4.0 ALTERNATIVES

As required by the NEPA, we have evaluated several alternatives to the proposed East Texas to Mississippi Expansion Project to determine whether they would be technically and economically feasible and environmentally preferable to the proposed action. Our alternatives analysis includes alternatives proposed by the general public as well as other federal and state resource agencies and considers the environmental differences resulting from each alternative as well as the alternative's ability to meet the proposed Project's objectives.

We considered the No Action or Postponed Action Alternative, alternative energy sources, the effects of energy conservation, system alternatives, route alternatives, route variations, and aboveground facility site alternatives. We also considered the potential impacts to environmental resources and land uses in our alternatives analysis and evaluated alternatives that would avoid or minimize impacts to environmental resources such as wetlands and waterbodies; and land uses such as timber production, and federally and state managed lands.

The following evaluation criteria were used to determine whether or not alternatives would be environmentally preferable:

- significant environmental advantage over the proposed Project;
- ability to meet the proposed Project objectives; and
- technical and economic feasibility and practicability.

4.1 NO ACTION AND POSTPONED ACTION ALTERNATIVE

The FERC has three alternative courses of action in processing an application for a Certificate: (1) grant the Certificate with or without conditions; (2) deny the Certificate; or (3) postpone action pending further study.

Implementation of the No Action alternative would require the Commission to deny Gulf South a Certificate to construct, own, operate, and maintain the proposed Project. Without the issuance of a Certificate, Gulf South would not be able to construct the proposed Project and therefore the environmental impacts identified in this EIS would be eliminated; however, the objectives of the proposed project would not be met and it is likely that customers would seek alternative projects and/or sources of energy that may result in greater impacts than those described in this EIS. As discussed in Section 1.1, nationwide consumption of natural gas is projected to increase by more than 20 percent by 2025, and natural gas derived from domestic sources will account for the majority of the total U.S. consumption (EIA 2006a). By 2025, natural gas demand in the Northeast and Midwest regions is projected to increase by 13 and 25 percent, respectively (EIA 2006b). Onshore production of natural gas from unconventional sources (e.g., shale, tight sands, and coal bed methane) is expected to be a major contributor to future domestic natural gas supplies (EIA 2006a). The proposed Project would supply up to 1.7 Bcf/d of natural gas from unconventional sources (i.e., Bossier Sand and Barnett Shale fields). Since the objectives of the proposed project would not be met by implementing the No Action alternative and the effects of other customer driven projects are unknown; we believe that this alternative is not preferable to the proposed action.

Implementation of the Postponed Action alternative would require the Commission to delay its determination on whether or not to grant Gulf South a Certificate. Postponing the Commission's action on this application could allow for further study of the environmental impacts resulting from construction and operation of the proposed Project; however, postponement would at the minimum delay and could also change the environmental impacts described in this Draft EIS. Based on the information provided in Gulf

South's application, its subsequent filings, and responses to environmental information requests, our analysis of this information and consultations with other responsible state and federal resource agencies; we believe that use of the Postponed Action alternative to allow for further study of the proposed Project is not necessary at this time and that delaying the effects described in this Draft EIS would not significantly change these effects; therefore, we believe that this alternative is not preferable to the proposed action.

Alternative Energy Sources

Several alternative energy sources to natural gas currently exist including petroleum and coal based energy, nuclear power, hydropower, and other energy sources including renewable energy technologies. Petroleum and coal based energy are commonly used and found throughout the U.S.; however, relative to natural gas, the use of petroleum or coal based energy would result in greatly increased emissions of pollutants, such as NO_x, SO_2, and CO_2. The increased emission of pollutants would result in reductions to air quality. In addition, the use of petroleum and coal based energy would result in numerous secondary impacts associated with their mining, extraction, transportation, and refinement. The use of this alternative would not meet the proposed Project's objectives and would not likely result in a significant reduction of environmental impacts; therefore we believe use of this energy source is not preferable to the proposed action.

Although there has recently been renewed interest in nuclear power production, growth in nuclear generating capacity will account for only about 10 percent of total U.S. generating capacity by 2019, and it is expected to remain at that level through 2030 (EIA 2006a). Additionally, regulatory requirements, cost considerations, and public concerns make it unlikely that new nuclear power plants would be sited and developed to serve the markets targeted by the proposed Project within a timeframe that would meet the objectives of the proposed Project; therefore we believe use of this energy source is not preferable to the proposed action.

Though efficiency upgrades at existing hydropower facilities are expected to produce incremental additions of power production in the coming years, it is unlikely that new and/or significant sources of hydropower would be permitted and brought online as reliable, energy source alternatives to the proposed Project. Federal, state, and local initiatives will likely contribute to an increase in the availability and cost effectiveness of non-hydropower renewable energy sources such as wind, solar, tidal, geothermal, and biomass. For example, state and local initiatives have increased the availability of wind power-derived energy to local consumers in Texas (Texas Renewable Energy Industries Association 2006), and renewable energy is playing a larger role in the Mid-Atlantic and Northeast regions of the United States (CSC 2004, New York State Energy Research and Development Authority 1999). Still, the percentage of electricity generated from non-hydropower renewable energy sources at the national level is projected to increase to only 3.2 percent by 2025 (EIA 2006a), which would offset only a small part of the projected national energy demands; therefore, we believe that these other energy sources would not be able to meet the overall objectives of the proposed Project and as a result are not preferable to the proposed action.

Energy Conservation Alternatives

An increase in the scope of energy conservation measures employed throughout the market area served by the proposed Project could also potentially decrease or slow the amount of increase in the nation's energy demand. However as noted in Section 1.1, energy demand in the United States has been increasing steadily with total energy consumption in the United States estimated to increase from 99.7 quadrillion BTU per year in 2004 to 127.0 quadrillion BTU per year in 2025 (EIA 2006). Natural gas usage will represent about 22 percent of all energy consumption in the United States by 2025. To maintain pace with growing energy demands, the EIA anticipates that consumption of natural gas in the United States will grow from 22.4 trillion cubic feet (Tcf) per year in 2004 to 27.0 Tcf by 2025. The growth in natural gas demand is being driven primarily by increased use of natural gas for electricity generation and industrial applications. Given

the anticipated increases of energy consumption over the next 20 years, it is unlikely that voluntary energy conservation measures would be sufficient to offset increasing demand in general or affect the need for the proposed Project in particular.

4.2 SYSTEM ALTERNATIVES

System alternatives are alternatives to the proposed action that would make use of existing, modified, or proposed pipeline systems to meet the stated objectives of the proposed Project. Implementation of a system alternative would make it unnecessary to construct the proposed Project, although some modifications or additions to existing or proposed pipeline systems may be required to meet the objectives of the proposed Project. Modifications or additions to existing or proposed pipeline systems would result in environmental impacts that may be less than, similar to, or greater than those associated with construction and operation of the proposed Project. The purpose of identifying and evaluating system alternatives is to determine whether or not the environmental impacts associated with the construction and operation of the proposed Project would be avoided or reduced by using existing, modified or proposed pipeline systems.

Our analysis of system alternatives includes an examination of existing and proposed natural gas systems that currently or would eventually serve the markets targeted by the proposed Project, and considers whether those systems would meet the proposed Project's objectives while offering an environmental advantage over the proposed Project. Specifically, the system alternatives considered in our analysis include an expansion of existing overland natural gas pipeline systems (Existing Pipeline System Alternatives); and the construction of other natural gas pipeline systems (New Pipeline System Alternatives).

4.2.1 Existing Pipeline System Alternatives

Two existing pipeline systems, one operated by Gulf South and the other operated by CenterPoint Energy Gas Transmission (CEGT), are located within the general vicinity of the proposed Project. Figure 4.2.1-1 depicts the location of the Gulf South System Alternative in relation to the proposed Project route and Figure 4.2.1-2 depicts the location of the CEGT Pipeline System Alternative in relation to the proposed Project route. We evaluated the Gulf South and the CEGT Pipeline System Alternatives to determine whether the expansion of either of these existing systems would be able to meet the objectives of the proposed Project and result in significantly less environmental impacts than those associated with the proposed Project.

4.2.1.1 Gulf South System Alternative

Gulf South currently operates an interstate pipeline system in Texas, Louisiana, Mississippi, Alabama, and Florida. This alternative would use Gulf South's existing (or modified) natural gas delivery system to meet the proposed Project's objectives.

Gulf South has indicated that its existing system is fully subscribed as a result of the increased demand for natural gas in the Gulf coast, Midwestern, Northeastern Southeastern regions of the United States. Additionally, Gulf South's existing pipeline system is relatively older, consisting of low pressure pipelines incapable of transporting the volumes of natural gas called for in the proposed action. Based on the characteristics of Gulf South's existing facilities and their status as fully subscribed; we believe, that this existing system would be unable to transport the volumes identified in the proposed action without significant modifications.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-4
Figure 4.2.1-1
Gulf South System Alternative

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-5
Figure 4.2.1-2
CenterPoint Pipeline System Alternative

Modifying Gulf South's existing system to meet the proposed Project's objectives would require the construction of approximately 257 miles of 42-inch-diameter pipeline loop; about 3.3 miles of 36-inch-diameter lateral pipeline; and the installation of approximately 120,906 hp of compression. Table 4.2-1 illustrates a comparison of the requirements and environmental considerations of this system alternative and the proposed Project.

TABLE 4.2-1
Comparison of the Gulf South System Alternative / Northern Route Alternative to the Proposed East Texas to Mississippi Expansion Project Route

Comparative Category	Unit	Proposed Route[a]	Gulf South System Alternative/Northern Route Alternative
Facility Requirements			
Pipeline length	Miles	243.3	257.0
Compressor station requirements	Number/hp	2 new, 1 expanded / 110,604	2 new, 1 expanded / 120,906
Land Requirements[b]			
Construction right-of-way	Acres	3,105.5	3,369.2
Permanent right-of-way	Acres	1,583.0	1,746.3
Environmental Considerations			
Waterbody crossings[c]	Number	358	375
Total Wetlands Affected by Construction[c]	Acres	230.3	161.3
Forested Wetlands Affected by Construction	Acres	60.6	75.1
Residential Lands Affected by Construction	Acres	2.9	186.3
Forested Lands Affected by Construction	Acres	1,521.1	1,340.3
Archaeological Sites Crossed	Number	3	7
Public lands crossed	Miles	0.2	5.8

Notes:

[a] Values reported are based on published data and mapping; therefore, the values shown may differ from actual values provided elsewhere in this document.

[b] Land requirements reported assume a 100-foot-wide construction right-of-way and a 60-foot-wide permanent right-of-way.

[c] Based on interpretation of U.S. Geological Survey topographic maps; number of blue-line stream crossings, and construction impacts to wetlands.

As indicated in Table 4.2-1, the proposed Project would affect less waterbodies, residential lands, and archaeological sites than the pipeline looping required under this system alternative. Although the proposed Project would impact more wetlands overall than the pipeline looping, less forested wetlands would be impacted by the proposed Project. Impacts to forested wetlands would be long-term or permanent, while impacts to emergent or scrub-shrub wetlands would be short-term or temporary. The pipeline looping would also result in the crossing of approximately 5.8 miles of the Jackson-Bienville WMA, which is managed by the LDWF and provides habitat for the federally endangered red-cockaded woodpecker. The proposed

Project would avoid suitable habitats for red-cockaded woodpeckers and would use HDD methodology to cross a 1,000-foot-long corridor under the Ouachita WMA, thereby significantly minimizing impacts to WMAs. This technology could not be utilized to cross the Jackson Bienville WMA due to the extended length of crossing. Although the pipeline looping associated with the Gulf South System Alternative would be collocated with Gulf South's existing pipeline right-of-way, which generally minimizes environmental impacts, our analysis as summarized in Table 4.2-1 indicates that the construction and operational impacts associated with this system alternative would be measurably greater than those of the proposed Project. Furthermore, the proposed pipeline route would parallel/be collocated with existing utility rights-of-way for approximately 181.7 miles, or about 76 percent of the proposed route; therefore the benefits gained from collocating with utility rights-of-way would still be realized with the proposed action.

Based on the increased land requirements and pipeline length, potentially increased impacts to the federally endangered red-cockaded woodpecker, waterbodies, residential lands, and archaeological sites; we believe that the Gulf South System Alternative would not be preferable to the proposed Project.

4.2.1.2 CEGT Pipeline System Alternative

CEGT currently operates an interstate pipeline system in Texas, Louisiana, Oklahoma, and Arkansas, segments of which extend from near Carthage, Texas, to Delhi, Louisiana. Because this system ends in Delhi, Louisiana, it would only replace about two-thirds of the length of the proposed Project. The remaining 79 miles of pipeline needed to transport the gas from Delhi, Louisiana to Harrisville, Mississippi would still be required.

Because this system does not contain sufficient available capacity to transport the volumes of gas identified in the proposed action, it would have to be significantly expanded and modified to meet the proposed Project's objectives. Specifically, to add capacity for an additional 1.2 Bcf/d of natural gas to Delhi, Louisiana, CEGT would need to construct approximately 190 miles of 42-inch-diameter pipeline looping as well as install significant compression. In the proposed action, approximately 149.0 miles of pipeline would be constructed to transport the gas to Delhi, Louisiana. Both the proposed Project and the system alternative would require about an additional 79 miles of pipeline to extend the system to the final delivery point in Mississippi.

Although, much of the pipeline looping could be collocated with existing CEGT rights-of-way, construction of this length of pipeline looping, within an assumed 100-foot-wide construction right-of-way, would impact more than 2,275 acres of land, including wetlands and surface waters, while the proposed Project would only affect about 2,000 acres of land. The construction and installation of facilities necessary to extend this system from Delhi into Mississippi would result in essentially the same impacts as the same segment of the proposed Project.

Therefore, since the CEGT Pipeline System Alternative would be about 40 miles longer than the proposed Project, the potential environmental impacts would likely be greater than those associated with construction and operation of the proposed Project and we believe that the CEGT Pipeline System Alternative would not be preferable to the proposed Project.

4.2.2 New Pipeline System Alternatives

Two new interstate natural gas pipeline projects, the recently certificated Carthage to Perryville Project and the proposed Southeast Supply Header (SESH) Project have been identified as potential system alternatives to the proposed Project. Figure 4.2.2-1 depicts the location of the Carthage to Perryville System Alternative in relation to the proposed Project route and Figure 4.2.2-2 depicts the location of the Southeast Supply Header Project System Alternative in relation to the proposed Project route.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-8
Figure 4.2.2-1
Carthage to Perryville Project System Alternative

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-9
Figure 4.2.2-2
Southeast Supply Header Project System Alternative

4.2.2.1 Carthage to Perryville System Alternative

The Carthage to Perryville Project consists of a 42-inch-diameter pipeline which when constructed would run easterly from Carthage, Texas to near Delhi, Louisiana. It is capable of transporting up to 1.2 Bcf/d of natural gas. However, the capacity of the Carthage to Perryville Project is fully subscribed. Additionally, the Carthage to Perryville Project does not extend into Mississippi. Since the Carthage to Perryville Project would be unable to transport the volumes of gas identified in the proposed action and the project does not extend into Mississippi, it would fail to meet the objectives of the proposed Project without significant modifications.

Modifying the Carthage to Perryville Project so that it could transport the required volumes of gas identified in the proposed action would require the construction of approximately 149 miles of additional pipeline parallel to its certificated pipeline and extending its certificated pipeline an additional 79 miles into Mississippi. This modification would require a significant redesign of the Carthage to Perryville Project and a re-examination of the environmental impacts of the project. Since the proposed Project is already collocated with the Carthage to Perryville Project for a significant portion of its length (approximately 83 miles), and the extension of the Carthage to Perryville Project would result in impacts similar to those of the proposed Project; we believe that this system alternative would not result in significantly less environmental impact than that of the proposed action. Therefore, we believe that this alternative would not be preferable to the proposed action.

4.2.2.2 Southeast Supply Header System Alternative

As proposed, the 42- and 36-inch-diameter SESH Pipeline Project, which would run south-easterly from Delhi, Louisiana to Coden, Alabama, would be capable of transporting 1.14 bcf of natural gas per day. Although the proposed SESH Project would be located generally parallel to the proposed Project for approximately 20 miles beginning near Delhi, Louisiana it would not extend further westward into Louisiana and would terminate in southeast Alabama over 100 miles from the termination point of the proposed Project. The proposed SESH Project also does not have sufficient unsubscribed capacity to transport the volumes of gas called for in the proposed action. The proposed SESH project would not be able to transport the volumes of gas to the proposed locations without significant modifications. The SESH project would have to be significantly redesigned with looping and/or a larger diameter pipeline; and lateral(s) to meet the objectives of the proposed Project. Since the proposed SESH project would have to be significantly modified and the impacts of those modifications would be similar or greater than those of the proposed Project and the time required to consider those modifications and analyze their impacts would significantly delay service, we believe that this alternative would not be preferable to the proposed action.

4.3 ROUTE ALTERNATIVES

Route alternatives represent potential routes that the proposed Project could follow that vary significantly from the proposed route. A route alternative would deviate from the proposed route for its entire length or at least a large portion of its total length. Based on input provided to us by the general public as well as federal and state resource agencies, and our review of the proposed Project, we identified and evaluated two major route alternatives: the Northern Route Alternative and the Tallulah to Florence Route Alternative to determine if either would avoid or significantly reduce environmental affects associated with the proposed Project.

4.3.1 Northern Route Alternative

The Northern Route Alternative would route the proposed pipeline adjacent to existing Gulf South facilities from Keatchie, Louisiana to Harrisville, Mississippi. This route alternative would be effectively the

same as the Gulf South System Alternative described previously; therefore our analysis of that system alternative and our belief that it would not be preferable to the proposed Project also apply to this route alternative.

4.3.2 Tallulah to Florence Route Alternative

The Tallulah to Florence Route Alternative would diverge from the proposed route at the Tallulah Compressor Station at MP 167.6 and would generally follow the proposed route of the SESH Project, crossing the Mississippi River just north of Letourneau, Mississippi (approximately 7 miles south of the proposed route), and continuing east to a terminus with the proposed route near MP 237.0 in Rankin County, Mississippi (Figure 4.3.2-1).

This alternative route would be approximately five miles longer than the proposed route and based on a review of topographic maps, would affect a similar amount of resources including waterbodies, wetlands, vegetation and wildlife as that of the proposed route. Environmentally, this route alternative would not result in impacts significantly greater than those of the proposed route. The Tallulah to Florence Route Alternative would not be collocated with any known existing rights-of-way. The proposed route would be collocated with existing rights-of-way for approximately 31 miles, or about 43 percent of the route in the segment between Tallulah, Louisiana and Harrisville, Mississippi.

Since this alternative would not result in significantly less environmental impacts, would require more pipeline length, and would not be collocated with existing utility rights-of-way; we believe that the Tallulah to Florence Route Alternative would not be preferable to the proposed route.

4.4 ROUTE VARIATIONS

Route variations differ from system or major route alternatives in that they are identified to resolve or reduce construction impacts to localized, specific resources such as cultural resources sites, wetlands, recreational lands, residences, landowner requests, and terrain conditions. Because route variations are identified in response to specific local concerns, they are often the result of landowner comments. While route variations may be a few miles in length, most are relatively short and in proximity to the proposed route. We have considered a variety of factors in identifying and evaluating route variations, including length, land requirements, the number of landowners affected, and potential for reducing or minimizing impacts to natural resources. During the pre-filing process, Gulf South refined its proposed route based on discussions with landowners, resource stewards, project engineers, and our input to avoid or minimize impacts to natural or cultural resources, reduce or eliminate engineering and constructability concerns, and/or avoid or minimize conflicts with existing land uses. After filing its application, Gulf South also filed several additional route modifications that better aligned the proposed route with existing rights-of-way, avoided sensitive resources, resolved landowner issues, and addressed constructability concerns. These route modifications (Appendix G) were incorporated as part of the proposed Project which we evaluated in Section 3.0.

As part of our alternatives analysis we have also evaluated variations to avoid or reduce impacts to sensitive environmental resources through our review of topographic maps, aerial photography, and other available information. These sensitive environmental resources include wetlands and waterbodies, as well as special land uses such as WRP easements, Sixteenth Section lands, and FWS-managed lands. Other specially managed areas located in the vicinity of the proposed Project, including the Tensas River National Wildlife Refuge and the Ouachita and Bayou Pierre Wildlife Management Areas, would either be avoided entirely or surface impacts would be avoided through use of special construction techniques such as HDD.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-12
Figure 4.3.2-1
Tallulah to Florence Route Alternative

Approximately 81 percent of the WRP easements that would be crossed by the proposed Project are located in Madison Parish, Louisiana, which has a high relative density of these sites rendering avoidance impractical. Additionally, Gulf South proposes a route in Madison Parish that avoids the Tensas River NWR, further limiting routing options that would avoid WRP easements. Gulf South continues to consult with NRCS regarding the crossing of WRP easements, including considerations for routing. To ensure that impacts to WRP lands are minimized, we are recommending in Section 3.8.4 that Gulf South continue this consultation and to file a plan with us that includes identification and discussion of any measures that NRCS recommends which Gulf South does not propose to adopt. Based on these routing considerations, the ongoing consultation, and our recommendation, we believe that the proposed route would avoid WRP easements to the extent practical.

The proposed Project would cross four areas enrolled in the State of Mississippi's Sixteenth Section Program as discussed in Section 3.8.4. Gulf South indicated that it had reached agreement or closed easement agreements with all of the involved property owners. Gulf South proposes to cross a portion of one of the properties using HDD, thereby avoiding impacts to the ground surface. Other considerations that Gulf South used for routing included avoidance of residential properties, avoidance of the central portions of individual tracts, and collocation with existing rights-of-way. Given the landowner agreements and the impact minimization measures adopted, we believe that the proposed route would avoid Sixteenth Section lands to the extent practical.

The proposed Project would cross two FWS-managed properties associated with the Tensas River NWR. The FWS manages one of these tracts as a fee-owned property located at MP 150.2 and the other tract is enrolled in a conservation easement program and is located west of the Tensas River NWR. Impacts to the fee-owned parcel would be avoided through the use of HDD. Gulf South is currently examining route alignment alternatives and other measures in consultation with FWS regarding possible avoidance of the Tensas River NWR easement tract. This consultation would have to be completed to the satisfaction of the FWS before the proposed crossing could occur. Given the avoidance of FWS managed lands, use of HDD, and ongoing consultations, we believe that the proposed route would avoid impacts to FWS lands to the extent practical.

Based on our review of the proposed Project route, Gulf South's proposed measures, and our recommendations, we believe that the proposed route's impacts to sensitive environmental resources and special land uses would be adequately avoided or minimized.

Identified Route Variations

Based on our analysis of the proposed Project and comments provided by the public we have identified and evaluated seven route variations. Table 4.4-1 lists these route variations, the segments of the proposed Project route that they would replace, and the reason for the proposed variation. Each route variation considered was compared to the corresponding segment of the proposed Project route to determine whether potential environmental benefits would be afforded. Our evaluation of route variations was based on information provided by Gulf South, comments filed with the FERC, review of available aerial photography and USGS topographic maps, and site visits performed by FERC staff.

TABLE 4.4-1
Summary of Route Variations Identified in Response to Public Comments Received for the Proposed East Texas to Mississippi Expansion Project

Route Variation	Proposed Route Mileposts (approximate)	Reason for Variation	Analysis in Section Noted
Garner 1	78.4 to 78.8	Avoid impacts to landowner	4.4.1
Garner 2	78.4 to 78.8	Avoid impacts to landowner	4.4.1
Hoychick	120.8 to 122.8	Avoid impacts to rice farming and hunting	4.4.2
Shelton	140.6 to 141.9	Avoid or minimize impacts to the Shelton property	4.4.3
Withrow/Broadbent	187.9 to 189.5	Avoid or minimize impacts to the Withrow/Broadbent property	4.4.4
Barton East	213.7 to 214.0	Avoid or minimize impacts to the Barton property	4.4.5
Pearl River	231.0 to 236.0	Avoid or minimize impacts to wetlands, black bear candidate denning trees, and a bird rookery	4.4.6

4.4.1 Garner Route Variations

The Garner Route Variations were developed in response to a landowner comment concerning Project affects to land use, specifically a loss of income from timber production. Both Garner Route Variations would diverge from the proposed Project route at MP 78.4 and rejoin the proposed Project route at approximately MP 78.8.

The Garner Route Variation 1 (Figure 4.4.1-1A) would parallel the north side of an existing transmission line right-of-way present on the Garner property, while the Garner Route Variation 2 (Figure 4.4.1-1B) would avoid the Garner property altogether by shifting the route north to an adjacent landowner's property. The Garner 1 Route Variation would be approximately the same total length as the proposed Project, while the Garner 2 Route Variation would require an additional 0.1 mile of pipeline length, resulting in an additional 1.3 acres of land temporarily impacted (Table 4.4.1-1). Lands impacted by both route variations and the proposed Project are comprised of forests and pine plantations. In addition to a similarity of land types crossed, both route variations would cross the same number of waterbodies as the originally proposed route and none of the options would affect wetlands. Unlike the proposed Project route, however, both route variations would result in two additional crossings of a high-voltage transmission line. Additionally, selection of the Garner 2 Route Variation would result in clearing of a new corridor in a forested area instead of collocation with the electric transmission line right-of-way or the Carthage to Perryville Project's pipeline right-of-way.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-15
Figure 4.4.1-1a
Garner Route Variation 1

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-16
Figure 4.4.1-1b
Garner Route Variation 2

TABLE 4.4.1-1
Comparison of Garner Route Variations and the Original Route

Evaluation Criteria	Original Route	Garner Route Variation 1	Garner Route Variation 2
Total Length (miles)	0.4	0.4	0.5
Landowners Affected (number)	3.0	3.0	3.0
Construction Impacts (acres)	4.8	4.8	6.1
Permanent Impacts (acres)	2.9	2.9	3.6
Adjacent to Existing Rights-of-Way (miles)	0.4	0.4	0.0
Stream Crossings (number)	4.0	4.0	4.0
Wetland Impacts (acres)	0.0	0.0	0.0
Land Use Type	Forest, silviculture	Forest, silviculture	Forest, silviculture, other

Although the Garner Route Variations would alleviate concerns raised by the affected landowner by avoiding timber production on the Garner property, adoption of either route variation would result in two additional crossings of a high-voltage electric transmission line that would introduce constructability and worker safety concerns. Further, neither the Garner Route Variation 1 nor the Garner Route Variation 2 would result in additional environmental benefit. In addition to the lack of environmental benefit and the additional transmission line crossings, the Garner Route Variation 2 would result in transference of impacts to another landowner. For these reasons, we believe that adoption of either of the Garner Route Variations would not be preferable to the proposed route.

4.4.2 Hoychick Route Variation

The Hoychick Route Variation was developed in response to a landowner comment concerning potential impacts to rice farming and hunting activities. The Hoychick Route Variation would eliminate impacts to this property; diverging from the proposed Project route at MP 120.8, passing north of the Hoychick property, and then rejoining the proposed Project route at approximately MP 122.8 (see Figure 4.4.2-1).

The Hoychick Route Variation would be the same length as the proposed route, with identical land requirements, and crossing the same number of landowners (Table 4.4.2-1). Both the route variation and the proposed Project route would cross agricultural and forestland. Neither the proposed route nor the route variation would cross any wetlands, but the route variation would require one more waterbody crossing than the proposed route. The route variation would also result in the alteration of the proposed Boeuf River crossing to a point approximately 1,000 feet north of its proposed location. The route variation would not be collocated with the Carthage to Perryville Project corridor. Consequently, Gulf South would not be able to use any of the CEGT's previously cleared construction right-of-way to minimize land impacts.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-18
Figure 4.4.2-1
Hoychick Route Variation

TABLE 4.4.2-1
Comparison of the Hoychick Route Variation and the Original Route

Evaluation Criteria	Original Route	Hoychick Route Variation
Total Length (miles)	2.0	2.0
Landowners Affected (number)	4.0	4.0
Construction Impacts (acres)	24.2	24.2
Permanent Impacts (acres)	14.5	14.5
Adjacent to Existing Rights-of-Way (miles)	2.0	0.0
Stream Crossings (number)	2.0	3.0
Wetland Impacts (acres)	0.0	0.0
Land Use Type	Agriculture, forest	Agriculture, forest

Although the Hoychick Route Variation would alleviate concerns raised by the landowner, by eliminating impacts to the Hoychick property, it would offer no significant environmental advantage over the proposed Project route and would result in an additional waterbody crossing. Additionally, the route variation would merely result in transference of impacts to other nearby landowners. For these reasons, we believe that adoption of the Hoychick Route Variation would not be preferable to the proposed route.

4.4.3 Shelton Route Variation

The Shelton Route Variation was developed in response to a landowner comment concerning potential impacts to livestock operations and property value. The Shelton Route Variation would move the proposed route north onto an adjacent property owner's land. The route variation would deviate from the proposed Project route at MP 140.6, west of the Shelton property, and proceed eastward before rejoining the proposed Project route at MP 141.9 (see Figure 4.4.3-1).

Relative to the proposed Project route, the Shelton Route Variation would be 0.1 mile longer in total pipeline length and would require an additional 1.2 acres for construction right-of-way land requirements (Table 4.4.3-1). Both the proposed Project route and the route variation would cross a mixture of croplands and forestland, and they both would cross identical amounts of wetlands. However, the Shelton Route Variation would cross one additional waterway and more forested land than the proposed Project route. Further, this route variation would not be adjacent to an existing right-of-way easement, and Gulf South would not be able to utilize any previously disturbed right-of-way for construction.

Although the Shelton Route Variation would alleviate concerns raised by the landowner, by eliminating impacts to the Shelton property, adoption of the route variation would merely result in transference of impact to other nearby landowners. Adoption of the Shelton Route Variation also would not allow an existing right-of-way to be followed, resulting in impacts to previously undisturbed upland forestlands, and no environmental benefit would be gained. For these reasons, we believe that adoption of the Shelton Route Variation would not be preferable to the proposed route.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-20
Figure 4.4.3-1
Shelton Route Variation

TABLE 4.4.3-1
Comparison of the Shelton Route Variation and the Original Route

Evaluation Criteria	Original Route	Shelton Route Variation
Total Length (miles)	1.3	1.4
Landowners Affected (number)	3.0	3.0
Construction Impacts (acres)	15.8	17.0
Permanent Impacts (acres)	9.5	10.2
Adjacent to Existing Rights-of-Way (miles)	1.3	0.0
Stream Crossings (number)	2.0	3.0
Wetland Impacts (acres)	1.7	1.7
Land Use Type	Agriculture and forest	Agriculture and forest

4.4.4 Withrow/Broadbent Route Variation

The Withrow/Broadbent Route Variation was developed in response to landowner comments concerning potential impacts to wildlife habitats, topography, sensitive soil types, and planned developments, as well as safety concerns. The Withrow/Broadbent Route Variation would eliminate impacts to these properties. The Withrow/Broadbent Route Variation would diverge from the proposed Project route at MP 187.9, circumvent the Withrow/Broadbent Property to the north, and rejoin the proposed Project route at approximately MP 189.5 (see Figure 4.4.4-1).

The Withrow/Broadbent Route Variation would be 0.2 mile longer than the proposed Project route (Table 4.4.4-1). Both the variation and the proposed route would cross forested lands. Due to the increased length of this variation, the construction right-of-way would require 2.4 acres of additional land. In addition to disturbing additional forested lands, the Withrow/Broadbent Route Variation would result in two additional stream crossings, would impact 0.2 acre of additional wetlands, and would not be adjacent to an existing powerline easement. Due to the more rugged topography on the north side of the power line, the Withrow/Broadbent Route Variation would also result in a significantly more difficult construction process.

Although the Withrow/Broadbent Route Variation would alleviate concerns raised by the landowners, it would increase the total route length, which would result in an increased conversion of forested lands, an increased number of waterway crossings, and increased impacts to wetlands. Adoption of the Withrow/Broadbent Route Variation would not allow collocation with an existing right-of-way, thereby impacting previously undisturbed lands. For these reasons, we believe that adoption of the Withrow/Broadbent Route Variation would not be preferable to the proposed route.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-22
Figure 4.4.4-1
Withrow/Broadbent Route Variation

TABLE 4.4.4-1
Comparison of the Withrow/Broadbent Route Variation and the Original Route

Evaluation Criteria	Original Route	Withrow/Broadbent Route Variation
Total Length (miles)	1.6	1.8
Landowners Affected (number)	6	6
Construction Impacts (acres)	19.4	21.8
Permanent Impacts (acres)	11.6	13.1
Adjacent to Existing Rights-of-Way (miles)	1.6	0.0
Stream Crossings (number)	5	7
Wetland Impacts (acres)	0.3	0.5
Land Use Type	Forest	Forest

4.4.5 Barton Route Variations

The Barton Route Variations were developed in response to a landowner comment concerning potential impacts to the center of the property, thereby potentially reducing the value of the land and restricting future property development. The commentor suggested two possible alternatives, traversing around the property to the east and west, respectively, to minimize impacts. The commentor identified the eastern alternative as the preferred route. The Barton East Route Variation was developed in response to that comment. The Barton East Route Variation would diverge from the proposed Project route at MP 213.7, proceed east circumventing the Barton property, and then rejoin the proposed alignment at MP 214.0 (Figure 4.4.5-1). The route variation would minimize impacts to the center of the Barton property by shifting the route to the northern property boundary.

The Barton East Route Variation would increase the total pipeline length by 0.3 mile and would increase the construction and permanent right-of-way land requirements by approximately 3.6 acres and 2.2 acres, respectively (Table 4.4.5-1). Both the proposed Project and the route variation are similar in that neither would be adjacent to existing rights-of-way and they both would cross pasture and forested lands, although the route variation would cross relatively more forested lands. The Barton Route variation would result in one additional waterbody crossing and one additional landowner being affected.

Although the Barton East Route Variation would alleviate concerns raised by the landowner by eliminating impacts to the Barton property, we believe that adoption of the Barton East Route Variation would not be preferable to the proposed route.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-24
Figure 4.4.5-1
Barton Route Variation

TABLE 4.4.5-1
Comparison of the Barton East Route Variation and the Original Route

Evaluation Criteria	Original Route	Barton East Route Variation
Total Length (miles)	0.8	1.1
Landowners Affected (number)	2	3
Construction Impacts (acres)	9.7	13.3
Permanent Impacts (acres)	5.8	8.0
Adjacent to Existing Rights-of-Way (miles)	0.0	0.0
Stream Crossings (number)	3	4
Wetland Impacts (acres)	0.0	0.0
Land Use Type	Pasture and forest	Pasture and forest

However, based on our review of topographic maps and aerial photography, it appears that the western alternative is feasible, without significant effects to waterbodies, wetlands, and forested areas, and that an orchard located west of the Barton property could also be avoided; therefore, in order to ensure that alternatives to crossing the center of the Barton property are adequately assessed, **we recommend that:**

- **Gulf South should file with the Secretary prior to the end of the Draft EIS comment period an environmental, engineering, and economic analysis of a route variation traversing west of the Barton property between MP 213.7 and 214.0. This analysis should include the following information so that a quantitative comparison can be made with Gulf South's proposed route in this area:**

  a. The length of pipeline (miles);

  b. The acreage of both the permanent and construction rights-of-way;

  c. The size and location of any non-typical work areas required;

  d. The number of residences within 50 feet of the edge of the construction right-of-way;

  e. The number of waterbodies and wetlands crossed, and the length of each crossing;

  f. The acres of agricultural land affected;

  g. The acres of forest cleared;

  h. The number of landowners affected;

  i. A description of the land use(s) affected; and

  j. The length adjacent to existing utility right(s)-of-way.

4.4.6 Pearl River Route Variation

The Pearl River Route Variation was developed during FWS consultations regarding the proposed Project. The FWS identified a potential minor route variation for the proposed crossing of the Pearl River near MP 232.5. In general terms, the minor route variation would deviate to the north, crossing the Pearl River along an existing road near the Hinds County and Copiah County border, and then rejoin the proposed

route east of the Pearl River. Based on our review of topographic maps and aerial photography of this area, this minor route alternative appears feasible and may minimize potential impacts to wetlands, identified candidate Louisiana black bear denning trees, and a bird rookery. In order to provide us with more detailed information so that we can determine the feasibility of this alternative and further evaluate it, **we recommend that:**

- **Gulf South should file with the Secretary prior to the end of the Draft EIS comment period an evaluation of a route variation traversing north of the proposed alignment at the Pearl River and crossing the Pearl River near an existing road at the Hinds County and Copiah County border. This analysis should include the following information so that a quantitative comparison can be made with Gulf South's proposed route in this area:**

  a. The length of pipeline (miles);

  b. The acreage of both the permanent and construction rights-of-way;

  c. The size and location of any non-typical work areas required;

  d. The number of residences within 50 feet of the edge of the construction right-of-way;

  e. The number of waterbodies and wetlands crossed, and the length of each crossing;

  f. The acres of agricultural land affected;

  g. The acres of forest cleared;

  h. The number of landowners affected;

  i. A description of the land use(s) affected; and

  j. The length adjacent to existing utility right(s)-of-way.

4.5 ABOVEGROUND FACILITY ALTERNATIVES

We evaluated the proposed locations of the new aboveground facilities to determine whether environmental impacts would be reduced or mitigated by use of alternative facility sites. Our evaluation involved inspection of aerial photographs and maps, as well as site visits along the proposed Project corridor. The aboveground facilities for the proposed Project include two new compressor stations and the addition of new compression at one existing station, six M/R stations, 11 MLVs, nine side valves, and six pig launcher and/or receiver stations. Because all of the pig launcher/receiver facilities would be located within the confines of the proposed compressor stations and/or M/R station sites, we did not consider alternatives for those facilities.

Because the location of the M/R stations would be linked to the location of the associated natural gas receipt and interconnect points, the search for alternatives was constrained to sites located adjacent to the intersection of the proposed Project route and the planned and existing pipeline facility locations. Similarly, the locations of MLVs would be linked to the location of the proposed Project pipeline. Further, the proposed locations of MLVs along the proposed Project route were largely determined based on DOT safety regulations that specify the maximum distance between sectionalizing block valves and also require that these facilities be located in readily accessible areas. We did not identify any alternative sites for the proposed M/R stations or MLV facilities that would offer a significant environmental advantage to the proposed sites for these facilities.

As with the other proposed aboveground facilities, the compressor station locations would be constrained to sites near the proposed pipeline route. Specifically, the proposed compressor station sites along the proposed pipeline route were largely dictated based on engineering and economic design standards.

Gulf South indicated that its existing Carthage Junction Compressor Station, located in Panola County, Texas, provided the optimal location for initial compression for the proposed Project and use of this existing facility would avoid disturbance and impacts to greenfield areas. The proposed Vixen Compressor Station would be located at MP 99.4 in Ouachita Parish, Louisiana, and the proposed Tallulah Compressor Station would be located at MP 167.6 in Madison Parish, Louisiana. As described in Section 3.8, construction and operation of the Vixen and Tallulah Compressor Stations would result in a permanent conversion of approximately 6.0 acres of pine plantation and 10.0 acres of agricultural land, respectively. However, no wetlands or other environmentally sensitive features would be affected at either of these proposed compressor station locations, and we have determined that operation of these facilities would not result in significant air quality degradation or noise impacts to any nearby residents given measures proposed by Gulf South and our recommendations (see Section 3.11).

During the scoping period for the proposed Project, we received a comment requesting consideration of an alternative to the Tallulah Compressor Station site. We evaluated site alternatives for both of the new compressor facilities associated with the proposed Project.

4.5.1 Vixen Compressor Station Site Alternatives

We looked at three alternative sites for the Vixen Compressor Station. Each of these three alternative sites, as well as the proposed site, are located on each quadrant of the intersection of the proposed Project and Gulf South's existing 30-inch-diameter Index 130 pipeline (Figure 4.5.1-1). In addition to being proximate to existing Gulf South facilities, this intersection meets the necessary engineering and hydraulic requirements for an intermediate location for compression. Each of the four potential sites currently contain planted pines, but variations in the area's topography and the presence of wetlands, access roads, and abandoned railroad crossings rendered each of the alternative sites less preferable than the proposed site. The proposed Vixen Compressor Station site would be located on the southwestern quadrant and was selected by Gulf South due to the lack of sensitive environmental resources present and also because of the presence of an existing access road, which would minimize land disturbance.

Our environmental review did not identify any significant environmental consequences for the proposed Vixen Compressor Station site in relation to the alternative sites. Therefore, we believe that adoption of any of the three alternative sites for the Vixen Compressor Station would not be preferable to the proposed location.

4.5.2 Tallulah Compressor Station Site Alternatives

We evaluated one alternative site (MP 172.1; Figure 4.5.2-1) for the Tallulah Compressor Station in addition to the proposed site at MP 167.6. One commentor indicated concern regarding the proposed location of the Tallulah Compressor Station, which would be adjacent to his home and property. Specifically, the commentor was concerned about potential visual and noise impacts to his property. Issues associated with visual and noise impacts are discussed in detail in Sections 3.8.6 and 3.11.2, respectively. Both sites would be located on agricultural lands and neither would contain wetlands, waterbodies, or other significant environmental resources. However, several residences are located within 0.25 mile of the alternative site, which would also require crossing agricultural operations to construct an access road. The proximity of these residences to the alternate site could result in the potential occurrence of visual and noise impacts. Additionally, the alternative site would be visually screened by existing trees on only one side. The proposed site is located at least 0.5 mile from the nearest residence and would be visually screened on three sides by trees, thereby reducing the potential for visual and noise impacts. Additionally, we evaluated the potential for noise impacts associated with the proposed Tallulah Compressor Station in Section 3.11.2 and concluded there would not be a significant impact on the noise environment, but recommended additional noise surveys and if necessary, noise controls, to ensure that adverse impacts would not occur.

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-28
Figure 4.5.1-1
Vixen Compressor Station Site Alternative

Non-Internet Public

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 4-29
Figure 4.5.2-1
Tallulah Compressor Station Site Alternative

Construction at either the proposed site or the alternative site for the proposed Tallulah Compressor Station would not result in significant environmental impacts, but the proposed site would be better visually screened and is located farther away from residences than the alternative site. For these reasons, we believe that the alternative site for the proposed Tallulah Compressor Station would not be preferable to the proposed location.