Appendix A

Preliminary Rusk Permit Area USACE Application Section 404(b)(1) Guideline Analysis

1.0 Introduction and Purpose of the Project

The Sabine Mining Company (Sabine), a wholly owned subsidiary of The North American Coal Corporation, proposes to construct, operate, and reclaim the Rusk Permit Area, which would be an expansion of the existing South Hallsville No. 1 Mine, an open-pit lignite mine located in Harrison County, Texas (see Draft EIS **Figure 1-2**). The proposed Rusk Permit Area encompasses approximately 20,377 acres south of the existing South Hallsville No. 1 Mine and the Sabine River in Rusk, Panola, and Harrison counties, Texas. The Rusk Permit Area would include the development of sequential mine pits through the removal of soil and rock in order to reach and extract lignite seams that occur at depths of 30 to 180 feet below the surface. An average of 4 million tons of lignite would be mined per year. The lignite would be trucked to an existing central blending facility located at American Electric Power/Southwestern Electric Power Company's (SWEPCO's) Henry W. Pirkey Unit No. 1 (Pirkey) Power Plant, located approximately 6 miles north of the northern boundary of the proposed Rusk Permit Area. The project also would include construction of access and haul roads, a dragline walkway, sediment control ponds, surface water ditches, transmission line, temporary lignite storage areas, non-lignite storage areas, a truck fueling/parking area, and wells for pit dewatering. Several existing county roads (CR), farm-to-market (FM) roads, state highways (SH), oil and gas facilities, and utility lines would be relocated or temporarily closed during the construction phase of the project.

Existing operations at Sabine's South Hallsville No. 1 Mine (see Draft EIS **Figure 2-1**) include open-pit lignite mining operations within the currently authorized South Marshall Permit Area and supporting infrastructure. Infrastructure components include a truck dump for stockpiling lignite for use at the Pirkey Power Plant, a coal barn for stockpiling of lignite for subsequent loading onto Norit Americas' highway haulers, mine offices, a truck shop, a fueling station, a truck wash, and warehouse facilities. The currently permitted mine area encompasses approximately 44,400 acres. No dewatering is required at the existing South Hallsville No. 1 Mine. Lignite reserves within the existing South Marshall Permit Area would be depleted in approximately 2027. Mine closure and final reclamation are anticipated to begin in 2027 and be completed in 2035.

Existing facilities located at the South Hallsville No. 1 Mine to be utilized by the Rusk Permit Area include office buildings and maintenance and truck wash facilities. Overburden removal at the Rusk Permit Area would be accomplished through use of one of the draglines currently operating at the existing South Marshall Permit Area of the South Hallsville No. 1 Mine. Four of these draglines would be moved to the Rusk Permit Area, two during the summer of 2012, one in 2018, and one in 2027. Groundwater wells located at the existing South Hallsville No. 1 Mine office would be utilized as a potable water source for the Rusk Permit Area. Flammable fluids and other classified toxic or hazardous substances would be stored at existing facilities at the South Hallsville No. 1 Mine, with the exception of diesel fuel and gasoline stored in aboveground tanks at the Rusk Permit Area.

The purpose of the proposed Rusk Permit Area is to expand Sabine's lignite mining operations at the existing South Hallsville No. 1 Mine in order to provide a long-term, reliable, continuous, and economically stable fuel source to SWEPCO's Pirkey Power Plant, thus supporting SWEPCO's efforts to supply dependable, affordable electricity to its customers. Sabine is seeking to utilize a local lignite resource to continue to provide local economic benefit through increased local employment, increased tax base, and indirect job growth in Rusk and Panola counties. Sabine also is proposing to develop the Rusk Permit Area for the purpose of fulfilling Sabine's contractual obligation to SWEPCO to deliver lignite mined from the Rusk County Reserve Area until 2035. Sabine's goal is to develop the Rusk Permit Area in an environmentally acceptable manner.

Sabine initiated lignite mining at the South Hallsville No. 1 Mine (see Draft EIS **Figure 2-1**) in 1984, and under contract has supplied up to 4.4 million tons of lignite annually to SWEPCO's Pirkey Power Plant, located adjacent to the mine. Sabine also has supplied up to 350,000 tons of lignite per year to Norit Americas' activated carbon plant in Marshall, Texas.

The proposed Rusk Permit Area is needed because Sabine is nearing the limit on the lignite reserves that can be safely and economically recovered at the existing South Hallsville No. 1 Mine in light of physical and environmental constraints, including environmentally sensitive areas, property encumbrances, and overburden depths. Therefore, Sabine needs a new source of lignite in order to fulfill its contractual obligations to SWEPCO for supplying lignite to the Pirkey Power Plant. The power plant requires approximately 4 million tons of lignite per year in order to generate 650 megawatts (MW) of baseload electricity annually. The electricity generated at the Pirkey Power Plant is a significant part of the capacity SWEPCO utilizes to satisfy its System Capability obligations under the Criteria of the Southwest Power Pool (SPP). The SPP relies on these requirements and commitments in planning and maintaining reliable operation of the SPP Transmission System. The lignite reserves in the proposed approximately 20,377-acre Rusk Permit Area would dependably supply lignite to SWEPCO to meet the SPP's projected needs until at least 2035.

Sabine submitted a permit application for the Rusk Permit Area to the RCT in May 2009. Sabine submitted a preliminary draft IP application to the USACE in accordance with Section 404 of the CWA in April 2009, with the draft IP application, including a proposed Conceptual Mitigation Plan, submitted in January 2010.

1.1 Location

The proposed Rusk Permit Area is located 1 mile north of Tatum, Texas (see Draft EIS **Figure 1-1**), in Rusk, Panola, and Harrison counties. The project site is immediately south of the existing South Hallsville No. 1 Mine and the Sabine River, west of SH 43, and north of FM 7096 to the eastern boundary of Gregg County, Texas (see Draft EIS **Figure 2-2**).

1.2 Project Description (Proposed Action)

The proposed Rusk Permit Area consists of 20,377 acres; of which up to 14,392 acres would be disturbed over the 30-year life of the mine for mining and ancillary facilities, such as transportation and utility corridors. Approximately 500 acres would be disturbed for surface mining at any one time during the project, based on sequential backfilling and concurrent reclamation of the mine pits. The Proposed Action is summarized below. See Section 2.5 of the Draft EIS for a detailed description of the Proposed Action.

Prior to initiation of mining at the Rusk Permit Area, the proposed transportation and utility corridor would be constructed. This corridor, inclusive of the proposed dragline walkway and primary haul road, would facilitate transfer of South Hallsville No. 1 Mine draglines to the proposed mine and would provide for transport of lignite from the proposed mine to the existing lignite truck dump or coal barn at the South Hallsville No. 1 Mine. The disturbed areas associated with the proposed Rusk Permit Area by major category are presented in Draft EIS **Table 2-4**. Additional detail regarding the proposed dragline walkway and main haul road is provided in Section 2.5.1.6 of the Draft EIS.

Overburden and interburden (the material to be removed above and between the lignite seams, respectively) primarily would be removed using 25- to 92-cubic yard capacity draglines to allow access to the lignite seams. Both highwall and spoil side positions would be used by the draglines. No blasting is proposed. The volume of overburden and interburden production would vary with the depth at which mining would occur. The minimum mineable lignite thickness considered to be recoverable is 0.25 feet.

Once an initial box pit is excavated, overburden and interburden from each subsequent pit would be backfilled into the previous pit to establish a graded surface at approximately the same elevation as the pre-mining surface. Overburden material would be selectively handled to ensure placement of a minimum 4-foot cover of suitable oxide material for use as growth media on top of the backfill. This surface then would be suitable for completion of reclamation procedures including rough and final grading, testing of selectively handled overburden for suitability, seeding and planting, and other final reclamation tasks. The sequence of activities would be implemented to achieve post-mining land uses and long-term reclamation goals as approved by permitting agencies prior to site construction.

Surface water control facilities would be constructed in appropriate locations prior to initiation of mining in each drainage area in order to control runoff from disturbance areas, including the initial mining area and infrastructure areas. These facilities would include a combination of ditches, sediment control ponds, and other control structures or best management practices (BMPs) (e.g., installation of riprap, check dams, temporary vegetation, managed discharges, etc.) designed to minimize erosion and control surface water quality discharged from the site. All surface water runoff from disturbance areas (except roads) would pass through a sediment control pond or series of sediment control structures prior to discharge through Texas Pollution Discharge Elimination System (TPDES)-regulated outfalls (see Draft EIS **Figure 2-5**). Each structure would be planned and constructed in accordance with RCT requirements.

Temporary sediment control measures (e.g., drop structures, terraces, silt fences, check dams) would be installed, as needed, prior to construction and during operations to minimize erosion from disturbance areas. These controls would decrease overland flow velocities, reduce runoff volumes, trap sediment, and stabilize reconstructed soils.

Dewatering of overburden potentially would be necessary where saturated portions of the Carrizo and Upper Wilcox sands exist in the proposed mining area. Dewatering would reduce the amount of groundwater entering the pits and would stabilize the highwall and spoil both for safety reasons and to allow efficient operations. Based on modeling conducted by Pastor, Behling & Wheeler, LLC (2009), approximately 129 dewatering wells, with a pumping rate of approximately 15 gpm, would be required incrementally for the initial (5-year) mine area. Underburden dewatering is not proposed due to lack of substantial underburden sands below the lowest mineable lignite seam, and it is anticipated that seepage into the pit would be sufficient to releave underburden pressure.

Dewatering well water (approximately 340 to 1,065 acre-feet per year) would be disposed of in accordance with Texas Commission on Environmental Quality (TCEQ) requirements either via sediment control ponds or, if the dewatering well water meets TPDES discharge standards without treatment, directly to the closest surface water channel. Discharge of dewatering well water through the sediment control ponds also would be conducted in accordance with TPDES permit criteria.

Surface disturbance associated with the proposed project construction and operation would result in direct impacts to a total of 303.1 acres of waters of the U.S., including 151.2 acres of forested wetlands, 62.6 acres of non-forested wetlands, 22.1 acres of ephemeral streams, 13.5 acres of intermittent streams, 5.4 acres of perennial streams, and 48.3 acres of ponds. These impacts would occur incrementally over the 30-year life of the mine. The waters of the U.S., including wetlands that would be affected, are shown in **Figure 3.2-14** of the Draft EIS. These impacts would be minimized by limiting surface disturbance in the mine areas to a maximum of 500 acres at one time and through implementation of the proposed reclamation program and Sabine's proposed Conceptual Mitigation Plan (**Appendix C** of the Draft EIS) that was developed through the USACE's Section 404 permitting process.

1.3 Regulatory Authority

This document provides preliminary analysis relative to the requirements of Section 404(b)(1) of the Clean Water Act (CWA). The purpose of this analysis is to identify and evaluate practicable alternatives as defined in 33 Code of Federal Regulations (CFR) 230.3 that minimize the impacts to the aquatic resource. The Section 404(b)(1) guidelines are the substantive criteria with which discharges must comply before a Section 404 permit may be issued by the USACE. These guidelines have been developed by the U.S. Environmental Protection Agency (USEPA) in coordination with the USACE.

The fundamental precept of the guidelines is that discharges of dredged or fill material into waters of the U.S., including wetlands, should not occur unless it can be demonstrated that such discharges, either individually or cumulatively, will not result in unacceptable adverse effects on the aquatic ecosystem. Discharge of dredged or fill material from the proposed project must comply with restrictions set forth in the guidelines. These restrictions include the following:

1. No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.
2. Discharge is not permitted if it causes or contributes to violation of applicable state water quality standards; violates toxic effluent standards; jeopardizes the continued existence of species listed under the Endangered Species Act of 1973; adversely affects designated critical habitat; or adversely affects any designated marine sanctuary under the Marine Protection, Research, and Sanctuaries Act of 1972.
3. Discharge is not permitted which would cause or contribute to significant degradation of the waters of the United States, including significant adverse effects on aquatic organisms and ecosystems.
4. No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Where the activity associated with a discharge that is proposed for a special aquatic site (as defined in subpart E) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water-dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge that do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise. A surface lignite mine is not a water-dependent activity. Therefore, it does not require access, proximity, or siting within a special aquatic site. However, because surface lignite mining is constrained by several factors, including the location of lignite reserves, location of the mine relative to the power plant proposed to be serviced (fueled), and the need for large expanses of land required to undertake large-scale open-pit mining activities, lignite mines typically result in unavoidable impacts to special aquatic sites. The only special aquatic sites present on the proposed project site are those associated with wetlands. These restrictions provide the general basis for the subsequent sections of the Section 404(b)(1) analysis and determination of the Least Environmentally Damaging Practicable Alternative.

1.4 Practicability

Pursuant to Section 404(b)(1) of the CWA, the USACE defines practicable alternatives as those that are “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes” (ibid). Sabine has provided industry-specific information with regard to cost, existing technology, and logistics on which to base practicability criteria for the proposed project. The USACE has verified that information and developed practicability criteria against which the preferred project and the identified alternatives can be compared.

1.4.1 Cost

To satisfy project objectives, the alternative must enable the Pirkey Power Plant to remain in operation and produce energy at a cost that is competitive in the local market. The chosen alternative must provide an economic method of fulfilling Sabine’s contractual obligation to provide lignite to the Pirkey Power Plant. The Pirkey Power Plant originally was sited to be near a fuel source for low-cost power generation. As the existing fuel source from the South Marshall Permit Area of the South Hallsville No. 1 Mine reaches its currently permitted limits for economic production, any replacement fuel source used at the Pirkey Power Plant must, in turn, be economically produced to maintain the availability of low-cost power generation.

1.4.1.1 Price Stability

The lignite in the South Hallsville No. 1 Mine and the Rusk Permit Area is an economic fuel source that Sabine can effectively own or control to fulfill contractual obligations. This means that in addition to project costs being low initially, they can be held stable for decades.

1.4.1.2 Overburden to Lignite Ratio

As the mining depth increases in a given mining area, the amount of overburden handled to produce the same quantity of lignite increases. This overburden to lignite ratio is one of the key factors determining the cost of fuel production.

1.4.2 Existing Technology

Sabine's fuel cost objectives only can be met by using currently available and competitively priced technologies for extraction and transport of lignite. The available technology includes the use of Sabine's four existing draglines currently in use at the South Marshall Permit Area of the South Hallsville No. 1 Mine and the ability to transport the lignite by truck to the Pirkey Power Plant.

1.4.3 Logistics

The lignite supplied to the Pirkey Power Plant also must meet various criteria regarding accessibility and reliability in order to ensure continuity of power generation operations. The following criteria must be met, as further discussed below:

- Legal accessibility
- Physical and economic accessibility
- Dependable quality and supply

1.4.3.1 Legal Accessibility

The mineral reserves must be legally available to Sabine.

1.4.3.2 Physical and Economic Accessibility

The mineral reserves must be available in a spatial orientation that enables effective mining operations. Thus, Sabine (or SWEPCO) must be able to acquire ownership or property control of sufficient contiguous reserves to facilitate efficient operations.

1.4.3.3 Dependable Quality and Supply

The mineral reserve must involve lignite seams of suitable quality and uniformity to provide a reliable fuel source meeting the requirements of the generating station.

1.4.4 Practicability Criteria

For purposes of this evaluation, an alternative will be considered practicable with regard to cost if the alternative will provide stable and predictable power costs. Sabine has identified this threshold as $3.00 per million British thermal units (MMBTU). Current production costs are approximately $2.10 per MMBTU at the South Marshall Permit Area of the South Hallsville No. 1 Mine.

An alternative will be considered practicable with regard to technology if it is compatible with the existing equipment and technology and does not require a major expenditure of capital for new equipment and technology.

To be considered practicable from the standpoint of logistics, an alternative must provide a fuel source that is legally accessible, economically available, conducive to mining, and exhibits suitable quality and quantity to represent a dependable supply.

1.5 Alternatives Considered

The USACE has three available alternatives relative to its consideration of Sabine's application for an Individual Permit (IP) pursuant to Section 404 of the CWA: 1) issue the permit as described above in Section 1.2; 2) issue the permit with special conditions; or 3) deny the permit. Permit denial is referred to as the No Action Alternative, as described below in Section 1.5.1.

Sabine considered a variety of alternatives during feasibility studies for the Rusk Permit Area, including the No Action Alternative. In addition, the USACE identified potential alternatives to the Rusk Permit Area based on issues identified during project evaluation. No alternatives were identified during the public scoping process. Alternatives to the proposed project are described below.

1.5.1 No Action

Under the No Action Alternative, the USACE would deny Sabine's application for an individual Section 404 permit. As a result, the proposed Rusk Permit Area would not be developed, and the potential impacts to the natural or human environment identified for the Proposed Action would not occur. However, existing operations at the South Marshall Permit Area of the South Hallsville No. 1 Mine would continue under existing authorizations until the lignite reserves are depleted (in approximately 2027). Potential impacts associated with the No Action Alternative are described in the resource-specific sections of Chapter 3.0 of the Draft EIS.

Implementation of the No Action Alternative would not meet the purpose and need for the project. However, the No Action Alternative must be addressed, because a permit cannot be issued by the USACE if such issuance would be contrary to the public interest and would not comply with the Section 404(b)(1) guidelines. Also, its inclusion in the Draft EIS analysis is required under provisions of NEPA and serves as a basis for comparison of environmental impacts among alternatives. Under this alternative, the identified lignite reserves at the proposed Rusk Permit Area would not be mined.

The No Action Alternative does not mean, however, that there would be no impacts to the lands in and near the Rusk Permit Area. The potential exists that the lignite reserves in the Rusk Permit Area would be mined at a later date, or that some portion of the land would be sold for purposes of development. The USACE has chosen not to speculate on the nature of the future land use, and has not predicted the associated possible future impacts from the No Action Alternative. Also note that with No Action, there still would be regional impacts, as identified in the analyses of cumulative impacts that are caused by activities other than development of the proposed Rusk Permit Area.

It is assumed the No Action Alternative would not affect the continued operation of the existing Pirkey Power Plant. If the USACE selects the No Action Alternative, there are other potential fuel sources for the power plant; however, as these fuel sources do not meet the purpose and need of the proposed project and are outside of Sabine's control, they are not considered as alternatives in the Draft EIS. If other fuel sources are proposed by SWEPCO at a future time, the development of those fuel sources would be subject to compliance with applicable environmental laws and regulations.

1.5.2 Alternatives Available to Sabine

Sabine considered various alternatives during feasibility studies for the Rusk Permit Area. In addition, the USACE identified potential alternatives to the Rusk Permit Area based on issues identified during project evaluation. No alternatives were identified during the public scoping process. The alternatives considered included alternatives to constructing and operating the Rusk Permit Area including: the Sabine River crossing location, dragline and haul road corridors, dragline scenarios, lignite transport scenarios, mining

scenarios, lignite resource areas, and use of public roads. All of these alternatives were considered relative to their technological and economic feasibility as well as their apparent likelihood to reduce environmental impacts. The USACE has reviewed the data and analyses provided by Sabine and has conducted an independent review of the associated costs. Based on the available data, the USACE believes Sabine's analysis to be reasonable. Based on the USACE's evaluation, these alternatives have been considered but subsequently eliminated from detailed analysis in the Draft EIS. The rationale for their elimination is summarized below.

1.5.2.1 Sabine River Crossing Location

This alternative considered alternate corridor locations for dragline and bridge crossings of the Sabine River, including separate corridors for the dragline and bridge crossings. Sabine considered the potential alternative locations in coordination with the USACE and the Texas Parks and Wildlife Department (TPWD).

Sabine evaluated a potential crossing location approximately 1,000 feet downstream of the currently proposed location. This location would have crossed on a coal shoal and then onto a property for which Sabine does not have right-of-entry. Although the coal shoal would provide additional stability, the temporary reroute of the Sabine River would have been difficult due to the river geomorphology at this location. The channel lacked the necessary sinuosity to provide a location to re-route and culvert the Sabine River around the dragline crossing location. In order to use the coal shoal location, additional disturbance would have been required, resulting in additional environmental impacts to the Sabine River. In addition to the property ownership and geomorphological issues, this location would not provide any apparent environmental advantages over the Proposed Action. Therefore, it was eliminated from further consideration.

Other potential Sabine River crossing locations initially were considered but subsequently were eliminated as they would not enable the haul road corridor to be directly aligned with the Pirkey Power Plant, resulting in a longer haul road and associated additional environmental disturbance and cost. A longer haul road also would require the purchase or lease of additional property rights, resulting in additional costs. The currently proposed bridge alignment would facilitate the potential future addition of a conveyor from the Rusk Permit Area to the Pirkey Power Plant, should Sabine decide to construct and operate a conveyor in the future. Note that a conveyor is not part of the Proposed Action; it is considered a reasonably foreseeable future action (RFFA) in the cumulative impact assessment (see Section 2.7 of the Draft EIS).

1.5.2.2 Split Transportation Corridor

This alternative considered separate corridors for the dragline walkway and haul road south of the Sabine River; the Sabine River crossings of the dragline walkway and haul road would be the same as the Proposed Action. South of the Sabine River, the corridors would remain separate over their entire length across the Sabine River floodplain until entering uplands close to the proposed pit locations. Sabine initially considered this alternative as the dragline walkway would have been shorter in length (and more cost-effective) than the proposed haul road. However, this alternative would have resulted in additional habitat fragmentation. At the direction of the USACE and the TPWD, this alternative was eliminated from consideration, and the proposed corridors were co-located between the Sabine River and the mine pits as described under the Proposed Action (see Section 2.5.1.6 of the Draft EIS). Additionally, the haul road would be located to parallel an existing natural gas pipeline right-of-way, to the maximum extent practicable, in an effort to further reduce habitat fragmentation.

1.5.2.3 Dragline Disassembly and Reassembly

As an alternative to the proposed construction of a dragline walkway across the Sabine River from the South Marshall Permit Area to the proposed Rusk Permit Area, Sabine considered dragline disassembly, transport, and reassembly. Sabine proposes to relocate up to four draglines to the Rusk Permit Area. Sabine estimates it would require approximately 18 months to disassemble, transport, and reassemble each dragline at an approximate cost of $15 million per dragline (in 2009 dollars) or a total of

approximately $60 million. This cost includes labor, equipment, materials and supplies, transport, tear-down, and erection pad construction. The draglines would be moved in 6- to 7-year increments during the life of the project; therefore, the costs would be incurred over a 25- to 30-year period with the associated increase in costs. This estimated cost is approximately $45 million more than the cost of construction and operation of the dragline walkway, including the removal and replacement of fill material and reclamation of the walkway following transfer of the final dragline.

Each of Sabine's four draglines is required to operate at full capacity to meet the Pirkey Power Plant's operational requirement of 4 million tons of lignite per year. Sabine is contractually obligated to meet the entire fuel requirements of the power plant. Based on Sabine's current strip ratios and the annual volume of overburden handled by each dragline, loss of a dragline for approximately 18 months per dragline (total of 6 dragline years) would substantially reduce lignite production and delivery to the power plant. The reduced lignite production rate for 18 months for each dragline would preclude Sabine from making the required fuel delivery and meeting its contractual obligations; therefore, this alternative was eliminated from further consideration.

1.5.2.4 Purchase of New Draglines

As an alternative to the proposed construction of a dragline walkway across the Sabine River and transfer of Sabine's existing draglines, Sabine considered the purchase of one or more new draglines for the Rusk Permit Area. The cost of a new dragline (in 2009 dollars) would be approximately $50 to $100 million for a total maximum cost of $400 million for four draglines. In addition to the cost of the new draglines, the existing four draglines at the South Hallsville No. 1 Mine would need to be idled and/or sold as mining of the remaining lignite reserves is completed. It is anticipated that, due to the age and obsolete technology of the draglines, selling them would be difficult. The estimated cost for the purchase of four new draglines is approximately $385 million more than the cost of construction and operation of the dragline walkway, including the removal and replacement of fill material and reclamation of the walkway following transfer of the final dragline. This alternative was eliminated from further consideration based on cost.

1.5.2.5 Lignite Transport by Conveyor or Rail

Although these alternatives would slightly reduce the required width for the transportation corridor, a haul road and dragline crossing of the Sabine River still would be required. Mobile equipment would need to access the mine areas for pre-stripping operations and mine maintenance.

The construction cost for a troughing conveyor, including a conveyor maintenance facility, is estimated at three-to-four times the cost of constructing a bridge across the Sabine River. Conveyor operational costs would be substantially less than the proposed truck haulage costs. A conveyor also would require construction of new coal handling facilities at the Rusk Permit Area to prepare the run-of-mine lignite for transport by conveyor, including a truck dump and crushing and transfer equipment; these costs are included in the cost estimate. Based on the estimated combined capital construction costs and operational costs, an overland conveyor is not currently cost effective. As Sabine may consider the future construction and operation of a conveyor, it is considered as a reasonably foreseeable future action in the cumulative impact assessment (see Section 2.7 of the Draft EIS).

At the time of the economic evaluation, a conveyor was not a feasible option; however, future conditions may require a re-evaluation of a conveyor option. The primary factor will be tons of lignite delivered per mile of conveyor required. As time progresses, the percentage of total tons of lignite deliveries from the Rusk reserves compared to total contractually obligated tons of lignite delivered would increase. At some point in the future, a conveyor option may become economically feasible. Other factors that would influence the future economic feasibility of a conveyor would include diesel fuel costs and costs and availability of tires for mobile equipment.

The construction cost for a rail line between the Rusk Permit Area and the Pirkey Power Plant is estimated at approximately four times the cost of the proposed haul road. Rail haulage operational costs are

estimated to be substantially less than the proposed truck haulage costs. Like a conveyor, rail transport would require construction of new lignite handling facilities at the Rusk Permit Area; these costs were included in the cost estimate.

A significant operational problem would result from the lack of a redundant backup for lignite deliveries in the event of a temporary failure of either a conveyor or rail transport of lignite from the Rusk Permit Area to the Pirkey Power Plant. Note that, in effect, the haul road would provide the access required for backup; however, Sabine would not have the trucking capacity necessary to meet the power plant demand with either a conveyor or rail line for lignite transport. These alternatives were eliminated for this reason, as well as cost and lack of substantial environmental advantage.

1.5.2.6 Deeper Mining at Existing South Marshall Permit Area

Deeper mining is not technically or economically feasible for the existing South Marshall Permit Area. The existing draglines are capable of digging approximately 95 feet below ground surface; however, additional lignite seams in the deposit exceed this depth. In addition, the stripping ratio would increase for the deeper seams. Deeper pits also would reduce pit slope stability, and safety factors required to ensure safe operations would result in an operating configuration with flatter slopes and associated higher costs for overburden removal. Thus, it would not be economically feasible to remove overburden at greater depths with the existing draglines. Mining the lignite resource at a greater depth and stripping ratio would require purchase of a minimum of two new draglines (at an approximate cost of $50 to $100 million per dragline) to handle the additional overburden. Another method to handle the increased volume of overburden would be to pre-strip multiple benches using mobile equipment. It is estimated that approximately twice the number of mobile equipment units (e.g., track-hoes, shovels, end-dumps, etc.) that currently are operating at the South Marshall Permit Area of the South Hallsville No. 1 Mine would be required to mine the deeper reserves with this method. Therefore, this alternative was eliminated from further consideration based on safety issues and cost.

1.5.2.7 Underground Mining of Rusk Permit Area

Underground mining of the Rusk Permit Area lignite resources is not technically or economically feasible due to geologic conditions, including the instability of the overburden material. Safety issues would preclude underground mining. Underground mining of this lignite resource also would result in a lower level of resource recovery and increased costs and environmental effects associated with the need for additional processing. Therefore, this alternative was eliminated from further consideration.

1.5.2.8 Alternate Mine Layout and Mine Sequencing

Alternate mine plans are technically achievable; however, they would result in additional costs associated with increased overburden handling, including the need for additional mobile equipment. In addition to economic issues, consideration also was given to the presence (and avoidance) of cultural resources. Directional changes in mining would cause pits to cross varying terrain, complicating Sabine's ability to handle in-pit runoff, as well as affecting additional watersheds at the start of the project. Therefore, this alternative was eliminated from further consideration based on environmental and cost considerations.

1.5.2.9 Mining of Other Lignite Resource Area

Several other lignite resource areas exist within Sabine's current permit area; however, these areas were eliminated due to portions of the alternate resource area being outside of Sabine's or SWEPCO's control, or due to extensive other encumbrances, including power lines, gas transmission lines, cultural resources, more extensive aquatic resources including forested wetlands, etc. Additional areas were eliminated due to floodplain issues and haul distances exceeding twice those of the proposed Rusk Permit Area that would result in additional environmental impacts within a longer corridor and additional habitat fragmentation. Many of the potential alternate resource areas are small and would be exhausted within approximately 5 to 10 years, or require the redisturbance of previously mined and reclaimed areas. It is assumed that development of a comparable alternate lignite resource would result in a total disturbance

area similar to Rusk. Other variables (e.g., relative cost, lignite quality, overburden depth, overburden-to-lignite ratio, property control, aquifer depressurization requirements, reclamation feasibility, etc.) also were evaluated. Any one of these variables would prohibit development of the alternate mine areas. As a result, development of an alternate lignite resource was eliminated from further consideration.

1.5.2.10 Use of Public Roads for Lignite Transport

Based on the proposed lignite haulage requirements, there would be an estimated 500 haul truck round-trips per day (based on daily lignite requirements for the Pirkey Power Plant of 12,500 tons and the use of 25-ton over-the-road (OTR) trucks between the proposed Rusk Permit Area and the Pirkey Power Plant. The use of public roads would compromise public safety due to the intermingling of private cars and trucks with lignite haul trucks. The use of public roads would require different lignite haul trucks suited for highway usage and would greatly increase the maintenance requirements for the public roads. Because these trucks are substantially smaller than the off-road lignite haulers used at Sabine, this method would increase lignite haulage costs. Increased road maintenance requirements, as well as additional fuel costs for the longer transport distance, would be cost-prohibitive for Sabine. Using OTR trucks on public roads would approximately double the haul distance that could be achieved using the proposed haul road and off-road haulers. The OTR trucks haul less tonnage and would travel twice the distance; the incremental per ton cost would be much higher using OTR trucks than using the proposed 240-ton haul trucks. Therefore, this alternative was eliminated from further consideration based on cost.

1.6 General Description of Dredged or Fill Material

1.6.1 General Characteristics of Material

Soils in the Rusk Permit Area are discussed in detail in Section 3.3.1.2 of the Draft EIS. Many of the undisturbed soils within the Rusk Permit Area have suitable growth media characteristics in the upper portions of the soil profiles, in some cases if amended with lime. Soils with excessive clay or sand content are not considered suitable for use as a reclamation growth media (Sabine 2009a).

To promote site stabilization and revegetation to meet post-mining land use objectives, topsoil would be selectively handled for reclamation together with oxidized overburden material. Prime farmland soil is defined by the Natural Resource Conservation Service (NRCS) as land that has the best combination of physical and chemical characteristics of soil properties, growing season, and moisture to produce sustained high yields of crops in an economic manner, if it is treated and managed according to acceptable farming methods. Sabine has requested a negative prime farmland determination from the RCT as the NRCS-designated prime farmland soil types within the proposed Rusk Permit Area have not been historically used as cropland. Should Sabine be granted a negative prime farmland determination, prime farmland soils would be handled with other soils, as described in Section 2.5.3.2 of the Draft EIS.

1.6.2 Quantity of Material

Surface disturbance associated with the proposed project construction and operation would result in direct impacts to a total of 303.1 acres of waters of the U.S., including 151.2 acres of forested wetlands, 62.6 acres of non-forested wetlands, 22.1 acres of ephemeral streams, 13.6 acres of intermittent streams, 5.4 acres of perennial streams, and 48.3 acres of ponds. These impacts would occur incrementally over the 30-year life of the mine. The waters of the U.S., including wetlands, that would be affected are shown in **Figure 3.2-14** of the Draft EIS. These impacts would be minimized by limiting surface disturbance in the mine areas to a maximum of 500 acres at one time, through implementation of the proposed reclamation program and Sabine's proposed Conceptual Mitigation Plan that was developed through the USACE's Section 404 permitting process.

The majority of material placed into waters of the U.S. would be native soils from the project area identified as suitable for reclamation purposes.

1.7 Description of the Proposed Discharge Site

Soil materials and underlying geologic strata above the lignite seams (overburden) to be mined would be removed from wetlands and waters of the U.S. within the mine areas along with the surrounding upland soils and overburden materials. Such materials would be excavated by dragline and placed as backfill in mined-out portions of the pit as the pit advances to expose additional lignite. Similarly, materials being placed in locations previously characterized as wetlands or waters of the U.S. generally would be mixed with run-of-mine overburden materials. Overburden with favorable chemical and physical characteristics would be selectively handled to ensure that the top layer of the replaced material provides a suitable growth medium for vegetation re-establishment. Thus, materials immediately underlying and adjacent to the redesigned drainage channels in the mined area would provide suitable growth media for re-establishing the desired reclamation species.

1.8 Description of Disposal Method

Soils and overburden materials disposed of in former wetland and waters of the U.S. areas typically would be disposed of by directly dumping these materials from the dragline bucket into the mine-out pit area. The dragline operations would produce overlapping ridges of spoil material that subsequently would be reshaped by dozers to achieve the desired post-mine topography. Overburden material would be selectively handled to ensure placement of a minimum 4-foot cover of suitable oxide overburden material for use as growth media on top of the backfill. This surface then would be suitable for completion of reclamation procedures including rough and final grading, testing of selectively handled overburden for suitability, seeding and planting, and other final reclamation tasks.

2.0 Factual Determinations

This section addresses the potential environmental effects of the Proposed Action. The analysis reflects the inclusion of Sabine's proposed reclamation (Section 2.5.3 of the Draft EIS), including restoration of Waters of the US, including wetlands (Section 2.5.3.6 of the Draft EIS); Sabine's committed environmental protection measures (Section 2.5.4 of the Draft EIS); and the USACE's recommended mitigation measures for individual resource (Chapter 3.0 of the Draft EIS).

2.1 Physical Substrate Determinations

2.1.1 Substrate Elevation and Slope

Waters of the U.S., including wetlands, that are restored as part of the proposed project would be constructed to elevations and slopes as close to the existing conditions as possible.

2.1.2 Sediment Type

The sediments contained within the affected waters of the U.S., including wetlands, are predominantly clays, silts, and organic materials produced from the surrounding upland soils described above. The fill material proposed to be placed into the waters of the U.S., including wetlands, would consist of a mixture of topsoil and suitable oxide overburden materials removed from the area mined. The materials placed at the surface would be selected to ensure their suitability as plant growth materials.

2.1.3 Dredged/Fill Material Movement

The vast majority of soil and overburden material removed from jurisdictional areas would be excavated by the dragline from the undisturbed side of the mine pit and moved across the pit into the previously mined portion of the pit with a single arc of the dragline boom. Thus, the initial movement would be approximately the distance across the mine pit. Additional movement of materials placed in the spoil ridges would occur as these ridges are recontoured with dozers and scrapers to reach the desired final topographic configuration. In this latter operation, the dredged material may be moved in almost any direction from its initial point of deposit by the dragline, but distances for relocating such material would be minimized for operational efficiency.

2.1.4 Physical Effects on Benthos

In total, the project would impact 303.1 acres of waters of the U.S. Surface waters within the proposed disturbance areas (including 48.3 acres of ponds, a total of 41.0 acres of perennial, intermittent, and ephemeral streams, 62.6 acres of non-forested wetlands, and 151.2 acres of forested wetlands) would be physically removed by mining or filled during construction and operation activities. Consequently, benthic organisms in these water bodies would be lost. These losses would occur in a staged progression as mining activities incrementally affect additional ponds or stream segments throughout the life of the operation. These incremental losses of aquatic habitat would be offset, in part, by the incremental creation of new ponds and replaced drainage channels in the areas being reclaimed as mining operations advance. Aside from the physical loss of aquatic habitat, changes would occur in the flow regime of streams during and after mining due to surface water diversions during mining, installation of sediment control ponds, and potential dewatering activities. These changes would be expected to affect the composition and abundance of benthic communities in the affected stream reaches.

Based on the proposed direct and compensatory mitigation ratios (see Draft EIS **Table 2-10**), Sabine would create approximately 89.4 acres of developed surface water features during reclamation, including ponds and perennial, intermittent, and ephemeral streams. Approximately 396.2 acres of forested and non-forested wetlands also would be created during reclamation. Mitigation (reclamation) may be accomplished through in-kind or out-of-kind restorative efforts, to be determined by the USACE. Benthic

communities would re-establish within the new surface water features. Benthic communities also would establish in the temporary water features present during the active mining operations including the diversion ditches and sediment control ponds. It is anticipated, however, that the alteration of flow regimes and impoundment conditions from those present in the pre-mining environment would lead to corresponding changes in the presence and abundance of various benthic organisms. Thus, the overall benthic communities during and following mining may be different than the existing communities.

Best Management Practices (BMPs) and engineered water management facilities would be utilized throughout construction and operation to limit erosion and reduce sediment transport as a result of storm water runoff from the proposed disturbance areas. However, it is possible that limited amounts of sediment may escape during very large precipitation events to enter the downstream perennial portions of these drainages. This potential off site sedimentation could affect benthos in such areas. Discharges from the sediment control ponds would meet RCT and TCEQ effluent limitations for receiving waters, achieving these requirements either by settling times in the ponds or through additional treatment, if necessary. The potential reduction in suspended solids and reduced potential for occasional channel flooding may result in conditions favoring different benthic organisms than those that currently dominate local communities.

2.1.5 Other Effects

None anticipated.

2.1.6 Actions Taken to Minimize Impacts

During operations, Sabine would use BMPs implemented in accordance with RCT regulations and a TCEQ Section 401 CWA review and certification process to limit erosion and reduce sediment transport resulting from disturbed area runoff. Storm water ditches and sediment control ponds would be installed during the construction phase and incrementally over the life of the mine to divert and route storm water and control sediment in surface water runoff from newly disturbed lands during mine pit advancement. The design, construction, and operation of these facilities are described in Section 2.5.1.1 of the Draft EIS.

A series of berms, ditches, or sumps would be constructed in and around the mine pits to control surface water and groundwater inflow. These water control features incrementally would be installed in appropriate locations throughout the life of the mine as operations advance. Collected water would be pumped to a sediment control pond prior to discharge.

Prompt and effective revegetation of disturbed areas would further reduce the potential for erosion. Following construction activities, disturbed areas such as cut-and-fill embankments, topsoil and subsoil stockpiles (if left in place over 30 days), and other temporary site disturbance would be seeded. All sediment and erosion controls would be inspected periodically, and repairs would be performed as needed. It is expected that at any time in the mine life approximately 500 acres of mine disturbance area would exist, including areas where existing vegetation has been removed, mining operations are underway, or recontouring of mine spoil is underway.

Routine and seasonal site maintenance would include inspection and repair of drainage and sediment control facilities and installed erosion controls, routine grading and related landform maintenance to maintain site drainage patterns, the cleaning of sediment control ponds and ditches, and the resurfacing of roads as needed.

Reclamation would be initiated as soon as practicable following the initial mine pit development and would continue concurrent with mining operations throughout the life of mine and through final closure. The short-term reclamation goals would include soil stabilization and prompt establishment of a vegetative cover to minimize erosion. On a long-term basis, the reclamation program is designed to create stable, productive plant communities and naturally appearing land forms effective in controlling erosion while meeting the desired post-mine land use objectives.

2.2 Water Chemistry and Flow Determinations

2.2.1 Water Characteristics

2.2.1.1 Salinity

There are no salt water sources within the permit area; therefore, water characteristics associated with salinity from salt water sources are not applicable. Other effects on water chemistry, including potential salinity from surface runoff or overburden sources, are discussed in the following subsections.

2.2.1.2 Water Chemistry

Surface water quality issues associated with lignite mining generally involve the potential for increased sediment transport, nutrient and pesticide loading, and acid or toxic drainage resulting in increases in iron, manganese, or total dissolved solids (TDS). Sediment, metals, and metalloids can be treated by settling or discharges, depending on the nature and timing of runoff or groundwater contributions to the sediment control pond/storm water management system. Information relative to the design, construction, and operation of the proposed surface water control facilities is presented in Sabine's RCT mine permit application, as summarized in Sections 2.5.1.1 and 2.5.2.1 of the Draft EIS and the Surface Water Quality Impacts subsection of Section 3.2.4.2 of the Draft EIS. Discharges during the life of the mine would be treated, as required, to meet TPDES requirements and new-source performance standards in 40 CFR 434. Adequate water treatment technologies (including retention, settling, and the use of flocculants) have been demonstrated at the existing South Hallsville No.1 Mine and would be implemented as part of the Rusk Permit Area water management system, as described in Section 2.5 of the Draft EIS.

Fertilizers and pesticides would be applied on reclaimed areas, as needed, to ensure successful reclamation. Due to the rapidly advancing pesticide technology, the selection of appropriate pesticides would be determined prior to use based on the target species and site-specific conditions. These materials would be applied in accordance with recommended application rates and procedures and are not anticipated to constitute a risk to water quality in local streams or groundwater as discussed in the Surface Water Quality Impacts subsection of Section 3.2.4.2 of the Draft EIS.

During operation, any water from pit sumps, overburden dewatering activities, and surface runoff from disturbed areas not used for dust control would report to the water management system prior to release. Based on monitoring and compliance with applicable RCT and TPDES requirements, surface water quality downstream of the Rusk Permit Area during periods of discharge likely would be within the normal range of variation for the respective drainages.

As described in Section 2.5.2.6 of the Draft EIS, Sabine's selective handling plans for overburden are proposed to minimize the potential for acid or toxic drainage from the project in the post-mining setting. Assuming prior identification of these materials and their deep burial within the pit, any seepage that may occur following reclamation would not come into contact with acid-generating or toxic material. Increased dissolved solids in groundwater are likely to occur within and near the mined area. Peak concentrations of dissolved solids in groundwater within the reclaimed overburden should occur during the initial resaturation period. During the resaturation process, the water quality within the spoil could be erratic and not follow a predictable trend. However, it is not expected that TDS would exceed 5,000 mg/L in the reclaimed mine pit backfill material as discussed in Section 3.2.3.2 of the Draft EIS.

The expected reduction in lateral hydraulic conductivity of the reclaimed overburden relative to the pre-mine conditions suggests that the quantities and rates of groundwater movement likewise would be substantially lower. Thus, from a mass balance perspective, the small volume of potentially high TDS groundwater migrating out of portions of the resaturated spoil would mix with a much larger volume of low TDS groundwater in the surrounding aquifers. This would result in minor changes to the surrounding groundwater chemistry. Dilution and dispersion should mitigate effects on water quality in adjacent shallow groundwater zones and limit these minor effects to a few hundred feet from the mined area.

Seeps or small springs that may occur in the reclaimed drainages would have minimal effects on surface water quality, including iron, selenium, manganese, and TDS levels beyond a few hundred feet from their point of origin. Flow losses through channel seepage, as well as dilution and dispersion in surface flows, would minimize impacts. Most of the surface water flow in the vicinity of the project area originates from precipitation events. As a result, neither the quality of the baseflow nor changes in baseflow timing would substantially affect water quality in gaining stream reaches during or after mining.

2.2.1.3 Clarity

Increases in suspended particulate and increased turbidity temporarily could reduce light penetration in the Sabine River and waterbodies within the project boundary. However, implementation of BMPs and additional recommended mitigation measures during construction and operation would minimize, if not eliminate, increases in suspended particulates and turbidity. In addition, the construction and operation of the proposed surface water control facilities as described in Sections 2.5.1.1 and 2.5.2.1 of the Draft EIS and the proposed concurrent reclamation program as described in Section 2.5.3 of the Draft EIS would further minimize potential increases in suspended particulates and turbidity both during and following construction and operation.

2.2.1.4 Color

With implementation of BMPs and the additional recommended mitigation measures, the proposed project would have no effect on water color.

2.2.1.5 Odor

The proposed project would have no effect on water odor.

2.2.1.6 Taste

The proposed project would have no effect on water taste.

2.2.1.7 Dissolved Gas Levels

Any increases in the turbidity of receiving waters would be temporary and would have minor effects on the oxygen content of intermittent and perennial stream reaches or perennial pools. The level of potential effects would depend largely on the nature of any organic materials suspended during disturbance. Removal of the headwater segments of local streams may affect dissolved oxygen concentrations in the nearby downstream reaches of these streams, since runoff may be stored temporarily in sedimentation ponds where it could become warmer and undergo greater Biological Oxygen Demand (BOD). The state dissolved oxygen standard for Segment 0505 (Sabine River above Toledo Bend Reservoir) is 5.0 milligrams per liter. Baseline monitoring data for the Sabine River indicate that levels typically are above this standard, whereas background data for the tributaries typically show values less than the standard, particularly during low-flow periods. These conditions are likely to continue. Concentrations would increase from turbulent releases through sediment control pond structures and flow onto the floodplain. During flow or storage on the Sabine River floodplain, dissolved oxygen concentrations would mimic baseline conditions in the un-mined water bodies.

2.2.1.8 Nutrients

Fertilizers would be applied on reclaimed areas, as needed, to ensure successful reclamation and revegetion (see Section 2.5.3.5 of the Draft EIS). As discussed in the Surface Water Quality Impacts subsection of Section 3.2.4.2 of the Draft EIS, increases in nutrient concentrations may occur in runoff from the reclaimed areas. This could result in periodic increases in nutrient levels in nearby sediment ponds and diversions. If they occurred, episodes of nutrient enhancement in runoff could produce corresponding increases in algal species abundance in these waters. However, it is not anticipated that the use of fertilizers during active reclamation would result in an upward trend in nutrient levels in receiving

streams, based on current water quality monitoring data from locations directly downstream of reclaimed areas at the existing South Hallsville No. 1 Mine.

2.2.1.9 Eutrophication

The proposed project would have negligible effect on eutrophication.

2.2.1.10 Others as Appropriate

None.

2.2.2 Flow and Water Circulation

2.2.2.1 Current Patterns and Flow Conditions

Flow patterns associated with the various streams and drainages within the proposed disturbance area would be altered as mining progresses. Channel routing and hydraulic characteristics of replaced drainages on reclaimed surfaces during mining operations would be designed primarily for runoff and erosion control. The overall surface water handling system for the project is described in Section 2.5.2.1 of the Draft EIS. The channels within and immediately around the active mine area would flow primarily in response to local precipitation events, attenuated in lower stream reaches by the presence of intervening sediment control ponds. The Sabine River, the major perennial stream located immediately north of the mine areas, would be the receiving waterbody for water discharged from the mine dewatering activities. Although runoff volumes would increase during the mining period, releases to the river would be attenuated by the water management system. Additional managed discharges would not substantially increase downstream flows in the river during the period of water discharges.

Following mine closure, the streams within the mined area would be reconfigured to a more natural pattern and design in accordance with Sabine's Reclamation Plan and proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS). Processes outlined in these plans would restore many of the characteristics of the existing stream network. Further effects from the watershed modifications are described in Section 3.2.4.2 of the Draft EIS.

2.2.2.2 Velocity

The Sabine River, a perennial stream, has been selected as the receiving waterbody for water discharged from the mine dewatering activities. Flows released to the Sabine River would be discharged at controlled rates to minimize downstream impacts. During sequential and final reclamation, permanent drainages would be re-established within the reclaimed mine area. Gradients of the temporary diversion ditches and the re-established drainages would not be identical to the existing channel conditions, but would be within the range of naturally occurring stream gradients in the area. For certain reaches of ephemeral and intermittent tributaries, velocities may be altered but would be controlled by channel gradients and permanent structures as needed.

2.2.2.3 Stratification

There are no stratified water layers within the Rusk Permit Area; therefore, water characteristics associated with stratification are not applicable.

2.2.2.4 Hydrologic Regime

As discussed in Section 2.2.2.1 above, various drainages, wetlands, and streams within the proposed disturbance area would be affected as mining activities advance. These effects would differ during and following mining, as discussed above. Effects to downstream receiving waters are expected to be minor, as water would be retained in sediment control ponds to minimize suspended solids concentrations prior to release. During and after mining, releases would be controlled by pond structures. It is expected that the potential mine dewatering activities would tend to reduce overall seepage flow into stream reaches. These

and other effects from watershed modifications are analyzed in Section 3.2.4.2 of the Draft EIS. During mining, the presence of sediment control ponds in the mine area watershed is expected to result in the attenuation of altered runoff conditions to Cherokee Bayou and other tributaries immediately downstream of the mine. After mining and reclamation, some of the sediment control ponds may be retained, pending final agency approval and landowner agreements. If retained, their location above the floodplain would alter the flow regimes of tributaries.

2.2.2.5 Normal Water Level Fluctuations

The controlled releases of runoff from the mine area would create minimal flow augmentation in the Sabine River; this would result in negligible increases in downstream water levels. During dry periods when water levels are low, there may be somewhat longer duration of flows as a result of controlled dewatering releases through sediment control ponds. As stated, this is expected to result in little impact.

2.2.2.6 Actions That Would be Taken to Minimize Impacts

BMPs would be implemented to ensure that siltation and erosion are minimized during the mining activities. Affected streams, drainages, and wetlands would be restored or recreated following completion of the various mine pits. Following mining, the permanent drainage channels would be modified in accordance with Sabine's proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS) to simulate natural conditions, where practicable. Mitigation measures presented in Section 3.2.4.4 of the Draft EIS are being considered to further reduce impacts.

2.3 Suspended Particulate/Turbidity Determinations

2.3.1 Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Mine

As discussed previously, there may be temporary increases in suspended particulates and turbidity immediately downstream of the mine disturbance area. These increases, should they occur, would be short term. Construction and operation of the proposed surface water control facilities and implementation of BMPs, applicant-committed environmental protection measures, and concurrent reclamation, as presented in Section 2.5 of the Draft EIS, would control any localized increases in suspended particulates and turbidity both during and following construction and operation in the mine area. In addition, all discharges during the life of the mine would be treated, as necessary, to meet TPDES criteria. Mitigation measures presented in Section 3.2.4.4 of the Draft EIS are being considered to further reduce impacts to the river and tributaries outside of the mine area.

2.3.2 Effects on Chemical and Physical Properties of the Water Column

2.3.2.1 Light Penetration

Increases in suspended particulates and increased turbidity temporarily could reduce light penetration; this impact would be short term, as the particulates are anticipated to settle rapidly. Implementation of BMPs and additional mitigation measures currently under consideration (see Draft EIS Section 3.2.4.4) during construction and operation would minimize increases in suspended particulates and turbidity. Implementation of applicant-committed environmental protection measures and concurrent reclamation, as presented in Section 2.5 of the Draft EIS, would minimize any localized increases in suspended particulates and turbidity, and the resulting effects on light penetration, both during and following construction and operation.

2.3.2.2 Dissolved Oxygen

An increase in turbidity would be temporary and would not affect oxygen content of perennial or intermittent stream reaches or perennial pools. Placement of fill in the headwater segments of local streams is not anticipated to affect dissolved oxygen within downstream perennial reaches of these streams since sediments arising from mine activities would be captured by on site sediment control ponds

and structures. Impacts to dissolved oxygen concentrations would be reduced by turbulent releases from sediment control ponds, and by natural mixing with background concentrations in tributaries below the mined area.

As discussed in the Surface Water Quality impacts subsection (under Section 3.2.4.2) of the Draft EIS, water quality data from field sampling indicate that groundwater discharge temperatures would be similar to surface water temperatures in the vicinity of the mine and, therefore, would not be anticipated to affect dissolved oxygen levels. In addition, waters discharged under a TPDES permit would be required to meet state water quality standards for both temperature and dissolved oxygen.

2.3.2.3 Toxic Metals and Organics

Acid or toxic drainage from the project would be avoided by selective handling of the overburden and interburden to achieve burial of any acid-forming materials near the bottom of the replaced mine spoils, as discussed in Section 2.5.2.6 of the Draft EIS.

2.3.2.4 Pathogens

There are no known water-borne pathogens within the Rusk Permit Area; therefore, water characteristics associated with pathogens are not applicable.

2.3.2.5 Aesthetics

The waters of the U.S. would be visually impacted from the time that they are initially disturbed by construction or mining operations until they are individually reclaimed. Adverse impacts on the existing appearance of waterbodies would be reduced as the drainages are reclaimed and revegetated.

2.3.2.6 Other as Appropriate

None.

2.3.3 Effects on Biota

2.3.3.1 Primary Production, Photosynthesis

Primary producers in the Sabine River and ephemeral and intermittent creeks and ponds within the Cherokee Bayou drainages include phytoplankton in pools and ponds, attached algae (periphyton), and macrophytes. Short-term, localized increases in suspended sediment could occur in areas downstream of the discharge in the Sabine River and areas adjacent to construction and mining activities. These short-term increases in sediment could result in temporary reductions in primary production. However, potential changes would be limited to several miles or less in relation to the disturbance areas. By implementing the proposed drainage design, including sediment control ponds and erosion control measures, the impact of increased sediment levels on primary producers would be minor. Mitigation measures presented in Section 3.2.4.4 of the Draft EIS are being considered to further reduce impacts.

2.3.3.2 Suspension/Filter Feeders

Suspension or filter-feeding organisms in the intermittent stream segments and ponds presently are limited due to a predominance of soft-bottomed substrates and lack of stream flows. The type of macroinvertebrates feeding in these habitats mainly consists of scrapers and predators. Once mine discharges enter these streams, suspension or filter-feeding macroinvertebrates represented by mayflies and caddisflies could become established in the riffle and run habitats. Short-term, localized increases in sediment could result in temporary reductions in suspension or filter feeders in riffle and run areas of stream segments located immediately downstream of disturbance areas. However, these potential changes would be limited to several miles or less in relation to the disturbance areas. By implementing proper drainage design including sediment control ponds and erosion control measures, the impact of

increased sediment levels on filter-feeding macroinvertebrates would be anticipated to be minor. Mitigation measures presented in Section 3.2.4.4 of the Draft EIS are being considered to further reduce impacts.

Dewatering of the Carrizo-Wilcox aquifer could result in flow reductions in the intermittent and ephemeral streams associated with Cherokee Bayou. For those areas located upstream of the dewatering points, there would be a reduction in aquatic habitat. Since habitat in these areas is mainly intermittent/ephemeral stream reaches, filter-feeding and suspension-feeding macroinvertebrates are expected to be a minor part of the aquatic community, and little impact is anticipated.

2.3.3.3 Sight Feeders

Sight-feeders present within the Sabine River and downstream of the project study area include fish species representing the minnow, sunfish, livebearer, killifish, and catfish families. Game fish species consist of sunfishes, catfishes, and low numbers of largemouth bass. These fish species feed on a variety on invertebrates and small fish. Short-term, localized increases in sediment could reduce the visibility for sight-feeders in segments located immediately downstream of disturbance areas. However, effects are considered minor due to the short-term duration of sedimentation, ability of fish to move to less turbid areas to feed, and the use of erosion control measures as part of mine operation.

2.3.3.4 Actions Taken to Minimize Impacts

As discussed above, Sabine would use BMPs and the installation of sediment control structures and ponds to limit erosion and reduce sediment transport as a result of storm water runoff from proposed project facilities and disturbance areas. These facilities and practices would control or minimize sediment and turbidity increases in surface waters. During and after mining, Sabine would implement a variety of mitigation measures as described in the proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS) to recreate wetlands, riparian woodlands, and surface water features of similar nature and function to those existing in the area prior to mining.

2.4 Contaminant Determinations

The material proposed for fill into waters of the U.S. would not introduce, relocate, or increase contaminants in the material itself or in the aquatic environment at the proposed disposal site.

2.5 Aquatic Ecosystem and Organism Determinations

2.5.1 Effects on Plankton

Phytoplankton and zooplankton communities may exist in pooled and ponded portions of Cherokee Bayou located within and downstream of the mine area. However, stream environments (Sabine River) typically contain low species diversity and abundance. As discussed in Section 3.5.2.1 of the Draft EIS, flow changes would occur due to water level changes and water discharges. Erosion control measures would be used to minimize sedimentation effects on water quality. Overall, project disturbance and mine discharge would result in minor to minimal effects on stream plankton communities.

2.5.2 Effects on Benthos

Short-term, localized increases in sediment could result in temporary effects on benthos (i.e., macroinvertebrates) located immediately downstream of disturbance areas. However, potential changes would be limited to several miles or less in relation to the disturbance areas. By implementing proper drainage design including detention ponds and erosion control measures, the impact of increased sediment levels on macroinvertebrates would be anticipated to be minor.

The effects of flow changes on benthos (macroinvertebrates) are discussed in Section 3.5.2.1 of the Draft EIS. In general, flow increases resulting from water discharges could create additional habitat and increased abundance for benthic organisms. In contrast, flow reductions from water level changes may

decrease habitat and lower abundances for benthic biota. Changes in species composition also could occur due to flow changes.

2.5.3 Effects on Nekton

Short-term, localized increases in sediment could reduce the visibility for fish in segments located immediately downstream of disturbance areas. However, effects would be considered minor due to the short-term duration of sedimentation, ability of fish to move to less turbid areas to feed, and the use of erosion control measures as part of mine operation. The effects of flow changes on fish communities is discussed in Section 3.5.2.1 of the Draft EIS. Minor flow increases could result in additional habitat for fish compared to existing conditions downstream of TPDES discharge points. Habitat upstream of the discharge points would be reduced; however, since these are mainly intermittent/ephemeral stream reaches, fish are expected to be a minor part of the aquatic community, and little impact is expected.

2.5.4 Effects on Aquatic Food Web

Since the potential impacts of project disturbance and discharge on plankton, invertebrate, and fish communities are considered minor, there would be minimal or no anticipated effects on the aquatic food web. Potential short-term effects on macroinvertebrates would not affect their role as a food source for fish.

2.5.5 Effects on Special Aquatic Sites

2.5.5.1 Sanctuaries and Refuges

A mussel sanctuary is located between SH 43 and U.S. Highway 59, approximately 4 miles downstream of the proposed transportation and utility corridor crossing of the Sabine River. The proposed project is not anticipated to impact this sanctuary as short-term, local increases in sediment would be limited to several miles or less of the transportation and utility corridor construction. The proposed project would have no effect on either sanctuaries or refuges.

2.5.5.2 Wetlands

The proposed project construction and operation would remove a total of 62.6 acres of non-forested wetlands and 151.2 acres of forested wetlands that are waters of the U.S. This information is discussed in detail in Section 3.2.5 of the Draft EIS. All wetland losses would be mitigated in accordance with Sabine's proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS). Forested wetlands would be replaced at a ratio of 2:1 and non-forested wetlands would be replaced at a ratio of 1.5:1 during the reclamation process and would be designed to mimic pre-disturbance hydrogeomorphic characteristics.

2.5.5.3 Mudflats

The proposed project would have no effect on mudflats.

2.5.5.4 Vegetated Shallows

The proposed project would have no effect on vegetated shallows.

2.5.5.5 Coral Reefs

The proposed project would have no effect on coral reefs.

2.5.5.6 Riffle and Pool Complexes

No riffle and pool complexes would be affected within the proposed mine area. Field survey information (HDR 2010g) indicates that no riffle/pool complexes were identified within the proposed mine area. Although the Sabine River is dominantly a sand-bed stream, riffles from lignite outcrops in the river bed do occur during low flows between Longview and SH 43. These features are apparently common in northern

Panola County (Ferguson 2009b), and may or may not be affected by the proposed river crossing. Since lignite outcrops are believed to be common in 5 to 10 miles of this portion of the river (Mills 1972), little or no impact to this type of aquatic site would be anticipated from the proposed project.

2.5.6 Threatened and Endangered Species

Potential effects of the project have been analyzed relative to federal and state listed threatened and endangered species with potential for occurrence in the vicinity of the proposed project (see Section 3.5.1.5 of the Draft EIS). A total of 19 federal and/or state listed species potentially occur in the Rusk Permit Area. Project-related impacts for these species are anticipated to be low to minimal, with the following exceptions. For the state listed bald eagle, impacts are anticipated to be moderate (see Draft EIS Section 3.5.2). Impacts primarily would be related to the short-term, incremental loss of habitat as a result of mine construction and operation. Implementation of applicant-committed environmental protection measures would minimize these impacts. For three state-listed mussel species (Texas pigtoe, sandbank pocketbook, and Texas heelsplitter), the potential for direct loss of individuals is anticipated to be high. Mitigation measures presented in Section 3.5.4 of the Draft EIS are being considered to further reduce impacts for these four species.

2.5.7 Other Wildlife

The temporary removal of wetlands and riparian areas during the life of the mine would result in a temporary reduction of habitat and foraging locations for wildlife currently utilizing those areas. These impacts are discussed in Section 3.5.2 of the Draft EIS.

2.5.8 Actions to Minimize Impacts

Sabine's use of BMPs and installation of sediment control ponds and structures would limit erosion and reduce sediment transport associated with storm water runoff from proposed project facilities and disturbance areas. These facilities and practices would control or minimize sediment and turbidity increases in surface water, thereby minimizing impacts to aquatic ecosystems and organisms. Mitigation measures presented in Section 3.2.4.4 of the Draft EIS are being considered to further reduce impacts.

In addition to the Sabine's proposed environmental protection measures and mitigation measures under consideration by the USACE, Sabine has developed a proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS) that addresses reclamation of wetlands, riparian woodlands, and surface water features. The reclamation objective is to create features of similar nature and function to those existing prior to the mining activities; the measures outlined in the plan include both direct and compensatory replacement ratios of features removed from the area by mining.

To mitigate for the project-related impacts to waters of the U.S., Sabine has proposed to perform a combination of activities including mine reclamation, channel relocation, and wetland creation within the reclaimed areas. Impacts to aquatic resources would be mitigated in accordance with the following ratios: 1:1 for ponds and streams, 1.5:1 for non-forested wetlands, and 2:1 for forested wetlands. Restored, enhanced, and created areas would be revegetated with native plants dominant within the project area.

2.6 Proposed Disposal Site Determinations

2.6.1 Mixing Zone Determination

Impacts would occur to those wetlands; ponds; and perennial, ephemeral, and intermittent streams removed during the mining process. These would be offset by restoration of the habitat types during the reclamation process, with a net increase in wetlands. Potential impacts to perennial stream reaches downstream from the mine should be minor or nonexistent due to the implementation of BMPs and additional mitigation measures presented in Section 3.2.4.4 of the Draft EIS that are being considered to further reduce impacts.

2.6.2 Determination of Compliance with Applicable Water Quality Standards

The project would not exceed current applicable water quality standards for the State of Texas.

2.6.3 Potential Effects on Human Use Characteristics

2.6.3.1 Municipal and Private Water Supply

During mining, groundwater wells within the proposed mine pits would be removed. Wells located within the projected 5-foot groundwater drawdown area may experience a decline in water levels and some wells may go dry, with the following exception. Wells deeper than 200 to 300 feet below ground surface are not anticipated to be affected by dewatering-related drawdown. During mining and following completion of reclamation, Sabine would replace water supply wells impacted by mining operations with new wells constructed and completed in the sand units of the Wilcox Formation underlying the proposed pit floor.

As discussed in the Groundwater Quality Impacts subsection in Section 3.2.3.2 of the Draft EIS, no impacts to groundwater quality are anticipated.

2.6.3.2 Recreational and Commercial Fisheries

The proposed project would have minimal impact on recreational fisheries (see Section 3.9.2 of the Draft EIS).

2.6.3.3 Water-related Recreation

As discussed in Section 3.9.2 of the Draft EIS, private recreation activities, including fishing, in the proposed disturbance area would be displaced to other private or public lands during operations; however, it is anticipated that participation in these activities occur at very low levels and the temporary displacement would have minimal effects on recreation resources (including fishing) in the region.

2.6.3.4 Aesthetics

Aesthetics would be impacted by the proposed project (see Section 2.3.2.5 above) as construction activities and mining operations alter the current visual character of the mine area. Visual impacts would be mitigated to the extent practicable with concurrent reclamation of previously mined pits and by use of vegetation screening at public access points and along roadways. The impacts would be localized to the current mine pit and nearby unreclaimed areas of mine spoil. Adverse impacts on aesthetics would be reduced as a result of concurrent and final reclamation.

2.6.3.5 Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

The proposed project would have no effect on national and historical monuments, national seashores, wilderness areas, research sites, or similar preserves.

2.7 Determination of Cumulative Effects on the Aquatic Ecosystem

Short-term, localized increases in sediment could result in temporary impacts on benthic macroinvertebrates and periphyton communities in intermittent/ephemeral streams, the Sabine River, and Cherokee Bayou due to cumulative surface disturbance. By implementing erosion control measures at the disturbance areas, no overall impact on sediment levels and aquatic biota are expected in perennial stream reaches located downstream of the permit area.

2.8 Determination of Secondary Effects on the Aquatic Ecosystem

None.

3.0 Preliminary Determination of Compliance or Non-compliance with the Restrictions on Discharge

The following paragraphs summarize the comparison of anticipated impacts from the proposed Rusk Permit Area, as mitigated by Sabine's proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS), with the specific regulatory criteria on restriction of discharge as listed in 40 CFR 230.10 and excerpted below.

No adaptations to the Section 404(b)(1) guidelines were made relative to this evaluation.

A. "Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."

The purpose of the proposed Rusk Permit Area is to expand Sabine's lignite mining operations at the existing South Hallsville No. 1 Mine in order to provide a long-term, reliable, continuous, and economically stable fuel source to SWEPCO's Pirkey Power Plant, thus supporting SWEPCO's efforts to supply dependable, affordable electricity to its customers. Sabine is seeking to utilize a local lignite resource to continue to provide local economic benefit through increased local employment, increased tax base, and indirect job growth in Rusk and Panola counties. Sabine also is proposing to develop the Rusk Permit Area for the purpose of fulfilling Sabine's contractual obligation to SWEPCO to deliver lignite mined from the Rusk County Reserve Area until 2035. Sabine's goal is to develop the Rusk Permit Area in an environmentally acceptable manner.

Alternatives considered included No Action and alternatives to constructing and operating the Rusk Permit Area including: the Sabine River crossing location, dragline and haul road corridors, dragline scenarios, lignite transport scenarios, mining scenarios, lignite resource areas, and use of public roads. All of these alternatives were considered relative to their technological and economic feasibility as well as their apparent likelihood to reduce environmental impacts. The No Action Alternative would not satisfy the purpose of the proposed project; however, it has been carried forward in the Draft EIS analysis in accordance with NEPA. For the other alternatives, the USACE has reviewed the data and analysis; based on the USACE's evaluation, these alternatives have been considered but subsequently eliminated from detailed analysis in the Draft EIS. Section 2.3.1 of the Draft EIS describes the rationale for their elimination.

There are no practicable alternatives that would have less adverse impacts on the aquatic ecosystem without other significant adverse environmental consequences that do not involve discharges into "waters of the United States." The proposed project is not within a special aquatic site and is not water-dependent. However, the applicant has demonstrated that there are no practicable alternative sites elsewhere.

B. "No discharge of dredged or fill material shall be permitted if it:

1. Causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standard";

   The proposed disposal of fill material associated with the Rusk Permit Area would not violate any applicable state water quality standards. The proposed project would not violate the toxic effluent standards under Section 307 of the CWA.

2. "Violates any applicable toxic effluent standard or prohibition under section 307 of the Act";

   The proposed disposal of fill material associated with the Rusk Permit Area would not involve any toxic effluents and would not violate Section 307 of the CWA.

3. "Jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended, or results in likelihood of destruction or adverse modification of a habitat which is determined by the Secretary of Interior or Commerce, as appropriate, to be a critical habitat under the Endangered Species Act of 1973, as amended."

   The proposed project would not jeopardize endangered or threatened species or their critical habitat.

4. "Violates any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972."

   The proposed disposal of fill material associated with the Rusk Permit Area would not violate any requirements imposed to protect designated marine sanctuaries.

C. "Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States."

   With the inclusion of mitigation measures identified by Sabine as part of the Proposed Action, as described in Section 2.5 of the Draft EIS, the Proposed Action would not cause or contribute to significant degradation of the waters of the U.S. The proposed project would not discharge pollutants resulting in significant adverse effects on: 1) human health or welfare; 2) life stages of aquatic life and other wildlife dependent on aquatic ecosystems; 3) aquatic ecosystem diversity, productivity, and stability; or 4) recreational, aesthetic, and economic values.

D "Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem."

   Steps to minimize potential adverse impacts of the project on aquatic ecosystems include BMPs to limit erosion and siltation and the mitigation of unavoidable impacts as discussed in Sabine's proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS). The proposed mitigation actions include reclamation of the Rusk Permit Area, channel relocations and restorations, riparian habitat enhancements, and the creation of new wetlands.

Conclusion

The discharge appears to comply with the USACE guidelines, with the inclusion of Sabine's proposed mitigation measures and the appropriate and practicable conditions listed below to minimize pollution or adverse effects to the affected ecosystem.

3.1 All Losses of Waters of the U.S. Would be Mitigated

The project would directly impact 303.1 acres of waters of the U.S. during the life of the mine, including 151.2 acres of forested wetlands, 62.6 acres of non-forested wetlands, 48.3 acres of open water, and 41.0 acres of perennial, ephemeral, or intermittent streams. Impacts to these areas would be mitigated in accordance with Sabine's proposed Conceptual Mitigation Plan (see **Appendix C** of the Draft EIS) for the proposed Rusk Permit Area. This mitigation involves replacement approaches and ratios developed in coordination with the USACE. Mitigation would include both on site replacement of wetlands, stream

channels, and surface waters, while enhancement and preservation of existing on or off site resources would require higher ratios and would be approved by the USACE on a site-specific basis. Mitigation typically would be in-kind for each resource type; out-of-kind mitigation would be considered a last resort for replacement.

3.2 Best Management Practices

BMPs would be implemented to limit erosion and reduce sediment transport as a result of storm water runoff from proposed project facilities and disturbance areas.