environmentally sensitive areas. Thus counties and parishes that contain significant environmentally sensitive areas were eliminated from consideration.

Under the Endangered Species Act (ESA), the government protects endangered and threatened plants and animals (listed species) and the habitats upon which they depend. The ESA requires federal agencies to ensure that any action it authorizes, funds, or carries out does not "adversely impact" any listed species, or "destroy or adversely modify" any critical habitat

for that species. Based on this evaluation, 21 DRA counties in Arkansas, two parishes in Louisiana and five counties in Mississippi are covered under this Act. The impact overlay for most of these counties and parishes must be reviewed on a case-by-case basis, however a number of these counties and parishes have been eliminated from further consideration because a significant portion of the county or parish contains endangered and threatened species.

Level II – Environmentally Sensitive Area Factors Eliminated Counties and Parishes

As a result of the Level II - Environmentally Sensitive Area Factors evaluation, an additional 20 counties and parishes were eliminated from further consideration. Based on the Level I – Fatal Flaw Factors and Level II - Environmentally Sensitive Area Factors a total of 205 counties and parishes are eliminated from consideration of a new oil refinery facility. The 35 counties and parishes remaining are located in Tennessee, Louisiana, Mississippi, and Arkansas.

Appendix B contains a list of each county and parish eliminated based on the Level II - Environmental and Sensitive Area Factors.

III. Infrastructure Factors

Infrastructure requirements associated with the location of an oil refinery facility are critical and include pipelines, ports, highways and power generators.

Pipelines

Pipelines are the primary raw material delivery system for oil refineries in the United States, with more than 14 billion barrels of petroleum transported each year according to the Association of Oil Pipelines (these volumes reflect shipments of both crude oil and refined product). Information from the Energy Information Administration shows that the Gulf Coast region, which includes portions of the DRA region, is the largest supply area accounting for more than 55 percent of crude oil production and 47 percent of refined product output in the U.S. Among the five regions of the Petroleum Administration for Defense Districts (PADDs), the area that includes the DRA region accounts for 90 percent of the crude oil shipments and 80 percent of the refined petroleum production shipments.

Site Selection and Identification Factors

...for an oil refinery facility

After September 11, 2001, the security of oil pipelines became a major concern and access to actual pipeline locations was restricted by the National Pipeline Management System. Based on this security issue, general pipeline location information from the Association of Oil Pipe Lines, the American Petroleum Institute's Pipeline Committee, the DOE Energy Information Administration, the Mississippi Development Authority, and other related sources was used in this evaluation.

According to the DOE Energy Information Administration the United States consumed over 20.6 million barrels per day of petroleum products in 2006. In 2007 and 2008, petroleum product consumption is projected to increase by over 1.3 percent per year with all categories of petroleum products contributing to that growth. The vast majority of these petroleum products are transported throughout the United States by the oil pipeline industry and thus, these pipeline networks are critically important to the petroleum industry.

The process of moving crude oil and refined petroleum products is a modern engineering marvel. Prior to World War II, most oil was delivered via tanker shipments to regional refineries and these tankers were also used to deliver some refined products from Gulf Coast refiners to the East Coast. With the outbreak of World War II, many of these oil tankers were targets, effectively disrupting the flow of oil in the United States. In response to this threat, a partnership was created between the federal government and private industry to develop another option for the transportation of petroleum, and the petroleum pipeline network was developed. Today, 68 percent of all domestic shipments of petroleum travel via pipeline.

Based on research from the Association of Oil Pipe Lines and the DOE Energy Information Administration, pipelines form the backbone of the petroleum transportation network, moving both crude oil and refined petroleum products to and from markets across large geographical areas. Oil pipeline shipments account for over 17 percent of the freight moved nationally. Pipelines are an economical transportation mode, consuming approximately two percent of the national freight cost. In addition to the pipeline transportation economic benefits, pipelines also provide a safe and reliable means for transporting petroleum products.

The Gulf Coast, and more specifically portions of the DRA region, constitutes the largest U.S. supply area, supplying crude oil to the Midwest and refined petroleum products to the Midwest and the East Coast, as well as to the Gulf region itself. According to the DOE Energy Information Administration, 55 percent of the nation's crude oil production and 47 percent of the

refined product output comes from the Gulf Coast states of Texas, Louisiana, Arkansas, Louisiana, Mississippi, and Alabama, of which five are in the DRA region.

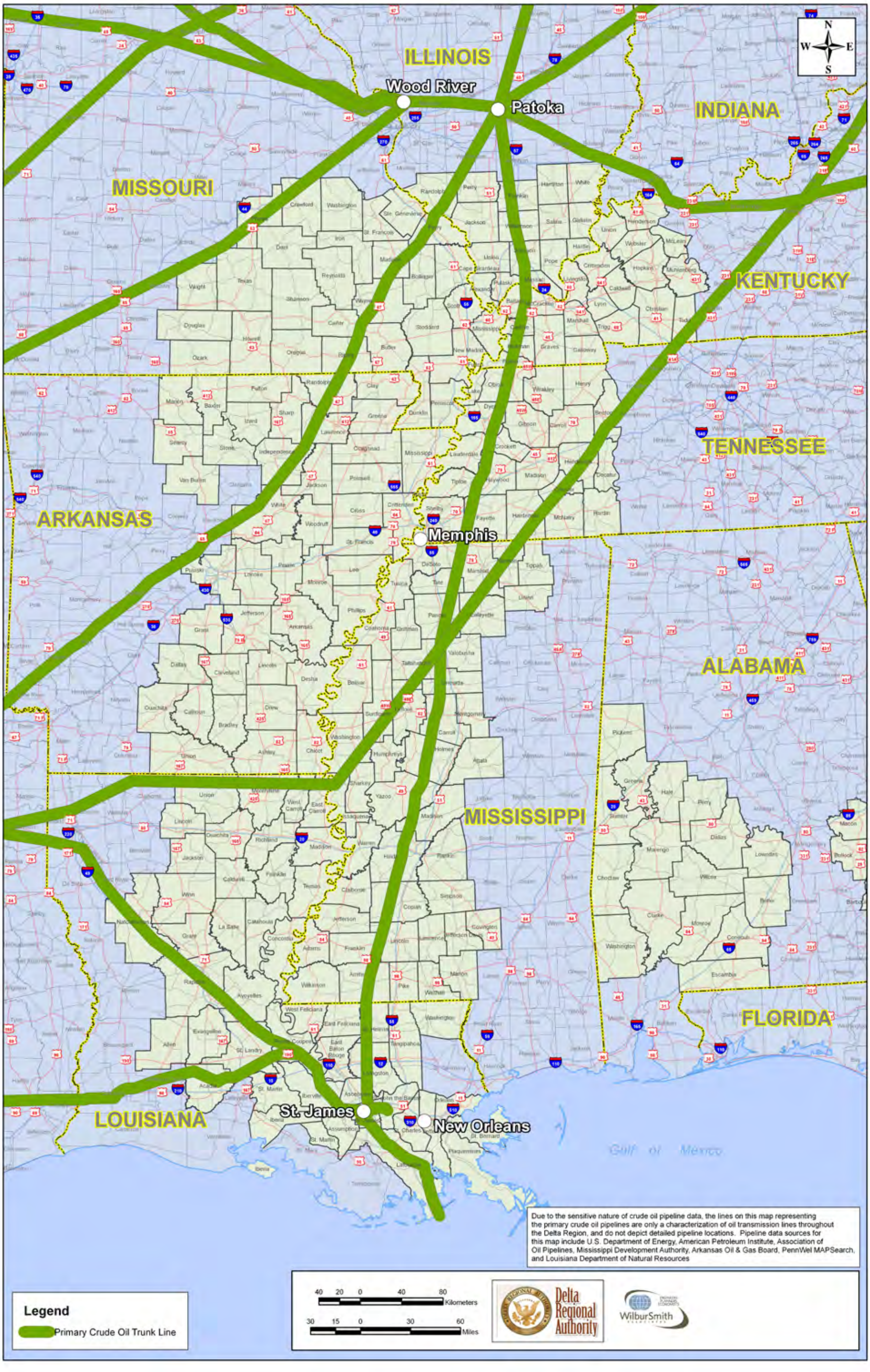
The DOE Energy Information Administration 2007 Petroleum Profile Report noted that "Louisiana is the nation's leading crude oil producer when production from the federally administered Louisiana Outer Continental Shelf is included." While Texas and Alaska account for a large share of the U.S. crude oil production, they are surpassed by the federal off-shore area in the Gulf of Mexico and California. Accordingly, with these significant crude oil production volumes throughout the Gulf Coast region, the DRA region is strategically positioned to support additional oil refiner capacity, through a new oil refinery facility, in the future given the proximity and availability of critical raw material and existing infrastructure.

According to research from the American Petroleum Institute's Pipeline Committee and the Association of Oil Pipe Lines, more than one million barrels of crude oil are transported daily from the Gulf Coast region to the southern Illinois crude oil pipeline hub in Patoka, Illinois and other pipelines move oil to refineries through the Midwest, as shown in Figure 4. Large volumes of crude oil are transported hundreds of miles via pipelines to inland refineries. Although there is a concentration of refineries along the Gulf Coast that are vulnerable to weather hazards, these other inland refining operations are an important part of the petroleum production system in the U.S.

The crude oil trunk piplines shown in Figure 4 approximate the location of large-diameter "trunk lines" for shipping crude oil to a refinery. There are other smaller diameter pipelines that are part of a gathering system, which is used to bring crude petroleum from individual wells and oil fields that are then pumped to storage facilities or moved to refineries, which produce various petroleum based products. There are several refining facilities in the DRA region that produce products including asphalts, industrial coatings, pigments, rubber compounding, printing inks, and a range of other petroleum based products. The pipelines shown in Figure 4 depict the larger trunk lines that are used to transport crude oil to refineries that primarily produce transportation fuels.

Recognizing both the high production volume and the critical role this nation's pipelines play in transporting crude oil, access to primary pipelines will unquestionably be a central issue concerning the location of a new oil refinery in the DRA region. In light of the importance of pipelines, counties and parishes located more than 30 to 40 miles from the general pipeline corridor were eliminated from consideration for an oil refinery facility.

Figure 4: Crude Oil Trunk Lines



Multimodal Transportation

While the crude oil pipeline represents the most significant transportation mode for the key raw materials for an oil refinery, locations that have access to the multimodal transportation system are more desirable. As a part of the evaluation process, primary port locations, major highway networks, and rail facilities that could facilitate the flow of raw materials, as well as refined products, were identified. Ultimately, the primary decision factor in transporting these products is cost. An area that has direct access to a multimodal transportation system certainly would help to moderate costs by creating greater competition among transportation providers.

Waterborne Transportation

Waterborne transportation is the oldest form of heavy industrial transportation in the U.S., and it has played a significant role in the economic development of this country.

The Mississippi River is the second longest river in the United States, and the third largest drainage basin in the world – exceeded in size only by the watersheds of the Amazon River and the Congo River. The Mississippi River is the dividing line between seven of the eight DRA states. The U.S. Army Corps of Engineers (USACE) is responsible for maintaining the navigable channel of the Mississippi River. According to the USACE Waterborne Commerce Report, tank barges along U.S. waterways move over 69 billion gallons of petroleum and petroleum products on average each year. There are more than 1,200 public and private port terminals located in the DRA region and these facilities have the following purposes:

- Designed to handle a wide variety of commodities with appropriate equipment and land bases to support a range of cargo and multimodal transportation services;
- Special-purpose terminals that generally handle only one type of commodity and have the equipment and landside facilities necessary to move these products; and
- Industrial ports and terminals that serve a single industrial plant or provide services to other businesses.

Many of these facilities handle only one or two products and are relatively small operations. During the evaluation process, publicly owned port facilities located along the Mississippi River, with the capacity (land) to expand operations to handle additional commodities, or those ports that presently have the capability to handle a variety of products were identified.

As shown in Figure 5, there are a total of 16 publicly owned ports in Mississippi. Two are owned by the state while the rest are owned by local port authorities or local governments. The four largest port facilities are located along the Gulf Coast in areas previously eliminated from consideration in this evaluation. There are six ports located on the Tombigbee River, five on the Mississippi River, and one on the Yazoo River, a tributary of the Mississippi. The availability of these public ports would be a significant advantage in locating a refinery, allowing the facility to utilize both land-based and waterborne transportation as needed.

According to the USACE, the Port at Vicksburg, Mississippi handles barges of crude petroleum from Louisiana and ships several petroleum products to Tennessee. The Port of Greenville, Mississippi handles fuel oils and gasoline being shipped in from Louisiana, as well as agricultural products. The top commodity handled by the Port of Pascagoula, Mississippi is also crude petroleum. In Louisiana, crude petroleum is the top commodity at the Port of New Orleans, the Port of Baton Rouge, and the Port of Lake Charles.

The Ports Association of Louisiana is a non-profit trade association representing the mutual interests of ports within the State. According to this organization, a number of the State's ports and terminals are located along the Mississippi and Red Rivers as shown in Figure 6. However, the majority of these port locations were eliminated from further consideration in Level I – Fatal Flaw Factors. Only one port located along the Mississippi River – the Port of Lake Providence – falls outside the Level I factors.

Louisiana is the leading state in the U.S. for waterborne transportation, according to the USACE and the Waterways Council, Inc. (WCI) . Mississippi has both deep-draft and shallow-draft navigation along the Intracoastal Waterway, the Mississippi River, the Yazoo River, the Tennessee River, and the Tennessee-Tombigbee Waterway. Between these two states, over five billion tons of commodities were shipped or received in 2001. These commodities included petroleum products, crude petroleum, coal, grain, chemicals, aggregates, ores/minerals, iron/steel, and other products. According to the most recent WCI report on waterborne commerce, over $21 billion in petroleum products and crude petroleum were shipped or received within Louisiana and Mississippi in 2001. The Navigation Data Center for the USACE reported that over 53 million tons of petroleum and petroleum products were shipped along the lower Mississippi River from Baton Rouge, Louisiana to the Mouth of Passes in 2004.

Arkansas has several ports along the Mississippi River, as shown in Figure 7, and more than 600 miles of navigable waterways within the state. Approximately $143 million in petroleum products

Figure 5: Mississippi Ports

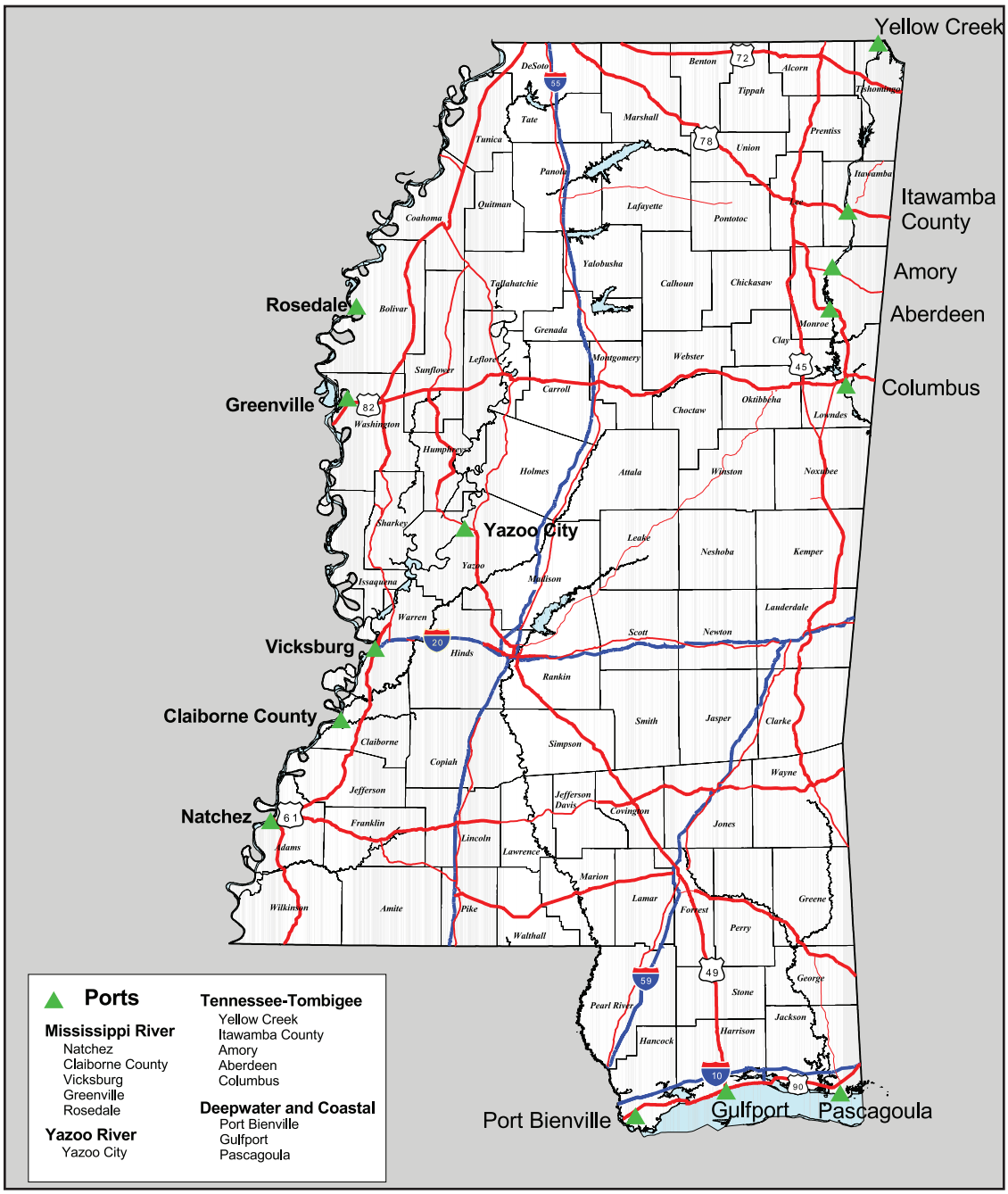


Figure 6: Louisiana Ports

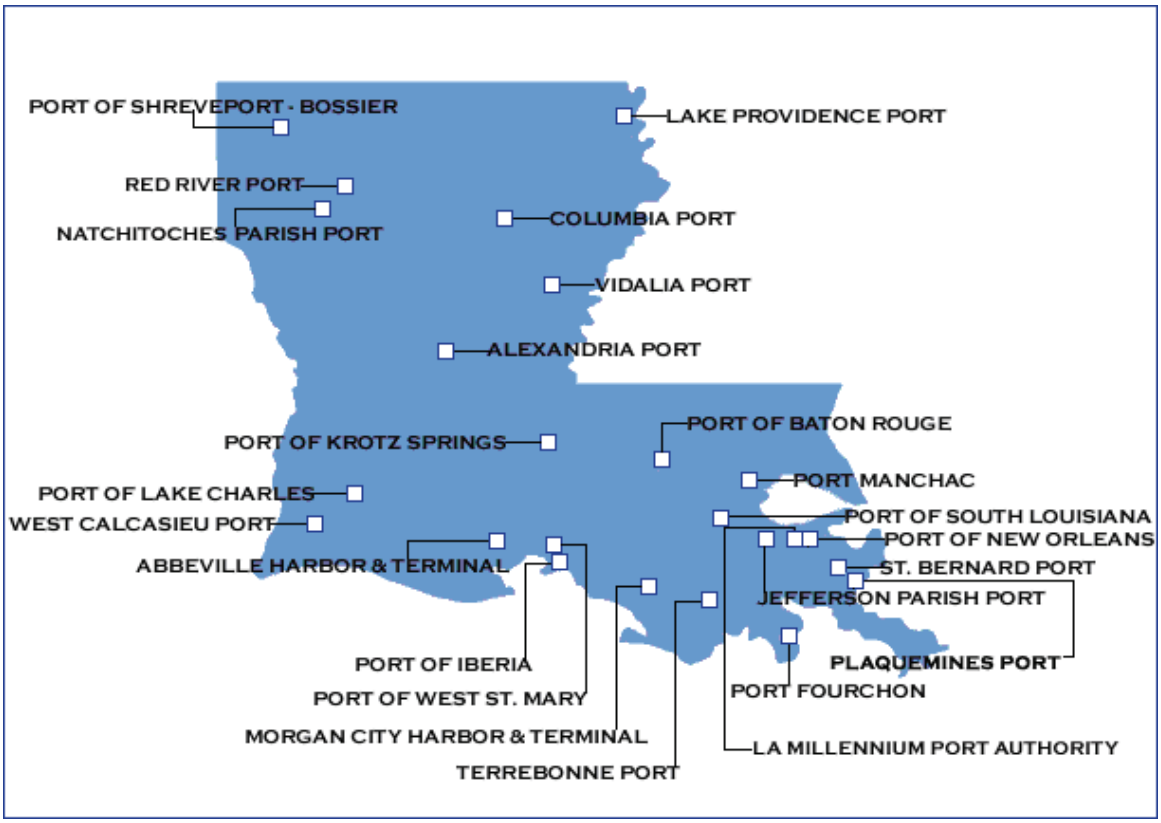
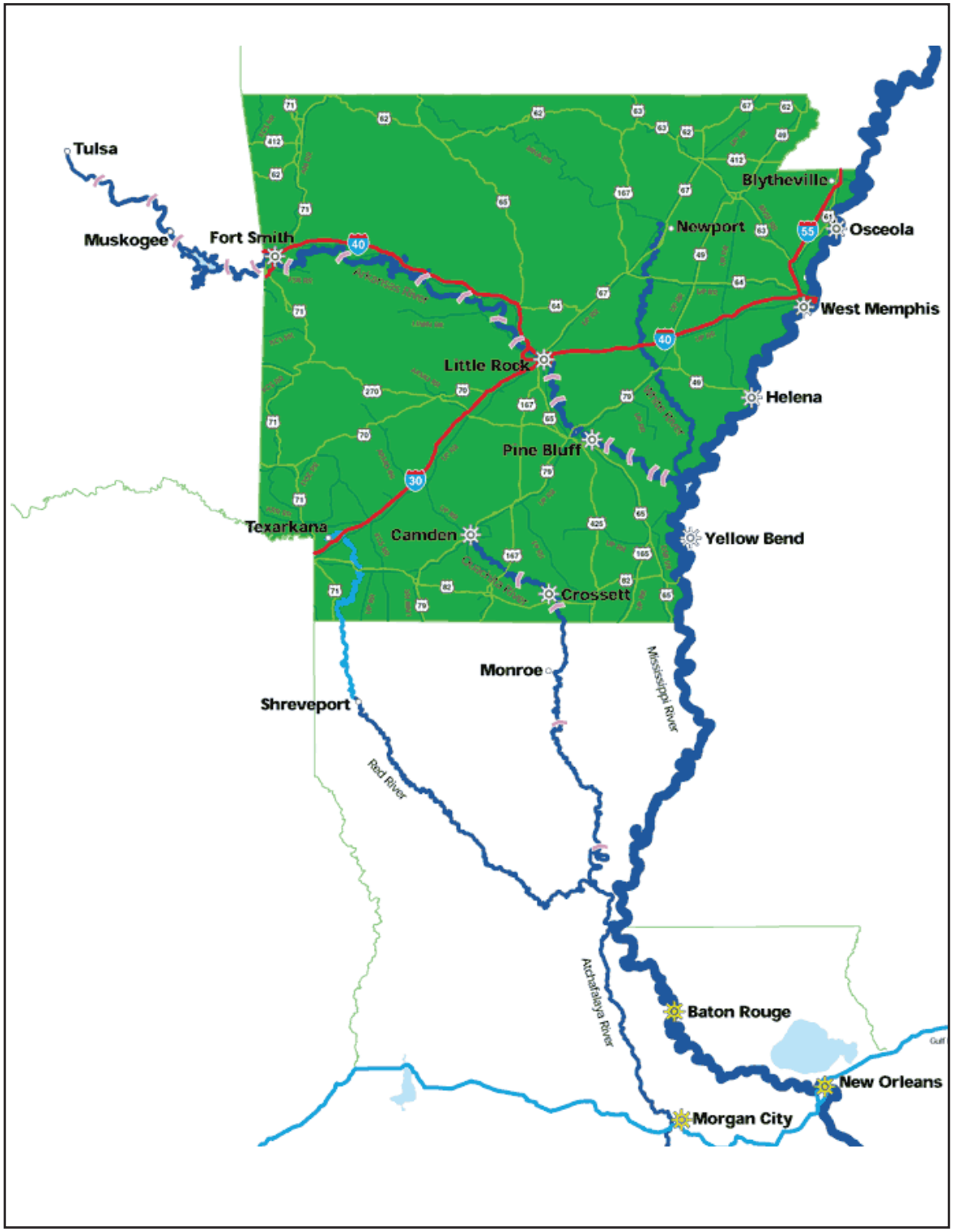


Figure 7: Arkansas River Ports



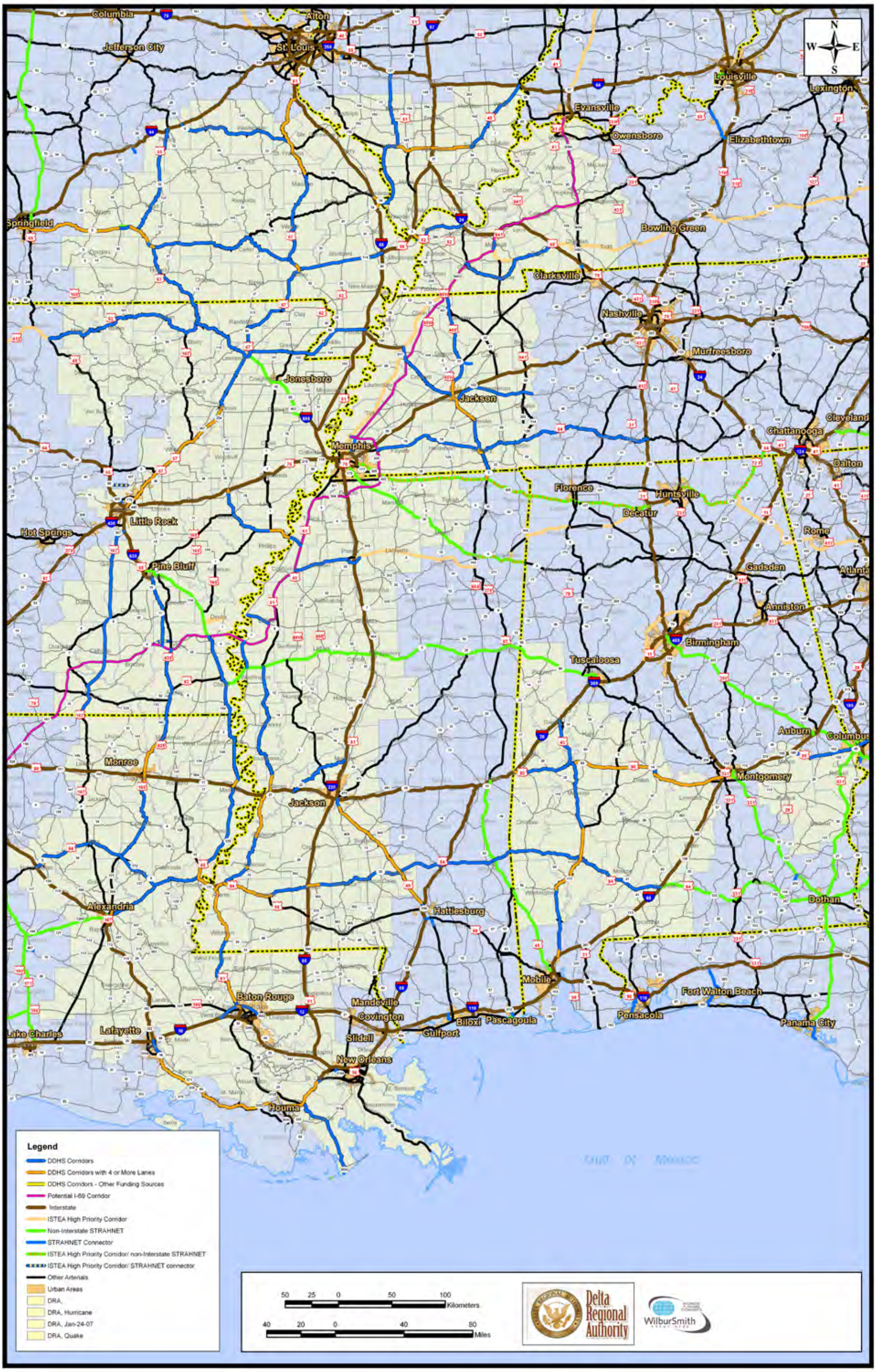
and crude petroleum were shipped to and from the state in 2001. By far, the leading commodities shipped along Arkansas waterways are agricultural products, although the primary commodities destined for Tennessee from Arkansas terminals are gasoline and fuel oils.

Based on recent research from the U.S. Department of Transportation Maritime Administration, waterborne transportation can often be priced to compete with pipelines, but this use is naturally restricted by geography. Where rivers and coasts allow, tank barges and tank vessels compete against pipelines. According to the Division of Domestic Shipping Office of Ports, which is part of the U.S. Department of Transportation Maritime Administration, over 622 million tons of freight annually moved on inland U.S. waterways in recent years. Within the DRA region, there are significant opportunities to make use of both pipeline and waterborne transport. The ability to employ multiple forms of transport, in turn, provides transport system redundancy and makes portions of the DRA region attractive as a location for a new oil refinery facility.

Highways

Highways are not a primary mode of transportation for either crude oil or refined petroleum products. Yet, they are important to consider in the oil refinery facility location process for other reasons. Employees traveling to and from work at the refinery and related facilities, suppliers delivering parts or materials, emergency vehicles requiring efficient access to the facility, and tankers providing limited transport all depend on roadway infrastructure. Thus, roadway access to and from an oil refinery facility will play a key role in the ongoing efficient operation of this facility. Each of the counties or parishes remaining have access to an interstate highway, STRAHNET connector, the proposed I-69 corridor, or a DDHS proposed corridor. Some counties and parishes have access to multiple highways as shown in Figure 8.

Figure 8: Highway System



Power Resources

Refineries are heavy users of electricity and steam, and many existing refineries have built co-generation plants. Some facilities even sell power to the electrical power generation grid. According to the DOE Energy Information Administration, a number of oil companies have developed power generation facilities based on their experience building and operating such units in other locations around the world.

Given the international trend toward refinery-constructed electrical generation facilities, it is possible that a new oil refinery facility would choose to do the same. In developing the site selection matrix, the primary electrical power generators already serving the DRA region were reviewed. The two primary electrical power companies serving a number of the counties and parishes evaluated in the DRA region are the Tennessee Valley Authority (TVA) and Entergy. Both of these companies are widely recognized for their reliability and rate options for large industrial customers. Given the significant electrical requirements of a facility of this nature, it is doubtful that the existing power grid would be used to provide primary power resources. Ultimately, both of these agencies might serve the selected site, along with cogeneration from the facility itself. TVA and Entergy are aggressive in their efforts to recruit and retain large power users in their respective franchise areas. Thus, both companies may be motivated to assist in determining the location of a new oil refinery facility in the DRA region, perhaps even in a collaborative venture.

LEVEL III – INFRASTRUCTURE FACTORS ELIMINATED COUNTIES AND PARISHES

As a result of the Level III - Infrastructure Factors evaluation, an additional 25 counties and parishes were eliminated from further consideration. Based on the Level I – Fatal Flaw Factors and Level II - Environmentally Sensitive Area Factors, and Level III - Infrastructure Factors a total of 230 counties and parishes are eliminated from consideration of a new oil refinery facility. The ten counties and parishes remaining are located in Louisiana, Mississippi, and Arkansas.

Appendix C contains a list of each county and parish eliminated based on the Level III - Infrastructure Factors.

IV. COMMUNITY FACTORS

Evaluating community factors, such as negative impacts to minority and low income populations, water resources, and acreage needed, is an important factor to assess when identifying an oil refinery facility location.

Environmental Justice

Environmental Justice (EJ) issues must also be considered for all projects requiring an EIS, and an oil refinery facility is expected to trigger such environmental documentation. Under the provision of Title VI of the Civil Rights Act, 42 U.S.C. 2000d, state environmental agencies that receive federal financial assistance must seek out and be responsive to community concerns regarding public health and the environment, including issues relating to inequity due to environmental impacts. As a result, many major projects are subject to an EJ review.

Environmental Justice issues focus on the inequity in the distribution of environmental impacts. In response to such concerns, specific guidelines were published in Executive Order 12898 in 1994. Specifically, the Order states,"…to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report in the National Performance Review, each federal agency, shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental

effects of its programs, policies, and activities on minority populations and low-income populations in the United States."

EJ relates directly to areas with a significant concentration of low-income persons and minority populations, and careful evaluation must be made to determine if the location of an oil refinery facility imposes any negative consequences on these two protected groups. Generally, sensitive populations are defined as people in the general population that would be more specifically affected by pollution – usually identified as children under the age of five and adults over the age of 65.

As mentioned earlier, OSHA regulations and EJ requirements prefer this type of facility to be located away from large population centers. The precise distance from population areas will vary based on air quality modeling, but negative impacts can be mitigated using new technology and equipment. While it may be difficult to locate sites that are thoroughly removed from population centers, sites that are four to five miles (at a minimum) from population centers are preferred.

Local Level Constraints

In addition to EJ requirements, there are a number of other local level constraints that could significantly impact the location of an oil refinery facility. The location of Historic Districts, properties on the National Historic Register, recreational rivers, wetland areas, floodways, and even prime farm lands could pose a challenge for locating a new refinery facility. While some of these issues could be mitigated, the cost to do so may prove significant. Until a specific site is identified, it is difficult to assess these issues and their potential impact on the project, or the oil refinery facility's effect on its surrounding area.

Facility Size Factors

In light of the community factors noted in this evaluation, the site required to support the development of an oil refinery facility should be between 2,500 to 3,000 acres. This provides an adequate site to support the oil refinery facility, a sufficient buffer area to surrounding communities, and adequate space for petroleum-related manufacturing facilities that would benefit from co-locating with the oil refinery facility. The suitability of the specific site for the new oil refinery facility, the history of development in the area, and site-specific environmental conditions that would determine necessary mitigation and control requirements will all be critical to the

ultimate success of locating a suitable site. The eventual oil refinery facility site must be suitable for industrial development with appropriate soil conditions, subsurface geology, and access to adequate raw water resources, and transportation and energy infrastructure.

LEVEL IV – COMMUNITY FACTORS ELIMINATED COUNTIES AND PARISHES

As a result of the Level IV - Community Factors evaluation, one county in Mississippi was eliminated from further consideration. The hydrology and surface water issues within Sunflower County, Mississippi along with a significant number of fish hatcheries that play a vital role in the community's economy are not conducive to locating an oil refinery facility in this county. The environmental challenges and potential economic impacts would be very difficult and very expensive to overcome. For those reasons, Sunflower County was eliminated from further consideration as a site for this facility. Based on the Level I – Fatal Flaw Factors, Level II - Environmentally Sensitive Area Factors, Level III – Infrastructure Factors and Level IV - Community Factors, a total of 231 counties and parishes were eliminated from consideration of a new oil refinery facility. The nine counties and parishes remaining are located in Louisiana, Mississippi, and Arkansas.

Appendix D contains a list of each county and parish eliminated based on the Level IV - Community Factors.

COUNTY PROFILES

Based on the Level I, II, III and IV evaluations, nine DRA counties and parishes were identified as potential locations for an oil refinery facility in the DRA region. Each of the remaining counties and parishes has characteristics that are important locational attributes for an oil refinery facility. There are larger acreage tracts available for development that are a sufficient distance from population concentration, reasonable proximity to petroleum pipelines, highways and power generation plants. Many of these nine counties and parishes have river port facilities that are equipped to handle petroleum products or ports with the necessary land base to expand their operations in order to provide the required services for a refinery at or near the port facility.