

4.0 ALTERNATIVES

As required by the NEPA, we have evaluated several alternatives to the proposed Southeast 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, 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 OR POSTPONED-ACTION ALTERNATIVES

The Commission 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 2030, and natural gas derived from domestic sources will account for the majority of the total U.S. consumption (EIA, 2007). 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, 2007). The proposed Project would supply up to 1.272 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 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 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 that include 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, SO₂, and CO₂. 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 on-line 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 100.2 quadrillion BTU per year in 2005 to 131.2 quadrillion BTU per year in 2030 (EIA, 2007). 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 Tcf per year in 2005 to 26.1 Tcf by 2030. 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.

Gulf South, because of its extensively interconnected system, would appear to have the sole potential existing pipeline system that could be used for a system alternative meeting the purposes or a portion of the purposes of the Southeast Expansion Project. However, use of Gulf South's system as a system alternative to the Southeast Expansion Project is very limited. Gulf South's existing pipeline system in the central Mississippi area is mostly low-pressure or medium-pressure pipeline and is mostly dedicated to a type of service that requires unpredictable contractual commitments. In addition, Gulf South has no available high-pressure take-away capacity from the central Mississippi area. Gulf South's high-pressure north-south Index 130 pipeline, which extends from Bayou Sale, Louisiana, to Kosciusko, Mississippi, is sold out of capacity at its MAOP. Because of these existing pipeline capacity constraints, the use of Gulf South's existing facilities to make the level of deliveries requested by the market are not a viable alternative. New pipeline and compression, such as that proposed for the Southeast Expansion Project, would have to be constructed to alleviate the new capacity constraints developing in the Perryville-Harrisville area and to provide additional outlets for new supplies.

Our engineering staff evaluated other potential system alternatives to Gulf South's expansion, using proposed pipeline systems such as Transcontinental Gas Pipe Line Company, and planned or proposed projects such as the Southeast Supply Header Project, the East Texas to Mississippi Expansion Project, and the currently-constructed Carthage to Perryville Expansion Project. Staff found that no other interstate pipeline systems in the region could serve Gulf South's customers without having to construct additional facilities that would result in environmental impacts similar to or greater than Gulf South's proposed Project.

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 one major route alternative to the proposed Project route: Major Route Alternative A (Alternative A). Both Alternative A and the proposed Project are summarized in Table 4.3-1 and discussed further below.

It should be noted that Alternative A and the proposed Project only differ in the westernmost sections of their respective routes (i.e., from MP 0 to approximate MP 38.3 on the preferred route). For the last approximately 72 miles, both routes are the same, collocating with the same existing rights-of-way to the terminus at Transco Station 85. Both routes begin at the proposed Harrisville Compressor Station and end at the existing Transco Station 85. Furthermore, the same aboveground facilities, including compressor stations, mainline valves, and interconnects, would be necessary for both Alternative A and the proposed Project. Thus, aboveground facilities are not discussed further in the consideration of route alternatives. However, alternative compressor station sites are discussed later in this section.

TABLE 4.3-1 Comparison of Route Alternatives to the Proposed Southeast Expansion Project			
Comparative Category	Unit	Proposed Project^{a,b}	Major Route Alternative A
Facility Requirements			
Pipeline length	Miles	110.8	116.0
Compressor station requirements	Hp/Number of engines	8,290/3 (new compressor station) 18,940/4 (new compressor station) 7,100/2 (new compressor station)	8,290/3 (new compressor station) 18,940/4 (new compressor station) 7,100/2 (new compressor station))
Land Requirements^b			
Construction right-of-way	Acres	1,240.3	1,337.9
Permanent right-of-way	Acres	731.4	779.0
Environmental Considerations^c			
Land use, upland forest	Acres (Temporary/Permanent)	492.9/301.2	572.0/343.7
Land use, pasture	Acres (Temporary/Permanent)	51.5/31.0	124.5/74.7
Waterbody crossings ^c	Number	101	125
Wetlands crossed	Acres (Temporary/Permanent)	28.37/8.33	51.20/5.10
Notes:			
a Values reported are based on actual data but may differ from other values reported elsewhere in this document so that the proposed Project can be compared to Alternative A.			
b Land requirements reported assume a 100-foot-wide construction right-of-way and a 60-foot-wide permanent right-of-way. Wetland acreages for the Proposed Project were based on a 75-foot temporary construction right-of-way and a 30-foot-wide permanent right-of-way.			
c Based on actual data for the proposed Project and U.S. Geological Survey topographic maps for Alternative A. For wetlands and waterbodies, actual numbers were used for the proposed Project, whereas acreage for Alternative A was determined from aerial photography. Numbers may differ from other portions of the EIS because the numbers in this table reflect only the portion of the proposed Project from MP 0.0 to 38.3.			

Alternative A would traverse north from the proposed Harrisville Compressor Station and parallel Gulf South's Index 130 pipeline for approximately 0.7 mile before turning east and traversing "greenfield" (i.e., not parallel to other pipeline or utility corridors) for approximately 2 miles. The pipeline route would then turn to the northeast and parallel the corridor of a CO₂ (carbon dioxide) pipeline owned by Denbury for approximately 3.3 miles. The pipeline route would then traverse more greenfield for 2 miles and intersect a 12-inch pipeline owned by Crosstex in Rankin County, Mississippi. The pipeline route would parallel the Crosstex pipeline, trending east-southeast for approximately 31.3 miles until joining the proposed route.

This alternative route would be approximately 5 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 the proposed route. Environmentally, this route alternative would result in some impacts slightly greater than those of the proposed route by impacting 97.6 additional acres of land, 79.1 acres more upland forest, 22.83 acres more wetlands, and crossing 24 more streams. However, this alternative would pass within 50 feet of 12 residences (versus 13 for the proposed route) and run parallel to existing pipelines for 112.0 miles of its 116.0-mile (97 percent) route, as compared to 72.7 of 110.8 miles (66 percent) for the proposed route. The collocation along the relatively unknown location of the older Crosstex pipeline would be difficult to achieve without a sufficiently safe offset.

Because Alternative A would result overall in greater environmental impacts, would require more pipeline length, and would be collocated with approximately the same amount of usable existing utility rights-of-way, we believe that the advantages of the proposed Project route would outweigh the disadvantages, and we do not recommend the use of Alternative A.

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 resource sites, wetlands, recreational lands, residences, terrain conditions, and to accommodate landowner requests. Because route variations are identified in response to specific local concerns, they are usually the result of landowner comments. While route variations may be a few miles in length, most are relatively short and in general proximity to the proposed Project. 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 or cultural 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.

As part of its Project development and route selection process, Gulf South identified a total of 16 minor route variations to the originally filed route that have been incorporated into the proposed Project route and which are incorporated into this EIS. These minor variations were developed based on discussions with landowners and resource stewards to avoid or minimize impacts to natural or cultural resources, and minimize conflicts with existing or proposed residential and agricultural land uses, as well as with project engineers, to reduce or eliminate engineering and constructability concerns. Each of these minor route variations is summarized in Table 4.4-1 and depicted in Figures H-1 through H-16 of Appendix H of this EIS. We have evaluated each of these minor route variations and considered their associated environmental consequence as part of our environmental analysis of the proposed Project provided in Section 3.0.

**TABLE 4.4-1
Route Variations Adopted for the Proposed Southeast Expansion Project**

Mileposts		County, State	Length (miles)	Land Use	Reason for Adoption
Begin	End				
1.29	1.69	Simpson, MS	0.40	Forest, planted pine, and forested wetland	Avoids a residential property and an environmentally sensitive feature.
5.24	5.72	Simpson, MS	0.48	Forest and commercial/industrial	Avoids an environmentally sensitive feature.
10.65	11.39	Simpson, MS	0.74	Industrial/commercial, forest, and open land	Slight shift in the route to avoid a landowner who denied permission to survey.
14.28	14.69	Simpson, MS	0.41	Forest	Avoids an environmentally sensitive feature.
15.04	16.15	Simpson, MS	1.11	Forest, pine plantation, and forested wetland	Straightens route to avoid false right-of-way for pullback string associated with Campbell's Creek HDD.
24.92	25.58	Simpson, MS	0.66	Forest and open land	Avoids impacts to a residential area.
38.74	39.12	Smith, MS	0.38	Forest	Shifts line to the north to lessen impact to a pond and an environmentally sensitive feature.
39.47	40.55	Smith, MS	1.08	Forest, pine plantation, and forested wetland	Line shift to avoid parallel creeks and an environmentally sensitive feature.
43.92	45.17	Smith, MS	1.25	Forest, pine plantation, and open land	Accommodates the straight crossing of Leaf River to avoid false right-of-way for pullback string.
45.46	46.87	Smith, MS	1.41	Forest, open land, commercial/industrial, and forested wetland	Avoids an environmentally sensitive feature.
54.24	54.97	Jasper, MS	0.73	Forest	Avoids an environmentally sensitive feature.
55.57	56.87	Jasper, MS	1.30	Forest and pine plantation	Accommodates a straight section for the HDD crossing Tallahoma Creek to avoid false right-of-way for pullback string.
74.69	74.93	Jasper, MS	0.24	Forest	Crossover of existing parallel pipeline was relocated to avoid difficult construction conditions.
82.06	83.20	Clarke, MS	1.14	Forest, wetland (forested, emergent, and scrub-shrub)	Crossover of existing parallel pipeline was relocated to accommodate new location for Destin Compressor Station and M&R Station, which were relocated to avoid wetland impacts on the previous site.
87.56	89.57	Clarke, MS	2.01	Forest, open land, pasture, and forested wetland	Avoids wetlands, an active horse farm, and an environmentally sensitive feature.
94.67	95.17	Clarke, MS	0.50	Planted pine and residential	Avoids a residential property and an environmentally sensitive feature.

Gulf South has indicated that other minor route variations may be necessary as they continue to negotiate with landowners.

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.

4.5 ABOVEGROUND FACILITY ALTERNATIVES

We evaluated the proposed locations of the aboveground facilities for the Southeast Expansion Project to determine whether environmental impacts would be reduced or mitigated by use of alternate 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 three new compressor stations and five M/R stations with associated piping (see Section 2.1). Eight mainline valves and two pig launcher/receiver stations would also be constructed in association with the proposed Project. Because two of the mainline valves and both of the pig launcher/receiver facilities would be located within the confines of a proposed compressor station and/or M/R station site, 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 mainline valves would also be linked to the location of the proposed Project route. Furthermore, the proposed locations of mainline valves 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, mainline valve facilities, or the pig launcher/receiver facilities that would offer a significant environmental advantage to the proposed sites.

As with the other proposed aboveground facilities, the compressor station locations would be constrained to sites near the proposed Project route. Specifically, the proposed compressor station sites along the proposed Project route were largely dictated based on engineering and economic design standards. The Harrisville Compressor Station would be located at MP 0.0 in Simpson County, Mississippi; the Destin Compressor Station would be located at MP 83.0 in Clarke County, Mississippi; and the Delhi Compressor Station would be built approximately 89 miles to the northwest of the Project in Richland Parish, Louisiana. As described in Section 3.8, construction and operation of the Delhi, Harrisville, and Destin Compressor Stations would result in a permanent conversion of approximately 69.5 acres of agriculture, 26.9 acres of upland forest, and 11.7 acres of pine plantation, respectively. A total of four waterbodies would be affected at these proposed compressor station locations. 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).

4.5.1 Delhi Compressor Station Site Alternatives

In order to meet the project's stated goals and objectives, the Delhi Compressor Station must be located in the proximity of the new receipt point associated with CenterPoint's Carthage to Perryville Project in Richland Parish, Louisiana. Two locations were evaluated for the Delhi Compressor Station: (1) a location in an active agricultural field to the south of the CGT facility, and (2) a location immediately to the north of that agricultural field, between that location and CGT's facility (see Figure 4.5-1). No significant environmental constraints appear to be present at either location. CenterPoint Energy and DEGT are purchasing the site to the north of the agricultural field for facilities associated with their SESH Project. Therefore, the only alternative location remaining is in the agricultural field, where Gulf South proposes to construct the Delhi Compressor Station. One stream feature exists across

the proposed alternative site, which will be rerouted around the proposed facility to maintain its flow regime across the property.

As can be seen in Figure 4.5-1, alternative sites for the Delhi Compressor Station are limited by existing land use. The Delhi Municipal Airport lies to the west of the proposed Delhi Compressor Station site. The airport and the flight paths associated with the airport make the eastern half of the Dunn and Delhi, Louisiana, USGS 7.5 minute quadrangle map, Section 36, undesirable. Similarly, only the western half of the Dunn and Delhi, Louisiana, USGS 7.5 minute quadrangle map, Section 31, is available, as Bayou Macon forms the eastern boundary of the parish. Gulf South's project requires setting the compressor station in the proximity of the CenterPoint Carthage to Perryville Project terminus – at the CGT Compressor Station shown as a pumping station on Figure 4.5-1. Eliminating as much distance as possible from this location would shorten the flow lines between the two stations and lessen environmental impacts and landowner inconvenience. Only two parcels of land are available as discussed above. Gulf South has proposed to place its Delhi Compressor Station boundary at the northern property boundary to lessen the length of the flow lines. In addition, Gulf South is proposing to locate the station directly south of the CGT station, again to shorten the length of the flow lines and provide greater flexibility in locating the lines in conjunction with the proposed CenterPoint/DEGT SESH Compressor Station.

With implementation of our recommendations as identified in Section 3.0 of this EIS, we identified no other sites preferable to that of Gulf South's proposed Delhi Compressor Station site.

4.5.2 Harrisville Compressor Station Site Alternatives

From a system design perspective, the Harrisville Compressor Station must be located at the intersection of Gulf South's existing Index 130 pipeline and the new 42-inch pipeline being proposed. Two locations were evaluated for the Harrisville Compressor Station: (1) an alternate location immediately adjacent to Gulf South's existing Index 130 pipeline, and (2) the proposed location 500 feet to the east of the Index 130 pipeline (see Figure 4.5-2). Both locations are within managed pine forest, but the location 500 feet to the east of the Index 130 pipeline offers better access to an existing access road and has much less variation in topography. One stream appears on this property. While both locations are approximately 2,500-2,600 feet from the nearest NSAs associated with the First Presbyterian Twin Lakes Camping Area located to the north, the proposed location is slightly more removed from the camping area. Therefore, in the absence of additional environmental constraints, Gulf South has chosen to construct the Harrisville Compressor Station at the location 500 feet to the east of the Index 130 pipeline.

Our environmental review did not identify any significant environmental advantage of the alternate site. Therefore, we believe that adoption of the alternative site for the Harrisville Compressor Station is not recommended.

4.5.3 Destin Compressor Station Site Alternatives

The purpose of the Destin Compressor Station is to increase the pressure of the gas in the Southeast Expansion Project pipeline to meet the operating pressure of the Destin pipeline. The Destin Compressor Station would be located at approximately MP 82.9 in Clarke County, Mississippi, and in the proximity of the Destin pipeline system. Two locations were evaluated for the Destin Compressor Station: at the northeastern and southeastern quadrants of the intersection of the Southeast Expansion Project pipeline with Destin's pipeline (see Figure 4.5-3). Both locations have similar land use, managed timber, and appear to have equivalent access to the Destin facilities, and are near the same residences.

However, impacts to wetlands are greater on the northeastern site. Therefore, we believe that adoption of the alternative site for the Destin Compressor Station is environmentally preferable.

Non-Internet Public

ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED SOUTHEAST EXPANSION PROJECT
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Figure 4.5-1
Alternatives for the Delhi Compressor Station

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Non-Internet Public

ENVIRONMENTAL IMPACT STATEMENT FOR THE
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Figure 4.5-2
Alternatives for the Harrisville Compressor Station

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ENVIRONMENTAL IMPACT STATEMENT FOR THE
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Figure 4.5-3
Alternatives for the Destin Compressor Station

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