

4.0 ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the proposed Cypress Pipeline and FGT Expansion Projects would vary in duration and significance. Four levels of impact duration were considered: temporary, short term, long term, and permanent. Temporary impact generally occurs during construction with the resource returning to preconstruction condition almost immediately afterward. Short term impact could continue for up to 3 years following construction. Impact was considered long term if the resource would require more than 3 years to recover. A permanent impact could occur as a result of any activity that modifies a resource to the extent that it would not return to preconstruction conditions during the life of the project, such as the construction of a compressor station. We considered an impact to be significant if it would result in a substantial adverse change in the physical environment.

In this section, we discuss the affected environment, general construction and operational impact, and proposed mitigation for each resource. Southern and FGT, as part of their proposals, agreed to implement certain measures to reduce impact. We evaluated Southern's and FGT's proposed mitigations to determine whether additional measures are necessary to reduce impact. These additional measures appear as bulleted, boldfaced paragraphs in the text. We will recommend that these measures be included as specific conditions to authorizations that the Commission may issue to Southern and FGT.

Conclusions in this EIS are based on our analysis of the environmental impact and the following assumptions:

- Southern and FGT would comply with all applicable laws and regulations;
- the proposed facilities would be constructed as described in section 2.0 of this document; and
- Southern and FGT would implement the mitigation measures included in their applications and supplemental filings to the FERC.

4.1 GEOLOGY

4.1.1 Geologic Setting

Cypress Pipeline Project

The proposed Cypress Pipeline Project facilities in Georgia and Florida would be located in the Coastal Plain physiographic province of the southeastern United States (Sandercock and Albadeff, 1996). The only exception would be Southern's Marietta Meter Station which would be located in the adjacent Piedmont physiographic province to the west. The boundary between these two physiographic provinces (referred to as the Fall Line) is the line where the easternmost edge of the hard crystalline rocks of the Piedmont abut the softer, younger sedimentary rocks and sediments of the Coastal Plain. The sandstones, limestones, and sediments of the Coastal Plain range in age from late Cretaceous to Holocene (100 million years ago to today).

The sediments crossed by Southern's proposed alignment were deposited in the Holocene, Pleistocene, Pliocene, and Miocene epochs of the Cenozoic era. Sea level fluctuations throughout the Cenozoic played a major role in creating the present landscape found in the project area through the processes of sediment deposition and erosion.

The elevation of the Coastal Plain is approximately 500 feet above mean sea level (AMSL) at the western edge and slopes gently downward to the east until reaching sea level at the Atlantic Ocean. The pipeline route would generally parallel the Atlantic coastline about 20 to 25 miles inland, and traverse nearly level to moderately sloping parts of the Coastal Plain ranging in elevation from 5 to 100 feet AMSL, with the elevations increasing as the alignment progresses southward into Florida.

The coastal counties in Georgia contain numerous marine terraces, which are characterized by low elongated ridges that parallel the present coastline. These ridges and the flat terrain that separates them are believed to be relict barrier island and back-barrier (marsh and lagoon) complexes similar to those presently found along Georgia's coast. According to (Brooks, 1981a, 1981b), the project locations in Florida are located in an upland plain of Plio-Pleistocene beach ridges with elevations between 80 and 100 feet AMSL.

The portion of the Piedmont in which the Marietta Meter Station would be located is the Central Uplands District, and it is characterized by a series of low ridges separated by broad, open valleys (Clark and Zisa, 1976). The proposed meter station site is at an elevation of approximately 980 feet AMSL.

As shown in table 4.1.1-1, the primary geologic unit crossed by the proposed pipeline facilities in Georgia would be the Pamlico Shoreline Complex, comprising marsh and lagoon deposits. This unit represents over 90 percent of the project area in Georgia and consists primarily of bluish-gray, greenish-gray, or gray silty muds and muds separated by thin laminae of silt, quartz sand, muddy sand or plant fragments. To a lesser degree, relict barrier island complexes and alluvium would be crossed. The barrier island sediments generally consist of fine to medium fine grained sands. The alluvium is comprised of recent mud, sand, and gravel deposits. The Pamlico Shoreline Complex and other Pleistocene deposits typically range between 50 and 60 feet in thickness in the project area.

Near the St. Mary's River and south into Florida, the pipeline route would be underlain by the Charlton Formation, which corresponds to the Charlton Member of the Coosawatchie Formation of the Hawthorn Group. This formation characteristically consists of interbedded carbonates (limestone and dolostone) and clays. The remaining portion of the pipeline route in Florida would cross the Cypresshead Formation. This formation overlies the Coosawatchie Formation and consists primarily of moderately well-sorted fine to very coarse grained sand. Small amounts of kaolinite and mica are also commonly found in the formation. The depth to bedrock in the project area typically ranges between 20 and 200 feet.

The entire pipeline route is located in soft sediments of the coastal plain; therefore, it is unlikely that resistant types of bedrock would be encountered. Based on Natural Resources Conservation Service maps and soil survey information, there are no locations along the pipeline route or at the aboveground facility sites where the depth to bedrock would be less than 5 feet. If soft bedrock or coarse fragments such as rocks are encountered, mechanical rippers or other mechanical means such as conventional excavation with a track-mounted excavator (backhoe), a trencher, or hammering with a backhoe-attached device followed by excavation, would likely have no problem clearing the trench.

Although unlikely, if required, blasting would be conducted according to guidelines designed to control energy propagation and protect persons and property in the area. Southern would employ proper safeguards including flags, barricades, and warning signals would be used at all times. Charges would be kept at a minimum required to break up the rock in the immediate vicinity of the trench. Blast mats would be used when needed to prevent injury from flying rock. Southern would adhere to all federal, state, and local regulations applying to blasting and blast vibration limits with regard to structures and underground utilities. Blasting in the vicinity of other pipelines would be coordinated with the pipeline owner.

TABLE 4.1.1-1

Geologic Units Underlying the Proposed Cypress Pipeline Project Facilities			
State/Facility	Milepost	Geologic Unit	Rock Type
Loop	95.0 – 98.1	Penholoway Shoreline Complex - marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	98.1 – 99.0	Penholoway Shoreline Complex - barrier island facies (Qpni)	Fine to medium fine grained micaceous quartz sand
	99.0 – 101.6	Talbot Shoreline Complex – marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	101.6 – 104.8	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
Mainline	0.0 – 11.6	Penholoway Shoreline Complex - marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	111.2 – 114.3	Penholoway Shoreline Complex - marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	11.6 – 12.8	Talbot Shoreline Complex – marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	12.8 – R22.6	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	R24.7 – R27.3	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	22.1 – 60.7		
	63.9 – 100.8		
	R22.6 – R24.7	Holocene Shoreline Complex - marsh and lagoonal facies (Qhm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
	60.7 – 63.9	Stream Alluvium and undifferentiated terraces deposits (Qal)	Mud, sand, and gravel
	104.2 – 107.8		
	100.8 – 104.2	Talbot Shoreline Complex - barrier island facies (Qti)	Fine to medium fine grained micaceous quartz sand
	107.8 – 111.2	Penholoway Shoreline Complex - barrier island facies (Qpni)	Fine to medium fine grained micaceous quartz sand
	114.3 – 115.5	Charlton Formation and Duplin Marl (Pcd)	Charlton: Imbedded carbonates (limestone and dolostone) and clays. Duplin marl: sandy and pebbly shell-marl and argillaceous sand.
115.5 – 116.1	Charlton Member of Coosawhatchie Formation, Hawthorn Group (Thcc)	Imbedded carbonates (limestone and dolostone) and clays	
116.1 – 159.8	Cypreshead (Tc)	Quartz sand	
Aboveground Facilities			
Compressor Station No 1	40.6	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
Compressor Station No 2	81.1	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
Compressor Station No 3	126.5	Cypreshead (Tc)	Quartz sand
AGL Meter Station	66.0	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
South Georgia Meter Station	143.7	Cypreshead (Tc)	Quartz sand
JEA Brandy Branch Meter Station	149.7	Cypreshead (Tc)	Quartz sand
FGT Meter Station	159.8	Cypreshead (Tc)	Quartz sand
Rincon Gate Meter Station	95.0 (loop)	Penholoway Shoreline Complex - marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
Port Wentworth Meter Station	104.8 (loop)	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
Marietta Meter Station	Offline	Hornblende gneiss/amphibolite (mm3)	Metamorphosed mafic rocks (may include metasedimentary varieties)
MLV # 1	0.0	Penholoway Shoreline Complex - marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
MLV #2	7.7	Penholoway Shoreline Complex - marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand

TABLE 4.1.1-1 (cont'd)

Geologic Units Underlying the Proposed Cypress Pipeline Project Facilities					
State/Facility	Milepost	Geologic Unit	Rock Type		
MLV #3	R 15.1	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand		
MLV #4	R 25.8				
MLV #5	40.5				
MLV #6	57.4				
MLV #7	66.0				
MLV #8	81.1				
MLV #9	81.1				
MLV #10	99.9				
MLV #11	119.2			Cypresshead (Tc)	Quartz sand
MLV #12	126.8				
MLV #13	143.7				
MLV #14	159.8				
LBV #1	104.8 (loop)			Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
LBV #2	95.0 (loop)			Penholoway Shoreline Complex - marsh and lagoonal facies (Qpnm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand
Pipeyards/Contractor Yards					
Charlton #2 Pipeyard	Offline	Penholoway Shoreline Complex - barrier island facies (Qpni)	Fine to medium fine grained micaceous quartz sand		
Glynn #2 Pipeyard	Offline	Holocene Shoreline Complex - marsh and lagoonal facies (Qhm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand		
Chatham #3 Pipeyard	Offline	Pamlico Shoreline Complex – barrier island facies (Qpmi)	Fine to medium fine grained micaceous quartz sand		
Warehouse #2	Offline	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand		
Warehouse #3	Offline	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand		
Warehouse #4	Offline	Wicomico Shoreline Complex – barrier island facies (Qwi)	Fine to medium fine grained micaceous quartz sand		
Warehouse #7	Offline	Pamlico Shoreline Complex - marsh and lagoonal facies (Qpmm)	Silty muds and muds; separated by thin laminae of silt, quartz sand, or mud sand		
McIntosh #2	Offline	Pamlico Shoreline Complex – barrier island facies (Qpmi)	Fine to medium fine grained micaceous quartz sand		
Warehouse #9	Offline	Talbot Shoreline Complex - barrier island facies (Qti)	Fine to medium fine grained micaceous quartz sand		
Warehouse #10	Offline	Wicomico Shoreline Complex – barrier island facies (Qwi)	Fine to medium fine grained micaceous quartz sand		
Warehouse #12	Offline	Cypresshead (Tc)	Quartz sand		
Duval #1 (Baldwin)	Offline	Cypresshead (Tc)	Quartz sand		

Sources: Geologic Formations of Florida (Hough, 1998); Geologic Map of Nassau County, Florida (Scott and Campbell, 1992); Geologic Map of Clay County, Florida (Scott, 1992a); Geologic Map of Duval County, Florida (Scott, 1992b), Digital Geologic Map of Georgia (Georgia Geological Survey, 1999).

Construction and operation of the proposed pipeline would not materially alter the geologic or natural topographic conditions in the pipeline project area. The natural topographic slope and contours would be temporarily altered along much of the pipeline route by grading and trenching activities. However, Southern would restore topographic contours and drainage conditions to the extent practicable to preconstruction conditions following installation of the pipeline, except at those locations where permanent changes in drainage would be required to prevent erosion, scour, and possible exposure of the pipeline.

FGT Expansion Project

The proposed FGT facilities would be located on the Florida Platform, a thick sequence of carbonate rocks that are capped by thin sediments ranging in age from 200 million years old to recent (Scott, 1992c). The Florida Platform is nearly 160,000 square miles, with more than half of the platform submerged underwater, leaving a narrow peninsula of land, which comprises the State of Florida without the panhandle. The geomorphology of Florida is classified broadly as consisting of either highlands or coastal lowlands. Highlands are generally well drained, while lowlands are swampy and/or poorly drained.

The surficial geology at the proposed FGT Expansion Project facilities is summarized in table 4.1.1-2. The pipeline loops would cross either Eocene age limestones and dolostones (Ocala Limestone and Avon Park Formation) or Quaternary and Tertiary sediments ranging in composition from clean sands to clays. The sediments are unconsolidated to poorly consolidated. Ocala Limestone is generally soft and porous but may be hard and dense in places because of cementation by crystalline calcite.

The surficial geology at the aboveground facilities includes the same units as along the pipeline loops as well as several additional units such as the Cypresshead and Coosawhatchie Formations. These additional units are generally unconsolidated or poorly consolidated with the exception of the Coosawhatchi Formation, which is poorly to moderately consolidated.

FGT does not anticipate that blasting would be required during construction of the pipeline loops or aboveground facilities because any bedrock encountered at or near the surface would be weathered or inherently soft enough to use traditional trenching techniques. However, if dense, hard limestone is encountered within the trench line or during construction of any aboveground facilities, blasting may be required.

In the unlikely event that blasting is required during construction, FGT would notify the FERC in advance and comply with all applicable local, state, and federal regulations. Seismically controlled blasting techniques would be used to limit stresses on FGT's existing pipeline and to ensure little to no effect on nearby residential and commercial structures, water supply wells, or electrical transmission tower footings. To avoid damage, the blasting contractor would conduct appropriate pre-blasting geotechnical investigations, as needed, and develop specific blasting operations and monitoring plans to address site variables. Rock and debris associated with blasting would be disposed of in accordance with all applicable regulations and at an approved disposal location.

TABLE 4.1.1-2

Geologic Units Underlying the Proposed FGT Expansion Project Facilities			
Facility	Milepost	Geologic Unit	Rock Type
Loop J	12.8 – 15.5	Ocala Limestone (To)	Marine limestone and occasional dolostones
	15.5 – 17.8	Undifferentiated Quaternary(Qu)	Unconsolidated to poorly consolidated clean to clayey, silty, variably organic-bearing sands to poorly to moderately consolidated sandy, silty clays
Loop K	38.5 – 42.6	Ocala Limestone (To)	Marine limestone and occasional dolostones
	45.5 – 50.2		
	51.4 – 52.1		
	42.6 – 45.5	Undifferentiated Quaternary (Qu)	Unconsolidated to poorly consolidated, clean to clayey, silty, variably organic-bearing sands to poorly to moderately consolidated, sandy, silty clays
Loop G	50.2 – 51.4	Avon Park Formation (Tap)	Fossiliferous marine limestone interbedded with dolostone
	52.1 – 53.7		
	104.9 – 106.3	Undifferentiated sediment (TQu)	Unconsolidated to poorly consolidated, fine to coarse grained, clean to clayey, unfossiliferous sands, sandy clays, and clays
	106.3 – 117.0	Beach ridge and dune (Qbd)	Similar to Qu above but with surficial expressions of beach ridges and dunes
Aboveground Facilities			
Compressor Station 26	West Leg 90.6	Ocala Limestone (To) and	Marine limestone and occasional dolostones
		Hawthorn Group (Th)	Sand, salt sand, and clay
Compressor Station 24	West Leg 25.4	Ocala Limestone (To)	Marine limestone and occasional dolostones
Compressor Station 16 (includes proposed contractor yard)	West Leg 0.0	Coosawhatchie Formation (Thc)	Poorly to moderately consolidated with variable clay and phosphitic sands, few to no fossils
Compressor Station 17	FGT Mainline 608.0	Cypresshead Formation (Tc)	Siliclastic clayey sands; a surficial aquifer in many places
Compressor Station 27	Jacksonville Lateral 160.2	Undifferentiated (Qu)	Unconsolidated to poorly consolidated, clean to clayey, silty, variably organic-bearing sands to poorly to moderately consolidated, sandy, silty clays
Cypress/FGT Interconnect	Jacksonville Lateral 27.6	Cypresshead Formation (Tc)	Siliclastic clayey sands; a surficial aquifer in many places
Long Branch Regulator Station	Jacksonville Lateral 27.6	Cypresshead Formation (Tc)	Siliclastic clayey sands; a surficial aquifer in many places.
Hines M&R Station	Agricola Lateral 7.3	Hawthorn Group, Peace River Formation, Bone Valley Member (Thpb)	Clastic unit of pebble and gravel size phosphate fragments mixed with quartz sand and bedded clays
Brandy Branch M&R Station	Jacksonville Lateral 21.1	Undifferentiated sediment (TQu)	Unconsolidated to poorly consolidated, fine to coarse grained, clean to clayey, unfossiliferous sands, sandy clays, and clays
Jacksonville M&R Station	Jacksonville Lateral 45.3	Holocene sediments (Qh)	Sand, clay, and organics
Lawtey Regulator Station	Jacksonville Lateral 21.2	Trail Ridge Sands (Qtr)	Undifferentiated sediment similar to Qu with surficial features of a trail ridge
Loop K Remote Blowdown	West Leg 44.5	Undifferentiated (Qu)	Unconsolidated to poorly consolidated, clean to clayey, silty, variably organic-bearing sands to poorly to moderately consolidated, sandy, silty clays
Loop K Remote Blowdown	West Leg 53.7	Avon Park Formation (Tap)	Fossiliferous marine limestone interbedded with dolostone
Loop G Remote Blowdown	West Leg 110.8	Beach ridge and dune (Qbd)	Similar to Qu but with surficial expressions of beach ridges and dunes
Loop G Remote Blowdown	West Leg 116.8	Beach ridge and dune (Qbd)	Similar to Qu but with surficial expressions of beach ridges and dunes

TABLE 4.1.1-2 (cont'd)

Geologic Units Underlying the Proposed FGT Expansion Project Facilities

Facility	Milepost	Geologic Unit	Rock Type
Brooksville Contractor/ Pipeyard	Offline	Hawthorn Group (Th)	Sand, salt sand, and clay
Bell Contractor/ Pipeyard	Offline	Ocala Limestone (To)	Marine limestone and occasional dolostones
Lawtey Contractor/Pipe Yard	Offline	Undifferentiated Sediments (TQu)	Unconsolidated to poorly consolidated, fine to coarse grained, clean to clayey, unfossiliferous sands, sandy clays and clays
Lacoochee Pipe Yard	Offline	Ocala Limestone (To)	Marine limestone and occasional dolostones

Sources: Geologic Map of the State of Florida, Florida Geological Survey, Thomas Scott, et al.

<http://geology.er.usgs.gov/paleo/geotime.shtml>

University of Florida Geology Department: http://www.clas.ufl.edu/users/querry/GLY4155/mio_holo.htm

http://sofia.usgs.gov/publications/maps/florida_geology/units.html

FGT also does not anticipate using HDD techniques during pipeline construction. However, should it be determined during the detailed design phase of the project that FGT would use HDD techniques, FGT has agreed to provide HDD contingency plans to FERC prior to initiating any HDD activities.

Construction and operation of FGT's proposed pipeline would have similar impacts as Southern's Proposed Cypress Pipeline described above.

4.1.2 Mineral Resources

Georgia is the leading clay-producing state in the United States, accounting for more than 24 percent of total clay production in 2003 (U.S. Geological Survey (USGS), 2003a). Florida has led the nation in phosphate production for over 90 years and accounts for nearly 25 percent of world phosphate production (FGS, 1994a). Other regionally mined mineral resources include quartz sand, crushed stone, barite and mica, iron oxide pigments, cement, and dimension stone. Oil and natural gas are also produced in the region, although no active wells are located near either of the proposed project areas. Within the proposed Cypress Pipeline Project area, exploited mineral resources primarily consist of sand and gravel. The mineral resources currently exploited in the FGT Project area include limestone, limestone aggregate, and sand.

The proposed Cypress Pipeline Project would not affect any present mineral mining activities and is not anticipated to affect any planned mining activities. The pipeline alignment would be located within 0.25 miles of a sand and gravel mining operation between mileposts R22.0 and R23.8; however, the proposed pipeline would be outside of the mining area. Crosby Paving Company, Inc., based in Savannah, Georgia operates this sand and gravel pit on land owned by International Paper. An existing perimeter access road apparently serves as the limit of the existing mining operations. The pipeline right-of-way would be at its closest point to the perimeter road at approximately milepost R22.3. Beginning at approximately milepost R22.5 and extending to milepost R23.8, Southern plans to install the pipeline by means of the HDD method (see section 2.3.2). This construction procedure would avoid a cultural resource site (a burial see section 4.10.1) as well as the sand and gravel operation.

Existing manmade and natural features would serve to limit any further expansion of the sand and gravel operation in the direction of the proposed pipeline. These include the Georgia Power suspension towers, wetlands, and a plantation cemetery, all of which would be located between the current mine operation and the pipeline right-of-way. Therefore, it is unlikely that the project would impact future operations of the mine.

As determined from review of aerial photographs, field surveys, the USGS Mineral Resources Program database (USGS, 2003a,b), the Florida Geological Survey (1994, 1999b), and information gathered by Southern land agents, no other current mining operations are known within 0.25 miles of the proposed project facilities. In addition, Southern's land agents have confirmed that the project does not encompass any lands owned by mining companies.

No mining operations are located within 0.25 mile of either Loop J or Loop K. An inactive limestone mine is located approximately 320 feet from Loop G route at about MP 110.8 and an active limestone mine is located approximately 370 feet from the proposed Loop G route at MP 111.0. These mines would not have an adverse impact on the pipeline, nor would the pipeline project have an impact on the mines. Loop G would be unlikely to affect future mining at this location or at other locations along the route because, with the exception of two remote blowdown sites, Loop G would be installed within an existing power line corridor that already precludes mining. Most of Loop K also would be located within existing pipeline or power line right-of-way, with only 0.5 mile of the loop requiring an additional 20 feet

of new permanent easement. Loop J would be routed along the edge of existing pipeline right-of-way and would require an additional 20 feet of new permanent easement. Therefore, neither Loop K nor Loop J would be likely to restrict future exploitation of mineral resources.

The only active mines within 0.25 mile of the aboveground facilities associated with the FGT Expansion Project are a sand quarry located more than 1,000 feet north of Compressor Station 26 and an unspecified open pit mining operation located approximately 1,500 feet southeast of Compressor Station 27. All work at the compressor stations would be performed within the existing fenced compressor station facilities and would not affect current or future mineral resource exploitation. Nor would mineral resource development impact the compressor stations. Reclaimed phosphate strip mines surround the Hines M&R Station. The proposed work at this location would not limit current or future mineral resource exploitation because the resources have already been developed. FGT's proposed four remote blowdown facilities would be in locations that would not affect mineral resources.

4.1.3 Geologic Hazards

Geologic hazards are conditions or phenomena that present a risk or are potentially dangerous to life and/or property. Geologic hazards that can affect underground pipelines and appurtenant facilities include seismicity, faults, landslides, and subsidence due to sinkhole development, groundwater withdrawal, or past mining activities. Other geologic hazards such as volcanism are not relevant to the region.

Seismicity and Faults

The Cypress Pipeline Project and FGT Expansion Project are not located in a region that represents a serious seismic risk to the proposed facilities. The potential for geologic hazards associated with seismicity, including ground shaking, active faults, and soil liquefaction is considered very low. Seismic risk can be quantified by the motions experienced by the ground surface or structures during a given earthquake, expressed in terms of the acceleration due to gravity, or "g." The USGS has developed a series of maps for the entire United States which describe the likelihood for shaking of varying degrees to occur in a given area (Frankel et al., 2002). According to the USGS, there is a 10 percent probability of a seismic event occurring within the next 50 years (an approximate 500-year return period), which would result in peak ground accelerations (PGAs) ranging in the Cypress Pipeline Project area from 1 percent (0.01) g in Clay County, Florida to 5 percent (0.05) g in Chatham County, Georgia and the Marietta Meter Station in Cobb County, Georgia. In the entire FGT Project area the corresponding PGA would be 1 percent (0.01) g. For reference, a PGA of 10 percent (0.10) g is generally considered to be the minimum threshold for damage to older structures or structures not made to resist earthquakes (USGS, 2004a).

The proposed Cypress Pipeline loop and mainline would not cross any faults of Cretaceous or Cenozoic ages (Prowell, 1983), and they would not be located near any active faults (Lane, 1991; Verdel, 2000; and USGS, 2005). The proposed FGT Expansion Project loops would not cross any known active faults, as there are no known Quaternary surface faults in the region (USGS, 2004b).

Secondary seismic effects triggered by strong ground shaking are often more serious than the shaking itself. The most damaging secondary seismic effect is often soil liquefaction, a physical process in which saturated, non-cohesive soils, such as sands, temporarily lose their bearing strength when subjected to strong and prolonged shaking. Soils most prone to liquefaction are poorly graded, or in other words, have a uniform grain size. Soil liquefaction can also lead to other ground failures, including settlement and lateral spreading. While some soil types along the proposed pipeline routes may have the potential to liquefy under strong ground shaking, as discussed above, the potential for such ground

shaking is considered low. In addition, the linear extent and ductile nature of pipelines make them much less susceptible to the effects of soil liquefaction compared to other structures.

Landslides

The Coastal Plain and Florida Platform are located in a region with a landslide incidence less than 1.5 percent (USGS, 2000; Godt, 1997). Topographic relief is relatively low along the proposed pipeline routes; therefore landslides would not likely occur in the project areas. Landslide potential would be limited to small slumps, earthflows, and soil creep primarily along ridges and riverbanks. Southern's Marietta Meter Station would be in a portion of the Piedmont that has a relatively high landslide incidence of 15 percent or more (USGS, 2000; Godt, 1997) due to the presence of weathered metamorphic rocks that are susceptible to earth flows, slumps, and rock slides (Radbruch-Hall et al., 1982). FGT reports that landslide activity historically has not been present along or within the proposed pipeline loop rights-of-way or within or near the property lines of the aboveground facilities for its expansion project.

Proper construction techniques, including drainage measures, would minimize the potential for slope failure. These techniques may include the use of water bars, terracing, diversion ditches, and other methods to control runoff and erosion. In addition, revegetation would be used to stabilize slopes. Further details on these mitigative measures are provided in section 4.2. Although the Marietta Meter Station would be in an area of high landslide incidence, the proposed work involves limited modifications to an existing meter station and is not expected to pose a risk relative to landslides.

Ground Subsidence

Ground subsidence can affect pipelines and aboveground facilities by causing a loss of support which may bend or even rupture pipelines or weaken the foundations of aboveground facilities. Although ground subsidence can result from subsurface mining, such activities are not within the proposed project area. Subsidence can also occur as a result of groundwater withdrawal. Historically, subsidence has occurred from pumping of the major drinking water aquifer in the Savannah area; however, this subsidence was not sufficient to be recognized as a serious engineering concern (Davis, 1987). While land subsidence is an issue in southern Florida where the surficial aquifer is heavily pumped, the St. Johns River Water Management District confirmed that land subsidence due to groundwater withdrawal is not an issue in Clay, Nassau, and Duval Counties where the Cypress pipeline would be located (Toth, 2005). Likewise, the FGT Expansion Project would not be located in an area where groundwater pumpage has resulted in land subsidence (USGS, 1999b).

Ground subsidence can be caused by karst features. Karst features such as caves, caverns, and sinkholes form as the result of long-term dissolution of soluble (typically) carbonate rocks (i.e., limestone and dolomite) by slightly acidic groundwater. Karst can be found within the Coastal Plain of Georgia but far from the Cypress Pipeline Project area (USGS, 2003c). The area of the Cypress Pipeline Project facilities in Georgia does not exhibit karst features and has a low probability for developing karst features. The Georgia Geological Survey has no records of known sinkholes located in the coastal counties of Georgia (O'Connor, 2001).

Likewise, the Florida portion of the Cypress Pipeline Project route and aboveground facility locations would not encompass areas of known karst topography; however a sinkhole is located approximately 15 miles from the proposed pipeline route. There are only a few sinkholes in the region and they are not a common feature. According to Sinclair and Stewart (1985), the carbonate rocks in this region are overlain by approximately 200 feet of clastic sediments that limit the groundwater circulation in the underlying carbonate rocks and the associated development of solution cavities. Therefore karst

development along the Cypress Pipeline Project routes is unlikely to occur. However, Southern’s routine maintenance and monitoring of the pipeline would watch for indications of ground subsidence.

Karst features are more common in the area of the FGT Expansion Project. In fact, the primary geological hazard within the FGT Expansion Project area is sinkhole formation. Three major types of sinkholes are common to Florida: solution sinkholes, cover-collapse sinkholes, and cover-subsidence sinkholes. Solution sinkholes occur where carbonate rock is exposed at the ground surface or is covered by thin layers of permeable soil. The slopes of the sides of these bowl-shaped depressions are determined by the rate of subsidence relative to the rate of erosion of the walls from surface runoff.

Cover-collapse sinkholes occur when a solution cavity develops in carbonate rocks that are overlain by less permeable sediments and the cavity enlarges to the point where the overburden can no longer be supported above the newly formed void space. The collapse of the overburden material is usually abrupt and provides dramatic local changes in topography. There are generally no indications of this type of sinkhole formation until it occurs. Cover-collapse sinkholes often form in areas where limestone is within 30 to 200 feet of the land surface.

Cover-subsidence sinkholes occur in areas where the overburden material consists of relatively non-cohesive and permeable sands. As underlying limestone is slowly being dissolved by percolating waters, the sand begins to move downward to fill the voids left by the dissolved limestone. Where the limestone is buried beneath a sufficient thickness of unconsolidated material, the formation of the sinkhole may go unnoticed for years.

The following table identifies areas of sinkhole development within 1,000 feet of the proposed FGT Expansion Project pipeline loops.

TABLE 4.1.3-1		
Sinkholes Within 0.25 Mile of the Proposed FGT Expansion Project Loops		
Project Component	Approximate Milepost	Approximate Distance from Right-of-Way (feet)
Loop K	39.2	775
	42.4	525
	42.5	450
	43.2	950
	48.3	250
	108.5	565
Loop G	113.5	125
	114.0	375
	114.4	650
	114.8	975
	114.8	975

Source: Florida Department of Environmental Protection Sinkholes database
http://www.dep.state.fl.us/geology/gisdatamaps/sinkhole_database.htm.

FGT would conduct geophysical survey and engineering studies if karst terrain or sinkholes are encountered during construction. Depending on site conditions, potential mitigation measures to be implemented by FGT would include the following:

- Route the pipeline away from the sinkholes and karst terrain;

- Use a thicker walled pipe;
- Remediate soil dome, rock cavity, or other incipient feature;
- Take special care to avoid releasing large volumes of water onto land that is prone to sinkhole development during hydrostatic testing of the pipeline; and
- Conduct post-construction inspections of pipeline facilities, and, if a sinkhole or karst terrain area is impacted, evaluate the area and take remedial action immediately.

4.1.4 Paleontological Resources

Paleontological resources are vertebrate and invertebrate fossils that are sometimes discovered at locations under excavation or in areas exposed by erosion. Direct effects on paleontological resources could occur during project construction by activities such as grading or trenching. Indirect effects on fossil beds could result from erosion caused by slope regrading, vegetation clearing, and unauthorized collection.

In Florida, the legislature has enacted a vertebrate fossil statute mandating the protection of the state's vertebrate fossil heritage and vertebrate paleontology sites. This law requires a permit from the Florida Museum of Natural History to collect vertebrate fossils on any state-owned or state-leased lands, or on any land designated by the state as a vertebrate paleontology site. It applies to both submerged and dry lands. The statute encourages mine and heavy equipment operators to cooperate with the state by notifying the Florida Museum of Natural History whenever vertebrate fossils are discovered during mining or digging operations and by allowing such fossils to be properly salvaged.

The State of Georgia does not have state laws protecting paleontological resources, and no records of such sites are maintained by the state (Verdel, 2000). Review of the State of Florida map titled "A Guide to Geologic and Paleontological Sites in Florida" (Rupert, 1989) indicates that the Cypress Pipeline Project does not cross known paleontological resources in Florida. Southern also received written confirmation as to that fact from the Florida Museum of Natural History in 2000 (McCarty, 2000) and from the Florida Geological Survey in 2005 (Bond, 2005).

No important or recognized fossil assemblages have been identified in the proposed FGT Expansion Project area. However, FGT has developed a Program for Recognizing and Reporting Paleontological Resources (Appendix G-1). Should significant paleontological resources be encountered during the project, the program directs project personnel to take photographs and record pertinent information such as location, landowner, provenance, description of the specimen(s), and protection measures. FGT would develop and complete a specimen form for paleontological resources and provide it to the Florida Museum of Natural History. Recognizing that paleontological resources are the property of the landowner, FGT would also encourage the landowner to contact the Florida Museum of Natural History.

4.2 SOILS

4.2.1 Existing Soil Resources

The soils crossed by Southern's loop and mainline were analyzed using the State Soil Geographic (STATSGO) database. The STATSGO database was developed by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) for use in regional, river basin, state, multi-state, and multi-county resource planning. STATSGO spatial data are compiled by combining

geologically and topographically related soils series found in county soil surveys into larger map units called Map Unit Identifiers (MUIDs). The STATSGO database provides information on soil characteristics that may be used to estimate the vulnerability of specific soils to development impacts. Soils within the proposed aboveground facilities associated with the Cypress Pipeline Project were identified using the Soil Surveys of Bryan and Chatham Counties, Georgia (USDA, 1974), Camden and Glynn Counties, Georgia (USDA, 1980), Liberty and Long Counties, Georgia (USDA, 1982), Clay County, Florida (USDA, 1989a), Nassau County, Florida (USDA, 1991b), and Duval County, Florida (USDA, 1998) as well as interim soil mapping, where available.

Information regarding soils crossed by the FGT loops and associated facilities was based on the Soil Surveys of Bradford County (USDA, 1991a), Citrus County (USDA, 1988), Clay County (USDA, 1989), Gilchrist County (USDA, 1992), Hernando County (USDA, 1977), Hillsborough County (USDA, 1989b), Levy County (USDA, 1996), Pasco County (USDA, 1981), and Polk County (USDA, 1990), Florida, and the Soil Survey Geographic Database (SSURGO) (USDA, 2003a). Additional information about the soils was obtained from Official Soil Series Descriptions (Soil Survey Division Staff, 1993).

The Cypress Pipeline Project would be located in the Atlantic Coast Flatwoods Major Land Resource Area (MLRA). The dominant soils within the MLRA are Aquults. Aquults are medium textured to fine textured soils that generally occur either in low places or on wide flats. Histosols are another common soil within the Atlantic Coast Flatwoods MLRA. Histosols are dominantly organic soils that commonly occur in wetlands. Many of the soils in the Atlantic Coast Flatwoods MLRA require artificial drainage before they can be used for crops, and some of the sandy soils need irrigation during droughts. Ninety-six percent of the soils along the Cypress Pipeline Project routes are somewhat poorly drained or wetter.

The FGT Expansion Project would be located in the North-Central Florida Ridge, South-Central Florida Ridge, and the Eastern Gulf Flatwoods MLRAs. The dominant soils in the North-Central and South-Central Florida Ridge MLRAs are Udults and Psamments. Udults are strongly leached, acidic soils that generally contain a subsurface horizon with accumulated clay. Psamments are sandy textured soils of recent origin. The dominant soils in the Eastern Gulf Flatwoods MLRA are Aquults, Aquepts, and Aquods. These soils have a sandy texture and are poorly or very poorly drained. Forty-four percent of the soils along the FGT Expansion Project pipeline loop are somewhat poorly drained or wetter.

4.2.2 Major Soil Characteristics

Pipeline Facilities

Soils along the pipeline routes were evaluated to identify major soil characteristics that could affect construction or increase the potential for construction related soil impacts. The soil characteristics evaluated were: hydric soils, compaction potential, erosion potential, revegetation potential, prime farmland, and the presence of shallow bedrock or coarse fragments. Table 4.4.4-1 provides a summary of the major soil characteristic that would be crossed. Individual soil characteristics are discussed below.

Hydric Soils – Hydric soils are defined as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register, July 13, 1994). Soils that are artificially drained or protected from flooding (e.g., by levees) are still considered hydric if the soil in its undisturbed state would meet the definition of a hydric soil. Hydric soils include very poorly, poorly, and a limited number of somewhat poorly drained soils. The majority of the soils that would be potentially impacted by the Southern project are considered hydric while only 32 percent of all the soils affected by the FGT project are considered hydric (see table 4.2.2-1).

TABLE 4.2.2-1

Acreage of Soil Characteristics Affected by the Cypress Pipeline Project and FGT Expansion Project Pipeline Facilities^a

Project/State/Facility/ County	Total	Hydric Soils ^b	Compaction Prone ^c	Erosion Potential from Water ^d	Erosion Potential from Wind ^e	Revegetation Concerns ^f	Prime Farmland ^b	Shallow Bedrock/ Stony Soils
Cypress Pipeline Project, Georgia								
Loop								
Effingham	57.0	32.4	0.9	0.0	52.0	0.0	0.0	0.0
Chatham	53.6	30.0	0.0	1.8	41.1	0.0	1.0	0.0
Subtotal Loop	110.6	62.5	0.9	1.8	93.1	0.0	1.0	0.0
Mainline								
Effingham	135.6	69.8	2.3	0.0	126.8	6.2	0.7	0.0
Chatham	121.5	70.1	0.0	0.9	103.2	5.0	0.5	0.0
Bryan	75.6	43.1	0.1	1.7	55.1	0.0	1.0	0.0
Liberty	199.5	163.3	24.0	0.0	12.2	0.0	0.0	0.0
Long	24.5	20.3	4.5	0.0	2.6	0.0	0.0	0.0
McIntosh	193.5	143.6	43.5	0.0	40.9	8.0	0.0	0.0
Glynn	255.5	207.6	59.0	0.0	35.5	0.0	0.0	0.0
Camden	200.7	135.3	27.7	0.0	88.7	0.0	0.0	0.0
Charlton	128.2	95.3	34.7	0.9	49.3	0.0	0.0	0.0
Cypress Pipeline Project, Florida								
Mainline								
Nassau	340.4	161.7	3.4	0.0	320.3	0.0	0.0	0.0
Duval	155.9	97.1	6.9	3.8	136.4	0.0	0.0	0.0
Clay	12.8	5.1	0.4	2.2	11.4	1.0	0.0	0.0
Subtotal Cypress Mainline	1843.9	1212.2	206.6	9.6	982.3	20.3	2.2	0.0
Total Cypress Pipeline Project	1954.5	1274.7	207.5	11.4	1075.4	20.3	3.2	0.0
FGT Expansion Project, Florida								
Loop J								
Gilchrist	60.9	0.0	0.0	0.0	60.9	60.9	0.0	0.0
Loop K								
Levy	183.6	126.3	0.0	0.0	159.7	1.9	0.0	12.6
Loop G								
Hernando	147.8	0.8	0.0	0.0	146.5	143.4	0.0	0.0
Total FGT Expansion Project	392.3	127.1	0.0	0.0	367.1	206.2	0.0	12.6

^a Acreage values do not include acreage impacts associated with access roads or temporary extra workspaces, and are calculated assuming fixed construction right-of-way widths for the pipe length that crosses given mapped soil characteristics. Actual impacts would differ slightly due to soil variability within the construction right-of-way and the actual construction right-of-way width. For the Cypress Pipeline Project, a 110-foot-wide construction right-of-way was assumed for the loop, a 97-foot-wide construction right-of-way for the mainline, and a 75-foot-wide construction right-of-way in wetland areas. For the FGT Expansion Project, a 100-foot-wide construction right-of-way was assumed for all loops. Values within a row do not sum to the total listed in the total column because soils may occur in more than one characteristic class or may not occur in any class listed in the table.

^b As designated by the Natural Resources Conservation Service (NRCS).

^c Includes soils in somewhat poor to very poor drainage classes with surface textures of sandy clay loam and finer.

^d Includes soils with a Land Capability Class of 3 thru 8 and a subclass of E (as designated by the NRCS), which denotes a severe limitation for crop management due to erosion.

^e Includes soils with a Wind Erodibility Group (WEG) classification of 1 or 2 (as designated by the NRCS), which indicates a susceptibility to erosion by wind.

^f Includes soils with a fine sand or coarser surface texture that are well drained, somewhat excessively drained, or excessively drained.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Fifty-seven percent of the soils potentially affected by Southern's loop are considered hydric soils and 65 percent of the soils that may be affected by the Southern's mainline route are considered hydric. Similarly, 69 percent of the soils affected by Loop K of the FGT Expansion Project are considered hydric. However, less than 1 percent of the soils affected by Loop J and Loop G are considered hydric.

Compaction Potential – Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils. The degree of compaction depends on moisture content and soil texture. Fine-textured soils with poor internal drainage that are moist or saturated during construction are the most susceptible to compaction and rutting. Compaction can be of particular concern on agricultural land because of impacts it could have on crop yields. Only a small percentage of the soils that would be potentially impacted by Southern's loop would have a high compaction potential. About eleven percent of Southern's mainline would potentially impact soils with a high compaction potential. None of the soils that would be potentially impacted by the FGT loops are considered prone to compaction.

Erosion Potential – Erosion is a continuing natural process that can be accelerated by human disturbance. Factors that influence the degree of erosion include soil texture, soil structure, length and percent of slope, vegetative cover, and rainfall or wind intensity. Soils most susceptible to erosion by water are typified by bare or sparse vegetative cover, noncohesive soil particles with low infiltration rates, and moderate to steep slopes. Wind erosion processes are less affected by slope steepness or length. Soil loss due to erosion could result in the discharge of sediment to waterbodies and wetlands and could also reduce soil fertility and impair revegetation.

Less than 1 percent of the soils that would be affected by Southern's loop and mainline are considered to have a high potential for erosion due to water. However, about 84 percent and 53 percent of the soils potentially affected by Southern's loop and mainline, respectively, have a wind erodibility group (WEG) of two or less and are therefore considered susceptible to wind erosion. These values may be a conservative estimate because a large portion of these soils are also classified as hydric soils. Many of these soils would be partially or fully saturated during construction and would be less likely to be susceptible to wind erosion due to the organic/hydric nature of the soil materials at the surface.

None of the soils that would be affected by the FGT Expansion Project have a high potential for erosion by water. However, approximately 94 percent of the soils potentially affected by the FGT Expansion loops have a wind erodibility group of two or less and are therefore considered susceptible to wind erosion.

Revegetation Potential – Successful restoration and revegetation are important for maintaining soil productivity and protecting the underlying soil from potential damage, such as erosion. Revegetation potential was assessed based on the surface texture and drainage class. Revegetation in soils that have a coarse surface texture and are well drained, somewhat excessively drained, or excessively drained may prove to be difficult to revegetate. The drier soils have less water to aid in the germination and eventual establishment of new vegetation. The coarser textured soils also have a lower water holding capacity following precipitation, which could result in moisture deficiencies in the root zone and creating unfavorable conditions for many plants. Few (about 1 percent) of the soils that would be potentially impacted by the pipeline facilities associated with the Cypress Pipeline Project are considered to have revegetation concerns based on the above criteria (see table 4.2.2-1).

Similarly, only 1 percent of the soils affected by Loop K of the FGT Expansion project have a low revegetation potential. However, the majority of the soils affected by Loop J (100 percent) and Loop G (97 percent) are classified as having a low revegetation potential. Revegetation of these areas is discussed further in section 4.5.3.

Prime Farmland – The USDA defines prime farmland as “land that is best suited to food, feed, fiber, and oilseed crops” (Soil Survey Division Staff, 1993). This designation includes cultivated land, pasture, woodland, or other lands that are either used for food or fiber crops or are available for these uses. Urbanized land and open water are excluded from prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent, prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., artificial drainage).

Less than 1 percent of the soils that would be potentially affected by the Cypress Pipeline Project are considered prime farmland (see table 4.2.2-1). None of the soils that would be impacted by the FGT Expansion Project pipeline loops are considered prime farmland.

Stony/Rocky Soils and Shallow-to-Bedrock Soils – Introducing rocks to surface layers may reduce soil moisture-holding capacity, resulting in a reduction of soil productivity. Additionally, some agricultural equipment may be damaged by contact with large rocks. The presence of rocks within the surface horizons and/or shallow bedrock may also create poor revegetation conditions. There would be no rocky soils along the proposed Cypress Pipeline or FGT Expansion Project pipeline routes. In addition, there would be no soils containing bedrock within approximately 5 feet of the surface along the proposed Southern pipeline route. However, approximately 3 percent of the proposed FGT pipeline route would cross soils with bedrock within 5 feet of the surface, all of which would be located along Loop K.

Aboveground Facilities

Southern’s new compressor stations and other new aboveground facilities would result in the permanent conversion of land to industrial uses, however, none of the affected land is classified as prime agricultural farmland or is considered to have a high potential for erosion by water. Compressor Station #3 and the majority of other new aboveground facilities would affect soils that are considered susceptible to wind erosion, however, Southern would install temporary and permanent erosion control measures according to our Plan 2003 (Appendix D) to prevent erosion of site soils.

The majority of FGT’s proposed upgrades, replacements, and modifications to existing facilities would affect lands that are already classified as commercial land and therefore would not affect lands classified as prime agricultural farmland. However, some of the proposed aboveground facilities, including FGT’s 4 new remote blowdown valves, would result in the permanent conversion of additional land to industrial uses. None of the affected land is classified as prime agricultural farmland and the majority is not considered to have a high potential for erosion by water. The majority of the soils at these facilities are considered susceptible to wind erosion, however, FGT would install temporary and permanent erosion control measures according to our Plan 2003 (Appendix D) to prevent erosion of site soils.

Warehouses and Pipeyards

Southern proposes to use 4 pipeyards and 8 warehouse yards during construction of the loop and mainline. Soils considered to be prime farmland would be affected at only one of the proposed warehouse sites (WH-7), which contains about 3.5 acres. However, those soils would not be permanently converted to another use. Upon completion of construction and use of the yard, all the yards would be restored and returned to preconstruction uses. None of the soils within the pipeyards or warehouse areas have a high potential for erosion by water; however, the majority of the soils are considered susceptible to wind erosion but erosion would be prevented by implementation of our Plan 2003 (Appendix D) with approved modifications.

FGT proposes to use 5 pipe storage and contractor yards during the construction of the 3 pipeline loops. None of these facilities would affect any soils considered to be prime farmland or have a high potential for erosion by water. However, the majority of the soils are considered susceptible to wind erosion. Erosion would be controlled by FGT's implementation of our Plan 2003 (Appendix D).

4.2.2 General Impacts and Mitigation

Pipeline construction activities such as clearing, grading, trench excavation, and backfilling, as well as the movement of construction equipment along the right-of-way may result in adverse impacts on soil resources. Clearing removes protective cover and exposes the soil to the effects of wind, sun, and precipitation, which may increase the potential for soil erosion and the movement of sediments to sensitive areas. Grading and equipment traffic may compact soil, reducing porosity and percolation rates, which would result in increased runoff potential and decreased agricultural productivity. Trench excavation and backfilling could lead to mixing of topsoil and subsoil and may introduce rocks to the soil surface from deeper soil horizons. Contamination from spills or leaks of fuels, lubricants, and coolants from construction equipment could also impact soils.

Drain tiles are subsurface structures used in agricultural areas to improve the productivity of the land by increasing drainage of the soils. Although Southern and FGT did not identify any drain tiles that would be crossed during construction, it is possible that some drain tiles could be encountered during construction. Rutting due to operation of heavy construction equipment in wet soils and excavation of the pipeline trench are construction activities that could damage drain tiles during construction.

The general measures that Southern and FGT would follow to avoid or minimize the potential effects of construction on soils are described below.

Our Plan 2003

The impacts on soils described above can be effectively minimized through the use of erosion control and revegetation measures described in our Plan 2003 (Appendix D). Southern would implement these measures but requested one modification, which is discussed below. FGT would implement our Plan 2003 and did not request any modifications. Our Plan 2003 includes measures to control erosion and sedimentation during construction and to ensure revegetation to prevent erosion following construction. Some of the relevant mitigation measures specified in our Plan 2003 are described below:

- Install sediment control measures, such as silt fencing and straw bales, to prevent transport of sediment from construction areas into adjacent waterbodies, wetlands, and roads.
- Ensure revegetation of all areas disturbed by project-related activities. Disturbed areas would be seeded in accordance with written recommendations from local soil conservation authorities or the request of the landowner or land management agency.
- Provide post-construction monitoring of mitigation practices to ensure their successful implementation. Revegetated areas would be monitored for at least 2 years following construction to ensure successful restoration. In areas not used for agriculture, restoration would be considered successful when the density and cover of non-nuisance vegetation is similar to adjacent undisturbed land. In agricultural areas, revegetation would be considered successful if crop yields were similar to adjacent undisturbed portions of the same field.

- Utilize EIs to ensure implementation of the practices outlined above.

Southern requested a modification to our Plan 2003 to conduct vegetation maintenance as often as every 2 years in upland areas, and annually in Class 3 DOT population centers (e.g., residential areas) and on the Fort Stewart property. Our Plan 2003 allows vegetation maintenance to be conducted in upland areas up to every 3 years. Because this modification would more directly affect vegetation resources see section 4.5.2 for further detail and our conclusions.

4.2.3 Site-specific Impact and Mitigation

Pipeline Facilities

The majority of the soils that would be impacted by the proposed Southern loop and mainline (57 percent and 65 percent, respectively) are considered hydric. Approximately 69 percent of the soils along the FGT loop K are hydric, and less than 1 percent of the soils affected by Loop J and Loop G are considered hydric. Due to extended periods of saturation, hydric soils can be prone to compaction and rutting. Southern and FGT would minimize rutting of hydric soils by using construction mats where hydric soils cannot support equipment. In addition, high groundwater levels associated with hydric soils could create a buoyancy hazard for the pipeline. Special construction methods such as a concrete coating and other weighting methods would be used to overcome buoyancy hazards during operation of the pipeline.

Excavation of the pipeline trench in saturated soils could result in an increased trench width due to sloughing of unstable trench walls. In addition, larger spoil storage areas could be needed to accommodate the saturated material being removed and stockpiled along the right-of-way. Based on the potential for larger trench width and spoil storage areas Southern has requested a modification to the FERC's Procedures to allow an increased right-of-way width in several wetlands crossed by the Southern loop and mainline that would contain sandy and saturated soils that are prone to sloughing. Approval of this modification would result in an additional 55.9 acres of impact on hydric soils along the proposed Southern pipeline routes. Avoidance of these impacts by denial of this modification may not be possible because a narrower right-of-way would not necessarily prevent the spoil from spreading (see section 4.4.5 for the FERC staff's conclusions regarding these modifications).

Construction equipment traveling over wet soils could disrupt soil structure, reduce pore space, increase runoff potential, and cause rutting. Compaction and rutting impacts on most soils would be more likely to occur when soils are moist or saturated. The Southern loop and mainline would cross about 207.5 acres of compaction prone soils. The FGT Loops J, K, and G would not affect soils considered to be prone to compaction. Southern and FGT would minimize compaction and rutting impacts by using measures outlined in our Plan 2003 (Appendix D) and Procedures 2003 (Appendix E), with approved modifications, during construction in soft or saturated soils (e.g., constructing on timber mats, or using low-ground-weight equipment). In addition, EIs could also restrict construction activities during unfavorable conditions (e.g., wet weather) to further reduce compaction and rutting. In accordance with our Plan 2003, Southern and FGT would use penetrometers or other appropriate devices to test for soil compaction in agricultural areas. Compaction impacts would be mitigated through the use of deep tillage during restoration activities using a paraplow or similar implement. In areas where topsoil segregation occurs, plowing to alleviate compaction would be conducted before replacement of the topsoil.

Clearing, grading, and equipment movement would expose soils to water and wind erosion and, without adequate protection, result in discharge of sediment to waterbodies and wetlands. Erosion could also reduce soil fertility and impair revegetation as a result of topsoil loss.

The majority (about 99 percent) of the soils crossed by the proposed Southern loop and mainline would not be highly susceptible to erosion by water. Similarly, none of the soils crossed by the FGT Loops J, K, and G would have a high potential for erosion by water. Southern and FGT would implement temporary and permanent erosion and sediment control measures (e.g., silt fence, hay bales, and trench breakers) and construction practices as specified in their Plans to minimize erosion during and after construction activities. Temporary erosion control devices would be installed immediately after initial ground disturbance and monitored as required throughout construction (i.e., daily in areas of active construction and weekly in areas with no active construction). Erosion and sedimentation controls on the pipeline right-of-way would be inspected and maintained as necessary until final stabilization was achieved.

The susceptibility of soils to wind erosion could result in the loss of topsoil and potential dust hazards. Large portions of the soils that would be affected by construction of the Southern loop (about 84 percent) and mainline (about 55 percent) would be susceptible to wind erosion. About 367.1 acres (94 percent) of FGT's Loops J, K, and G would be susceptible to wind erosion. Southern and FGT would implement dust mitigation measures, including the use of water and mulch, to reduce impacts from wind erosion on exposed soil and surrounding resources. Permanent revegetation of the disturbed soils would control wind erosion after construction is completed.

The clearing and grading of soils with poor revegetation potential could result in a lack of adequate vegetation following construction and restoration of the right-of-way, which could lead to increased erosion, a reduction in wildlife habitat, and negative visual impacts. Construction of the pipeline facilities associated with the Cypress Pipeline Project would affect about 20.3 acres (1 percent) of soils with revegetation concerns all located along the mainline. About 206.2 acres (53 percent) of the soils that would be affected by the FGT loops could exhibit poor revegetation potential. In accordance with our Plan 2003, with approved modifications, and recommendations from the NRCS, Southern and FGT would mitigate the effects of poor revegetation potential by applying fertilizer, pH modifiers, and using mulch (where appropriate) to create a favorable environment for the re-establishment of vegetation. A seed mixture, developed through consultation with the NRCS and in accordance with landowner agreements, would be applied to reestablish vegetation following final grading. Southern and FGT would monitor the success of revegetation of the right-of-way in the year following construction and again during the second growing season (see section 4.5). If the success standards required by our Plan 2003 are not met, additional revegetation efforts would be conducted until revegetation is deemed successful.

Potential impacts on prime agricultural farmland would include interference with agricultural drainage (if present), mixing of topsoil and subsoil, and compaction and rutting. These impacts would result primarily from trench excavation and backfilling, and vehicular traffic along the construction right-of-way. Most impacts would be temporary, and would not result in permanent conversion of prime farmland to non-agricultural uses. Less than 1 percent of the land that would be affected by construction of Southern's loop and mainline are considered prime farmland and none of the soils potentially affected by the FGT Expansion Project are considered prime farmland soils. To mitigate impacts on prime farmland soils, Southern would implement the measures included in our Plan 2003, which include topsoil segregation, compaction relief, removal of excess rock, and restoration of any agricultural drainage systems encountered. In agricultural areas, revegetation would be considered successful if crop yields are similar to adjacent undisturbed portions of the same field and Southern would be required to continue revegetation efforts until revegetation is successful.

Any drain tiles, culverts, or other items damaged during construction would be repaired or replaced to preconstruction conditions. Based on field surveys and correspondence with landowners, no drain tiles were identified within the proposed pipeline routes. However, in the event drain tiles would be discovered, they would be probed beyond the limits of the trench to determine if any damage occurred.

Tiles would be repaired to original condition or better. Qualified specialists would conduct testing and repair of the drain tiles. Southern and FGT would monitor the function of any encountered drainage systems after construction to ensure that performance of drain tile systems remains consistent with performance prior to construction. Adherence to these measures would minimize impacts on prime farmland and other agricultural land and would promote the long-term productivity of the soil.

Trenching through stony/rocky soils could bring rocks to the surface, which could interfere with agricultural practices and hinder revegetation of the right-of-way. Because there are no rocky/stony soils along the proposed Southern loop and mainline and FGT loops and only a small portion (3 percent) of the FGT loops would cross soils with bedrock within 5 feet of the surface, the potential for impacts associated with increased stones or rocks at the soil surface would be minimal. However, should excess rocks and stones accumulate at the soil surface as a result of construction practices, Southern's and FGT's implementation of our Plan 2003 would require that rock be removed from at least the top 12 inches in actively cultivated or rotated cropland and pastures, hayfields, and residential areas, as well as other areas at the request of the landowner in order to make conditions similar those in undisturbed areas adjacent to the construction work area.

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of contamination are typically minor because of the low frequency and volumes of spills and leaks, and because of the rapid response to spill conditions. To prevent and contain, if necessary, accidental spills of any material that may contaminate soils, and to ensure that inadvertent spills of fuels, lubricants, or solvents are contained and cleaned up in an appropriate manner, Southern would implement its SPCC Plan including its Waste Management Plan and Container Management Policy (Appendix F-1), and FGT would develop spill prevention and response procedures consistent with the requirements of our Procedures 2003 (see section IV of Appendix E).

Southern conducted a review of the 2004 Hazardous Waste Inventory for Georgia (GADNR, 2005a), the FLDEP listing of State Funded Sites (FLDEP, 2005a) and Superfund Sites in Florida (FLDEP, 2005b) for the proposed project area. No potential sources of contamination were identified within 0.5 mile of the proposed pipeline routes or associated facilities. Three contaminated sites were identified that would be within 0.7 to 1.3 miles of the proposed Cypress Pipeline Project, but none of these sites would be disturbed during construction

Southern would include its waste management plan in the contractor's scope of work to address identification, testing, handling, and disposal of contaminated wastes. EIs would monitor trenching operations to identify if potentially contaminated soils are encountered by visual inspection for stained soils, groundwater sheen, or open trenches with suspect odors. If suspect soils are encountered, the soil would be tested for contaminated materials. Any soils found to be contaminated would be properly managed according to the waste management plan and disposed of at an approved disposal facility.

FGT conducted a review of the USEPA National Priority List and FLDEP State-Funded Cleanup Program for the proposed project area (USEPA, 2005a; FLDEP, 2005a). No potential sources of contamination were identified within 0.5 mile of the proposed pipeline routes or associated facilities. However, if contaminated soils are encountered during construction FGT would implement procedures to identify and manage the contamination.

Although the potential to encounter contaminated soils during pipeline construction is relatively low, mismanagement of contaminated materials encountered during construction could result in serious impacts on soils and other sensitive resources. As a result, **we recommend that:**

- **FGT should prepare a Plan for the Discovery and Management of Contaminated Soils and Groundwater. This plan should comply with applicable state and federal regulations and should include procedures for the identification and management of unknown contaminants if any are encountered. Prior to construction, the plan should be filed with the Secretary for review and approval by the Director of OEP.**

Aboveground Facilities

Construction of aboveground facilities associated with the Cypress Pipeline Project would temporarily impact about 51.5 acres of land and operation of the aboveground facilities would permanently affect about 22.6 acres of land. Construction of aboveground facilities associated with the FGT Expansion Project would temporarily impact about 11.4 acres of land located outside of existing facilities, 5.1 acres of which would be permanently affected by operation of the aboveground facilities. None of the soils contained within aboveground facilities are considered prime farmland so no permanent impacts on prime farmland would result from construction or operation of Southern's or FGT's aboveground facilities. In addition, the majority of the soils at the proposed aboveground facilities are not highly susceptible to water erosion, so adverse impacts on nearby sensitive resources from erosion and sedimentation would be minor. Many of these soils, however, are susceptible to wind erosion. However, erosion control procedures and restoration of vegetation as specified in our Plan 2003 (Appendix D) would be implemented where appropriate, thereby further minimizing potential impacts on soils.

Warehouses and Pipeyards

The 3.5 acres of prime farmland soils that would be affected at warehouse site WH-7 of the Cypress Pipeline Project are not currently used for active cultivation. In addition, the site would be returned to preconstruction conditions, so no permanent impacts on prime farmland would result from use of the site. None of the pipe storage and contactor yards associated with the FGT Expansion Project would affect any soils considered to be prime farmland. To reduce the potential for wind erosion on exposed soil at all warehouse and pipeyard sites, Southern and FGT would implement mitigation measures including the use of water trucks to moisten exposed and stockpile soil and the application of mulch. Following construction, all sites would be permanently stabilized by revegetation.

4.3 WATER RESOURCES

4.3.1 Groundwater

4.3.1.1 Existing Groundwater Resources

Groundwater serves as a water source to a majority of the population in the Cypress Pipeline and FGT Expansion Project areas. There are three major aquifer systems in the project areas including the: 1) surficial aquifers, 2) Upper and Lower Brunswick aquifers, and 3) Floridian Aquifer (USGS, 1999). Of these, the Floridian Aquifer serves as the principal source of drinking water throughout both project areas. The Upper and Lower Brunswick aquifers do not occur in the FGT Expansion Project area and are not a major source of water. These aquifers are considered a supplemental water supply to the Floridian aquifer in the vicinity of the Cypress Pipeline Project area. The surficial aquifers are generally used in rural areas of both projects.

The EPA defines a sole- or principal-source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water. Although there are two EPA-designated sole-source aquifers located in

Florida (EPA, 2005a), none of the aquifers are designated as sole-source aquifers in the areas crossed by Cypress Pipeline and FGT Expansion Projects.

Surficial Aquifers

The surficial aquifer that occurs within the Cypress Pipeline Project area consists of intermixed layers of unconsolidated clays, silts, and sands that typically occur under unconfined or semi-confined conditions beneath layers of silt and clay in coastal areas. The surficial aquifer can range from 11 to 72 feet in depth below the ground surface, and generally yields 2 to 25 gallons per minute (USGS, 1999a). The surficial aquifer crossed by the Cypress Pipeline Project is generally used for domestic and livestock supplies.

The FGT Expansion Project occurs within the surficial aquifer system in five counties, including Polk, Bradford, Clay, Hillsborough, and Duval County, Florida. This aquifer system is generally present under unconfined, or water table conditions and consists of mainly unconsolidated sand, sandy shell, and shell material. The aquifer thickness is usually less than 50 feet, and the water table elevation typically ranges from 5 to 40 feet above mean sea level (AMSL). Water enters this aquifer from rainfall and exits as baseflow into streams and rivers, discharges to coastal areas, evapotranspiration, and as downward recharge to deeper aquifers. The surficial aquifer system crossed by the FGT Expansion Project generally produces a low yield and is mainly utilized for domestic, commercial, or small municipal supplies.

Upper and Lower Brunswick Aquifers

The Upper and Lower Brunswick Aquifers occur within the Cypress Pipeline Project area and underlie the surficial aquifer system. These aquifers are comprised of discontinuous lens-shaped bodies of sand, generally 50 to 80 feet thick that are composed of Miocene deposits and exist within the outcrop areas of the Miocene Altamaha Formation and Hawthorne Group (Clarke, 2003; USGS, 1999a; Donahue, 1999). These aquifers are typically confined by less permeable Miocene clays and sandy clays. These aquifers can range from 85 to 390 feet below ground, and generally yield 10 to 30 gallons per minute. Groundwater sampling by the GADNR's Environmental Protection Division (EPD) has shown elevated nitrate/nitrite and benzene levels at several wells that produce water from the Brunswick Aquifers (Donahue, 1999).

Floridian Aquifer

The Floridian Aquifer system occurs within the FGT Expansion Project area and beneath the Brunswick aquifers in the Cypress Pipeline Project area. The Floridian Aquifer consists of predominantly Eocene and Oligocene limestones and dolostones that are hydraulically connected and underlie an area of about 100,000 square miles in southern Alabama, southeastern Georgia, southern South Carolina, and all of Florida.

The Florida Aquifer is a principal artesian aquifer that provides water for several large cities in the project areas including, Savannah and Brunswick in Georgia, and Jacksonville, Tallahassee, Orlando, and St. Petersburg in Florida. In addition, the aquifer system provides water for hundreds of thousands of people in smaller communities and rural areas. Pumping wells in the aquifer can yield up to approximately 1,000 to 5,000 gallons per minute (USGS, 1999), and account for a significant withdrawal of water from the aquifer. It is the principal source of potable water for most of north and central Florida. Other uses include industrial and agricultural withdrawals. An estimated 4,020 million gallons per day (Mgal/d) of water was withdrawn from the Floridian aquifer system in 2000. Nearly 78 percent (3,125 Mgal/d) of this water was withdrawn in Florida (Marella, 2005). Natural discharge occurs to springs,

rivers, lakes, and as leakage to overlying units. Most of the springs occur along the large rivers in north central Florida and in the Panhandle (e.g., Suwannee River).

The Floridian Aquifer system generally consists of an Upper Floridian Aquifer and a Lower Floridian Aquifer, separated by less-permeable carbonate beds within the lower Avon Park Formation. The Upper Floridian Aquifer unit is highly permeable and consists principally of three carbonate units: the Suwannee Limestone, the Ocala Limestone, and the upper part of the Avon Park Formation (Johnston and Bush, 1988). It can be unconfined, semi-confined, or confined throughout Florida. Sinkholes are common in the unconfined and semi-confined areas and provide hydraulic connection between the surface and the Upper Floridian Aquifer. Generally, when the upper confining unit is less than 100 feet thick, it can be locally breached by sinkholes.

The Floridian Aquifer system generally thickens seaward from inland areas in northern Florida and can reach depths as large as 1,000 feet below sea level in southern Florida and 1,500 feet below sea level in the westernmost part of the Florida Panhandle. Recharge to the Floridian Aquifer occurs in areas where the aquifer is near the surface under unconfined conditions as well as through sinkholes and solution pipes that penetrate the aquifer. Although the Floridian Aquifer system is confined in the Cypress Pipeline Project area, it is at or near the land surface in the western part of the Florida peninsula that includes the FGT Expansion Project area. The groundwater quality is generally good throughout the project areas, and no significant contamination has been identified. The main inorganic constituent is calcium carbonate with the concentration of dissolved solids less than 500 mg/l. The confined nature of the aquifer in the Cypress Pipeline Project area provides a level of protection to its water quality.

Groundwater Contamination

No known or potential sources of groundwater and/or soil contamination have been identified within one mile of the Cypress Pipeline Project area. However, four contaminated sites were identified within a two mile radius of Southern's proposed pipeline alignment. Each of these sites is located in Chatham County, Georgia, near the beginning of the project. However, due to their distance of 0.7 to 1.3 miles from the project, contamination associated with these sites is not expected to be encountered. Additionally, no sites with contamination have been identified within 0.5 mile of proposed FGT Expansion Project facilities. Therefore, it is not anticipated that contaminated groundwater and/or soils would be encountered during construction of either project.

The majority of the aquifer systems in Florida are vulnerable to contamination due to the presence of sandy soils situated over porous limestone, and the presence of shallow overburden water tables and relatively high annual rainfall. The main contaminants of concern are associated with the historical application of agricultural fertilizers and pesticides, which have impacted the shallow groundwater in areas of Florida. Ambient water quality data indicates that the average nitrate and nitrite concentrations vary across the state, and while some regions contain elevated concentrations, the majority of the groundwater is within the state groundwater standards.

4.3.1.2 General Impact and Mitigation

Although proposed pipeline construction activities could affect groundwater resources, most potential impacts would be avoided or minimized by each project using the standard and specialized construction techniques, and adhering to our Plan 2003 and Procedures 2003, with approved modifications, as described in Appendices D and E, respectively. Shallow aquifers could sustain minor impacts from changes in overland water flow and recharge caused by clearing and grading of the proposed right-of-way. Near-surface soil compaction caused by heavy construction vehicles could reduce the soil's ability to absorb water, which could increase surface runoff and the potential for ponding. In

forested areas, water infiltration normally enhanced by vegetation, would be reduced until vegetation is reestablished. These minor impacts would be temporary and would not significantly affect groundwater resources or groundwater quality. Upon completion of construction, Southern and FGT would restore the ground surface as closely as practicable to original contours and revegetate the right-of-way to ensure restoration of preconstruction overland flow and recharge patterns.

Construction of the proposed pipelines would require trenching and backfilling to a depth of approximately six to seven feet below ground surface. In areas where the water table is near the ground surface, trench excavation could intersect the water table, requiring trench dewatering. Trench dewatering may result in localized, minor changes to the water table, as well as to springs and wetland areas. Because pipeline construction at a given location would be completed within a short period of time, potential impacts from dewatering would be temporary and water table elevations would be quickly reestablished. At locations where the trench may be continually flooded and dewatering would not be feasible, the pipe would be floated into place using the push-pull method as described in section 2.3.2.

Alteration of the natural soil strata could result in new migration pathways for groundwater, particularly in wetland areas. However, backfilling with previously excavated materials and the installation of trench breakers at the edge of waterbodies, in wetlands, and in any other areas where the trench is below the water table would prevent groundwater migration along the pipeline. No long-term water table changes or changes/impediments to groundwater flow as a result of pipeline construction are anticipated.

The Cypress Pipeline Project would avoid groundwater impacts to the Brunswick and Floridan Aquifers because they are below the construction zone and protected by the confining layers of the Miocene Altamaha Formation and Hawthorne Group, which decrease infiltration. To minimize the impact of the HDD locations, the depth of the drills has been planned to avoid impacts to these aquifers. In the event that a drilled hole is abandoned, the hole would be filled with a mixture of bentonite and drilled spoil. No grouting of abandoned holes is proposed.

Spills or leaks of hazardous liquids have the potential for long-term impacts on groundwater resources, especially in areas where there is a high susceptibility to surface contamination. Accidental spills and leaks of hazardous materials associated with equipment trailers; the refueling or maintenance of vehicles; and the storage of fuel, oil, and other fluids pose the greatest risk to groundwater resources. If not cleaned up, contaminated soils would continue to leach and add pollutants to groundwater long after a spill has occurred. These potential impacts would be avoided or greatly reduced by regulating fuel storage and refueling activities, and by requiring immediate cleanup should a spill or leak occur.

To ensure that potential impacts to groundwater resources are prevented and minimized to the extent possible, and to avoid spills and leaks, Southern would implement its SPCC Plan including its Waste Management Plan and Container Management Policy (Appendix F-1), and FGT would develop spill prevention and response procedures consistent with the requirements of our Procedures 2003 (see section IV of Appendix E). Preventive measures include instructions for construction personnel on spill prevention, spill response procedures, and spill response materials, plus guidance and protocols for refueling operations and regular inspection of containers and equipment for signs of deterioration. We have reviewed Southern's SPCC Plan and find it adequately addresses the storage and transfer of hazardous materials and the response to be taken in the event of a spill. By following the SPCC Plans, the potential impacts on groundwater due to spills or leaks would be minimized.

Although no contaminated sites or groundwater have been identified within the proposed Cypress Pipeline or FGT Expansion Project areas, Southern would implement procedures to identify and manage contamination in the event that unknown pre-existing contamination is encountered during construction,

and FGT would develop a plan for the discovery and management of contaminated soils and groundwater as recommended in section 4.2.3. Southern would include its waste management plan (see Appendix F-1) in the contractor's scope of work that would include identification, testing, handling and disposal of contaminated wastes, and Environmental inspectors would monitor trenching operations to identify if potentially contaminated soils are encountered by visual inspection for stained soils, groundwater sheen, or open trenches with suspect odors. If suspect soils are encountered, the soil would be tested for contaminated materials. Any soils found to be contaminated would be properly managed according to the waste management plan and disposed of at an approved disposal facility.

4.3.1.3 Water Supply Wells and Springs

Potential impacts on wells located near the construction right-of-way could include: localized decreases in groundwater recharge rates, changes to overland water flow contamination due to hazardous materials spills, decreased well yields, decreased water quality (such as an increase in turbidity or odor in the water), interference with well mechanics, or complete disruption of the well.

Cypress Pipeline Project

Southern reviewed state and water management district well database records in 2000, and conducted field surveys in 2000 and 2005 that included investigations for wells and springs where survey permission was granted. Based on these analyses, no springs were identified. Southern identified several private wells along the loop and mainline routes in Effingham County, Georgia, and one well near the mainline route in Clay County, Florida. These wells are associated with private residences and their locations are summarized by pipeline facility, approximate milepost, and distance and direction from the pipeline centerline in table 4.3-1. No other wells have been identified by Southern. Southern is currently updating its consultations with the state and water management district database record to determine the location of additional wells that may have been installed since their previous investigations in 2000, and would continue to investigate for the presence of wells and springs during its civil and engineering surveys and landowner negotiations. In addition, Southern's EIs would be trained to monitor the construction right-of-way for any previously unidentified wells, springs, or side hill seeps.

State/County/Facility	MP	Distance from Centerline (feet)	Direction from Centerline
Georgia, Effingham County			
Loop	101.7	125	North
	98.3	125	West
	98.3	100	West
	98.2	125	West
	98.2	150	North
Mainline	1.6	125	North
Florida, Clay County			
Mainline	159.1	35	East

Southern would monitor wells within 150 feet of the centerline during construction. The wells would be inspected for water quality and flow characteristics before and after construction. If construction temporarily impairs well water, Southern would provide alternative sources of water or otherwise compensate the owner. If permanent well damage is documented, Southern would either compensate the owner or arrange for a new well to be drilled.

If springs are identified that construction activity could impact, Southern would treat the springs as waterbodies and avoid or minimize impacts by following our Procedures 2003 that include such measures as installation of erosion control devices (i.e., silt fence, hay bales), seep collars (e.g., trench plugs), and equipment bridges and culverts, as appropriate, and also limit grading and reduce the construction width, if possible.

Southern evaluated its project for the occurrence of wellhead protection areas (WPAs). The FLDEP and GADNR have designated wellhead protection areas to protect potable water wells and to prevent the need for their replacement or restoration due to contamination. In Florida, the wellhead protection areas consist of a 500-foot radial setback distance around potable water wells and include the surface and subsurface area surrounding the wells (FLDEP, 2005c). Southern's review of FLDEP and Georgia Geologic Survey databases in 2000 did not show any wellhead protection areas, and the SJRWMD did not identify any potable wells within 0.5 mile of the project area. More recent consultation with GADNR has confirmed that no wellhead protection areas or community municipal water supply wells are within 500 feet of the proposed Cypress Pipeline Project (Robertson, 2005). Southern is currently in consultation with SJRWMD to determine the location of any additional water wells that may have been installed in proximity to the project subsequent to their investigations in 2000 in the state of Florida. Additionally, Southern is consulting with the SJRWMD to determine whether any recent wellhead protection areas have been established near the pipeline corridor or ancillary facilities. Although no new or previously unidentified wells or wellhead protection areas are anticipated, if any are identified, Southern has agreed to comply with mitigative measures outlined by FLDEP, GADNR, and SJRWMD to monitor and protect these water resources.

Based on the ongoing efforts by Southern to identify springs, seeps, and wells near the construction work areas, **we recommend that:**

- **Southern should file the locations of all springs, seeps, and wells identified within 150 feet of its construction right-of-way with the Secretary prior to construction.**

In addition, to further ensure that water supply wells/systems are adequately protected, **we recommend that:**

- **Southern should file a report with the Secretary, within 30 days of placing their pipeline facilities in service, identifying all water supply wells/systems damaged by construction and how they were repaired. The report should include a discussion of any complaints concerning the well yield or quality and how each problem was resolved.**

FGT Expansion Project

FGT would not cross any designated wellhead protection areas. FGT identified eight county water supply wells that are located between milepost 115.1 and 116.3 on Loop G, as summarized on table 4.3-2. The county water supply wells serve as a water supply source for the Hernando County water collection and distribution plant. The water distribution facility supplies potable water and firewater to approximately 5,190 people. The wells were constructed between 1989 and 2004 and are not the sole sources of water because the plant is interconnected with other groundwater supply wells in the county. The wells are within 500 feet of the proposed work areas but would be separated from the construction right-of-way by the presence of FPL's existing right-of-way. This separation would minimize the risk of a construction spill affecting groundwater quality in the vicinity of the county wells.

FGT identified 12 private wells located within 150 feet of construction work areas, including six on Loop J and six on Loop G, as summarized on table 4.3-2. FGT states that survey work has not been

completed for the entire pipeline route and consultations with the FLDEP have not been completed to identify other public water supply wells in the vicinity of the proposed FGT facilities. Therefore, there is potential for additional water wells or springs to be within 150 feet of construction work areas. FGT has agreed to continue to investigate the presence of wells and springs during its preconstruction civil and engineering surveys, as well as during landowner negotiations and agency consultations. In addition, FGT has also agreed to test water wells and springs within 150 feet of temporary construction work areas prior to any blasting. In the unlikely event that construction activities, including blasting, temporarily impair water wells or springs within 150 feet of temporary construction work areas, FGT would provide alternative sources of water or otherwise compensate the owner. If permanent well damage is substantiated, FGT would either compensate the owner for damages or repair the water supply.

Well	Approximate Depth (ft)	Approximate MP	Offset from Centerline (ft)	Offset from Construction Work Area (ft)
Loop J				
Private Well	N/A	14.0	120	100
Private Well	N/A	15.2	140	120
Private Well	N/A	15.4	170	90
Private Well	N/A	17.2	90	0
Private Well	N/A	17.5	65	0
Private Well	N/A	17.8	200	100
Loop K (None)				
Loop G				
Private Well	N/A	108.8	18	0
Private Well	N/A	108.8	62	42
Private Well	N/A	108.9	95	80
Private Well	N/A	109.6	110	95
Private Well	N/A	109.9	22	7
Private Well	N/A	109.9	95	80
Hernando County Utilities Well #1	535	115.1	250	175
Hernando County Utilities Well #2	461	115.2	250	175
Hernando County Utilities Well #3	535	115.5	255	175
Hernando County Utilities Well #4	508	115.6	260	115
Hernando County Utilities Well #5	530	115.9	395	250
Hernando County Utilities Well #6	480	116.1	350	270
Hernando County Utilities Well #7	450	116.1	325	190
Hernando County Utilities Well # 8	N/A	116.3	315	245

Based on the ongoing efforts by FGT to identify springs, seeps, and wells near the construction work areas, **we recommend that:**

- **FGT should file the locations of all springs, seeps, and wells identified within 150 feet of its construction right-of-way with the Secretary of the OEP prior to construction.**

In addition, to further ensure that water supply wells/systems are adequately protected, we recommend that:

- **FGT should file a report with the Secretary, within 30 days of placing their pipeline facilities in service, identifying all water supply wells/systems damaged by construction and how they were repaired. The report should include a discussion of any complaints concerning the well yield or quality and how each problem was resolved.**

4.3.1.4 Groundwater Uses During Construction

Both Southern and FGT are expected to encounter groundwater when excavating the trench or in other areas that there is a high water table. Dewatering groundwater from the excavations may be required for short periods of time to complete construction. Generally, pipeline construction activities that would require dewatering within a particular location, such as completing isolated welds or inspecting the trench before lowering in the pipe, are typically completed within several days. The potential effect on users of the groundwater would depend on the rate and duration of pumping and the location of the activity. FGT would also need to use about 9.1 million gallons of groundwater for hydrostatic testing of its three loops. Where groundwater would be used, the additional pumping could lower the water table and impact groundwater supplies or the baseflows of nearby streams. However, the total volumes of water to be used by FGT are relatively low, the groundwater resources in the project area are abundant, and the resulting impacts would likely be insignificant. After the testing is completed, hydrostatic test water would be discharged to upland locations and would be considered non consumptive (i.e., the water would be returned to the watershed on the completion of testing). Long-term impacts on water supplies would not be anticipated as a result of dewatering or hydrostatic testing activities.

4.3.2 Surface Water Resources

Watershed Descriptions

Georgia and Florida manage their surface waters using a watershed management/planning approach, which provides the framework for identifying, assessing, and prioritizing water resource issues, developing implementation strategies, and providing opportunities for targeted, cooperative actions to reduce pollution, enhance aquatic habitat, and provide a dependable water supply (FLDEP, 2004; GADNR, 2002c). Table 4.3.2-1 identifies the pipeline facility, river basin name, milepost location, and description of the nine basins that would be crossed by the Cypress Pipeline and FGT Expansion Projects.

TABLE 4.3.2-1

Major Watersheds Crossed by the Cypress Pipeline and FGT Expansion Projects

Pipeline Facility/Basin Name	Milepost Range or Pipeline Segment	Description of Drainage Area
Cypress Pipeline Project		
Savannah River Basin	R0.0 – R9.5	The Savannah River Basin is approximately 10,577 square miles in size and drains approximately 5,821 square miles in eastern Georgia. The Savannah River defines the state boundary between Georgia and South Carolina (GADNR, 2001b).
Ogeechee River Basin	R9.5 – 59.5	The Ogeechee River Basin is located entirely within the state of Georgia and drains approximately 5,450 square miles. In the headwaters, the North and South Fork Ogeechee Rivers join to form the Ogeechee River, which flows approximately 245 miles in a southeasterly direction to the Atlantic Ocean (GADNR, 2001a).
Altamaha River Basin	59.5 – 68.3	The Altamaha River Basin is located in southeast Georgia and drains approximately 2,850 square miles. The Altamaha River begins at the confluence of the Oconee and Ocmulgee Rivers and flows in a southeasterly direction where it discharges into the Atlantic Ocean (GADNR, 2003).
Satilla River Basin	68.3 – 109.5	The Satilla River Basin is located in southeast Georgia and drains approximately 3,940 square miles. In addition to the Satilla River, the other main streams in the basin include the Little Satilla River and the Alabaha River (GADNR, 2002b).
St. Marys River Basin	109.5 – 152.6 ^a	The St. Marys River Basin is located in Georgia and Florida and drains approximately 1,300 square miles (GADNR, 2002a). The St. Marys River originates in Charlton County, Georgia and serves as a natural border between Georgia and Florida (SJRWMD, 2000).
Nassau River Basin	121.6 – 140.3 ^a	The Nassau River Basin is located in northeastern Florida and covers much of Nassau and Duval Counties. The basin drains approximately 430 square miles of mostly forested and wetland areas (SJRWMD, 2000).
Lower St. Johns River Basin	152.6 – 159.9	The St. Johns River is Florida's longest river at about 310 miles. The St. Johns River is divided into three drainage basins: The upper basin; middle basin; and lower basin. The lower basin is approximately 2,750 square miles in size and covers the area from Putnam County to the mouth in Duval County where the river discharges to the Atlantic Ocean (SJRWMD, 2000).
FGT Expansion Project		
Suwannee River Basin	Loops J and K	The Suwannee River Basin covers approximately 7,702 square miles in north central Florida within all or part of 14 counties. Portions of the basin also extend into southern Georgia and include the watersheds of the following rivers: Aucilla; Econfina-steinhatchee, Alapaha, Withlacoochee, Upper Suwannee, Lower Suwannee, Sante Fe, and Waccasassa (FLDEP, 2001).
Springs Coast River Basin	Loop G	The Springs Coast Watershed consists of about 800 square miles of coastal land in Citrus, Hernando and Pasco counties. The watershed is dominated by numerous springs that discharge to form several rivers, the extensive coastal swamps and salt marshes, high pine woodlands and lakes. There are four major groups of springs in the Springs Coast Watershed. They are: Crystal River Springs, Homosassa Springs, Chassahowitzka Springs and Weekiwachee Springs. Combined, these springs discharge about 900 million gallons of water per day (Southwest Florida Water Management District, 2005).

^a The proposed pipeline would cross between the St. Marys River Basin and the Nassau River Basin several times between MPs 121.6 to 140.3.

Surface Water Quality Standards and Designated Uses

Water quality standards are developed by states to enhance or maintain water quality, protect the public health or welfare, and to provide for, and protect, the designated uses of the waters of the state. In Georgia, the surface water quality standards are described in the *Rules and Regulations for Water Quality Control* (GADNR, 2004a) and are administered by the GADNR, Environmental Protection Division. Florida's surface water quality standards are listed in Chapter 62-302 of the Florida Administrative Code (FAC) and enforced by the FLDEP, Water Quality Standards and Special Projects Program. The designated uses of surface waters in Georgia and Florida are listed in table 4.3.2-2.

State/Designated Use	Description
Georgia	
Drinking Water	Those waters approved as a source for drinking water systems permitted, or to be permitted, by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality
Recreation	General recreational activities, or for any other use requiring water of a lower quality, such as recreational fishing
Fishing, Propagation of Fish, Shellfish, Game and Other Aquatic Life	Secondary contact recreation in and on the water or for any use requiring water of a lower quality
Coastal Fishing	This classification will be applicable to specific sites when so designated by the Environmental Protection Division. For waters designated as "Coastal Fishing," site specific criteria for dissolved oxygen will be assigned. All other criteria and uses for the fishing use classification will apply for coastal fishing
Wild River	Includes rivers that the Georgia Board of Natural Resources has designated as wild and in which there shall be no alteration of natural water quality from any source
Scenic River	Includes rivers that the Georgia Board of Natural Resources has designated as scenic and in which there shall be no alteration of natural water quality from any source
Florida	
Class I	Potable Water Supply
Class II	Shellfish Propagation or Harvesting
Class III	Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife
Class IV	Agricultural Water Supply
Class V	Navigation, Utility, and Industrial Use

Waterbody Crossings

Waterbodies crossed by the proposed facilities were identified by examining United States Geological Survey (USGS) topographic maps and aerial photographs, and through field reconnaissance. Construction of the Cypress Pipeline and FGT Expansion Projects would involve crossing a total of 111 waterbodies including perennial and intermittent streams, manmade ditches, and ponds. A table identifying the state, pipeline facility, crossing location, waterbody name, flow type, crossing width, state water quality classification, and the proposed crossing method(s) for each waterbody is included as appendix H. A description of the waterbody crossings along the Cypress Pipeline and FGT Expansion Projects are described below.

Cypress Pipeline Project – Construction of the loop and mainline would involve crossing 104 waterbodies including 17 crossed by the loop and 87 crossed by the mainline. Of the 96 waterbodies that would be crossed by the loop and mainline in Georgia, 55 are perennial streams, 34 are intermittent

streams, 4 are manmade ditches, and 3 are ponds. Of the eight waterbodies that would be crossed by the mainline in Florida, six are perennial streams and two are intermittent streams.

Southern completed field surveys at the proposed aboveground facilities, access roads, and warehouse sites to confirm the presence or absence of surface waters. Based on the results of the field surveys, no perennial or intermittent waterbodies are located at the three compressor station sites or four new meter station sites. One pond exists within the proposed footprint for the expansion of the existing Rincon Gate Meter Station in Effingham County, Georgia. The pond is apparently man-made and would be permanently filled for construction and operation of the site. However, due to our recommendation for the Rincon Gate Meter Station in section 3.3.3.4, the pond may not be affected by the proposed project.

One intermittent stream was identified at a contractor yard (WH-7) and a manmade ditch was identified at a pipeyard location (GL-1), both located in Georgia. Southern does not anticipate that the use of these sites would affect the associated surface waters. Southern would minimize impacts on those waterbodies by implementing our Procedures 2003, with approved modifications, as described below.

Waterbodies were identified along existing access roads that Southern proposes to use during construction. Based on field reconnaissance, Southern anticipates that several access roads would require improvements at waterbody crossings to accommodate construction vehicles. The improvements would likely be minor and consist of upgrading culverts and/or reinforcing existing crossings. Table 4.3.2-3 identifies the access road and MP location, type of improvement, and the associated waterbody where improvements may be required.

TABLE 4.3.2-3		
Access Roads Requiring Improvements at Waterbody Crossings		
Access Road (MP Location)	Type of Improvement	Associated Waterbody
Access Road 14.5 ext (14.5)	Replace culverts	Unnamed Waterbody
Access Road 39.3 (39.3)	Stream Improvement	Russell Creek
Access Road 153.6 (153.6)	Bridge Improvement	Yellow Water Creek
Access Road 154.6 (154.6)	Grading, culvert installation	Tributary of Yellow Water Creek

In addition to the access road improvements identified in table 4.3.2-3, Southern stated that it may also need to complete other road improvements such as widening, increasing turning radius, blading, and leveling (see Southern’s comments provided for each access road listed in table C-2 of Appendix C). The other access roads that could require improvements, and the specific nature and extent of those potential improvements, including whether they could occur outside the existing roadway, have not been determined at this time. In order to ensure improvements to existing roads would not affect sensitive environmental resources such as waterbodies, wetlands, cultural resources, or protected species, **the FERC staff recommends that:**

- Prior to construction, Southern should file with the Secretary for review and written approval by the Director of OEP access road information specifying the locations and dimensions of the road improvements relative to the existing road configuration; documentation that necessary wetland, cultural resource, and protected species surveys have been completed for the road improvements; and documentation that necessary permits and landowner approvals, have been obtained for the road improvements.**

FGT Expansion Project – The FGT Expansion Project would cross a total of seven waterbodies, including two perennial streams and five intermittent streams. All of the waterbody crossing would occur along Loop K. No waterbodies would be crossed by Loops J and G.

FGT completed field surveys at its proposed aboveground facility and contractor and pipe yard sites to confirm the presence or absence of surface waters. Based on the results of the investigations, no surface waters would be affected at any of the aboveground facility sites. In order to access the Cypress/FGT Interconnect, FGT would use an existing access road that crosses two unnamed waterbodies that discharge to the Long Branch of the North Fork of Black Creek. Both of these waterbodies flow across the access through a culvert and would not be disturbed by construction.

Major and Navigable Waterbodies

Our Procedures 2003 (Appendix E) define major waterbodies as those that are greater than 100 feet wide at the crossing location. Navigable waters are defined by the COE as waters subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Navigable waters are regulated by the COE under section 10 of the Rivers and Harbors Act.

Cypress Pipeline Project – The Cypress Pipeline Project would cross six major waterbodies, including the Ogeechee River (MP 23.7), two Sand Pit Lake crossings (MPs 61.6 and 61.7), the Altamaha River (MP 62.8), the Satilla River (MP 104.3), and the St. Marys River (MP 115.4). Navigable waterbodies that would be crossed include the Little Ogeechee River (MPs 10.9 and 11.2), Ogeechee River (MP 23.7), Altamaha River (MP 62.8), Satilla River (104.3), and St. Marys River (MP 115.4).

FGT Expansion Project – None of the waterbodies that would be crossed by the FGT Expansion Project are classified as major or navigable.

Sensitive Waterbodies

For the purposes of this analysis, sensitive waterbodies have been defined to include those that: are designated as National Wild and Scenic Rivers or listed on the Nationwide Rivers Inventory (NRI); are state-designated high quality or outstanding natural resource waters; provide habitat for threatened and/or endangered species; have potable surface water intakes located within 3 miles downstream of the pipeline crossing; and/or do not currently support designated uses.

Cypress Pipeline Project – While none of the waterbodies that would be crossed by the proposed pipeline facilities are designated as National Wild and Scenic Rivers, the St. Marys River (MP 115.4) has been authorized as a study river. The Wild and Scenic Rivers Act (WSR Act) specifies how rivers may be added to the National Wild and Scenic Rivers System (NWSRS). The status of this designation process for the St. Marys River, and our recommendation to prevent the Cypress Pipeline Project from affecting its potential eligibility to be added to the NWSRS, are evaluated further in section 4.8.5.

Segments of the Altamaha River, Satilla River, and the St. Marys River are listed on the NRI. The NRI is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more “outstandingly remarkable” natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential directive, and related Council on Environmental Quality procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments (NPS, 2005a).

None of the waterbody crossings are classified as Outstanding National Resource Waters, Outstanding Florida Waters, or trout waters (GADNR, 2004a; FLDEP, 2005d).

The Ogeechee, Altamaha, Satilla, and St. Marys Rivers may support the following two federally endangered species: the shortnose sturgeon (*Acipenser brevirostrum*) and the West Indian manatee (*Trichechus manatus*). An analysis of potential impacts on federally listed threatened and endangered species is included in section 4.7.1.

Based on review of the designated uses, none of the waterbodies that would be crossed are classified as a source of drinking water or potable water supply within 3 miles downstream of the proposed pipeline waterbody crossings (GADNR, 2004a; FLDEP, 2004).

Section 305(b) of the CWA requires states to submit biennial water quality reports to the EPA. These reports, referred to as 305(b) reports or Integrated Monitoring and Assessment reports, describe surface water and groundwater quality and trends and the extent to which waters are attaining their designated uses (such as drinking water and recreation). Under section 303(d) of the CWA, states are also required to identify waters that are not attaining their designated use. For these waters the states must develop total maximum daily loads (TMDLs), which represent the maximum amount of a given pollutant that a waterbody can assimilate and still meet its designated use(s).

Based on review of the draft Georgia 2004 305(b)/303(d) list, five waterbodies that would be crossed in Georgia do not currently fully support their designated uses and are listed as only partially supporting designated uses (GADNR, 2004b). Table 4.3.2-4 identifies the MP location, waterbody name, water quality criterion violated, evaluated cause, and the proposed water quality improvement measures of the waterbodies listed as partially supporting designated uses.

Milepost	Waterbody Name	Water Quality Criterion Violated	Evaluated Cause	Proposed Water Quality Improvement Measures
23.7	Ogeechee River	Trophic-weighted residue value of mercury in fish tissue.	Nonpoint/unknown sources	Watershed protection strategy to minimize nonpoint sources
37.1	Peacock Creek	Dissolved oxygen/fecal coliform bacteria	Urban runoff	Watershed protection strategy to minimize urban runoff. Phase II General NPDES Stormwater Permit issued 12/9/02.
62.8	Altamaha River	Fecal coliform bacteria	Nonpoint/unknown sources	Watershed protection strategy to minimize nonpoint sources.
104.3	Satilla River	Trophic-weighted residue value of mercury in fish tissue.	Nonpoint/unknown sources	Water quality impairment will be remediated through the development of a local plan.
115.4	St. Marys River	Trophic-weighted residue value of mercury in fish tissue.	Nonpoint/unknown sources	Water quality impairment will be remediated through the development of a local plan.

Based on review of the Integrated Water Quality Assessment for Florida: 2002 305(b) Report and 303(d) List Update, all of the waterbodies that would be crossed in Florida currently support their designated uses (FLDEP, 2004).

The GADNR conducted a search of its Natural Heritage and Conservation Lands Databases and identified the St. Marys River, Satilla River, Altamaha River, and Ogeechee River as high priority streams included in its Comprehensive Wildlife Conservation Strategy (see section 4.6.1.4). The GADNR search also indicated that a scenic easement exists on both sides of the Altamaha River crossing.

FGT Expansion Project – Based on review of the Integrated Water Quality Assessment for Florida: 2002 305(b) Report and 303(d) List Update, and the Suwannee Water Quality Assessment Report, none of the waterbody crossings along the FGT Expansion Project are considered sensitive or sources of potable water, and all currently support their designated uses (FLDEP, 2004; FLDEP, 2003).

4.3.3 General Impact and Mitigation

As identified on the waterbody crossing table included in appendix H, the majority of the streams affected by the Southern and FGT projects would be crossed using the open-cut, flume, or dam and pump methods. Descriptions of these crossing methods are described in section 2.3.2. Pipeline construction across perennial streams using the open-cut construction method could adversely affect surface waters. Potential impacts from clearing and grading, in-stream trenching, trench dewatering, and backfilling could modify aquatic habitat, increase sedimentation rates and turbidity, decrease dissolved oxygen concentrations, increase water temperature, and introduce fuels and oils from accidental spills. The impacts of the open-cut construction method on the minor and intermediate streams located along the pipeline routes would generally be localized and short term. The degree of impact would depend, in part, on the flow volume in the streams during construction. If construction occurs during a dry period, most of the impacts on streams would be avoided. If the streams are flowing during construction, clearing, grading, and trenching within and adjacent to these streams could affect water quality. Sediments would be resuspended by in-stream construction activities or by erosion of cleared stream banks and riparian areas.

Implementation of dry crossing techniques such as the dam-and-pump or flume methods, would avoid the majority of the impacts described above because the pipeline trench within the streambed would be isolated from the stream flow (see section 2.3.2). Impacts, such as the clearing of riparian vegetation and the disturbance of the bed and the banks of the waterbody would still occur, but would be expected to be less severe than the open-cut construction technique. Following pipeline installation, suspended sediment and turbidity levels would be expected to return to preconstruction levels soon after the stream crossing is completed.

The FERC staff developed its Procedures 2003 (Appendix E) in order to minimize impacts associated with waterbody crossings, including open-cut or dry crossings. Measures in our Procedures 2003 include but are not limited to:

- maintaining adequate flow rates throughout construction to protect aquatic life and prevent the interruption of existing downstream uses;
- restricting storage and refueling activities near surface waters and implementing a Spill Plan if a spill or leak occurs during construction;
- limiting the use of equipment operating in the waterbody to that needed to construct the crossing;

- requiring temporary erosion and sediment control measures to be installed across the entire width of the construction right-of-way to prevent the flow of spoil or heavily silt-laden water into any waterbody;
- requiring bank stabilization and reestablishment of bed and bank contours after construction;
- complying with the permit terms and conditions of the COE, or its delegated agency; and
- limiting post-construction maintenance of vegetated buffer strips adjacent to streams.

Southern and FGT would implement our Procedures 2003 during waterbody crossings, but have requested certain modifications. These modifications are discussed below.

Requested Modifications to our Procedures 2003

Cypress Pipeline Project – Southern has requested three modifications to our Procedures 2003 that would potentially affect surface waters. Table 4.3.3-1 summarizes these modifications and provides our conclusions regarding whether each modification is acceptable. These modifications are also called out in our Procedures 2003 located in Appendix E. Because certain modifications are approved with stipulations or denied, **we recommend that:**

- **Prior to construction, Southern should require that buffers (extra work area setbacks, refueling restrictions, etc.) be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete. Alternatively, Southern may provide additional information before the end of the draft EIS comment period to justify approval of modifications that have been recommended for denial.**

FGT Expansion Project – FGT has requested one modification from section V.B.2.a. of our Procedures 2003 concerning the setback distance for extra workspace for two waterbody crossings. The waterbodies are located on Loop K and include FGT’s crossing of Otter Creek at about MP 49.7, and Flat Branch at about MP 52.8. This modification has been reviewed and appears necessary for soil stockpiling during the waterbody crossings. Therefore, we believe this modification is warranted.

TABLE 4.3.3-1

Southern's Proposed Modifications from our Procedures

Section	Modification Request	Conclusion and Approval Status
IV.A.1.d	<p>Southern proposes to allow refueling within 100 feet of a waterbody when maintaining a 100-foot buffer is not practical. To minimize impacts on wetlands and waterbodies, Southern would implement its SPCC Plan when refueling is required within 100 feet of a waterbody. Southern's revised text omits any discussion regarding overnight parking of vehicles within 100 feet of wetlands or waterbodies.</p>	<p>Our Procedures 2003 require that all equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. As specified in our Procedures 2003, these activities can occur closer only if the EI finds, in advance, no reasonable alternative and the project sponsor and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill. Additionally, an EI would need to approve parking equipment within 100 feet of a wetland or waterbody. Implementation of the above site-specific guidance would address Southern's request without requiring a modification. In addition, our compliance monitors would further ensure that waterbodies and wetlands are adequately protected if Southern's EIs approve refueling within 100 feet of these resources.</p>
V.B.1b.	<p>Southern proposes to modify the FERC's requirement to restrict the waterbody crossing construction window for coolwater and warmwater fisheries. Southern would use its discretion to utilize the most appropriate crossing method for a particular location during a time period within its construction schedule and would do so in consultation with federal and state regulatory agencies. Southern would attempt to minimize in-stream impacts by expediting the crossing time and adhering to best management practices for waterbody crossings.</p>	<p>Our Procedures restrict the construction window for coolwater and warmwater fisheries to June 1 through November 30. The FLDEP recommends that waterbody crossings occur when rainfall is less frequent, and Southern has stated it would attempt to schedule major waterbody crossing during typically low flow periods. In consideration of the FLDEPs recommendation and because waterbody crossings would be conducted in consultation with federal and state regulatory agencies, this modification is approved.</p>
V.B.2.a	<p>Southern has identified 26 locations where it requests to locate extra workspaces within 50 feet of a wetland or waterbody boundary or directly within a wetland.</p>	<p>Our Procedures requires that all extra work areas (such as staging areas and additional spoil storage areas) be located at least 50 feet away from waterbody/wetland boundaries, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. In accordance with our Procedures, Southern has depicted these locations on aerial photo-based alignment sheets and provided a site-specific explanation of the conditions that would prevent a 50-foot setback for extra workspace at waterbody or wetland crossings. We have reviewed the alignment sheets and Southern's explanations to make determinations whether to approve or deny each modification requested. Based on our review, most of the modifications appear to be reasonable and adequately justified. Southern's site-specific modification requests and the status of our approval or denial are provided in table J-1 in Appendix J. Southern would also submit these modification requests to other applicable agencies (e.g., the COE, the FLDEP, and the GADNR) as part of its permit applications. These other agencies may approve, approve with stipulations/modifications, or deny the requests as part of their permit decisions. Southern's implementation of modifications approved by the FERC would need to be consistent with its permits from the other jurisdictional agencies.</p>

TABLE 4.3.3-1 (cont'd)

Southern's Proposed Modifications from our Procedures

Section	Modification Request	Conclusion and Approval Status
V.B.3.f	Southern omitted text from our Procedures regarding the marking of waterbody buffers.	Our Procedures requires that buffers (extra work area setbacks, refueling restrictions, etc.) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete. Therefore, we recommend that: Southern should require that buffers (extra work area setbacks, refueling restrictions, etc.) be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

Construction Spills

Refueling of vehicles and storage of fuel, oil, or other hazardous fluids near surface waters may create a potential for surface water contamination due to an accidental release. If a spill were to occur, immediate downstream uses could be impacted. Acute and chronic toxic effects on aquatic organisms could result from such a spill. To minimize the potential for spills Southern has developed an SPCC Plan and FGT would develop spill prevention and response procedures consistent with the requirements of our Procedures 2003 (see section IV of Appendix E). Both plans would, at a minimum, ensure that:

- All employees handling fuels and other hazardous materials are properly trained;
- All equipment is in good operating order and inspected on a regular basis;
- Fuel trucks transporting fuel to on-site equipment travel only on approved access roads;
- All equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. These activities can occur closer only if the EI finds, in advance, no reasonable alternative and the project sponsor and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill;
- Hazardous materials, including chemicals, fuels, and lubricating oils, are not stored within 100 feet of a wetland, waterbody, or designated municipal watershed area, unless the location is designated for such use by an appropriate governmental authority;
- Concrete coating activities are not performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use;
- Sufficient supplies of absorbent and barrier materials and tools are available to stop leaks and allow the rapid containment and recovery of spilled materials;
- Construction personnel know the contact names and telephone numbers for all local, state, and federal agencies (including, if necessary, the National Response Center) that must be notified of a spill, and knows the procedures for reporting spills; and,
- Contractors follow the requirements of those agencies in cleaning up the spill, in excavating and disposing of soils or other materials contaminated by a spill, and in collecting and disposing of waste generated during spill cleanup.

By implementing the construction and restoration methods identified in our Procedures 2003 (Appendix E), and in Southern's SPCC Plan, we believe that the impacts on surface water quality would be minimized and no long-term impacts would occur. Other federal, state, or local agencies may require Southern and FGT to implement additional protective measures.

4.3.4 Site-Specific Mitigation

Cypress Pipeline Project – Southern proposes to cross 14 waterbodies using the HDD construction technique (see table H-1 in appendix H). The HDD technique is a trenchless crossing method that involves drilling a hole beneath the waterbody and installing a pre-fabricated section of pipe through the hole to complete the installation (see section 2.3.2). This technique would avoid disturbing the bed or the banks of the waterbodies and minimize environmental impacts. Southern completed

feasibility investigations at the proposed HDD crossing locations and prepared a *Horizontal Directional Drilling Contingency Plan and Feasibility Assessment* (HDD Plan). The feasibility analysis included subsurface borings and geotechnical analyses, site assessments for equipment and material staging, stream flow and flooding analyses, and development of contingencies for inadvertent releases of drilling fluids or failure to successfully install the pipeline. Southern's HDD Plan determined that all of the crossings are technically feasible using the HDD technique. Southern developed site-specific HDD construction plans for each HDD crossing. Although technically feasible, HDD crossings can fail for various reasons, including failure to complete the pilot hole, inability to maintain a stable open hole, or inability to pull the pipe through the borehole. Southern has indicated that if the HDD construction technique were to fail at any of the crossings, Southern would install the pipeline using the open-cut construction technique. A copy of the HDD Plan is included as Appendix F-2; however, Southern's HDD Plan does not include site-specific drawings identifying areas that would be disturbed by construction-related activities in the event the HDD technique fails at any of the 14 waterbodies. While we do not believe any of the HDD crossings are likely to fail, we do recognize the potential problems with an HDD crossing method, therefore, **we recommend that:**

- **Southern should not begin an open-cut crossing of the Ogeechee, Altamaha, Satilla, or St. Mary's Rivers until it files an amended HDD Crossing Plan with the Secretary for review and written approval by the Director of OEP. The amended HDD Crossing Plan should include site-specific drawings identifying all areas that would be disturbed by construction using an alternate crossing method. Southern should file its amended HDD Crossing Plan with the COE, FWS, NOAA Fisheries, NPS, GADNR, FFWC, as applicable, and other agencies responsible for issuing permits to implement this plan.**

The HDD construction technique involves circulating drilling fluids to transmit hydraulic power to the drill bit, stabilize the borehole, cool and clean the drill bit, and transport spoil. A release or inadvertent return of drilling fluid to the waterbody being crossed could adversely impact water quality by temporarily increasing turbidity. Turbid conditions can also detrimentally affect aquatic resources (see section 4.6.2). Drilling fluids are typically comprised of bentonite clay (typically less than 4 percent by volume), with the remaining components being water and drill cuttings. In order to minimize potential impacts, Southern would adhere to the measures contained in its HDD Plan, including, but not limited to:

- completing the HDD crossing in the shortest time possible;
- monitoring all phases of drilling activity;
- using lost circulation materials (e.g., walnut hulls) in the drilling fluid to minimize or prevent leaking of drilling fluid into a wetland or waterbody (inadvertent returns);
- containing and cleaning up inadvertent returns, where practical; and
- suspending drilling operations when an inadvertent return poses a threat to the public health and safety.

We received a comment regarding the potential for construction and operation of the Cypress Pipeline Project to impact potable surface water withdrawals from the Altamaha River. Currently, the Altamaha River is not used as source for drinking water; however, the Brunswick-Golden Isles Chamber of Commerce indicated that Altamaha River may be used as a source for potable water for Glynn County, Georgia at some point in the future. Pipeline construction and operation could impact potable surface supplies as a result of a change in water quality or quantity. Pipeline installation across waterbodies could

impact the quality of water as a result of increased turbidity or an accidental spill of a hazardous material (e.g., fuel), which could preclude its use as a potable source. Southern would avoid impacts on water quality by crossing the Altamaha River using the HDD method and implementing its HDD Plan. In addition, Southern would adhere to the measures contained in its SPCC Plan, which include measures to identify, contain, and clean up accidental spills. Water diversions from the Altamaha River during construction could adversely affect flow volumes and the amount of water that would be available for potable uses. Southern proposes to appropriate water from the Altamaha River to complete hydrostatic testing of the pipeline. Following testing, the water would be returned to the Altamaha River watershed. Because the project would not permanently divert water from the Altamaha River watershed, no long-term impacts would be expected.

By implementing our Procedures 2003 (Appendix E), with approved modifications, and Southern's HDD Plan, we believe that potential environmental impacts associated with the HDD construction technique would be minimized. Other federal, state, or local agencies may require Southern to implement additional protective measures as part of their permit requirements.

We received a comment from the FLDEP recommending that stream crossings along the Cypress Pipeline Project be completed during periods when rainfall is less frequent (i.e., between November and March). Southern's Procedures require that stream crossings be completed between June 1 and September 30 at streams that support a coldwater fishery and between June 1 and November 30 at streams that support coolwater and warmwater fisheries to minimize impacts on fish and fish habitat. However, Southern's Procedures allow stream crossings to be completed outside of its timing windows if approved in writing by the appropriate state agency on a site-specific basis. Southern stated that it would plan its construction window for major waterbodies during the time of year when low water flows are normally encountered (see table 4.3.3-1).

FGT Expansion Project – FGT has not identified any site-specific mitigation measures in addition to those included in our Procedures 2003 (Appendix E). However, based on FGT's proposed construction schedule, and in compliance with our Procedures 2003, FGT would need to obtain written approval from the FLDEP in order to complete the stream crossings (Otter Creek and Flat Branch) outside of the warmwater fishery time-of-year window. This issue is addressed further in section 4.6.2.4.

Hydrostatic Testing

Prior to placing the pipeline facilities in service, Southern and FGT would hydrostatically test the new pipeline segments in accordance with the DOT pipeline safety regulations identified in 49 CFR Part 192. Table 4.3.3-2 identifies the pipeline facility, MP location, source water, discharge location, and the estimated volume of water that would be required to complete hydrostatic testing.

Withdrawal of hydrostatic test water from surface water sources could temporarily affect the recreational and biological use of the waterbody if the diversion were to constitute a large percentage of the source's total flow or volume. Other potential impacts on aquatic species could include an increase in water temperature, a reduction of dissolved oxygen levels, and the potential for the entrainment of aquatic species. These impacts would be minimized by obtaining hydrostatic test water from surface waters with sufficient flow or volume to fill the test sections and by screening the intake hoses. Where groundwater would be used, the additional pumping could lower the water table and impact groundwater supplies or the baseflows of nearby streams. After the testing is completed, hydrostatic test water would be discharged to upland locations; therefore, because the use would be non consumptive (i.e., the water would be returned to the watershed upon the completion of testing), long-term impacts on water supplies would not be anticipated as a result of hydrostatic testing activities. Potential impacts resulting from the discharge of hydrostatic test waters to upland areas would generally be limited to erosion of soils.

Southern and FGT would minimize these potential impacts by adhering to the measures contained in their Procedures. No chemicals would be added to the test water during hydrostatic testing.

TABLE 4.3.3-2			
Hydrostatic Test Water Sources for the Cypress Pipeline and FGT Expansion Projects			
Pipeline Facility/ MP Location	Source Water	Discharge Location	Estimated Volume (Gallons)
Cypress Pipeline Project			
23.7	Ogeechee River	Upland Location Adjacent to Source Water	1,575,000
37.1	Peacock Creek	Upland Location Adjacent to Source Water	1,575,000
62.8	Altamaha River	Upland Location Adjacent to Source Water	1,575,000 ^a
104.3	Satilla River	Upland Location Adjacent to Source Water	1,575,000 ^a
115.4	St. Marys River	Upland Location Adjacent to Source Water	1,575,000 ^a
		Cypress Subtotal	7,875,000
FGT Expansion Project			
12.8	FGT Water Well – Phase 1	Upland Location	1,400,000
44.5	FGT Water Well – Phase 1	Upland Location	1,700,000
44.5	FGT Water Well – Phase 2	Upland Location	2,600,000
110.8	FGT Water Well – Phase 1	Upland Location	1,700,000
110.8	FGT Water Well – Phase 2	Upland Location	1,700,000
		FGT Subtotal	9,100,000
		Cypress and FGT Total	15,400,000
^a As discussed in section 4.6.2.4, the GADNR must approve withdrawals from these waterbodies that are more than 100,000 gallons per day over a period longer than 30 days.			

Although the Altamaha River, Satilla River, and the St. Marys River are known to contain sensitive resources (see section 4.7), the GADNR (Liotta, 2005) does not object to the use of these rivers as sources of hydrostatic test water and/or as discharge locations. However, as directed by the GADNR (Liotta, 2005), to minimize impacts on aquatic resources associated with these waterbodies, **we recommend that:**

- **Southern should withdraw no more than 100,000 gallons of water per day from the Altamaha, Satilla, or St. Mary’s Rivers for hydrostatic testing unless Southern obtains specific approval for additional water volumes from the GADNR.**

4.4 WETLANDS

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation adapted for life in saturated soil conditions (COE, 1987). Wetlands can be a source of substantial biodiversity and serve a variety of functions that include providing wildlife habitat, recreational opportunities, flood control, and naturally improving water quality.

Wetlands affected by the Cypress Pipeline and FGT Expansion Projects are regulated at the federal and state levels. On the federal level, the COE has authority under section 404 of the CWA to review and issue permits for activities that would result in the discharge of dredged or fill material into waters of the United States, including wetlands. Section 401 of the CWA requires that proposed dredge and fill activities under section 404 be reviewed and certified by the designated state agency (the GADNR in Georgia and the FLDEP in Florida) to ensure that the proposed projects would meet state water quality

standards. In Florida, the FLDEP also has the authority to regulate wetlands under Florida Statutes Chapter 373, Section 373.019.

4.4.1 Existing Wetland Resources

Southern and FGT conducted wetland delineations along their proposed pipeline routes, temporary extra workspaces, temporary and permanent access roads, aboveground facility sites, pipe storage yards, and contractor yards. Delineations were conducted in accordance with federal and state regulations and methodologies using the COE Wetland Delineation Manual (COE, 1987), and the guidelines outlined in Chapter 62-340 of the FAC, Delineation of the Landward Extent of Wetlands and Surface Waters. Additionally, qualitative assessments were conducted for each wetland. In Georgia, the COE requires that qualitative assessments be based on five ecological parameters that include: quality of wetland vegetation; soils; hydrology; presence of plant and animal species of concern; and level of disturbance within the wetland and adjacent areas. In Florida, the COE requires that wetlands be evaluated using the Wetland Rapid Assessment Procedure (WRAP) that assesses wetlands according to six parameters that include: wetland overstory vegetation; wetland groundcover; water quality input; wildlife use; buffer (surrounding habitats); and hydrology. As part of its Environmental Resource Permit (ERP) requirements, the FLDEP requires that wetlands be assessed according to the Uniform Mitigation Assessment Method (UMAM). The COE would take jurisdiction on all wetlands included in Southern's and FGT's wetland delineation reports. In addition, FLDEP would assume jurisdiction on all delineated wetlands in Florida with the exception of hydric pine plantation wetlands (i.e., wetlands with an overstory of slash or longleaf pine and an understory dominated by saw palmetto).

Wetlands affected by both the projects are classified into one of three types according to Cowardin et al. (1979), including:

- palustrine forested wetlands (forested wetlands), which are dominated by tree species at least 6 meters tall;
- palustrine scrub-shrub wetlands (scrub-shrub wetlands), which are dominated by woody vegetation less than 6 meters tall; or
- palustrine emergent wetlands (emergent wetlands), dominated by erect, rooted, herbaceous hydrophytes.

Palustrine Forested Wetlands – The palustrine forested wetlands crossed by the Cypress Pipeline Project consist of an overstory dominated primarily by deciduous broad-leaved tree species, some conifer species, and a variety of herbaceous plants and vines in the herbaceous layer. Plant species composition consists of water oak (*Quercus nigra*), laurel oak (*Quercus laurifolia*), sweet gum (*Liquidambar styraciflua*), sweet bay (*Magnolia virginiana*), tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum v. trilobum*), black gum (*Nyssa sylvatica v. biflora*), bald cypress (*Taxodium distichum*), loblolly pine (*Pinus taeda*), longleaf pine (*Pinus palustris*), slash pine (*Pinus elliotii*), bushy bluestem (*Andropogon glomeratus*), giant cane (*Arundinaria gigantea*), sedges (*Carex* spp.), soft rush (*Juncus effusus*), dwarf palmetto (*Sabal minor*), saw palmetto (*Serenoa repens*), and greenbriar (*Smilax* spp.). A portion of the forested wetlands crossed by the project are hydric pine plantations (about 11 percent in Georgia and 25 percent in Florida). Typically, these disturbed hydric pine plantation wetlands are periodically logged for timber or wood pulp production.

Similar to the Cypress Pipeline Project, the forested wetlands crossed by the FGT Expansion Project consist of an overstory dominated primarily by deciduous broad-leaved tree species, and an assortment of herbaceous plants and vines in the herbaceous layer; however, some of the species

comprising this vegetation type differ. Swamp hardwood and wetland hardwood hammock communities are typically dominated by water oak, water ash (*Fraxinus caroliniana*), live oak (*Quercus virginiana*), red maple, laurel oak (*Quercus phellos*), and sweet gum. Bottomland hardwoods include American elm (*Ulmus americana*), American hornbeam (*Ostrya virginiana*), overcup oak (*Quercus lyrata*), river birch (*Betula nigra*), water oak, water hickory (*Carya aquatica*), sweet gum, and Shumard oak (*Quercus shumardii*).

Palustrine Scrub Shrub – The palustrine scrub-shrub wetlands identified in the Cypress Pipeline Project area typically occur within the adjacent utility rights-of-way where periodic mowing prevents the establishment of tree species, but allow for the establishment of shrubs and herbaceous species. These scrub-shrub wetlands consist of red maple and black willow (*Salix nigra*) saplings, as well as eastern false willow (*Baccharis halimifolia*), yaupon holly (*Ilex vomitoria*), and southern bayberry, (*Myrica cerifera*). Herbaceous species found in scrub-shrub wetlands include bushy bluestem, giant cane, sedges, soft rush, dwarf palmetto, saw palmetto, and greenbriar. For the FGT Expansion Project, scrub-shrub wetland species occur as associates or codominants with emergent species, not in distinct shrub-dominated wetlands. Scrub-shrub species identified in the FGT project area consist of fetterbush (*Lyonia lucida*), gallberry (*Ilex glabra*), titi (*Cyrilla racemiflora*), and sweet pepperbush (*Clethra alnifolia*).

Palustrine Emergent – The palustrine emergent wetlands in the Cypress Pipeline Project area are dominated by a mix of bushy bluestem, Virginia button-weed (*Diodia virginiana*), spikerush (*Eleocharis baldwinii*), soft rush, redroot (*Lachnanthes carolina*), maidencane (*Panicum hemitomon*), pickerelweed (*Pontederia cordata*), Meadow-beauty (*Rhexia mariana*), hooded pitcher plant (*Sarracenia minor*), and bulrush (*Scirpus spp.*). Palustrine emergent wetlands affected by the FGT Expansion project are comprised of beak rushes (*Rhynchospora spp.*), bull rushes (*Scirpus spp.*), sedges (*Carex spp.*), maidencane, and various rush species (*Juncus spp.*).

In total the Cypress Pipeline and FGT Expansion Projects would cross 71.7 miles of wetlands including 52.3 miles in Georgia, and 19.4 miles in Florida. A summary of the wetland types that would be affected by construction and operation of each project are presented in table 4.4.1-1 by state, facility, and type. Tables I-1 and I-2 provided in Appendix I list the specific wetlands crossed by each project, including wetland ID number, milepost location, wetland type, length of crossing, approximate acreage affected by construction and operation, and wetland quality rating.

Cypress Pipeline Project

Pipeline Facilities – Based on Southern’s field surveys, the proposed loop and mainline would cross 318 wetlands (255 in Georgia and 63 in Florida) for a total distance of about 68.5 miles. Of the 68.5 miles of wetlands, about 55.4 miles (80 percent) would be crossed in Georgia and 13.1 miles (20 percent) would be crossed in Florida (see table I-1 in Appendix I). Of the wetlands that would be affected by the project, approximately 65 percent are forested wetlands, 28 percent are emergent wetlands, and 7 percent are scrub-shrub wetland.

Aboveground Facilities – Compressor Station 2 would be located within a hydric pine plantation wetland in Georgia. Construction of this facility would result in temporary and permanent impacts on forested and emergent wetlands as well as the upland planted pine cover type (see section 4.5.1). No wetlands would be affected by the construction and operation of Compressor Stations 1 or 3.

TABLE 4.4.1-1

Summary of Wetlands Affected by the Cypress Pipeline and FGT Expansion Projects

Project/State/Facility	Wetland Classification Types ^a	Temporary Construction Impact (acres) ^b	Permanent Operation Impact (acres) ^c
Cypress Pipeline Project			
Georgia			
Loop	PFO	15.0	0.1
	PSS	1.3	0.0
	PEM	33.6	0.0
Mainline	PFO	298.6	143.2
	PSS	36.5	0.0
	PEM	88.4	0.0
	Subtotal	473.4	143.3
Aboveground Facilities	PFO	10.8	3.8
	PSS	0.0	0.0
	PEM	2.8	1.2
	Subtotal	13.6	5.0
Florida			
Mainline	PFO	59.1	31.6
	PSS	2.3	0.0
	PEM	37.8	0.0
Aboveground Facilities		0.0	0.0
	Subtotal	99.2	31.6
	Subtotal (PFO)	383.5	178.7
	Subtotal (PSS)	40.1	0
	Subtotal (PEM)	162.6	1.2
	Cypress Pipeline Project Total	586.2	179.9
FGT Expansion Project			
Loop J (No wetlands affected)			
Loop K	PFO	3.3	1.3
	PSS/PEM ^d	58.7	0.0
Loop G (No wetlands affected)			
	Subtotal	62.0	1.3
Aboveground Facilities/Access Roads	PFO	0.8	0.8
	PSS/PEM ^d	0.3	0.3
	Subtotal	1.1	1.1
	Subtotal (PFO)	4.1	2.1
	Subtotal (PSS/PEM)	59.0	0.3
	FGT Expansion Project Total	63.1	2.4

TABLE 4.4.1-1 (cont'd)

Summary of Wetlands Affected by the Cypress Pipeline and FGT Expansion Projects

Project/State/Facility	Wetland Classification Types ^a	Temporary Construction Impact (acres) ^b	Permanent Operation Impact (acres) ^c
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^a Wetland types classified according to Cowardin et al. (1979):
PFO = palustrine forested
PSS = palustrine scrub-shrub
PEM = palustrine emergent

^b Construction impacts were calculated using a 75-foot-wide construction right-of-way width.

^c Permanent wetland vegetation type conversion impacts are associated with forested wetlands. Operational requirements (corrosion/leak surveys) allow a 10-foot-wide corridor centered over the pipeline to be maintained in an herbaceous state and allow trees within 15 feet of the pipeline that are greater than 15 feet in height to be selectively cut from the right-of-way. To determine permanent conversion impacts on forested wetlands, a 30-foot-wide corridor centered over the pipeline was assessed for forested wetlands.

^d For the FGT Expansion Project, PSS and PEM wetlands were not broken out separately. The shrub components of these wetlands were identified as associates or codominant with emergent vegetation as opposed to distinct shrub-dominated wetlands.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Construction at two existing meter station sites in Georgia would affect wetlands. Construction of the tie-in facilities, two MLVs, and pig launcher/receiver facilities adjacent to the Rincon Gate Meter Station would result in temporary and permanent impacts on forested and emergent wetlands. The tie-in of the mainline to the loop and the installation of a MLV at the Port Wentworth Meter Station would result in permanent impacts on forested wetlands. Construction of MLVs 8 and 9 would also result in permanent impacts on forested wetlands in Georgia. No wetlands would be affected by construction of the remaining meter stations, MLVs, and pig launcher/receiver facilities proposed in Georgia or Florida.

Pipe Storage and Contractor Yards – Wetlands were identified at seven of the 13 proposed pipe storage and contractor yards all located in Georgia. At contractor yard MC-2A a forested wetland was identified; emergent wetlands were identified at contractor yards CM-1, GI-1, DU-1, CH-1 WH-2; and at contractor yard WH-4 an emergent/scrub shrub wetland was identified; however, project activities would not affect wetlands at these sites. Southern states that these wetlands would be completely avoided and would be further protected by the installation of silt fence at the perimeter of these sites and by the implementation of other erosion controls as necessary.

Access Roads – To access the project area during construction, Southern would use existing roads (paved, graveled, and two-track) some of which cross wetlands (see appendix C-2). No wetlands were identified along new permanent access roads that would be constructed to access project facilities (see table 2.1.1-3 in section 2.1.1.3).

FGT Expansion Project

Loop Facilities – The FGT Loops would cross 42 wetlands for a total distance of about 9.9 miles all of which are located along Loop K (see table I-2 in Appendix I). About 5 percent of the wetlands affected would be forested. The remaining 95 percent would be scrub-shrub/emergent wetlands the majority of which would be scrub-shrub.

Aboveground Facilities – Emergent and forested wetlands were identified at the Compressor Station 16 site, and an emergent wetland was identified at the Hines M&R Station; although, these wetlands would not be affected by the construction activities. However, construction of a remote blowdown valve at MP 53.7 on Loop K would affect forested wetlands. No wetlands were identified at the other proposed aboveground facilities sites.

Pipe Storage and Contractor Yards – Forested wetlands were identified adjacent to the Brooker contractor yard, an emergent wetland was identified at the edge of the Lacoochee contractor yard; and scrub-shrub/emergent wetlands were identified at the Lawtey pipe storage and contractor yard. No wetlands would be affected by the activities proposed at these locations. No wetlands were identified at the remaining pipe storage and contractor yards. FGT's implementation of our Procedures 2003 would minimize potential impacts on these wetlands from activities occurring adjacent to these features.

Access Roads – FGT would construct new access roads to the Cypress/FGT Interconnect and the remote blowdown valve at MP 53.7. Construction of each of these roads would affect forested, scrub-shrub, and emergent wetlands (see table C-5 in Appendix C).

4.4.2 General Impact and Mitigation

The primary impact of the Cypress Pipeline and FGT Expansion Projects on wetlands would be the temporary and permanent alteration of wetland vegetation. These effects would be greatest during and immediately following construction. Generally, the wetland vegetation community would eventually transition back into a community with a function similar to that of the wetland before construction. In

emergent wetlands, the herbaceous vegetation would regenerate quickly (typically within 1 to 2 years). Scrub-shrub wetlands could take 2 to 4 years to reach functionality similar to preconstruction conditions depending on the age and complexity of the system. In forested wetlands, the impact of construction would be much longer due to the time needed to regenerate a forest community. Given the species that dominate the forested wetlands crossed by the Cypress Pipeline and FGT Expansion Projects, regeneration to preconstruction conditions may take up to 30 years.

Although our Procedures 2003 (Appendix E) allow annual vegetative maintenance of a 10-foot-wide strip centered over the pipelines, herbaceous wetland vegetation would not generally be mowed or otherwise maintained. Therefore, following revegetation, there would be little permanent impact on emergent wetland vegetation in the maintained right-of-way because these areas would remain open to herbaceous communities. Scrub-shrub wetlands would be allowed to regenerate but would be affected by maintenance of the 10-foot-wide strip. Most of the permanent wetland impacts would be in areas where new permanent right-of-way is created in forested wetlands. Our Procedures 2003 allow trees within 15 feet of the pipeline centerline that are greater than 15 feet tall to be selectively cut and removed once every three years. Therefore, by maintaining the right-of-way and limiting revegetation of a portion of forested wetlands, some of the functions (primarily habitat) of these forested wetlands would be permanently altered. Although permanent impacts on forested wetlands would occur as a result of the proposed projects, they would be primarily impacts on the structure of the wetlands (i.e., result in more herbaceous and shrubby vegetation and fewer trees), but would not greatly reduce the existing wetland functions or amount of wetlands in the project area.

Other types of impacts associated with construction of pipelines in wetlands could include changes in wetland hydrology and water quality. During construction, failure to segregate topsoil over the trenchline in non-saturated wetlands could result in the mixing of the topsoil with the subsoil. This disturbance could result in altered biological activities and chemical conditions in wetland soils and could affect the reestablishment and natural recruitment of native wetland vegetation. In addition, inadvertent compaction and rutting of soils during construction could result from the movement of heavy machinery and the transport of pipe sections. The resulting alteration of the natural hydrologic patterns of the wetlands could inhibit seed germination and regeneration of vegetative species. The discharge of stormwater, trench water, or hydrostatic test water could also increase the potential for sediment-laden water to enter wetlands and cover native soils and vegetation. Finally, construction clearing activities and disturbance of wetland vegetation could also temporarily affect the wetland's capacity to buffer flood flows and/or control erosion. The procedures that Southern and FGT would implement to avoid or minimize these wetland impacts are discussed below.

General Wetland Construction and Mitigation Procedures

In general, wetland impacts need to be avoided, minimized, rectified, reduced, and mitigated in accordance with federal and state regulations. These steps are commonly referred to as "sequencing" because one step must be completed before the next step is started. As described in section 3.2.2, both the Cypress Pipeline and FGT Expansion projects have been routed to avoid wetlands to the extent feasible. In addition, wetland impacts would be minimized by the proposed pipeline routing either adjacent to or within existing maintained rights-of-way, which would minimize impacts on previously undisturbed wetlands. Both projects would further avoid wetland impacts by limiting the width of the construction right-of-way to 75 feet in about 29 percent of the wetlands crossed the Cypress Pipeline Project and 100 percent of the wetlands crossed by the FGT project.

Southern and FGT would minimize construction-related impacts by implementing our Procedures 2003 with approved modifications, as discussed below and by using wetland construction methods described in section 2.3.2. Southern and FGT would also comply with the conditions of applicable

authorization such as from the COE under section 404 and the FLDEP's ERP. When unavoidable wetland impacts would result from the proposed action, the COE and the FLDEP would require that all practicable actions be taken to mitigate those impacts. This is consistent with the CEQ's Regulations for Implementing the Procedural Provisions of the NEPA (Title 40 CFR Part 1508.20), which defines mitigation to include the following criteria:

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- compensating for the impact by replacing or providing substitute resources or environments.

The COE stated that typically, mitigation for temporary impacts on emergent or scrub-shrub wetlands would need to be "in-kind, in-place" (i.e., rehabilitation of the wetlands that are impacted) as opposed to compensatory mitigation (Soderberg, 2005b). Active planting or seeding in emergent and scrub-shrub wetlands would not be required as long as the wetlands are adequately restored within two growing seasons. However, the COE's mitigation requirements for temporary impacts on forested wetlands would include planting to reestablish the forest vegetation as well as compensatory mitigation for the long-term impacts. Mitigation for forested wetlands that would be converted to emergent wetlands would include active planting to establish emergent wetland vegetation as well as compensatory mitigation for the permanent loss of wetland function. Planting would include the use of live plants of specific sizes planted at specified densities with certain survival rates required. Where permanent wetland impacts would occur at aboveground facility sites, the COE would require compensatory mitigation.

The COE has a policy of "no net loss" of wetlands in the United States. This means that every wetland impact must be offset by the creation, restoration, enhancement, or preservation of at least an equal amount of wetlands, which is referred to as compensatory mitigation. Compensatory mitigation is considered when the regulatory agencies have evidence that sequencing has been carried out. Residual wetland impacts that are not or cannot be mitigated within the project area are accounted for using compensatory mitigation to ensure that there is a full replacement of both wetland area and functions. Compensatory mitigation would be achieved by the purchase of credits from a wetland mitigation bank approved by the COE or by providing funding (i.e., in-lieu fees) for an approved, agency-sponsored wetland preservation, enhancement, or creation project. The COE has stated that mitigation would be required to occur within the same watershed where the impacts occurred. The COE also indicated that compensatory mitigation in the form of mitigation bank credits would be its preferred form of compensatory mitigation (Soderberg, 2005a). Both Southern and FGT have developed preliminary compensatory wetland mitigation plans to mitigate the permanent loss, permanent conversion, and long term impacts on wetlands resulting from their projects (see section 4.4.3 below). Southern and FGT have agreed to abide by any conditions in the permits they have requested from the COE.

In Florida, Southern and FGT would also minimize impacts on wetlands by complying with the conditions of the FLDEP's ERP. Compensatory mitigation required by the FLDEP would vary depending on the type of impacts (i.e., short term, long term, or permanent) and the results of the UMAM

assessments. Because of the differing assessment processes used by the COE and the FLDEP (WRAP and UMAM respectively), the companies would need to develop separate compensatory mitigation plans for each agency; however, much of the mitigation proposed would likely be common to both plans.

Our Procedures 2003

Both Southern and FGT would implement the wetland construction and restoration measures contained in our Procedures 2003 including certain modifications that Southern and FGT have requested, as discussed below. Our Procedures 2003 (Appendix E) would apply to all wetlands crossed by the projects and would include:

- locating extra workspaces at least 50 feet back from wetland boundaries unless a reduced setback is requested on a site-specific basis and approved by the FERC and other applicable agencies;
- segregating topsoil from the trenchline in non-saturated wetlands and returning it to the proper horizon after backfilling the trench, which would promote reestablishment of wetland species by preserving the vegetative propagules (e.g., seeds, tubers, rhizomes, bulbs) in the soil;
- returning wetlands to their preconstruction contours to the extent practicable and sealing the trench bottom, where necessary, to maintain hydrologic characteristics;
- prohibiting storage of hazardous materials, chemicals, fuels, and lubricating oils within a wetland or within 100 feet of a wetland boundary;
- prohibiting parking and/or fueling of equipment within a wetland or within 100 feet of a wetland boundary, unless the EI determines that no reasonable alternative exists and appropriate steps, including secondary containment structures, are taken to prevent spills and provide for prompt cleanup in the event of a spill; and
- limiting post-construction maintenance of vegetation within wetlands to the removal of trees that are greater than 15 feet in height and within 15 feet of the pipeline centerline.

Requested Modifications to our Procedures 2003

Cypress Pipeline Project – Southern requested six modifications to our Procedures 2003 that pertain to wetlands, and identified one construction mitigation method in its application to the FERC that would also require a modification, for a total of seven modification requests from our Procedures 2003. These modifications are summarized in table 4.4.2-1 along with our conclusions. Southern would also submit these modification requests to other applicable agencies (e.g., the COE and the FLDEP) as part of its permit applications. These other agencies may approve, approve with stipulations/modifications, or deny the requests as part of their permit decisions. Southern's implementation of modifications approved by the FERC would need to be consistent with its permits from the other jurisdictional agencies. Based on the review and approval of these modifications, Southern would need to revise its Procedures, as applicable, to ensure the proper procedures would be implemented (see our recommendation included in section 4.3.3).

TABLE 4.4.2-1

Southern's Proposed Modifications from our Procedures 2003

Section	Modification Request	Comments and Conclusions Regarding Approval
IV.A.1.d	Southern proposes to allow refueling within 100 feet of a wetland when maintaining the 100-foot buffer is not practical. To minimize impacts on wetlands and waterbodies, Southern would implement its SPCC Plan when refueling is required within 100 feet of a waterbody.	See table 4.3.3-1 in section 4.3.3 for a discussion of our conclusions.
V.B.2.a	Southern has identified 117 locations where it requests to locate extra workspaces within 50 feet of wetland boundary or directly within a wetland.	Our Procedures 2003 require that all extra work areas (such as staging areas and additional spoil storage areas) be located at least 50 feet away from wetland boundaries, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. In accordance with our Procedures 2003, Southern has depicted these locations on aerial photo-based alignment sheets and provided a site-specific explanation of the conditions that would prevent a 50-foot setback for extra workspace at wetland crossings. We have reviewed the alignment sheets and Southern's explanations to make determinations whether to approve or deny each modification requested. Based on our review, certain modifications appear to be reasonable and adequately justified, certain modifications do not appear justified, and others require additional information. Southern's specific modification requests and the status of our approval or denial are provided in table J-1 in Appendix J. Southern would also submit these modification requests to other applicable agencies (e.g., the COE, the FLDEP, and the GADNR) as part of its permit applications. These other agencies may approve, approve with stipulations/modifications, or deny the requests as part of their permit decisions. Southern's implementation of modifications approved by the FERC would need to be consistent with its permits from the other jurisdictional agencies. Additionally, during construction FERC Compliance Monitors would have the authority to approve workspaces within 50 feet of a wetland if the request is adequately justified and adequate protection devices are installed to prevent impact on the wetland.
VI.A.3	Southern proposes to increase the construction right-of-way width in selected wetlands to an 82-foot-wide right-of-way along the mainline and a 90-foot-wide right-of-way along the loop. Southern states that the increased right-of-way widths are needed for the following reasons: wetlands of a certain length that would require additional spoil storage areas; and the sandy saturated soils occurring within many of these wetlands lack the strength to support the weight of equipment and would result in caving or sloughing of the trench wall, which would result in a wider trench. The increase in right-of-way width would occur over existing utility rights-of-way affecting previously disturbed emergent wetlands. Southern provided geotechnical studies that identified areas of poor soil strength that coincided with certain wetlands where a greater right-of-way width was requested.	Our Procedures 2003 require that the right-of-way width be limited to 75 feet or less in wetlands. Southern's has identified these locations in its table <i>Wetlands Requiring Additional Temporary Workspace</i> (see table K-1 in Appendix K). The FERC staff agrees that sandy saturated soils exist in many of the wetlands along the proposed loop and mainline, which would result in a wider trench and could necessitate a wider right-of way width; therefore, we approve this modification.

TABLE 4.4.2-1 (cont'd)

Southern's Proposed Modifications from our Procedures 2003

Section	Modification Request	Comments and Conclusions Regarding Approval
VI.A.6	Southern proposes to locate Compressor Station 2 (and MLVs 8 and 9) primarily within forested (hydric plantation pine) wetlands in Georgia. Southern states that the siting of the compressor station at this site is necessary for the system requirements based upon hydraulic design and proximity of the sites to existing access roads and to power supplies. Three alternative sites were evaluated for Compressor Station 2. In each case the alternatives exhibited environmental or engineering constraints that outweigh the impacts associated with the proposed site (see section 3.2.4.2).	Our Procedures 2003 require that aboveground facilities not be located within wetlands except where the location of such facilities outside of wetlands would prohibit compliance with U.S. DOT regulations. The FERC staff believes that the placement of this facility within wetlands is acceptable because we evaluated other locations that could meet engineering constraints and these alternative sites exhibited environmental factors that would be less desirable than the impacts associated with permanently impacting these previously disturbed, low quality wetlands. Additionally, the COE would require compensatory mitigation that Southern must provide to satisfy its COE permit requirements for construction of aboveground facilities in wetlands. Therefore, we approve this modification
VI.B.2.a	Southern proposes to use gravel over geotextile fabric as a means to temporarily stabilize the working surface in wetlands.	Our Procedures 2003 specify that rock should not be used to support equipment. We do not believe imported gravel would be completely removed, even with use of geotextile fabric. In addition, we believe importing gravel would increase wetland soil compaction. Therefore, we deny this modification.
VI.C.4	Southern proposes not to revegetate wetlands by planting native species and instead rely on natural revegetation to adequately restore wetland vegetation. Southern cited studies that indicate wetlands of the southeast that have been allowed to revegetate naturally exhibit a higher success rate than actively planted wetlands.	Our Procedures 2003 require the applicant consult with the appropriate land management agency to develop a project-specific wetland restoration plan. The COE has indicated that planting may not be necessary in emergent wetlands because topsoil restoration would protect the existing seed bank. However, where forested wetlands would be converted to emergent wetland vegetation, the necessary emergent seed bank may not be present in the existing topsoil. Additionally, the COE indicated that it would require planting in forested wetlands that would be allowed to return to preconstruction conditions. Because Southern's proposed modification would not provide equal or better protection of forested wetland types and would be contrary to the requirements of other regulatory agencies, we approve this modification only in emergent and scrub-shrub wetlands to the extent that the COE and FLDEP agree.
VI.D.3	Southern proposes to cease wetland restoration monitoring at the time the restoration is deemed successful.	Our Procedures 2003 requires wetland revegetation monitoring occur for 3 years after construction or until wetland revegetation is successful. Therefore this is not a modification to our Procedures. However, our Procedures 2003 would require Southern to file a report identifying the status of wetland revegetation efforts at the end of 3 years. Additionally, the COE indicated that it would require a minimum of 5 years of monitoring.

FGT Expansion Project – FGT requested two modifications to our Procedures 2003 as shown in table 4.4.2-2. One would allow extra workspaces within 50 feet of a wetland boundary or directly within wetlands, while the other modification request would allow an aboveground facility site to be located within wetlands.

TABLE 4.4.2-2		
FGT's Proposed Modification from our Procedures 2003		
Section	Modification Request	Comments and Conclusions Regarding Approval
V.B.2.a	FGT has identified 18 locations where it requests to locate extra workspaces within 50 feet of a wetland boundary or directly within a wetland.	Our Procedures 2003 require that all extra work areas (such as staging areas and additional spoil storage areas) be located at least 50 feet away from wetland boundaries, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. In accordance with our Procedures 2003, FGT provided site-specific plans and an explanation of the conditions that would prevent a 50-foot setback for extra workspace at wetland crossings. We have reviewed the site-specific plans and FGT's explanations to make determinations whether to approve or deny each modification requested. Based on our review, certain modifications appear to be reasonable and adequately justified, others require additional information, and one was denied. FGT's specific modification requests and the status of our approval or denial are provided in table J-2 in Appendix J. Southern would also submit these modification requests to other applicable agencies (e.g., the COE and the FLDEP) as part of its permit applications. These other agencies may approve, approve with stipulations/modifications, or deny the requests as part of their permit decisions. FGT's implementation of modifications approved by the FERC would need to be consistent with its permits from the other jurisdictional agencies.
VI.A.6	FGT requests to locate a remote blowdown facility at MP 53.7 where the facility and the access road to the facility would permanently affect wetlands.	Our Procedures 2003 require that aboveground facilities not be located within wetlands except where the location of such facilities outside of wetlands would prohibit compliance with U.S. DOT regulations. As discussed below in section 4.4.3 we included a recommendation in section 3.4.3 that FGT adopt an alternate site for this blowdown facility; therefore, this modification request is denied.

4.4.3 Site Specific Wetland Impacts and Mitigation

Cypress Pipeline Project

Pipeline Facilities – Construction of the loop and mainline would affect about 572.6 acres of wetlands, including 372.7 acres (65 percent) of forested wetlands, 159.8 acres (28 percent) of emergent wetlands, and 40.1 acres (7 percent) of scrub-shrub wetlands (see table 4.4.1-1). Of the forested wetland impacts, approximately 197.8 acres would be subject to long-term impacts from the loss of tree vegetation during construction, while the remaining 174.9 acres would be permanently affected by conversion of the vegetation to scrub-shrub or emergent types due to maintenance of a 30-foot-wide corridor centered over the pipeline. Of the forested wetlands affected about 18 percent are identified as hydric plantation pine, which are generally considered to be low quality wetlands due to periodic disturbance and the alteration of vegetation types resulting in limited vegetation diversity.

Southern has requested modifications at numerous wetland crossings (about 71 percent of the affected wetlands) to increase the construction right-of-way width from the 75-foot width allowed by our Procedures 2003 to 82 feet wide in specific wetlands along the mainline and 90 feet wide in specific wetlands along the loop (see table 4.4.2-1 in section 4.4.2 and table K-1 in Appendix K). In all cases, the additional width would be within existing adjacent rights-of-way. Approval of Southern's modification requests for these additional widths would result in an additional 55.9 acres of temporary impacts to previously disturbed emergent wetlands (44.4 acres in Georgia and 11.5 acres in Florida). Southern has also requested modifications from our Procedures 2003 to allow some extra workspaces to be located within 50 feet of wetlands and for some extra workspaces to be located within wetlands (see table 4.4.2-1 in section 4.4.2 and table J-1 Appendix J). The most common justifications for these requests was the need for staging areas for long wetland crossings, HDD crossings, and road bores where wetlands are located adjacent to the road crossings.

During our review of Southern's proposed action, we asked Southern to investigate locating its proposed HDD extra workspace to minimize impacts on forested wetlands and upland forested areas, and Southern subsequently shifted several selected workspaces toward the existing previously disturbed right-of-way, which resulted in reduced impacts on upland forest (reductions in upland forest vegetation are summarized in section 4.5.3) and forested wetlands (see below). If all of the modifications requested for extra workspaces located within wetlands are approved, an additional 21.7 acres of wetlands, including about 16.9 acres of forested wetlands (14.2 in Georgia and 2.7 in Florida), and 4.8 acres of emergent/scrub-shrub wetlands (4.1 in Georgia and 0.7 in Florida) would be affected. Sections 4.3.3 and 4.4.2 provide additional detail and our conclusions regarding Southern's requested modifications to our Procedures 2003. In addition, we evaluated alternative routes and route variations that would minimize the project's impact on wetlands as well as other resources. In section 3.3.2.1 we recommended that Southern adopt a route variation between MPs 0.0 and 9.5 that shifts the centerline of the pipeline from 10 feet outside, to 5 feet inside an existing right-of-way. This realignment would result in reduced impacts on previously undisturbed forested wetlands while increasing impacts on previously disturbed scrub-shrub and emergent wetlands.

Southern would avoid or minimize impacts on 10 wetlands by crossing all or a portion of the wetlands using the HDD method. In general, these wetlands are located adjacent to waterbodies or other features that would also be crossed using the HDD method. For example, at the Buffalo Creek and Satilla River crossings, Southern would extend the length of its HDD to avoid adjacent wetlands. Implementation of the HDD crossings would reduce potential wetland impacts by about 9.0 acres assuming a 75-foot-wide right-of-way. As discussed above, Southern has agreed to shift HDD extra workspaces onto existing disturbed right-of-way, which would reduce forested wetland impacts by a total of 3.0 acres at the following locations:

- Sand Pit Lakes (MP 61.6);
- Altamaha River (MP 62.8);
- Atlantic Coast Railroad (MP 78.4);
- Little Satilla River (MP 86.3);
- St. Marys (MP 115.4); and
- Brandy Branch Swamp (MP 145.5).

Aboveground Facilities – Construction of Compressor Station 2 would affect about 9.6 acres of forested wetlands, and 0.8 acre of emergent wetlands. The forested wetlands are comprised of hydric plantation pine. Impacts on about 3.1 acres of forested wetlands and 0.4 acre of emergent wetlands would be permanent due to the importation of about 5.9 acres of imported fill material and the placement and maintenance of the proposed facilities. As discussed in table 4.4.2-1, the placement of new aboveground

facilities in wetlands is not in accordance with our Procedures 2003 and would require the approval of a modification request (see Southern's Requested Modifications to our Procedures 2003 above).

About 0.9 acre of forested wetland and 2.0 acres of emergent vegetation would be affected by construction at the existing Rincon Gate Meter Station. Permanent wetland impacts at the Rincon Gate Meter Station would amount to about 0.7 acre of forested wetlands and 0.8 acre of emergent wetlands due to the placement of aboveground facilities. Less than 0.1 acre of forested wetland would be permanently affected by the construction and maintenance of MLVs 8 and 9 adjacent to Compressor Station 2. Permanent impacts on wetlands would be mitigated by compensatory wetland mitigation (see section 4.4.4). These facilities must be located adjacent to existing facilities to meet pipeline design specifications and to be in compliance with DOT regulations; therefore, a modification from our Procedures 2003 is not necessary. However, as part of our alternatives analysis, we recommended that Southern investigate installing the Rincon Gate Meter Station on the McIntosh Meter Station Property, either into the cleared area north and east of the site, or in the area southeast of the existing site, to reduce wetland impacts (see section 3.3.3.4).

Access Roads – Southern does not anticipate the need to conduct improvements along temporary access roads that would affect wetland resources. However, there is a potential that unforeseen improvements may be necessary during construction to allow adequate access to the right-of-way. Because of the numerous wetlands and waterbodies located along these roads, impacts on wetland and waterbody could occur during road improvements; therefore, we have recommended in section 4.3.2 that Southern notify the FERC Staff prior to any access road improvements that would affect wetlands or waterbodies.

High Quality and Sensitive Wetlands – Southern conducted quality assessments of each wetland affected by the project using the methods required by the Savannah and Jacksonville COE Districts. High quality wetlands include those where field observations and visual inspection of aerial photographs do not indicate stress or disturbance within the wetlands or in the adjacent area. High quality forested wetlands are typically composed of diverse and mature vegetation types. Hydrologic and soil indicators are characteristic of the specific community type. High quality wetlands usually provide suitable habitat for wildlife species or rare, threatened, or endangered plant and/or animal species. In Georgia, 31 wetlands along the mainline would be considered high quality according to the COE Savannah District's quality assessment methodology. No high quality wetlands were identified along the loop. Two wetlands along the pipeline route in Florida rated in the high quality category (0.81-1.0) using the COE Jacksonville District's WRAP. Southern qualified its assessment of high quality wetlands noting that most would not technically rate as high quality due to their proximity to disturbed habitat (i.e., existing rights-of-way).

The GADNR identified the following wetlands in a letter to the FERC on July 21, 2005 (GADNR, 2005b), that are listed as sensitive by the Georgia Natural Heritage Program and would be within or adjacent to the mainline right-of-way:

- The Lost Swamp, located within the Ogeechee River floodplain near MP R23.8, is a high quality wetland located on both sides of the Ogeechee River where the GADNR recommends that Southern minimize the clearing of trees and not alter the existing hydrology. Southern reduced its proposed right-of-way width to 75 feet through this wetland; however, Southern proposes to cross the Ogeechee River using the HDD crossing method and has requested to locate extra workspace to support HDD operations within the adjacent wetland, which would result in tree removal (see sections 4.3 and 4.5). Implementation of our Procedures 2003 would protect the wetland hydrology.

- A high quality wetland community occurs within a sand ridge pond forest located near MP 66.7 where, pondspice, a state listed threatened species has been identified at the sand ridge pond. Southern agreed to re-survey the area for pondspice prior to construction. During construction, hydrology would not be altered and efforts would be made to avoid, protect, or preserve this species during construction (see section 4.7).
- The Altamaha River swamp near MP 62.8 is a fairly disturbed wetland where there is a potential for the spread of invasive species. Cypress would implement its Nuisance Species Plan to prevent the spread of invasive species during construction (see section 4.5.5).
- The Brailey and Redcap Swamps located near MPs 94.2 and 95.4 are considered high quality wetlands where wood storks, a federally and state listed species, have been known to nest. The GADNR recommends that Southern not alter hydrology of these wetlands, and minimize the clearing of trees and site disturbance. Southern reduced its proposed right-of-way width to 75 feet through a majority of wetlands between these MPs. Additionally, the implementation of our Procedures 2003 would protect the wetland hydrology. However, at about MP 95.4, the mainline crosses State Highway 259 and extra workspace would be necessary to bore beneath this highway resulting in the clearing of trees from this forested wetland. Based on our review of the alignment sheets, this area is adjacent to existing cleared right-of-way, where there is the potential to relocate the necessary extra workspace; therefore, we have denied Southern's modification request to locate extra workspace within this wetland (see table J-1 in Appendix J).
- A pitcherplant bog, located near MP 117.3 south of a known federally endangered red cockaded woodpecker colony, contains various state listed plant species (see sections 4.6 and 4.7). Southern would conduct additional biological surveys in this location prior to construction and would attempt to avoid or preserve special status plant species identified within the work areas.

The GADNR also identified sites where important habitats, sensitive species, and land uses may be affected, which are discussed in sections 4.4.5, 4.6, 4.7, and 4.8. Southern has attempted to address the GADNR's concerns identified in its July 21, 2005 letter and subsequent correspondence; however, it is not clear whether Southern's approach to minimize impacts on these locations/resource is acceptable to the GADNR; therefore, **we recommend that:**

- **Southern should consult with the GADNR to address its concerns regarding impacts on the sensitive wetland areas identified in its July 21, 2005 letter. Southern should file documentation indicating that the GADNR concurs with Southern's construction plans through these areas before the end of the draft EIS comment period**

Designated Wetland Mitigation Areas – The loop would cross a designated wetland mitigation area in Chatham and Effingham Counties in Georgia. A restrictive covenant was placed on wetlands located between MPs 99.3 to 100.6 to mitigate for dredge and fill activities associated with the construction of a road that services the Coldbrook Plantation subdivision. Southern states that because this portion of the project is a loop and the existing pipeline transects the wetlands, rerouting the loop to avoid the wetlands is infeasible. Construction would affect about 2.8 acres of forested wetlands and 5.4 acres of emergent wetlands. The wetlands in this area would be located outside of the existing permanent right-of-way and would be allowed to revert to preconstruction conditions.

In Florida, the mainline originally crossed a designated wetland mitigation area near MP 149.7 in Duvall County. The mitigation easement was established to offset wetlands impacts resulting from the construction of Jacksonville Electric Authority's Brandy Branch Generation Station. Southern consulted with the Jacksonville COE and the FLDEP to develop a reroute effectively avoiding the mitigation area comprising about 4.4 acres of forested wetlands and 1.4 acres of emergent wetlands.

FGT Expansion Project

Pipeline Facilities – Construction of the FGT Expansion Loops would affect about 62.0 acres of wetlands, including 3.3 acres of forested wetlands and 58.7 acres of scrub-shrub/emergent wetlands. Approximately 1.3 acres of forested wetland would be permanently affected by vegetation type conversions (see table 4.4.1-1).

As described in table 4.4.2-2, in section 4.4.2, FGT requested a modification to our Procedures 2003 to allow extra workspaces within 17 wetlands. About 1.5 acres of wetlands, including 1.1 acres of forested wetlands and 0.4 acre of scrub-shrub/emergent wetlands would be affected during construction if each of these extra workspaces is approved. Based on a review of the alignment sheets and FGT's site-specific justifications for its requests, we have either approved, or denied FGT's requests. The approval status of these wetlands is provided in table J-2 of Appendix J.

Aboveground Facilities – About 0.8 acre of forested wetlands would be permanently affected if FGT were to construct and operate a remote blowdown valve at its proposed location at MP 53.7. However, as part of our alternatives analysis we requested that FGT identify an alternate site for the blowdown valve that would avoid impacts on wetlands. FGT identified two alternate locations (alternate site 1 and alternate site 2). After comparing the environmental impacts of the proposed location and the two alternate sites, we concluded that alternate site 2 would be a preferable location because it would completely avoid impacts on forested wetlands. We recommended that FGT adopt this location for placement of its blowdown valve; therefore, no wetlands would be affected by the construction and operation of aboveground facility sites (see section 3.4.3).

Access Roads – Construction of the access road to the remote blowdown valve at MP 53.7 would result in permanent impacts on less than 0.1 acre of forested wetlands and less than 0.1 acre of scrub-shrub/emergent wetlands. Construction of the access road to the Cypress/FGT Interconnect would permanently affect about 0.3 acre of scrub-shrub/emergent wetlands.

- High Quality and Sensitive Wetlands – FGT conducted wetland quality assessments of the wetlands affected by the FGT Expansion Project using Florida's UMAM. The majority of the wetlands affected by the FGT project are typically previously disturbed, isolated, linear roadside swales and ditches, which on average rate of about 0.5 (on a scale from 0.0-1.0). One wetland (CPY-CL-1) associated with the Cypress/FGT Interconnect rated in the high quality category (0.81-1.0). Two previously undisturbed forested wetlands, one adjacent Otter Creek (LK-LE-11B), and one adjacent to Flat Branch (LK-LE-4B) would result in a conversion of forested wetland into emergent or scrub-shrub if FGT's modification requests to locate extra workspaces within wetlands are approved.
- Designated Wetland Mitigation Areas – No designated wetland mitigation areas were identified along the loops or at aboveground facility sites.

4.4.4 Compensatory Mitigation

Cypress Pipeline Project

Southern would mitigate for long-term wetland impacts (i.e., the removal of forested wetland vegetation within the temporary right-of-way); permanent conversions of wetland types (i.e., forested wetlands converted to emergent wetlands) and the permanent loss of wetlands (i.e., filling wetlands associated with aboveground facilities) through compensatory mitigation. Southern has developed a preliminary compensatory wetland mitigation plan that was included in its wetland delineation report. Southern proposes to compensate for wetland impacts as depicted in table 4.4.4-1.

Wetland Impact Type	Acres Impacted in Georgia	Acres Impacted in Florida	Compensatory Mitigation Acres/Credits Proposed for Georgia	Compensatory Mitigation Acres/Credits Proposed for Florida	Total Proposed Compensatory Mitigation Credits
Long term Temporary	177.3	27.5	88.7	27.5	116.2
Permanent Conversion	143.3	31.6	143.3	63.2	206.4
Permanent Loss	5.0	0.0	10	0	10
Total Acres	325.6	59.1	242.0	90.7	332.7

The mitigation credits/acres proposed by Southern are preliminary and would likely change following review by the COE, and FLDEP during the processing of Southern’s permit applications. Neither the COE nor the FLDEP use simple ratios based solely on impact type to determine mitigation requirements. Instead, the COE and FLDEP would assess the impacts on a wetland-specific basis, taking into account various wetland characteristics to determine the appropriate mitigation. Table 4.4.4-2 lists possible mitigation banks and projects that Southern could use to satisfy its mitigation requirements.

Because Southern’s preliminary compensatory mitigation plan is still under development, we **recommend that:**

- Southern should consult with the COE, the FLDEP, the GADNR and other applicable agencies and organizations to further develop its compensatory wetland mitigation plan. The plan should include details regarding the amount, location, and types of mitigation proposed; specific performance standards to measure the success of the mitigation; and remedial measures, as necessary, to ensure that compensatory mitigation is successful. Southern should file the compensatory wetland mitigation plan with the FERC, including the agency comments, before the end of the draft EIS comment period.**

TABLE 4.4.4-2

Potential Wetland Mitigation Banks and Mitigation Projects Available to the Cypress Pipeline Project

Potential Mitigation Banks			
State	Name	Service Areas	Credits Available
Georgia	Marshlands Plantation	Satilla, Altamaha, and St. Marys watersheds; Camden, Charlton, Glynn, Long, and McIntosh Counties	Yes
	Millhaven Mitigation Bank	Chatham, Liberty, Bryan Counties	Yes
	Old Thorn Pond Wetland Mitigation Bank	Ogeechee Watershed	Yes
Florida	Northeast Florida Wetland Mitigation Bank	Duval, Nassau, and Clay Counties	Yes
	Sundew Mitigation Bank	Clay County	Yes
	Loblolly Mitigation Bank	Duval County	Yes
	Longleaf Mitigation Bank	Nassau County	Yes
	Soggy Bottom Mitigation Bank	Nassau County	Pending

Potential Mitigation Projects Available to the Cypress Pipeline Project			
State	Project	Location	Partners ^a
Georgia	Quacco Canal Wetland Restoration	Chatham County	COE, FWS, NMFS, GADNR, Chatham County
	Mill Creek Restoration	Bryan County	COE, others
	Ogeechee River Wetlands	Jenkins County	FWS, NRCS, private landowners
	Satilla River Wetlands	Camden County	FWS, NRCS, private landowners
	Savannah River Wetlands	Burke County	FWS, NRCS, COE, The Nature Conservancy, GADNR, private landowners
	Academy Creek Restoration, Brunswick Harbor, North End	Brunswick	COE, FWS, GADNR, GADOT, City of Brunswick
	Myrtle Pond Restoration, Little St. Simons Is.	Glynn County	Little St. Simons Is., COE, FWS, GADNR, Ducks Unlimited
	St. Simons Island Marsh Animal/Fish Corridor Restoration	Glynn County	FWS, GADOT, Glynn County Environmental Coalition, Others
	Marsh Restoration/Enhancement through Marsh Management for Mosquito Control	Glynn County	FWS, EPA, NMFS, Sapelo Island NERR., Glynn County, GADNR, GADOT, Others
	Cumberland Island Tidal Creeks and Freshwater Slough Restoration	Cumberland Island	NPS, others
Florida	Hogan's Creek Ecosystem Restoration	Jacksonville, FL	City of Jacksonville, COE, SJRWMD

^a U.S. Army Corps of Engineers (COE), U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), Natural Resource Conservation Service (NRCS), Georgia Department of Transportation (GADOT), Georgia Department of Natural Resources (GADNR), Sapelo Island National Estuarine Resource Reserve (Sapelo Island NERR), National Park Service (NPS) St. Johns River Water Management District (SJRWMD)

FGT Expansion Project

FGT would mitigate for long-term temporary wetland impacts, the permanent conversion of wetland types, and the permanent loss of wetlands through compensatory mitigation. FGT has not developed a formal wetland compensatory mitigation plan although it has conducted a preliminary investigation into its mitigation options. Because it has determined that there are no mitigation banks available within the watersheds affected by the project, FGT plans to pursue participation in ongoing or proposed mitigation projects. FGT would attempt to participate in projects coordinated by the Florida Division of Forestry with whom FGT has partnered with in the past as part of other wetland mitigation projects. One project (of several) that FGT is investigating is located in Levy County and would restore the historic hydrological patterns of a cypress pond. In addition, FGT proposes to replant trees in the forested wetlands that would be affected adjacent to Otter Creek and Flat Branch. Because FGT's wetland mitigation plans are still under development, **we recommend that:**

- **FGT should continue to consult with the COE, the FLDEP, and other applicable agencies and organizations to develop a compensatory wetland mitigation plan. The plan should include details regarding the amount, location, and types of mitigation proposed; specific performance standards to measure the success of the mitigation; and remedial measures, as necessary, to ensure that compensatory mitigation is successful. FGT should file the compensatory wetland mitigation plan with the FERC, including the agency comments, before the end of the draft EIS comment period.**

4.5 VEGETATION

4.5.1 Existing Vegetation Resources

The Cypress Pipeline and FGT Expansion Projects would cross the Outer Coastal Plain Mixed Forest ecological province, which occupies the flat and irregular Atlantic and Gulf Coastal Plains down to the sea. Vegetative cover types include extensive coastal marshes and interior swamps dominated by sweet gum and bald cypress. Most upland areas are covered by subclimax pine forest, which has an understory of grasses and sedges called savannas. Undrained shallow depressions in savannas form upland bogs or pocosins, in which evergreen shrubs predominate (Bailey, 1995). Within this ecological province, distinct vegetation cover types have been identified that occur within the project areas as discussed below. Table 4.5.1-1 lists these cover types; provides general descriptions, including common vegetative species typical of each community; and identifies the counties in which each cover type occurs. Wetland vegetation communities that would be affected by the project are discussed in section 4.4.

Cypress Pipeline Project

Construction of Southern's loop, mainline, and aboveground facilities would affect five distinct upland vegetation cover types as shown in table 4.5.1-1.

Pipeline Facilities – The primary vegetation cover type that would be crossed by the loop and mainline (about 51.3 miles) is planted pine. The next two most prevalent vegetation cover types are the upland forest and herbaceous cover types of which 35.7 and 22.0 miles would be crossed, respectively. The remaining vegetation cover types crossed by the loop and mainline are agriculture (7.0 miles), and landscape (0.3 mile). Of the vegetation communities that would be crossed by the loop and mainline, upland vegetation comprises about 65 percent while wetland vegetation (i.e., forested, scrub-shrub, and emergent wetland vegetation) accounts for about 35 percent. Wetland vegetation is addressed in section 4.4.

TABLE 4.5.1-1

Vegetation Cover Types Occurring Along the Pipeline and Loop Associated with the Cypress Pipeline Project

Vegetation Community	General Description	Common Species	Location of Occurrence (State/County)
Cypress Pipeline Project			
Planted Pine	Dense pine forests planted primarily for timber or wood pulp production with little understory present. Understory species are often controlled through maintenance activities.	Loblolly pine, slash pine, shortleaf pine, long-leaf pine	Georgia/ Chatham, Effingham, Bryan, Liberty, McIntosh, Glynn, Camden, Charlton
Upland Forest	Consists of the southern mixed pine-oak forest and pine flatwoods that include evergreen and hardwood tree species with a well developed understory.	Long-leaf pine, shortleaf pine, loblolly pine, slash pine, live oak (myrtle oak laurel oak water oak willow oak), red maple, black gum, sweet gum, elm, beech, sycamore, magnolia, hollies, Understory: saw palmetto, southern bayberry, winged sumac, bluestem grass, yellow stargrass, wiregrass, redroot, Spanish moss, colic root	Georgia/ Chatham, Effingham, Bryan, Liberty, Long, Glynn, Camden, Charlton Florida/ Nassau, Duval, Clay
Herbaceous	Comprises open land including maintained utility rights-of-way that are dominated by herbaceous species.	Fescue, broomsedge, ragweed, dog fennel, goldenrod, sheep sorrel, blackberry, Japanese honeysuckle	Georgia/ Chatham, Effingham, Bryan, Liberty, McIntosh, Glynn, Camden, Charlton Florida/ Nassau, Duval, Clay
Agriculture	Comprises cultivated species the majority of which are annual crops.	Peanuts, zucchini, various types of squash, cotton, corn	Florida/ Nassau, Duval
Landscape	Dominated by typical landscape vegetation including turf grass, ornamental shrubs, and trees typically found in residential and commercial/industrial areas.	Various landscape tree, shrub, and groundcover species, generally non-native	Georgia/ Chatham, Effingham Florida/ Duval
FGT Expansion Project			
Upland Forest	Includes oak dominated forests and open pine forests with an oak understory or herbaceous layer.	Oak Forest: laurel oak, water oak, slash pine, black cherry Pine Forest: longleaf pine, turkey oak, blue jack oak, southern red oak, sand post oak, and sand live oak, Understory: wiregrass, pawpaws, sandhill milkweed, greeneyes, paintbrush, goldenaster, blazing star, roserush, narrowleaf	Florida/ Gilchrist, Levy, Hernando, Clay
Agricultural Land	Same as Cypress Pipeline Project.	Tobacco, watermelon, peanuts	Florida/ Gilchrist
Planted Pine	Typically planted with slash pine used for timber production. The understory consists of a mix of nonnative and weedy species or no understory, depending on age and management practices.	Slash pine	Florida/ Gilchrist, Levy
Herbaceous	Typically occurs in cleared areas (e.g., maintained rights-of-way) consisting of native and nonnative grasses and forbs; On well drained soils scrub oak may also occur.	Bahiagrass, fennel, goldenrods, prickly pear cactus, dayflower, saw palmetto, narrowleaf silkgrass, splitbeard bluestem, wiregrass, groundsel tree, scrub oak, turkey oak, live oak	Florida/ Gilchrist, Levy, Hernando, Polk, Bradford
Landscape	Same as Cypress Pipeline Project.	Landscape trees, shrubs, and generally non-native groundcover species	Florida/ Gilchrist

Aboveground Facilities – In Georgia, construction of Compressor Station 1 would primarily affect planted pine vegetation. Construction of Compressor Station 2 would primarily affect wetland vegetation (see section 4.4), although planted pine would also be affected. Construction of Compressor Station 3 in Florida would affect upland forest and herbaceous cover types.

Construction of the new AGL Meter Station and modifications at the existing Marietta, Rincon Gate, and Port Wentworth Meter Stations in Georgia would affect landscape, herbaceous, and planted pine cover types as well as wetland vegetation (see section 4.4). Construction of the three meter stations in Florida (the South Georgia, JEA Brandy Branch, and FGT Meter Stations) would affect upland forest, planted pine, and landscape cover types.

Of the 16 block valves proposed along the loop and mainline, four, including three in Georgia and one in Florida would be collocated with other aboveground facilities and would not affect additional vegetation resources. The 12 remaining non-collocated block valves, (nine in Georgia and three in Florida), would be constructed within the construction right-of-way or additional temporary extra workspace used for construction of the mainline. Permanent impacts on planted pine and upland forest cover types would result from the maintenance of the 12 non-collocated block valve sites as fenced and graveled areas.

The proposed pig launcher/receiver facilities would be collocated with other aboveground facilities (i.e., compressor stations, meter stations, or block valves) and would not affect vegetation resources in addition to those described above.

Pipe Storage and Contractor Yards – Southern has identified 13 pipe storage and contractor yards that would be used to facilitate construction activities. The use of these yards would affect herbaceous, landscape, upland forest, and planted pine cover types. Forested, scrub-shrub, and emergent wetlands are also present at these sites (see section 4.4). Of the upland cover types that would be affected, herbaceous and landscape cover types comprise about 77 percent while upland forest and planted pine cover types comprise about 23 percent.

Access Roads – Of the eight permanent access roads to be constructed, seven would be constructed within the proposed permanent right-of-way and would not affect additional vegetation resources. One permanent access road would be located outside of the construction right-of-way to access MLV #4 and would affect landscape and upland forest cover types. Table 2.1.1-2 in section 2 lists the permanent access roads that would be constructed for the Cypress Project. Southern anticipates that only minor modifications would be needed along the existing permanent and temporary access roads located outside of the construction right-of-way. These modifications would not result in impacts on vegetation. A list of existing roads proposed for temporary and permanent access to facilities associated with the Cypress Project is included in table C-2 of Appendix C.

FGT Expansion Project

The FGT loops and aboveground facilities would affect five distinct upland vegetation cover types as shown in table 4.5.1-1.

Pipeline Facilities – The majority of the FGT loops would cross two vegetation cover types and would be located within existing maintained rights-of-way. The primary vegetation cover type that would be crossed by loops (about 31.3 miles) is herbaceous-scrub. This community comprises about 96 percent of the vegetation cover types. The next most prevalent vegetation cover type crossed is agricultural of which 0.5 mile would be crossed. Non-vegetated industrial areas would be crossed by the remaining lengths of the loops. Three vegetation cover types, upland forest, planted pine, and landscape, would be

affected by the use of construction workspace and temporary extra workspaces located outside the permanent right-of-way. Of the vegetation communities that would be affected, upland vegetation comprises about 87 percent while wetland vegetation (i.e., forested, scrub-shrub, and emergent wetland vegetation) accounts for about 13 percent. Wetland vegetation is discussed in section 4.4.

Aboveground Facilities – Modifications at four existing compressor stations as part of the FGT Expansion Project would occur within the fence lines of the facilities and would not affect vegetation resources. Modifications to the Cypress/FGT Interconnect and construction of the Long Branch Regulator Station would affect upland forest vegetation. Modifications to the Hines and Brandy Branch M&R Stations and the Lawtey Regulator Station would affect 5.8 acres of herbaceous vegetation. Herbaceous vegetation would also be affected by the installation of the four proposed remote blowdown valves.

Pipe Storage and Contractor Yards – FGT identified five sites to be used for pipe storage or contractor yards. Use of these sites would affect herbaceous vegetation.

Access Roads – Herbaceous vegetation would be affected by FGT's proposed improvements for 10 existing access roads.

4.5.2 General Impacts and Mitigation

The primary impact of the pipeline facilities on vegetation would be the cutting, clearing, and/or removal of existing vegetation within the construction work areas. The degree of impact would depend on the type and amount of vegetation affected, the rate at which the vegetation would regenerate after construction, and the frequency of vegetation maintenance conducted during operation. Existing vegetation would be disturbed along the entire construction right-of-way. In general, the swath of upland vegetation that would be disturbed during construction of the Cypress Pipeline Project would be 110 feet wide for the length of the loop and 97 feet wide for the length of the mainline. For the FGT Expansion Project, upland vegetation would be disturbed along a 100-foot-wide swath for the majority of the expansion loops. Both the Cypress Pipeline and FGT Expansion Projects would be primarily located adjacent to and/or within an existing utility corridor and would use a portion of existing previously disturbed rights-of-way for spoil and topsoil storage. By using existing rights-of-way, the area of new disturbance would be reduced.

Secondary effects associated with disturbances to vegetation could include increased soil erosion (see section 4.2), increased potential for the introduction and establishment of invasive weedy species (see section 4.5.5), and a local reduction in available wildlife habitat (see section 4.6).

After cleanup and reseeded of the right-of-way, agricultural, landscape, and herbaceous cover types would typically regenerate quickly (e.g., within 1-2 years), and impacts would be short term. Cultivated areas are regularly disturbed and would be expected to quickly reestablish on the right-of-way following replanting by the landowners. Similarly, herbaceous cover types would revegetate quickly because of the ample rainfall received throughout the long growing seasons within the project areas. Landscape cover types would typically be replanted after construction as part of site-specific plans and agreements with landowners; however, tree planting would be prohibited within the permanent right-of-way. Additional information about impacts on and potential mitigation measures for residential areas, including landscaping, is presented in section 4.8.3.

Impacts on the forest cover types (i.e., upland forest and planted pine) would be considered long term because of the time required to restore the woody vegetation to its preconstruction condition can typically be 25 years or more, depending on the species and preconstruction conditions. Impacts

associated with construction and operation would be greatest on these cover types due to the change in structure and environment caused by the removal of the large, mature tree canopy over the width of the construction right-of-way. Permanent impacts would be greatest over the maintained portion of the right-of-way. A 10-foot-wide area centered over the pipelines would be maintained treeless on an annual basis, which would result in the conversion of the forest cover types in this area to an herbaceous cover type. The clearing of the entire permanent easement could also occur as frequently as every 3 years and would prevent forest overstory vegetation within that area from attaining a mature size and thus would permanently alter the nature of the cover type. Southern would maintain a 50-foot-wide permanent right-of-way, while FGT's new permanent right-of-way width would vary between 20 and 40 feet of new permanent right-of-way depending on the loop (see section 2.2.2). Southern has requested a modification to the FERC staff's Plan that, if approved, would increase the frequency of maintenance over the permanent right-of-way (see discussion below).

The clearing of trees from the construction right-of-way could also affect trees along the edge of the right-of-way. Trees located on the edge of the right-of-way may be subject to mechanical damage to trunks and branches and root impacts from soil disturbance and compaction, all of which could result in the decreased health and viability of the remaining edge trees. Edge trees that were located within a dense stand of trees before construction may lack stability following removal of adjacent supporting trees, which may result in increased tree failures and potential safety hazards. In areas where forest regeneration would be allowed, (i.e., temporary extra workspaces) the re-establishment of forest vegetation to preconstruction conditions would probably take between 25 and 150 years depending on the tree species, although the general rotation ages of pine plantations is between 40 and 60 years, depending on the species and proposed use.

Permanent impacts on vegetation would also occur wherever aboveground facilities are located. In addition to the vegetation displaced by the placement of piping, mechanical equipment, and buildings, an area around each facility would be fenced and graveled and maintained free of vegetation.

Our Plan 2003

To reduce impacts on vegetation within the construction and permanent rights-of-way and improve revegetation success, both Southern and FGT would implement our Plan 2003 (Appendix D) except for certain modifications that Southern has requested (see discussion below). FGT adopted our Plan 2003 without requesting modifications. Our Plan 2003 would apply to all upland habitats crossed by the projects. Specifically, Southern and FGT would implement the following measures:

- Test for soil compaction following construction in agricultural and residential areas and, where necessary, compaction would be relieved by using a paraplow or other deep tillage equipment. This treatment would aid revegetation by preparing a viable seedbed and allowing plant roots to grow freely.
- Monitor the success of revegetation of the right-of-way in the year following construction and again during the second growing season. In non-agricultural lands, revegetation would be considered successful if upon visual survey, the density and cover are similar to adjacent undisturbed lands. In agricultural areas, revegetation would be considered successful if crop yields are similar to adjacent undisturbed portions of the same field. Additional revegetation efforts would be conducted until revegetation is deemed successful.

Following construction, seed and fertilizer would be applied to all upland areas. The fertilizer type, seed species composition, and application rates would be in accordance with recommendations from

local NRCS offices or as requested by the landowner. Disturbed areas would be seeded within six working days after final grading is complete, weather and soil conditions permitting. Seed would be applied using the drill seeding, hydroseeding, or broadcast seeding methods as required by our Plan 2003.

Requested Modifications to our Plan 2003

Cypress Pipeline Project

Southern requested a modification to our Plan 2003 which would directly affect vegetation. Southern proposes to conduct vegetation maintenance over the entire permanent right-of-way as often as every two years in upland areas, and annually in Class 3 DOT population centers (e.g., residential areas) and on the Fort Stewart property. This differs from our Plan which specifies routine vegetation maintenance be conducted at frequency not greater than every three years with the exception of a 10-foot-wide corridor centered over the pipeline that can be maintained annually to facilitate leak-detection surveys. Southern stated that the project area experiences a long and wet growing season and that the extent of vegetation growth in three years would be such that heavier equipment would be needed, which in turn could cause soil disturbance and would result in the need for additional reclamation of the right-of-way. Additionally, Southern stated that in residential areas, landowners commonly request annual vegetation maintenance to address concerns regarding aesthetics and increased interaction with nuisance wildlife (e.g., rats, snakes, opossums, and mosquitoes).

In addition, Fort Stewart requested that Southern perform annual vegetation maintenance because Fort Stewart implements an annual prescribed burning program on their property and annual vegetation maintenance of the right-of-way would be required to prevent the fire from affecting the mainline and block valve that would be located on Fort Stewart property. We agree that there may be certain situations where an increased frequency of vegetation maintenance would be warranted and recommend approval of this modification in Class 3 DOT populations when requested by the landowner and on Fort Stewart to address safety issues. However, Southern has not provided adequate justification for an increased frequency of vegetation maintenance in other upland areas. Therefore, **we recommend that:**

- **Southern should not conduct vegetation maintenance at a frequency greater than every 3 years except: in Class 3 U.S. Department of Transportation (DOT) population centers *if requested by the landowner*, and on Fort Stewart Military Reservation lands as requested by Fort Stewart.**

FGT Expansion Project

FGT adopted our Plan 2003 without requesting modifications.

4.5.3 Site-Specific Impact and Mitigation

Impacts on vegetation resources and measures to mitigate those impacts would be specific to each project. The amount of each vegetation cover type that would be affected by construction and operation of the Cypress Pipeline and FGT Expansion projects is listed in table 4.5.3-1.

Cypress Pipeline Project

Pipeline Facilities – As summarized in table 4.5.3-1, Southern's proposed loop and mainline construction right-of-way, temporary workspaces, and access roads would disturb a total of about 1,368.8 acres of upland vegetation. The most common vegetation types occurring along the loop and mainline are planted pine (548.2 acres), herbaceous (397.7 acres), and upland forest (361.1 acres), which together

account for over 95 percent of the upland vegetation that would be cleared or affected by construction. Disturbance to the remaining cover types, agriculture, and landscape would total 53.4 and 8.4 acres respectively. Permanent impacts on the upland forest and planted pine cover types resulting from right-of-way maintenance activities would total about 548.2 acres while long term impacts resulting from the temporary removal of forested vegetation would total 361.1 acres. However, as part of our alternatives analysis, we evaluated various route alternatives and variations that would reduce impacts on forest land as well as other resources. In section 3.3.2.1 we included a recommendation that Southern realign its mainline between MPs 0.0 and 9.5 so that the resulting pipeline centerline is generally 5 feet inside (as opposed to 10 feet outside) an existing power line corridor. Additionally, in 3.3.2.5 we recommended that Southern adopt two route variations along the mainline near MPs R26.5 and 73.8. Adopting these three route variations would result in reduced impacts of forest vegetation.

TABLE 4.5.3-1

Acres of Upland Vegetation Cover Types Affected by the Cypress Pipeline Project and FGT Expansion Project Pipeline Facilities^a

Project/State/ Facility	Planted Pine		Herbaceous		Upland Forest		Agriculture		Landscape		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Cypress Pipeline Project												
Georgia												
Loop	16.1	0.0	37.0	0.0	4.5	0.0	0.0	0.0	1.2	0.4	58.8	0.4
Mainline	532.1	325.0	234.4	48.9	144.4	74.8	0.0	0.0	1.2	0.7	912.1	449.4
Florida												
Mainline	0.0	0.0	126.3	18.6	212.2	148.4	53.4	40.9	6.0	0.5	397.9	208.4
Total	548.2	325.0	397.7	67.5	361.1	223.2	53.4	40.9	8.4	1.6	1368.8	658.2
Percent ^b	40.0%	49.4%	29.1%	10.3%	26.4%	33.9%	3.9%	6.2%	0.6%	0.2%	100.0%	100.0%
FGT Expansion												
Florida												
Loop J	6.7	0.0	38.0	19.9	11.3	0.0	7.7	2.4	0.6	0.0	64.4	22.3
Loop K	2.6	0.0	159.7	73.3	1.2	0.0	0.0	0.0	0.0	0.0	163.4	73.3
Loop G	0.0	0.0	167.8	52.0	0.3	0.0	0.0	0.0	0.0	0.0	168.1	52.0
Total	9.3	0.0	365.5	145.2	12.8	0.0	7.7	2.4	0.6	0.0	395.9	147.7
Percent ^b	2.4%	0.0%	92.3%	98.3%	3.2%	0.0%	2.0%	1.6%	0.1%	0.0%	100.0%	100.0%
^a Acres impacted include pipeline right-of-way extra workspaces, and access roads within the permanent right-of-way. Aboveground facilities located outside of the pipeline rights-of-way, non-vegetated areas, and areas of open water are not included.												
^b Percent of upland vegetation affected by each project.												

Southern’s primary mitigation strategies are avoidance and minimization of impacts. Southern routed its pipeline adjacent to existing maintained rights-of-way and during construction would utilize a portion of those previously disturbed areas along 95 percent of its route. The construction right-of-way would overlap onto existing previously disturbed rights-of-way by 65 feet for the entire Loop, and by 32 feet for 141.5 miles, and 7 feet for 14.1 miles, of the mainline. There would be no overlap of existing rights-of-way for about 9.1 miles. By using existing rights-of-way during construction, long term impacts on upland forest and planted pine cover types would be lessened and shifted to impacts on the herbaceous cover type (which would be considered short term), and impacts on previously undisturbed vegetation would be minimized.

In order to address landowner concerns about the removal of mature trees and the loss of timber resources, Southern has configured its construction right-of-way to overlap existing rights-of-way to reduce the need for clearing forest vegetation. Additionally, for short lengths of the pipeline where trees

provide a buffer between existing residences and existing pipeline or powerline corridors, Southern has agreed to negotiate with individual landowners to minimize clearing of trees on those properties. Where tree loss within the construction right-of-way cannot be avoided, specific revegetation treatments and/or compensation for the loss of vegetation would be negotiated by Southern during the acquisition of easements from landowners. Additional information about impacts on residential areas associated with the removal of trees is presented in section 4.8.3.

Southern would minimize impacts on vegetation by implementing our Plan 2003. Implementation of our Plan 2003 would prevent to the loss of topsoil by requiring topsoil segregation and erosion control measures and would promote revegetation of disturbed areas through active seeding. Southern has agreed to consult with the local NRCS offices in Georgia and Florida and provide their recommendations for fertilizer types, seed species, and application rates to the Secretary prior to construction.

Aboveground Facilities – In Georgia, construction of Compressor Station 1 would affect about 13.5 acres planted pine of which about 5.5 acres would be permanently affected by operation of this facility. Although construction of Compressor Station 2 would primarily affect wetland vegetation (see section 4.4), about 5.2 acres of planted pine would also be affected. About 2.4 acres of planted pine would be permanently affected by operation of Compressor Station 2. Construction of Compressor Station 3 in Florida would affect 13.6 acres of the upland forest and herbaceous cover types. About 5.1 acres, consisting primarily of upland forest would be permanently affected by operation of Compressor Station 3.

In Georgia, modifications at the existing Marietta Meter Station would temporarily affect about 0.8 acre of the herbaceous and landscape cover types. Modifications at the Rincon Gate Meter Station would temporarily affect 0.7 acre and permanently affect 0.1 acre of herbaceous cover type as well as wetland vegetation (see section 4.4). Modifications to the Port Wentworth Meter Station would affect wetland vegetation (see section 4.4). Construction of the new AGL Meter Station would permanently affect about 1.0 acre of the planted pine and herbaceous cover types. In Florida, construction of the South Georgia Meter Station would permanently affect about 1.1 acre of upland forest cover type. Construction of the JEA Brandy Branch Meter Station and the FGT Meter Station would each permanently affect about 1.0 acre comprised of the herbaceous and upland forest cover types.

Construction of 12 proposed block valves (MLV Nos. 2 through 13) would occur within the construction right-of-way and/or extra workspaces required for the mainline and would not result in additional temporary impacts on vegetation. However, these 12 valve sites would be maintained as fenced graveled areas and result in a total of about 0.4 acre of permanent impacts on vegetation affecting planted pine and upland forest cover types. Of these permanent impacts, about 0.3 acre would occur in Georgia, and less than 0.1 acre would occur in Florida. Construction of MLV Nos. 1 and 14, and LBV Nos. 1 and 2, would be collocated with aboveground facilities and no additional vegetative impacts would occur beyond those identified for the aboveground facilities.

Pipe Storage and Contractor Yards – The temporary use of 13 pipe storage and contractor yards (12 in Georgia and 1 in Florida) would affect about 224 acres. Based on information provided in Southern's application, temporary impacts in Georgia would affect about 95 acres of herbaceous, 71 acres of landscape, 36 acres of upland forest, and 14 acres of planted pine cover types. In Florida, about 8 acres of the herbaceous cover type would be affected. No permanent impacts on vegetation would result from the use of these sites.

Access Roads – Of the eight new permanent access roads that would be constructed, only the access road to MLV 4 would be located outside of the mainline right-of-way. Less than 0.1 acre of the

landscape and upland forest cover types would be permanently affected by the long term use and maintenance of this access road. Impacts associated with the seven new permanent access roads that would be located within the permanent right-of-way are accounted for in the impacts resulting from construction and operation of pipeline facilities (see table 4.5.3-1). Southern proposes to use other existing roads for permanent access to its facilities; however, because the use of these roads would not require significant improvements, no impacts on vegetation resources are anticipated.

FGT Expansion Project

Pipeline Facilities – Construction of Loops J, K, and G, including the construction right-of-way and temporary workspaces, would disturb a total of about 395.9 acres of upland vegetation. The most common vegetation type occurring along the loops is herbaceous (365.5 acres) accounting for about 92 percent of the upland vegetation that would be cleared or affected by construction. Upland forest (12.8 acres), planted pine (9.3 acres), and agriculture (7.7 acres) are the next most prevalent cover types, together accounting for almost 8 percent of the vegetation affected along the loops. About 0.6 acre of landscape cover type would be affected by construction. Long term impacts would occur on a total of about 22.1 acres of upland forest and planted pine cover types due to the removal of mature forested vegetation, while less than 0.1 acre would be permanently affected by right-of-way maintenance activities.

Similar to the Cypress Pipeline Project, the FGT Expansion Project would minimize impacts on undisturbed vegetation by overlapping its construction right-of-way onto previously disturbed existing rights-of-way. Loop J would overlap FGT's existing permanent easement by 20 feet for the entirety of the loop. Loop K would typically overlap onto existing rights-of-way between 40 and 45 feet for the entirety of the loop, and Loop G would overlap onto existing rights-of-way by 60-70 feet for more than half of the length of the loop and by 36 feet for about 6.1 miles.

On loop G, the temporary workspace for the northern 6.3 miles would be 70 feet wide and entirely within FPL's existing easement. For the southern 6.1 miles of loop G, FGT would use 60 feet of temporary workspace that would consist of 24 feet outside (west of) and 36 feet inside FPL's existing easement for the portions of the route north of State Road 50 (Cortez Boulevard). FGT's temporary workspace for the portion of loop G that is south of State Road 50 would be 60-foot-wide located entirely within FPL's existing easement.

FGT would minimize impacts on vegetation by implementing our Plan 2003, which would prevent to the loss of topsoil by requiring topsoil segregation and erosion control measures and would promote revegetation of disturbed areas through active seeding. All of the soils crossed by Loop J (100 percent) and a majority of the soils crossed by Loop G (97 percent) have potential revegetation concerns (see section 4.2.). Potential revegetation concerns would be minimized by implementation of our Plan 2003, which requires consultation with local NRCS offices and requires that revegetation be successful. The NRCS would specify revegetation species and fertilizer types specific to the disturbed areas. In addition, our Plan 2003 specifies that all disturbed areas would be monitored for two years after construction to ensure that successful revegetation has occurred, or that revegetation efforts continue until the revegetation is deemed successful. Revegetation would be considered successful in nonagricultural areas if vegetation density and cover on disturbed areas are similar to adjacent undisturbed areas. In agricultural areas, revegetation would be considered successful if crop yields on disturbed areas are similar to adjacent undisturbed agricultural areas.

Aboveground Facilities – About 3.9 acres of upland forest cover type would be affected by modifications proposed for the Cypress/FGT Interconnect, and the construction of the Long Branch Regulator Station of which, 2.7 acres would be permanently affected by operations. Modifications to the

Hines, Brandy Branch, and Jacksonville M&R Stations, and the Lawtey Regulator Station, would affect 4.4 acres of herbaceous cover type and result in a total of about 0.2 acre of permanent impacts during operation. Construction of the four proposed remote blowdown valves would affect about 1.4 acres of herbaceous cover type of which approximately 1.0 acre would be permanently impacted.

Pipe Storage and Contractor Yards – Use of the five sites that FGT proposes for pipe storage and/or contractor yards would temporarily affect about 36.4 acres of herbaceous cover type.

Access Roads – Proposed improvements to 10 existing access roads would temporarily affect about 9.5 acres of herbaceous cover type.

4.5.4 Vegetation Communities of Special Concern or Value

Cypress Pipeline Project

Based on a search of the Georgia Natural Heritage Program, the GADNR identified the following locations as areas of special concern in its July 21, 2005 letter (GADNR, 2005b) to the FERC:

- Mature pine trees are present near MP 65.4 adjacent to McLendon Swamp, which is a high-quality cypress-gum swamp. The GADNR recommends that Southern avoid clearing these trees if possible. Southern reduced its proposed right-of-way width to 75 feet through this wetland area which would minimize impacts.
- About 15.6 acres of native longleaf pine forest would be crossed by the project. Longleaf pine forest is an important vegetation type because it provides habitat for sensitive species (see sections 4.6.1.4). The GADNR stated that it would prefer the pipeline be located within the existing cleared right-of-way to avoid the clearing of “sensitive and disappearing longleaf habitat” (Ozier, 2005). One area of longleaf pine forest identified is near MP 110; however, this location has subsequently been clearcut by the landowner. Another area of longleaf pine was identified on the Fort Stewart Military Reservation between approximate MPs R24.9-R26.6; however, this stand is a mixed stand of longleaf and loblolly pine cultivated for timber production¹. The mainline route is located adjacent to existing road right-of-way through this area, which minimizes impacts on forested vegetation. Within this area, about 11.2 acres would be cleared for construction, and about 5.0 acres would be permanently impacted by right-of-way maintenance activities.

The GADNR also identified sites included in the Georgia Natural Heritage Program where important wetlands, habitats, sensitive species, and land uses may be affected. These locations are addressed in sections 4.4, 4.6, 4.7, and 4.8, respectively. Subsequent consultation has occurred between Southern and the GADNR regarding these areas. Although Southern has attempted to address the GADNR’s concerns and minimize impacts on these resources, it is not clear that the GADNR concurs with Southern’s approach; therefore, we included a recommendation in section 4.4.3 that Southern continue to consult with the GADNR to resolve any remaining concerns and provide documentation that indicates that the GADNR finds Southern’s construction plans through these areas acceptable.

During the scoping process, a representative from the SJRWMD noted that the pipeline would potentially affect unique plant communities including pitcher plants where it crosses the Ralph E. Simmons State Forest. However, the representative also stated that these plant communities occur within

¹ Our recommend route variation at MP R26.5 would minimize impact on longleaf pine forest at this location (see section 3.3.2.5).

the existing cleared utility corridor and noted that clearing of planted pine vegetation adjacent to the utility corridor could potentially provide favorable conditions for the establishment of these communities. Measures to avoid or minimize impacts on vegetation communities of special concern or value could include topsoil segregation, the use of protection fencing around plants to be preserved, and/or other appropriate mitigation measures. Because vegetation communities of special concern or value could be affected where the Cypress mainline crosses the Ralph E. Simmons State Forest; **we recommend that:**

- **Southern should consult with the SJRWMD and/or Florida Division of Forestry to develop measures to avoid or minimize impacts on vegetation communities of special concern or value. Southern should provide documentation of its consultations with the agencies, and its proposed mitigation for vegetation communities of special concern, before the end of the draft EIS comment period.**

Riparian vegetation would be affected in both Georgia and Florida due to the removal of vegetation adjacent to waterbody crossings. Typically, the amount of impact would be equivalent to the width of the construction right-of-way at each crossing, which would be 110 feet wide for the loop and 97 feet wide for the mainline. Extra workspaces for waterbody crossings would typically be set back at least 50 feet from the waterbody edge. However, Southern's modification requests to allow extra workspaces to be located within 50 feet at various waterbody crossings would lead to increased impacts on riparian vegetation (see section 4.3.2) than would be allowed by our Procedures 2003. Southern would reduce impacts on riparian vegetation by utilizing the HDD method at 14 waterbody crossings, which would avoid much of the riparian vegetation adjacent to these waterbodies. Additionally, Southern shifted HDD workspaces onto the existing cleared right-of-way at six waterbody crossings, which would reduce the amount of tree and shrub clearing that would be required adjacent to waterbodies by about 3.1 acres. To further reduce impacts on riparian vegetation within the construction and permanent rights-of-way, Southern would implement our Procedures 2003 (Appendix E). These measures would include: revegetating disturbed riparian areas with conservation grasses and legumes or native plant species, preferably woody species; and allowing a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way.

In considering whether to issue a section 404 permit for the Cypress Pipeline Project, the COE would consider impacts on riparian vegetation and may include conditions to further minimize impacts on riparian vegetation. In addition, Southern would be required to apply for a Stream Buffer Variance from the GADNR Environmental Protection Division in order to remove vegetation within the 50-foot protected buffer adjacent to state waters.² In its buffer variance application, Southern would have to demonstrate that the amount of vegetative disturbance has been minimized. Additional conditions relating to impacts on riparian vegetation may be required by the FL DEP in its ERP authorization.

FGT Expansion Project

No vegetation communities of special concern or value were identified along the FGT loops.

4.5.5 Noxious Weeds and Other Invasive Plants

Noxious weeds and other invasive plants are non-native, undesirable natives, or introduced species that are able to exclude or compete against desirable native species, and thereby decrease overall

² "State waters" in Georgia means any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface or subsurface water, natural and artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation, except as may be defined in O.C.G.A. 12-7-17(7) (GADNR, 2005c).

species diversity. Noxious weeds often invade and persist in areas after disturbance (e.g., after construction of a pipeline) and can hinder restoration. Other aggressive plant species, both native and introduced, may also out-compete desirable native and other beneficial species. Noxious weeds are addressed by Executive Order 13112 issued in February, 1999. Executive Order 13112 directs federal agencies to prevent the introduction of invasive species; provide for their control; and minimize the economic, ecological, and human health impacts that invasive species could cause. The order further specifies that a federal agency shall not authorize, fund, or carry out actions likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless it has determined that the benefits of such actions outweigh the potential harm caused by invasive species and that all feasible and prudent measures to minimize risk of harm would be taken in conjunction with the actions.

The State of Georgia does not currently regulate invasive weeds. However, the GADNR is concerned about the spread of invasive weeds and reviews projects for their potential to affect the spread of invasive weeds on state lands (Elliot, 2005). The GADNR relies on the list of invasive weeds maintained by the Georgia Exotic Pest Plant Council (GA EPPC). Table 4.5.5-1 lists the 20 plant species designated by the GA EPPC as invasive weeds in the state of Georgia.

Common Name	Scientific Name
Tree of Heaven	<i>Ailanthus altissima</i>
Mimosa	<i>Albizia julibrissin</i>
Giant Reed	<i>Arundo donax</i>
Tropical Spiderwort	<i>Commelina benghalensis</i>
Autumn Olive	<i>Elaeagnus umbellata</i>
Hydrilla	<i>Hydrilla verticillata</i>
Cogongrass	<i>Imperata cylindrica</i>
Exotic lespedezas	<i>Lespedeza bicolor</i> & <i>L. cuneata</i>
Chinese privets	<i>Ligustrum sinense</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
Japanese climbing fern	<i>Lygodium japonicum</i>
Chinaberrytree	<i>Melia azedarach</i>
Nepalese browntop	<i>Microstegium vimineum</i>
Small Broomrape	<i>Orobanche minor</i>
Golden Bamboo	<i>Phyllostachys aurea</i>
Kudzu	<i>Pueraria Montana</i>
Giant Salvinia	<i>Salvinia molesta</i>
Tropical Soda Apple	<i>Solanum viarum</i>
Tallow Tree	<i>Triadica sebifera</i>
Wisteria	<i>Wisteria sinensis</i>

Although Florida has regulated aquatic invasive plants since the late 1800s, in 1997, the Florida legislature mandated that the FLDEP implement a program to control invasive exotic upland plant species within natural areas. Currently the Florida Bureau of Invasive Plant Management (FLBIPM) is the lead state agency responsible for coordinating both the Aquatic Plant Management and Upland Invasive Exotic Plant Management Programs to address the control of invasive species. In Florida, noxious weed species have been identified by the county in which they have the potential to occur. Thirty-three Florida state-listed invasive weeds have the potential to occur along the Cypress pipeline route and FGT Expansion loops in Florida (see table 4.5.5-2).

TABLE 4.5.5-2

**Invasive Weed Species with the Potential to Occur in the Vicinity of the Cypress Pipeline
and FGT Expansion Projects In Florida**

Common Name	Scientific Name	County with Potential for Occurrence
Mimosa	<i>Albizia julibrissin</i>	Bradford, Citrus, Clay, Gilchrist, Levy
Alligator weed	<i>Alternanthera philoxeroides</i>	Bradford
Coral ardisia	<i>Ardisia crenata</i>	Bradford
Asparagus fern	<i>Asparagus densiflorus</i>	Citrus
Camphor tree	<i>Cinnamomum camphora</i>	Citrus, Clay, Duval, Gilchrist, Levy
Wild taro	<i>Colocasia esculenta</i>	Bradford, Citrus, Clay
Air potato	<i>Dioscorea bulbifera</i>	Citrus, Clay, Hernando, Levy, Nassau
Water hyacinth	<i>Eichhornia crassipes</i>	Duval, Levy
Thorny eleagnus	<i>Elaeagnus pungens</i>	Marion
Hydrilla	<i>Hydrilla verticillata</i>	Duval
Cogon grass	<i>Imperata cylindrical</i>	Citrus, Clay, Hernando, Gilchrist, Levy, Marion
Flamegold tree	<i>Koelreuteria elegans</i>	Citrus, Marion
Lantana	<i>Lantana camara</i>	Bradford, Duval, Gilchrist, Nassau
Glossy privet	<i>Ligustrum lucidum</i>	Citrus, Duval, Marion
Chinese privet	<i>Ligustrum sinense</i>	Bradford, Citrus, Duval
Japanese Honeysuckle	<i>Lonicera japonica</i>	Bradford, Duval, Gilchrist, Nassau
Japanese climbing fern	<i>Lygodium japonicum</i>	Bradford, Clay, Duval, Hernando, Levy
Cat's claw vine	<i>Macfadyena unguis-cati</i>	Hernando
Chinaberry	<i>Melia azedarach</i>	Citrus, Clay, Duval, Hernando, Levy, Marion, Nassau
Heavenly bamboo, Nandia	<i>Nandina domestica</i>	Citrus, Marion
Tuberous Sword Fern	<i>Nephrolepis cordifolia</i>	Duval
Skunk vine	<i>Paederia foetida</i>	Citrus, Duval, Hernando
Torpedo grass	<i>Panicum repens</i>	Bradford, Duval, Levy
Elephant grass	<i>Pennisetum purpureum</i>	Duval
Water lettuce	<i>Pistia stratiotes</i>	Duval, Levy
Kudzu	<i>Pueraria montana</i>	Citrus, Hernando, Levy
Castor bean	<i>Ricinus communis</i>	Hernando
Chinese Tallow	<i>Sapium sebiferum</i>	Citrus, Clay, Duval, Marion
Purple sesban, Rattlebox	<i>Sesbania punicea</i>	Clay
Brazilian pepper	<i>Schinus terebinthifolius</i>	Citrus, Hernando, Levy
Caesar's weed	<i>Urena lobata</i>	Marion
Chinese wisteria	<i>Wisteria sinensis</i>	Citrus, Clay, Levy, Marion
Elephant ear, Malanga	<i>Xanthosoma sagittifolium</i>	Citrus

Cypress Pipeline Project

Southern identified only one invasive weed species occurring along its proposed mainline. Chinese tallow, a Florida listed invasive weed species, was identified in two locations in Duval County. Southern proposes to remove the plants and burn the debris on site. Southern has agreed to develop a Nuisance Species Plan to control invasive weed species in upland and wetland areas in consultation with the FLDEP and GADNR. Specific mitigation measures that Southern would implement include:

- develop a program to train EIs to identify invasive weed species;

- require the EIs to identify and mark the limits of invasive weed infestations within the construction area prior to clearing;
- require operators to clean equipment prior to leaving areas identified as weed infested;
- remove or burn invasive weed vegetation removed during clearing operations; and,
- monitor restoration and treat weed infestations where the weed species account for a greater percentage of vegetation on the right-of-way as compared to the percentage of weed species off of the right-of-way.

Because the details of Southern's Nuisance Species Plan are not finalized, **we recommend that:**

- **Prior to construction, Southern should file with the Secretary, for review and written approval by the Director of OEP, a revised Nuisance Species Plan developed in consultation with the GADNR and FLDEP. This plan should include measures to prevent the spread of invasive weeds during construction and to control invasive weeds that may develop post construction.**

FGT Expansion Project

FGT has agreed to consult with the FLDEP and other appropriate agencies to develop a Nuisance Species Plan for the FGT Expansion Project. Measures to control invasive species that FGT would incorporate into its plan include:

- conduct preconstruction surveys to identify invasive species along the loops
- require the EIs to identify and mark the limits of invasive weed infestations within the construction area prior to clearing;
- require operators to clean equipment prior to leaving areas identified as weed infested; and,
- remove or burn invasive weed vegetation removed during clearing operations.

Because the details of FGT's Nuisance Species Plan have not yet been developed, **we recommend that:**

- **Prior to construction, FGT should file with the Secretary for the review and approval by the Director of OEP its Nuisance Species Plan developed in consultation with the FLDEP. This plan should include measures to prevent the spread of invasive weeds during construction and to control invasive weeds that may develop post construction.**

4.6 WILDLIFE AND AQUATIC RESOURCES

4.6.1 Wildlife

4.6.1.1 Existing Wildlife Resources

Wildlife species inhabiting the proposed Cypress Pipeline Project and FGT Expansion Project areas are characteristic of the vegetation communities found along the pipeline routes. The pipelines would cross an extensive amount of forested land as well as open land and wetlands. Specific vegetative communities crossed by the Cypress Pipeline Project and the FGT Expansion Project include upland forest, planted pine, herbaceous, agriculture, and landscape. These vegetative communities are discussed in sections 4.4.1 and 4.5.1. Numerous vertebrates inhabit these areas and use the resources for food, cover, shelter, and nesting purposes. Additionally, the proposed facilities would cross a number of significant habitats with the potential for supporting federally and state-listed or proposed endangered and threatened wildlife species, as discussed in section 4.7.

Cypress Pipeline Project

The primary region that would be impacted by the Cypress Pipeline Project is an area of the lower Coastal Plain with uplands dominated by southern mixed hardwood forest and forested wetlands composed predominantly of red maple, cypress, and black gum trees (see section 4.5). Specifically, the Cypress Pipeline Project would cross the Sea Island Flatwoods and Floodplains and Low Terraces ecoregions. The Sea Island Flatwoods are poorly-drained flat plains with low elevations. Wet soils are common, although small areas of better-drained soils add some ecological diversity. Loblolly and slash pine plantations cover much of the region. Water oak, willow oak, sweetgum, blackgum, and cypress occur in wet areas. The Floodplains and Low Terraces ecoregion is comprised of the broad floodplains and terraces of major rivers, such as the Savannah, Ogeechee, and Altamaha. This ecoregion is composed of stream alluvium and terrace deposits of sand, silt, clay, and gravel, along with some organic muck and swamp deposits. Swamp forests of bald cypress and water tupelo and oak-dominated bottomland hardwood forests provide important wildlife habitat (GADNR, 2001c).

There are a number of wildlife species that are endemic to the community types found in this ecoregion. Mammals that are found in this area include the armadillo, opossum, white-tailed deer, gray fox, smokey and short-tailed shrew, cottontail rabbit, various species of mice, eastern mole, southern flying squirrel, bobcat, and black bear. Resident and migratory non-game bird species are also numerous and include wild turkey, bobwhite quail, mourning dove, cardinal, Carolina wren, and vultures. Migratory waterfowl and wading birds, such as ibises, cormorants, herons, egrets, and kingfishers, are common in flooded areas. The lower Coastal Plain also provides habitat for a number of amphibian and reptile species, including flatwoods and marbled salamanders; ornate chorus, and southern leopard frogs; southeastern five-lined, ground, and broad-headed skinks; eastern fence lizard; southern ring-neck snake; yellow rat snake; southern black racer; eastern king snake; red-bellied snake; eastern hognose snake; rough green snake; corn snake; garter snake; eastern indigo snake; eastern diamondback rattlesnake; and gopher tortoise (Kircher and Morrison, 1988).

Intensively managed pine plantations comprise the majority of the Cypress Pipeline Project area and provide habitat for a variety of game and non-game animal species. Amphibian and reptile species commonly found in this community include the eastern fence lizard, southern leopard and cricket frogs, southern black racer, common garter snake, and eastern diamondback rattlesnake. Game species in this community include the white-tailed deer, gray squirrel, bobwhite quail, mourning dove, wild turkey, and cottontail rabbit (Burt and Grosseheider, 1976). Loblolly pine seeds provide a major food source for rodents, such as gray squirrels and pine voles, and non-game birds, such as sparrows. Small songbirds

that inhabit this vegetative community include warblers, vireos, and thrushes. Raptors, such as the red-tailed hawk, bald eagle, screech and barred owl, and red-shouldered hawk, may also be present (Robbins *et al.*, 1966; Imhof, 1976).

The proposed meter stations and compressor stations for the Cypress Pipeline Project would be located within an area of the Coastal Plain province adjacent to an existing right-of-way in areas of managed pine plantations, southern mixed hardwood forest, palustrine forested wetlands, or southern mixed pine-oak forest. The warehouse sites and access roads are located within the Coastal Plain province in areas similar to the other pipeline facilities. Wildlife associated with the proposed aboveground facilities, warehouse sites, and access roads are similar to those discussed in the pipeline facilities section.

FGT Expansion Project

The FGT Expansion Project facilities would encroach upon the Gulf Coast Flatwoods and Central Florida Ridges and Uplands ecoregions. Specifically, Loops J and K would be located within the Gulf Coast Flatwoods ecoregion, and Loop G would be located within the Central Florida Ridges and Uplands ecoregion. The Gulf Coast Flatwoods ecoregion supports pine forest with understory vegetation primarily consisting of chalky bluestem, indiagrass, and several panicum species. Palmetto, gallberry, and wax myrtle are the dominant woody shrubs, and longleaf and slash pine are the major trees. The Florida Ridges and Uplands ecoregion "sand hill" vegetation consisting of turkey oak, bluejack oak, and longleaf pine. Running oak, gopher apple, and such grasses as bluestems and panicums characterize the understory in this ecoregion (OSU, 2005).

The FGT Expansion Project facilities would be located within two major upland forest types: the mesic oak forest and the high pine forest. Both forest communities are habitat for such mammal species as the white-tailed deer, gray fox, gray squirrel, armadillo, striped skunk, southeastern pocket gopher, and least shrew. Typical bird species include the red-headed woodpecker, loggerhead shrike, eastern kingbird, hairy woodpecker, eastern bluebird, brown-headed nuthatch, pine warbler, bobwhite, and the white turkey. The box turtle, six-lined racerunner, black racer, eastern diamondback rattlesnake, and oak toad are typical reptiles and amphibians (Burt and Grossenheider, 1976; Peterson, 1980; Myers and Ewel, 1990; Conant and Collins, 1991).

Pine plantations typically show decreased vegetative and structural diversity due to the continual harvesting or thinning of trees, which generally equates to decreased capacity to support various and abundant wildlife species. However, wildlife does utilize these areas, and typically includes species such as white-tailed deer, wild turkey, gray squirrel, bobwhite, mourning dove, cottontail rabbit, and fox squirrel.

Scrub habitats within the FGT Expansion Project area are characterized by very dry, well-drained sandy soils. Vegetation and wildlife are well adapted to the xeric conditions where runoff and percolation rates are extremely high. Typical amphibian and reptile species in scrub habitats that would be crossed by the pipeline loops include tiger salamander, barking treefrog, spadefoot toad, gopher tortoise, gopher frog, fence lizard, mole skink, eastern coachwhip, pine snake, and eastern diamondback rattlesnake. Bird and mammal species that are common in this habitat include the bobwhite, ground dove, red-headed woodpecker, rufous-sided towhee, fox squirrel, and pocket gopher (Burt and Grossenheider, 1976; Peterson, 1980; Myers and Ewel, 1990; Conant and Collins, 1991).

The proposed FGT Expansion Project pipeline facilities would cross three major freshwater wetland types: forested wetlands, scrub-shrub wetlands, and emergent wetlands. Typical aquatic and wetland wildlife in forested and scrub-shrub wetlands include the white-tailed deer, raccoon, river otter,

cotton mouse, white ibis, glossy ibis, wood duck, prothonotary warbler, wild turkey, lesser siren, mud snake, and cottonmouth. Freshwater marshes provide habitat for many aquatic wildlife species, including those found in forest and shrub swamps, as well as the rice rat, least bittern, green-backed heron, common yellowthroat, red-winged blackbird, leopard frog, bullfrog, green water snake, mud turtle, cooter, chicken turtle, and pygmy rattlesnake (Burt and Grossenheider, 1976; Peterson, 1980; Myers and Ewel, 1990; Conant and Collins, 1991).

Many of the wildlife species mentioned above are important game animals hunted in the project area. These include the white-tailed deer, bobcat, fox, gray squirrel, raccoon, cottontail rabbit, wild turkey, bobwhite, mourning dove, and waterfowl (ducks and geese).

The aboveground facilities associated with the FGT Expansion Project would be located in industrial/commercial and forested areas. Wildlife occurring in these areas are similar to those described in the pipeline facilities section.

4.6.1.2 General Impact and Mitigation

The temporary and permanent impacts of construction and operation of the proposed project on wildlife and their habitats would vary depending on the requirements of each species and the amount and quality of existing habitat present in the project area. Temporary wildlife impacts are those associated with the disturbance of habitats and/or individuals during construction, such as noise and clearing. Permanent impacts are those associated with the conversion of forest habitat to early successional habitats due to the periodic maintenance of the permanent pipeline right-of-way and permanent conversions from vegetated land to aboveground facilities. The general region of the projects has been impacted by intense pine plantation management, draining, and conversion of habitat for development. Construction and operation of the project would result in temporary and permanent alteration of wildlife habitat, as well as direct impacts on wildlife species including disturbance, displacement, and mortality.

Pipeline Facilities

Pipeline construction requires vegetation clearing along the temporary construction right-of-way, which would primarily result in localized impacts on wildlife populations. The general disturbance of the right-of-way associated with construction activities would likely result in the temporary displacement of most wildlife from the immediate vicinity of the construction zone and adjacent areas. Clearing of the temporary construction right-of-way would reduce cover, nesting, and foraging habitat for some species and may result in mortality to less mobile forms of wildlife, such as small rodents and reptiles. Other wildlife, such as birds and larger mammals, would leave the project area as construction activities approach. These animals may relocate into similar habitats nearby; however, the lack of adequate territorial space could force these animals into suboptimal habitat and/or increased densities, which could lower reproductive success and survival depending on the duration of displacement.

Forest habitat would be altered more than any other habitat during construction. All trees on the construction right-of-way would be removed causing species that depend upon trees for food, refuge, or nesting to be displaced to nearby forested habitat. Some nesting species and tree cavity nesting species may suffer mortality during right-of-way clearing. For those adult birds that are able to disperse from the working right-of-way, nesting success may be denied or diminished for one annual breeding cycle. The relatively slow regeneration of forested communities within the temporary right-of-way would result in the long-term loss of habitat for those species that utilize these communities; however, species that use early successional shrub or forest communities may benefit from the regeneration process. Additionally, the non-woody vegetation may provide seeds and foliage for food for small mammals and birds, as well as habitat for ground-nesting birds, mammals, and reptiles. Approximately 398.1 acres of forested land

would be cleared and maintained for permanent pipeline right-of-way for the Cypress Pipeline Project. FGT's use of existing pipeline and utility corridors and overlapping construction workspace with the adjacent pipeline corridor would minimize potential impacts by reducing the overall extent of clearing and land disturbance; there would be no forested lands cleared and maintained for permanent right-of-way for the FGT Expansion Project.

Southern and FGT's proposed pipelines would temporarily impact 1606.1 acres of non-forested habitats (agriculture, pine plantation, dry prairie, scrub, open space, and wetlands), of which 587.9 acres would be permanently maintained for operation and maintenance of the pipeline. In herbaceous and shrub communities, construction activities would result in a short-term loss of wildlife habitat in the unmaintained construction right-of-way due to the shorter amount of time necessary for these communities to reestablish; however, the extent of disturbance would vary with the habitat type and associated fauna. For example, removal of scrub habitat could negatively impact those species that depend on such habitats for nesting and foraging (e.g., Florida scrub jay), while potentially increasing foraging habitat for other species (e.g., gopher tortoise).

The pipeline would cross numerous wetland and riparian systems. These habitats are important for a number of resident wildlife species. Disturbance to these habitats would be minimized through adherence to our Procedures 2003, with approved modifications. Additionally, Cypress plans to directionally drill the Ogeechee, Altamaha, Satilla, and St. Marys Rivers, which would further minimize impacts to riparian habitats.

All disturbed areas would be reseeded according to our Plan 2003 (Appendix D) and would conform to the NRCS planting schedule. The temporary right-of-way and extra workspaces would be seeded with herbaceous species and allowed to revegetate naturally with resident trees and shrubs following construction.

Maintenance of the permanent right-of-way in forested areas would permanently alter the wildlife habitat immediately within the right-of-way. It is unlikely that the proposed pipeline corridor widths would increase fragmentation of forested tracts, as most researchers have defined a forest as discrete if it is separated from other forest by at least 328 feet of land (Rich *et al.*, 1994). The principal impact on wildlife using the right-of-way would be a shift from those species favoring forest habitats to those using either edge habitat or more open areas. Cleared and maintained right-of-way may benefit species such as mourning dove, Henslow's sparrow, and Bachman's sparrow. Additionally, the maintained right-of-way may be used for the Project Wildlife Incentives for Non-Game and Game Species (Project WINGS). Project WINGS is a program that began in 1996 to enhance wildlife habitat beneath electrical transmission lines. Project WINGS is administered by the Two Rivers Resource Conservation and Development District of Lagrange, Georgia. The program encourages landowners to create wildlife habitat along gas line and electrical power line rights-of-way through grants and technical assistance from the NRCS and the GADNR (NRCS, 2003b). Edges may result in increased songbird nest predation and parasitism (Harris, 1984).

Maintenance of the permanent right-of-way would occur according to the guidelines in our Plan 2003, with approved modifications, which requires that routine vegetative maintenance not occur more frequently than every three years (see Section 4.5.2 regarding our vegetative maintenance recommendation). Right-of-way vegetation maintenance clearing would not occur between April 15 and August 1 of any year, or in any areas that have been identified as protected species habitat between March 1 and October 1. Southern and FGT would re-establish, to the extent possible, vegetated habitats that are comparable to pre-existing conditions. Southern and FGT would conduct post-construction monitoring in accordance with our Plan 2003. Wildlife would be able to use the right-of-way and the localized loss of

any individuals during construction would be rapidly replaced through colonization of the emerging habitat.

Aboveground Facilities, Warehouse Sites, and Access Roads

Construction of the meter stations and compressor stations would have minor short-term and long-term impacts on construction habitat, causing localized impacts on wildlife populations. During construction, the clearing and grading activities would result in a loss of vegetative cover and may result in mortality of less mobile forms of wildlife, such as small rodents and reptiles. The general disturbance of the sites designated for meter stations and the compressor stations associated with the construction activities would likely cause the temporary displacement of most wildlife from the immediate vicinity and adjacent areas of the construction zone. The meter stations and compressor stations would be permanent structures that would provide minimal habitat for wildlife after construction. The meter stations would all be located within the permanent pipeline right-of-way; therefore, there would be no additional permanent impacts on wildlife and wildlife habitats associated with operation of these facilities. The Cypress/FGT Interconnect and the Long Branch Regulator Station, however, would result in the permanent conversion of about 2.7 acres of forested land to open land. Species found in this habitat are expected to use adjacent habitats.

Impacts on wildlife at warehouse sites and access roads would only be incurred where habitats are modified. Warehouse sites would not require modification; therefore, no impacts on wildlife are expected. Construction at access roads would have minor short-term and long-term impacts on wildlife habitat, causing localized impacts on wildlife species. The types of impacts associated with access roads would be the same as those mentioned above for pipeline facilities. To minimize impacts, Southern and FGT would use the measures outlined in our Plan 2003 and Procedures 2003, with approved modifications, for Southern (Appendices D and E, respectively).

4.6.1.3 Migratory Birds

A variety of migratory bird species, including songbirds and raptors, utilize the vegetation communities found within the project area. Migratory birds are species that nest in the United States and Canada during the summer, and then migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season.

The Cypress Pipeline Project is within the Southeastern Coastal Plain Bird Conservation Region (BCR), which includes extensive riverine swamps and marsh complexes along the Atlantic Coast, as well as interior forest vegetation. Priority bird species include the red-cockaded woodpecker, painted bunting, Bachman's sparrow, Swainson's warbler, and swallow-tailed kite. Coastal intertidal habitats provide critical wintering areas for the American oystercatcher and important wintering and spring migration areas for the short-billed dowitcher and dunlin. Coastal areas also provide important nesting and foraging habitats for large numbers of herons, egrets, ibis, terns, and other species, as well as winter habitat for large numbers of canvasback, mallard, American wigeon, redhead, and the majority of the continent's population of tundra swans.

The FGT Expansion Project is within the Peninsular Florida BCR. The northern portion of the region is a transitional zone where the pine and bottomland hardwood elements of the Coastal Plain begin to merge with the elements of south Florida. Many of the important pine and bottomland birds of the Coastal Plain, including red-cockaded woodpecker and swallow-tailed kite, extend into this area. Colonies of wood stork, glossy ibis, and other herons and egrets are found throughout the region.

Executive Order 13186 (January 2001) directs federal agencies to consider the effects of agency actions and plans on migratory birds, with emphasis on species of concern. The project would also result in a temporary loss of habitat available to migratory birds. However, this effect would be mitigated by the restoration of disturbed areas following construction, which would make them available for use by migratory birds during the next nesting season following construction.

Suitable nesting habitat occurs throughout the Cypress Pipeline and FGT Expansion Project areas. Southern's current construction schedule is to begin construction on Phase I in October 2006 with an in-service date of May 2007, and to begin construction on Phase II in the fall of 2007 with an in-service date of May 2008. FGT's current construction schedule is to begin construction on Phase I in October 2006 with an in-service date of May 2007, and to begin construction on Phase II in October 2008 with an in-service date of May 2009. Construction of FGT's aboveground facilities is also scheduled between October and May throughout the project. This schedule would avoid impacting nesting migratory birds because chicks and nesting adults would have left their nests by October. Additionally, clearing of the right-of-way is expected to be completed by Spring for all phases of each project, and would temporarily remove nesting habitat from the right-of-way and prevent birds from nesting on the right-of-way in late-winter or early-spring. Although the project activities could cause some migratory birds to avoid the construction areas, this impact would be limited to the relatively short period of active construction and is not expected to result in a significant or long-term change in migration patterns through the area.

4.6.1.4 Sensitive or Managed Wildlife Habitats and Species

Cypress Pipeline Project

Consultation with the GADNR identified a total of 18 sensitive habitats within the Cypress Pipeline Project vicinity. These include the following: Fort Stewart Longleaf Forests, Lost Swamp, Ogeechee River, indigo snake habitat at the Altamaha Sand Ridge, Sand Ridge Pond Forest, Drainage from Sandhills Pond to McLendon Swamp, Altamaha River Swamp, Altamaha River scenic easement, Altamaha River, Mixed pine-oak community, Sansavilla Wildlife Management Area (WMA), Pineland plantain habitat, Paulk's Pasture WMA, Brailey and Redcap Swamps, Satilla River, Pitcherplant bogs, red-cockaded woodpecker colony, and the St. Marys River. Measures to minimize impacts to these sensitive habitats are discussed below with the exception of those habitats whose concern is related to special status species, which are discussed in section 4.7. With the use of the proposed minimization measures, as detailed in table 4.6.1-1 and discussed below, the Cypress Pipeline Project would have no impact on 7 of the 18 sensitive habitats in Georgia. Additionally, implementation of proposed minimization measures would make impacts to four of the remaining 11 sensitive habitats insignificant.

The Cypress Pipeline Project has routed the pipeline in the area of the longleaf pine communities in Ft. Stewart along the I-95 corridor to minimize the amount of impact to this community. Because of the selected pipeline route, any affect to longleaf pine forests in this area would be minimal. The habitat that would be impacted by the Cypress Pipeline Project is mixed longleaf/loblolly pines, which are cultivated and harvested by Ft. Stewart. Approximately 11.6 acres of forested habitat would be impacted during construction, of which 5.0 acres would be permanently converted to maintained right-of-way (i.e., herbaceous). Our recommended route variation at MP R26.5 in section 3.3.2.5 would reduce the clearing of longleaf pine forest in the vicinity of Ft. Stewart.

The Cypress Pipeline Project would cross two wildlife management areas (WMAs): Sansavilla WMA and Paulk's Pasture WMA³. Southern would request an easement from the state of Georgia to

³ In section 3.3.2.5, we have recommended a route variation between MPs 73.8 and 75.2 to minimize impact and reduce forest clearing in the Paulk's Pasture WMA.

cross state lands. Details regarding impacts to sensitive habitats from the Cypress Pipeline Project are provided in table 4.6.1-1.

FGT Expansion Project

No sensitive or managed wildlife habitats were identified that would be affected by the FGT Expansion Project.

4.6.2 Aquatic Resources

4.6.2.1 Existing Aquatic Resources

Cypress Pipeline Project

The proposed Cypress Pipeline Project would cross a total of 104 waterbodies, including 61 perennial waterbodies, 36 intermittent waterbodies, 4 manmade ditches, and 3 ponds. All waterbodies that would be crossed by the Cypress Pipeline Project are listed in table 4.3.2-3 in section 4.3.2 and have been classified as Fishing, Propagation of Fish, Shellfish, Game and Other Aquatic Life for waterbodies in Georgia, and as Class III (Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife) for waterbodies crossed in Florida. Explanations of these classifications can be found in section 4.3.2.

All perennial waterbodies that would be crossed by the proposed loop and mainline are warmwater fisheries. These are waters unsuitable for the propagation of trout and not capable of supporting a stocked trout population. Warmwater species often found in the southeastern coastal plain region include largemouth bass, spotted bass, bream, crappie, suckers, catfish, darters, minnows, drum, gar, eels, and various species of mussels.

There are four high priority streams that would be crossed by the Cypress Pipeline Project: the Ogeechee River, the Altamaha River, the Satilla River, and the St. Marys River. High priority streams are those streams identified by the Comprehensive Wildlife Conservation Strategy (CWCS) Fishes and Freshwater Invertebrates team as having (1) documented occurrences of high priority aquatic species; (2) high water quality rankings based on Index of Biotic Integrity scores; or (3) designation as exemplary streams in a previous study by The Nature Conservancy (TNC).

There are no intermittent or perennial streams associated with any of the meter station or compressor station locations. There is one intermittent stream within the boundary of the Cypress Pipeline Project's Warehouse Site 7 in McIntosh County. Should Southern use this warehouse site, all work activities would be sited away from the waterbody and erosion control measures specified in our Plan 2003 (Appendix D) would be implemented to protect water quality. Thus, aquatic resources within the waterbody associated with Warehouse Site 7 would not be impacted.

TABLE 4.6.1-1

Minimization and Mitigation Measures for Impacts to Sensitive Habitat Locations along the Cypress Pipeline Project

County	Mileposts	Sensitive Habitat Description	Minimization and Mitigation Measures
Cypress Pipeline Project			
Bryan	R24.1	Ogeechee River	River would be crossed using HDD
	R24.5	Lost Swamp	Construction corridor and maintained right-of-way would be reduced in wetlands Temporary extra workspace needed for HDD of the Ogeechee River would be minimized as much as practicable Hydrology would not be altered
	26.8	Ft. Stewart Longleaf Forests	Pipeline has been routed along the I-95 corridor to significantly minimize the amount of impact to any longleaf forests in the area
McIntosh/Glynn	62.8	Altamaha River	River would be crossed using HDD
Glynn	63.0	Altamaha River Swamp	Construction corridor and maintained right-of-way would be reduced in wetlands temporary extra workspace would be minimized as much as practicable
	63.0	Altamaha River Scenic Easement	River would be crossed using HDD
	64.7	Sansavilla Wildlife Management Area	Easement would be requested from state of Georgia to cross state lands
	64.5	Drainage from Sandhills Pond to McLendon Swamp	Construction corridor and maintained right-of-way would be reduced in wetlands temporary extra workspace would be minimized as much as practicable
	66.7	Sand Ridge Pond Forest – high-quality wetland community that contains pondspice	Area would be re-surveyed prior to construction During construction, hydrology would not be altered and efforts would be made to avoid, protect, or preserve these species
	67.0	Indigo Snake Habitat at Altamaha sand ridge	No suitable habitat was identified along the proposed corridor at Altamaha sand ridge during field surveys
	71.6	Pineland Plantain Habitat	Area would be re-surveyed prior to construction During construction, hydrology would not be altered and efforts would be made to avoid, protect, or preserve these species
	72.8	Mixed Pine-Oak Community – contains green fly orchid and bluff white oak	Area would be re-surveyed prior to construction During construction, hydrology would not be altered and efforts would be made to avoid, protect, or preserve these species
	73.7	Paulk's Pasture Wildlife Management Area	Easement would be requested from state of Georgia to cross state lands
Camden	94.2 and 95.4	Brailey and Redcap Swamps	Construction corridor and maintained right-of-way would be reduced in wetlands temporary extra workspace would be minimized as much as practicable Hydrology would not be altered
Charlton	104.3	Satilla River	River would be crossed using HDD
	117.3	Pitcherplant Bog	Area would be re-surveyed prior to construction During construction, hydrology would not be altered and efforts would be made to avoid, protect, or preserve these species
	116.5	Red-cockaded Woodpecker Colony	Pipeline has been re-routed to avoid the RCW colony
	115.4	St. Marys River	River would be crossed using HDD

The Cypress Pipeline Project would use access roads that are located within existing utility rights-of-way or are existing roads primarily used for logging. Proposed access roads are generally in good condition and would require minimal improvement for use by pipeline construction vehicles; however, minor improvements would be necessary for four access roads consisting of replacement or installation of culverts or reinforcement of an existing bridge. Waterbodies crossed by access roads used for the project are listed in table C-2 in Appendix C. The access roads that would require minor improvements at waterbodies include: AR 14.5 ext. (culvert replacement); AR 39.3 (stream crossing improvements); AR 153.6 (bridge reinforcement); and AR 154.6 (culvert placement).

FGT Expansion Project

The loops associated with the FGT Expansion Project would cross two perennial waterbodies and five unnamed drainages, all of which would be crossed by Loop K. The perennial waterbodies crossed by Loop K include Otter Creek at MP 49.7 and Flat Branch at MP 52.8. All waterbodies crossed by Loop K are minor to intermediate sized streams that drain the Waccasassa River drainage basin (EPA, 2005c). These waterbodies are listed in table H-1 in Appendix H and are warmwater fisheries. None of the waterbodies crossed by the FGT Expansion Project are utilized by anadromous fishes, nor do they provide significant spawning or rearing areas for commercially or recreationally important fish species.

The FGT Expansion Project would not cross any Outstanding Florida Waters or Outstanding National Resource Waters as defined under the FLDEP Chapter 62-302.700. Additionally, review of databases maintained by the FWS, FLFWC, and the Florida Natural Areas Inventory and FGT correspondence with the FLFWC identified one federally endangered and one state-listed fish species of special concern with the potential to occur within the project area. FGT field surveys determined that the species are unlikely to occur in the waterbodies crossed by the pipeline loop due to lack of suitable habitat. Section 4.7 discusses potential impacts and mitigation measures for endangered and threatened species.

Construction and operation of the aboveground facilities associated with the FGT Expansion Project would not directly affect surface water quality or fishery resources since there are no aquatic resources within or near these facilities. All modifications at compressor stations would occur within existing and previously developed property boundaries. All activities associated with aboveground facilities and contractor/pipe storage yards would be conducted in accordance with our Plan 2003 and Procedures 2003 (Appendices D and E, respectively) which would minimize the potential for adverse effects on fish species.

4.6.2.2 Essential Fish Habitat

Essential Fish Habitat (EFH) is defined by Congress as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. 1802(10)). The Magnuson-Stevens Fishery Management and Conservation Act (MSA) (Public Law 94-265, as amended) was established, along with other goals, to promote the protection of EFH in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat.

Section 302 of the MSA establishes eight regional fishery management councils. The South Atlantic Fishery Management Council (SAFMC) is responsible for the creation of management plans for fishery resources in federal waters off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West. The SAFMC has identified areas in coastal Georgia and Florida that are designated as EFH. Estuarine waters of the Ogeechee, Altamaha, Satilla, and St. Marys rivers comprise EFH for postlarval and juvenile red drum (*Sciaenops ocellatus*), brown shrimp (*Penaeus aztecus*), white shrimp (*P. setiferus*), and the pink shrimp (*P. duorarum*). Additionally, these rivers provide high quality nursery,

cover, and foraging habitat for other recreationally and economically important aquatic resources such as spotted seatrout (*Cynoscion nebulosus*), southern flounder (*Paralichthys lethostigma*), Atlantic croaker (*Micropogonias undulatus*), Atlantic menhaden (*Brevoortia tyrannus*), bluefish (*Pomatomus saltatrix*), and blue crab (*Callinectes sapidus*). Many of these estuarine-dependent organisms serve as prey for other species that are managed under the MSA by the SAFMC and for highly migratory species that are managed by NOAA Fisheries.

The Cypress Pipeline Project would cross rivers considered as EFH using the HDD construction method, and therefore, direct and indirect effects on EFH are not anticipated. However, the cumulative effect of crossing EFH waterbodies by the HDD methods and wetland impacts in the river watersheds could diminish the abundance, diversity, and health of federal and state fishery resources from the temporal loss of wetlands and the vital ecological functions and food web support they provide. There is the potential for impacts during HDD construction from inadvertent releases of drilling mud during the drilling process. Section 2.3.2 provides additional information on the HDD construction method and Southern's HDD Plan (Appendix F-2) describes Southern's plan for site preparation and for minimizing environmental impact associated with HDD drilling fluids. Impacts on the riverine swamp, forested wetlands, and scrub-shrub wetlands would also be minimized through the use of our Plan 2003 and Procedures 2003 (Appendices D and E, respectively) with Southern's approved modifications.

Consultation with NMFS resulted in two requests regarding proposed mitigation for wetland impacts. The first was a request from NMFS that Southern monitor revegetation of affected areas following restoration of site contours, and if wetlands have not regenerated after three growing seasons, Southern should seed the areas with ground cover and plant native wetland species to ensure successful restoration. As discussed in section 4.4.2, the COE would require active planting and seeding in emergent/scrub-shrub wetlands that are not adequately restored within two growing seasons. Following construction, planting would be required in all forested wetlands affected to reestablish wetland vegetation. The COE would require 5 years of monitoring to ensure adequate wetland revegetation. If after 3 years wetland revegetation is not successful, our Procedures would require Southern to develop and implement a remedial revegetation plan to actively revegetate the wetland(s) in consultation with a professional wetland ecologist (see Appendix E). The second request from the NMFS was that Southern should consider placing the wetlands within the pipeline corridor under perpetual conservation easements that would preclude further excavation, filling, ditching, or other consumptive uses, except as needed for pipeline maintenance. Southern does not own the land upon which the Cypress Pipeline Project would be constructed; therefore Southern cannot place the pipeline right-of-way within a conservation easement. Although, as part of its mitigation plan, Southern proposes to purchase credits from an approved mitigation bank in the watersheds affected by the Project that has a perpetual conservation easement in place.

The Gulf of Mexico Fishery Management Council is responsible for the preparation of fishery plans that are designed to manage fishery resources from where state waters end out to the 200-mile limit of the Gulf of Mexico. There is no EFH within the vicinity of the FGT Expansion Project.

4.6.2.3 General Impact and Mitigation

Short-term impacts on streams and rivers could result from pipeline construction. The biota that may be impacted by construction activities include phytoplankton, rooted aquatic vegetation, invertebrates, amphibians, and fish. Impacts on fisheries from pipeline construction could occur due to sedimentation and turbidity, destruction of stream cover, introduction of water pollutants, interruption of fish migration and spawning, and entrainment of fish. Construction-related impacts on aquatic resources could also result from an inadvertent release of drilling mud during HDD construction, in-stream blasting,

hydrostatic testing, and water withdrawals for dust control. These potential impacts are evaluated fully in the subsections below.

Southern and FGT would implement Best Management Practices (BMPs) described in our Plan 2003 (Appendix D) and our Procedures 2003 (Appendix E), with approved modifications, during construction of the pipelines, aboveground facilities, and access roads to minimize impacts on waterbodies. These measures would prevent sedimentation and turbidity from erosion of adjacent areas during and after construction, and would minimize loss of stream cover and other temporary impacts on stream vegetation, wildlife, and fishery resources. No long-term effects on water temperature, pH, dissolved oxygen, benthic invertebrate populations, or fish populations are expected as a result of the Cypress Pipeline and FGT Expansion Projects.

Sedimentation and Turbidity

Increased sedimentation and turbidity from in-stream construction activities have the greatest potential to adversely affect fishery resources. A short-term increase in water column turbidity may occur as a result of runoff associated with pipeline construction in upland areas, underwater excavation, and backfilling of the pipeline trench. Increased suspended sediment levels during construction could increase invertebrate drift and reduce fish feeding for brief periods. In addition, increased sedimentation may affect nesting sites, where eggs and young fry concentrate, and reduce access to some food sources. In the immediate construction area, fish reproductive activities may be affected due to temporary disturbance of spawning areas, disturbances to fish, or reduced egg survival from increased sedimentation.

Turbidity resulting from suspension of sediments during in-stream construction or erosion of cleared right-of-way areas could reduce light penetration and the photosynthesis of aquatic vegetation, which could negatively effect dissolved oxygen levels in the water column. Additionally, resuspension of organic and inorganic materials can cause an increase in biological and chemical uptake of oxygen, resulting in a decrease of dissolved oxygen. Ponds, lakes, and slow-moving streams that have thick organic sediment deposits often experience a decrease in oxygen at the sediment-water interface, particularly during the summer months when bacterial respiration is high and chemical oxidation is greatest (Wetzel, 1983). Resuspension of this type of sediment could result in localized depletion of oxygen throughout the water column, which could temporarily displace fish from the affected area or kill the fish if they cannot move to unaffected areas.

In addition to the direct impacts of sedimentation and turbidity from in-stream construction at waterbody crossings, increases in sedimentation and turbidity may result from trenching activities in uplands adjacent to waterbodies or from clearing of vegetation from areas adjacent to waterbodies. Surface drainage patterns and hydrology could be temporarily altered and could increase the potential for the trench to act as a drainage channel. Trenching could also penetrate or remove impervious soil layers within the wetland and, consequently, drain perched water tables, resulting in drier soil conditions which could inhibit the reestablishment of wetland vegetation. Disturbance of adjacent wetlands could also affect the capacity to control erosion and flooding. To minimize impacts to aquatic resources from overland flow of silt and sediment, Southern and FGT would develop Stormwater Pollution Prevention Plans (SWPPPs) in compliance with state requirements. Additionally, implementation of measures outlined in the Procedures 2003, such as the use of trench breakers or sealing of the trench bottom, would prevent drainage of perched water tables or other changes in wetland hydrology, thereby minimizing the potential impacts on aquatic resources from wetland impacts.

The extent of impacts from sedimentation and turbidity would depend on sediment loads, flow, velocity, turbulence, stream bank and stream bed composition, sediment particle size, and the duration of

the disturbances. Standard open-cut techniques could elevate the concentration of suspended solids, but the elevated levels would be relatively high for only short periods and short distances downstream of the crossing. Overall, the impact of construction on benthic macroinvertebrates and fish is expected to be localized and short term because in-stream conditions and suspended sediment concentrations would return to background condition levels soon after in-stream construction has been completed. Furthermore, the warm water species generally found in these streams are typically resilient to turbid conditions. The streams to be crossed normally carry heavy silt loads during rainy seasons and continually collect runoff from harvested silviculture lands in the area. Impacts on spawning areas would be temporary and minor due to the homogeneous sediment matrix and resilient habitat found in the streams traversed. Additionally, impacts from increased sedimentation and turbidity would be temporary as total suspended solid (TSS) concentrations would decrease soon after construction is complete as the in-stream sediments disturbed during construction are allowed to settle.

The use of dry crossing construction techniques (e.g., fluming, dam and pump) specified in our Procedures 2003 (Appendix E) and described in section 2.3.2 would minimize the potential for construction activities to increase sedimentation and turbidity in waterbodies. Therefore, impacts resulting from short-term siltation and/or sedimentation caused by construction activity within the stream bed or from erosion of stream banks should have minimal adverse effects on aquatic organisms and fishery resources.

The effects of in-stream turbidity on fish resources may be minimized by scheduling stream crossing activities during low flow conditions. Construction of the Cypress Pipeline and FGT Expansion Projects would occur during the generally low flow periods from October through March. Additionally, construction and mitigation for project stream crossings would follow our Procedures 2003, including the completion of in-stream work in less than 24 hours for minor streams (less than 10 feet across) to 48 hours for intermediate streams (between 10 and 100 feet across) at each crossing. Trench spoil would be stored above the banks of waterbodies, and would be protected with erosion control devices that prevent, or significantly reduce, sediment runoff from entering the waterbody. The implementation of these procedures would also minimize siltation, sedimentation, and other impacts that may temporarily affect aquatic resources.

Loss of Cover

Stream bank vegetation, in-stream logs and rocks, and undercut banks provide important cover for fish. Open-cut construction would require the clearing of streamside vegetation, and would result in reduced shading and possible increases in water temperature in some of the warmwater streams, as well as the potential displacement of fish that normally reside in these areas. The use of dry crossing methods and construction activities could also disrupt benthic communities; however, these effects would be relatively minor because of the small area affected at each stream. Stream bank clearing would be limited and mostly occur adjacent to previously cleared rights-of-way; therefore, the effect is expected to be localized and minimal, and it is not expected that downstream water temperatures would increase significantly.

Minimal impacts on fishery resources are expected from maintenance mowing or manual removal of woody vegetation in the vicinity of the proposed pipeline rights-of-way during operation. According to our Procedures 2003, vegetation control would be conducted solely by mechanical means, no herbicides would be used within 100 feet of a waterbody, and vegetation maintenance would be limited adjacent to waterbodies to a riparian strip not more than 25 feet wide so that the remainder of the right-of-way can permanently revegetate with native plants. Therefore, no impacts on aquatic resources due to right-of-way maintenance are expected.

Introduction of Water Pollutants

Introduction of water pollutants can occur either through an inadvertent release of drilling mud during HDD across a waterbody or through accidental fuel and chemical spills. The HDD construction method avoids in-stream impacts by eliminating the need for in-stream excavation; however, it does not completely remove the possibility of impacts on aquatic resources due to the possibility of an inadvertent release of drilling mud or fluid into the waterbody. An inadvertent release of drilling mud into a waterbody would increase the turbidity of the water column and cause sedimentation. However, the potential for these impacts would be minimized by Southern's implementation of its HDD Plan (Appendix F-1).

There is also the potential for impacts to aquatic resources from fuel spills from storage containers, from equipment working in or near streams, and from fuel transfers. Direct spills of petroleum products into or in the immediate vicinity of streams and rivers could be detrimental to the water quality of the stream and could be toxic to fish, depending on the type, quantity, and concentration of the spill. To reduce the potential for direct surface water contamination, Southern and FGT would refuel equipment and store fuel and other potentially toxic materials at least 100 feet from waterbodies, in accordance with Southern's SPCC Plan (Appendix F-1) and FGT's implementation of our Procedures 2003 (Appendix E). Additionally, Southern and FGT would ensure adequate supplies of suitable absorbent material and any other supplies and equipment necessary for the immediate containment and cleanup of inadvertent spills would be available on all construction spreads. Disposal of construction waste materials would follow local, state, and federal regulations.

Interruption of Fish Migration and Spawning and Entrainment of Fish

Other potential effects of construction could include interruption of fish migration and spawning and entrainment of fish. Construction may cause temporary emigration of fish populations from the immediate area, and fish movements and migrations upstream or downstream may be temporarily delayed by construction activities. However, it is unlikely that relocation or delayed migration would significantly affect fish populations because construction activities would be completed in 24 to 48 hours as specified by our Procedures 2003 (Appendix E). The timing restrictions contained in our Procedures 2003 and those that may be requested by other resource agencies are designed to minimize this likelihood since construction activities are largely restricted to times outside fish spawning periods.

Entrainment of fish during water withdrawal for HDDs, hydrostatic testing, and dust control would not likely occur since intakes would be screened as required by our Plan 2003 (Appendix D); however, fish larvae and eggs could be entrained if present in the source water.

4.6.2.4 Site-Specific Impact and Mitigation

Cypress Pipeline Project

To minimize potential impacts to aquatic resources, Southern would utilize construction methods for a particular stream crossing that would be compatible with the environmental sensitivity of the stream and the type of bottom or bank sediments. Specifically, Southern proposes to utilize one of four crossing methods that are described in section 4.3.2. Method 1 is a wet crossing method for waterbodies less than 50 feet wide, Method 2 is a dry crossing method for streams between 10 and 50 feet wide, Method 3 is a wet crossing method for waterbodies greater than 50 feet wide, and Method 4 is the HDD method. Table H-1 in Appendix H identifies the specific crossing methods that may be used at each waterbody crossed by the Cypress Pipeline Project.

The Ogeechee River (MP 23.7), the Altamaha River (MP 62.7), the Satilla River (MP 104.3), and the St. Marys River (MP 115.4) are designated as high priority streams and may potentially support populations of the shortnose sturgeon (*Acipenser brevirostrum*), a federal and state-listed endangered species and the Atlantic sturgeon (*A. oxyrinchus*), a Florida species of special concern. Additionally, the Altamaha River is home to the Altamaha spiny mussel (*Elliptio spinosa*), a federal candidate species that is endemic to the Altamaha River, and the Altamaha and Satilla rivers are currently part of an Atlantic striped bass (*Morone saxatilis*), a Georgia protected species, restoration program. As these waters would be crossed by HDD, no impacts on these high priority streams or sensitive species are anticipated. Southern has developed a HDD Plan (Appendix F-2) that describes mitigation measures that would be implemented to minimize the potential for impacts associated with the HDD method.

FGT Expansion Project

There are no waterbodies crossed by Loops J and G of the FGT Expansion Project. Loop K crosses five unnamed drainages and two perennial waterbodies, Otter Creek and Flat Branch, at MPs 49.7 and 52.8, respectively. These waterbodies would be crossed using the wet open-cut construction method according to our Procedures 2003 (Appendix E). The implementation of our Procedures 2003 would minimize the potential for impacts to aquatic resources.

FGT consulted with the FLFWC regarding time of year restrictions for construction across waterbodies. The FLFWC stated that any restrictions would be identified during the permitting phase of the proposed project (FLFWC, 2005). To ensure compliance with permit requirements and our Procedures 2003, **we recommend that:**

- **Prior to construction along Loop K, FGT should file with the Secretary permits issued by the state of Florida relating to time-of-year waterbody crossing restriction.**

4.7 SPECIAL STATUS SPECIES

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed and federally proposed species that are protected under the Endangered Species Act (ESA), as amended, or are considered as candidates for such listing by the FWS, and those species that are state-listed as threatened or endangered.

Southern, acting as the FERC's non-federal representative for the purpose of complying with Section 7(a)(2) of the ESA, initiated informal consultation with the FWS, NOAA Fisheries, the GADNR, and the FLFWC on June 24, 2005, regarding federally listed species with the potential to be affected by the proposed project. Initial consultations concluded that the Georgia Field Office of the FWS would serve as the lead office for project consultations. FGT initiated written consultation with the FWS on October 19, 2005, NOAA Fisheries on November 7, 2005, and the FLFWC on November 7, 2005. FGT reviewed various sources of available data including National Wetland Inventory (NWI) digital maps; the Florida DEP's Environmental Resource Analysis Online Web site; digital NRCS soil maps; the Florida Natural Areas Inventory (FLNAI) Web site Tracking Lists and digital FLNAI species sighting records and Element Occurrence records by Quad maintained by the state of Florida (Florida Geographic Data Library); the Bald Eagle Nest Locator Web site maintained by the FLFWC; Florida Atlas of Breeding Sites for Herons and Their Allies, Update 1986 – 89 (FLFWC, 1991); two FLNAI publications including the Field Guide to the Rare Plants of Florida and the Field Guide to the Rare Animals of Florida (FLNAI, 2000a); and the FWS list of endangered and threatened species for Florida.

Section 7 of the Endangered Species Act (ESA), as amended, requires the lead federal agency to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. The agency is required to consult with the FWS and/or the NOAA Fisheries to determine whether any federally listed endangered or threatened species or any of their designated critical habitat are found in the vicinity of the proposed project, and to determine the proposed action's potential effects on those species or critical habitats.

For actions involving major construction activities with the potential to affect listed species or designated critical habitat, the federal agency must prepare a Biological Assessment (BA) for those federally listed species that may be affected. The agency must submit its BA to the FWS, and if it is determined that the action would adversely affect a federally listed species, the lead federal agency must submit a request for formal consultation to comply with Section 7 of the ESA. In response, the FWS would issue a Biological Opinion (BO) as to whether or not the federal action would likely jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of designated critical habitat. For the Cypress Pipeline Project and the FGT Expansion Project, we have incorporated information necessary for a BA into this EIS. To initiate formal consultation in compliance with Section 7 of the ESA, we have requested that the FWS consider this EIS, along with the various survey reports prepared by Southern and FGT, as our BA for the Cypress Pipeline and FGT Expansion Projects.

For purposes of this environmental analysis, special status species of plants and animals include species officially listed by Georgia, Florida, or the federal government as endangered, threatened, or rare; or species noted as sensitive or of special concern by the GADNR, FLNAI, FLFWC, FWS, or NOAA Fisheries. To assist in compliance with Section 7 of the ESA, Southern and FGT consulted with the FWS and NOAA Fisheries regarding the presence of federally listed or proposed endangered and threatened species in the project vicinity. Additionally, Southern and FGT have assisted the Commission in meeting its Section 7 obligations by conducting informal consultation with the FWS, NOAA Fisheries, GADNR, and the FLFWC; by reviewing rare and endangered species databases maintained by the Georgia Natural Heritage Program (GANHP) and FLNAI; and by conducting surveys of the project area in Georgia and Florida.

A review of species lists and consultation with the resource agencies identified 108 special status species with potential to occur in the project vicinity. Of these 108 species, two species of whale (right and humpback) and five species of sea turtle (green, leatherback, loggerhead, hawksbill, and Kemp's ridley) are not included in this NEPA analysis since the proposed project would not affect coastal or oceanic waters, which are the required habitat for these species. Sixty-seven additional species considered potential inhabitants in the vicinity of the projects were also eliminated from additional consideration due to a lack of suitable habitat in the project areas or, in the case of plants, when surveys were conducted during the flowering period or species had identifiable vegetative characteristics during other survey periods, because no individuals were identified during surveys (table 4.7.1-1). Table 4.7.1-2 lists the 34 remaining species with suitable habitat along the proposed project areas or in which individuals were noted during field surveys.

Southern conducted surveys along the entirety⁴ of its loop and mainline routes and at aboveground facility sites for individuals and populations of sensitive species and their habitats between August 23, 2000 and December 15, 2000. Follow-up surveys were conducted in March 2001 where protected species or their habitats were observed. Additional surveys were conducted in January and February 2005 and pre-construction surveys are scheduled to occur between December 2005 and March 2006. Following completion of the field surveys, Southern prepared a Sensitive Species Mitigation Plan

⁴ 9.6 miles were surveyed from the adjacent corridor.

(Appendix F-3) describing measures to be implemented to avoid or minimize impacts on protected species identified during surveys as occurring or potentially occurring along the proposed project right-of-way. Details of this plan are summarized for the applicable species in the text below.

FGT conducted field surveys along all but 0.7 miles of Loop G, due to denied access, during June through August, 2005. Following completion of field surveys, FGT prepared an Endangered & Threatened Species Field Reconnaissance Report. Along with survey results, this report detailed measures FGT proposes to implement to avoid or minimize impacts on protected species during construction of the FGT Expansion Project. Applicable details of this report are summarized in the species discussions below.

4.7.1 Federally Listed Threatened and Endangered Species

As shown in tables 4.7.1-1 and 4.7.1-2, a total of 20 federally listed threatened and endangered species were identified as potentially occurring within the vicinity of the proposed Cypress Pipeline and the FGT Expansion Projects. Of these 20 species, 10 are known to occur within the project areas. The remaining 10 species are not known to occur within the project areas, occur only as occasional transients, or habitat for the species was not identified within the project areas during Southern's and FGT's field surveys. The 10 federally listed threatened and endangered species identified during surveys or with suitable habitat along the proposed projects (see table 4.7.1-2) are described below.

West Indian Manatee

The West Indian manatee is listed as federally endangered as well as state endangered in both Georgia and Florida. Manatees inhabit both salt and fresh water of sufficient depth (1.5 meters to usually less than 6 meters) throughout their range. They may be encountered in canals, rivers, estuarine habitats, and saltwater bays. The manatee has been observed as far as 3.7 miles off the Florida Gulf coast. Between October and April, Florida manatees concentrate in areas of warmer water. The FWS (undated) stated that potential impacts on manatees should be considered for crossings of any waterbodies connected to coastal waters in which manatees occur.

The FWS has developed a set of guidelines to minimize impacts on manatees in the event of an open-cut crossing (*Manatee Protection Construction Guidelines* in Georgia and the *Standard Manatee Construction Conditions* in Florida). During construction of the projects, if in-stream construction activities must occur in areas of potential manatee occurrence, implementation of these guidelines, which include education of construction personnel of manatee presence and speed zones; the need to operate water craft at idle with no wakes; use of turbidity barriers that manatees can not become entangled in; use of observers watching for manatees during in-stream activities; and use of temporary signs during construction, would avoid or minimize adverse impacts on manatees.

TABLE 4.7.1-1

**Federal and State-Listed Species Eliminated from Detailed NEPA Analysis
for the Proposed Cypress Pipeline and FGT Expansion Projects**

Common Name	Status ^{a,b}			Project (state) - County Where Species May Occur ^c	Comments
	Federal	Georgia	Florida		
Mammals					
Florida Salt Marsh Vole <i>Microtus pennsylvanicus dukecampbelli</i>	E	--	E	FGT – Levy	Known only from Waccasassa Bay; species not known from project area
Birds					
Bachman's Warbler <i>Vermicora bachmanii</i>	E	E	--	Cypress (GA) – Bryan, Camden, Chatham, Glynn, Liberty, Long, McIntosh	Species is thought to be extinct. Suitable habitat is not present within the project area.
Florida Burrowing Owl <i>Athene cunicularia floridana</i>	--	--	SSC	FGT – All counties	No individuals identified during field surveys
Florida Sandhill Crane <i>Grus canadensis pratensis</i>	--	--	T	FGT – All counties	Suitable habitat is not present within the project area
Gull-billed Tern <i>Sterna nilotica</i>	--	T	--	Cypress (GA) – Glynn, McIntosh	Suitable habitat is not present within the project area
Kirtland's Warbler <i>Dendroica kirtlandii</i>	E	E	--	Cypress (GA) – Bryan, Camden, Chatham, Glynn, Liberty, Long, McIntosh	Suitable habitat is not present within the project area
Least Tern <i>Sterna antillarum</i>	E	R	T	Cypress (GA) – Chatham, Glynn, McIntosh Cypress (FL) – Duval, Nassau FGT – Hernando, Levy	Suitable habitat is not present within the project area
Limpkin <i>Aramus guarauna</i>	--	--	SSC	FGT – All counties	Suitable habitat is not present within the project area
Piping Plover <i>Charadrius melodus</i>	T	T	T	Cypress (GA) – Camden, Chatham, Liberty, McIntosh Cypress (FL) – Duval, Nassau FGT – Hernando, Levy	Suitable habitat is not present within the project area
Reptiles					
Alligator Snapping Turtle <i>Macrolemys temminckii</i>	--	--	SSC	FGT – Gilchrist, Levy, Bradford	Suitable habitat is not present within the project area
Suwannee Cooter <i>Pseudemys concinna suwanniensis</i>	--	--	SSC	FGT – All counties	Suitable habitat is not present within the project area
Plants					
American Chaffseed <i>Schwalbea americana</i>	E	--	E	Cypress (FL) – Duval	Suitable habitat is not present within the project area
Atlantic Coast Florida Lantana <i>Lantana depressa var. floridana</i>	--	--	E	Cypress (FL) – Duval	Suitable habitat is not present within the project area
Auricled Spleenwort <i>Asplenium erosum</i>	--	--	E	FGT - All counties	Suitable habitat is not present within the project area
Ball Moss <i>Tillandsia recurvata</i>	--	T	--	Cypress (GA) – Camden, Glynn	Suitable habitat is not present within the project area; no individuals identified during field surveys
Bartram's Ixia <i>Calydorea coelestina</i>	--	--	E	Cypress (FL) – Clay, Duval	Suitable habitat is not present within the project area; no individuals identified during field surveys

TABLE 4.7.1-1 (cont'd)

**Federal and State-Listed Species Eliminated from Detailed NEPA Analysis
for the Proposed Cypress Pipeline and FGT Expansion Projects**

Common Name	Status ^{a,b}			Project (state) - County Where Species May Occur ^c	Comments
	Federal	Georgia	Florida		
Brittle Maidenhair Fern <i>Adiantum tenerum</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Britton's Beargrass <i>Nolina brittoniana</i>	E	--	E	FGT – Hernando	No individuals identified during field surveys
Brooksville Bellflower <i>Campanula robinsiae</i>	E	--	E	FGT – Hernando	Species is native to the Brooksville Ridge; suitable habitat is not present within the project area
Chapman's Rhododendron <i>Rhododendron chapmanii</i>	E	--	E	Cypress (FL) – Clay	Suitable habitat is not present within the project area
Chapman's Sedge <i>Carex chapmanii</i>	--	--	E	FGT – Levy	Suitable habitat is not present within the project area
Chipola Dye-flower <i>Coreopsis integrifolia</i>	--	--	E	Cypress (FL) – Nassau	No individuals identified during field surveys
Climbing Buckthorn <i>Sageretia minutiflora</i>	--	T	--	Cypress (GA) – Camden, Chatham, Glynn, McIntosh	Suitable habitat is not present within the project area; no individuals identified during field surveys
Cooley's Water-willow <i>Justicia cooleyi</i>	E	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Corkwood <i>Leitneria floridana</i>	--	--	T	FGT – Levy	Suitable habitat is not present within the project area
Craighead's Nodding-caps <i>Triphora craigheadii</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Curtiss' Sandgrass <i>Calamovilfa curtissii</i>	--	--	T	Cypress (FL) – Duval	No individuals identified during field surveys
Dwarf Spleenwort <i>Asplenium pumilum</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Florida Hasteola <i>Hasteola robertiorum</i>	--	--	E	FGT – Levy	Suitable habitat is not present within the project area
Florida Merrybells / Florida Bellwort <i>Uvularia floridana</i>	--	--	E	Cypress (FL) – Nassau	Suitable habitat is not present within the project area
Florida Mountain-mint <i>Pycnanthemum floridanum</i>	--	--	T	Cypress (FL) – Clay, Duval FGT – Hernando	Suitable habitat is not present within the project area; no individuals identified during field surveys
Florida Spiny-pod <i>Matelea floridana</i>	--	--	E	Cypress (FL) – Clay, Duval	Suitable habitat is not present within the project area; no individuals identified during field surveys
Florida Toothache Grass <i>Ctenium floridanum</i>	--	--	E	Cypress (FL) – All Counties FGT – Bradford, Clay	No individuals identified during field surveys (Cypress); suitable habitat is not present with the project area (FGT)
Florida Willow <i>Salix floridana</i>	--	--	E	FGT – All counties	No individuals identified during field surveys
Giant Orchid <i>Pteroglossaspis ecristata</i>	--	--	E	Cypress (FL) – Clay FGT – Hernando, Levy	No individuals identified during field surveys

TABLE 4.7.1-1 (cont'd)

**Federal and State-Listed Species Eliminated from Detailed NEPA Analysis
for the Proposed Cypress Pipeline and FGT Expansion Projects**

Common Name	Status ^{a,b}			Project (state) - County Where Species May Occur ^c	Comments
	Federal	Georgia	Florida		
Godfrey's Privet <i>Forestiera godfreyi</i>	--	--	E	Cypress (FL) – Duval FGT – Gilchrist, Levy	Suitable habitat is not present within the project area; no individuals identified during field surveys
Green Ladies'-tresses <i>Spiranthes polyantha</i>	--	--	E	Cypress (FL) – Duval	Suitable habitat is not present within the project area; no individuals identified during field surveys
Hartwrightia <i>Hartwrightia floridana</i>	--	T	T	Cypress (GA) – Charlton Cypress (FL) – Clay, Nassau	No individuals identified during field surveys
Heartleaf <i>Hexastylis arifolia</i>	--	--	T	Cypress (FL) – Nassau	Suitable habitat is not present within the project area; no individuals identified during field surveys
Incised Groove-bur <i>Agrimonia incise</i>	SMC	--	E	Cypress (FL) – Clay, Duval	No individuals identified during field surveys
Many-flowered Grasspink <i>Calopogon multiflorus</i>	--	--	E	Cypress (FL) – All counties	Suitable habitat is not present within the project area; no individuals identified during field surveys
Narrow-leaf Dragonhead Tidal Marsh Obedient Plant <i>Physostegia leptophylla</i>	--	E	--	Cypress (GA) – Bryan, Chatham, McIntosh	No individuals identified during field surveys
Night-flowering Wild Petunia <i>Ruellia noctiflora</i>	--	--	E	Cypress (FL) – All counties	No individuals identified during field surveys
Piedmont Jointgrass <i>Coelorachis tuberculosa</i>	--	--	T	FGT – Hernando	Suitable habitat is not present within the project area
Pigmy Pipes <i>Monotropsis reynoldsiae</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Pine Pinweed <i>Lechea divaricata</i>	--	--	E	FGT – Hernando	No individuals identified during field surveys
Pinewood Dainties <i>Phyllanthus leibmannianus</i>	--	--	E	FGT – Levy	No individuals identified during field surveys
Pinkroot <i>Spigelia loganioides</i>	--	--	E	FGT – Levy	Suitable habitat is not present within the project area
Pinnate-lobed Coneflower <i>Rudbeckia triloba</i> var <i>pinnatiloba</i>	--	--	E	FGT – Levy	No individuals identified during field surveys
Plume Polypody <i>Pecluma plumula</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Sand Butterfly Pea <i>Centrosema arenicola</i>	--	--	E	FGT – Hernando	No individuals identified during field surveys
Scrub Bluestem <i>Schizachyrium niveum</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Scrub Stylisma <i>Stylisma abdita</i>	--	--	E	Cypress (FL) – Clay	No individuals identified during field surveys
Sinkhole Fern <i>Blechnum occidentale</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Southern Lip Fern <i>Cheilanthes microphylla</i>	--	--	E	Cypress (FL) – Duval	No individuals identified during field surveys
Southern Milkweed <i>Asclepias viridula</i>	--	--	T	Cypress (FL) – Duval, Nassau	No individuals identified during field surveys

TABLE 4.7.1-1 (cont'd)

**Federal and State-Listed Species Eliminated from Detailed NEPA Analysis
for the Proposed Cypress Pipeline and FGT Expansion Projects**

Common Name	Status ^{a,b}			Project (state) - County Where Species May Occur ^c	Comments
	Federal	Georgia	Florida		
Spoon-leaved Sundew <i>Drosera intermedia</i>	--	--	T	Cypress (FL) – Duval FGT – Levy	No individuals identified during field surveys
St. John's Susan <i>Rudbeckia nitida</i>	--	--	E	Cypress (FL) – Clay	No individuals identified during field surveys
Swamp Buckthorn <i>Sideroxylon thornei</i>	--	E	--	Cypress (GA) – Long	No individuals identified during field surveys
Sweet-shrub <i>Calycanthus floridus</i>	--	--	E	FGT – All counties	Suitable habitat is not present within the project area; no individuals identified during field surveys
Tampa Vervain <i>Glandularia tampensis</i>	--	--	E	FGT – Levy	Suitable habitat is not present within the project area
Terrestrial Peperomia <i>Peperomia humilis</i>	--	--	E	Cypress (FL) – Duval	No individuals identified during field surveys
Variable-leaved Indian-plantain <i>Arnoglossum diversifolium</i>	--	--	T	FGT – Levy	Suitable habitat is not present within the project area
Wagner Spleenwort <i>Asplenium heteroresiliens</i>	SMC	T	--	Cypress (GA) – Camden	No individuals identified during field surveys
West's Flax <i>Linum westii</i>	--	--	E	Cypress (FL) – Clay	Suitable habitat is not present within the project area; no individuals identified during field surveys
Widespread polypody <i>Pecluma dispersa</i>	--	--	E	FGT – Hernando	Suitable habitat is not present within the project area
Wood Spurge <i>Euphorbia commutata</i>	--	--	E	FGT – Levy	Suitable habitat is not present within the project area

^a Federal Status: E = endangered, T = threatened, SMC = species of management concern

^b State Status: E = endangered, T = threatened, R = rare, SSC = Species of Special Concern

^c Cypress = Cypress Pipeline Project

FGT = FGT Expansion Project

TABLE 4.7.1-2

**Federal and State-Listed Species Potentially Occurring in the Vicinity
of the Proposed Cypress Pipeline and FGT Expansion Projects**

Common Name	Status ^{a,b}			Project (state) - County Where Species May Occur ^c	Comments
	Federal	Georgia	Florida		
Mammals					
Florida Black Bear <i>Ursus americanus floridanus</i>	--	--	T	Cypress (FL) – All counties FGT – Hernando, Levy	Tracks identified along the Cypress Pipeline Corridor
Florida Mouse <i>Podomys floridanus</i>	--	--	SSC	FGT – All counties	Could occur in all areas where gopher tortoise burrows are found
Round-tailed Muskrat <i>Neofiber alleni</i>	--	T	--	Cypress (GA) – Camden, Charlton	Suitable habitat identified along access roads in Florida Species is not protected in Florida
Sherman's Fox Squirrel <i>Sciurus niger shermani</i>	--	--	SSC	FGT – All counties	Suitable habitat and individuals noted along project corridor
West Indian Manatee <i>Trichechus manatus</i>	E	E	E	Cypress (GA) – Camden, Glynn, McIntosh Cypress (FL) – Clay, Duval, Nassau FGT – Levy, Hernando	Potential impacts considered for crossings of waterbodies connected to coastal waters
Birds					
Bald Eagle <i>Haliaeetus leucocephalus</i>	T	E	T	Cypress (GA) – Camden, Chatham, Glynn, Liberty, Long, McIntosh Cypress (FL) – Clay, Duval, Nassau FGT – Levy, Hernando	Migratory and non-breeding birds may occur throughout the project area
Florida Scrub Jay <i>Aphelocoma coerulescens</i>	T	--	T	Cypress (FL) – Clay FGT – All counties	Suitable habitat identified along Loop G
Peregrine Falcon <i>Falco peregrinus</i>	--	E	E	Cypress (GA) – Bryan, Camden, Chatham, Glynn, Liberty, McIntosh Cypress (FL) – All counties FGT – All counties	Suitable breeding habitat is not present within the project area Transients may be present within the project area
Red-cockaded Woodpecker <i>Picoides borealis</i>	E	E	SSC	Cypress (GA) – Bryan, Chatham, Charlton, Liberty, Long Cypress (FL) – All counties FGT – All counties	Cypress Pipeline re-routed to avoid known group Suitable habitat identified along 4 access roads in Nassau County, FL
Southeastern American Kestrel <i>Falco sparverius</i>	--	--	T	Cypress (FL) – Nassau, Duval, Clay FGT – Gilchrist, Levy, Hernando	No suitable habitat observed for the Cypress Project Juvenile kestrels identified along right-of-way for Loop G and observed on Loop J of FGT
Wood Stork <i>Myctera americana</i>	E	E	E	Cypress (GA) – Camden, Charlton, Glynn, Liberty, Long, McIntosh Cypress (FL) – All counties FGT – All counties	Known to nest in Brailey and Redcap Swamps Projects are within the foraging range of the wood stork
Reptiles					
American Alligator <i>Alligator mississippiensis</i>	T	--	SSC	Cypress (FL) – All counties FGT – All counties	Suitable habitat identified along the Cypress pipeline route

TABLE 4.7.1-2 (cont'd)

**Federal and State-Listed Species Potentially Occurring in the Vicinity
of the Proposed Cypress Pipeline and FGT Expansion Projects**

Common Name	Status ^{a,b}			Project (state) - County Where Species May Occur ^c	Comments
	Federal	Georgia	Florida		
Eastern Indigo Snake <i>Drymarchon corais couperi</i>	T	T	T	Cypress (GA) – Bryan, Camden, Charlton, Glynn, Liberty, Long, McIntosh Cypress (FL) – All counties FGT – All counties	Could occur in all areas where gopher tortoise burrows are found
Florida Pine Snake <i>Pituophis melanoleucus mugitus</i>	SMC	--	SSC	Cypress (FL) – Clay, Duval FGT – All counties	Suitable habitat is present within the Cypress Pipeline Project area
Gopher Tortoise <i>Gopherus polyphemus</i>	SMC	T	SSC	Cypress (GA) – Bryan, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh Cypress (FL) – All counties FGT – All counties	Suitable habitat and individuals were identified within the Cypress Pipeline Project area
Short-tailed Snake <i>Stilosoma extenuatum</i>	--	--	T	FGT – All counties	Suitable habitat is present within the FGT Expansion Project area
Amphibians					
Flatwoods Salamander <i>Ambystoma cingulatum</i>	T	R	--	Cypress (GA) – Bryan, Charlton, Chatham, Effingham, Liberty, Long, McIntosh	Pipeline re-routed to avoid habitat Suitable habitat identified along 3 access roads in Charlton County
Gopher Frog <i>Rana capito</i>	--	T	SSC	Cypress (GA) – All counties Cypress (FL) – All counties FGT – All counties	Could occur in all areas where gopher tortoise burrows are found
Striped Newt <i>Notophthalmus perstriatus</i>	SMC	R	--	Cypress (GA) – Bryan, Camden, Charlton, Liberty, Long Cypress (FL) – All counties	Suitable habitat identified along access roads in Florida
Fish					
Atlantic Striped Bass <i>Morone saxatilis</i>	--	--	R	Cypress – Chatham, Glynn	Potentially inhabits the Altamaha and Satilla Rivers
Atlantic Sturgeon <i>Acipenser oxyrhynchus</i>	--	--	R	Cypress – Bryan, Chatham, Glynn, McIntosh	Potentially inhabits the Savannah, Ogeechee, Altamaha, Satilla, and St. Marys Rivers
Black-banded Sunfish <i>Enneacanthus chaetodon</i>	--	R	--	Cypress – Charlton	Potential occurrence in two perennial streams; surveys to be conducted
Shortnose Sturgeon <i>Acipenser brevirostrum</i>	E	E	E	Cypress (GA) – Bryan, Chatham, Glynn, McIntosh Cypress (FL) – Clay, Duval	Known to inhabit the Savannah, Ogeechee, Altamaha, Satilla, St. Marys, and St. John's Rivers
Invertebrates					
Altamaha Spiny mussel <i>Elliptio spinosa</i>	SMC	SSC	--	Cypress (GA) – Long, McIntosh	Endemic to the Altamaha River
Plants					
Bluff White Oak <i>Quercus austrina</i>	--	R	--	Cypress – Glynn	Known to occur along proposed project corridor
Dwarf Witch-alder <i>Fothergilla gardenia</i>	--	T	--	Cypress (GA) – Long, Effingham	Suitable habitat was identified in Effingham County

TABLE 4.7.1-2 (cont'd)

**Federal and State-Listed Species Potentially Occurring in the Vicinity
of the Proposed Cypress Pipeline and FGT Expansion Projects**

Common Name	Status ^{a,b}			Project (state) - County Where Species May Occur ^c	Comments
	Federal	Georgia	Florida		
Green-fly Orchid <i>Epidendrum conopsum</i>	--	R	--	Cypress – Glynn	Known to occur along proposed project corridor
Hooded Pitcherplant <i>Sarracenia minor</i>	--	R	--	Cypress (GA) – Charlton	Numerous sitings of this species in transmission line right-of-way adjacent to pipeline corridor Two populations identified in Charlton County Suitable habitat is present throughout the Cypress Pipeline Project area
Parrot Pitcherplant <i>Sarracenia psittacina</i>	--	T	--	Cypress (GA) – Charlton	Numerous sitings of this species in transmission line right-of-way adjacent to pipeline corridor Two populations identified in Charlton County Suitable habitat is present throughout the Cypress Pipeline Project area
Pineland Plantain <i>Plantago sparsiflora</i>	SMC	SSC	--	Cypress (GA) – Glynn, Long	Suitable habitat is present along the Cypress Pipeline Project
Pondberry <i>Linder melissifolia</i>	E	E	--	Cypress (GA) – Bryan, Chatham, Effingham, McIntosh	New surveys to be conducted
Pondspice <i>Litsea aetivalis</i>	SMC	T	E	Cypress (GA) – Bryan, Camden, Charlton, Glynn, McIntosh Cypress (FL) – Clay	New surveys to be conducted
Purple Honeycomb Head <i>Balduina atropurpurea</i>	SMC	R	E	Cypress (GA) – Charlton, Liberty, Long Cypress (FL) – Clay, Nassau	Suitable habitat is present within the pitcherplant bog in the transmission line right-of-way adjacent to the proposed pipeline corridor
Southern Umbrella Sedge <i>Fuirena scirpoidea</i>	--	R	--	Cypress – Charlton	Suitable habitat is present within the pitcherplant bog in the transmission line right-of-way adjacent to the proposed pipeline corridor

^a Federal Status: E = endangered, T = threatened, SMC = species of management concern

^b State Status: E = endangered, T = threatened, R = rare, SSC = Species of Special Concern

^c Cypress = Cypress Pipeline Project

FGT = FGT Expansion Project.

The manatee could occur in the vicinity of the Cypress Pipeline Project in McIntosh, Glynn, and Camden Counties in Georgia (GANHP, 2005), and in Nassau, Duval, and Clay Counties in Florida; and may occur in the vicinity of the FGT Expansion Project facilities in Levy Counties, Florida (FLNAI, 2005; FWS, 2005). The Cypress Pipeline Project would cross four waterbodies connected to coastal waters: the Ogeechee, Altamaha, Satilla, and St. Marys Rivers. Southern is planning to cross these waterbodies using the HDD method (as described in section 2.3.1), which would avoid impacts on manatees by eliminating in-stream work. However, in the unlikely event of an HDD failure at one of these locations, and Southern must cross these waterbodies using in-stream construction methods, Southern would be required, according to our HDD contingency plan recommendation in section 4.3.3, to provide a site-specific alternate crossing plan and provide this plan to the FWS, NOAA, COE, GADNR, and the FLFWC for their approval. If Southern were to conduct in-stream work at these locations, the potential for impacts on West Indian manatees would increase; therefore, **we recommend that:**

- **Southern should ensure that any open cut crossing plan for the Ogeechee, Altamaha, Satilla, or St. Mary's Rivers include the *Manatee Protection Construction Guidelines* in Georgia and the *Standard Manatee Construction Conditions* in Florida as directed by the FWS (undated).**

Use of HDD construction methods to cross waterbodies considered as potentially suitable habitat for manatees would avoid impacts on this species. If alternative in-stream construction methods are necessary, implementation of our recommendation would minimize the potential for impacts such that we conclude the Cypress Pipeline Project is *not likely to adversely affect the manatee*.

The FGT Expansion Project would cross two perennial waterbodies on Loop K, Otter Creek and Flat Branch, which are both about seven miles inland from Florida's west coast. While Otter Creek and Flat Branch are not considered to be within the coastal river watershed, these waterbodies discharge into the Waccasassa River, which flows to the Gulf of Mexico. Nonetheless, due to the distance between the pipeline crossings for Otter Creek and Flat Branch from suitable manatee habitat, we conclude the FGT Expansion Project is *not likely to adversely affect the manatee*.

Bald Eagle

The bald eagle is listed as threatened in the federal register, endangered in the state of Georgia, and threatened in the state of Florida. Bald eagle populations may occur anywhere on the North American continent where there are adequate trees, roosts, nesting sites, and feeding grounds. Nest site selection is based on proximity to water (within ½ mile), clear flight path to water, large living trees, and an open view of the surrounding area. Suitable foraging habitat includes mature forests with super-canopy trees. In the southeast, nesting and egg laying extends from October to March (FWS, 2000). The bald eagle nests communally, especially in winter. Most eagles that breed in Canada and the northern United States migrate south for the winter (NatureServe, 2005). Potential locations of bald eagle populations within the Cypress Pipeline Project vicinity occur in Chatham, Liberty, Long, McIntosh, Glynn, and Camden Counties, Georgia (GANHP, 2005) and in Nassau, Duval, and Clay Counties, Florida; and may also occur in Levy and Hernando Counties, Florida in the vicinity of FGT Expansion Project (FLNAI, 2005; FWS, 2005b,c).

Migratory and non-breeding bald eagles could potentially occur throughout areas affected by the Cypress Pipeline and FGT Expansion Projects; however, no concentrations of birds are expected. Breeding birds could be affected by construction of the projects if nest trees were cut or if construction occurred within the vicinity of active nests during the breeding season and caused reduced reproductive success or nest abandonment. However, no bald eagle nests were identified near the proposed pipeline

projects and as such, impacts on eagles would be limited to temporary disturbance of foraging individuals.

Due to the abundance of suitable foraging habitat in the project areas and the lack of eagle nests along the project corridors, we conclude the Cypress Pipeline Project is *not likely to adversely affect the bald eagle*.

FGT reviewed the bald eagle nest database maintained by the FLFWC to identify eagle nests known to occur in the vicinity of the proposed expansion project. Only one known nest was located within one mile of proposed project. That nest is located along Loop K of the project and is within 400 feet of proposed construction activities. Additional field reconnaissance was conducted outside of the active nesting season, and no other active nests were identified. FGT proposes to coordinate with the FLFWC regarding potential nest sites along the proposed project corridors.

The FWS maintains zones around bald eagle nests for purposes of implementing management recommendations to protect the nests. The most restrictive zone around a nest extends 750 feet from the nest. The FWS (2005) reported no significant differences in nesting success between nests in urban or disturbed areas and those in more rural areas as long as the 750-foot primary protection zone is maintained. FGT has indicated that it would attempt to schedule construction outside of the nesting season if active nests are identified along the proposed project corridor. However, construction is currently scheduled to occur from October through April, thus coinciding with the bald eagle nesting season (October 1 through May 15). Given the degree of overlap of the two periods, it is unlikely FGT would be able to avoid construction during the timing period. Because responses of individual pairs of eagles to human disturbance can vary, the FWS (2005) typically recommends biological monitoring of a nesting territory if construction is proposed to occur within 1,500 feet of a nest tree during the nesting season. If construction is scheduled to occur within this zone during the nesting season, FGT proposes to implement a compressed construction schedule through the zone and implement a monitoring program. The FWS has developed a set of Bald Eagle Monitoring Guidelines (FWS, 2005d). These guidelines include, but are not limited to initial monitoring to confirm occupancy of a nesting territory, monitoring during early phases of the nesting cycle, and monitoring during the last phase of the nesting cycle. However, FGT's proposed monitoring program would not allow for the level of detail or protection described by the FWS (2005). Therefore, to allow the maximum protection to nesting bald eagles, **we recommend that:**

- **Prior to constructing within 1,500 feet of an active bald eagle nest, FGT should implement the Bald Eagle Monitoring Guidelines (FWS, 2005) and file with the Secretary for review and approval by the Director of OEP the results of its consultation with the FWS regarding site-specific construction plans within the nest buffer for bald eagles.**

Although potential impacts on a known bald eagle nest, as well as other potential previously unidentified nests, could occur during construction, by implementing our recommendation and adhering to the FWS' monitoring protocol, we conclude the proposed FGT Expansion Project is *unlikely to adversely affect the bald eagle*.

Florida Scrub Jay

The Florida scrub jay is listed as federally threatened and state threatened in Florida. The Florida scrub jay is a non-migratory bird that inhabits open, low-growing oak dominated scrub communities endemic to central peninsular Florida. They also use coastal scrub communities with a pine component, rarely in areas with greater than 50% canopy cover that is taller than three meters. Florida scrub jay

numbers have declined dramatically in recent years because of habitat degradation and fragmentation; most birds occur on federal lands with management problems (Natureserve, 2005). This species could occur in the vicinity of the Cypress Pipeline Project area in Clay County, Florida and may also occur within the area of the FGT Expansion Project in Gilchrist, Levy, and Hernando Counties, Florida (FLNAI, 2005; FWS, 2005a, b, c).

There were no individuals or suitable habitat observed during the field surveys conducted for the Cypress Pipeline Project, therefore we conclude this project is *not likely to adversely affect the Florida scrub jay*.

Suitable scrub jay habitat was identified along Loop G of the FGT Expansion Project. Although the habitat was considered degraded and/or marginally suitable, the potential exists for scrub jays to utilize the area for nesting and foraging. FGT conducted limited scrub jay surveys, using callback tapes, and did not identify scrub jays in the area, although surveys were conducted outside the optimal survey period. As such, if construction through areas of suitable habitat are scheduled to occur during the scrub jay nesting season (March through mid-June), FGT proposes to conduct nest surveys prior to the initiation of construction activities. If active nests are encountered, FGT would prohibit clearing within 150 feet of the nest until the young have fledged. Based on the current construction schedule for the proposed FGT Expansion Project, nesting and foraging habitat would be cleared prior to March thereby reducing the potential for direct impacts on nesting scrub jays. Additionally, if scrub jays are identified within or adjacent to the project area, FGT would not revegetate the immediate area near the jay's location to allow bare areas, thereby increasing the quality of the habitat in the area.

Although scrub jays could occur in the vicinity of Loop G, FGT's proposed conservation measures are expected to avoid or minimize impacts on individual birds such that we conclude the FGT Expansion Project is *not likely to adversely affect the scrub jay*.

Red-cockaded Woodpecker

The red-cockaded woodpecker is listed as federally endangered, state endangered in Georgia, and a species of special concern in Florida. The red-cockaded woodpecker has historically been distributed throughout the southeastern United States. The species inhabits mature stands of pine forests, excavating its nesting cavities in live pine trees, typically those where the heartwood has been weakened by red heart fungus. Cavity trees generally range from 60 to 140 years of age. However, stands as young as 30 years have contained active colonies. Older growth pine or pine-dominated stands are also needed for foraging, but not to the extent needed for nesting or roosting. Within the vicinity of the Cypress Pipeline Project the red-cockaded woodpecker could occur in Chatham, Bryan, Liberty, Long, and Charlton Counties, Georgia (GANHP, 2005), and Nassau, Duval, and Clay Counties, Florida; and has the potential to occur in Gilchrist, Levy, and Hernando Counties, Florida, which would be crossed by the FGT Expansion Project (FLNAI, 2005; FWS, 2005a, b, c).

Areas of mature pine forest where the red-cockaded woodpecker could occur were identified at multiple locations along the proposed Cypress Pipeline Project during the initial field surveys in late 2000. Qualified biologists revisited areas along the pipeline route with high potential for red-cockaded woodpeckers in 2005 to resurvey in accordance with methodology outlined by V. Gary Henry (1989). Nest cavities and individuals of this species were observed during these surveys at a known red-cockaded woodpecker group outside of the proposed pipeline corridor near MP 110 in Charlton County, Georgia. Southern has adopted a re-route of the pipeline at this location that would avoid impacts on the group (see section 3.3.2.5). Since there are no known red-cockaded woodpecker groups within Southern's loop and mainline construction rights-of-way, we conclude construction of the project is *not likely to adversely affect* this species. Suitable habitat for the red-cockaded woodpecker was identified along four access

roads in Nassau County, Florida. Because only minor road modifications are planned along access roads and these minor modifications would not result in loss of suitable woodpecker foraging or nesting habitat, Southern's use of these access roads would have no impacts on this species.

Suitable red-cockaded woodpecker nesting habitat was identified along Loop G of the proposed FGT Expansion Project. However, FGT did not conduct species specific surveys in the area nor were additional details regarding the habitat provided. FGT noted that cavities were not located during casual observation of the area from the existing right-of-way nor were woodpecker vocalizations heard. As such, and given the expanding residential development in the area, FGT considered the presence of this species in the area to be unlikely.

Although the majority of construction disturbance along Loop G would occur within an existing cleared right-of-way, some clearing of trees would be required, including in areas containing suitable nesting and foraging habitat. Without survey information and additional documentation of the specific location of the suitable habitat as well as details of the surrounding land use, potential impacts on this species can not be determined. Thus, in order to facilitate a complete review of potential impacts on the red-cockaded woodpecker, **we recommend that:**

- **FGT should file with the Secretary for review and approval by the Director of OEP the results of its consultation with the FWS regarding survey methodology and results of new surveys (if necessary) for the red-cockaded woodpecker.**

If, through the recommended consultation with the FWS, and subsequent surveys as necessary, FGT determines that red-cockaded woodpeckers nest in the proposed project area or could otherwise be affected by the proposed activities, **we recommend that:**

- **FGT should file with the Secretary for review and approval by the Director of OEP the measures to avoid or minimize impacts on red-cockaded woodpeckers as well as copies of consultation with the FWS.**

If red-cockaded woodpeckers could be affected by the proposed activities, FGT would not be authorized to begin construction of Loop G until FERC has completed any necessary Section 7 consultation and the Director of OEP notifies FGT in writing that construction or implementation of mitigation measures may begin. Through implementation of our recommendation to avoid or minimize impacts on red-cockaded woodpeckers, or if it is determined that this species is not nesting in the area nor using the area for foraging, we conclude the FGT Expansion Project is *not likely to adversely affect the red-cockaded woodpecker*.

Wood Stork

The wood stork is listed as federally endangered and state endangered in both Georgia and Florida. Wood storks prefer areas where there are freshwater or brackish wetlands. Historically, the wood stork bred throughout the southeastern United States and Texas; however, recent studies of breeding areas show that they have become restricted to Florida, Georgia, and South Carolina. They nest primarily in cypress or mangrove swamps, with nests usually located in the upper branches of these trees (Ogden, undated). Nesting is tied to receding water levels and concentration of food sources, regardless of date. Foraging habitat includes freshwater marshes and stock ponds; managed impoundments; depressions in cypress heads and swamp sloughs; and shallow, seasonally flooded roadside and agricultural ditches. A major factor in the decline of wood stork populations is low productivity associated with inadequate food caused by the disruption and drainage of wetlands. Populations are

threatened by human manipulation of water regimes, which affect nesting and feeding sites (NatureServe, 2005).

The FWS has developed *Habitat Management Guidelines for the Wood Stork in the Southeast Region* which include mitigation measures such as: establishment of a buffer zone (i.e., no human intrusion) of 300 feet around feeding sites where a solid vegetation screen exists; establishment of a buffer zone 750 feet in areas with no vegetation screen; establishment of a 1,000- to 1,500-foot primary zone buffer in all directions from the actual colony boundary when there are no visual or broad aquatic barriers (never less than 500 feet when there are strong visual or aquatic barriers); establishment of a secondary zone buffer that extends to a radius of 2,500 feet from the outer edge of the colony; avoidance of human activities within 500 to 1,000 feet of roost sites during the seasons of the year and times of day when storks may be present, especially avoidance of nocturnal activities; and protection of vegetative and hydrological characteristics of the more important roosting sites, which are those that are used annually and/or used by flocks of 25 or more storks. Wood storks may occur in the vicinity of the Cypress Pipeline Project in Liberty, Long, McIntosh, Glynn, Camden, and Charlton Counties in Georgia (GANHP, 2005), and in Nassau, Duval, and Clay Counties in Florida; and may occur in the vicinity of the FGT Expansion Project in Polk, Gilchrist, Levy, and Hernando Counties, Florida (FLNAI, 2005; FWS, 2005a, b, c).

Wood storks have been known to nest in Brailey and Redcap Swamps, which would be crossed by the Cypress Pipeline Project near MPs 94.2 and 95.4, respectively. The Brailey Swamp Wood Stork Rookery in Camden County, Georgia is less than one mile from Southern's proposed mainline construction corridor (GADNR, 2005d). While construction would be outside of the requested buffers for the wood stork rookeries, foraging habitat may be affected and the Little Satilla River HDD is within this buffer. A large number of wood stork rookeries are located in foraging range of Southern's proposed mainline. Wood storks may also forage in wetlands occurring along Loop K or within the drainage canal at the Hines M&R Station location along the FGT Expansion Project. Wood storks depend on a large number and variety of streams and wetlands in their foraging ranges. Activities that alter traditional water levels or seasonal drying patterns, or the introduction of contaminants, fertilizers, or herbicides that would adversely affect native vegetation of feeding sites or alter the number or diversity of native fishes can adversely affect wood storks. Foraging habitat is ample within the project areas, and any disruption would be temporary. Nonetheless, because the Cypress Pipeline and FGT Expansion Projects would cross a number of streams and wetlands within the foraging range of wood stork rookeries, **we recommend that:**

- **Southern and FGT should strictly follow the FWS Habitat Management Guidelines for the Wood Stork in the Southeast Region for any portion of their respective projects that are located near a wood stork rookery. Additionally, as recommended by the FWS, Southern and FGT should delay or halt daily construction operations if foraging or roosting storks are encountered at a work site and work could begin once storks leave the area on their own.**
- **Prior to construction, Southern should develop and file with the Secretary, for the review and written approval by the Director of OEP, an HDD noise reduction plan that reduces impacts on wood stork rookeries at the Little Satilla Swamp.**

This recommendation is expected to reduce noise impacts on wood stork rookeries that may be impacted from HDD activities, and may be accomplished through time of year restrictions, positioning of equipment in a manor to buffer noise impacts, or various other methods. Impacts to the Brailey and Redcap Swamps are also discussed in section 4.4.3. Implementation of our recommendations by

Southern and FGT would minimize impacts on wood storks such that we conclude the Cypress Pipeline and FGT Expansion Projects are *not likely to adversely affect the wood stork*.

American Alligator

The American alligator is a federally threatened species and a species of special concern in the state of Florida. Numbers and distribution of the American alligator do not support federal listing of the alligator as threatened, but rather it is listed due to similarity in appearance with the American crocodile. The alligator inhabits freshwater swamps and marshes, but is also found in rivers, lakes, and smaller bodies of water. Nesting times vary, but can be expected to occur in late spring to early summer (FWS, 2000). This species may potentially occur in Florida in the vicinity of the Cypress Pipeline Project in Nassau, Duval, and Clay Counties; and the FGT Expansion Project in Gilchrist, Levy, and Hernando Counties (FLNAI, 2005).

Suitable habitat was observed in an area that would be affected by the Cypress Pipeline Project. An individual alligator was identified along Loop K of the FGT Expansion Project and all drains and wetlands along the project are considered suitable habitat for this species. Evidence of nesting was not identified along either project corridor. Impacts on this species resulting from construction of the Cypress project would be temporary as individuals may be disturbed and displaced to adjacent wet habitat. It is likely that individuals would return to the wet habitats traversed by the pipeline right-of-way after the completion of construction. Additionally, although there would be the conversion of swamp forests to marsh and shrub swamps, long-term adverse effects on the species are not expected because American alligators use all of the above habitats. Thus, we conclude the Cypress Pipeline and FGT Expansion Projects are *not likely to adversely affect the American alligator*.

Eastern Indigo Snake

The eastern indigo snake is a federally and state-listed threatened species in Georgia and Florida. The eastern indigo snake is known to occur in McIntosh County, Georgia in the immediate area of the Altamaha sand ridge (GADNR, 2005d). The species can be found in a wide variety of natural, disturbed, and non-natural habitats; however, the eastern indigo snake prefers large tracts of useable habitat, often including a mosaic of upland and wetland areas. Breeding occurs November through March with peak activity occurring in December (Kochman, 1978). In xeric⁵ habitats, the species is often closely associated with the gopher tortoise (see section 4.7.3). Consequently, eastern indigo snakes could occur in all areas where gopher tortoise burrows are found. The species may potentially occur in the vicinity of the Cypress Pipeline Project in Bryan, Liberty, Long, McIntosh, Glynn, Camden, and Charlton, Counties, Georgia (GANHP, 2005), and in Nassau, Duval, and Clay Counties, Florida; and could also occur in Gilchrist, Levy, and Hernando Counties, Florida, which would be crossed by the FGT Expansion Project (FLNAI, 2005; FWS, 2005a, b, c).

During field surveys, Southern initially identified gopher tortoise burrows in 21 locations along the proposed pipeline route and along 7 access roads. There were a total of 178 gopher tortoise burrows identified during the initial field surveys conducted in 2001 and 2005. Since the eastern indigo snake often inhabits gopher tortoise burrows, inspection of these burrows by infrared camera in March 2001 included inspection for this species. No eastern indigo snakes were discovered during these surveys.

Given the preference of indigo snakes to utilize gopher tortoise burrows, the potential exists for snakes to be affected during construction through areas of tortoise burrows. In order to avoid impacts on

⁵ Characterized by or related to extremely dry habitat

eastern indigo snakes occupying gopher tortoise burrows, Southern has proposed to implement the following measures along the Cypress Pipeline Project:

- Pre-construction surveys of the proposed construction corridor, all proposed facilities sites, all pipe storage/contractor work yards, and all adjacent areas that have been previously identified as suitable habitat for gopher tortoises and commensal species (species that may also use gopher tortoise burrows), and that may be potentially disturbed during construction. Each burrow would be inspected with a remote video system to determine occupancy by tortoises and/or protected commensal species.
- Burrows that are conclusively determined to be unoccupied by gopher tortoises or commensals would be collapsed immediately.
- Burrows with eastern indigo snakes would be left undisturbed to allow the snakes to vacate independently. If after a minimum of two weeks, the snake still occupies the burrow, Southern proposes to excavate the burrow and capture the eastern indigo snakes for relocation.

Although capture and relocation of indigo snakes would likely avoid adverse direct impacts on the individuals, handling of snakes would be considered harm under the definition of the ESA and would require formal consultation between the FERC Staff and the FWS. However, the lead FWS office for the Cypress Pipeline Project has indicated that if Southern could allow individual snakes to leave burrows on their own accord or avoid those burrows occupied by snakes during construction and therefore avoid handling, adverse impacts on snakes could be also avoided. Given the low likelihood of encountering eastern indigo snakes along the Cypress Pipeline Project due to the relatively low number of burrows identified along the project corridor, we believe that Southern should be able to accommodate this FWS suggestion. As such, **we recommend that:**

- **Southern should clarify, before the end of the draft EIS comment period, whether it intends to avoid burrows occupied by eastern indigo snakes during construction until snakes vacate the burrows or by reconfiguring the right-of-way to avoid the burrows completely.**

Because we believe the likelihood of encountering eastern indigo snakes in gopher tortoise burrows occurring along the Cypress Pipeline Project is low and we further believe that Southern should be able to accommodate the FWS recommendation and avoid handling of individual snakes if identified during surveys, the Cypress Pipeline Project is *not likely to adversely affect the eastern indigo snake*.

The majority of upland habitat along the proposed FGT Expansion Project is considered suitable habitat for gopher tortoise burrows. Surveys throughout the project area, excluding 0.7 miles Loop G for which access was not permitted, identified 1,246 burrows, including active, inactive, and abandoned burrows. Of these burrows, 1,036 were considered active or inactive which are more representative of actual population size in the area. FGT reported that the number of burrows along the project corridor is higher than the actual number of burrows that would be affected by the project as the survey corridor was wider than the proposed construction right-of-way. FGT proposes to determine the actual number of affected burrows upon completion of final design of the project and would provide survey details to the FLFWC and FERC Staff.

Similar to the Cypress Pipeline Project, the eastern indigo snake could be adversely affected if individuals are injured by FGT's construction equipment or if snakes are trapped in an open trench or collapsed gopher tortoise burrows. Impacts on the eastern indigo snake would be minimized by FGT's

proposed gopher tortoise mitigation plans. As they relate to eastern indigo snakes, FGT's gopher tortoise mitigation plans are similar to Southern's and include the following:

- Pre-construction surveys of the proposed construction corridor, all proposed facilities sites, all pipe storage/contractor work yards, and all adjacent areas that have been previously identified as suitable habitat for gopher tortoises and commensal species (species that may also use gopher tortoise burrows), and that may be potentially disturbed during construction. Each burrow would be inspected with a remote video system to determine occupancy by tortoises and/or protected commensal species.
- Burrows that are conclusively determined to be unoccupied by gopher tortoises or commensals would be collapsed immediately.
- Burrows with eastern indigo snakes would be left undisturbed to allow the snakes to vacate independently. If after a minimum of two weeks, the snake still occupies the burrow, the burrow would be excavated and the eastern indigo snakes captured.
- Captured eastern indigo snakes would be released into existing gopher tortoise burrows in adjacent habitats or directly into adjacent habitats.
- Biologists trapping and relocating eastern indigo snakes would have previous experience working with the species, or would be directly supervised by biologists with previous experience.

Although implementation of these measures would provide some protection to eastern indigo snakes, the FWS has indicated that additional measures utilizing the *Standard Protection Measures for the Eastern Indigo Snake* developed by the North Florida Field Office of the FWS may further minimize or avoid impacts on this species. These standard protection measures include development of an education plan for construction personnel; limiting individuals who may come in contact with or relocate snakes to those persons authorized by a section 10(a)(1)(A) permit or designated as an agent by the State of Florida; holding snakes in captivity only long enough to transport them to a release site; and details regarding indigo snake monitoring reports. We concur with the FWS and as such, **we recommend that:**

- **Prior to construction, FGT should file with the Secretary for review and approval by the Director of OEP the results of its winter burrow camera surveys for the eastern indigo snake, its eastern indigo snake protection plan utilizing the *Standard Protection Measures for the Eastern Indigo Snake* developed by the North Florida Field office of the FWS, and the results of its consultation with the FWS regarding the eastern indigo snake.**

Although implementing an avoidance plan for FGT similar to Southern's in which gopher tortoise burrows occupied by eastern indigo snakes would be avoided until snakes vacated the burrows or burrows could be avoided with a right-of-way reconfiguration could avoid impacts on snakes, due to the greater density of burrows along FGT's proposed route, we do not believe FGT could agree to this plan without adverse consequences on construction schedule. This could result in an inability to meet the project's purpose and need. Nonetheless, adherence to FGT's proposed gopher tortoise mitigation plans and development and adherence to an eastern indigo snake protection plan would minimize adverse effects to the eastern indigo snake. However, due to the abundance of gopher tortoise burrows in the proposed project areas and preference of indigo snakes to use these burrows and because FGT could be handling and moving eastern indigo snakes if found to occupy burrows, we have determined that construction of the FGT Expansion Project *may affect the eastern indigo snake*.

Flatwoods Salamander

The flatwoods salamander is federally listed as threatened and state listed in Georgia as rare. The preferred habitat for this species includes open, moderately moist woodlands of longleaf/slash pine maintained by frequent fires. Flatwoods salamanders range from Alabama across north Florida and north through the Coastal Plain of Georgia to South Carolina (Ashton, 1992). Breeding occurs from October to December in wetland areas including pine flatwoods depressions, cypress- or blackgum-dominated swamps, roadside ditches, and borrow pits (Jensen 1999c). This species may occur near the Cypress Pipeline Project in Chatham, Effingham, Bryan, Liberty, Long, McIntosh, and Charlton, Counties, Georgia (GANHP, 2005). Suitable habitat has not been identified in the FGT Expansion Project area for this species, therefore, we have determined the FGT Expansion Project would have *no effect* on the flatwoods salamander.

Historic sightings of the flatwoods salamander occur within the vicinity of the proposed loop and mainline in Chatham and McIntosh Counties, Georgia (FWS, undated). However, few of the areas crossed by the Cypress Pipeline Project contain habitat suitable for this species. Flatwoods salamanders require pine flatwoods/wiregrass habitat that is relatively open and undisturbed; the forested areas traversed by the pipeline are primarily managed as pine plantation, which is generally unsuitable. Potential habitat for the flatwoods salamander was identified on the same tract as the red-cockaded woodpecker in Charlton County, Georgia. Additionally, potential habitat was identified along three access roads in Charlton County. Surveys for the flatwoods salamander were conducted in March 2001 in all areas where suitable habitat was identified during the 2000 surveys. No flatwoods salamanders were identified during these surveys. However, at the time of the survey, Georgia was in the midst of a severe drought that began in 1998 and continued through 2002; consequently, conditions at the time of survey for this species did not allow for an adequate assessment. Although an analysis of the project corridor by the GADNR concluded that areas of known locations of the salamander would not be affected by the project, per a request by the FWS, in 2005, Southern re-assessed aerial photographs of the proposed project area to identify areas of potential habitat. This assessment identified several areas that appeared to be potential flatwoods salamander habitat. Most of the areas that were considered potential habitat based on aerial photograph review are not suitable habitat due to current management regimes of the areas (e.g., no fire regime, bedded planted pines, etc.). Nonetheless, potential habitat was identified in Bryan and Glynn Counties, Georgia. These areas would be re-surveyed to determine if suitable habitat or flatwoods salamanders are present.

The FWS has recommended specific revisions to Southern's proposed survey protocol for flatwoods salamanders. Specifically, the FWS indicated that larval sampling would be unsuccessful if ponds to be sampled are not flooded by mid-February. The FWS suggested that sampling sites be monitored to determine if suitable sampling conditions are present and recommended that larval sampling be postponed if water depths sufficient for breeding and larval development are not reached prior to February. If suitable conditions are not present and the construction schedule allows, Southern is to postpone larval sampling until the next season or consider sampling for migrating adults the following fall and early winter. If survey conditions do not allow proper sampling or schedule constraints limit survey options, the FWS suggested that Southern could presume presence of the species in the area and proceed accordingly. Because suitability of survey conditions will not be known until February and the Staff have not received an indication from Southern as to their ability to accommodate a delayed survey protocol, **we recommend that:**

- **Prior to construction in Bryan and Glynn Counties, Georgia, Southern should file with the Secretary for review and approval by the Director of OEP its consultation regarding survey methodology for flatwoods salamanders with the FWS.**

If, through the recommended consultation with the FWS, and subsequent surveys as necessary, Southern determines that flatwoods salamanders occur in the proposed project area or could otherwise be affected by the proposed activities, **we recommend that:**

- **Southern should further coordinate with the FWS to develop measures to avoid or minimize impacts on flatwoods salamanders during construction and operation. Copies of such coordination, including any recommended mitigation measures, should be filed with the Secretary for review and approval by the Director of OEP.**

Southern has agreed to provide training to all construction and maintenance personnel about flatwoods salamander ecology, their protected status, lawful consequences, and conservation measures. Informational pamphlets would be provided containing information about the species; its protection under federal and Georgia laws; clear instructions not to injure, harm, harass, or kill the species; and phone numbers to call if a flatwoods salamander is discovered. Additionally, if a flatwoods salamander is sighted during construction, a qualified biologist would be called to remove the salamander from any harmful situation and release it outside the silt fence barrier.

By conducting surveys prior to construction to identify areas of suitable flatwoods salamander habitat and implementing our recommendation to develop measures to avoid impacts on habitat and/or individual salamanders, we conclude the Cypress Pipeline Project is *not likely to adversely affect flatwoods salamanders*. Southern would not be authorized to begin construction until FERC has completed any necessary section 7 consultation and the Director of OEP notifies Southern in writing that construction or implementation of mitigation measures may begin.

Shortnose Sturgeon

The shortnose sturgeon is a federally and state listed endangered species in both Georgia and Florida. This species prefers Atlantic seaboard rivers, river mouths, lakes, estuaries, and bays. The majority of adults reside in river or estuarine surroundings. Sturgeons are bottom dwellers that seem to prefer rocky substrates and fast flowing water at a wide range of depths. Spawning occurs in freshwater during February and March (Cummings, 1999; Freeman, 1999a), although migrations to spawning beds along the project corridor begin in late November and early December. Post-spawning migrations generally begin shortly after spawning and typically correspond to rising water temperatures (NOAA Fisheries, 1998). The species may potentially occur in streams affected by the Cypress Pipeline Project in Chatham, Bryan, McIntosh, and Glynn Counties in Georgia (GANHP, 2005) and in Duval and Clay Counties in Florida (FLNAI, 2005).

The shortnose sturgeon is known to inhabit the Savannah, Ogeechee, Altamaha, Satilla, and St. Marys Rivers in Georgia and the St. John's River in Florida. Of these rivers, four (the Ogeechee, Altamaha, Satilla, and St. Marys Rivers) would be crossed by the Cypress Pipeline Project. Southern would cross these rivers using the HDD crossing method, as described in sections 2.3.2 and 4.3.2, to minimize impacts on waterbodies and associated fish species by avoiding in-stream work. However, shortnose sturgeon could be affected in the unlikely event of an HDD failure, and Southern had to use in-stream construction methods to cross these rivers, or if other in-stream work is conducted at these locations.

The FWS has developed a set of guidelines to minimize impacts to shortnose sturgeon in the event of an open-cut crossing (Shortnose Sturgeon Protection Construction Guidelines). These guidelines include, but are not limited to, educating construction personnel about civil and criminal penalties for harming, harassing, or killing shortnose sturgeon; prohibiting discharge of construction debris in the rivers; limiting speeds of equipment and materials in to the rivers; and contacting the applicable agencies

in the event that a shortnose sturgeon is injured or killed during construction. Implementation of these measures during project construction would avoid or minimize adverse impacts on shortnose sturgeon. In the event Southern can not complete an HDD crossing of the Ogeechee, Altamaha, Satilla, or St. Marys Rivers, Southern would be required, according to our HDD contingency plan recommendation in section 4.3.3, to provide a site-specific alternate crossing plan to the FWS, NOAA, COE, GADNR, and the FLFWC for their approval prior to initiating a non-HDD crossing. **We recommend that:**

- **Southern's HDD contingency plan and any open cut crossing plan for the Ogeechee, Altamaha, Satilla, and St. Marys Rivers should include the *Shortnose Sturgeon Protection Construction Guidelines*, as directed by the FWS (undated). Southern should also consult with the appropriate agencies to determine the need for additional measures to avoid or minimize adverse effects on the shortnose sturgeon.**

We have determined that because the Ogeechee, Altamaha, Satilla, and St. Marys Rivers would be crossed using the HDD technique, the Cypress Pipeline Project is *not likely to adversely affect the shortnose sturgeon*. Furthermore, if in-stream construction activities are to occur at these waterbodies, implementation of the shortnose sturgeon protection guidelines would be expected to minimize the potential for adverse impacts on the sturgeon.

Pondberry

Pondberry is a federally and Georgia-listed endangered plant. Pondberry is often associated with wetland habitats, and can be found in or around cypress ponds, bottomland hardwood swamps, or sandhill depressional ponds. The species generally grows in shady areas, but may occur in full sun (Patrick et al., 1995). There are 36 known populations of the plant across the southeastern United States. Extensive clearing and drainage of bottomland forests has been a major factor affecting the species (Natureserve, 2005). The species may occur within the Cypress Pipeline Project vicinity in Bryan, Chatham, and Effingham Counties (GANHP, 2005); however, suitable habitats are found throughout the coastal area in Georgia.

There were no individuals observed in the Cypress Pipeline Project area during the 2000/2001 field surveys or during surveys conducted in early 2005. However, because these surveys were conducted outside of the flowering/fruitlet period for this species, Southern proposes to re-survey areas of suitable habitat during the growing season in March 2006 prior to initiating construction in those areas. If pondberry is identified during those surveys, Southern has agreed to avoid the population or develop specialized construction techniques to preserve the plants. Possible techniques that would be implemented include a reduced construction corridor and modified maintenance regime in the area of the plants. However, the locations of the plants are unknown and avoidance and the need for specialized construction is also unknown. Due to these factors in conjunction with strict FWS survey protocol **we recommend that:**

- **Prior to initiation of surveys for Pondberry, Southern should consult with the FWS for appropriate survey methods and timing windows. Also, Southern should contact the FWS immediately if, during surveys, pondberry is identified within the survey corridor to obtain guidance from the FWS regarding a course of action.**
- **Prior to construction, Southern should file the completed survey report with the Secretary, that contains the following information:**
 - a. **Name(s) and qualifications of the person(s) conducting the survey;**

- b. Method(s) used to conduct the survey;**
- c. Date(s) of the survey;**
- d. Area surveyed (include the mileposts surveyed); and**
- e. Proposed mitigation that would substantially minimize or avoid the potential impacts.**

By revising the proposed construction methods for the proposed project and by implementing our recommendation, we conclude the Cypress Pipeline Project is *not likely to adversely affect pondberry*.

4.7.2 State-listed Threatened and Endangered Species

State-listed threatened and endangered species were identified through a review of the GADNR and FLNAI databases, and consultation with the FWS, the GADNR, and the FLFWC. A total of 82 state-listed threatened and endangered species have the potential to occur within the project vicinity. Of the 82 total state-listed threatened and endangered species, 63 were eliminated from further consideration due to a lack of suitable habitat in the project area or, in the case of plants when surveys were conducted during the appropriate periods, a lack of individuals being noted during surveys. Of the remaining 19 species, 8 are also federally listed and were previously discussed in section 4.7.1; the remaining 11 species are discussed below.

Florida Black Bear

The Florida black bear is a state-listed threatened species in Florida. The current bear populations are widespread in Florida, but the distribution is fragmented. The species utilizes a variety of forested habitats. Typical habitats utilized by the Florida black bear include pine flatwoods, hardwood swamps, cypress swamps, cabbage palm forest, sand pine scrub, and mixed hardwood hammocks. The bears prefer large, undeveloped wooded tracts. This species has the potential to occur within the vicinity of the Cypress Pipeline Project in Nassau, Duval, and Clay Counties, Florida; and along Loops K and G of the FGT Expansion Project in Hernando and Levy Counties, Florida. The general vicinity of the Cypress Interconnect could also be used as a travel corridor by transient black bears.

Florida black bear tracks were identified along Southern's proposed mainline route in Florida. Although the Florida black bear may be present within the Cypress project area, the mobile nature of the animal would allow the bear to relocate during construction. No evidence of black bears was noted during field surveys for the FGT Expansion Project. Black bears are typically found in dense, wooded forests. However, since bears present in the project vicinity are already using existing utility corridors, minimal widening of those existing corridors and creation of new corridors are not expected to adversely impact the species.

Round-tailed Muskrat

The round-tailed muskrat is listed as a threatened species in the state of Georgia. This species inhabits freshwater marshes and bogs where they nest in dome-shaped houses woven from sedges, grasses, and other wetland vegetation. They breed throughout the year with a peak in late fall (Ozier, 1999). This species may potentially occur in Camden and Charlton Counties, Georgia in the vicinity of the Cypress Pipeline Project (GANHP, 2005). Potential habitat for the species was identified along access roads in Florida; however, the species is not protected in Florida and due to the mobile nature of this species, it is not anticipated that the Project would impact this species. Additionally, access roads

would be used to enter the construction right-of-way, and traffic would be restricted to the limits of the access road; therefore, no impacts on the round-tailed muskrat are expected.

Peregrine Falcon

The peregrine falcon is listed as endangered in the states of Georgia and Florida. The peregrine falcon breeds from the non-arctic portions of Alaska and Canada south to Baja California, central Arizona, and Mexico; western limits follow the eastern front of the Rocky Mountains in the United States. The original population in the eastern United States had been decimated; however, a captive breeding program has successfully reestablished the population. The ideal nesting habitat for the falcon is on cliffs or a series of cliffs, but they may also nest in river cutbacks, trees, and manmade structures. Threats to the species include loss of wetland habitat, loss of primary prey, poachers robbing nests, hunting, and food chain contamination. Depending on its nesting location, the peregrine falcon arrives in its breeding area in late-April to early-May and begins departure in late-August through early-September (Natureserve, 2005). This species may potentially occur in the vicinity of the Cypress Pipeline Project in Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden Counties, in Georgia (GANHP, 2005) and in Nassau, Duval, and Clay Counties in Florida; and could occur in the vicinity of the FGT Expansion Project in Gilchrist, Levy and Hernando Counties, Florida (FLNAI, 2005).

There were no individuals or suitable breeding habitat observed during the Cypress Pipeline Project field surveys; however, there is the potential for occasional transients in the vicinity of all facilities that cross wetlands and waterbodies. Transients in the project area would avoid the construction right-of-way due to construction activities and use the surrounding, undisturbed habitats to forage. Thus, construction of the Cypress Pipeline Project is unlikely to have any adverse impacts on this species.

Southeastern American Kestrel

The southeastern American kestrel is a Florida listed threatened bird. This species is endemic to the lower southeast Coastal Plain. Optimal habitat for the species is sandhills, but it also inhabits prairies, coasts, wooded streams, cultivated lands, open woodland, and residential areas. Kestrels require abandoned woodpecker nesting cavities for nesting and brooding young. The southeastern American kestrel has undergone a population decline as a result of insecticide use and destruction of habitat, principally the longleaf pine-sandhill ecosystem. To maintain a viable population, large tracts of suitable habitat are necessary, along with prescribed burns (Natureserve, 2005). This species may occur in the vicinity of the Cypress Pipeline Project in Nassau, Duval, and Clay Counties, Florida and in the vicinity of the FGT Expansion Project along Loop G and Loop J in Gilchrist, Levy, and Hernando Counties, Florida (FLNAI, 2005). Potential habitat is also present adjacent to FGT's existing Compressor Station 26 site.

No individuals or suitable habitat were observed during field surveys for the Cypress Pipeline Project; however, juvenile kestrels were identified along the edge of the existing right-of-way corridor near Loop G during surveys for the FGT Expansion Project. Kestrels were also observed and heard at various locations along Loop J, including two locations considered as a potential nest site, as determined based on behavior of a pair of birds. Potential nest locations occur outside of the proposed construction right-of-way and would not be directly affected by the proposed FGT Expansion Project. Although potential roost locations could be lost during tree clearing and other project activities, the amount of habitat actually removed would be minimal relative to available habitat in the area. Thus, adverse impacts on the southeastern American kestrel are not expected.

Gopher Tortoise

The gopher tortoise is listed as a federal special management concern species, as threatened in the state of Georgia, and as a species of special concern in Florida. This species occurs in sandy coastal plain habitats from extreme southern South Carolina to the southeastern corner of Louisiana, and throughout most of Florida. Individuals may occur in areas with well-drained, sandy soils in transitional areas. They are also associated with a pine overstory and an open understory with a grass and forb groundcover with sunny areas for nesting. Gopher tortoises construct unusually long burrows that are often used by other animals. Females lay eggs between late April and mid July, which hatch between August and September (Jensen, 1999; FWS, 2000). The gopher tortoise may potentially occur in the area of the Cypress Pipeline Project in Chatham, Effingham, Bryan, Liberty, Long, McIntosh Glynn, and Charlton Counties, Georgia (GANHP, 2005), as well as Nassau Duval, and Clay Counties, Florida; and could occur in the FGT Expansion Project area in Gilchrist, Levy, and Hernando Counties, Florida (FLNAI, 2005).

Suitable habitat and individuals were documented within the Cypress Pipeline Project area during field surveys in Georgia and Florida. Gopher tortoise burrows were identified in 21 locations along the pipeline route and along 7 access roads; there were a total of 172 gopher tortoise burrows identified during the initial field surveys conducted in late 2000. During 2005 surveys, 178 burrows were located.

Surveys conducted along the FGT Expansion Project corridors identified 1,246 gopher tortoise burrows. The actual number of burrows that could be affected by the proposed project is expected to be lower than this total since the construction right-of-way would be smaller than the corridor used during surveys.

If occupied during construction, mechanical crushing of active burrows could result in injury or death of gopher tortoises. Additionally, if gopher tortoises occupying adjacent habitats were present on the right-of-way during construction, injury or mortality could also occur if the individuals were not avoided. To minimize impacts on the species, Southern and FGT have proposed similar mitigation plans for the gopher tortoise that would be implemented prior to and during construction, and during maintenance of the proposed facilities. Major points from the mitigation plans are summarized below. Any discussion pertaining to “protected commensals” is secondary to measures described for individual species elsewhere in this document, especially for the eastern indigo snake.

Preconstruction Measures

1. All areas within the project area that have been previously identified as suitable habitat for gopher tortoises and their commensals, and that might potentially be disturbed during construction, would be resurveyed.
2. Tortoises and their commensals identified in burrows would be given the opportunity to leave burrows on their own, or would be trapped if necessary.
3. All unoccupied burrows would be collapsed.
4. All burrows for which occupancy cannot be conclusively determined would be fitted with a pitfall or *Tomahawk*-type live trap.
5. After two weeks, any gopher tortoise or protected commensals that cannot be trapped would be captured by careful excavation of the burrow.

6. Data would be collected for each captured tortoise, and the tortoise would be marked and released into an unoccupied burrow located in unimpacted habitats adjacent to the construction corridor.
7. Barricade fencing would be erected along the right-of-way edge to prevent tortoises from entering the construction area and prevent any inadvertent impacts from heavy equipment and related construction activities.
8. Prior to any construction activities, Southern would require all construction personnel to attend an educational presentation to acquaint them with gopher tortoise ecology, its protected status, and Southern's conservation/mitigation efforts.

Construction

1. A biologist with previous gopher tortoise and protected commensal experience would be on-site to monitor all construction activities within the vicinity of occupied tortoise burrows.
2. All construction areas, trenches, and spoil piles in the vicinity of occupied gopher tortoise burrows would be inspected daily prior to the start of any construction activities.
3. Any new burrows that are identified during daily surveys would be inspected for occupancy using a remote video system. Occupied burrows would be excavated and the tortoises and/or protected commensals handled for data collection and release into nearby unoccupied/starter burrows following preconstruction procedures.
4. Except in emergency situations, only project biologists and specifically trained environmental inspectors would be allowed to handle tortoises and protected commensal species. These individuals would wear pagers and have access to radios and/or cellular phones while in the field.
5. If a gopher tortoise or commensal species is encountered by construction personnel within the construction corridor, all activities that might harm the species would be stopped and a project biologist or environmental inspector would be summoned.
6. If a gopher tortoise or protected commensal species is found dead during construction activities, the specimen would be frozen and the FWS, FLFWC, FLDEP, or GADNR, would be notified within 24 hours of the incident.

Post-Construction Right-of-Way Maintenance and Operation

1. Mowing activities would be conducted during the gopher tortoise's inactive season, between November 1 and March 1.
2. Southern and FGT would train mowing personnel in gopher tortoise awareness and would provide maps showing the locations of known active/inactive burrows on or near the right-of-way.
3. Mowers would reduce the speed of power equipment within 50 feet of burrows.

4. Hand pushed mowers and hand-held equipment would be used within 15 feet of tortoise burrows, and maintenance personnel would avoid mowing across the burrow apron, burrow entrance, and the area immediately behind the entrance.
5. Except for travel on existing roads and paths, routine maintenance activities unrelated to vegetation maintenance would be restricted to areas at least 15 feet from tortoise burrows. Where these activities may be required to be closer than 15 feet from burrows, only hand-held equipment would be used and the maintenance personnel would avoid the burrow apron, entrance, and area immediately behind the entrance.
6. Gopher tortoise burrows within 50 feet of maintenance activities requiring excavation would be clearly marked for avoidance, and all excavation areas within the vicinity of gopher tortoise burrows would be surrounded by a fence with a minimum two-inch mesh to exclude tortoises.
7. If maintenance activities require capture and displacement of gopher tortoises or protected commensal species, a qualified biologist would be called to trap/excavate the individual, collect data, and release the individual into a nearby unoccupied/starter burrow using preconstruction relocation procedures.
8. In the event of emergency repair, all efforts would be made to protect any tortoises and commensals that may be located in the area, and a biologist would be called to the site as soon as possible to assess the potential impacts of the emergency situation and repair work on nearby tortoises or protected commensal species. The nearest FWS, FLFWC, FLDEP, or GADNR office would be immediately contacted concerning any adverse effects on these species.
9. If a gopher tortoise or protected commensal species is found dead during construction activities, the specimen would be frozen and the FWS, FLFWC, FLDEP, or GADNR, would be notified within 24 hours of the incident.

Impacts on the gopher tortoise would be temporary due to displacement of individuals during construction. The temporary loss of habitat during construction could also affect gopher tortoises; however, maintenance of the right-of-way during operation of the proposed facilities would create better foraging and refuge sites in areas of marginal habitat. With implementation of Southern's and FGT's proposed mitigation measures, the impact of the proposed facilities on gopher tortoises would be minimized and the proposed projects would not likely result in adverse impacts on this species.

Short-tailed Snake

The short-tailed snake is a Florida-listed threatened species. The species is restricted to Florida and is distributed within the northern and central peninsula from the Suwannee River to Highlands County, Florida (FLNAI, 2001). The short-tailed snake prefers dry, upland habitats, principally sandhill, xeric hammock, and sand pine scrub. This snake is secretive and is rarely seen above ground; most aboveground activity occurs in October and November, with a few sightings in March and April. The decline of the species is attributed to the loss and conversion of habitat for citrus, mining, silviculture, and development (FLNAI, 2005). This species has the potential to occur in the vicinity of the FGT Expansion Project in Gilchrist, Levy, and Hernando Counties, Florida (FLNAI, 2005).

Suitable habitat was identified as the narrow strip of mature pine forest adjacent to the existing maintained right-of-way along Loop G and in various patches of high pinelands along Loop J of the FGT

Expansion Project. Species-specific surveys were not conducted as this species is largely fossorial; thus, surveys would not provide ample evidence regarding presence or absence of the species in the project area. Given the level of existing disturbance along the proposed project route, it is unlikely the species occurs in the project area. Nonetheless, because suitable habitat was identified, the species could be present in the area. If present during construction, individual short-tailed snakes could be injured or killed. However, impacts on suitable habitat would be limited to a small proportion of available habitat and associated potential impacts on individuals are not expected to affect population viability, if they occur. Thus, although individual snakes may be inadvertently affected during construction, the proposed FGT Expansion Project is not expected to have adverse effects on the short-tailed snake population.

Gopher Frog

The gopher frog is listed as threatened in the state of Georgia, and is a species of special concern in Florida. The gopher frog's principal habitat is longleaf pine-turkey oak woodlands and sandhills with adjacent ephemeral wetlands for breeding. It is also associated with the same xeric habitats as the gopher tortoise and often utilizes the gopher tortoise's burrow as a place of refuge (Conant and Collins, 1991). The gopher frog may potentially occur in all counties crossed by the Cypress Pipeline and FGT Expansion Projects in Georgia and Florida (FLNAI, 2005; GANHP, 2005).

Similar to the gopher tortoise, construction of the project could have temporary impacts on this species through a loss of habitat when burrows are crushed during construction. If individuals were present within burrows, injury or death could result. However, implementation of Southern's and FGT's Gopher Tortoise Mitigation Plans would result in avoidance or minimization of potential impacts on the gopher frog such that adverse impacts would not be expected.

Dwarf Witch-alder

The Dwarf witch-alder is a Georgia-listed threatened plant. This species is found in low, flat, swampy areas, especially shrub-dominated margins of upland swamps, Carolina bays, and wet savannas (Patrick et al., 1995). This plant may potentially occur in the vicinity of the Cypress Pipeline Project in Long County, Georgia (GANHP, 2005); however, potential habitat for this species was identified within the Cypress Pipeline Project area in Effingham County, Georgia. Because the species is present in an adjacent county, it is possible that the right-of-way may support a population of this plant. Southern has not yet determined whether or not impacts on this species could occur as a result of the Cypress Pipeline Project. Therefore, **we recommend:**

- **Prior to construction in Effingham County, Georgia, Southern should file with the Secretary, for the review and written approval of the Director of OEP, the results of consultation with the GADNR regarding the need for surveys and avoidance or minimization of impacts on the dwarf witch-alder.**

Parrot Pitcherplant

The parrot pitcherplant is a threatened species in the state of Georgia that potentially occurs in the vicinity of Southern's mainline in Charlton County, Georgia (GANHP, 2005). Habitat for this plant includes low pinelands, marshes, and bogs along the Coastal Plain from North Carolina to Florida. The GANHP originally listed this species to curtail the excessive collection of the plant for the horticulture trade.

Field surveys revealed numerous sightings of parrot pitcherplant within the existing transmission line right-of-way that would be paralleled by Southern's mainline. There were also two populations of

parrot pitcherplant identified within the proposed mainline construction right-of-way in Charlton County, and suitable habitat for the species was identified along the mainline route and along access roads. Southern would implement the measures contained within our Procedures 2003 (Appendix E) to minimize impacts on wetlands and associated species. The GADNR recommended that construction be limited to the western portion of the existing right-of-way in the area of the pitcherplant bog near MP 117 to protect pitcherplants and associated sensitive species. Therefore, in addition to Southern's proposed impact minimization measures, **we recommend that:**

- **Prior to construction, Southern should file with the Secretary for the review and written approval of the Director of OEP the results of consultation with the GADNR regarding avoidance and minimization of impacts of the parrot pitcherplants and other associated sensitive species.**

With the implementation of our Procedures 2003 and the above recommendation, we believe that the Cypress Pipeline Project would avoid adverse impacts on this species. Additionally, the plant is a light-loving species, favoring cleared, seasonally inundated, non-woody areas; thus, the cleared right-of-way would create additional habitat for this species.

Pondspice

Pondspice is listed as threatened in Georgia and endangered in Florida. This plant is mostly an outer Coastal Plain species ranging from the coastal plain of Maryland to Florida, but appears in low numbers when found. Habitat for this species includes pond and swamp margins and low, wet woodlands. It can also be found within basins of limesinks or other depressional ponds (Patrick et al., 1995). Pondspice is threatened due to alterations in hydrology and by suppression of natural fire regimes (Natureserve, 2005). This species may potentially occur within the Cypress Pipeline Project vicinity in Bryan, Long, McIntosh, Glynn, Camden, and Charlton, Counties, Georgia (GANHP, 2005), and in Clay County, Florida (FLNAI, 2005).

Suitable habitat for this species was identified during field surveys in Effingham County, Georgia. However, no individuals were identified during surveys. Because those initial surveys were conducted outside of the flowering/fruitletting period for this species, Southern proposes to conduct pre-construction surveys during March 2006, concurrent with surveys for pondberry, to determine if the species occurs in areas of suitable habitat. Construction through areas where this species occurs could result in injury or direct mortality to individual plants. Thus, to minimize or avoid impacts on pondspice, if the species is identified during surveys, **we recommend that:**

- **Prior to construction, Southern should file with the Secretary for review and approval of the Director of OEP the results of its consultation with the GADNR regarding survey methodology, timing, and results, as well as details of specialized construction methods that would avoid impacts on individual pondspice plants or a pondspice population.**

Purple Honeycomb Head

Purple honeycomb head is a rare species in the state of Georgia and an endangered species in Florida. This plant may potentially occur within the Cypress Pipeline Project vicinity in Liberty, Long and Charlton, Counties, Georgia (GANHP, 2005), and Nassau and Clay Counties, Florida (FLNAI, 2005). Individuals thrive best in low, wet areas of pitcher plant bogs as well as wet pine flatwoods and wet pine savannas. This plant typically grows in moist, acidic, sandy soils, and is often associated with an understory of palmetto, saw palmetto, ericaceous shrubs, and pitcher plants (Patrick et al., 1995). The

species ranges from northeastern Florida into southeastern Georgia. There are currently seven known populations of the species in Florida, three of which are in state forests; the remaining four occur on private timberlands. Draining, ditching, mechanical clearing, bedding, and soil disturbance are potential threats to this species (FLNAI, 2005).

There were no individuals or suitable habitat for this species observed during the field surveys of the Cypress Pipeline Project area. However, there is a pitcherplant bog along a power transmission line near MP 117 that is known to contain the purple honeycomb head. The Cypress Pipeline Project may impact this and other pitcherplant bogs. Southern has agreed to resurvey potential pitcherplant bog communities in March 2006. As noted for the parrot pitcherplant discussed above, we have recommended that Southern coordinate with the appropriate resource agencies to determine the need for developing additional mitigation measures to avoid or minimize impacts on pitcherplants and associated sensitive species. Implementation of the recommendation would avoid adverse impacts on purple honeycomb head.

4.7.3 Other Special Status Species

In addition to the federally and state listed endangered and threatened species discussed in sections 4.7.1 and 4.7.2, the FWS, FLDEP, and GADNR identified other special species including federally designated candidate species; federal species of management concern; and state rare, unusual, and tracked species. No federal candidate species were identified as occurring within the vicinity of the Cypress Pipeline or FGT Expansion Projects. However, consultation with these agencies resulted in identification of 13 species of concern that were not also listed as endangered or threatened by a state or federal agency. These 13 species are described below.

Florida Mouse

The Florida mouse is considered a species of special concern in Florida. This species occurs in the northern two-thirds of peninsular Florida and along most of the eastern coast of the state. Preferred habitat of the Florida mouse is the sand pine scrub community, but it also occurs in longleaf pine and turkey oak; south Florida slash pine flatwoods (early successional phases); and in scrub, sandhill, and pine flatwoods. The primary habitat requirements appear to be xeric conditions, open tree stands, clumps of scrubby oaks and other shrubs, well-drained sandy soils, and patches of bare ground. The Florida mouse appears to be an obligate burrow-dwelling species and is often found within gopher tortoise burrows.

Given the distribution of the Florida mouse and the number and distribution of gopher tortoise burrows occurring in the project area, the Florida mouse could occur along similar portions of the proposed project. Locations of gopher tortoise burrows were surveyed using GPS units during right-of-way surveys (see section 3.6.1.4); however, no specific surveys were conducted for the Florida mouse.

FGT proposes to relocate gopher tortoises and associated commensals occurring within the actual construction right-of-way a short distance to the non-construction portions of the existing right-of-way or into adjacent suitable habitat. During this process, FGT would inspect active and inactive gopher tortoise burrows (and as many abandoned burrows as possible) with a remote video camera system. If Florida mice or any other protected gopher tortoise commensals are observed in a burrow, an effort would be made to allow them to leave the burrow naturally. Any Florida mice trapped would be released immediately into gopher tortoise burrows occurring in adjacent non-construction areas. Implementation of FGT's Gopher Tortoise Mitigation Plan would avoid adverse impacts on the Florida mouse during construction of the FGT Expansion Project.

Sherman's Fox Squirrel

The Sherman's fox squirrel is a species of special concern in Florida. Sherman's fox squirrel habitat includes longleaf pine and turkey oak sandhill community with an open understory. Individuals require about 6.5 acres for territorial range. With the decrease of optimal community type, Sherman's fox squirrel is currently found in sub-optimal habitats such as turkey oak woodlands, bayhead and slash pine flatwoods, cypress areas, scrubby flatwoods, or the margins of flatwoods cypress ponds (Kantola, 1992). The fox squirrel has two nesting periods, winter and summer. Young are born in January or February, and again in June or July, with the young spending up to 2.5 months in the nest.

Incidental sightings of this species, presence of suitable habitat, and evidence of potential occurrence were recorded. Individuals were observed or reported on Loop J and Loop G of the FGT Expansion Project. Impacts on this species would be minimal and result primarily from the removal of trees. Movement of individuals would not be permanently affected since no aboveground facilities are planned in areas where this species was observed. Additionally, the areas where individual fox squirrels were observed are near developed areas, including a large power substation, thus the species is likely acclimated to regular disturbance. Therefore, although loss of trees would remove some habitat, the FGT Expansion Project is not expected to have adverse impacts on the Sherman's fox squirrel.

Florida Pine Snake

The Florida pine snake is a federal species of management concern and a species of special concern in Florida. The pine snake's habitat is primarily in the longleaf pine-turkey oak woodlands. It is also associated with the same xeric habitats that support gopher tortoise populations (see section 4.7.3) (Conant and Collins, 1991). This species may potentially occur in Duval and Clay Counties, Florida in the vicinity of the Cypress Pipeline Project; and could occur in Gilchrist, Levy, and Hernando Counties, Florida in the vicinity of the FGT Expansion Project (FLNAI, 2005).

There were no individuals observed during surveys for the Cypress Pipeline Project; however, there is habitat for the species within the vicinity of the Cypress Pipeline Project, and a shed skin was discovered at the SJRWMD, which is crossed by the mainline. Similarly, no individuals were identified during surveys for the FGT Expansion Project; however, a shed skin assumed to be from a Florida pine snake was found along Loop J. Thus, this species is assumed to occur along both projects. If present during construction, specifically within burrows being collapsed, individuals could be injured or killed.

Implementation of Southern's and FGT's Gopher Tortoise Mitigation Plans along with our additional mitigation measures recommended for the eastern indigo snake would minimize impacts such that the proposed projects would not result in adverse impacts on the Florida pine snake.

Striped Newt

The striped newt is a rare species in Georgia. The striped newt is associated with the same habitat as the gopher tortoise and prefers pine flatwoods, ponds, ditches, and ephemeral ponds, where breeding occurs in late winter in temporary water sources (Jensen, 1999c). This species may occur in the vicinity of the Cypress Pipeline Project in Bryan, Liberty, Long, Charlton, and Camden Counties, Georgia (GANHP, 2005), and in Nassau, Clay, and Duval Counties, Florida (FLNAI, 2005). Potential habitat for this species was identified along several access roads for the Cypress Pipeline Project in Florida. Access roads would be used to enter the construction right-of-way. Because only minor road modifications are planned along access roads, no impacts on the species are expected as a result of Southern's use of these access roads.

Implementation of Southern's Gopher Tortoise Mitigation Plans along with our additional mitigation measures recommended for the eastern indigo snake would minimize impacts on the striped newt if present along the pipeline corridor such that the proposed project would not result in adverse impacts on this species.

Atlantic Striped Bass

The Atlantic striped bass is a marine and estuarine coastal species that moves far upstream in channels of medium to large rivers during spawning migrations. In coastal areas, typically within 6 km of shore where adults use wide a range of substrates, spawning occurs as early as mid-February in Florida. Juveniles prefer clean sandy bottoms but have been found over gravel, rock, and soft mud. Juveniles may or may not move to areas of higher salinity in first summer/fall (NatureServe, 2005).

Atlantic striped bass inhabit the Altamaha and Satilla Rivers in Georgia and are currently part of an Atlantic striped bass restoration program. Southern would cross these rivers using the HDD crossing method, which, as described in sections 2.3.2 and 4.3.2, would minimize impacts on waterbodies and associated fish species by avoiding in-stream work. In the unlikely event Southern can not complete an HDD crossing of these rivers, Southern would file a site-specific alternate crossing plan (see our contingency crossing plan recommendation in Section 4.3.3). Southern would not be authorized to conduct an open-cut crossing of the Altamaha or Satilla Rivers until further agency consultation has occurred and an environmental review has been conducted by Commission staff.

Atlantic Sturgeon

The Atlantic sturgeon is an anadromous species that occurs along the Atlantic coast of the United States and Canada in major rivers and the coastal ocean. This species is primarily marine, but close to shore, when not breeding. Atlantic sturgeon migrate to rivers for spawning and move downstream afterward. Spawning occurs as early as February and March in the south, where they spawn over the bottom of hard clay, rubble, gravel, or shell substrates. Juveniles spend winter and spring mainly in river mouths, and in some rivers, juveniles may spend several years continuously in freshwater (NatureServe, 2005).

The Atlantic sturgeon may be found in the Savannah, Ogeechee, Altamaha, Satilla, and St. Marys Rivers in Georgia. Southern would cross these rivers using the HDD crossing method, which, as described in sections 2.3.2 and 4.3.2, would minimize impacts on waterbodies and associated fish species by avoiding in-stream work. In the unlikely event Southern can not complete an HDD crossing of these rivers, Southern would file a site-specific alternate crossing plan (see our contingency crossing plan recommendation in Section 4.3.3). Southern would not be authorized to conduct an open-cut crossing of the Ogeechee, Altamaha, Satilla, or St. Marys Rivers until further agency consultation has occurred and an environmental review has been conducted by Commission.

Black-banded Sunfish

The black-banded sunfish is an extremely rare species in Georgia. This species is largely restricted to quiet, shallow, heavily vegetated, nonturbid, darkly stained, slightly to very acidic waters of sand- and mud-bottomed creeks, small to medium rivers, ponds, lakes, and roadside drainage ditches. Eggs are laid in a nest made by the male in a weed bed, either on the substrate or in a hollow made in plants (NatureServe, 2005).

The black-banded sunfish may potentially occur in two unnamed perennial streams (MPs 106.7 and 112.2) crossed by the Cypress Pipeline Project in Charlton County, Georgia. The GADNR has expressed concern about potential impacts on this species (GADNR, 2005e). Southern has agreed to

survey for this species prior to initiating construction in streams where the GADNR has indicated the black-banded sunfish has a potential to exist. In the event this species is found, Southern has further agreed to use a dry crossing method and expedite stream crossing.

Altamaha Spiny mussel

The Altamaha spiny mussel is a species of special concern in the state of Georgia. This species is endemic to the Altamaha River and can be found buried in sandbars in swift currents (GANHP, 2005). The Altamaha River would be crossed by Southern's proposed mainline at the border between Long and McIntosh Counties and there is a documented occurrence of the Altamaha spiny mussel just downstream of the proposed crossing location.

The Altamaha River would be crossed by HDD. As discussed in sections 2.3.2 and 4.3.2, the HDD crossing method would minimize impacts on waterbodies and associated species by avoiding in-stream work. However, in the unlikely event an HDD crossing cannot be completed, Southern would likely request authorization to open-cut the Altamaha River. Southern would file a site-specific alternate crossing plan (see our contingency crossing plan recommendation in Section 4.3.3). Southern would not be authorized to conduct an open-cut crossing of the Altamaha River until an environmental review has been conducted by the Commission staff.

Bluff White Oak

Bluff white oak is a Georgia tracked species with potential to occur within the Cypress Pipeline Project area in Glynn County (GADNR, 2005d). This species is a rare tree of calcareous bluffs and mesic woods.

The bluff white oak was known to occur in mixed pine-oak communities along the Cypress Pipeline Project corridor in 1993. However, these areas have been cleared and the present status of the species is unknown (GANDR, 2005d). Southern has agreed to resurvey areas with mixed pine-oak communities prior to construction to determine if this species is present. If present, the implementation of our Plan 2003 and Procedures 2003 (Appendices D and E, respectively), with approved modifications, would minimize impacts to the Bluff White Oak by minimizing tree clearing.

Green-Fly Orchid

The green-fly orchid is considered a rare species by the state of Georgia and may occur in the Cypress Pipeline Project area in Glynn County (GADNR, 2005d). This species is a perennial herb that grows on trees or rocks, and can be found on shaded limbs of southern magnolia and live oaks as well as other hardwoods in swamps and on bluffs (UGA, 2002).

The green fly orchid was known to occur in mixed pine-oak communities in the vicinity of the Cypress Pipeline Project corridor in 1993 (GANDR, 2005d). However, these areas have been previously cleared and the present status of the species is unknown (GANDR, 2005d). Southern has agreed to resurvey areas with mixed pine-oak communities prior to construction. If present, the implementation of our Plan 2003 and Procedures 2003 (Appendices D and E, respectively), with approved modifications, would minimize impacts to green fly orchid by minimizing tree clearing.

Hooded Pitcherplant

The hooded pitcherplant is a rare species in the state of Georgia with the potential to occur in the Cypress Pipeline Project area in Charlton County (GADNR, 2005d). This species may occur in or near bogs or swamps or open pine lands generally in soils leached of soluble nutrients.

There is a pitcherplant bog along a power transmission line that contains the hooded pitcherplant. The Cypress Pipeline Project may impact this and other pitcherplant bogs. Southern has agreed to resurvey potential pitcherplant bog communities in March 2006. As noted for the parrot pitcherplant discussed above, we have recommended that Southern coordinate with the appropriate resource agencies to determine the need for developing additional mitigation measures to avoid or minimize impacts on pitcherplants and associated sensitive species. Implementation of the recommendation would avoid adverse impacts on this species.

Pineland Plantain

Pineland plantain is a tracked species in Georgia and could occur in the vicinity of the Cypress Pipeline Project in Long and Glynn Counties, Georgia. This plant is a rare inhabitant of low roadsides and savannahs along the lower coastal plain from North Carolina to Florida. The largest known population of pineland plantain is within the Altamaha basin (UGA, 2002).

Southern has agreed to resurvey areas that may contain pineland plantain prior to construction in March 2006. Implementation of our Plan 2003 and Procedures 2003 (Appendices D and E, respectively) with approved modifications would minimize impacts on this species, if present in the project area.

Southern Umbrella-sedge

Southern umbrella-sedge is a tracked species in Georgia with potential to occur in the Cypress Pipeline Project area in Charlton County. This species is an emergent species that grows from many lakes and ponds into adjacent wet meadows, often in association with pitcherplant bogs.

A pitcherplant bog is known to occur along a power transmission line that is adjacent to the Cypress Pipeline Project corridor. The Cypress Pipeline Project may impact this and other pitcherplant bogs. Southern has agreed to resurvey potential pitcherplant bog communities in March 2006. As noted for the parrot pitcherplant discussed above, we have recommended that Southern coordinate with the appropriate resource agencies to determine the need for developing additional mitigation measures to avoid or minimize impacts on pitcherplants and associated sensitive species. Implementation of the recommendation would avoid adverse impacts on southern umbrella-sedge.

4.7.4 Summary of Determinations of Effect for Federally Listed or Special Status Species

Habitat availability is believed to be the primary limiting factor for some threatened, endangered, and special-status species. The distribution and abundance of threatened, endangered, and special-status species is limited; therefore, any impact on these species may affect the size or viability of the existing populations.

Both Southern and FGT have agreed to complete surveys of previously unsurveyed corridor prior to construction. We have determined that with the implementation of Southern's and FGT's proposed construction and mitigation plans, and our recommendations, the projects would have no effect on 10 species, are not likely to adversely affect 9 species, and may adversely affect the eastern indigo snake for the FGT Expansion Project. Additional surveys are scheduled to occur prior to construction for the eastern indigo snake, gopher tortoise, flatwoods salamander, gopher frog, pondberry, and pondspice (see table 4.7.4-1). The results of these surveys would not alter our determinations of effect as Southern and FGT would still be required to adhere to their proposed or our recommended conservation measures.

TABLE 4.7.4-1

Survey Schedule for Potential Federal and State-listed Species within the Cypress and FGT Expansion Project Area					
Species	Status			Project/County Where Species May Occur ^a	Survey Schedule
	Federal	Georgia	Florida		
Reptiles					
Eastern Indigo Snake <i>Drymarchon corais couperi</i>	T	T	T	Cypress (GA) – Bryan, Camden, Charlton, Glynn, Liberty, Long, McIntosh Cypress (FL) – All counties FGT – All counties	December 2005 – March 2006
Gopher Tortoise <i>Gopherus polyphemus</i>	SMC	T	SSC	Cypress (GA) – Bryan, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh Cypress (FL) – All counties FGT – All counties	December 2005 – March 2006
Amphibians					
Flatwoods Salamander <i>Ambystoma cingulatum</i>	T	R	--	Cypress (GA) – Bryan, Charlton, Chatham, Effingham, Liberty, Long, McIntosh	March 2006
Gopher Frog <i>Rana capito</i>	--	T	SSC	Cypress (GA) – All counties Cypress (FL) – All counties FGT – All counties	December 2005 – March 2006
Plants					
Pondberry <i>Lindera melissifolia</i>	E	E	--	Cypress (GA) – Chatham, Effingham	March 2006
Pondspice <i>Litsea aetivalis</i>	SMC	T	E	Cypress (GA) – Bryan, Camden, Charlton, Glynn, Long, McIntosh Cypress (FL) – Clay	March 2006
^a Federal Status: E = endangered, T = threatened, SMC = species of management concern ^b State Status: E = endangered, T = threatened, R = rare, SSC = Species of Special Concern ^c Cypress = Cypress Pipeline Project FGT = FGT Expansion Project.					

We believe that if the species-specific minimization and mitigation measures are followed, construction and maintenance activities of the Cypress Pipeline and FGT Expansion Projects would either have no effect or no adverse effect on the other threatened, endangered, or special-status species. Because we have requested that the FWS consider this draft EIS as our BA for the Cypress Pipeline and FGT Expansion Projects with respect to construction, maintenance, and associated operational activities, in order to comply with our responsibilities under Section 7 of ESA, **we recommend that:**

- **Southern and FGT should not begin construction activities for the respective projects until:**
 - a. **the FERC staff receives survey comments from the FWS or state agencies regarding their respective proposed actions;**
 - b. **the FERC staff completes formal consultation with the FWS for the eastern indigo snake for the FGT Expansion Project; and**
 - c. **Southern and FGT have received written notification from the Director of OEP that construction or use of mitigation may begin.**

4.8 LAND USE, TRANSPORTATION, SPECIAL MANAGEMENT AREAS, RECREATION AND PUBLIC INTEREST AREAS, AND VISUAL RESOURCES

4.8.1 Land Use

4.8.1.1 Cypress Pipeline Project

Pipeline Facilities

Southern's Cypress Pipeline Project would involve construction of 176.5 miles of loop, mainline, and lateral pipeline in Chatham, Effingham, Bryan, Liberty, Long, McIntosh, Glynn, Camden, and Charlton Counties, Georgia; and Nassau, Duval, and Clay Counties Florida. The pipeline facilities would include 9.8 miles of loop, 166.6 miles of mainline, and 0.1 mile of lateral pipeline.

Open land accounts for 63.7 percent (73.8 acres) of the land use that would be affected by construction of the loop. Forest land and silvicultural land (i.e., pine plantation) are the next most prevalent land uses that would be impacted with 19.7 percent (22.8 acres) and 15.3 percent (17.7 acres) of impact, respectively. The remaining 1.3 percent of land use that would be affected by construction of the loop includes industrial and residential land with 0.9 and 0.6 acres of impact, respectively. These impacts include a total of 6.8 acres would be cleared for temporary extra workspace, of which 3.3 acres is forest land, 1.9 acres is open land, and 1.6 acres is silvicultural lands. Following construction, Southern would permanently retain 1.9 acres for operation of the loop.

Construction of the mainline would primarily affect forest land (829.4 acres), silvicultural land (582.1 acres), and open land (641.2 acres). These three land uses account for 93.5 percent of the land uses that would be affected by the construction right-of-way. Impacts on forest lands would occur primarily in Chatham, Effingham, Bryan, Liberty, Glynn and Camden Counties, Georgia, and Nassau and Duval Counties, Florida. Impacts on silvicultural lands would occur in Georgia, primarily in Chatham, Effingham, Liberty, McIntosh, Glynn, Camden, and Charleton Counties. The majority of open land impacts would occur in Chatham, Effingham, Liberty, McIntosh, Glynn, Camden, and Charlton Counties, Georgia and Nassau and Duval Counties, Florida.

Construction of the mainline would also impact 81.7 acres (3.7 percent) of industrial land in Chatham County, Georgia and Duval County, Florida; 53.4 acres (2.4 percent) of agricultural land in Nassau and Duval Counties, Florida; 4.6 acres (0.2 percent) of open water in Chatham, Effingham, Bryan, McIntosh, Glynn, Camden, and Charlton Counties, Georgia and Nassau and Duval Counties, Florida; and 2.7 acres (0.1 percent) of residential property in Effingham County, Georgia and Duval and Clay Counties, Florida. Following construction, Southern would permanently retain 855.7 acres for operation of the mainline. Construction of the mainline would also require 90.2 acres of temporary extra workspace and 223.4 acres of staging areas, all of which would be allowed to revert to their previous land uses following construction.

Construction of Southern's 12-inch-diameter lateral pipeline in Duval County, Florida would affect 0.7 acre of industrial land during construction. Southern would retain 0.4 acre for operation of the lateral pipeline.

In addition to the impacts described above, Southern would use about 187 existing public and private roads that intersect or parallel the proposed pipeline routes to access the right-of-way (see table C-2 in Appendix C). Southern anticipates that four of these access roads may require improvements associated with waterbody crossings, prior to use. These roads and the anticipated improvements are discussed in section 2.2.1.

Table 4.8.1-1 summarizes the lengths of various land uses that would be crossed by the centerline of Southern's pipeline facilities.

TABLE 4.8.1-1

Land Uses Crossed by the Centerline of Southern's Pipeline Facilities (in miles)^a

Facility/State/County	Residential ^b	Industrial ^c	Agriculture ^d	Forest Land ^e	Silviculture ^f	Open Land ^g	Open Water ^h	Total
Georgia Loop								
Chatham, GA	0.0	0.0	0.0	0.0	0.0	4.8	0.0	4.8
Effingham, GA	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0
Loop total	0.0	0.0	0.0	0.0	0.0	9.8	0.0	9.8
Mainline								
Georgia Mainline								
Chatham, GA	0.0	0.1	0.0	6.2	3.9	1.4	0.0	11.6
Effingham, GA	0.1	0.0	0.0	5.9	4.9	1.9	0.1	12.9
Bryan, GA	0.0	0.0	0.0	5.0	1.6	0.9	0.1	7.6
Liberty, GA	0.0	0.0	0.0	5.0	8.9	4.1	0.0	18.0
Long, GA	0.0	0.0	0.0	1.0	1.0	0.0	0.0	2.0
McIntosh, GA	0.0	0.0	0.0	4.3	10.0	2.5	0.1	16.9
Glynn, GA	0.0	0.0	0.0	10.5	9.6	3.7	0.1	23.9
Camden, GA	0.0	0.0	0.0	10.1	5.1	2.7	0.1	18.0
Charlton, GA	0.0	0.0	0.0	3.1	5.9	2.4	0.1	11.5
Georgia Mainline total	0.1	0.1	0.0	51.1	50.9	19.6	0.6	122.4
Florida Mainline								
Nassau, FL	0.0	0.0	5.9	21.8	0.0	2.3	0.0	30.0
Duval, FL	0.0	0.1	0.8	9.8	0.0	2.8	0.0	13.5
Clay, FL	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.7
Florida Mainline total	0.0	0.1	6.7	31.9	0.0	5.5	0.0	44.2
Mainline total	0.1	0.2	6.7	83.0	50.9	25.1	0.6	166.6
Lateral								
Duval, FL	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Project Total	0.1	0.3	6.7	83.3	50.9	35.0	0.6	176.5

^a Based on the centerline of the pipe.

^b Residential land consists of areas used primarily for private dwellings. Residential yards, subdivisions, and planned new residential developments are also included in this land use category.

^c Commercial/Industrial land includes electric power plants or gas utility stations, manufacturing or industrial plants, and commercial or retail facilities.

^d Agricultural land consists of areas primarily used for active cropland, orchards, vineyards, or hay fields.

^e Forest land consists of upland and wetland forest areas not being used for agricultural or forestry specific purposes.

^f Silviculture consists of pine plantations used for timber, Christmas trees, and silviculture.

^g Open land consists of vacant parcels or open space not specifically designated for outdoor recreation. Includes mowed areas (not residential lawns) and undeveloped areas of property owned by commercial/industrial operations or private residents. Also includes open field regrowth and upland scrub. Emergent and scrub-shrub wetlands and open maintained existing powerline and pipeline right-of-way are also included in this land use category.

^h Open water includes stream crossings greater than 10 feet in width (e.g., the Altamaha River crossing).

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Aboveground Facilities

Aboveground facilities proposed for the Cypress Pipeline Project include three new compressor stations, four new meter stations, and 16 block valves as well as modifications to its existing Port Wentworth, Rincon Gate and Marietta Meter Stations. The specific land requirements and land uses that would be affected by each of Southern's aboveground facilities are listed in table 4.8.1-2.

TABLE 4.8.1-2

Aboveground Facility Land Requirements and Land Use for the Cypress Pipeline Project

Facility	Milepost	County, State	Acres Affected During Construction/ Operation	Existing Land Use
New Compressor Stations ^a				
Compressor Station 1	40.5	Liberty, GA	13.5/5.5	Forest Land
Compressor Station 2	81.1	Glynn, GA	15.6/5.9	Forest Land
Compressor Station 3	126.9	Nassau, FL	13.6/5.1	Forest Land/Open Land
New Meter Stations ^b				
AGL Meter Station	65.9	Glynn, GA	1.0/1.0	Forest Land / Open Land
South Georgia Meter Station	143.7	Nassau, FL	1.1/1.1	Forest Land
JEA Brandy Branch Meter Station	149.7	Duval, FL	1.0/1.0	Industrial
FGT Meter Station	159.8	Clay, FL	1.0/1.0	Forest Land
Existing Meter Stations ^b				
Rincon Gate Meter Station	95.0	Effingham, GA	3.6/1.6	Forest Land/Open Water/Open Land
Port Wentworth Meter Station	104.8	Chatham, GA	0.3/0.0	Industrial
Marietta Meter Station	N/A	Cobb, GA	0.8/0.8	Industrial
New Mainline Block Valves (MLV) ^c				
MLV #1	R0.0	Effingham, GA	0.0/0.0	Forest Land/Open Land
MLV #2	7.7	Effingham, GA	0.0/0.0	Forest Land
MLV #3	R15.1	Chatham, GA	0.0/0.0	Forest Land
MLV #4	R25.8	Bryan, GA	0.0/0.0	Forest Land
MLV #5	40.5	Liberty, GA	0.0/0.0	Forest Land
MLV #6	57.4	McIntosh, GA	0.1/0.1	Forest Land
MLV #7	66.0	Glynn, GA	0.0/0.0	Forest Land
MLV #8	81.1	Glynn, GA	0.0/0.0	Forest Land
MLV #9	81.1	Glynn, GA	0.0/0.0	Forest Land
MLV #10	99.9	Camden, GA	0.1/0.1	Forest Land
MLV #11	119.2	Nassau, FL	0.1/0.1	Forest Land
MLV #12	126.8	Nassau, FL	0.0/0.0	Forest Land
MLV #13	143.7	Nassau, FL	0.0/0.0	Forest Land
MLV #14	159.8	Clay, FL	0.0/0.0	Forest Land
New Loop Block Valves (LBV) ^c				
LBV #1	104.8	Chatham, GA	0.0/0.0	Industrial
LBV #2	95.0	Effingham, GA	0.0/0.0	Forest Land/Open Land

^a Southern would acquire a 32.6-acre parcel for Compressor Station 1, a 36.0-acre parcel for Compressor Station 2, and a 35.0-acre parcel for Compressor Station 3; however, only about one-third of each parcel would be used to construct and operate the facility.

^b The one-acre meter station parcels would be located partially within the construction and permanent rights-of-way for the pipeline facilities. The Port Wentworth Meter Station site would also accommodate LBV #1 and a pig launcher. The AGL Meter Station site would also accommodate MLV #7. The South Georgia Meter Station site would also accommodate MLV #13. The FGT Meter Station site would also accommodate MLV #14 and a pig receiver.

^c With the exception of MLVs #6, #10, #11, MLVs and LBVs would be located either within or adjacent to compressor station or meter station sites, or within the mainline permanent right-of-way.

Forest land would be the primary land use affected by Southern's proposed aboveground facilities. Some open land and industrial land would also be affected. The majority of the forest clearing would occur at the three new compressor stations sites. Compressor Station 1 would be located on a 32.6-acre parcel. Construction of the station would disturb approximately, 13.5 acres of forest land. Southern would maintain and fence about 5.5 acres of the site to operate the facility. The remainder of the 32.6-acre site would be retained as a buffer. Compressor Station 2 would be located on a 36-acre parcel. Construction of the station would disturb approximately 15.6 acres of forest land. Southern would maintain and fence about 5.9 acres of the site to operate the facility. The remainder of the 36.0-acre site would be retained as a buffer. Compressor Station 3 would be located on a 35-acre parcel. Construction of the station would disturb approximately, 13.6 acres of forest land and open land. Southern would maintain and fence about 5.1 acres of the site to operate the facility. The remainder of the 35.0-acre site would be retained as a buffer.

Construction of three of the four new meter stations would each temporarily and permanently impact about 1.0 acre of land. Construction of the fourth new meter station (the South Georgia Meter Station) would temporarily and permanently impact 1.1 acre of land. The AGL Meter Station would be located partially on forested wetland and planted pine and partially on open land. The South Georgia and FGT Meter Stations would each be located on forest land. The JEA Brandy Branch Meter Station would be located on industrial land. The proposed expansion of the Rincon Gate Meter Station would affect about 3.6 acres of partially forested, partially open water, and partially open land; and about 1.6 acres of this area would be retained to operate the facility. The proposed modifications to the Port Wentworth and Marietta Meter Stations would temporarily impact about 0.3 acre and 0.8 acre, respectively, of land within the boundaries of the existing facility sites. The Port Wentworth modifications would not require new permanent right-of-way and the Marietta Meter Station modifications would require 0.8 acre of new permanent right-of-way.

Four of the 16 new block valves, including MLV 1, MLV 14, and both LBVs, and all the new pig launcher/receiver facilities, would be located within new compressor station or new/existing meter station sites. Of the other 12 block valves, eight would be adjacent to new compressor station or meter station sites and within the footprint of the permanent right-of-way for the mainline, and four would be within or adjacent to the mainline permanent right-of-way. Block valves would be spaced at intervals ranging between about 7.5 to 20 miles apart and each block valve would be permanently fenced and graveled for a combined total of about 0.4 acre of land impact within the permanent right-of-way for the mainline. With the exception of MLVs 6, 10, and 11, which would each require an additional 20 by 30 foot wide area directly adjacent to the mainline permanent right-of-way, no additional temporary or permanent land use impacts would be required for these facilities beyond that needed for construction and operation of the mainline.

4.8.1.2 FGT Expansion Project

Pipeline Facilities

FGT's Expansion Project would involve construction of 32.6 miles of pipeline loop in Gilchrist, Levy, and Hernando Counties, Florida. FGT would install 5.0 miles in Gilchrist County (Loop J), 15.2 miles in Levy County (Loop K), and 12.4 miles in Hernando County (Loop G).

All of the land use impacts associated with FGT's pipeline loops would be in Florida. A total of 67.5 acres of land would be required for construction of Loop J in Gilchrist County, 168.5 acres would be required for construction of Loop K in Levy County, and 173.5 acres would be required for construction of Loop G in Hernando County. Following construction, FGT would retain 152.7 acres for operation of the pipeline loops.

Open land accounts for 89.2 percent of the land that would be affected by pipeline construction. In all, construction of FGT’s pipeline loops would impact 365.5 acres of open land. The impact of FGT’s loop construction on other land uses would be relatively small, accounting for about 10.8 percent of the total area disturbed. The impacts would include, in descending order of acreage affected, about 16.1 acres (3.9 percent) of forest lands associated primarily with Gilchrist County; 10.3 acres (2.5 percent) of industrial land; 9.3 acres (2.3 percent) of silvicultural land in Gilchrist and Levy Counties; 7.7 acres (1.9 percent) of agricultural land in Gilchrist County; and 0.6 acre (0.2 percent) of residential land in Gilchrist County.

In addition to the impacts described above, FGT would use existing public and private roads that intersect or parallel the proposed pipeline routes to access the right-of-way. FGT anticipates that ten of these access roads may require grading prior to use (see table C-4 in Appendix C). These roads and the anticipated improvements are discussed in section 2.2.2.

Table 4.8.1-3 summarizes the miles of various land uses crossed by the centerline of FGT Expansion Project loops.

Facility/County/State	Residential	Industrial ^b	Agriculture ^c	Forest Land	Silviculture ^d	Open Land ^e	Open Water	Total
Loop J								
Gilchrist, FL	0.0	0.4	0.5	0.0	0.0	4.1	0.0	5.0
Loop K								
Levy, FL	0.0	0.1	0.0	0.0	0.0	15.1	0.0	15.2
Loop G								
Hernando, FL	0.0	0.4	0.0	0.0	0.0	12.2	0.0	12.4
Project Total	0.0	0.9	0.5	0.0	0.0	31.4	0.0	32.6

^a Based on the centerline of the pipe. Does not include land uses crossed by construction right-of-way.
^b Commercial/Industrial land includes electric power plants or gas utility stations, manufacturing or industrial plants, and commercial or retail facilities.
^c Agricultural land consists of areas primarily used for active cropland, orchards, vineyards, or hay fields.
^d Silviculture consists of pine plantations used for timber, Christmas trees, and silviculture.
^e Open land consists of vacant parcels or open space not specifically designated for outdoor recreation. Includes mowed areas (not residential lawns) and undeveloped areas of property owned by commercial/industrial operations or private residents. Also includes open field regrowth and upland scrub. Emergent and scrub-shrub wetlands and open maintained existing powerline and pipeline rights-of-way are also included in this land use category.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Aboveground Facilities

FGT proposes to add compression at two existing compressor stations and make modifications at three other existing compressor stations. FGT would also install new or modify existing piping and/or equipment at five meter and/or regulator stations, and would install new remote blowdown piping at four locations along the proposed pipeline loops (two on Loop K and two on Loop G). Table 4.8.1-4 summarizes the temporary and permanent land uses that would be affected by these facilities. A more detailed description of the components, locations, and construction of aboveground facilities is provided in section 2.1.2.

All of the proposed facilities at FGT’s existing compressor stations would be constructed within the existing fencelines of the stations and no excavation or ground disturbance would be necessary except for modifications at Compressor Stations 26, 16 and 17, which would require generally minor ground disturbances of commercial/industrial land within the existing fenced sites.

TABLE 4.8.1-4

Aboveground Facility Land Requirements and Land Use for the FGT Expansion Project

Facility	Milepost ^a	County	Acres Affected During Construction / Operation	Existing Land Use
Compressor Station 26	West Leg MP 90.6	Citrus	5.0 / 0.0	Commercial/Industrial
Compressor Station 24	West Leg MP 25.4	Gilchrist	0.0 / 0.0	Commercial/Industrial
Compressor Station 16	Jacksonville Lateral MP 0.0	Bradford	6.0 / 0.0	Commercial/Industrial
Compressor Station 17	Mainline MP 608.0	Marion	2.0 / 0.0	Commercial/Industrial
Compressor Station 27	West Leg MP 160.2	Hillsborough	0.0 / 0.0	Commercial/Industrial
Cypress/FGT Interconnect	Jacksonville Lateral MP 27.6	Clay	0.4 / 0.2	Forest Land
Long Branch Regulator Station	Jacksonville Lateral MP 27.6	Clay	3.5 / 2.5	Forest Land
Hines M&R Station	Agricola Lateral MP 7.3	Polk	2.2 / 0.1	Open Land
Brandy Branch M&R Station	Jacksonville Lateral MP 21.1	Bradford	1.1 / <0.1	Open Land
Jacksonville M&R Station	Jacksonville Lateral MP 45.4	Duval	0.4 / 0.0	Commercial/Industrial
Lawtey Regulator Station	Jacksonville Lateral MP 21.2	Bradford	1.1 / <0.1	Open Land
Loop K Remote Blowdown	West Leg MP 44.5	Levy	1.1 / 0.6	Open Land/Silviculture
Loop K Remote Blowdown	West Leg MP 53.7	Levy	0.8 / 0.6	Open Land
Loop G Remote Blowdown	West Lag MP 110.8	Hernando	0.7 / 0.5	Open Land
Loop G Remote Blowdown	West Lag MP 116.8	Hernando	0.7 / 0.5	Open Land

^a Indicates names and mileposts relative to the existing FGT pipeline system facilities

FGT’s installation of new and/or modified piping and/or equipment at the Cypress/FGT Interconnect, Long Branch Regulator Station, Hines M&R Station, Lawtey Regulator Station, Brandy Branch M&R Station, and the Jacksonville M&R Station would require generally minor ground disturbances within or directly adjacent to existing facilities and some new permanent aboveground facilities. The Cypress/FGT Interconnect would impact forested land adjacent to Southern’s proposed FGT meter station, and the Long Branch Regulator Station would impact forest land just east of the Cypress/FGT Interconnect. Those facilities each would require about 0.4 acre and 3.5 acres for construction, and 0.2 acre and 2.5 acres for operation, respectively.

The new and modified facilities at the Hines M&R, Brandy Branch M&R, and Lawtey Regulator Stations would each disturb about 2.2, 1.1, and 1.1 acres of open land within and adjacent to the existing facility sites during construction, and would require 0.1, <0.1, and <0.1 acre of new permanent rights-of-way, respectively. The Jacksonville M&R Station improvements would temporarily impact about 0.4 acre of commercial/industrial land, and would not require any new permanent right-of-way.

Loop K and Loop G would each require installation of two remote blowdown locations. Construction of the remote blowdown on Loop K at MP 44.5 would require disturbance to about 0.7 acre of open land and about 0.4 acre of pine plantation, of which 0.4 and 0.1 acre of open and forest land, respectively, would be permanently retained for operation of the facility. The remote blowdown facility at MP 53.7 on Loop K would require disturbance to 0.8 acre of open land and 0.6 acre would be permanently retained to operate the facility. Each of the remote blowdown locations on Loop G would occur in open lands and would require 0.7 and 0.5 acre each for construction and operation, respectively.

4.8.1.3 General Impacts

Construction and operation of the proposed pipelines would result in short-term, long-term, and permanent land use impacts. Short-term impacts would result primarily from ground disturbance and increased equipment traffic associated with clearing and subsequent construction activities. Impacts would include an increase in local traffic congestion, noise, and dust, as well as the temporary loss of land use and disturbance of the visual landscape. These impacts would be confined primarily to the duration of construction and would dissipate or end after the right-of-way is restored and revegetated and the temporary work areas are relinquished to the landowner. Following construction, the land for the temporary construction right-of-way and temporary extra workspaces would be allowed to revert to prior uses.

Long-term and permanent impacts would result primarily from tree clearing, and land encumbrances associated with use restrictions on the permanent right-of-way and aboveground facility sites. Restrictions would prohibit certain types of uses from occurring within the right-of-way, including the construction of any permanent aboveground structures.

Operational activities would include periodic mechanical maintenance of vegetation on the permanent right-of-way to keep it in an herbaceous state to facilitate periodic aerial and pedestrian surveys of the pipeline. Landowners would be allowed to use the permanent right-of-way for most uses in accordance with their easement agreements. However, structures that are not easily moveable, such as house additions, garages, patios, swimming pools, and septic tanks, would not be permitted on the permanent right-of-way. In addition, trees and bushes greater than 5 feet in height would not be permitted on the permanent right-of-way.

The effect of the pipelines would be greatest in forest lands (which includes forested wetlands) and in silvicultural lands consisting of upland and wetland pine plantations. Impacts on forest land and pine plantations would include the removal of trees within the construction rights-of-way and temporary extra workspaces, and the post-construction maintenance of the permanent rights-of-way, which would prevent the reestablishment of trees. The amount of temporary and permanent forest clearing would depend on width of the construction and permanent rights-of-way and the degree to which these areas overlap other existing cleared rights-of-way. A detailed description of the widths and overlap of these areas is included in section 2.2. Following construction, forest land and pine plantation located outside of the permanent rights-of-way would be allowed to regrow. It is expected that the reestablishment of forest like what was present prior to construction could take up to 20 to 40 years depending on the age of trees removed and the species of trees that are recruited or replanted. Compensation for tree loss would be determined during easement negotiations.

The impact of the projects on other land uses would be less than in forested areas because less acreage of these other land uses would be affected and because these other land uses would recover to preconstruction condition more quickly. Open lands would likely return to preconstruction condition within 1 to 5 years. Impacts on open water, industrial land, agricultural land, and residential properties would be limited primarily to the period of construction, although the productivity of some lands such as agricultural land could be diminished for 1 to 3 years following construction (see sections 4.2.2 and 4.8.3 for more discussion of agricultural and residential land impacts and mitigation).

The impact of aboveground facilities on land uses would depend on the type and location of the facilities relative to other land uses, but could include temporary loss of existing land uses during construction, permanent loss of existing land uses resulting from fencing and the conversion of the existing land uses to industrial use, and visual impacts. Table 4.8.1-5 summarizes the various land uses that would be affected in each county and state by the pipeline, aboveground facilities, and temporary extra workspaces and warehouse yards.

TABLE 4.8.1-5

Acres of Land Affected by Construction and Operation of the Cypress Pipeline and FGT Expansion Projects

Facility/County/State	Residential Land		Industrial Land		Agricultural Land		Forest Land		Silviculture		Open Land		Open Water		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
CYPRESS PIPELINE PROJECT																	
Loop																	
Chatham, GA																	
Pipeline-Right-of-Way	0.0	0.0	0.6	0.4	0.0	0.0	8.9	0.1	10.1	0.0	35.7	1.4	0.0	0.0	55.3	1.9	
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.1	0.0	1.9	0.0	0.0	0.0	6.0	0.0	
Aboveground Facilities	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	
Effingham, GA																	
Pipeline-Right-of-Way	0.6	0.0	0.0	0.0	0.0	0.0	10.6	0.0	6.0	0.0	36.2	0.0	0.0	0.0	53.4	0.0	
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.8	0.0	
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	
Loop total	0.6	0.0	0.9	0.4	0.0	0.0	22.8	0.1	17.7	0.0	73.8	1.4	0.0	0.0	115.8	1.9	
Mainline																	
Georgia Mainline																	
Chatham, GA																	
Pipeline-Right-of-Way	0.0	0.0	0.3	0.0	0.0	0.0	59.6	28.7	44.8	23.7	18.5	4.8	0.5	0.0	123.7	57.2	
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	10.0	0.0	0.0	0.0	4.5	0.0	0.9	0.0	6.0	0.0	0.0	0.0	21.4	0.0	
Aboveground Facilities	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	
Effingham, GA																	
Pipeline-Right-of-Way	0.9	0.7	0.0	0.0	0.0	0.0	43.4	20.7	41.6	29.7	44.8	3.0	0.5	0.0	131.2	54.1	

TABLE 4.8.1-5 (cont'd)

Acres of Land Affected by Construction and Operation of the Cypress Pipeline and FGT Expansion Projects

Facility/County/State	Residential Land		Industrial Land		Agricultural Land		Forest Land		Silviculture		Open Land		Open Water		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
Bryan, GA	Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.3	0.0	0.0	0.0	3.4	0.0
	Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.8	0.0	0.0	1.7	0.7	0.2	0.1	3.6	1.6
	Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	52.0	24.9	20.0	9.6	8.2	4.6	0.4	0.0	80.6	39.1
	Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Liberty, GA	Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	44.1	19.0	102.9	54.8	50.0	13.1	0.0	0.0	197.0	86.9
	Temporary Extra Workspace and Warehouse Yards	0.0	0.0	7.0	0.0	0.0	0.0	0.5	0.0	2.4	0.0	7.9	0.0	0.0	0.0	17.8	0.0
Long, GA	Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	13.5	5.5	0.0	0.0	0.0	0.0	0.0	0.0	13.5	5.5
	Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	7.0	4.1	8.5	5.9	6.6	0.3	0.0	0.0	22.1	10.3
	Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
McIntosh, GA	Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	29.4	16.0	95.3	65.0	61.3	5.6	1.1	0.0	187.1	86.6

TABLE 4.8.1-5 (cont'd)

Acres of Land Affected by Construction and Operation of the Cypress Pipeline and FGT Expansion Projects

Facility/County/State	Residential Land		Industrial Land		Agricultural Land		Forest Land		Silviculture		Open Land		Open Water		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	36.0	0.0	2.8	0.0	18.9	0.0	0.0	0.0	57.7	0.0
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1
Glynn, GA																
Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	76.9	41.9	91.5	61.3	79.1	6.8	0.6	0.0	248.1	110.0
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	53.7	0.0	0.0	0.0	3.0	0.0	15.6	0.0	1.4	0.0	0.0	0.0	73.7	0.0
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	15.6	5.9	0.0	0.0	1.0	1.0	0.0	0.0	16.6	6.9
Camden, GA																
Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	107.3	50.0	58.6	34.0	53.7	5.6	0.4	0.0	220.0	89.6
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	20.3	0.0	10.9	0.0	0.6	0.0	0.0	0.0	31.8	0.0
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1
Charlton, GA																
Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	22.0	12.7	68.9	41.0	37.1	5.8	0.5	0.0	128.5	59.5
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	40.2	0.0	0.0	0.0	48.5	0.0
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wayne, GA ^a																
Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 4.8.1-5 (cont'd)

Acres of Land Affected by Construction and Operation of the Cypress Pipeline and FGT Expansion Projects

Facility/County/State	Residential Land		Industrial Land		Agricultural Land		Forest Land		Silviculture		Open Land		Open Water		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
Cobb, GA ^b	Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	0.0	0.0	0.0	13.2	0.0
	Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Aboveground Facilities	0.0	0.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
	Georgia Mainline total	0.9	0.7	72.1	0.8	0.0	0.0	537.5	230.2	573.1	325.0	453.5	51.3	4.2	0.1	1641.3	608.1
Florida Mainline																	
Nassau, FL																	
Pipeline-Right-of-Way	0.0	0.0	0.0	0.0	46.6	35.8	164.6	118.7	0.0	0.0	115.3	10.1	0.1	0.0	327.2	164.6	
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	3.6	0.0	9.8	0.0	0.0	0.0	17.2	0.0	
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	14.7	6.2	0.0	0.0	0.0	0.0	0.0	0.0	14.7	6.2	
Duval, FL																	
Pipeline-Right-of-Way	0.4	0.0	4.4	0.5	6.8	5.1	99.3	58.2	0.0	0.0	45.3	5.4	0.3	0.0	156.5	70.5	
Temporary Extra Workspace and Warehouse Yards	0.2	0.0	4.2	0.0	0.0	0.0	1.1	0.0	5.4	0.0	14.1	0.0	0.0	0.0	25.0	0.0	
Aboveground Facilities	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	
Clay, FL																	
Pipeline-Right-of-Way	1.2	0.0	0.0	0.0	0.0	0.0	7.4	3.1	0.0	0.0	2.6	2.5	0.0	0.0	11.2	5.6	

TABLE 4.8.1-5 (cont'd)

Acres of Land Affected by Construction and Operation of the Cypress Pipeline and FGT Expansion Projects

Facility/County/State	Residential Land		Industrial Land		Agricultural Land		Forest Land		Silviculture		Open Land		Open Water		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
Temporary Extra Workspace and Warehouse Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	
Florida Mainline total	1.8	0.0	9.6	1.5	53.4	40.9	291.9	187.2	9.0	0.0	187.7	18.0	0.4	0.0	553.8	247.6	
Mainline total	2.7	0.7	81.7	1.5	53.4	40.9	829.4	417.4	582.1	325.0	641.2	69.3	4.6	0.0	2195.1	855.7	
Lateral																	
Duval, FL (Brandy Branch Lateral)	0.0	0.0	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	
Cypress Pipeline Project Total^c	3.3	0.7	83.3	2.3	53.4	40.9	852.2	417.5	599.8	325.0	715.0	70.7	4.6	0.0	2311.6	858.0	
FGT EXPANSION PROJECT																	
Loop J																	
Gilchrist, FL																	
Pipeline-Right-of-Way	0.6	0.0	3.2	2.1	7.7	2.4	11.3	0.0	6.7	0.0	38.0	19.9	0.0	0.0	67.5	24.4	
Temporary Extra Workspaces	0.1	0.0	0.2	0.0	0.3	0.0	0.7	0.0	3.2	0.0	6.7	0.0	0.0	0.0	11.2	0.0	
Loop K																	
Levy County, FL																	
Pipeline-Right-of-Way	0.0	0.0	1.7	0.4	0.0	0.0	4.5	1.3	2.6	0.4	159.7	73.3	0.0	0.0	168.5	75.4	
Temporary Extra Workspaces	0.0	0.0	2.8	0.0	0.0	0.0	1.1	0.0	0.0	0.0	17.9	0.0	0.0	0.0	21.8	0.0	
Blowdown Valves	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.4	0.1	1.5	1.1	0.0	0.0	2.7	2.0	
Loop G																	
Hernando County, FL																	
Pipeline-Right-of-Way	0.0	0.0	5.4	0.9	0.0	0.0	0.3	0.0	0.0	0.0	167.8	52.0	0.0	0.0	173.5	52.9	
Temporary Extra Workspaces	0.0	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.5	0.0	0.0	0.0	14.5	0.0	
Blowdown Valves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.1	0.0	0.0	1.4	1.1	

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TABLE 4.8.1-5 (cont'd)

Acres of Land Affected by Construction and Operation of the Cypress Pipeline and FGT Expansion Projects

Facility/County/State	Residential Land		Industrial Land		Agricultural Land		Forest Land		Silviculture		Open Land		Open Water		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
Aboveground Facilities																	
Compressor Station 26																	
Citrus County, FL	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	
Compressor Stations 24 and 27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Compressor Station 16	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	
Bradford County, FL																	
Compressor Station 17	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	
Marion County, FL																	
Cypress/FGT Interconnect	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	
Clay County, FL																	
Long Branch Regulator Station	0.0	0.0	0.0	0.0	0.0	0.0	3.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	3.5	2.5	
Clay County, FL																	
Hines M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.1	0.0	0.0	2.2	0.1	
Polk County, FL																	
Brandy Branch M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	<0.1	0.0	0.0	1.1	<0.1	
Bradford County, FL																	
Jacksonville M&R Station	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	
Duval County, FL																	
Lawtey Regulator Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	<0.1	0.0	0.0	1.1	<0.1	
Bradford County, FL																	
Contractor and Pipeyards																	
FGT CS 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	0.0	0.0	5.5	0.0	
Bradford County, FL																	
Lacoochee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4	0.0	0.0	0.0	17.4	0.0	
Hernando County, FL																	
Brooksville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	
Hernando County, FL																	
Bell	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.9	0.0	0.0	0.0	13.9	0.0	
Gilchrist County, FL																	
Lawtey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	0.0	7.5	0.0	
Bradford County, FL																	
FGT Expansion Project Total ^c	0.7	0.0	26.7	3.4	8.0	2.4	22.6	4.8	12.9	0.5	471.2	147.5	0.0	0.0	542.1	158.6	

TABLE 4.8.1-5 (cont'd)

Acres of Land Affected by Construction and Operation of the Cypress Pipeline and FGT Expansion Projects

Facility/County/State	Residential Land		Industrial Land		Agricultural Land		Forest Land		Silviculture		Open Land		Open Water		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Cypress Pipeline and FGT Expansion Project Totals	4.0	0.7	110.0	6.5	61.4	43.3	874.8	422.3	612.7	325.5	1186.2	218.2	4.6	0.1	2853.7	1016.6

- ^a Acreage impacts in this county is related only to an offline staging yard.
- ^b Acreage impacts in this county is related only to offline improvements at an existing meter station.
- ^c Total acreages do not include access road impacts.

Const. = Construction Impacts

Oper. = Operation Impacts

Note: The totals shown in this table may not equal the sum of addends due to rounding.

4.8.2 Land Ownership and Easement Requirements

4.8.2.1 Pipeline Facilities

Table 4.8.2-1 summarizes land ownership along Southern's and FGT's pipeline routes. Most of the lands that would be affected by the pipelines, including about 164.9 miles (93.4 percent) of Southern's pipeline routes and 32.1 miles of the FGT routes are privately owned. The 12.0 miles (6.8 percent) of public land that would be crossed by Southern's pipelines includes federal land managed by the U.S. Department of Defense; state land managed by either the GADNR or the Saint John's River Water Management District in Florida; and municipal or county lands owned by the City of Jacksonville. The 0.1 mile of public land that would be crossed by FGT's pipelines consists of state land managed by the Florida Department of Agriculture and Consumer Services, Division of Forestry.

Prior to initiating construction, an easement would need to be secured to convey both temporary (for construction) and permanent (for operation) rights-of-way to the pipeline company. The easement would give the company the right to construct, operate, and maintain the pipeline, and establish a permanent right-of-way. In return, the company would compensate the landowner for use of the land. The easement agreement between the company and landowner typically specifies compensation for loss of use during construction, loss of nonrenewable or other resources, damage to property during construction, and allowable uses of the permanent right-of-way after construction.

If an easement cannot be negotiated with a landowner and the project has been certificated by the FERC, the company may use the right of eminent domain granted to it under Section 7(h) of the NGA and the procedure set forth under the Federal Rules of Civil Procedure (Rule 71A) to obtain the right-of-way and extra workspace areas. The company would still be required to compensate the landowner for the right-of-way and for any damages incurred during construction. However, a court would determine the level of compensation if a Certificate is issued. In either case, the landowner would be compensated for the use of the land. Eminent domain would not apply to lands under federal ownership.

4.8.2.2 Aboveground Facilities

All of the Southern and FGT aboveground facilities, except Southern's AGL Meter Station and MLV #4 would be located on private land. The AGL Meter Station would be located on state land within the Sansavilla Wildlife Management Area. MLV #4 would be located on federal land within Fort Stewart. Southern and FGT would purchase the lands in fee or would negotiate easements with the existing landowners for the proposed aboveground facilities. As with the pipeline easements, if the FERC issues Certificates for the projects and an agreement cannot be negotiated, the companies may use the right of eminent domain granted to it under Section 7(h) of the NGA and the procedure set forth under the Federal Rules of Civil Procedure (Rule 71A) to obtain the necessary lands.

4.8.3 Existing Residences and Planned Developments

4.8.3.1 Cypress Pipeline Project

Southern's proposed construction work area for the pipeline facilities would be located within 50 feet of 8 residences, 15 non-residential structures (e.g., carports, sheds, barns, etc), and 2 industrial buildings associated with the McIntosh Power Plant. Ten of the non-residential structures and the two industrial buildings would actually be located within the typical construction work area but would be avoided by reducing the construction right-of-way. Six of the residences and five non-residential structures would be within 25 feet of construction work areas. All of these residences and non-residential structures are in areas where Southern would be constructing either adjacent to its existing pipelines (i.e., the loop pipeline) or existing power line corridors (i.e., the mainline pipeline).

TABLE 4.8.2-1

Summary of Land Ownership Crossed by the Cypress Pipeline and FGT Expansion Projects (in miles)

Facility /County/State	Private	Federal	State	County/ Municipal	Total
CYPRESS PIPELINE PROJECT					
Loop					
Chatham, GA	4.8	0.0	0.0	0.0	4.8
Effingham, GA	5.0	0.0	0.0	0.0	5.0
Loop total	9.8	0.0	0.0	0.0	9.8
Georgia Mainline					
Chatham, GA	11.6	0.0	0.0	0.0	11.6
Effingham, GA	12.9	0.0	0.0	0.0	12.9
Bryan, GA	5.9	1.7 ^a	0.0	0.0	7.6
Liberty, GA	18.0	0.0	0.0	0.0	18.0
Long, GA	2.0	0.0	0.0	0.0	2.0
McIntosh, GA	16.9	0.0	0.0	0.0	16.9
Glynn, GA	16.0	0.0	7.9 ^b	0.0	23.9
Camden, GA	18.0	0.0	0.0	0.0	18.0
Charlton, GA	11.5	0.0	0.0	0.0	11.5
Subtotal	112.8	1.7	7.9	0.0	122.4
Florida Mainline					
Nassau, FL	28.7	0.0	1.3 ^c	0.0	30.0
Duval, FL	12.4	0.0	0.0	1.1 ^d	13.5
Clay, FL	0.7	0.0	0.0	0.0	0.7
Subtotal	41.8	0.0	1.3	1.1	44.2
Mainline total	154.6	1.7	9.2	1.1	166.6
Lateral					
Duval, FL	0.1	0.0	0.0	0.0	0.1
Project Total	164.5	1.7	9.2	1.1	176.5
FGT EXPANSION PROJECT					
Loop J					
Gilchrist, FL	5.0	0.0	0.0	0.0	5.0
Loop K					
Levy, FL	15.1	0.0	0.1 ^e	0.0	15.2
Loop G					
Nassau, FL	12.4	0.0	0.0	0.0	12.4
Project Total	32.5	0.0	0.1	0.0	32.6
^a	Federal land in Bryan County, Georgia includes 1.7 miles of Fort Stewart managed by the Department of Defense.				
^b	State land in Glynn County, Georgia includes 3.7 miles of the Sansavilla Wildlife Management Area and 4.2 miles of the Paulk's Pasture Wildlife Management Area. Both wildlife management areas are managed by the Georgia Department of Natural Resources.				
^c	State land in Nassau County, Florida includes 1.3 miles of the Ralph E. Simmons State Forest managed by the Saint John's River Water Management District.				
^d	The referenced mileage crossed reflects the proposed Northeast Florida Timberlands and Watershed Reserve Florida Forever BOT Project (which includes 132,450 acres); only one tract of public land is crossed by the Cypress Pipeline Project at MPs 147.6-148.7 (1.1-acres).				
^e	State land crossed by Loop K includes 0.1 mile of the Andrews Nursery, which is managed by the Florida Department of Agriculture and Consumer Services, Division of Forestry.				

Southern has prepared site-specific residential construction mitigation plans to minimize disruption and maintain access to residences within 50 feet of construction work areas. These site-

specific plans depict the location of residences in relation to the proposed pipeline and other existing facilities; the edge of the construction work area; the edge of the new permanent right-of-way; other nearby residences, structures, roads, or waterbodies; and planned mitigation measures. Table 4.8.3-1 identifies residences within 50 feet of Southern’s construction work area and specific mitigation measures (including two residences within 60 feet and 52 feet of the construction right-of-way, respectively). In addition, our recommended collocation variation (see section 3.3.2.1) would further reduce impact on two residences along the mainline at MP 6.5 and M.P. 8.2.

Facility/County/State	Milepost	Tract	Type of Structure	Distance to Construction Work Area (feet) ^a	Distance to Pipeline Centerline (feet) ^a	Site-Specific Residential Drawing	Proposed Mitigation
Loop							
Effingham, GA	98.3	274.1	Residential	19	44	1220-CYP-RM-006	b, c, d, e, or f
Effingham, GA	98.3	275	Residential	40	65	1220-CYP-RM-006	b, c, d, e, or f
Mainline							
Effingham, GA	1.5	EF-014	Residential	60	100	1220-CYP-RM-001	b, c, d, or g
Effingham, GA	6.5	EF-060	Residential	12	57	1220-CYP-RM-002	b, c, d, or f
Effingham, GA	8.2	EF-064	Residential	13	53	1220-CYP-RM-003	b, e, or f
Effingham, GA	98.3	274.1	Residential	19	44	1220-CYP-RM-006	b, c, d, e, or f
Effingham, GA	98.3	275	Residential	40	65	1220-CYP-RM-006	b, c, d, e, or f
Nassau, FL	116.9	NA-274	Residential	25	80	1220-CYP-RM-004	b, or c
Duval, FL	155.8	DU-343	Residential	52	87.4	1220-CYP-RM-007	b or d
Clay, FL	159.2	CL-351.2	Residential	23	63	1220-CYP-RM-005	b, c, or f
^a	Distances are approximate.						
^b	Avoid removal of mature trees, immediately restore all lawn areas after back-filling the trench, and fence the construction work area throughout the open trench phase of construction.						
^c	Reduce the construction work area to increase the distance between the residence and the construction work area.						
^d	Adjust centerline/reduce pipeline separation.						
^e	Work over adjacent pipelines.						
^f	Relocate portable structures.						
^g	Provide alternative septic treatment during construction and restore septic system.						

Residential properties encumbered by new permanent pipeline easements would sustain long-term impacts. Residences located along the loop would not be as affected since Southern would not acquire any new permanent right-of-way for the loop in the areas where the homes are located. Along the mainline, however, Southern proposes to acquire about 50 feet of new permanent right-of-way adjacent to the existing power line corridors. This would incrementally widen the existing corridors and increase the encumbrance of the existing corridor on the affected properties.

Three planned developments would be crossed by Southern’s proposed pipeline facilities and two other planned developments would be located within 0.25 mile of Southern’s proposed pipeline facilities. The locations of these planned developments and the distance between these developments and the proposed pipeline routes are presented in table 4.8.3-2.

TABLE 4.8.3-2 Planned Developments within 0.25 Mile of the Cypress Pipeline Project				
Facility/County/State	Approx. Milepost	Planned Development	Approx. Distance from Pipeline Route	Project Start and End Dates
Loop				
Effingham, GA	95.6	6,000 Equivalent Residential Units	Crossed	None given (First phase of filing process)
Mainline				
Liberty, GA	34.5	Unnamed Residential Development	Crossed	None given
Effingham, GA	6.5	389 Equivalent Residential Units	Crossed	None given (First phase of filing process)
Effingham, GA	1.6	449 Equivalent Residential Units	300 feet north	None given (First phase of filing process)
Effingham, GA	4.5	200 Equivalent Residential Units	800 feet south	None given (First phase of filing process completed / Construction may start at any time)

Southern’s loop would cross the Branigar Subdivision approximately 3,500 feet south of the Rincon Gate Meter Station in Effingham County at about MP 95.6. The application for this subdivision, which includes plans for 6,000 equivalent residential units, is still in the first phase of the filing process and the proposed schedule for implementation of the development is currently unknown. As currently proposed, construction of the pipeline would require temporary work space within the subdivision. However, the loop would be installed adjacent to Southern’s existing pipelines and within Southern’s existing permanent right-of-way. Any development plans would have taken the existing facilities and easements into account and thus would not be permanently affected by the proposed pipeline loop.

Southern’s mainline pipeline would cross the proposed Windfield subdivision in Effingham County at about MP 6.5 and an unnamed planned residential development in Liberty County at about MP 34.5. According to the Effingham County Board of Commissioners Zoning, GIS Department, the Windfield subdivision is proposed to be built in two phases; the first would include 200 equivalent residential units, and the second an additional adjacent 389 equivalent residential units. The Windfield Subdivision development application is still in the first phase of the filing process, thus the proposed schedule for implementation of the development is still unknown. The unnamed residential development identified by the Liberty County Board of Commissioners Zoning and Planning Department is located on coastal development tract #158. The pipeline would cross approximately 300 feet of the eastern corner of this planned development. At both locations the pipeline would be installed adjacent to an existing power line corridor. The developers of these properties would have taken into account the existing power line

corridors and, Southern's construction of the pipeline adjacent to these corridors would minimize impacts on the planned developments. Our recommended collocation variation in section 3.3.2.1 would further reduce impact on the proposed Windfield subdivision development by aligning Southern's proposed mainline within the existing powerline right-of-way and by reducing the new permanent right-of-way requirements between MPs 0.0 and 9.5.

Southern's mainline would also be approximately 300 feet south of and 800 feet north proposed Timber Lakes and Myrtlewood subdivisions, near MPs 1.6 and 4.5 respectively. The development applications for both subdivisions are still in the first phase of the filing process, thus the proposed schedules for implementation of these developments are currently unknown. Due to their distance from the pipeline, neither of these subdivisions would be directly affected by the project. If construction of the pipeline were to occur after one or both of these subdivisions are developed, residents in homes near construction work areas could experience noise, dust, and possibly traffic delays on nearby area roads. These effects, however, would be temporary and limited to the time that the pipeline is constructed near each area since no permanent right-of-way would be needed within these developments.

4.8.3.2 FGT Expansion Project

FGT's proposed construction work area for the pipeline facilities (i.e., construction right-of-way and temporary extra workspaces) would be located within 50 feet of 34 residences and 28 non-residential structures (e.g., garages, sheds). Five of the residences would be located within the proposed construction work area. Another five of these residences would be located within 25 feet of the construction work area.

Table 4.8.3-3 lists the MP location of the residential structures located within 50 feet of construction work areas, and their distance from the proposed pipeline centerline.

FGT has not identified any planned development projects that would be crossed by the proposed pipeline loops or within 0.25 mile of the pipeline and associated facilities. Prior to construction, FGT would identify all planned developments that would be crossed by or within 0.25 mile of the pipeline route, and would provide FERC the following information:

- Project start and end dates;
- Site-specific impacts;
- Site-specific concerns as represented by landowners/agencies/developers/other interested parties; and
- Proposed site-specific mitigation measures.

4.8.3.3 General Impacts

The primary impact of pipeline construction and operation on residential properties would be the disturbance of residential property during construction and the encumbrance of the permanent right-of-way on future development (i.e., the ban on building future permanent structures within the permanent right-of-way). Residences adjacent to the construction right-of-way would be most likely to experience the effects of pipeline construction and operation.

TABLE 4.8.3-3

Residences and Structures within 50 feet of FGT Expansion Project

Facility/County	Milepost	Type of Structure	Distance to Construction Work Area (feet)	Distance to Pipeline Centerline (feet)
Loop J				
Gilchrist	13.6	Residential	20	60
Gilchrist	15.4	Residential	40	120
Gilchrist	17.2	Residential	50	180
Gilchrist	17.6	Residential	10	90
Loop K				
Levy	49.95	Residential	35	140
Loop G				
Hernando	108.4	Residential	45	60
Hernando	113.2	Residential (20 + people)	Within Construction Work Area	30
Hernando	113.3	Residential (20 + people)	Within Construction Work Area	30
Hernando	113.3	Residential (20 + people)	Within Construction Work Area	30
Hernando	113.4	Residential (20 + people)	Within Construction Work Area	30
Hernando	113.4	Residential (20 + people)	Within Construction Work Area	30
Hernando	114.3	Residential	45	70
Hernando	114.3	Residential	45	70
Hernando	114.4	Residential	45	70
Hernando	114.7	Residential	45	70
Hernando	114.8	Residential	5	30
Hernando	115.5	Residential	35	60
Hernando	115.5	Residential	35	60
Hernando	115.6	Residential	45	70
Hernando	115.7	Residential	20	45
Hernando	115.8	Residential	45	70
Hernando	115.8	Residential	45	70
Hernando	115.8	Residential	45	70
Hernando	115.8	Residential	45	70
Hernando	115.8	Residential	45	70
Hernando	115.9	Residential	35	60
Hernando	115.9	Residential	35	60
Hernando	115.9	Residential	45	70
Hernando	115.9	Residential	45	70
Hernando	115.9	Residential	35	60
Hernando	115.9	Residential	35	60
Hernando	116.0	Residential	25	50
Hernando	116.1	Residential	35	60
Hernando	116.1	Residential	35	60

Temporary impacts during construction of the pipeline facilities in residential areas could include: inconvenience caused by noise and dust generated by construction traffic; disruption to access of homes by trenching of roads or driveways; increased localized traffic from transporting workers, equipment, and materials to the work site; disturbance of lawns, landscaping, and visual character caused by the removal of turf, shrubs, trees, and/or other landscaping between residences and adjacent rights-of-way; and

potential damage to existing septic systems or wells. Furthermore, during typical overland pipeline construction, the trench is sometimes excavated before the pipe is strung or welded. This results in open trenches for extended periods of time, which can pose a safety hazard to nearby residents.

Typical mitigation measures for residential construction may include installation of exclusion fencing and sediment control devices, locating the pipeline at a greater distance from the residence, using specialized construction practices such as stove-pipe or drag-section construction techniques, and by reducing the amount of time the trench remains open in the vicinity of residences. Other special construction practices include reducing workspace requirements; ensuring that construction proceeds quickly through these areas; minimizing exposure to nuisance effects; installing temporary safety fencing to preclude inadvertent entry into potentially dangerous work areas; avoiding tree removal; and wetting roads and work areas to control fugitive dust.

We have reviewed the site-specific residential plans submitted by Southern and believe that implementation of those plans and the residential construction and mitigation procedures described in section 2.3.2 would minimize residential impacts associated with the Cypress Pipeline Project.

FGT has not provided site-specific residential construction plans for review. However, FGT indicated it would minimize disruption and maintain access to residences, and coordinate with property owners before and throughout the construction process to minimize impact on the landowners. Owners of residential property crossed by the pipelines would be contacted individually by land agents to notify them of the approximate time that construction would take place on their property and to keep them informed about any special construction activities that may concern them. In addition, for residences located within 50 feet of the construction work areas identified in table 4.8.3-3, FGT would implement the following residential mitigation measures:

- Reduce the construction right-of-way width to 75 feet;
- Install safety fence along the edge of the construction work area adjacent to the residence for a distance of 100 feet on either side of the residence;
- Preserve as many trees as possible on residential property;
- Trim tree branches on the working side to allow for safe operation and passage of construction equipment. Vegetation removed would be disposed of as negotiated by the landowner and FGT;
- Restore or replace lawns and landscaping to pre-construction conditions;
- Repair, as necessary, walls and other structures within the construction work area as negotiated with the landowner. This work would be completed in a reasonable time after the trench is backfilled and cleanup is complete;
- Segregate topsoil where appropriate or as negotiated with the landowner;
- Maintain utility service during construction activities;
- Construct only during daylight hours;
- Clean up and backfill the area immediately after the pipeline is installed; and

- Revegetate at the first seasonal opportunity.

Where FGT is unable to maintain 25 feet or more between a residence and the construction work area, FGT would develop site-specific residential construction plans and would submit the plans to the FERC for review and approval prior to construction. We believe these measures would minimize residential impacts.

To help us monitor the implementation of construction procedures and mitigation measures used on these projects, we would require Cypress and FGT to file weekly status reports during construction that would include a description of landowner/resident complaints and how these complaints were addressed or resolved. We would follow up on these issues or concerns during our field inspections of the Southern and FGT construction activities.

4.8.4 Transportation

The proposed pipeline routes cross or are adjacent to several linear transportation rights-of-way including highways, roads, and railroads. Major roads, such as federal interstate freeways or state route highways, would be crossed by the Cypress Pipeline Project at 32 locations. A number of county and local roads would also be crossed. The FGT Expansion Project would cross two state roads and 25 county and local roads. Table 4.8.4-1 lists the major roads that would be crossed by the proposed Cypress Pipeline and FGT Expansion Projects and the crossing technique that would be used at each crossing.

Pipe and other construction materials would be transported into the project area by rail and/or truck to the proposed pipe and contractor yards listed on table C-1 and C-4 in Appendix C. Construction vehicles would load equipment and materials at the pipe and contractor yards and transport them to the construction right-of-way using major highways, surfaced streets and approved access roads.

The existing transportation system within the project area could be temporarily affected by the use of roads to move construction equipment, materials, and workers to and from the work site, and from pipeline construction across roadways. According to Southern and FGT, existing rural roadway systems are not at capacity and additional vehicles associated with the presence of construction workers would not cause significant traffic congestion problems. An increased number of vehicles may occur during morning and evening peak times, corresponding to normal workday hours; however, work hours for pipeline construction workers are typically from sunup to sundown, which does not coincide with peak morning and evening traffic times.

Because construction would move sequentially along the pipeline route, traffic flow impacts would be temporary on any given roadway. Southern and FGT would minimize traffic disruption by storing construction equipment and material at contractor yards where adequate roadway access to the pipeline construction area currently exists, and would use major highways, to the extent practicable, to transport heavy, slow-moving construction equipment to the right-of-way on faster moving rubber-tired trailers. To minimize disruption to traffic, construction equipment and materials would be located at contractor yards with existing adequate roadway access to the pipeline construction areas. Where it is necessary for equipment to cross highways, Southern and FGT would use appropriate traffic controls such as flagmen, signs, barriers, and flashing lights. Southern and FGT would also keep roads free of mud and would minimize the potential for road damage by requiring tracked equipment to cross the roads on tires or equipment mats. Additionally, FGT would minimize road damage by following local weight limitations and restrictions. Roadways damaged during construction would be repaired to as near pre-construction conditions as possible. No long-term effects to roadways are expected.

TABLE 4.8.4-1

Major Roads Crossed by the Cypress Pipeline and FGT Expansion Projects

Major Road ^a	County/State	MP	Construction Technique
CYPRESS PIPELINE PROJECT			
Loop			
State Highway 30	Chatham/Georgia	102.8	Conventional Bore
Interstate 95	Chatham/Georgia	102.9	Conventional Bore
Jimmy DeLoach Parkway	Chatham/Georgia	104.5	Horizontal Directional Drill
State Highway 21	Chatham/Georgia	104.7	Horizontal Directional Drill
Mainline			
State Highway 30	Effingham/Georgia	6.5	Conventional Bore
State Highway 17	Effingham/Georgia	7.6	Conventional Bore
US Highway 80	Effingham/Georgia	9.5	Conventional Bore
Interstate 16	Effingham/Georgia	12.4	Conventional Bore
Pine Barren Road	Chatham/Georgia	R14.1	Conventional Bore
State Highway 204	Chatham/Georgia	R21.3	Conventional Bore
State Highway 144	Bryan/Georgia	25.9	Conventional Bore
State Highway 196	Liberty/Georgia	34.7	Conventional Bore
US Highway 84	Liberty/Georgia	36.1	Conventional Bore
State Highway 57	McIntosh/Georgia	54.6	Conventional Bore
US Highway 25	Glynn/Georgia	66.5	Conventional Bore
State Highway 32	Glynn/Georgia	75.9	Conventional Bore
US Highway 82	Glynn/Georgia	81.3	Conventional Bore
State Highway 110	Camden/Georgia	89.7	Conventional Bore
State Highway 259	Camden/Georgia	95.5	Conventional Bore
State Highway 252	Camden/Georgia	99.9	Conventional Bore
State Highway 40	Camden/Georgia	111.7	Conventional Bore
Kolars Ferry Road	Nassau/Florida	116.7	Conventional Bore
US Highway 1/23	Nassau/Florida	119.2	Conventional Bore
County Highway 115	Nassau/Florida	123.6	Conventional Bore
County Highway 108	Nassau/Florida	126.7	Conventional Bore
County Highway 108	Nassau/Florida	131.8	Conventional Bore
County Highway 119	Nassau/Florida	143.6	Conventional Bore
US Highway 301	Nassau/Florida	145.1	Conventional Bore
County Highway 119	Duval/Florida	145.7	Conventional Bore
US Highway 90	Duval/Florida	150.8	Conventional Bore
Interstate 10	Duval/Florida	151.4	Conventional Bore
State Highway 228	Duval/Florida	157.4	Conventional Bore
FGT EXPANSION PROJECT			
Loop J			
None			
Loop K			
State Road #24	Levy/Florida	50.0	Conventional Bore
Loop G			
State Road #50	Hernando/Florida	113.6	Conventional Bore

^a Major roads constitute federal highways and state highways.

Southern and FGT would apply for permits necessary for pipeline crossings of roads and railroads. All major roads and railroads would be crossed by boring to avoid disrupting traffic. Unpaved roads would typically be crossed using the open-cut method. This technique would require the temporary

closure of these roads and the implementation of detours. If no reasonable detour is feasible, at least one traffic lane would be maintained open, except for brief periods essential to laying the new pipeline. Construction disturbance at each open cut road crossing would typically be completed in one day. Construction across roads is not expected to have a significant impact on local traffic patterns. Where construction crosses roads that access private residences and no alternative entrances exist, measures would be implemented to maintain passage for landowners during construction. Attempts would be made to avoid peak traffic time periods during construction that temporarily closes roads.

Operation and maintenance of pipeline facilities would not affect traffic flow on paved roads or highways in the project area. Although periodic maintenance and inspections would be required, these events would involve only infrequent light vehicle movement on and off the roadways. In order to address concerns about heavy timber harvest equipment that would need to cross the pipeline after construction, Southern and FGT would coordinate with landowners to establish crossing points over the pipeline and design the pipeline to withstand the potential load of the timber harvest equipment in these areas.

4.8.5 Recreation and Public Interest Areas

4.8.5.1 Cypress Pipeline Project

Southern's mainline would cross a historic canal and proposed bike path, a federal military reservation, two sand pit lakes that are used for recreational fishing, three rivers that are potential candidates for inclusion into the National Wild and Scenic River System, two state wildlife management areas, a state forest, and a recreational trail. Table 4.8.5-1 lists the name and location of each of these areas. A description of each area is presented below.

One of the primary concerns when crossing recreational or public interest areas is the impact of construction on recreational activities and public access. Disruption and noise during construction could be a nuisance to individuals using recreational areas, and could cause disturbance to wildlife, especially in protected areas. The duration of the impact in any one area, however, would be short term, lasting several days to several weeks. The clearing of forestland in recreational areas could have a longer-term effect and could impact visual resources, and natural plant and wildlife communities. Additionally, the maintenance of a permanent right-of-way, could increase public access to environmentally sensitive areas.

Savannah-Ogeechee Canal

Southern's mainline would cross the Savannah-Ogeechee Canal located in Chatham County, Georgia at about MP R18.9. The canal is part of the Chatham County Park System and is listed on the National Register of Historic Places. The canal is currently under renovation by the Savannah-Ogeechee Canal Society, which has plans to install a bike path adjacent to the canal in the future. No impact would occur to the canal due to Southern's planned HDD crossing method. Southern's HDD plan for the Savannah-Ogeechee Canal would keep ground disturbing activities about 1,600 feet from the northerly edge of the canal, and about 950 feet from its southerly edge on privately owned forest land directly adjacent to an existing powerline corridor.

TABLE 4.8.5-1

Recreation and Public Interest Areas Crossed by the Cypress Pipeline Project

Facility/State/ County	MP	Name of Area	Crossing Length	Acreage Affected by Construction	Land Use Affected By Construction (acres)	Estimated Time of Construction
Mainline						
Georgia						
Chatham	R18.9	Savannah-Ogeechee Canal	20 feet	None	NA (Impact avoided by use of HDD crossing method)	October, 2006 to May, 2007
Bryan	R24.9- R26.6	Fort Stewart Military Reservation	1.7 miles	19.3	Open Land: 1.2; Forest Land: 13.8; Silviculture: 4.3	October, 2006 to May, 2007
McIntosh	61.6 – 61.7	Sand Pit Lakes (two crossings)	174 feet and 628 feet	None	NA (Impact avoided by use of HDD crossing method)	October, 2006 to May, 2007
McIntosh/ Glynn	62.8	Altamaha River	641 feet	None	NA (Impact avoided by use of HDD crossing method)	October, 2006 to May, 2007
Glynn	62.9- 66.6	Sansavilla Wildlife Management Area	3.7 miles	89.6	Forest Land: 21.7; Open Land: 23.9; Open Water: 0.6; Silviculture: 43.5	October, 2006 to May, 2007
Glynn	71.6- 75.8	Paulk's Pasture Wildlife Management Area	4.2 miles	51.9	Open Land: 13.4; Forest Land: 8.3; Silviculture: 30.4	October, 2006 to May, 2007
Camden/ Charlton	104.3	Satilla River	507 feet	None	NA (Impact avoided by use of HDD crossing method)	October, 2006 to May, 2007
Florida						
Nassau	115.4	St. Marys River	300 feet	None	NA (Impact avoided by use of HDD crossing method)	October, 2006 to May, 2007
Nassau	115.4- 116.7	Ralph E. Simmons State Forest (SJRWMD)	1.3 miles	13.2	Open Land: 10.1; Open Water: 0.1; Forest Land: 2.9	October, 2006 to May, 2007
Nassau	144.0- 145.4	Baldwin Bay/St. Marys River Florida Forever BOT Project	1.5 miles ^a	16.0	Agriculture: 7.7; Open Land: 4.7; Forest Land: 3.6	October, 2006 to May, 2007
Nassau/ Duval/ Clay	145.6- 149.7 / 152.7- 159.8	Northeast Florida Timberlands and Watershed Reserve Florida Forever BOT Project	11.3 miles ^b	140.3	Agriculture: 6.8; Industrial: 4.4; Forest Land: 84.1; Open Land: 43.1; Open Water: 0.3; Residential: 1.6	October, 2006 to May, 2007
Duval	149.9	Jacksonville-Baldwin Rail Trail (FLDEP)	160 Feet	None	NA (Impact avoided by use of horizontal bore crossing method)	October, 2006 to May, 2007

^a The referenced mileage crossed reflects the planned area, no land has been acquired nor would any public lands be crossed by the Cypress Pipeline Project within this planned project area.

^b The referenced mileage crossed reflects the planned 132,450 acre area, and only one tract of public land is crossed by the Cypress Pipeline Project within this planned area at MPs 147.6-148.7(1.1 miles).

NA = Not applicable

Fort Stewart

The mainline would cross about 1.7 miles of the federally owned Fort Stewart between MPs R24.9 and R26.6 in Chatham and Bryan Counties, Georgia. Nearly half of the pipeline route (approximately 4,000 feet) through Fort Stewart is located adjacent to the west side of Long Wood Road. Another 600 feet of the pipeline route within Fort Stewart is adjacent to State Highway 144. Most of the remainder of the route within Fort Stewart follows a narrow field road west of I-95. In addition to the right-of-way, Southern plans to use two, 5-foot by 150-foot temporary extra workspace areas within Fort Stewart for the crossing of State Highway 144. Southern also proposes to install and operate MLV #4 at about MP R25.7. Construction and operation of the pipeline within Fort Stewart would affect about 13.8 acres and 4.3 acres of forest land and silviculture, respectively. The majority of impact would occur during construction where the pipeline would be installed adjacent to Long Wood Road near several military facilities located immediately northeast of the road. Long Wood Road is the only means of access to these facilities and construction of the pipeline would likely result in local traffic congestion and increased noise and dust near the construction right-of-way. However, these effects would be short-term and limited to the duration of construction within Fort Stewart.

Sand Pit Lakes

Two sand pit lakes that are associated with an inactive sand mining operation, would be crossed by the mainline at about MP 61.6 adjacent to an existing GPC powerline corridor. Since mining activities have ceased, the quarry pits have filled with water and are currently used for fishing. Southern intends to avoid these two inactive sand pits by use of the HDD crossing method. Southern's HDD plan for the Sand Pit Lakes would keep ground disturbing activities about 300 feet from the northerly edge of the northerly Sand Pit Lake, and about 350 feet from the southerly edge of the southerly sand pit lake.

Recreational Waterbodies

Southern's mainline would cross three rivers that have been listed on the Nationwide Rivers Inventory (NRI). Two of these rivers, the Altamaha River at MP 62.8 and the Satilla River at MP 104.3, are located in Georgia. The third river, the St. Marys River at MP 115.4, is located in Florida. Portions of the St. Marys River are being considered for inclusion into the National Wild and Scenic River System under the National Wild and Scenic Rivers Act. In addition to their recreational value, these rivers have also been recognized for their scenic, wildlife use, and historic values and are classified as navigable waterways by the COE. All three rivers also include suitable habitats for protected species (see section 4.7).

At the proposed crossing locations for these waterbodies, Southern's mainline would be adjacent to existing power line corridors. Additionally, Southern proposes to install the pipeline by the HDD method under each of these waterbodies. The drill entry and the exit points at the Altamaha and Satilla Rivers and the drill exit point at the St. Marys River would be located on privately owned forestland. The drill entry point at the St. Mary's River would be located on public land managed by the SJRWMD. Use of the HDD crossing method would avoid direct impacts on the bed or banks of the waterbodies and would not restrict recreational uses associated with these areas. Southern proposes to disturb additional temporary workspace on either side of each waterbody to accommodate equipment and/or pipe stringing area at the drill entry and drill exit locations. Although the drilling operations would increase noise locally on either side of the river for several weeks, the majority of activities would be confined to the extra workspaces that would be located back from water's edge.

Sansavilla and Paulk's Pasture Wildlife Management Areas and Private Hunting Areas

The mainline would cross 3.7 miles of the 17,814-acre Sansavilla Wildlife Management Area (WMA) between MPs 62.9 and 66.6 and 4.2 miles of the 17,000-acre Paulk's Pasture WMA between MPs 71.6 and 75.8 in Glynn County, Georgia. Both WMAs are leased by the state from timber companies. The Sansavilla WMA is used primarily for hunting, fishing, and wilderness excursions, and as a boat launching area. The Paulk's Pasture WMA is used primarily for hunting and wilderness excursions. Southern's mainline would also cross large tracts of land that contain private recreation and hunting leases. The majority of the pipeline route within these WMAs and private hunting and recreational areas is forested; although, all of the route within the Sansavilla WMA and all but 1.5 miles of route with the Paulk's Pasture WMA is located adjacent to existing power line corridors⁶. Construction of the pipeline within the Sansavilla and Paulk's Pasture WMAs and private hunting and recreational lands would remove trees, and disturb wildlife habitats. The hunting season in the project area typically begins in September during the proposed construction schedule for Phase 1 facilities, thus construction may also affect recreational activities and disrupt hunting near the right-of-way. Southern's retention of new permanent right-of-way would also incrementally widen the existing corridors in the WMAs and private hunting areas and create about 1.5 miles of new corridor within the Paulk's Pasture WMA. Southern is in the process of consulting with the owners of these lands to determine specific restoration requirements. If construction infringes on the use of any private recreational area crossed by the pipeline, Southern has indicated that they would consider those losses in compensatory negotiations with the landowner or lessee.

Ralph E. Simmons Memorial State Forest

The mainline would cross about 1.3 miles of the Ralph E. Simmons Memorial State Forest (RSMSF) between MPs 115.4 and 116.7 in Nassau County, Florida. The 3,638-acre RSMSF is managed by the SJRWMD and contains natural communities of pine-dominated natural levees and bald-cypress swamp forests, and is a refuge for several species of rare and globally endangered plants. The area also supports several species of wildlife including whitetail deer, wild turkey, bobcat, gopher tortoise, and otter (see section 4.6.1 and 4.7 for additional discussion of wildlife and endangered and threatened species). The primary recreational uses of the area are hiking, horseback riding, and off-road bicycling. Nearly all of the land that would be crossed by the pipeline within the RSMSF is forested, however, all of the pipeline within the RSMSF would be adjacent to an existing FPL power line corridor. Construction of the pipeline within the RSMSF would remove trees, disturb wildlife habitats and affect recreational activities near the right-of-way. Southern's retention of new permanent right-of-way would also incrementally widen the existing corridor. Southern is in the process of consulting with the managers of the state forest to determine specific restoration requirements.

Florida Forever BOT Project Lands

The pipeline route would traverse a section of the Baldwin Bay/St. Marys River Florida Forever BOT Project in Nassau County, Florida between MPs 144.0-145.4. The Baldwin Bay/St. Marys River Project was added to the 2003 Florida Forever Project list on December 5, 2002. The project consists of 9,500 acres with the intent to potentially preserve relatively intact forests and flatwoods of older growth trees. This land is currently privately owned. If completed the project would connect to the Jacksonville-Baldwin Rail Trail and would increase the recreational opportunities for all trail users. The planned project would be managed as a multi-use area with the potential for diverse forms of resource-based recreation by the Division of Forestry of the Florida Department of Agriculture and Consumer Services.

⁶ Our recommended route variation between MPs 73.8 and 75.2 would align the pipeline right-of-way adjacent to existing roads in the Paulk's Pasture WMA to minimize forest clearing and avoid the creation of new greenfield route (see section 3.3.2.5).

Much of the project area (about 59 percent) has been converted to intensive silviculture. Recent clearcuts and slash piles mar the landscape and the pipeline in this area would be constructed through mostly open lands adjacent to an FPL power line corridor.

The pipeline would also traverse a section of the Northeast Florida Timberlands and Watershed Reserve Florida Forever BOT Project in Nassau/Duval/Clay Counties, Florida between MPs 145.6-149.7 and MPs 152.7-159.8. The Northeast Florida Timberlands and Watershed Reserve Project was added to the 2002 Florida Forever Project list on December 6, 2001. The project area consists of a three-county corridor in Nassau, Duval, and Clay Counties, Florida. It encompasses the original 114,650 acres of pine woods, bottomland forests, and basin swamps and has been combined with a 17,800-acre addition to the Etoniah/Cross Florida Greenway for a total of 132,450 acres. The planned project would be managed under a multiple-use management regime consistent with the management of the Carey State Forest, the Jennings State Forest, and the Cecil Field Conservation Corridor by the Division of Forestry of the Florida Department of Agriculture and Consumer Services. Much of the project area (about 75 percent) is used, or has been used, for silviculture and would require restoration work. Only 33,826 acres of the 132,450 acres proposed for the project has been acquired by the state.

The lands along the pipeline route consist of a mosaic of forestland, recently timbered land, and some open land. The only public land crossed by the proposed pipeline within the Northeast Florida Timberlands and Watershed Reserve Project is a tract (DU-331) of land owned by the City of Jacksonville between MPs 147.6-148.7. For most of its length within the Northeast Florida Timberlands and Watershed Reserve Florida Forever BOT Project area the pipeline would be adjacent to existing corridors, consisting of either power line or pipeline rights-of-way. The one exception would be between MPs 158.3 and 159.4 where the pipeline would follow a greenfield corridor which avoids forested wetland impacts along the existing FPL corridor.

The effects of construction on the Florida Forever BOT properties would be mostly short term and limited to the duration of construction. Following construction, Southern's acquisition of a new permanent right-of-way would mostly incrementally widen the existing power line and pipeline corridors except between MPs 158.3 and 159.4 where the pipeline would create a new corridor. None of these effects, however, would likely affect the future management of the properties.

Jacksonville-Baldwin Rail Trail

Southern's mainline would traverse the Jacksonville-Baldwin Rail Trail at MP 149.9 in Duval County, Florida. This 14.5-mile recreational trail is maintained by the FLDEP. The primary recreational uses of the trail are for biking, hiking, and horseback riding. At the proposed crossing location, the trail is bordered by upland forest to the north and a utility corridor to the south. The pipeline would be installed using standard construction methods. Southern would utilize our Plan 2003 (Appendix D) to minimize erosion when constructing across the Jackson-Baldwin Rail Trail. The primary affects of construction activities associated with the trail crossing would be impacts on the wildlife and plant communities and impact on recreational users. The affects of construction on the trail itself would be short term and minor, and would be caused primarily by ground disturbance. The affects of construction on the users of the recreational area would be primarily short term, beginning with clearing activities and ending upon restoration of the trail. Impacts could include a substantial increase in noise and dust, a moderate level of inconvenience caused by users being routed around the construction area, and trail user's safety. Following construction of the pipeline, the trail would be restored to its original condition. The only long-term impacts of the project would be associated with the removal of trees and Southern's retention of a new permanent right-of-way, which would incrementally increase the width of the existing power line corridor bordering the trail.

4.8.5.2 FGT Expansion Project

FGT’s pipeline loops would cross two state-managed areas: Andrews Nursery and the Annutteliga Hammock Area. Table 4.8.5-2 lists the name and location of each of these areas. A description of each area is presented below.

Facility/County	MP	Name of Area	Crossing Length	Acreage Affected by Construction	Land Use Affected by Construction (acres)	Estimated Time of Construction
Loop K						
Levy	38.9-39.0	Andrews Nursery	600 feet	0.1	Silviculture	October to May
Loop G						
Hernando	104.8-108.0	Annutteliga Hammock Area	3.2 miles	N/A	Open Land	October to May

Andrews Nursery

Andrews Nursery is managed by the Florida Department of Agriculture and Consumer Services, Division of Forestry, and produces over 33.5 million bareroot seedlings. These seedlings are sold to private and corporate landowners and to state and federal agencies to support Florida’s reforestation needs. The north end of Loop K would be located adjacent to approximately 1,600 feet of Andrews Nursery between MPs 38.6 and 38.9. Additionally, Loop K would disturb a portion of Andrews Nursery for the next 600 feet between MPs 38.9 and 39.0. FGT would consult with the Division of Forestry prior to construction to determine appropriate mitigation measures for the Andrews Nursery area that would be disturbed during construction.

Annutteliga Hammock Area

The Annutteliga Hammock area is located in Hernando and Citrus Counties, Florida. Loop G would traverse a portion of this area between MPs 104.8 and 108.0 in Hernando County. A portion of this area has been determined to be environmentally sensitive sand hills and upland forest, and has been purchased by the state for protection through the Florida Forever Trust Fund. The portion of the Annutteliga Hammock area that would be crossed by the proposed project is not within the public lands, and FGT would construct its pipeline entirely within the existing and cleared FPL powerline corridor over this segment. Therefore, no impact to the Annutteliga Hammock area would occur.

4.8.6 Hazardous Waste Sites

Southern and FGT contacted government agencies, conducted on-site investigations, and searched GIS databases to identify landfills and hazardous waste sites near the pipeline routes. This search revealed that no landfills would be crossed or affected by the pipelines and that there are no known or listed hazardous waste sites within 0.5 mile of any of the pipeline routes or aboveground facility sites.

If any contaminated soil or groundwater is encountered during construction, Southern and FGT would manage excavated materials in accordance with local, state, and federal regulations for handling contaminated soils. Southern would follow its Waste Management Plan that is included as part of its SPCC Plan (Appendix F-1) and FGT would implement its plan for Unanticipated Discoveries of Contaminated Soils (Appendix G-2).

4.8.7 Visual Resources

4.8.7.1 Cypress Pipeline Project

Southern's mainline would cross several areas that have been recognized for their scenic value including the Savannah-Ogeechee Canal, the Jackson-Baldwin Rail Trail, and three rivers (the Altamaha River, the Satilla River, and the St. Marys River).

Potential impact of the pipelines on visual resources would result primarily from the clearing of vegetation, grading and trenching. The removal of existing vegetation and the exposure of bare soils would diminish the visual character of the areas crossed by the pipelines. The degree of visual impact would depend on the type of vegetation crossed; the existing visual quality of the affected area; the width of the construction right-of-way; the number of potential viewers affected; the presence or absence of other utility corridors; and the length of time the landscape is visually affected. Visual impact would be greatest in forested areas where the pipeline route is not adjacent to other existing rights-of-way and at locations where the construction right-of-way is highly visible such as at road crossings or residences. Visual impact would be less in open areas and along existing rights-of-way, particularly along power line corridors where visual resources have already been affected by transmission towers and overhead wires.

The visual impact of Southern's mainline on the Savannah-Ogeechee Canal, Jackson-Baldwin Rail Trail, and Altamaha, Satilla, and St. Marys Rivers is expected to be minor. Southern proposes to use the HDD method to install the pipeline under the canal and rivers. The drill entry and exit locations would be located far from the banks of these waterbodies and only minor clearing of vegetation between the drill entry and exit points would be necessary to facilitate the drilling operations. The pipeline route crosses the Jackson-Baldwin Rail Trail adjacent to an existing powerline right-of-way. Visual impact associated with crossing the trail would be temporary and limited primarily to the period of construction. The right-of-way would be seeded with grasses following installation of the pipeline and the visibility of the disturbed areas of the right-of-way would diminish quickly as the grasses become established.

The visual impact of Southern's pipelines would be relatively minor and short term. The pipeline generally would not have a long-term visual impact since it would be installed below ground and the right-of-way would be revegetated with grasses shortly after the pipeline is installed. Although forestland is the most common land use crossed by the project, approximately 96 percent of Southern's pipelines would be constructed adjacent to existing power lines and other rights-of-way. Southern would reduce the visual impact of the pipelines by overlapping a portion of the construction right-of-way with existing cleared rights-of-way in most areas. Consequently, the installation of the pipeline would generally only incrementally widen the existing corridors.

Southern's proposed aboveground facilities would have relatively minor visual impact. The compressor stations would consist of compressor units housed in insulated buildings to lessen noise impacts. Other equipment at the compressor stations would include an outdoor lube cooler, an electrical substation, outdoor air supplies for cooling the compressor unit motors, and valve sites. All of these facilities would be enclosed by a chain link security fence. Although construction of each compressor station would disturb between 13.5 and 15.6 acres of land, these areas represent less than half of the property that would be acquired for each compressor station. Moreover, much of the property that would not be disturbed by construction of the facilities is covered by forests or pine plantation. Together, the large parcel size and retention of existing pine vegetation would visually buffer the sites.

The Rincon Gate, Port Wentworth, Brandy Branch, and FGT Meter Stations would be located within or adjacent to existing utility facilities, which would significantly decrease their visual impact. The AGL Meter Station would be located relatively far from residences or heavily traveled roads in

forested areas that would amply screen the site from viewers. The impact of the South Georgia Meter Station would be somewhat greater because of its proximity to several residences and its less remote location. It is likely that the meter station would be visible to residents living near the meter station entrance road as well as motorist traveling along State Highway 119. To minimize visual impacts, **we recommend that:**

- **Prior to construction, Southern should file with the Secretary for review and approval by the Director of OEP a visual screening plan for the proposed South Georgia Meter Station at MP 143.7.**

Ten of Southern's 16 new block valves and all of the new launcher/receiver facilities would be installed within or adjacent to compressor or meter station sites and would have only very minor incremental visual impact. Southern's other six block valves would be located at intervals along the mainline right-of-way. These MLVs would have a minor effect on the surrounding visual landscape. Most of the facilities associated with the MLVs would be below ground. The only aboveground facilities would include a valve stem and operator, two 6-inch blowdown risers with one valve stem and one closure on each, and 6-inch bypass piping connecting the blowdown risers. The tallest of these facilities would be about seven feet above the ground. The sites would be graded and graveled and enclosed by security fence. MLVs 6, 10, and 11 would have somewhat greater visual impact than the other block valves since they would be visible by motorists and each would require an additional fenced 20-foot by 30-foot (about 0.1 acre) area adjacent to the mainline permanent right-of-way. To minimize visual impacts, **we recommend that:**

- **Prior to construction, Southern should file with the Secretary for review and approval by the Director of OEP a visual screening plan for proposed MLV 6 at MP 57.4, MLV 10 at MP 99.9, and MLV 11 at MP 119.2.**

4.8.7.2 FGT Expansion Project

FGT's pipeline loops would have temporary visual impacts that would be mitigated through natural recruitment of vegetation and replanting efforts in selected areas following construction and restoration. In certain visually sensitive areas, FGT would replant selected tree species across the temporary right-of-way at primary viewpoints, which would reduce the duration of the temporary impacts created during the construction of the new pipeline facilities. FGT has agreed to design site-specific visual impact mitigation plans at the request of land managing agencies. FGT would provide copies of these mitigation plans to the FERC upon agency approval. Additionally, FGT would adhere to all local government requirements for mitigation of visual impacts.

The visual impact of FGT's pipeline loops would be relatively minor and short term. The pipeline generally would not have a long-term visual impact since it would be installed below ground and the right-of-way would be revegetated with grasses shortly after the pipeline is installed. About 100 percent of FGT's pipeline would be constructed adjacent to existing power lines and other rights-of-way and the installation of the pipeline would only incrementally widen the existing corridors. FGT would reduce the visual impact of the pipelines by overlapping a portion of the construction right-of-way with existing cleared rights-of-way in most areas.

4.8.8 Coastal Zone Management

In 1972, Congress passed the CZMA to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the nation's coastal zone for this and succeeding generations" and to

“encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone” (16 USC 1452, section 303 (1) and (2)).

Section 307 (c)(3)(A) of the CZMA states that “any applicant for a required federal license or permit to conduct an activity, in or outside the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide a certification that the proposed activity complies with the enforceable policies of the state’s approved program and that such activity would be conducted in a manner consistent with the program.” In order to participate in the coastal zone management program, a state is required to prepare a program management plan for approval by the NOAA, Office of Coast and Ocean Resource Management (OCRM). Once the OCRM has approved a plan and its enforceable program policies, a state program gains “federal consistency” jurisdiction. This means that any federal action (e.g., a project requiring federally issued licenses or permits) that takes place within a state’s coastal zone must be found to be consistent with state coastal policies before the federal action can take place.

The Cypress Pipeline and FGT Expansion Projects are subject to a federal Coastal Zone Consistency Review because they would 1) involve activities within the coastal zones of Georgia and Florida as described in sections 4.8.8.1, and 4.8.8.2, respectively; and 2) require federal permits and approvals (see table 1.5-1).

4.8.8.1 Georgia

The Coastal Management Program, which in Georgia is administered by the GADNR, Coastal Resources Division, uses existing state resource laws and establishes a network among agencies with management authority in the eleven-county coastal service area. The Georgia Coastal Management Act (O.C.G.A 12-5-320, *et seq.*) provides the authority for state agencies to network and coordinate activities, and for the state to participate in the National Coastal Zone Management Program. A description of the applicable project activities, and information provided by Southern in its FERC application regarding consistency of the projects with state policies is provided below.

Southern’s consultations with the GADNR have revealed that the Cypress Pipeline Project may cross state-owned estuaries in Georgia. These areas are defined as all tidally influenced waters, marshes and marshlands lying within a tide elevation range from 5.6 feet above mean tide level and below. Southern would coordinate with the GADNR to determine which state-owned areas would be involved with the construction of the project and would obtain an easement through the Georgia State Property Commission. Southern has not yet filed a federal consistency certification with the GADNR. If the Cypress Pipeline Project is approved by the Commission, concurrence from the GADNR that the project is consistent with the Georgia Coastal Zone Management Program (GCZMP) must be received prior to any issuance of a Notice to Proceed with construction from the FERC. Therefore, **we recommend that:**

- **Prior to construction, Southern should file with the Secretary documentation of concurrence from the GADNR that its project is consistent with the GCZMP.**

4.8.8.2 Florida

The CZMA is administered in Florida by the FLDEP under the Florida Coastal Management Program (FLCMP). The FLCMP consists of a network of agencies implementing 23 statutes. A description of the applicable project activities, and information provided by Southern and FGT in its FERC applications regarding consistency of the projects with state policies is provided below.

Consultations with the FLDEP has revealed that the only sovereign, state-owned land the Cypress pipeline would cross would be the St. Marys River. Southern has indicated that they would utilize the HDD construction method for crossing the St. Marys River and would obtain an easement for the crossing.

Southern has not yet filed a federal consistency certification with the FLDEP. If the Cypress Pipeline Project is approved by the Commission, concurrence from the FLDEP that the project is consistent with the FLCMP must be received prior to any issuance of a Notice to Proceed with construction from the FERC. Therefore, **we recommend that:**

- **Prior to construction, Southern should file with the Secretary documentation of concurrence from the FLDEP that its project is consistent with the FLCMP.**

Correspondence with the state of Florida regarding a FLCMP consistency determination has been initiated as part of the agency notification being conducted as part of the FGT Expansion Project. The FLDEP has advised that the project would require a Coastal Zone Consistency Determination by the agency and FGT is in the process of acquiring this determination. Therefore, **we recommend that:**

- **Prior to construction, FGT should file with the Secretary documentation of concurrence from the FLDEP that its project is consistent with the FLCMP.**

4.9 SOCIOECONOMICS

Potential socioeconomic effects from construction, operation, and maintenance of the Cypress Pipeline and FGT Expansion Projects are related to the number of construction workers that would work on the projects and their impact on population, public services, and temporary housing during construction. Other potential effects are related to construction, such as increased traffic or disrupted traffic patterns, or temporary disturbance of agricultural activities, homes, and businesses. Potential economic benefits associated with the project include increased property tax revenue, increased job opportunities, and increased income associated with local construction employment, and local expenditures by the pipeline companies and non-local construction workers.

As discussed in section 2.1, the Cypress Pipeline Project would involve the construction and operation of new pipeline facilities in nine counties in Georgia and three counties in Florida. Additionally, there would be three new compressor stations constructed in Liberty and Glynn Counties, Georgia, and in Nassau County, Florida; four new meter stations constructed in Glynn County, Georgia and Duval, Nassau, and Clay Counties, Florida; and modifications at three existing meter stations in Cobb, Effingham, and Chatham Counties, Georgia. A discussion of the Cypress Pipeline Project effects on population, employment, housing, public services, transportation and traffic, and tax revenues is provided below as well as a discussion of the impact of the project on property values. However, the work on the meter station in Cobb County, Georgia is not included in the FERC staff's analysis of these socioeconomic factors because that work would be completed by a small crew and would not have measurable socioeconomic effects.

The FGT Expansion Project would involve the construction and operation of new pipeline loop facilities in Gilchrist, Levy, and Hernando Counties, Florida. Additionally, new metering and regulation facilities are proposed at two sites in Clay County, Florida; and generally moderate to minor modifications are proposed at existing aboveground facilities located in Citrus, Bradford, Marion, Polk, Duval, and Hillsborough Counties. Work to be completed at most of the existing aboveground facilities is expected to involve about 15 temporary persons working for about two weeks and would not have a measurable effect on population, employment, housing, public services, traffic conditions, and tax

revenues. Therefore, these facilities are not included in the FERC staff's analysis of these socioeconomic factors. However, more extensive modifications would be made to the existing aboveground facilities located in Citrus and Bradford Counties where up to 90 and 35 temporary persons working for about 6 months and 4 months, respectively, are expected to be required. In addition, construction of each new pipeline loop is expected to result in some socioeconomic effects. A discussion of the socioeconomic effects for the applicable portions of the FGT project is provided below.

4.9.1 Population and Employment

4.9.1.1 Cypress Pipeline Project

As shown in table 4.9.1-1, the counties crossed that would be affected by the Cypress Pipeline Project vary widely in their population totals and densities. The most densely populated county affected by the project would be Duval County, Florida, which has a population density of 1,006 persons per square mile. In contrast, the least densely populated county by the project would be Charlton County, Georgia, which has a population density of 13.2 persons per square mile. The 2004 U.S. Census indicates the county populations in the project area range from 10,928 in Long County to 821,338 in Duval County.

State/County	2004 Population ^a	2000 Population Density ^a (persons per square mile)	2000 Per Capita Personal Income ^b	2000 Civilian Labor Force ^a	2004 December Unemployment Rate (percent) ^c	2000 Leading Industries ^{a, d}
Georgia	8,829,383	141.4	\$27,794	4,129,666	4.8	E, M, R
Effingham	44,661	78.3	\$23,016	18,229	3.6	E, M, R
Chatham	238,518	529.7	\$28,634	113,087	4.0	E, R, A
Bryan	27,535	53.0	\$23,560	11,505	3.4	E, M, R
Liberty	61,748	118.7	\$16,494	31,136	7.2	E, R, P
Long	10,928	25.7	\$12,374	4,889	3.3	E, R, P
McIntosh	11,138	25.0	\$16,214	4,703	4.4	E, R, M
Glynn	71,357	160.0	\$29,511	33,858	3.9	E, A, R
Camden	45,108	69.3	\$19,020	22,707	4.6	E, M, A
Charlton	10,698	13.2	\$16,430	3,771	3.5	E, M, C
Florida	17,397,161	296.4	\$27,764	7,471,977	4.6	E, R, S
Duval	821,338	1,006.7	\$27,084	401,657	5.0	E, F, R
Nassau	63,157	88.5	\$28,189	28,726	4.0	E, M, A
Clay	164,394	234.3	\$25,421	71,993	4.2	E, R, F

^a Data was obtained from the U.S. Census Bureau website, 2005 (www.census.gov), and is the most current available information.

^b U.S. Census Bureau. 2000a. Census 2000a: MapStats/County Profile. <http://www.fedstats.gov/qf>.

^c Data was obtained from the Department of Labor website, 2005 (www.dol.gov), and is the most current available information.

^d Leading Industries Key:
A = Arts, Entertainment, Recreation, Accommodation & Food Service
C = Construction
E = Education, Health & Social Service Occupations
F = Finance, Insurance, Real Estate, & Rental & Leasing
M = Manufacturing
P = Public Administration
R = Retail Trade
S = Professional, Scientific, Management, Administration, and Waste Management Services

In Georgia, two of the nine affected counties have a higher per capita personal income than the state average and the remaining seven have a lower per capita than the state average. The unemployment rates for counties within the project area range from a high of 7.2 percent in Liberty County to a low of 3.3 percent in Long County. Only one county, Liberty County, exceeds the state unemployment rate of 4.8 percent.

In Florida, the per capita personal income in one county (Nassau) was above the state average and the remaining two counties were below the state average. The unemployment rate ranges from a high of 5.0 percent in Duval County to a low of 4.0 percent in Nassau County. One county, Duval County, exceeds the state unemployment rate of 4.6 percent.

The largest employment sectors for the states of Georgia and Florida are in education, health and social services, manufacturing, and retail trade. Savannah, Georgia and Jacksonville, Florida are the centers for government services in the respective areas, and offer a wide range of public services such as full-service law enforcement, fire department, schools, hospitals and emergency response services. The remaining counties and communities have more limited government services available.

4.9.1.2 FGT Expansion Project

As shown in table 4.9.1-2, the five counties that would be most affected by the FGT Expansion Project facilities vary widely in their populations and densities. The most densely populated county that would be affected by the project is Hernando County, Florida, which has a population density of 273.5 persons per square mile. In contrast, the least densely populated county that would be affected by the project is Levy County, Florida, which has a population density of 30.8 persons per square mile. The 2003 population estimate provided by the U.S. Census indicates the populations in the project area range from 16,024 in Gilchrest County to 150,370 in Hernando County.

State/County	Population 2003 (est.) ^a	2000 Population Density ^a (persons per square mile)	2000 Per Capita Personal Income ^b	2000 Civilian Labor Force ^a	2004 December Unemployment Rate (percent) ^c	2000 Leading Industries ^{a, d}
Florida	17,397,161	296.4	\$27,764	7,471,977	4.6	E, R, S
Gilchrest	16,024	41.4	\$17,042	6,023	3.9	E, R, C
Levy	37,330	30.8	\$17,942	13,808	4.8	E, R, C
Hernando	150,370	273.5	\$22,921	46,581	5.6	E, R, C
Citrus	130,465	202.3	\$18,585	38,837	2.8	E, R, C
Bradford	27,622	89.0	\$14,226	10,033	2.3	E, R, P

^a Data was obtained from the U.S. Census Bureau website, 2005 (www.census.gov), and is the most current available information.

^b U.S. Census Bureau. 2000a. Census 2000a: MapStats/County Profile. <http://www.fedstats.gov/qf>.

^c Data was obtained from the Department of Labor website, 2005 (www.dol.gov), and is the most current available information

^d Leading Industries Key:
 C = Construction
 E = Education, Health & Social Service Occupations
 P = Public Administration
 R = Retail Trade
 S = Professional, Scientific, Management, Administration, and Waste Management Services

For the three affected counties, the county-wide per capita personal incomes are lower than the state average. The unemployment rates for counties within the project area range from a high of 5.6 percent in Hernando County to a low of 3.9 percent in Gilchrest County. Two affected counties, Levy and Hernando Counties, exceed the state unemployment rate of 4.6 percent.

The largest employment sectors in Florida are in education, health and social services, manufacturing, and retail trade. Jacksonville, Florida is the center of government services, and offers a wide range of public services and facilities such as full-service law enforcement, fire department, schools, hospitals and emergency response services. The remaining counties and communities have more limited government services available.

4.9.2 Construction Workforce

4.9.2.1 Cypress Pipeline Project

As shown in table 4.9.2-1, the Cypress Pipeline Project would be constructed in three phases. Southern anticipates during Phase One a peak work force of 335 construction personnel for 8 months. Phase Two would require 120 construction personnel for 7 months. Phase Three would be divided into two segments: the first segment would require 175 construction personnel for 6 weeks and the second segment would require 240 construction personnel for 7 months.

TABLE 4.9.2-1			
Estimated Construction Workforce for the Cypress Pipeline Project			
Facility	County/State	Milepost	Estimated Workforce (number)
Phase One			
Mainline	Effingham, Chatham, Bryan, Liberty, Long, McIntosh, Glynn, Camden, Charlton/Georgia	0.0 – 166.6	335
Rincon Gate Meter Station	Duval, Clay, Nassau / Florida		
AGL Meter Station	Effingham / Georgia	95.0	
South Georgia Meter Station	Glynn / Georgia	66.0	
JEA Brandy Branch Meter Station	Nassau / Florida	143.7	Subset of 335 pipeline personnel
FGT Meter Station	Duval / Florida	149.7	
	Clay / Florida	159.8	
Phase Two			
Compressor Station 2	Glynn / Georgia	81.1	120
Phase Three			
Loop	Effingham, Chatham / Georgia	94.9 – 104.8	175 (segment one) 240 (segment two)
Compressor Station 1	Liberty / Georgia	40.1	Subset of 240 pipeline personnel
Compressor Station 3	Nassau / Florida	126.9	

Construction of the Cypress Pipeline Project would result in a temporary increase in population within the project area. Southern estimates that about 30 percent of its required workforce would be hired from the local workforce depending on availability of workers with the required skills. Additional construction personnel would be hired from outside the project area. Non-local personnel would typically include pipeline construction specialists, supervisory personnel, and inspectors who would temporarily relocate to the project area.

The total temporary population change in the project area would equal the total number of non-local construction workers, plus any family members accompanying them. During Phase One, assuming 30 percent of the 335-person construction workforce would be local hires, about 235 construction workers and 423 family members (assuming each worker would bring 1.8 family members) may temporarily move to the project area. These workers would be dispersed throughout the 12 affected counties. During Phase Two, assuming 30 percent of the 120-person construction workforce would be local hires, about 84 construction workers and 151 family members (assuming each worker would bring 1.8 family members) would temporarily locate to the project area in Glynn County, Georgia. During Phase Three, assuming 30 percent of the 175-construction workforce on Segment 1 would be local hires, about 122 construction workers and 220 family members (assuming each worker would bring 1.8 family members) would temporarily locate to the project area and on Segment 2 assuming 30 percent of the 240-construction workforce would be local hires, about 168 construction workers and 302 family members (assuming each worker would bring 1.8 family members) would temporarily locate to the project area in three counties (Effingham, Chatham, and Liberty) in Georgia and one county (Nassau) in Florida. In most cases, the short-term impact of construction worker influx on the local population would be minimal due to the relative size of the existing population base. In addition, the increase in population would be temporary, lasting just several months in any one location. Non-local construction personnel would typically disperse following completion of construction activities.

No long-term population impacts would result from operation of the proposed facilities. Southern anticipates that the new facilities would be operated by up to five personnel. Compressor Stations 1 and 3 would be unmanned. Compressor Station 2 would have two to three personnel Monday through Friday to support the facility and one to two personnel to support the pipeline facility operations.

4.9.2.2 FGT Expansion Project

As shown in table 4.9.2-2, the FGT Expansion Project would be constructed in two phases and in 5 segments. Phase One would utilize a peak work force of 225 construction personnel for three months. Phase Two would utilize a peak work force of 150 construction personnel for two months.

Facility	County	Length (miles)	Estimated Workforce (number)
Phase One			
Loop J	Gilchrist	5.0 miles	225 ^a
Loop K	Levy	6.0 miles	225 ^a
Loop G	Hernando	6.3 miles	225 ^a
Compressor Station 26 Modifications	Citrus	N/A	90
Compressor Station 16 Modifications	Bradford	N/A	35
Phase Two			
Loop K	Levy	9.2 miles	150 ^a
Loop G	Hernando	6.1 miles	150 ^a

^a Workforce number is assumed to be the total needed for construction of all loops during each phase.

Construction of the FGT Expansion Project would result in a temporary increase in population within the project area for about three months during Phase One and two months during Phase Two. FGT estimates that about 30 percent of its required workforce would be hired from the local workforce if they are available and possess the required skills. Additional construction personnel would be hired from

outside the project area. Non-local personnel would typically include pipeline construction specialists, supervisory personnel, and inspectors who would temporarily relocate to the project area.

The total temporary population change in the project area would equal the total number of non-local construction workers, plus any family members accompanying them. During Phase One, assuming 30 percent of the 225-person construction workforce would be local hires, about 158 construction workers and 284 family members (assuming each worker would bring 1.8 family members) may temporarily move to the project area. These workers would be dispersed over the project area. During Phase Two, assuming 30 percent of the 150-person construction workforce would be local hires, about 105 construction workers and 189 family members (assuming each worker would bring 1.8 family members) would temporarily locate to the project area in Levy and Hernando Counties, Florida. The short-term impact of construction worker influx on the local population would be minimal due to the relative size of the existing population base. The minor increase in population would be temporary, lasting just several months in any one location. Non-local construction personnel would typically disperse following completion of construction activities.

No new personnel would be required to operate the new facilities, therefore no long-term population impacts would result from operation of the proposed facilities.

4.9.3 Housing

4.9.3.1 Cypress Pipeline Project

Housing statistics for the counties affected by the Cypress Pipeline Project are presented in table 4.9.3-1. Temporary housing availability varies seasonally and geographically within the counties and communities near the proposed facilities. Temporary housing would be available in the form of daily, weekly, and monthly rentals in motels, hotels, campgrounds, and recreational vehicle (RV) parks. Typically the demand for temporary housing in the project area as a result of tourism is greatest during the winter months in northern Florida. Southern proposes to construct the Cypress Pipeline Project starting in October of 2007 for Phase One, the fall of 2008 for Phase Two, the fall of 2010 for Phase Three. However, given the vacancy rates, the number of rental housing units in the area, and the number of hotel/motel rooms and campgrounds available in the cities and towns in the vicinity of the project, construction crews should not encounter difficulty in finding temporary housing. If construction occurs concurrently with other projects, temporary housing would still be available but may be slightly more difficult to find and/or more expensive to secure. Regardless, these effects would be temporary, lasting only for the duration of construction, and there would be no long-term effect on housing.

In Georgia, rental vacancy rates in counties affected by the project are all higher than the state average of 8.2 percent. In Florida, the rental vacancy rate in Nassau County is higher than the state average and in Clay and Duval Counties the rental vacancy rates are lower than the state average of 9.3 percent.

During the construction of the pipeline, the additional workers and their families relocating within the project area would temporarily increase the demand for short-term housing. Based upon the estimate of non-local workers required during construction, an estimated 235 housing units would be required during Phase One, 84 housing units would be required during Phase Two, and 122 housing units would be required during Segment 1 and 168 housing units would be required during Segment 2 of Phase Three. Previous pipeline industry experience has indicated that non-local construction workers would use the following housing sources: 60 percent hotels/rental units, 30 percent trailers, and 10 percent in RV parks. The existing temporary housing stock available in the project area would be sufficient to meet the demand

for housing, and the existing supply of housing would be sufficient to accommodate the increased demand due to the addition of up to five permanent operations personnel.

TABLE 4.9.3-1
Housing Characteristics in Counties Affected by the Cypress Pipeline Project

State/County	Owner Occupied (%)	Renter Occupied (%)	Median Value, Owner Occupied Units (\$)	Median Gross Monthly Rent (\$)	For Seasonal or Occasional Use (units)	Owner Vacancy Rate (%)	Rental Vacancy Rate (%)
Georgia	67.5	32.5	111,200	613	50,064	1.9	8.2
Effingham	82.6	17.4	106,600	500	85	2.1	9.2
Chatham	60.4	39.6	95,000	589	1137	1.7	9.7
Bryan	77.9	23.1	115,600	541	88	1.7	8.3
Liberty	50.7	49.3	79,800	529	361	3.8	9.1
Long	66.2	33.8	71,100	456	55	2.7	17.4
McIntosh	83.6	16.4	81,700	369	1025	2.2	11.0
Glynn	65.5	34.5	114,500	533	2245	2.2	15.1
Camden	63.3	36.7	85,300	551	516	2.5	12.5
Charlton	80.8	19.2	67,300	394	99	2.2	14.9
Florida	70.1	29.9	105,500	641	482,944	2.7	9.3
Duval	63.1	36.9	89,600	604	1458	1.8	9.0
Nassau	80.6	19.4	126,700	553	1403	1.5	23.4
Clay	77.9	22.1	108,400	668	808	1.4	8.2

Sources: U.S. Census Bureau. 2000b. 2000 Census of Population and Housing. Summary Social, Economic and Housing Characteristics. PHC-2. <http://www.census.gov/prod/cen2000/>.
U.S. Census Bureau. 2000c. 2000 Census of Population and Housing. Population and Housing Unit Counts. PHC-3. <http://www.census.gov/prod/cen2000/>.

4.9.3.2 FGT Expansion Project

Housing statistics for the counties affected by the FGT Expansion Project is presented in table 4.9.3-2. Temporary housing availability varies seasonally and geographically within the counties and communities near the proposed facilities. Temporary housing is available in the form of daily, weekly, and monthly rentals in motels, hotels, campgrounds, and RV parks. The greatest demand for temporary housing in the project area is generally tourism, which is at its peak during the winter months. Rental vacancy rates in the Gilchrist and Hernando Counties are lower than the state average, while the vacancy rate in Levy, Citrus, and Bradford Counties are higher than the state average.

Based upon the estimate of non-local workers required during construction, an estimated 158 housing units would be required during Phase One and an estimated 105 housing units would be required for Phase Two. Even though FGT proposes to construct during the winter months, the existing temporary housing stock available in the project area would be sufficient to meet the demand for temporary housing associated with the project.

TABLE 4.9.3-2

Housing Characteristics in Counties Affected by the FGT Expansion Project

State/County	Owner Occupied (%)	Renter Occupied (%)	Median Value, Owner Occupied Units (\$)	Median Gross Monthly Rent (\$)	For Seasonal or Occasional Use (units)	Owner Vacancy Rate (%)	Rental Vacancy Rate (%)
Florida	70.1	29.9	105,500	641	482,944	2.7	9.3
Gilchrest	86.3	13.7	78,000	420	384	2.5	7.3
Levy	83.6	16.4	75,800	413	1085	2.9	15.4
Hernando	86.5	13.5	81,300	550	3566	2.4	8.7
Citrus	84.6	14.4	84,400	475	5,192	2.6	13.4
Bradford	79.0	21.0	71,700	430	5,192	2.3	12.6

Sources: U.S. Census Bureau. 2000b. 2000 Census of Population and Housing. Summary Social, Economic and Housing Characteristics. PHC-2. <http://www.census.gov/prod/cen2000/>.
U.S. Census Bureau. 2000c. 2000 Census of Population and Housing. Population and Housing Unit Counts. PHC-3. <http://www.census.gov/prod/cen2000/>.

4.9.4 Public Services

Impacts on public services, such as police, fire protection and medical services resulting from both the Cypress Pipeline Project and FGT Expansion Project would generally be minimal and short term in duration. Demands on local agencies would include increased enforcement activities associated with permit issuance for vehicle load and width limits; need for local police assistance during construction at road crossings to facilitate traffic flow; and the need for emergency medical services to treat construction-related injuries that could occur.

4.9.4.1 Cypress Pipeline Project

Because the non-local workforce would be small relative to the current population, construction of the Cypress Pipeline Project would result in minor and temporary impact on local community facilities and services, such as police, fire, and medical services. The counties, in the project vicinity, presently have adequate infrastructure and services to meet the needs of the non-local workers.

Other construction-related demands on local services would include increased demand for permits for vehicle load and width limits, and emergency medical services to treat construction-related injuries. Southern would work with the local law enforcement, fire departments, and emergency medical services to coordinate for effective emergency response for their respective projects.

The limited number of permanent employees (up to five) associated with the proposed project would not result in a detectable impact on public services.

4.9.4.2 FGT Expansion Project

Because the non-local workforce would be small relative to the current population, construction of the FGT Expansion Project would result in minor, temporary, or no impact on local community facilities and services, such as police, fire, and medical services. The counties, in the project vicinity presently have adequate infrastructure and services to meet the needs of the non-local workers.

FGT would work with the local law enforcement, fire departments, and emergency medical services to coordinate for effective emergency response for their respective projects.

No additional permanent employees are associated with the proposed project, as such, no long-term impacts on these public services.

4.9.5 Transportation and Traffic

Construction of the Cypress Pipeline Project and the FGT Expansion Project could affect transportation and traffic in the project area as a result of construction across roads and highways, commuting of the construction workforce to the project area, and the movement of construction vehicles and delivery of equipment and materials to the construction work areas. Topographic-based maps of the project depict existing roads and are included in Appendix B-1 and B-2. A table of the access roads Southern plans to use is provided in Appendix C-2; a table of access roads FGT plans to use is provided in Appendix C-4.

Because construction would move sequentially along the proposed pipeline route, any traffic flow impacts that arise would be temporary and local. The increase in vehicles operating on roads to and from the construction right-of-way would occur primarily during morning and evening peak times, corresponding to normal workday hours. To minimize disruption to traffic, construction equipment and materials would be located at contractor yards with existing adequate roadway access to the pipeline construction areas. In addition, major highways would be used as much as possible to transport slow-moving heavy construction equipment to the construction right-of-way.

Operation and maintenance of pipeline facilities would not affect traffic flow on any of the paved roads or highways in the project area. Although periodic maintenance and inspections would be required, these events would involve only a low frequency of light vehicle movement.

Southern and FGT would apply for road crossing permits as necessary. Paved roads would either be bored or open cut as determined by state or local jurisdiction crossing permits. Boring typically requires temporary extra workspace on both sides of the crossing for excavating bore pits to the depth of the pipeline. The bore pits are typically located just outside of the road right-of-way limits; however, site-specific conditions such as the presence of structures or waterbodies may require the bore pits and temporary extra workspaces to be moved within the road right-of-way. There would be little or no disruption of traffic at road crossings that are bored. Unpaved roads and driveways would be open cut where permitted by local authorities or landowners. The open-cut method would require temporary closure of the road to traffic and the establishment of detours. If no reasonable detour is feasible, at least one lane of traffic would remain open. However, in a worst-case scenario, the open-cut construction method may require the road to be closed for about 24 hours. Most open-cut crossings would be completed and the road resurfaced in 1 or 2 days. Where project construction crosses roads necessary for access to private residences and no alternative entrance exists, Southern would implement measures (e.g., plating over the open portion of the trench) to maintain passage for landowners and emergency vehicles. In addition, Southern would place and maintain traffic control measures such as flag persons, warning signs, lights, and barriers to ensure safety and to minimize traffic congestion.

4.9.6 Tax Revenues

4.9.6.1 Cypress Pipeline Project

Construction and operation of the Cypress Pipeline Project would have beneficial impacts on local sales tax revenue. Table 4.9.6-1 provides the estimated payroll, cost of materials purchased locally, and sales tax revenues associated with the project. Construction payroll taxes would also be collected from the workers employed on the project.

TABLE 4.9.6-1

Construction Cost Estimates by County for the Cypress Pipeline Project

State/County	Total Construction Payroll (\$) ^a	Material Purchases (\$) ^b	Estimated Sales Tax Revenues (\$) ^c	Expenditure By Construction Workers (\$) ^d
Georgia				
Cobb	65,432	116,049	9,193	16,358
Chatham	12,103,924	6,713,347	643,448	3,025,981
Effingham	13,365,077	7,539,186	713,934	3,341,269
Bryan	4,387,498	2,203,492	226,054	1,096,875
Liberty	14,506,307	14,403,221	1,244,773	3,626,577
Long	1,170,000	582,340	60,281	292,500
McIntosh	9,944,996	5,009,041	512,388	2,486,249
Glynn	17,978,860	16,315,205	1,450,644	4,494,715
Camden	10,334,996	5,209,727	532,482	2,583,749
Charleton	6,727,498	3,387,889	346,616	1,681,875
Florida				
Nassau	21,128,343	18,155,942	1,616,125	5,282,086
Duval	8,272,418	4,569,761	453,823	2,068,105
Clay	838,502	1,039,672	82,073	209,626
Project Total	120,823,851	85,244,872	7,891,861	30,205,965
^a	Labor costs are based on past experience from Southern for installing similar facilities and on conversations with installation contractors.			
^b	Material costs are based on manufacturer's published prices or quotations, conversations with equipment suppliers, and on historical experience.			
^c	Estimated tax revenues are generated by combining the sales tax estimates of material purchases and sales tax from estimated expenditures by construction workers. It does not include ad valorem taxes or taxes generated by the operation of Southern's facilities.			
^d	It is estimated that workers would be expected to spend between 25 to 30 percent of their income locally. In area where aboveground facilities would be installed, estimates may be higher due to an extended presence of workers.			

Southern anticipates about a \$121 million construction payroll, excluding deductions such as federal income tax and Federal Insurance Contribution Act (FICA) payments. During construction, some portion of the construction payroll would be spent locally for the purchase of housing, food, gasoline, entertainment, and luxury items. The dollar amount would depend on the number of construction workers in a given area and the duration of their stay. Based on previous experience, Southern estimates that its construction workers would spend about \$30 million locally. In addition to the construction payroll spent locally, Southern estimates about \$85 million would be spent locally on construction materials, rental space for yards and offices, office support and similar expenditures.

Operation of the Cypress facilities would require up to five employees that would provide a combined annual payroll of about \$462,210.

4.9.7 Environmental Justice

Executive Order 12898 on Environmental Justice recognizes the importance of using the NEPA process to identify and address, as appropriate, disproportionately high and adverse health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The provisions of Executive Order 12898 apply equally to Native American programs. The EPA provides guidance on determining whether there is a minority or low income community to be addressed in a NEPA analysis. Minority population issues must be addressed when they comprise over

50 percent of an affected area or when the minority population percentage of the affected area is substantially greater than the minority percentage in the larger area of the general population. Low-income populations are those that fall within the annual statistical poverty thresholds from the U.S. Department of Commerce, Bureau of the Census Population Reports, Series P-60 on Income and Poverty.

4.9.7.1 Cypress Pipeline Project

Table 4.9.7-1 presents the general ethnic mix and the economic status of the counties and states that would be affected by the Cypress Pipeline Project.

State/County	Racial/Ethnic Group, 2000 (percent)					Total Minority Population	Median Family Income (1999)	Persons Below Poverty Rate (percent) (1999) ^a
	White	Black	Native American	Asian	Persons of Hispanic or Latin Origin			
Georgia	65.1	28.7	0.3	2.1	5.3	36.4	\$42,433	13.0
Effingham	84.7	13.0	0.3	0.5	1.4	15.2	\$46,505	9.3
Chatham	55.3	40.5	0.2	1.7	2.3	44.7	\$37,752	15.6
Bryan	82.8	14.1	0.3	0.8	2.0	17.2	\$48,345	11.7
Liberty	46.6	42.8	0.5	1.8	8.2	53.3	\$33,477	15.0
Long	68.4	24.3	0.7	0.6	8.4	34.0	\$30,640	19.5
McIntosh	61.3	36.8	0.4	0.3	0.9	38.4	\$30,102	18.7
Glynn	70.7	26.5	0.3	0.6	3.0	30.4	\$38,765	15.1
Camden	75.0	20.1	0.5	1.0	3.6	25.2	\$41,056	10.1
Charlton	68.6	29.3	0.4	0.3	0.8	30.8	\$27,869	20.9
Florida	78.0	14.6	0.3	1.7	16.8	33.4	\$38,819	12.5
Nassau	90.2	6.7	0.4	0.5	1.5	9.1	\$46,022	9.1
Duval	65.8	27.8	0.3	2.7	4.1	34.9	\$40,703	11.9
Clay	87.4	7.7	0.5	2.0	4.3	14.5	\$48,854	6.8

^a Percent of persons with incomes below the poverty level in 1993, as defined by the Census Bureau for Federal statistical purposes, on the basis of family size and family income. Source: U.S. Department of Commerce, Bureau of the Census, 2000 Census of Population and Housing, USA Counties General Profile (www.census.gov).

As shown in table 4.9.7-1, 4 counties have a higher percentage minority population than their respective state averages. Six counties have a higher percentage of poverty than the state poverty rate and lower median family income than their respective state averages. Although six of the twelve project areas counties can be characterized as poorer than average, there is no evidence that the project would adversely affect the population because the pipeline route in those counties is located exclusively in a rural area that is sparsely populated. The proposed route does not cross any Native American land.

4.9.7.2 FGT Expansion Project

Table 4.9.7-2 presents the general ethnic mix and the economic status of the counties and states that would be affected by the FGT Expansion Project.

State/County	Racial/Ethnic Group, 2000 (percent)					Total Minority Population	1999 Median Family Income	1999 Persons Below Poverty Rate (percent) ^a
	White	Black	Native American	Asian	Persons of Hispanic or Latin Origin			
Florida	78.0	14.6	0.3	1.7	16.8	33.4	\$38,819	12.5
Gilchrist	90.5	7.0	0.4	0.2	2.8	10.4	\$30,328	14.1
Levy	85.9	11.0	0.5	0.4	3.9	15.8	\$26,959	18.6
Hernando	92.9	4.1	0.3	0.6	5.0	10.0	\$32,572	10.3
Citrus	95.0	2.4	0.4	0.8	2.7	5.0	\$36,711	12.4
Bradford	76.3	20.8	0.3	0.6	2.4	23.7	\$39,123	14.6

^a Percent of persons with incomes below the poverty level in 1993, as defined by the Census Bureau for Federal statistical purposes, on the basis of family size and family income. Source: U.S. Department of Commerce, Bureau of the Census, 2000 Census of Population and Housing, USA Counties General Profile www.census.gov.

As shown in table 4.9.7-2, the counties within the project area have a lower percentage minority population than the respective state average. Three counties (Gilchrist, Levy, and Bradford) have a higher percentage of poverty than the state poverty rate. Four counties (Gilchrist, Levy, Hernando, and Citrus Counties) have a lower median family income than the respective state average. The location of the facilities associated with the FGT Expansion Project were determined relative to FGT's existing system without any distinction based on minority or income status of the populations living in the area. The proposed facilities would be located primarily within or adjacent FGT's and/or other existing easements.

4.10 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires that the FERC take into account the effects of its undertakings (including the issuance of Certificates) on properties listed on, or eligible for listing on, the National Register of Historic Places (NRHP) and provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Southern and FGT, as non-federal parties, are assisting the FERC in meeting its obligations under section 106 and the implementing regulations in 36 CFR 800.

4.10.1 Results of Cultural Resources Survey

Cypress Pipeline Project

Georgia

As part of its application, Southern provided a summary report of Phase I cultural resources surveys it completed in 2000 and 2001 and a supplemental Phase I cultural resources survey report documenting surveys it completed in 2005. Southern's summary report describes cultural resource survey of the mainline, including the initial 13.8 miles that are not part of the proposed project. Southern's supplemental report included the results of additional surveys conducted for the mainline, route variations along the mainline, the loop, access roads, and ancillary facilities. Southern surveyed a 200-foot-wide corridor offset from the proposed pipeline centerline in areas where the proposed pipeline route is adjacent to existing utilities. Southern surveyed a 300-foot-wide corridor centered on the proposed pipeline centerline in areas of new right-of-way. Approximately 0.1 mile of the loop and 8.6 miles of the mainline were not surveyed due to denied access. In addition, Southern was not able to complete surveys across the entire corridor width along about 0.5 mile of the loop and 0.1 mile of the mainline.

Southern's initial surveys along the proposed mainline and loop pipeline routes, access roads, and ancillary facilities identified 24 cultural resources sites, including seven prehistoric sites, nine historic-period sites, and eight sites with both prehistoric and historic-period components. In addition, Southern's surveys identified five standing structures more than 50 years old. Surveys documented in Southern's supplemental report identified eight cultural resources sites, including one prehistoric site and seven historic-period sites.

One of the historic-period sites (the Savannah Ogeechee Canal) is listed on the NRHP. Southern would avoid impacts on this site by drilling under it during construction using the HDD method (see section 2.3.2). No further work is recommended at this site. The NRHP-eligibility of two previously recorded historic-period sites could not be determined because they were not relocated within the survey corridor during surveys. The NRHP-eligibility at one other previously recorded historic-period site could not be determined due to denied access. One site with both prehistoric and historic-period components was recommended as not eligible for listing on the NRHP. This site included evidence of at least one human interment. Southern indicated it would avoid impact on this site by drilling under it during construction. One structure (the Wayfarer Church/Hardshell Church) is recommended as potentially eligible for listing on the NRHP, but would be avoided during construction. The remaining 27 cultural resources sites and 4 standing structures are recommended as not eligible for listing on the NRHP and no further work is recommended. In addition, one of the proposed pipe yards is located within the historic J.A. Jones Shipyard. Southern stated that no alterations to existing buildings or grounds would occur and, therefore, that no adverse impacts would occur as a result of the proposed activities at the pipe yard. In a letter dated February 25, 2005, the Georgia State Historic Preservation Office (SHPO) concurred with the recommendations in the Phase I summary report. In a letter dated July 12, 2005, the Georgia SHPO concurred that the HDD crossings of the Savannah Ogeechee Canal and the multi-component site with the human interment would "have no adverse effect to these properties." In a letter dated August 3, 2005, the Georgia SHPO agreed with the findings in Southern's supplemental report. We also concur.

A portion of the proposed mainline in Georgia crosses Fort Stewart. No sites were identified on Fort Stewart. Fort Stewart indicated that it was satisfied with the work accomplished, and requested a copy of the final report. Southern has provided Fort Stewart with a copy of the final report.

Florida

As part of its application, Southern provided a summary report of Phase I cultural resources surveys it completed in 2000 and 2001 and a supplemental Phase I cultural resources survey report documenting surveys it completed in 2005. Southern surveyed a 200-foot-wide corridor offset from the proposed pipeline centerline in Florida. Approximately 6.2 miles of the mainline were not surveyed due to denied access.

Surveys along the proposed pipeline route, access roads, and ancillary facilities identified four cultural resources sites, including two prehistoric sites, one historic-period site, and one site with both prehistoric and historic-period components. None of these are recommended as eligible for listing on the NRHP and no further work is recommended. In a letter dated February 2, 2005, the Florida SHPO concurred with these recommendations. No cultural resources were identified during surveys documented in Southern's supplemental report. In a letter dated June 13, 2005, the Florida SHPO concurred with the results documented in Southern's supplemental report. In a letter dated July 25, 2005 the Florida SHPO concurred that the proposed project would have no effect on historic properties. In a letter dated May 19, 2005, Southern requested that the Florida SHPO assess the need for surveys along a route alternative within an existing JEA transmission line corridor. In a letter dated June 16, 2005, the Florida SHPO concurred that the proposed segment would have no effect on historic properties. We also

concur with the recommendations in the survey report and supplemental survey report, and for the JEA transmission line corridor.

FGT Expansion Project

As part of its application, FGT provided its cultural resources survey results summarizing previous surveys that were conducted along the proposed pipeline route and new surveys that were conducted for the proposed project. FGT developed its survey methods in consultation with the Florida SHPO. The proposed pipeline route is located adjacent to the corridor that was previously surveyed for the FGT Phase III Expansion. However, it was determined that the previously surveyed corridor was not adequate for the entire proposed route. For Loop J, FGT conducted an archaeological survey and historic structure survey of a 225-foot-wide corridor adjacent to the previously surveyed corridor. The Florida SHPO indicated that the previous archaeological surveys along Loops K and G were adequate to cover the proposed project. However, FGT agreed to conduct archaeological and historic structures surveys at areas that are outside the proposed construction workspace, and conduct a walkover survey for historic structures along Loops K and G. In addition, the Florida SHPO indicated that no fieldwork would be required at the existing facilities and facilities that are within the survey corridor. The Florida SHPO has not yet commented on FGT's cultural resources survey summary report. Information on some project facilities (e.g., access roads, the Long Branch Regulator Station, and the Brandy Branch and the Jacksonville M&R Stations) was not available when FGT filed its application. FGT has stated that it would consult with the Florida SHPO regarding the need for survey at these locations.

Loops J, K, and G

Along Loop J, no archaeological sites or historic structures were identified during previous surveys conducted for the FGT Phase III Expansion, and no archaeological sites or historic structures were identified during FGT's current surveys.

Along Loop K, four archaeological sites were located during previous surveys conducted for the FGT Phase III Expansion. Three of these were recommended as not eligible for listing on the NRHP and the Florida SHPO concurred with these recommendations. The fourth site, a historic-period turpentine-related site, was recommended as potentially eligible for listing on the NRHP. FGT completed additional evaluations and recommended this site as not eligible for listing on the NRHP. In letters dated February 28, 1994 and May 9, 1994, the Florida SHPO concurred with these recommendations. Nine historic-period resources were located during FGT's current historic structures survey for the proposed project, including seven abandoned historic railroad bridges, one abandoned historic railroad, and one historic railroad resource group. All of these resources are recommended as not eligible for listing on the NRHP and no further work is recommended. No archaeological sites or historic structures were identified during current surveys of workspaces that are outside the previously surveyed corridor.

Along Loop G, fifteen archaeological sites including nine prehistoric sites and six historic turpentine-related sites were located during previous surveys conducted for the FGT Phase III Expansion. All of these cultural resources were recommended as not eligible for listing on the NRHP and the Florida SHPO concurred with these recommendations (February 28 and March 7, 1994 and July 6, 2000). No structures were located during FGT's current walkover survey of the proposed pipeline route, and no archaeological sites or historic structures were located during current surveys of workspaces that are outside the previously surveyed corridor.

Aboveground Facilities and Contractor and Pipe Yards

The Florida SHPO indicated that no survey would be required at the compressor stations associated with the proposed project. FGT completed a walkover survey of the FPD-Hines Meter and Regulator Station to verify the site was previously disturbed and no subsurface survey was completed. FGT completed pedestrian and subsurface surveys at the Lawson Regulator Station, Cypress/FGT Interconnect, Lacoochee, Brooksville, Bell, and Lawtey Contractor and Pipe Storage Yards, as well as a previously unsurveyed portion of the Compressor Station 16 Contractor and Pipe Storage Yard. One previously recorded prehistoric site was relocated during survey of the Brooksville Contractor and Pipe Storage Yard. This site was previously recommended as not eligible for listing on the NRHP. As a result of its surveys, FGT also recommended the site as not eligible for listing on the NRHP. No cultural resources were identified during surveys of the remaining aboveground facilities and yards.

4.10.2 Unanticipated Discovery Plan

Cypress Pipeline Project

As part of its application, Southern provided a plan to be used in the event that cultural resources or human remains are discovered during construction. In a letter dated February 25, 2005, the Georgia SHPO accepted Southern's Unanticipated Discoveries and Emergency Procedures Plan. The Florida SHPO has not yet provided comments on the plan.

FGT Expansion Project

As part of its application, FGT provided a plan to be used in the event that cultural resources or human remains are discovered during construction. The Florida SHPO has not yet provided comments on the plan.

4.10.3 Native American Consultation

Cypress Pipeline Project

Southern contacted seven Native American tribes regarding the proposed project (see table 4.10.3-1). Southern sent its initial consultation letters in September 2000. These letters described the proposed project and provided the tribes with the opportunity to comment on the project and identify sites or places that might be of religious or cultural significance to the tribe. Southern sent follow-up letters in January 2001 to tribes that had not yet responded and in August 2001 to provide an update on the project schedule. In February and April 2005, Southern sent letters to the tribes to reintroduce the proposed project. To date, Southern has received responses from four of the Native American tribes it contacted (see table 4.10.3-1). No comments have been received to date from the remaining three Native American tribes.

TABLE 4.10.3-1

Native American Consultations for the Cypress Pipeline Project		
Native American Tribe	Date of Contact Letter	Response
Georgia		
Eastern Band of Cherokee Indians	9/15/00 1/25/01	6/27/01: stated that the proposed project is not within the traditional territory of the Eastern Band of Cherokee Indians.
Georgia and Florida		
Cherokees of Southeast Alabama	9/15/00 (GA) 1/25/01 (GA) 8/9/01 (FL) 2/4/05 (FL) 4/4/05 (FL)	To date no response has been received.
Muscogee (Creek) Nation of Oklahoma	9/15/00(GA) 9/25/00 (FL) 1/25/01 (GA) 8/9/01 (FL) 2/4/05 (FL) 4/4/05 (acknowledging receipt of 3/8/05 letter) 6/10/05 (transmittal of GA and FL survey results per 3/8/05 letter)	10/5/00: requested a copy of the proposed fieldwork and methodologies and notification of any unanticipated discoveries during construction. 2/9/01: requested a copy of the survey report. 3/8/05: stated that the Tribe does not foresee any impact by the proposed project and requested notification of any unanticipated discoveries during construction.
Poarch Band of Creek Indians	9/15/00(GA) 9/25/00 (FL) 1/25/01 (GA) 8/9/01 (FL) 2/4/05 (FL) 4/4/05 (FL)	9/26/00: requested a copy of the survey reports for review and stated that it may request a site visit.
Seminole Indian Tribe of Florida	9/15/00(GA) 9/25/00 (FL) 8/9/01 (FL) 2/4/05 (FL) 4/4/05 (FL)	To date no response has been received.
Seminole Nation of Oklahoma	9/15/00(GA) 9/25/00 (FL) 8/9/01 (FL) 2/4/05 (FL) 4/4/05 (FL)	To date no response has been received.
Florida		
Miccosukee Indian Tribe	9/25/00 8/9/01 2/4/05 4/4/05 (acknowledging receipt of 2/10/05 letter) 6/10/05 (transmittal of survey results per 2/10/05 letter)	2/10/05: stated that the Tribe did not have direct knowledge of sites along the proposed route in Florida, requested that the pipeline route be changed to avoid any sites that are discovered, and requested that the Tribe be contacted if any cultural resources are discovered during surveys.

FGT Expansion Project

FGT contacted the Seminole Tribe of Florida and the Seminole Nation at the Mekusukey Mission regarding the proposed project. The Tribal Historic Preservation Officer of the Seminole Tribe of Florida requested a copy of the cultural resources survey report and identified the earliest Seminole Tribe town, which is located near the proposed project. FGT conducted background research regarding the town, and found two previously recorded sites in the area; however, these sites are located 0.3 and 1 mile away from

the proposed pipeline route. FGT provided a copy of the draft cultural resources report to the Seminole Tribe of Florida for comment. To date, no response has been received from the Seminole Nation at the Mekusukey Mission. In addition, we received responses from two tribes regarding our Pre-filing Notice. In a letter dated June 29, 2005, the Iowa Tribe of Oklahoma commented that the proposed project area does not have religious or cultural significance to the tribe, but requested that it be informed if anything new is discovered. In a letter dated July 8, 2005, the Sac and Fox Tribe of the Mississippi in Iowa commented that it has no objections to the proposed project, but requested that it be contacted in the event of unanticipated discoveries during construction.

4.10.4 General Impact and Mitigation

Cypress Pipeline Project

Southern has not completed cultural resources surveys for about 0.1 mile of the proposed loop route and 14.8 miles of the proposed mainline route due to denied access. Therefore, we have not completed the process of complying with section 106 of the NHPA for Southern's proposed facilities. Once cultural resources surveys and evaluations are complete, if any historic properties would be adversely affected by the proposed project, a treatment plan would be prepared.

To ensure that the Commission's responsibilities under the NHPA and its implementing regulations are met, **we recommend that:**

- **Southern should defer construction of facilities and use of all staging, storage, or temporary work areas and new or to-be-improved access roads until:**
 - a. **Southern conducts surveys and any required evaluations for the denied access areas and any other areas that remain to be surveyed, files with the Secretary the remaining cultural resources survey reports; any required evaluation reports and treatment/avoidance plans; and the Georgia and Florida SHPOs' comments on the reports and plans;**
 - b. **The ACHP is afforded an opportunity to comment, if historic properties would be adversely affected; and**
 - c. **The Director of OEP reviews all cultural resources survey reports and plans, and notifies Southern in writing that treatment plans may be implemented or construction may proceed.**

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE."

FGT Expansion Project

FGT has not yet filed the Florida SHPO's comments on its survey report. In addition, FGT needs to provide documentation of consultation regarding the need for survey of, and conduct any required survey for, certain access roads and aboveground facilities. Therefore, we have not completed the process of complying with section 106 of the NHPA for FGT's proposed facilities.

To ensure that the Commission's responsibilities under the NHPA and its implementing regulations are met, **we recommend that:**

- **FGT should defer construction of facilities, and use of all staging, storage, or temporary work areas and new or to-be-improved access roads until:**
 - a. **FGT files with the Secretary the Florida SHPO's comments on the survey report and the need for additional surveys;**
 - b. **FGT files any additional required survey reports and any required treatment plans, and the SHPO's comments on the reports and plans;**
 - c. **The ACHP is afforded an opportunity to comment, if historic properties would be adversely affected; and**
 - d. **The Director of OEP reviews all cultural resources survey reports and plans, and notifies FGT in writing that construction may proceed.**

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE."

4.11 AIR QUALITY AND NOISE

4.11.1 Air Quality

Air emissions associated with the Cypress Pipeline and FGT Expansion Projects would be primarily attributed to the operation of three new compressor stations and the modification of two existing compressor stations, respectively. These projects would also involve the construction of new natural gas pipeline and auxiliary facilities including Southern's four new meter stations, sixteen new block valves, and miscellaneous piping and regulation facilities, and FGT's miscellaneous piping and facility modifications. There would be no air emissions generated by operation of the pipeline or auxiliary facilities, however, there would be some emissions generated from equipment during the construction and building of these facilities.

Cypress Pipeline Project

Southern proposes to construct three new compressor stations; Compressor Station 1 would be in Glynn County, Georgia, Compressor Station 2 would be in Liberty County, Georgia, and Compressor Station 3 would be in Nassau County, Florida. Compressor Station 1 would be located about 15 miles west of Brunswick, Georgia; Compressor Station 2 would be about 5 miles west of Midway, Georgia; and Compressor Station 3 would be about 10 miles southwest of Hilliard, Florida.

Each of Southern's compressor stations would include the installation of new equipment at what would be considered greenfield sites (e.g., no existing equipment). The construction of each compressor station would include the addition of a natural gas turbine compressor unit equipped with a standard low emission combustion system and a fuel gas heater. Each compressor station would have a maximum net power output of 10,350 horsepower (hp) and maximum heat input of 88.59 million British thermal units per hour (MMBtu/hr). The horsepower ratings are based on International Organization for Standardization (ISO) conditions. In addition, each compressor station would be equipped with a fuel-

burning backup power generation unit with a maximum net output power of 791 hp and a maximum heat input of 6.88 MMBtu/hr.

FGT Expansion Project

FGT proposes to increase compression by 9,800 hp by making improvements at two existing compressor stations; one in Gilchrist County, and one in Citrus County, Florida. At FGT's Compressor Station No. 26 in Citrus County, Florida, a new electric driven 15,000 hp motor and gear box would replace a 7,200 hp gas driven unit resulting in 22,300 total hp for Compressor Station No. 26. In addition, at 2,000 hp would be added FGT's Compressor Station No. 24 in Gilchrist County by up-rating an existing gas driven turbine resulting in 22,200 total hp. The FGT Expansion Project would also include modifications at two other existing compressor stations and other auxiliary facilities located in Gilchrist, Levy, Bradford, Clay, Polk, Hillsborough, Citrus, and Hernando Counties, Florida; however, those modifications would not result in new operational emissions.

Emission control measures for the FGT project would include the replacement of an existing gas-fired engine at Compressor Station No. 26 with an electric driven engine and installation of a Mars-100 gas-fired turbine equipped with a standard low emission combustion system (DryLoNox technology) to decrease nitrogen oxide emissions.

The gas driven turbines associated with the Cypress Pipeline and FGT Expansion Projects would be fueled with natural gas obtained directly from the pipeline. The primary pollutants emitted by natural gas compressor stations, auxiliary facilities, and construction activities are nitrogen oxides (NO_x), carbon monoxide (CO), Volatile Organic Compounds (VOC), particulate matter less than 10 microns in aerodynamic diameter (PM₁₀), particulate matter less than 2.5 microns in aerodynamic diameter (PM_{2.5}), sulfur dioxide (SO₂), and hazardous air pollutants (HAPs), primarily formaldehyde.

4.11.1.1 Existing Air Quality

The eastern portion of Georgia and Florida along the Atlantic coast, experiences a climate that is characterized regionally as humid subtropical. The area experiences mild temperatures during the winter and summer with rainfall throughout the year. According to the South East Regional Climate Center (SERCC), Georgia receives an average of approximately 50 inches of precipitation per year, with July having the highest average monthly rainfall at 5.63 inches. The average temperatures in Georgia range from 46.8 degrees Fahrenheit (°F) in January to 80.0 °F in July. For Florida, the average temperatures range from 58.3 °F in January to 81.3 °F in July and August. (SERCC, 2005a). In Florida, the average annual rainfall is approximately 54 inches. July has the highest average monthly rainfall at 6.38 inches. (SERCC, 2005b)

For Savannah, Georgia, the annual prevailing wind direction is from the west at an annual average speed of 8 miles per hour. At the Brunswick/Glynco NAS, the annual prevailing wind direction is southwest at an annual average wind speed of 7 miles per hour. For Jacksonville, Florida, the annual prevailing wind direction is west-southwest at an annual wind speed of 8 miles per hour. (NOAA, 1998).

For Gainesville, Florida, the wind rose shows that wind direction is from the northeast and east-northeast directions approximately 18% of the time. The average wind speed is approximately 9 miles per hour and average rainfall is approximately 55 inches.

A climate summary for the area around Compressor Station 26 shows the area climate to be mild with average annual temperatures ranging from highs of 82.3°F to a low of 59.1°F with annual precipitation averaging 54 inches. The area is within a typical track for major tropical storm events and

strong localized storms. The gas turbines would operate in enclosures that would be well protected from storm events. Fuel is provided by closed systems as well. Predominate winds originate from the east-northeast and northeast directions approximately 24% of the time. The average wind speed is approximately 11 miles per hour.

Ambient air quality is protected by federal and state regulations. The EPA has developed National Ambient Air Quality Standards (NAAQS) for certain criteria pollutants. These criteria pollutants include nitrogen dioxide (NO₂), SO₂, PM₁₀, PM_{2.5}, carbon monoxide (CO), ozone (O₃), and lead. Georgia's ambient air quality standards are the same as the NAAQS. Florida's ambient air quality standards are also the same as the NAAQS except that the following standards have been established for one criteria pollutant in addition to the federal NAAQS:

- for SO₂, a standard of 0.1 ppm by volume average for a 1-day period not to be exceeded more than once per 1-year period; and
- for SO₂, a standard of 0.02 ppm by volume average for a 1-year period not to be exceeded.

Areas within the United States have been classified into one of several categories on a pollutant-by-pollutant basis regarding their status with the NAAQS. These categories include: Attainment, Unclassifiable, Nonattainment, or Maintenance. Depending on the specific designation of an area, air quality emission requirements are set for stationary sources. Areas where an ambient air pollutant concentration is determined to be below the applicable ambient air quality standard for a given pollutant would be designated to be in Attainment for that pollutant. Areas where no data are available are designated Unclassifiable. Areas where the ambient air concentration is greater than the applicable ambient air quality standard are designated Nonattainment. Areas that have been historically designated as Nonattainment for a pollutant, but have since demonstrated compliance with the ambient air quality standard(s), are designated as Maintenance for that pollutant. Maintenance areas are treated similar to Attainment areas for the permitting of stationary sources; however, specific provisions may be incorporated through the state's approved maintenance plan to ensure that the air quality would remain in compliance with the ambient air quality standard(s) for that pollutant.

The NAAQS designation for each county in Georgia and Florida that would be crossed by the Cypress Pipeline and FGT Expansion Projects can be found in Title 40 CFR Parts 81.310 and 81.311. For the Cypress Pipeline and FGT Expansion Projects, the status of all the areas surrounding each compressor station is designated as Attainment or Unclassifiable for all criteria pollutants. Three PSD Class I Areas are located within the vicinity of the Cypress Pipeline and FGT Expansion Projects. They include the Chassahowitza Wilderness, the Okefenokee Wilderness, and the St. Mark's Wilderness, which are all discussed further below.

Regulatory Requirements for Air Quality

Air quality in the United States is regulated by federal statutes in the Clean Air Act (CAA) and its amendments. The provisions of the CAA that are applicable to the Cypress Pipeline and FGT Expansion Projects include:

- Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR);
- Federal Class I Area Protection;

- National Emission Standards (NES) for Hazardous Air Pollutants (HAPs);
- New Source Performance Standards (NSPS);
- Title V Air Permitting; and
- state air quality regulations.

Prevention of Significant Deterioration and Nonattainment New Source Review – Ambient air quality is protected by the EPA’s PSD and NNSR programs. The PSD regulations apply to new major stationary sources or major modifications to stationary sources located in Attainment areas. The NNSR regulations apply to new or modified stationary sources located in Nonattainment areas. The PSD regulations, as codified in Title 40 CFR Part 52.21, define a major source or major modification as:

- a source with a potential-to-emit (PTE) of more than 100 tons per year (tpy) of any criteria pollutant for a facility that is one of the 28 industrial source categories listed in Title 40 CFR Part 52.21(b)(1)(i)(a);
- a source with a PTE of more than 250 tpy of any criteria pollutant for a facility that is not one of the 28 industrial source categories listed in Title 40 CFR Part 52.21(b)(1)(i)(a);
- a modification to an existing major source that results in a net emissions increase greater than the PSD significant emission rate specified in Title 40 CFR Part 52.21 (b)(23)(i); or
- an existing minor source proposing a modification that is major by itself.

As stated above, the locations where the new emissions would occur for the Cypress Pipeline and FGT Expansion Projects are designated Unclassifiable or Attainment for the NAAQS for all criteria pollutants. Therefore, NNSR does not apply. In addition, the PTE would not exceed 250 tpy for any criteria pollutant at any of the compressor stations. The potential emissions of each regulated pollutant (NO_x, VOC, CO, SO₂, PM₁₀, and HAPs) from the installation and operation of each compressor station are summarized in table 4.11.1-1, below, in comparison with the applicable major source threshold. The potential emissions are based on 8,760 hours of operation annually. During any given year, net emissions would be less than those presented in table 4.11.1-1 if natural gas demand was below system capacity, resulting in lower hours of operation.

As shown in table 4.11.1-1, the net emissions associated with each compressor station for each of the criteria pollutants would be less than the major source applicability thresholds. Therefore, the Cypress Pipeline and FGT Expansion Projects would be considered a “minor source” with regards to PSD review. As a result, Best Available Control Technology (BACT) or PSD modeling (air dispersion modeling) would not be required. Additionally, Georgia and Florida do not require state BACT or dispersion modeling for minor sources.

TABLE 4.11.1-1

Estimated Net Emissions for the Cypress Pipeline and FGT Expansion Projects

Facility/Pollutant	Post Project Total Facility Emissions (tpy) ^a	Applicability Threshold (tpy) ^b
CYPRESS PIPELINE PROJECT		
Glynn County Compressor Station		
NO _x	46.48	250
VOC	13.05	250
CO	46.27	250
SO ₂	1.32	250
PM ₁₀ ^c	2.63	250
HAPs	1.88	25
Liberty County Compressor Station		
NO _x	46.48	250
VOC	13.05	250
CO	46.27	250
SO ₂	1.32	250
PM ₁₀ ^c	2.63	250
HAPs	1.88	25
Nassau County Compressor Station		
NO _x	46.48	250
VOC	13.05	250
CO	46.27	250
SO ₂	1.32	250
PM ₁₀ ^c	2.63	250
HAPs	1.88	25
FGT EXPANSION PROJECT		
Compressor Station 24		
NO _x	79.3	250
VOC	8.7	250
CO	94.6	250
SO ₂	24.2	250
PM ₁₀ ^c	5.6	250
HAPs	2.41	25
Compressor Station 26		
NO _x	24.5	250
VOC	0.9	250
CO	29.8	250
SO ₂	7.5	250
PM ₁₀ ^c	1.8	250
HAPs	0.89	25
^a	Includes emissions from all combustion units for each Compressor Station.	
^b	PSD New Source Applicability Threshold.	
^c	Includes PM emissions.	

Federal Class I Area Protection – Certain lands were designated as mandatory federal Class I (Class I) Areas as a part of the CAA Amendments of 1977. Class I Areas were designated because the air quality was considered a special feature of the area (e.g., national parks, wilderness areas, national forests). Federal Class I Areas are protected against several types of pollution including criteria pollutant concentrations, visibility degradation, and acidic deposition. If a new source or major modification is subject to the PSD program requirements and is within 62 miles (100 kilometers) of a Class I Area, the

facility is required to notify the appropriate federal officials and assess the impacts of the proposed project on the nearby Class I Areas.

The closest Class I Areas to the Cypress Pipeline and FGT Expansion Projects are the Chassahowitka, St. Marks, and Okefenokee Wilderness areas. The St. Marks Wilderness is about 100 miles from the nearest modified source (FGT's Compressor Station 24), and both the Chassahowitka and Okefenokee Class I Areas are within 62 miles of new or modified sources. However, the Cypress Pipeline and FGT Expansion Projects would not be subject to PSD program requirements as discussed above and therefore, would not be required to assess impacts to these Class I Areas. Additionally, air dispersion modeling was completed for the proposed modifications to Compressor Station No. 24 and Compressor Station No. 26 and predicted the maximum impact for these compressor stations would not exceed Class I significance levels.

National Emission Standards for Hazardous Air Pollutants – Title 40 CFR Parts 61 and 63 regulate facilities that emit specific HAPs. Part 61 was promulgated before the 1990 CAA amendments and regulates only eight hazardous substances. The CAA as amended in 1990 established a list of 189 HAPs and guidelines for regulating these pollutants from any major source, resulting in the promulgation of Part 63. Part 63, also known as the Maximum Achievable Control Technology (MACT) standards, regulates HAP emissions from major sources and specific source categories. Part 63 defines a major source of HAPs as any source that has the PTE 10 tpy of any single HAP or 25 tpy of HAPs in aggregate.

As detailed in Table 4.11.1-1, HAP emissions for the Cypress Pipeline and FGT Expansion Projects would be below the thresholds of 10 tpy for a single HAP and 25 tpy facility wide total HAPs. Therefore, the compressor stations associated with the Cypress Pipeline and FGT Expansion Projects would not be major sources of HAPs and Part 63 requirements would not apply.

Subpart HH (National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities) regulates the HAP emissions from glycol dehydration units, storage vessels, and equipment leaks. Subpart HHH (National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage) regulates the HAP emissions from glycol dehydration units. Subpart YYYYY (National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines) regulates HAP emissions from combustion turbines. Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines) regulates HAP emissions from reciprocating internal combustion engines. Subpart DDDDD (National Emission Standards for Hazardous Air Pollutants for Industrial/Commercial/Institutional Boilers and Process Heaters) regulates HAP emissions from boilers and heaters. Subparts HH, HHH, YYYYY, ZZZZ, and DDDDD apply only to sources located at major sources of HAPs. Provisions of this subpart apply to stationary gas turbines at facilities whose hazardous air pollutant (HAP) emissions exceed major threshold levels of 10 tpy single HAP or 25 tpy total HAPs. The gas-fired turbines to be constructed and/or modified for the Cypress Pipeline and FGT Expansion Projects would not be required to meet the requirements of Subpart YYYYY. In addition, the natural gas pipeline and auxiliary equipment associated with the Cypress Pipeline and FGT Expansion Projects would not be subject to Subparts HH, HHH, YYYYY, ZZZZ, and DDDDD.

New Source Performance Standards (NSPS) – The NSPS, codified in Title 40 CFR Part 60, apply to new, modified, or reconstructed stationary sources that meet or exceed specified applicability thresholds. The NSPS are divided into several subparts. Each subpart regulates a specific source type and size and defines emission limitations and monitoring requirements that are applicable to a particular source group. The potentially applicable subparts are addressed below.

Subpart GG applies to new, modified, or reconstructed stationary gas turbines with a heat input at peak load of greater than or equal to 10 MMBtu/hr. The three new turbines that would be installed at each of Southern's compressor stations, in addition to the natural gas driven turbines at FGT's Compressor Stations No. 24, would have a peak load of greater than 10 MMBtu/hr. Therefore, these turbines would be subject to NSPS Subpart GG. Subpart GG establishes NO_x emission limits and fuel sulfur content limits. The gas turbines would meet the requirements of Subpart GG by burning only pipeline quality natural gas. The electric unit at Compressor Station 26 would not be subject to this subpart.

Subpart KKK applies to VOC emissions from equipment leaks at onshore natural gas processing plants. Natural gas processing plants are defined under Subpart KKK as any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids, or both. Natural gas liquids are defined in Subpart KKK as the hydrocarbons, such as ethane, propane, butane, and pentane that are typically extracted from field gas before being placed in transmission pipelines. Southern's compressor stations and FGT's compressor station upgrades are not designed for extraction of natural gas liquids; therefore, the proposed modifications would not be subject to NSPS Subpart KKK.

Subpart LLL applies to sweetening units and sulfur recovery units at facilities that process natural gas. Sweetening units are defined by Subpart LLL as process devices that separate the hydrogen sulfide and carbon dioxide contents from sour natural gas. There are no gas sweetening units or sulfur recovery units proposed as a part of the Cypress Pipeline or FGT Expansion Projects; therefore, the projects would not be subject to NSPS Subpart LLL.

On February 9, 2005, the EPA proposed performance standards for new stationary combustion turbines as NSPS Subpart KKKK. The proposed Subpart KKKK provisions would apply to stationary combustion turbines with a power output at peak load that is greater than or equal to one (1) megawatt. EPA has proposed to finalize the rule by February 2006. Any turbine that has been constructed, modified or reconstructed after February 18, 2005 would fall subject to the requirements in this subpart. This standard and its requirements would apply to the combustion turbines and any associated heat recovery steam generator duct burner. Turbines subject to Subpart KKKK are exempt from the requirements of 40 CFR Part 60, Subpart GG. Southern and FGT would need to monitor the development of this rule to ensure compliance with all applicable requirements.

Title V Permitting – Title V of the CAA requires each state to develop an operating permit program. The operating permit program is implemented through Title 40 CFR Part 70 and establishes applicability thresholds for criteria pollutants and HAPs. If a facility's PTE exceeds one or more of these thresholds, the facility is considered a "major source." The major source threshold for a source in an Attainment area is 100 tpy of PM₁₀, SO₂, NO_x, VOC, or CO. As outlined above, the total PTE of all criteria pollutants would be less than the Title V major source threshold of 100 tpy and the potential emissions of HAPs would be below the 10 tpy threshold for an individual HAP and 25 tpy threshold for all combined HAPs. Therefore, the compressor stations to be constructed and /or modified as part of the Cypress Pipeline and FGT Expansion Projects would not be subject to the Title V permitting requirements because they would be minor sources.

State Air Permitting – Georgia allows for the issuance of a combined construction and operating permit for minor sources. In accordance with Georgia requirements, Southern would be required to submit a construction permit application and secure a State Construction Permit prior to commencing construction of the Compressor Stations in Glynn County and Liberty County.

Florida has separate State Construction and State Operating Permit Programs for minor sources. In accordance with the Florida requirements, Southern and FGT would need to obtain a construction

permit application prior to the start of construction of the new compressor station or compressor station upgrades. Additionally, a State Operating Permit would have to be obtained following the completion of construction and prior to operation of the new or expanded facilities.

4.11.1.2 Air Emission Impacts

Construction Emissions

Construction activities for the proposed pipelines and aboveground facilities would result in intermittent and short-term fugitive emissions associated with equipment operation, land clearing, ground excavation, and grading operations. The intermittent and short-term emissions generated would include dust from soil disruption and combustion emissions such as NO_x, SO₂, VOC, CO, and PM₁₀ from the operation of the construction equipment. The fugitive dust emissions (e.g., PM₁₀) would depend on the moisture content and texture of the soils that would be disturbed. The impact of these emissions would be highly localized and would vary from day to day depending on the level of activity, the specific operations, and prevailing weather. Southern and FGT have agreed to mitigate fugitive dust emissions by watering the construction areas.

Southern would maintain construction equipment in proper working condition to reduce air emissions from equipment exhaust. Southern's inspectors would monitor the condition and performance of equipment and require that the contractor repair or replace equipment found to be in poor operating condition including visually observed excessive emissions. Most of the construction equipment would be powered by diesel engines and would be equipped with typical control equipment (e.g., catalytic converters). Emissions from construction of the pipeline and aboveground facilities are not expected to cause or significantly contribute to a violation of an applicable ambient air quality standard at the property boundaries or the nearest residence (in the case of the pipeline construction) because the construction equipment would be operated primarily on an as-needed basis during daylight hours, except perhaps HDD equipment. The emissions from gasoline and diesel engines would be minimized because the engines must be built to meet the standards for mobile sources established by the EPA mobile source emission regulations including those in Title 40 CFR Part 85. Therefore, it is not anticipated that the construction-related emissions would have a significant impact on the air quality.

Operation Emissions

The proposed turbines and fuel gas heaters would operate on natural gas. Therefore, the primary pollutants emitted by these units would be NO_x and CO. The use of DryLoNox technology and good combustion practices have been identified as the emission reduction measures to be implemented for the proposed turbines that would be installed for the Cypress Pipeline Project. The FGT Expansion Project would use DryLoNox technology and good combustion practices as emission control measures at Compressor Station No. 24, in addition to an electric driven turbine at Compressor Station No. 26. As discussed in section 4.11.1.1, the proposed installations and modifications for the Cypress Pipeline and FGT Expansion Projects would not be subject to PSD review because these installations and modifications would not meet PSD emission thresholds.

As outlined above, the Cypress Pipeline and FGT Expansion Project would involve the construction of new natural gas pipeline and auxiliary facilities including meter stations, miscellaneous piping and regulation facilities, and sixteen new block valves. Each block valve facility would typically include a blowdown valve for maintenance. Natural gas blowdown is not a part of normal operation and is considered an insignificant source of emissions due to the minimal amount of regulated pollutant (VOC) in natural gas that is vented when compared to the amount of gas released. Therefore, there would be no air emissions generated by operation of the blowdown valves or other auxiliary facilities.

The Cypress Pipeline and FGT Expansion Projects would be located in areas that are currently in Attainment or listed as Unclassifiable with respect to the NAAQS for all criteria pollutants. The PTE of all regulated pollutants is below 100 tpy and would meet toxic air pollutant standards. Therefore, it is not anticipated that the operation-related emissions would have a significant impact on air quality. Additionally, air dispersion modeling completed for the proposed modifications to Compressor Station No. 24 and Compressor Station No. 26 showed the predicted impacts as having minimal effect on the local environment with the overall conclusion that the project would not result in a significant adverse impact to the local air quality.

Southern does not believe the minor impacts of this project would have a significant cumulative effect when aggregated with other Southern operations in the area. With regard to Southern's Elba Island facility, the Elba Island LNG import terminal is separately permitted. Its air permit provides for the operation of the facility up to its designed capacity.

4.11.2 Noise

At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week. Variation is caused in part by changing weather conditions, the effects of seasonal vegetative cover, and man-made activities. Two measures used by federal agencies for the time-varying quality of environmental noise known to affect people are the 24-hour equivalent sound level ($L_{eq(24)}$) and the day-night equivalent sound level (L_{dn}). The $L_{eq(24)}$ is the level of steady sound with the same total (equivalent) energy as the time-varying sound of concern, averaged over a 24-hour period. The L_{dn} is the $L_{eq(24)}$ with 10 decibels of the A-weighted scale (dBA) added to nighttime sound levels between the hours of 10:00 PM and 7:00 AM to account for people's greater sensitivity to sound during nighttime hours. The human ear's threshold of perception for noise change is generally considered to be 3 dBA.

4.11.2.1 Existing Noise Levels

Cypress Pipeline Project

Compressor Station 1

Southern's proposed Compressor Station 1 would be located in a rural area of Liberty County, Georgia, with very few residents within a mile of the proposed site. Southern conducted a sound survey at one noise sensitive area (NSA) in the vicinity of the proposed compressor station to determine representative background noise levels at the NSA. The noise survey was conducted over a 1.0 hour period on March 15, 2005. Results of the survey are shown in Table 4.11.2-1. This NSA is a residential home approximately 6,500 feet to the west of the proposed compressor station, with additional residences farther to the west.

The measured daytime sound level was influenced by vehicle traffic noise associated with State Highway 119 at the time of the noise survey. An estimated nighttime sound level was provided to account for the lower sound levels which result due to lower nighttime traffic volume. The estimated nighttime sound level corresponds to published average rural noise levels, as identified in the Environmental Protection Agency's 1974 reference document titled *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA, 1974). Using this estimated value provides a more accurate representation of the ambient L_{dn} near NSA #1.

TABLE 4.11.2-1

Cypress Pipeline Project
Nearest Noise-Sensitive Areas to Compressor Stations

Compressor Station Number	Noise Sensitive Area (NSA)	Distance (ft) and Direction of NSA to Site Center	Measured L_d (dBA)	Estimated L_n (dBA)	Calculated L_{dn} (dBA)
1 ^a	NSA #1	6,500 – West	56.1	40.0	54.7
2 ^b	NSA #1	4,000 – West	54.6	40.0	53.4
2 ^b	NSA #2	5,800 – East	38.7	38.7	45.1
3 ^c	NSA #1	4,200 – Northeast	37.2	43.6	

^a Noise survey was conducted on March 15, 2005 between 4:00 p.m. and 5:00 p.m.
^b Noise survey was conducted on November 28, 2000 between 9:00 a.m. and 12:30 p.m.
^c Noise survey was conducted on March 17, 2005 between 8:30 a.m. and 9:30 a.m.

Compressor Station 2

Southern's Compressor Station 2 would be located in a rural area of Glynn County, Georgia, with a few residences within a mile of the proposed site. Southern conducted a sound survey at the two nearest NSAs in the vicinity of the proposed compressor station to determine representative background noise levels at the NSAs. The noise survey was conducted over a 3.5 hour period on November 28, 2000 and was re-visited on March 16, 2005 to verify the existing NSAs. Results of the survey are shown in Table 4.11.2-1. The nearest NSA is a residential home approximately 4,000 feet to the west of the proposed compressor station.

The measured daytime sound level was influenced by vehicle traffic noise associated with U.S. Highway 82 at the time of the noise survey, most notably at NSA #1. As such, an estimated nighttime sound level for NSA #1 was provided to account for the lower sound levels which result due to lower nighttime traffic volume. The estimated nighttime sound level corresponds to EPA-published average rural noise levels (EPA, 1974). Using this estimated value provides a more accurate representation of the ambient L_{dn} near NSA #1.

Compressor Station 3

Southern's Compressor Station 3 would be located in a rural area in Nassau County, Florida, with a few residences within a mile of the proposed site. A sound survey was conducted at the nearest NSAs in the vicinity of the proposed compressor station to determine representative background noise levels at the NSAs. The noise survey was conducted over a 1-hour period on March 17, 2005. Results of the survey are shown in Table 4.11.2-1. The nearest NSA is a residential home approximately 4,200 feet to the northeast of the proposed compressor station.

The measured daytime sound level was influenced by vehicle traffic noise associated with County Road 108, wind, birds and a high-altitude aircraft. However, due to the nature of these noise influences, no nighttime sound level was estimated, and an L_{dn} was calculated directly from the measured sound level.

FGT Expansion Project

Compressor Station 24

As part of the FGT Expansion Project, FGT would modify its existing Compressor Station 24 located in Gilchrist County, Florida. Noise sources from the compressor station include compression unit

2401, which contains a 13,000 hp Mars 90 driver. FGT conducted preconstruction sound level measurements at Compressor Station 24 on May 5, 2004 while the compression unit was operating at full capacity. Results of the survey are shown in table 4.11.2-2. The nearest NSA is a residence approximately 2,100 feet northeast of the existing compressor station.

TABLE 4.11.2-2			
FGT Expansion Project Noise Analysis Summary – Compressor Station 24 ^a			
Noise Sensitive Area (NSA)	Distance (ft) and Direction of NSA to Site Center	Measured $L_{eq(24)}$ (dBA)	Calculated L_{dn} (dBA)
NSA #1	2,200 – Southeast	40.6	47.0
NSA #2	3,510 – West	42.0	48.4
NSA #3	2,230 – Northeast	40.9	47.3
NSA #4	2,100 – Northeast	44.2	50.6

^a Noise survey was conducted on May 5, 2004.

Compressor Station 26

FGT is also proposing to modify their existing Compressor Station 26 located in Citrus County, Florida. Noise sources from the compressor station include compression unit 2601, which contains a 7,300 hp Taurus-60 driver and compression unit 2602, which contains a 7,200 hp driver. FGT conducted preconstruction sound level measurements at Compressor Station 26 on June 14, 2005 while the compression units were operating at full capacity. Results of the survey are shown in table 4.11.2-3. The nearest NSA is a residence approximately 1,020 feet south of the existing compressor station.

TABLE 4.11.2-3			
FGT Expansion Project Noise Analysis Summary – Compressor Station 26 ^a			
Noise Sensitive Area (NSA)	Distance (ft) and Direction of NSA to Site Center	Measured $L_{eq(24)}$ (dBA)	Calculated L_{dn} (dBA)
NSA #1	1,440 – Southeast	41.8	48.2
NSA #2	1,020 – South	43.6	50.0
NSA #3	1,080 – South-Southwest	43.9	50.3
NSA #4	1,670 – Southwest	40.9	47.3
NSA #5	1,900 – Northwest	43.1	49.5
NSA #6	2,700 – North-Northwest	40.5	46.9

^a Noise survey was conducted on June 14, 2005.

The actual sound level at NSA #4 was influenced by noise contribution from traffic on a nearby highway; therefore, the reported $L_{eq(24)}$ was calculated by taking a sound measurement about 560 feet from the compressor station which was not influenced by traffic noise and calculating an estimated noise at NSA #4 by subtracting a distance adjustment of 9.5 dBA from the actual 50.4 dBA measurement.

Noise Regulations

The previously referenced EPA document (EPA, 1974) was published to evaluate the effects of environmental noise with respect to public health and safety. The EPA has identified that noise levels should not exceed 55 dBA L_{dn} to protect the public from indoor and outdoor activity interference. Federal and state agencies have used this recommendation to develop noise limitations from various noise

sources. FERC has adopted the requirement that noise attributable to any compressor station not exceed 55 dBA L_{dn} at any NSA (e.g., residences, schools, hospitals) unless the NSA is established after facility construction. This level equates to an $L_{eq(24)}$ of 48.6 dBA.

There are no applicable state or local noise regulations that would apply to the Cypress Pipeline Project.

There are no applicable state noise regulations that would apply to the FGT Expansion Project. Gilchrist, Citrus, and Levy Counties have local noise ordinances. Citrus county noise regulations require the noise at residential property line to be 60 dBA L_{10} during the day and 55 dBA L_{10} at night. (L_{10} means that noise exceeds these limits only 10% of the time). Citrus County grants an exemption to their noise ordinance to construction operations for which building permits have been issued, or construction operations not requiring a building permit. This exemption does not apply between the hours of 10:00 pm and 7:00 am. For Compressor Station 26, the acoustical analysis indicates that the compressor station would comply with Citrus County's noise regulations. The Gilchrist County noise ordinance is not applicable to compressor stations or other industrial-type noise sources. Levy County has a noise ordinance that requires a permit for construction noise expected to exceed 65 dBA at the nearest residential property line between 7:00 am and 10:00 pm.

4.11.2.2 Impact and Mitigation

Potential noise impacts from each project could be caused by short-term increases in noise during construction and long-term increases in noise due to operation of the proposed facilities. Noise would be generated during the construction phase of the pipeline and ancillary facilities for each project and during construction of new or modified compressor stations. Pipeline construction usually proceeds at rates ranging from several hundred feet to 1 mile per day. However, due to the assembly-line method of construction, construction activities in any one area could last from several weeks to several months on an intermittent basis. Construction equipment would be operated on an as-needed basis during this period. While individuals in the immediate vicinity of construction activities could experience an increase in noise, this effect would be temporary and local. Nighttime noise levels are not expected to increase during construction because most construction activities would be limited to daylight hours, except for some specialized construction methods such as HDD, road bores, and hydrostatic testing.

Operational noise impacts would be primarily associated with operation of the compressor stations. The potential construction and operational noise increases were compared with the FERC standard for permissible noise at NSAs.

Cypress Pipeline Project

Construction Noise

Although the FERC does not regulate noise from construction activities, comments were raised during the scoping period for the Cypress Pipeline Project related to potential noise impacts as a result of construction. As such, site-specific construction impacts are discussed below.

Construction of the proposed compressor stations would consist of earth work, such as clearing and grading, and construction of site buildings. It is assumed that the largest amount of noise would be generated during site earth work, which would require the largest number of construction equipment to be operating at the same time. Southern has predicted the sound contribution resulting from compressor station construction equipment and activities at the nearest NSA by summing the estimated noise contribution from the construction equipment that typically operates during site earth work and estimating

the noise contribution at the nearest NSA using distance attenuation. Southern used published data originally found in an EPA report on construction noise and summarized in an April 1995 report prepared for the Office of Planning of the Federal Transit Administration to estimate the noise contribution from the construction equipment. The results of the assessment are summarized in table 4.11.2-4.

Noise Sensitive Area (NSA)	Distance (ft) and Direction of NSA to Site Center	Estimated Maximum Sound Level of Equipment at the NSA (dBA)	Calculated L _{dn} (dBA)
Compressor Station 1 – NSA #1	6,500 – West	32.0	38.4
Compressor Station 2 – NSA #1	4,000 – West	40.0	46.4
Compressor Station 3 – NSA #1	4,200 – Northeast	40.0	46.4

In addition to the construction of the proposed compressor stations, some construction activities associated with the installation of the pipeline could generate noise impacts due to their potential to occur as continuous operations (i.e., 24 hours per day) during part of the activity. The operations with the potential to occur as continuous operations during at least part of the activity are:

- Horizontal Directional Drilling (HDD) – Estimated duration 8 weeks
- Road Bores – Estimated duration 3 days
- Hydrostatic Testing – Estimated duration 7 days

Southern has prepared a report estimating noise impacts resulting from HDD activities at the nearest NSA for planned drilling locations with an NSA within one-half mile of site. Southern used data collected at drilling sites with equipment similar to the type of equipment expected to be used at the proposed HDD sites. Noise levels from anticipated equipment were determined, and expected noise attenuation from the proposed activities to the nearest NSA was calculated based upon hemispherical radiation, atmospheric sound absorption and vegetative or land contour sound shielding, as appropriate based upon site conditions. The results were then summed and converted to A-weighted sound levels. Table 4.11.2-5 summarizes the results of the noise impact analysis.

Location of Planned HDD Construction Site	Entry or Exit Point	Distance (ft) and Direction of Nearest NSA	Estimated Maximum Sound Level of Drilling Activity at NSA (dBA)	Calculated L _{dn} (dBA) due to Drilling Activity
Hwy 21 – Port Wentworth	Entry	300 – South	67.3	73.7
Hwy 21 – Port Wentworth	Entry	1,000 – Northeast	46.1	52.5
Jimmy DeLoach Pkwy	Entry	1,670 – Northeast	47.2	53.6
Jimmy DeLoach Pkwy	Exit	1,560 – Northeast	40.5	46.9
Savannah-Ogeechee Canal	Entry	400 – West	64.6	71.0
Savannah-Ogeechee Canal	Exit	2,500 – South	35.4	41.8
Little Buffalo Swamp	Entry	2,300 – West Southwest	43.7	50.1
Little Buffalo Swamp	Exit	1,350 – West Northwest	42.0	48.4
Brandy Branch Swamp	Entry	650 – North Northeast	59.1	65.5
Brandy Branch Swamp	Exit	650 – Northeast	51.6	58.0

The results of this analysis indicate that four of the HDD sites have the potential to exceed 55 dBA L_{dn} at the nearest NSA. As such, Southern has committed to installing a temporary noise barrier around each site where construction-generated noise would exceed the FERC benchmark of 55 dBA. Table 4.11.2-6 presents Southern’s estimates of the L_{dn} at these four NSAs with the implementation of the proposed noise control measures.

Location of Planned HDD Construction Site	Entry or Exit Point	Distance (ft) and Direction of Nearest NSA	Calculated L_{dn} (dBA) due to Drilling Activity – without Noise Control	Estimated L_{dn} (dBA) due to Drilling Activity – with Noise Control
Hwy 21 – Port Wentworth	Entry	300 – South	73.7	62.0
Savannah-Ogeechee Canal	Entry	400 – West	71.0	59.4
Brandy Branch Swamp	Entry	650 – North Northeast	65.5	54.4
Brandy Branch Swamp	Exit	650 – Northeast	58.0	47.0

To ensure that NSAs are not exposed to excessive noise during nighttime drilling operations, we recommend that:

- **Southern should file with the Secretary, before the end of the draft EIS comment period, a residential HDD noise analysis, mitigation and compliance plan for review and approval. This plan should demonstrate that noise due to nighttime drilling operations would be below 55 decibels on the A-weighted scale (dBA) day-night equivalent sound level (L_{dn}) at the nearest noise-sensitive areas (NSA) and specify all noise mitigation equipment necessary to reduce noise to levels below 55 dBA L_{dn} . The plan should include details of how Southern would ensure compliance, and confirm that where surveys indicate that noise attributable to nighttime drilling would exceed 55 dBA L_{dn} , Southern should:**
 - a. **stop drilling and mitigate the noise at the affected NSAs to reduce the noise levels at those NSAs to 55 dBA L_{dn} or below, or**
 - b. **offer temporary housing until L_{dn} levels at the NSAs are 55 dBA or below.**

Operational Noise

The proposed compressor stations would generate noise on a continuous basis once operating (i.e., 24 hours per day). The noise impacts associated with the compressor stations would be limited to the general vicinity of the facilities. The specific operation noise sources associated with these facilities and estimated impacts to the nearest NSAs are described below.

Compressor Station 1, 2, and 3

An increase in noise during the operational phase of the project would be primarily limited to areas in the vicinity of the compressor stations. Station 1 in Liberty County, Georgia, Station 2 in Glynn County, Georgia, and Station 3 in Nassau County, Florida. Southern is proposing the following equipment at each of the compressor stations:

- One Solar Taurus 70S turbine (ISO rating of 10,350 HP) driving a Solar centrifugal gas compressor;
- An outdoor lube oil cooler and a gas aftercooler;
- A turbine exhaust muffler system and exhaust stack;
- A turbine air intake filter system with an in-duct intake silencer, and;
- Gas piping and piping components and a unit blowdown vent.

The turbine and gas compressors would be housed in an insulated metal building.

The following proposed noise mitigation measures and equipment specifications would be implemented by Southern at each of its proposed new Compressor Stations:

- Compressor Unit Buildings - The compressor unit buildings would not have any voids, openings, windows, or louvers, with the exception of a minimum number of skylights in the building roof. The building walls and roof would be constructed of 22-gauge exterior steel, 4 inches of mineral wool (6.0-8.0 pounds per cubic foot (pcf) uniform density), and a 26-gauge perforated metal interior liner. The air-supply fans for the forced air ventilation system would employ air-supply fans installed on the inside of walls, with exhaust air vented through roof openings and/or a roof ridge vent. Each air-supply fan would include a lined weather hood.
- Turbine Exhaust Systems – The turbine exhaust systems would be designed to include a muffler system.
- Lube Oil Coolers and Outdoor Motor Air Blowers - The lube oil coolers would be designed with electric motor driven fans and air blowers that would not exceed 65 dBA at 50 feet from the cooler perimeter.
- Air Intake Systems - A minimum 5-foot dissipative silencer (i.e., parallel-baffle type design) would be installed in the air exhaust ducting of each motor. The turbine air intake system would be designed so that noise radiating from the system, including noise from air intake filters and associated ductwork located outside the compressor building, would not exceed 65 dBA at 50 feet from the turbine air intake.
- Gas Aftercoolers - The gas aftercoolers would be designed with electric motor drive fans that would not exceed 70 dBA at 50 feet from the cooler perimeter with all fans operating at maximum design tip speed.
- Station Unit Blowdown Silencers – The unit blowdown silencers would be designed to attenuate the blowdown noise to equal to or less than 60 dBA at 300 feet from the outlet of the silencer, including the noise radiated from the shell of the silencer during the blowdown event.

Southern's noise analysis estimated the impacts of the proposed compressor stations on the noise environment at the nearest NSAs. The noise impacts were calculated based on hemispherical radiation and attenuation due to atmospheric absorption (based on 60 degrees Fahrenheit and 70 percent relative humidity) of noise from each equipment unit, taking credit for proposed noise mitigation measures. The

resulting noise levels were used to predict the estimated noise contribution from the compressor stations at each NSA, as well as the estimated total sound levels at each NSA once the facilities are operating. Table 4.11.2-7 shows the predicted noise impacts at the various NSAs due to the proposed compressor stations.

Southern plans to implement only the noise control measures assumed in the noise calculations. Southern does not plan to insulate the aboveground outdoor gas piping, although the aboveground outdoor discharge pipe and suction piping would be inserted underground as soon as possible based on design, operational, and maintenance requirements. If an in-service noise survey results in noise levels exceeding 55 dBA at the nearest NSA, Southern has agreed to implement the recommended alternate noise control measures to comply with the 55 dBA standard.

TABLE 4.11.2-7 Cypress Pipeline Project Predicted Compressor Station Noise Impacts				
Noise Sensitive Area (NSA)	Distance (feet) and Direction to Site Center	Existing Ambient L _{dn} (dBA)	Proposed Estimated L _{dn} of New Compressor Station (dBA)	Proposed Total L _{dn} (dBA)
Compressor Station 1 NSA #1	6,500 – West	54.7	36.5	54.8
Compressor Station 2 NSA #1	4,000 – West	53.4	43.7	53.8
NSA #2	5,800 – West	45.1	38.4	45.9
Compressor Station 3 NSA #1	4,200 – Northeast	43.6	43.0	46.3

Southern also would install blowdowns at each of the compressor stations to evacuate natural gas from the facility in the event of an emergency, accident, or maintenance. Typically emergency blowdowns are triggered during an emergency station shutdown, a very rare event. Maintenance or “unit” blowdowns, occur when gas from the compressors and piping must be evacuated. This may happen several times per month, although the exact number is difficult to quantify. Emergency blowdowns typically are much longer and louder than unit blowdowns. Noise from both types of unsilenced blowdown events can be upwards of 100 dBA L_{eq} at 50 feet, however, noise would be temporary and intermittent.

To ensure that the actual noise resulting from the operation of the proposed compressor stations are below an L_{dn} of 55 dBA at the nearest NSAs , **we recommend that:**

- Southern should conduct noise surveys to verify that the noise from the proposed new Compressor Stations operated at full load do not exceed an L_{dn} of 55 dBA at any NSAs, and file the results of the noise survey with the FERC no later than 60 days after placing the compressor stations in service. If the noise attributable to the operation of the compressor stations at full load exceeds an L_{dn} of 55 dBA at any nearby NSAs, Southern should file a report on what changes are needed and should install additional noise controls to meet that level within 1 year of the in-service date. Southern should confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the FERC no later than 60 days after it installs the additional noise controls.**

Due to the phased scheduling of the proposed Cypress Pipeline Project, the potential exists for the construction of NSAs in closer proximity to the proposed compressor station locations prior to station construction and operation. Southern has committed to evaluating existing conditions 1 year prior to the in service date of the proposed compressor stations to verify whether any NSAs closer than those included in the noise analyses have been constructed. If any closer NSAs were constructed, Southern has agreed to re-evaluate the potential noise impacts at the closer NSAs. In addition, we believe that all NSAs should be evaluated at the time of facility start-up. It is unlikely that those constructing, or purchasing a home near a proposed compressor station site would know that a compressor station would be constructed nearby, nor would they have any opportunity to comment. Therefore, our recommended condition would apply to any NSAs that are built between any project approval and actual construction of the compressor station.

If Southern verifies that any noise impacts have been mitigated, as indicated by our recommendation, we believe that project-operation noise levels would not result in significant impacts to local residents.

FGT Expansion Project

Construction Noise

Similar to the Cypress Pipeline Project, temporary and localized noise would occur during construction of the proposed FGT loops and other existing facility modifications. However, those impacts are not expected to be significant or long term.

Levy County has a noise ordinance that would apply to construction noise associated with the proposed project. FGT has contacted the Levy County Building Department, which is responsible for enforcement of all county ordinances related to construction, to review the proposal. According to Levy County Building Department representatives, the proposed project would not violate the noise ordinance if construction occurs during normal daylight hours, and if Levy County Commissioners approved the proposed project for construction, no further action with respect to the noise ordinance would be required.

Operational Noise

Increases in operational noise were evaluated at the FGT compressor stations that would add or increase compression. FGT's two existing compressor units that would not have new or increased compression, and FGT's other proposed existing facility modifications would not result in increased noise levels. The specific noise generating equipment, operational noise levels, and proposed or recommended mitigation measures to attenuate operational noise are described below.

Compressor Station 24

As part of the FGT Expansion Project, FGT is proposing to replace the existing Mars 90 driver at Compressor Station 24 and install a Mars 100 driver either by replacing the engine of the existing Unit 2401, or replacing some of its internal components. The upgrade would provide a 2,000 hp increase, resulting in a total rated power of 15,000 hp. The modification would involve upgrading the turbine, controls, and turbine operating software but would not add any new equipment outside of the compressor building.

The noise associated with the compressor station modification would be continuous and would be limited to the general vicinity of the facilities. In an effort to assess the impacts of the compressor station modifications to surrounding NSAs, FGT has applied a horsepower adjustment factor to the previous

sound level measurements to predict the future sound levels as a result of the proposed project. Table 4.11.2-8 summarizes the results of the noise analysis.

As demonstrated in table 4.11.2-8, the proposed compressor station modification would result in total noise levels below the FERC requirement of 55 dBA L_{dn} .

Noise Sensitive Area (NSA)	Distance (feet) and Direction from Compressor Station	Existing L_{dn} (dBA)	Increase in Station Contribution L_{dn} (dBA)	Total Post-Expansion L_{dn} (dBA)
NSA #1	2,200 – Southeast	47.0	0.4	47.4
NSA #2	3,510 – West	48.4	0.4	48.8
NSA #3	2,230 – Northeast	47.3	0.4	47.7
NSA #4	2,100 – Northeast	50.6	0.4	51.0

FGT is not proposing any additional noise mitigation measures at this site.

Compressor Station 26

As part of the FGT Expansion Project, FGT is proposing to upgrade the total horsepower of the current compressor, Unit 2601, by abandoning the existing 7,300 hp Taurus-60 driver and installing a 15,000 hp electric motor and gearbox for an increase of 7,800 hp. During the modification, FGT is proposing to re-wheel the two existing compressors, Units 2601 and 2602. In addition to these proposed modifications, FGT would add the following new equipment at Compressor Station 26:

- One 15,000 hp electric engine within the existing compressor building;
- Motor cooling air intake;
- Exhaust ducts and blowers;
- Lube Oil Cooler; and:
- Gas Aftercooler.

The upgrade would result in a 2,000 hp increase, resulting in a total rated power of 22,300 hp. The noise associated with the compressor station modification would be continuous and would be limited to the general vicinity of the facilities. In an effort to assess the impacts of the compressor station modifications to surrounding NSAs, FGT has applied a horsepower adjustment factor to the previous sound level measurements to predict the future sound levels as a result of the modification to Unit 2601. Sound levels for the proposed new equipment were estimated using field data taken of other similar equipment currently operating at Compressor Station 26, from other FGT compressor stations, and from manufacturer data. This information was then used to generate a computer noise model, taking into account spreading losses, ground and atmospheric effects, shielding from barriers and buildings, and reflections from other surfaces. Table 4.11.2-9 summarizes the results of the noise analysis.

As demonstrated in table 4.11.2-9, the proposed compressor station modification would result in total noise levels below the FERC requirement of 55 dBA L_{dn} .

TABLE 4.11.2-9

**FGT Expansion Project
Predicted Post-Modification Compressor Station Noise Impacts - Compressor Station 26**

Noise Sensitive Area (NSA)	Distance (feet) and Direction from Compressor Station	Existing L _{dn} (dBA)	Estimated L _{dn} (dBA) with Only Unit 2601 ^a	Additional L _{dn} (dBA) Due to Upgraded Unit 2602	Total Future L _{dn} (dBA) ^b
NSA #1	1,440 – Southeast	48.2	45.2	46.7	49.0
NSA #2	1,020 – South	50.0	47.0	47.6	50.3
NSA #3	1,080 – South Southwest	50.3	47.3	46.3	49.8
NSA #4	1,670 – Southwest	47.3	44.3	40.2	45.7
NSA #5	1,900 – Northwest	49.5	46.5	40.3	47.4
NSA #6	2,700 – North Northwest	46.9	43.9	35.6	44.5

^a A sound level reduction was estimated using the formula $10 \log_{10}(\text{removed total hp} / \text{previous total hp})$. This reduction was subtracted from the measured L_{dn} to provide an estimate with only the sound contribution of Unit 2601.

^b Total future L_{dn} (dBA) was logarithmically added to the estimated facility noise including only Unit 2601.

dBA = decibels of the A-weighted scale.
L_{dn} = day-night sound level.

The noise analysis for the proposed new equipment at Compressor Station 26 was completed with the assumption that all aboveground piping, including flanges, valve bodies, and pipe supports were insulated with acoustical treatment. Although the modification to Unit 2602 would result in a net increase in total rated horsepower at Compressor Station 26, four of the estimated future sound levels at the NSA in the vicinity of the station are predicted to have a lower sound level than the current measured sound level. In general, the sound levels generated by an electrical turbine driver are less than those generated by a similarly sized natural gas-fired driver.

Citrus County has adopted a noise ordinance which defines property line limits for residential property at 60 dBA L₁₀ during the day and 55 dBA L₁₀ at night. Absent other extraneous environmental noise, the L₁₀ should be similar to the L_{eq} for a short-term measurement of a continuous noise source. The L_{dn} is the L_{eq(24)} with 10 decibels of the A-weighted scale (dBA) added to nighttime sound levels; this conversion is completed by adding 6.4 dBA to the measured L_{eq}. FGT would be required by Citrus County to comply with its noise ordinance during operation of its pipeline and in particular Compressor Station 26.

FGT's analysis predicts that the proposed modifications to Compressor Stations 24 and 26 would produce noise levels that do not exceed an L_{dn} of 55 dBA, the level that protects the public from outdoor activity interference and annoyance in residential areas. However, these noise levels are calculated based on installation of proposed noise abatement measures. To ensure that the actual noise resulting from the operation of the proposed compressor station is below an L_{dn} of 55 dBA, **we recommend that:**

- **FGT should conduct noise surveys to verify that the noise from Compressor Stations 24 and 26 operated at full load do not exceed an L_{dn} of 55 dBA at any NSAs, and file the results of the noise survey with the FERC no later than 60 days after placing the compressor stations in service. If the noise attributable to the operation of the compressor stations at full load exceeds an L_{dn} of 55 dBA at any nearby NSAs, FGT should file a report on what changes are needed and should install additional noise controls to meet that level within 1 year of the in-service date. FGT should confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the FERC no later than 60 days after it installs the additional noise controls.**

If FGT verifies that noise impacts have been mitigated, as indicated by the recommendations, we believe that project-operation noise levels would not result in significant impacts to local residents.

4.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an ignition temperature of 1,000 °F and is flammable at concentrations between 5.0 percent and 15.0 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

4.12.1 Safety Standards

The DOT is mandated to provide pipeline safety under Title 49, United States Code (USC) Chapter 601. The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 specifically addresses natural gas pipeline safety issues. The Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local levels. Section 5(a) of the Natural Gas Pipeline Safety Act provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards, while section 5(b) permits a state agency that does not qualify under section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for the enforcement action. The majority of the states have either 5(a) certifications or 5(b) agreements, while nine states act as interstate agents.

Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993 between the DOT and the FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a certificate is requested in accordance with federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert the DOT. The Memorandum also provides for referring to the DOT complaints and inquiries made by state and local governments and the general public involving safety matters related to pipeline under the Commission's jurisdiction. The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Cypress Pipeline and FGT Expansion Projects must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR Part 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Part 192 also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1 mile length of pipeline. The four area classifications are defined as follows:

- Class 1 - location with 10 or fewer buildings per mile intended for human occupancy;
- Class 2 - location with more than 10 but less than 46 buildings per mile intended for human occupancy;
- Class 3 - location with 46 or more buildings per mile intended for human occupancy or where the pipeline lies within 100 yards of any building or small well-defined outside area occupied by 20 or more people during normal use; and
- Class 4 - location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Preliminary class locations for the Cypress Pipeline Project and FGT Pipeline routes have been developed based on the relationship of the pipeline centerline to other nearby structures and manmade features. The Cypress Pipeline Project would consist of approximately 161.4 miles of Class 1 locations. The remainder of the mainline route would consist of 2.7 miles of Class 2 and 2.5 miles of Class 3 locations. The proposed loop route would consist of approximately 7.6 miles of Class 1 locations. The remainder of the route would consist of 2.2 miles of Class 2 locations. The FGT pipeline loops would consist of 21.7 miles of Class 1 locations. The remainder of the loops would consist of 5.4 miles of Class 2 and 5.5 miles of Class 3 locations.

If a subsequent increase in population density adjacent to the right-of-way indicates a change in class location for the pipeline, Southern or FGT would be required to reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness, if required, to comply with the DOT code of regulations for the new class location.

In compliance with Part 192, Southern and FGT would be required to implement several safety measures during the construction and operation of the three compressor stations. The piping, fittings, and other components containing natural gas under pressure must be designed with a significant margin of safety factor above normal operating parameters. This means the piping can safely contain pressures

significantly higher than those that are likely to occur at the station. To ensure that this maximum pressure is never exceeded, the system must be equipped with safety relief valves set to release gas which would maintain pressures well below the MAOP. The relief valves must be tested periodically for proper operation and set point, and repaired or replaced as required. Gas vented to the atmosphere must be directed away from any potential sources of ignition.

In 2002, Congress passed an act to strengthen the Nation's pipeline safety laws. The Pipeline Safety Improvement Act of 2002 (HR 3609) was passed by Congress on November 15, 2002, and signed into law by the President in December, 2002. As of December 17, 2004, gas transmission operators must develop and follow a written integrity management program that contains all the elements described in §192.911 of the DOT regulations and address the risks on each covered transmission pipeline segment. Specifically, the law establishes an integrity management program which applies to all high consequence areas (HCAs). The DOT (68 Federal Register (FR) 69778, 69 FR 18228, and 69 FR 29903) defines HCAs as they relate to the different class zones, potential impact circles, or areas containing an identified site as defined in §192.903 of the DOT regulations.

The OPS published a series of rules from August 6, 2002 to May 26, 2004 (69 FR 29903), that defines HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate in 49 USC 60109 for OPS to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. The first method includes:

- current Class 3 and 4 locations;
- any area in Class 1 or 2 where the potential impact radius⁷ is greater than 660 feet and there are 20 or more buildings intended for human occupancy within that area; or
- any area in Class 1 or 2 where the potential impact circle includes an identified site.⁸

In the second method an HCA includes any area within a potential impact circle which contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Once a pipeline operator has determined the HCAs on its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the integrity management plan at Part 192.911. The HCAs have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. Of the 166.6 miles of the proposed Cypress Pipeline Project route and 32.6 miles of FGT's proposed loops, the companies have identified 2.5 miles, and 5.5 miles, respectively, that would be classified as high consequence areas. No HCAs would be crossed by Southern's loop or FGT's Loop J and Loop K. Table 4.12.1-1 lists by milepost the HCAs crossed by the proposed projects.

⁷ The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in psi multiplied by the pipeline diameter in inches.

⁸ An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

The pipeline integrity management rule for HCAs requires inspection of the entire pipeline in HCAs every 7 years.

TABLE 4.12.1-1				
High Consequence Areas Crossed by the Cypress Pipeline Project and FGT Expansion Project Pipeline Facilities ^a				
Project/Facility	Milepost Begin	Milepost End	Length (miles)	Location Class
Cypress Pipeline Project				
Loop	NA	NA	0.0	NA
Mainline	1.4	2.2	0.8	Class 3
	6.2	6.9	0.7	Class 3
	R24.8	R25.8	1.0	Class 3
FGT Expansion Project				
Loop J	NA	NA	0.0	NA
Loop K	NA	NA	0.0	NA
Loop G	111.4	116.9	5.5	Class 3

^a High consequence areas identified as all Class 3 and Class 4 locations.
 NA – Not Applicable, the facility does not cross any Class 3 or Class 4 locations.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under section 192.615, each pipeline operator must also establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events such as: gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency shutdown of system and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards.

The proposed pipelines, which would be operated by the customers receiving natural gas from the proposed Project, would be operated according to standards and procedures that have been approved by the DOT.

The pipeline would be patrolled and inspected on the ground on a periodic basis per DOT requirements or better. The frequency of these inspections would be affected by activity along the pipeline route such as construction or possible encroachment. These inspections would identify conditions indicative of pipeline leaks, evidence of pipeline damage or deterioration, damage to erosion controls, loss of cover, third party activities, or conditions which may presently or in the future affect

pipeline integrity, safety, or operation of the pipeline. The pipeline system would participate in the Georgia and Florida “One Call” system.

Part 192 requires that each operator must establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Southern and FGT would maintain liaisons with public authorities and local utilities and a current contact list would be included in the emergency response plan. Southern’s and FGT’s liaison program would include: periodic fire fighting demonstrations emphasizing when and when not to extinguish a natural gas fire during an emergency and how to extinguish different types of natural gas fires; periodic visits with emergency response agencies (fire and police) to inform them of the nature and operation conditions of the pipeline facilities and to coordinate an emergency response in the event of an accident; special informational meetings and training at the request of the municipality; periodic literature distribution to the emergency response agencies listing emergency telephone numbers for Southern and FGT and other pertinent data; and providing maps to police and fire departments showing the location of the pipeline within the boundaries of their communities.

4.12.2 Pipeline Accident Data

Since February 9, 1970, 49 CFR Part 191 has required all operators of transmission and gathering systems to notify the DOT of any reportable incident and to submit a report on form F7100.2 within 20 days. Reportable incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization;
- required taking any segment of transmission line out of service;
- resulted in gas ignition;
- caused estimated damage to the property of the operator, or others, or both, of a total of \$5,000 or more;
- required immediate repair on a transmission line;
- occurred while testing with gas or another medium; or
- in the judgment of the operator was significant, even though it did not meet the above criteria.

The DOT changed reporting requirements after June 1984 to reduce the amount of data collected. Since that date, operators must only report incidents that involve property damage of more than \$50,000, injury, death, release of gas, or that are otherwise considered significant by the operator. Table 4.12.2-1 presents a summary of incident data for the 1970 to 1984 period, as well as more recent incident data for 1986 through 2003, recognizing the difference in reporting requirements. The 14.5-year period from

1970 through June 1984, which provides a larger universe of data and more basic report information than subsequent years, has been subject to detailed analysis, as is discussed in the following sections.⁹

TABLE 4.12.2-1		
Natural Gas Service Incidents by Cause		
Cause	Incidents per 1,000 miles of Pipeline (percentage)	
	1970-1984	1986-2003
Outside force	0.70 (53.8)	0.10 (38.4)
Corrosion	0.22 (16.9)	0.06 (23.1)
Construction or material defect	0.27 (20.8)	0.04 (15.4)
Other	0.11 (8.5)	0.06 (23.1)
Total	1.30	0.26

During the 14.5-year period, 5,862 service incidents were reported over the more than 300,000 total miles of natural gas transmission and gathering systems nationwide. Service incidents, defined as failures that occur during pipeline operation, have remained fairly constant over this period with no clear upward or downward trend in annual totals. In addition, 2,013 test failures were reported. Correction of test failures removed defects from the pipeline before operation.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 4.12.2-1 provides a percentage distribution of the causal factors as well as the annual frequency of each factor per 1,000 miles of pipeline in service.

The dominant incident cause is outside forces, constituting 53.8 percent of all service incidents. Outside forces incidents result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 4.12.2-2 shows that human error in equipment usage was responsible for approximately 75 percent of outside forces incidents. Since April 1982, operators have been required to participate in “One Call” public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The “One Call” program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. The 1986 through 2003 data show that the portion of incidents caused by outside forces has decreased to 38.4 percent. Based on 2004 data the incidents caused by outside forces have further decreased to 35.0 percent.

TABLE 4.12.2-2	
Outside Forces Incidents by Cause (1970-1984)	
Cause	Percent
Equipment operated by outside party	67.1
Equipment operated by or for operator	7.3
Earth movement	13.3
Weather	10.8
Other	1.5

⁹ American Gas Association. 1986. "An Analysis of Reportable Incidents for Natural Gas Transportation and Gathering Lines 1970 Through June 1984." NG-18 Report No. 158, Pipeline Research Committee of the American Gas Association.

The pipelines included in the data set in table 4.12.2-1 vary widely in terms of age, pipe diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of service incidents is strongly dependent on pipeline age. While pipelines installed since 1950 exhibit a fairly constant level of service incident frequency, pipelines installed before that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer pipelines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

Table 4.12.2-3 clearly demonstrates the effectiveness of corrosion control in reducing the incidence of failures caused by external corrosion. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe. The data shows that bare, cathodically protected pipe actually has a higher corrosion rate than unprotected pipe. This anomaly reflects the retrofitting of cathodic protection to actively corroding spots on pipes.

TABLE 4.12.2-3	
External Corrosion by Level of Control (1970-1984)	
Corrosion Control	Incidents per 1,000 miles per Year
None-bare pipe	0.42
Cathodic protection only	0.97
Coated only	0.40
Coated and cathodic protection	0.11

4.12.3 Impact on Public Safety

The service incident data summarized in table 4.12.2-1 includes pipeline failures of all magnitudes with widely varying consequences. Approximately two-thirds of the incidents were classified as leaks, and the remaining third classified as ruptures, implying a more serious failure.

Table 4.12.3-1 presents the average annual fatalities that occurred on natural gas transmission and gathering lines from 1970 to 2003. Fatalities between 1970 and June 1984 have been separated into employees and nonemployees, to better identify a fatality rate experienced by the general public. Of the total 5.0 nationwide average, fatalities among the public averaged 2.6 per year over this period. The simplified reporting requirements in effect after June 1984 do not differentiate between employees and nonemployees. However, the data show that the total annual average for the period 1984 through 2003 decreased to 3.8 fatalities per year. Subtracting two major offshore incidents in 1989, which do not reflect the risk to the onshore public, yields a total annual rate of 2.9 fatalities per year for this period.

Year	Employees	Nonemployees	Total
1970-June 1984 ^b	2.4	2.6	5.0
1984-2003 ^c	-	-	3.8
1984-2003 ^c	-	-	2.9 ^d

^a DOT Hazardous Materials Information System.
^b 1970 through June 1984 - American Gas Association, 1986.
^c Employee/nonemployee breakdown not available after June 1984.
^d Without 18 offshore fatalities occurring in 1989: 11 fatalities resulted from a fishing vessel striking an offshore pipeline and 7 fatalities resulted from explosion on an offshore production platform.

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in table 4.12.3-2 in order to provide a relative measure of the industry-wide safety of natural gas pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. Nevertheless, the average 2.6 public fatalities per year is relatively small considering the more than 300,000 miles of transmission and gathering lines in service nationwide. Furthermore, the fatality rate is approximately two orders of magnitude (100 times) lower than the fatalities from natural hazards such as lightning, tornados, floods, earthquakes, etc.

Type of Accident	Fatalities
All accidents	90,523
Motor vehicles	43,649
Falls	14,985
Drowning	3,488
Poisoning	9,510
Fires and burns	3,791
Suffocation by ingested object	3,206
Tornado, flood, earthquake, etc. (1984 to 1993 average)	181
All liquid and gas pipelines (1978 to 1987 average) ^b	27
Gas transmission and gathering lines Nonemployees only (1970 to 1984 average) ^c	2.6

^a All data, unless otherwise noted, reflects 1996 statistics from the U.S. Department of Commerce, Bureau of the Census, "Statistical Abstract of the United States 118th Edition."
^b U.S. Department of Transportation, "Annual Report on Pipeline Safety - Calendar Year 1987."
^c American Gas Association, 1986.

The available data show that natural gas pipelines continue to be a safe, reliable means of energy transportation. Based on approximately 320,906 miles in service, the rate of public fatalities for the nationwide mix of transmission and gathering lines in service is approximately 0.008 per 1,000 miles per year. Using this rate, the Cypress Pipeline Project might be expected to result in a public fatality about every 700 years, while FGT Expansion Project would be every 3,900 years. Based on these numbers, we believe the proposed Southern and FGT facilities would represent only a slight increase in risk to the nearby public.

4.12.4 Terrorism and Security Issues

During the scoping process, we received a comment from the Canoochee Riverskeepers regarding the potential for terrorist attacks that could affect the integrity of the pipeline and associated facilities. Safety and security concerns have changed the way pipeline operators as well as regulators must consider terrorism, both in approving new projects and in operating existing facilities. The Office of Homeland Security is tasked with the mission of coordinating the efforts of all executive departments and agencies to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States. The Commission, in cooperation with other federal agencies, industry trade groups, and interstate natural gas companies is working to improve pipeline security practices, strengthen communications within the industry and extend public outreach in an ongoing effort to secure pipeline infrastructure.

The Commission is faced with a dilemma in how much information can be offered to the public while still providing a significant level of protection to the facility. Consequently, energy facility design plans and location information have been removed from its website to ensure that sensitive information filed under Critical Energy Infrastructure Information is not readily available (RM02-4-000 and PL02-1-000 issued February 20, 2003).

The likelihood of future acts of terrorism or sabotage occurring at either of the proposed projects or at any of the myriad of natural gas pipeline or energy facilities throughout the United States is unpredictable given the disparate motives and abilities of terrorist groups. The continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such future acts.

4.12.5 LNG Interchangeability Issues

Several commenters (Dominion Cove Point LNG, Florida Gas Utility, JEA, Florida Power and Light Company, and Peoples Gas System) expressed concerns about the safety issues associated with the interchangeability of gas supplies derived from imported LNG and those derived from traditional sources. In particular, concerns are that the LNG transported by Southern may result in degradation of pipeline seals and cause pipeline leaks in distribution systems. LNG could contain a higher heating value than the domestic natural gas traditionally transported on Southern's and FGT's existing pipeline system, and it is believed that this could result in serious harm to the distribution system facilities. In response to these concerns, Southern has stated that all regasified LNG transported through the proposed expansion facilities would be subject to an effective interchangeability specification in the FERC Gas Tariff of Southern LNG. This serves as a standard to ensure uniform gas quality as it enters the Southern system, regardless of the original source of the LNG. In addition, since recommencing operations in December 2001, Southern has supplied regasified LNG on a regular basis through the Southern pipeline system to five power plants in Georgia and South Carolina. To date, Southern has received no complaints regarding the quality of their gas supplies.

In addition, the interchangeability issue is the subject of an industry wide inquiry and has been previously addressed by the FERC in Docket No. PL04-03-000. FERC has also addressed this issue in its PD for this project, (CP05-388-000) issued on November 20, 2005. Based on this information, we do not believe the interchangeability of gas supplies would be a safety issue.

4.13 CUMULATIVE IMPACTS

Cumulative impacts may result when the environmental effects associated with a proposed project are superimposed on, or added to, either temporary (construction related) or permanent (operation

related) impacts associated with past, present, or reasonably foreseeable future projects. Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects could be significant.

Existing conditions in the vicinity of the proposed Southern and FGT projects reflect the extensive changes brought about by long-term human occupancy and use of the project area. For example, native vegetation communities in the project area have been substantially altered from their pre-Euro-American settlement condition by silviculture activities/timber harvest and commercial/industrial and residential developments, while fisheries have been affected by commercial harvest and physical alteration of rivers and streams.

Table 4.13-1 lists present or reasonably foreseeable future projects or activities that may cumulatively or additively impact resources that would be affected by construction and operation of the Southern and FGT projects. Construction schedules of the future projects depend on factors such as economics, funding, and politics. Projects and activities included in this analysis are generally those of comparable magnitude and nature of impact, and are located within the same counties that would be affected by the Southern and FGT projects. More geographically distant projects are not assessed because their impact would generally be localized and, therefore, would not contribute significantly to cumulative impacts in the proposed project area.

4.13.1 Geology and Soils

The facilities associated with the Southern and FGT projects are expected to have a temporary impact on near-surface geology and soils. Clearing activities could expose the soil to erosive elements such as precipitation and wind. The potential for impacts due to erosion by water is minimal because less than 1 percent of soils crossed by the proposed Southern loop and mainline would be susceptible to water erosion while none of the soils crossed by FGT's proposed loops would be susceptible to water erosion. However about 55 percent of soils crossed by the Southern loop and mainline and 93 percent of FGT's loops would cross soils considered to be susceptible to wind erosion. Grading activities could lead to compaction of the soil especially in fine-textured soils that are moist or saturated during construction, however, only about 11 percent of the soils along the Southern loop and mainline are considered to be prone to compaction and no compaction prone soils would be affected by the FGT Expansion Project. Less than 1 percent of the soils that would be crossed by the Southern loop and mainline, and none of the soils that would be crossed by the FGT loops are designated as prime farmland. Trench excavation and backfilling can mix topsoil and subsoil, and contamination of soils from construction equipment is also possible. Impacts on geological resources and soils would be minimized by implementation of our Plan 2003 and Procedures 2003 (Appendices D and E, respectively) with approved modifications, during construction and restoration of the projects. In addition, implementation of Southern's SPCC Plan would lessen the likelihood and impact of potential contamination.

The effects from the Southern and FGT projects would be highly localized and limited primarily to the period of construction. Therefore, cumulative impacts on geology and soils would only occur if other projects are constructed at the same time and place as the proposed facilities. The construction of several of the projects listed in table 4.13-1 would coincide with the schedule proposed for the Southern and FGT projects. Projects that require significant excavation or grading, such as the various highway widening projects, would also have temporary impacts on near-surface geology and soils. The additive impact of the Southern and FGT projects on most of these projects would be minimal because most would not occur within the same local vicinity and the Southern and FGT projects would occur in phases over a 3-year period. In addition, the major construction projects listed in table 4.13-1 would be required to implement erosion controls and most would be required to revegetate disturbed areas. Consequently, any potential cumulative impacts on geological resources and soils would be minor.

4.13.2 Waterbodies and Wetlands

The pipeline facilities associated with the Southern and FGT projects would require the crossing of 111 waterbodies. Neither project would involve construction of permanent diversions or dams and, therefore, are expected to have only temporary impacts on surface water quality. Cumulative effects on surface water resources affected by the Southern and FGT projects would be limited primarily to waterbodies that are affected by other projects located within the same major watershed. Direct in-stream effects associated with wet open-cut crossings would result in the greatest impact on water resources. Runoff from construction activities near waterbodies could also result in cumulative impacts, although this effect would be relatively minor and would be further minimized by implementation of the FERC Plan 2003 and Procedures 2003. Most of the projects listed in table 4.13-1 are located within the same major watersheds crossed by the Southern and FGT projects, and some of these projects (e.g., repairs to the U.S. 17 bridge across the St. Marys River and replacement of County Road 209 across Black Creek) would likely involve direct in-stream impacts.

The FGT Expansion Project loops do not cross major waterbodies. The major waterbodies crossed by the Southern's pipeline facilities would be crossed using the HDD method, which if successful, would greatly minimize potential environmental impacts. Introduction of water pollutants can occur either through an inadvertent release of drilling mud (i.e., "frac-out") during HDD across a waterbody or through accidental fuel and chemical spills. A frac-out can cause significant sedimentation of the water column. In case of a frac-out, Southern would implement the measures detailed in its HDD Plan (Appendix F-2) and in case of fuel or chemical spills Southern would implement its SPCC Plan and FGT would follow the spill prevention and response procedure requirements of our Procedures 2003 (Appendix E). Water quality impacts resulting from construction of the proposed pipeline facilities would be temporary until restoration was completed. The geographic extent and duration of waterbody disturbances caused by construction of the Southern and FGT projects would be minimal and further reduced by the implementation of our Procedures 2003, with approved modifications.

Southern and FGT would hydrostatically test the new pipeline segments in accordance with the DOT pipeline safety regulations in 49 CFR Part 192 prior to placing the pipeline facilities in service. Southern would acquire a total of 6,300,000 gallons of hydrostatic test water from four surface water sources: the Ogeechee River, Peacock Creek, Altamaha River, and St. Marys River. FGT would acquire 9,300,000 gallons of hydrostatic test water from FGT-owned wells. Hydrostatic testing of the pipelines would be non consumptive (i.e., the water would be returned to the waterbody or watershed upon completion of testing), therefore, long-term impacts on water supplies would not be anticipated as a result of hydrostatic testing activities. Water would be discharged to upland areas following testing or would be discharged to the waterbody from which it was appropriated. Also, no chemical additives would be added to the water during testing. Therefore, the cumulative impacts of these projects and the projects listed in table 4.13-1 on surface water resources are expected to be minor.

TABLE 4.13-1

**Existing or Proposed Activities Cumulatively Affecting Resources of Concern
for the Cypress Pipeline and FGT Expansion Projects**

Activity/Project	County	Description	Anticipated Construction Dates
Cypress Pipeline Project Area			
Windfield Subdivision Residential Development	Effingham	Construct 389 equivalent residential units.	N/A ^a
Timber Lakes Subdivision Residential Development	Effingham	Construct 449 equivalent residential units.	N/A ^a
Myrtlewood Subdivision Residential Development	Effingham	Construct 200 equivalent residential units.	N/A ^a
Branigar Subdivision Residential Development	Effingham	Construct 6,000 equivalent residential units.	N/A ^a
County Road 183/Log Landing Road	Effingham	Construct bridges on County Road 183/Log Landing Road at Ebenezer Creek 4 miles north of Rincon.	Begin 2005
State Road 26/US 80	Effingham	Bridge work at Ogeechee River overflow, 9 miles south of Guyton.	Begin 2007
City of Savannah, Waterline Construction	Effingham/Chatham	Install 11 miles of waterline within the SEPCO right-of-way.	Begin 2006
Elba Island Expansion Project	Chatham	Expansion of the Elba Island LNG import terminal including adding a second and third docking berth, a fourth cryogenic storage tank, and associated facilities.	Completed
State Road 307 Widening	Chatham	Widen Dean Forest Road (State Road 307) from US 17 To I-16.	Begin 2007
State Road 25 Bridge Work	Chatham	Work on the State Road 25 Houlihan Bridge over the Savannah River.	Begin 2009
Jimmy DeLoach Parkway/County Road 17 Road Work	Chatham	Extend Jimmy DeLoach Parkway from I-16 to US 80.	Begin 2005
I-516 Bridge Work	Chatham	Bridge Work on Lynes Pkwy (I-516) on southbound & northbound lanes at State Road 25/US 17 in Savannah.	Begin 2007
State Road 204 Widening	Chatham	Widen Abercorn Street (State Road 204) from King George Blvd. to Rio Road.	Begin 2009
State Road 21 Widening	Chatham	Widen State Road 21 from CS 590/Smith Ave north to State Road 307	Begin 2009
State Road 144 Widening	Bryan	Add passing lanes to State Road 144 through Fort Stewart/Bryan-Liberty.	Begin 2008
State Road 196 Widening	Liberty	Widen State Road 196 from State Road 38/US 84 to State Road 25/US 17 southwest of I-95.	Begin 2006
State Road 1961 Bridge Work	Liberty	Bridge Work on State Road 196 at Baker Swamp Slough.	Begin 2006
State Road 144 Widening	Liberty	Add passing lanes on State Road 144 through Fort Stewart/Bryan-Liberty.	Begin 2008
State Road 144 Widening	Long	Add passing lanes on State Road 144 through Fort Stewart/Bryan-Liberty.	Begin 2008
I-95 Widening	McIntosh	Widen I-95 from 1-mile north of State Road 251 to State Road 57 -- Phase 1.	Begin 2007
Dixieville Sewer/Stormdrain Installation	Glynn	Install a 15-inch diameter sanitary gravity sewer line and storm drainage in Brunswick.	N/A ^a
Water Reclamation Project	Glynn	Installation of a Pumping Station and a 2-inch line from Academy Creek Wastewater Brunswick-Treatment Plant to Georgia Pacific Plant.	N/A ^a
State Road 40 Widening	Camden	Widen State Road 40 from west of County Road 61 to State Road 25/US 17.	Begin 2009
County Road 3 Bridge Work	Charlton	Bridge Work on County Road 3 at Sparkman Creek 11 miles south of St. George.	Begin 2005

TABLE 4.13-1 (cont'd)

**Existing or Proposed Activities Cumulatively Affecting Resources of Concern
for the Cypress Pipeline and FGT Expansion Projects**

Activity/Project	County	Description	Anticipated Construction Dates
State Road 4/US 1 at CSX railroad Bridge Work	Charlton	Bridge Rehabilitation State Road 4/US 1 at CSX railroad.	Begin 2005
U.S. 17 Bridge Work	Nassau	Repaint and repair U.S. 17 moveable span bridge over the St. Marys River and also repair the concrete piers.	Begin Summer 2004; Complete Summer 2005
State Road A1A Widening	Nassau	Add lanes to State Road A1A from I-95 to the Amelia River Bridge (11 miles).	Begin 2007-2008-2009
U.S. 301 Widening	Nassau	Add two lanes to U.S. 301 from the Duval County line to north of Thomas Creek (8.5 miles).	Begin 2004-2005
Century Street Bridge Replacement	Duval	Replace Century Street Bridge over Strawberry Creek.	Completed Summer 2005
Heckscher Drive (State Road 105) Bridge Replacement	Duval	Replace Heckscher Drive low level bridge at Ft. George Inlet.	Began Summer 2002
Old Kings Road Bridge Replacement	Duval	Replace Old Kings Road low level bridges over the Trout River and over Six Mile Creek.	Begin 2004; Complete 2005
Arlington Expressway (State Road 10A) Bridge Work	Duval	Rehabilitate and strengthen the existing steel grating and floor beams of the Mathews Bridge over the St. Johns River on the Arlington Expressway (State Road 10A).	N/A
JIA (Jacksonville International Airport) Interchange	Duval	Constructed major interchange at South Access Road and Airport Road.	Completed Summer 2004
County Road 209 Bridge Replacement	Clay	Replace County Road 209 Black Creek Bridge.	Begin in 2008/09
State Road 16 Widening	Clay	Add lanes to State Road 16 and reconstruct from U.S. 17 to Reynolds Industrial Park.	Begin in 2009/10
State Road 21 Bridge Replacement	Clay	Replace State Road 21 bridge over Black Creek.	Begin in 2008/09
FGT Expansion Project			
State Road 100 Resurfacing	Bradford	Resurface State Road 100 from County Road 100A east of U.S. 301 to Union County Line (12 miles).	Began Early 2005
Laura Street Bridge Replacement	Bradford	Replaced low level bridge over Alligator Creek.	Completed
State Road 261 Resurfacing	Gilchrist	Resurfacing from Fanning Springs to Trenton (7miles).	Began April 2005
State Road 261 Resurfacing	Gilchrist	Resurface from U.S. 129 to the Alachua County line (10 miles).	Begin 2006/2007
State Road 24 Resurfacing	Levy	Resurfacing from Bronson to Alachua County line (6.8 miles).	Began Summer 2005
U.S. 19 Resurfacing	Levy	Resurface from Lebanon Station to State Road 24 (14.2 miles).	Begin 2007/2008
U.S. 41 Widening	Citrus	Widen U.S. 41 from Watson St. to SR 44.	Complete Spring 2007
State Road 44 Widening	Citrus	Widen State Road 44 from U.S. 41 (State Road 45) to County Road 470.	Completed
State Road 44 Widening	Citrus	Widened State Road 44 from County Road 470 to west of the Withalcoochee River from two to four lanes.	Completed
U.S. 41 Widening	Hernando	Widened U.S. 41 from two to four lanes from Hviezdoslav Street to Powell Road	Complete Fall 2006
State Road 60 (Memorial)	Hillsborough	Construction from Cypress Street to north of the	Begin Aug. 2005

TABLE 4.13-1 (cont'd)

**Existing or Proposed Activities Cumulatively Affecting Resources of Concern
for the Cypress Pipeline and FGT Expansion Projects**

Activity/Project	County	Description	Anticipated Construction Dates
Highway) Road Work		Courtney Campbell Causeway.	
I-4 Widening	Hillsborough	Widen I-4 from 4 to 8 lanes from west of 14 th street to east of 50 th street.	Complete 2008
U.S. 301 Widening	Hillsborough	Widen U.S. 301 from two to four lanes from south of Sligh Avenue to south of the Tampa Bypass Canal.	Began Summer 2005
State Road 676 (Causeway Blvd.) Widening	Hillsborough	Widen State Road 676 from U.S. 41 to U.S. 301.	Begin 2006
I-4 Widening	Polk	Widening I-4 from 4 to 6 lanes and bridge replacements west of Memorial Blvd. to west of U.S. 98.	Began Oct. 2002
U.S. 27 Widening	Polk	Widening U.S. 27 from 4 to 6 lanes, resurfacing, replacement of bridges from State Road 544 to Blue heron Bay Boulevard.	Began Aug. 2004
I-4 Widening	Polk	Widening I-4 from 4 to 6 lanes, bridge widening and bridge replacement east of U.S. 98 Interchange to County Road 557.	Completed July 2005

^a The anticipated construction date is not available for this project.

There would be a permanent loss of some existing wetlands as a result of constructing and operating the proposed Southern and FGT projects and the other reasonably foreseeable future projects. The Southern and FGT projects together would result in the permanent loss of about 5.3 acres of wetlands, and it is likely that one or more of the highway widening projects would result in the permanent loss of wetland resources. However, most of these projects (including the Southern and FGT projects) would require, by the terms and conditions of their respective COE section 404 and FLDEP's ERP conditions, compensatory mitigation for temporary and permanent wetland impacts. In the recent past, similar projects have been required to restore historic wetland habitat. The Upper St. Johns River Basin Project (SJRWMD, 2005) and the Pembroke Pines Wetland Mitigation Bank (Florida Wetland Bank, 2005) both located in Florida are examples of wetland mitigation projects where historic wetlands that were drained or filled due to past land management activities, were restored to functioning wetland systems. Therefore, although construction and operation of the Southern and FGT projects along with the other potential projects and activities would result in a reduction in the amount of existing wetlands in the vicinity, the restoration of historic wetlands and the enhancement of existing wetlands as required by the COE and the FLDEP are anticipated to result in no net loss in the regional wetland resources.

4.13.3 Vegetation and Wildlife

When projects are constructed at the same time or close to the same time, they would have a cumulative impact on vegetation and wildlife occurring in the area where the projects would be built. Right-of-way clearing and grading and other construction activities associated with the Southern and FGT projects along with other construction projects, such as the Braniger and Myrtlewood subdivisions and various highway widening projects listed in table 4.13-1, would result in the removal of vegetation; alteration of wildlife habitat; displacement of wildlife; mortality to less mobile forms of wildlife; and other secondary effects such as increased population stress, predation, and establishment of invasive plant species. These effects would be greatest where other projects are constructed within the same time frame and area as the proposed projects. However, extensive silviculture activities occurring in the project areas have substantially altered the vegetative landscape. The cumulative impact of the proposed projects on vegetation in the area would be minimal. With the exception of routine vegetative maintenance clearing along the proposed pipelines, most of the vegetation cover types crossed by the pipeline and loops would be allowed to return to preconstruction conditions.

Forest habitat would be altered more than any other habitat during construction. All trees on the construction right-of-way would be cut, which would cause species that depend upon trees for food, refuge, or nesting to be displaced to nearby forested habitat. Trees located on the edge of the right-of-way may be subject to mechanical damage to trunks and branches and root impacts from soil disturbance and compaction, all of which may result in the decreased health and viability of the remaining edge trees. For the Cypress Pipeline Project, approximately 723.1 acres of forested land (includes upland forest, silviculture, and forested wetland vegetation) would be cleared and converted to herbaceous vegetation within the maintained loop and mainline rights-of-way. About 45 percent of this cleared forest vegetation would be planted pine. Conversion of the typical planted pine monoculture could provide increased species diversity and result in habitat enhancement. Less than 1.0 acre of forest land impact would result from the clearing and maintenance of the permanent right-of-way for the FGT Expansion Project loops. A total of about 22.9 acres of forested land would be permanently cleared for aboveground facility operations primarily associated with the Cypress Pipeline Project (19.4 acres) and to a lesser extent the FGT Expansion Project (about 3.5 acres). This permanent loss of forest in addition to the permanent loss that would likely result from the construction of some of the projects included in table 4.13-1 (e.g., the highway widening and residential development projects) would result in cumulative impacts on forest vegetation.

The Southern and FGT projects and a number of the projects listed in table 4.13-1 could potentially fragment vegetation habitat; however, this effect would be minimal because many of the proposed projects are road improvement projects that, similar to the Southern and FGT projects, would primarily occur within or immediately adjacent to existing rights-of-way which would result in an incremental widening of existing right-of-way corridors. Southern and FGT would implement mitigation measures designed to minimize the potential for long-term erosion, increase the stability of site conditions, and control the spread of noxious weeds. It is expected that the other proposed projects would do the same, thereby minimizing the degree and duration of the cumulative impacts of these projects. To reduce impacts on vegetation within the construction and permanent rights-of-way both Southern and FGT would implement the upland construction and restoration measures contained in our Plan 2003.

Construction of the Southern and FGT projects at the same time as other projects listed in table 4.13-1, such as the bridge replacement projects that would affect waterbodies, could cause cumulative impacts on aquatic resources within the project area, including waterbodies designated as EFH. Potential impacts to waterbodies within the project area include sedimentation and turbidity, destruction of stream cover, introduction of water pollutants, interruption of fish migration and spawning, and entrainment of fish. Potential impacts would be minimized due to the short duration of in-stream construction activities, scheduling construction during low flow conditions, and implementation of the our Plan 2003 and Procedures 2003, Southern's SPCC Plan, and Southern's HDD Plan. The Cypress Pipeline Project would cross the Ogeechee, Altamaha, Satilla, and St. Marys rivers, which are considered EFH and high priority rivers. Southern would avoid impacting these sensitive rivers by using the HDD crossing method. In case of a frac-out, Southern would implement the measures detailed in its HDD Plan (Appendix F-2). Impacts on wetlands within the river watersheds may also have an effect on EFH. Effects on these wetlands would be minimized by implementation of our Procedures 2003. In addition, Southern would implement a seeding and replanting program if revegetation does not take place within three years, as recommended by the NOAA Fisheries. There is no EFH located within the FGT Expansion Project area. Additionally, if any of the projects listed in table 4.13-1 would involve direct in-stream impacts on waterbodies designated as EFH, they would be required to obtain permits from the COE, the GADNR or FLDEP, and consultation with the NOAA Fisheries and the FWS would be required. These agencies would assess the potential for cumulative impacts from these projects and require measures to mitigate impacts on aquatic resources; therefore, cumulative impacts would be minimal.

A total of 33 special-status species were identified as either occurring, or for which suitable habitat was found, in the Southern and FGT project areas during agency consultations. Cumulative impacts on these species could result if other reasonably foreseeable future projects would also affect these same species or their habitat. However, conservation measures would likely be required for each of these projects by the jurisdictional agencies to minimize potential impacts on federally and state-listed species. Additionally, conservation measures may be recommended for candidate species and species of concern. Conservation measures would be project specific and would be expected to reduce impacts such that the projects would not adversely affect special status species or would not jeopardize the continued existence of a species or cause the adverse modification of critical habitat.

4.13.4 Land Use, Recreation and Special Interest Areas, and Visual Resources

Land Use

The Southern and FGT projects and several other foreseeable future projects would result in both temporary and permanent changes to current land uses. The Southern and FGT projects would temporarily disturb about 2853.7 acres of land of which about 42.0 percent is open lands, 31.0 percent is forest land, 21.0 percent is silviculture, 4.0 is industrial, and 2.0 percent is agriculture. Open water and residential land each account for less than 1 percent of the land affected by construction. The Branigar

and Myrtlewood subdivision projects and the various road improvement and development projects listed in table 4.13-1 would disturb hundreds of additional acres of land affecting a variety of land uses. While most of these projects would have permanent impacts on land uses, the majority of land use impacts associated with the Southern and FGT projects would be temporary, as most land uses would be allowed to revert to prior uses following construction. However, about 26.0 percent of the land affected by the Southern and FGT projects would be converted from a land use supporting trees (forest and silviculture) to open lands, which could result in cumulative impacts on land uses assuming the other projects listed in table 4.13-1 would also affect similar land uses. Only about 1 percent (approximately 29 acres) of the land affected by construction of the Southern and FGT projects would be required for the operation of aboveground facilities. Compared to the other proposed projects this permanent change in land use is relatively minor and would not represent a significant cumulative impact.

Visual Resources

The visual character of the existing landscape is defined by historic and current land uses such as silviculture, recreation, conservation, and development. The visual qualities of the landscape are further influenced by existing linear installations such as highways, railroads, pipelines, and electrical transmission and distribution lines. Within this context the proposed compressor stations, meter stations, block valves, and other aboveground facilities would have the most visual impact, while the pipeline portion of the proposed projects would be visually subordinate to the existing landscape character and would have a minor effect on overall visual conditions, particularly after completion of reclamation and the reestablishment of vegetation in 3 to 5 years. Of the projects listed in table 4.13-1, the proposed residential subdivisions would have the most impact on visual resources in the area resulting in the loss of vegetation and construction of permanent aboveground structures.

Construction of the new compressor stations proposed for the Cypress Pipeline Project would disturb less than half of the amount of land appropriated for each compressor station, leaving forested vegetation on the undisturbed portions of the property. Compression for the FGT Expansion Project would involve work only at existing compressor station sites; therefore, additional visual impact would be minimal. Collocation of certain new aboveground facilities (e.g., block valves, pig launcher/receiver facilities) would lessen the visual impact of the aboveground facilities because their presence would be consistent with the current viewshed in the area. Visual impacts along the pipeline route would be greatest in forested areas where it would take many years to regenerate mature trees in areas immediately adjacent to the right-of-way and trees would be restricted from growing in the permanent right-of-way. The majority of the pipeline facilities, however, are adjacent to existing utility rights-of-way, which would lessen the potential visual impact. Therefore, the proposed Southern and FGT projects would not significantly contribute to cumulative effects on visual resources.

Recreation and Special Interest Areas

A number of recreational or areas of special interest would be affected by the Southern and FGT projects, which if built at the same time as other foreseeable future projects, could result in cumulative impacts on recreational or special interest areas if these projects would affect the same area or feature (e.g., trails) at the same time. The majority of impacts due to the Southern and FGT projects would be temporary because most of the recreational areas involve passive uses that would be allowed to resume following construction. Long-term impacts would result in forested areas converted to open areas; however, because both the Southern and FGT projects are located adjacent to or within existing rights-of-way, the projects would only incrementally widen existing utility corridors. Consequently, the proposed Southern and FGT projects would not significantly contribute to cumulative effects on recreational and special interest areas.

4.13.5 Socioeconomics

Present and reasonably foreseeable future projects and activities could cumulatively impact socioeconomic conditions in the project areas. Employment, housing, infrastructure, and public services could experience both beneficial and detrimental impacts. No environmental justice issues have been identified.

Economy and Employment

The projects considered in this section would have cumulative effects on employment during construction if more than one project is built at the same time. Southern and FGT estimate that about 30 percent of its required workforce would be hired from the local workforce if they are available and possess the required skills. Southern estimates it would require between 100 to 136 temporary local hires and FGT estimates it would require between 45 and 68 temporary local hires depending on the particular construction phase. Southern would require about four permanent workers during operation of the proposed facilities, while FGT would not require new permanent employees. Although the areas affected by the projects have relatively low unemployment rates (with an average of about 4.4 percent), considering the large civilian workforce present it is likely the local labor force could meet the employment needs induced by construction of these projects. It is unknown whether a sufficient number of these unemployed persons have the necessary skills to work on these projects. Therefore, if the various proposed and foreseeable projects are constructed at the same time, the demand for local workers may exceed supply. It is assumed that the remainder of the employment positions would be filled by non-local hires.

In addition to impacts on local employment, these projects would provide an increase in tax revenue for the states of Georgia and Florida, the counties, and other local economies through the payment of payroll tax, sales tax, property tax, and other taxes and fees. The estimated payroll for the proposed Cypress Pipeline Project would be \$120 million during the construction phase. Southern estimates that construction workers would spend about \$30 million locally and that \$85 million would be spent locally on construction materials, rental space for yards and offices, office support and similar expenditures. A similar net increase in payroll and revenues could be expected from the other projects listed in table 4.13-1. Cumulatively, these projects would have both short- and long-term beneficial impacts on state, county, and local economies.

Temporary Housing

Temporary housing for the construction workers would be needed for the portion of the workforce not drawn from the local area. Between 122 and 235 temporary housing units would be required per month for the Cypress Pipeline Project depending on the construction phase. The FGT Expansion Project would require between 105 and 158 temporary housing units per month depending on the construction phase. Given the vacancy rates, the number of rental housing units in the area, and the number of hotel/motel rooms and campgrounds available in the cities and towns in the vicinity of the project, construction crews should not encounter difficulty in finding temporary housing. If construction occurs concurrently with other projects, temporary housing would still be available but may be slightly more difficult to find and/or more expensive to secure. Regardless, these effects would be temporary, lasting only for the duration of construction, and there would be no long-term cumulative effect on housing.

Public Services

The cumulative impact of the Southern and FGT projects and the other projects listed in table 4.13-1 on infrastructure and public services would depend on the number of projects under construction at one time. Demands on local agencies would include increased enforcement activities associated with permit issuance for vehicle load and width limits; need for local police assistance during construction at road crossings to facilitate traffic flow; and the need for emergency medical services to treat injuries as a result of construction work accidents. Because the number of construction personnel is small relative to the local population, the Cypress Pipeline and FGT Expansion Projects would result in minor or no impact on local fire, medical, and police forces. Solid waste, sewer and water, and electricity demands by the projects would be temporary and short-term and would be accommodated by the local infrastructure. No long-term cumulative effect on infrastructure and public services is anticipated.

Transportation and Traffic

Pipe and other construction materials would be transported into the project area by rail and/or truck to the proposed pipe and contractor yards included in Appendix C. Where installation of the proposed pipeline facilities occur at road crossings, road traffic could be temporarily disrupted or delayed, but most roads in the project area are not currently at capacity. Southern and FGT have committed to minimizing the transportation of equipment and materials through planning and coordination (e.g., transporting heavy materials during off-peak hours). Cumulative impacts on traffic congestion in the project area could result if several projects are being constructed at once. However, most of the projects listed in table 4.13-1 are not located within the immediate vicinity of the proposed pipeline facilities, so a significant cumulative impact is not anticipated. During construction of the Cypress and FGT projects, all major roads would be crossed by boring to avoid disrupting traffic. Both lanes of most smaller, unpaved roads would be open cut unless no feasible detour is possible, and then one lane would be left open. The road may be closed for up to 24-hours and disruption of traffic would be temporary and short-term.

4.13.6 Cultural Resources

Past disturbances to cultural resources in the project area have been related to agricultural and silvicultural practices; intentional destruction or vandalism; and construction and maintenance operations associated with existing roads, railroads, utility lines, and electrical transmission line rights-of-way. The currently proposed projects listed in table 4.13-1 that are defined as federal actions would include mitigation measures designed to avoid or minimize additional direct impacts on cultural resources. Where direct impacts on significant cultural resources are unavoidable, mitigation (e.g., recovery and curation of materials) would occur before construction. Non-federal actions would need to comply with any mitigation measures required by the state. In addition, Southern and FGT have developed project-specific plans to address unanticipated discoveries of cultural resources and human remains in the event they are discovered during construction. Increased access by rights-of-way and service roads would increase the potential for trespass or vandalism at previously inaccessible sites. The proposed mainline and loops would only incrementally add to the effects of the other projects on cultural resources in the area.

4.13.7 Air Quality and Noise

Air Quality

The Cypress Pipeline and FGT Expansion Projects would include the construction of three new compressor stations and the modification of five existing compressor stations, and the construction of approximately 209 miles of natural gas pipeline and auxiliary facilities in Georgia and Florida (including

four new meter stations, miscellaneous piping and regulation facilities). Construction of most of the reasonably foreseeable future projects and activities listed in table 4.13-1 would involve the use of heavy equipment that would produce noise, dust from soil disruption, and combustion emissions from the construction equipment. Construction and operation of the Southern and FGT projects would contribute cumulatively to both air quality and noise. These effects could add to the ongoing air and noise impacts in the project area. The counties where the proposed compressor stations would be constructed are designated as Attainable or Unclassifiable for all NAAQS criteria pollutants. Also, the PTE of all regulated pollutants is below 100 tpy and would meet toxic air pollutant standards. Emissions from construction equipment would be primarily restricted to daylight hours and would be minimized through typical control equipment (e.g., catalytic converters). The construction equipment emissions would result in short-term fugitive emissions that would be highly localized. The majority of these effects would be mitigated by the large 17-county geographical area over which the various projects are located and the fact that the projects would be constructed in phases over a 3-year period. Operation and construction related air emissions are not expected to have a significant impact on air quality in the region. Because the projects listed in table 4.13-1 are located over a large area; have varying construction schedules; and must adhere to federal, state, and local regulations for the protection of ambient air quality, cumulative impacts on air quality are not anticipated.

Noise

Potential impacts from the Southern and FGT projects could be caused by short-term increases in noise during construction and long-term increases in noise due to operation of the project. Noise impacts during construction would be primarily restricted to daylight hours only. Construction in a particular area would be short-term and temporary, resulting in a minimal impact to the area. Operational noise was analyzed in the proposed project area by looking at noise sensitive areas nearest to the proposed compressor stations, assessing current background noise levels, and estimating future noise levels based upon the proposed equipment at the compressor stations. Based on calculations, the compressor stations associated with the Southern and FGT projects would produce noise levels that do not exceed an L_{dn} of 55 dBA, the level that protects the public from outdoor activity interference and annoyance in residential areas. To ensure this level is not exceeded, Southern and FGT would follow our recommendations outlined in Section 4.11.1 following construction. In addition, the Cypress and FGT projects are generally at a considerable distance from other planned projects. Therefore, cumulative noise impacts associated with construction and operation would be unlikely.

4.13.8 Reliability and Safety

Impact on reliability and public safety would be mitigated through the use of the DOT Minimum Federal Safety Standards in Title 49 CFR Part 192, which are intended to protect the public and to prevent natural gas facility accidents and failures. No cumulative impacts would be anticipated to occur.

4.13.9 Conclusion

The majority of cumulative impacts would be temporary and minor. However, long-term cumulative impacts on vegetation and land uses in forested areas could occur if the other reasonably foreseeable future projects listed in table 4.13-1 would be constructed and affect similar vegetation/ land uses. Long-term cumulative benefits would be realized from a boost to the local economy associated with tax revenues. Short-term cumulative benefits would also be realized through jobs and wages and purchases of goods and materials.