4.0 Environmental Impacts of Construction

This chapter presents descriptions of the potential impacts of construction of STP 3 & 4. This chapter is divided into the following seven sections:

- Land Use Impacts (Construction) (Section 4.1)
- Water-Related Impacts (Section 4.2)
- Ecological Impacts (Section 4.3)
- Socioeconomic Impacts (Section 4.4)
- Radiation Exposure to Construction Workers (Section 4.5)
- Measures and Controls to Limit Adverse Impacts During Construction (Section 4.6)
- Nonradiological Health Impacts (Section 4.7)

4.1 Land-Use Impacts (Construction)

The proposed addition of STP 3 & 4 will impact STP property within the current site boundary. Impact of construction and operation can be categorized as impact at the site and vicinity and impact of any transmission corridors.

Impact is also categorized as preconstruction, Limited work Authorization (LWA), construction impact, and impact associated with permanent structures.

Preconstruction and construction activities, including limited construction activities permitted under 10 CFR 50.10(e), known as LWA activities, are listed in Table 3.9S.1. Table 3.9S.1 provides the approximate duration of pre-construction and construction activities. The following preconstruction activities, LWA activities, and construction activities are projected:

Preconstruction Activities:

- Installation of temporary utilities
- Installation of temporary construction facilities
- Laydown, fabrication, shop area preparation
- Clearing, grubbing, and grading
- Underground installations
- Unloading facilities installation
- Construction of intake/discharge coffer dams
- Power block earthwork (excavation)

LWA Activities (for structures, systems, and components as defined in 10 CFR 50.10(a)(1)):

- The driving of piles
- Subsurface preparation
- Installation of foundations
- Placement of backfill, concrete, or retaining walls within an excavation
- In-place assembly, erection, fabrication or testing

COL Construction Activities:

- Construction of main power block building/structures
- Circulating water intake and pump house
- Ultimate heat sink cooling tower and pump house

Upon completion of construction activities, surface and subsurface features would be restored in accordance with landowner and permit/consent requirements (Subsection 3.9S.2.11).

Construction activities and potential land-use impacts to the site and vicinity are presented in Subsection 4.1.1. Potential impacts along transmission corridors and offsite areas are addressed in Subsection 4.1.2. Subsection 4.1.3 describes potential impacts of the proposed project construction activities associated with historical and cultural resource properties at the site and vicinity.

4.1.1 The Site and Vicinity

4.1.1.1 Impact Assessment (direct)

Before construction of STP 1 & 2 in the early 1980s, land within the site boundary would have been classified as agricultural, forest, or rangeland (see Figure 2.2-1 and Table 2.2-1). Subsection 2.2.1.1 identifies land-use classification at the site based on NOAA categories. Of the approximately 12,220 acres within the STP property (Table 2.2-1), approximately 57.5% comprises water, 33.1% agricultural land, 8.8% forest land, with the remaining land use (0.7%) classified as rangeland. Cattle are permitted to graze on a small portion of STP land adjacent to the Colorado River. This area is located just within the eastern boundary of the STP property, south of the STP barge slip.

Land use within six miles of the STP site is discussed in Subsection 2.2.1. Land use is predominantly agricultural, but there is also commercial fishing in the lower Colorado River, East and West Matagorda Bays, Gulf Intracoastal Waterway, and the Gulf of Mexico (Reference 4.1-1). Recreational use areas within six miles of the STP site include the Lower Colorado River Authority (LCRA) Park.

All temporary and new permanent facilities associated with the construction of STP 3 & 4 are located within the existing STP site boundary, on land areas previously disturbed by construction (Reference 4.1-2). STPNOC concludes that the site land-use impacts upon completion of all construction activities would be SMALL and would not warrant mitigation.

Land directly affected by construction would be confined to the existing site and only those transmission corridors contained within the site boundary (fenceline). There are no new offsite transmission lines or corridors required to support STP 3 & 4 (Subsection 2.2.2.2). Transmission lines and offsite areas are further discussed in Subsection 4.1.2. Areas that would be disturbed by site construction are located primarily to the west of the existing STP 1 & 2, as shown in Figure 3.9S-1.

Of the approximately 12,200 acres located within the site boundary (fenceline), approximately 770 acres would be disturbed for long-term or short-term construction activities associated with construction of STP 3 & 4 and their supporting facilities. Since there is no zoning in Matagorda County, no rezoning would be required for this project (Reference 4.1-3). All land that would be impacted during construction of STP 3 & 4 is within the STP site boundary, and was previously disturbed during construction of STP 1 & 2 (References 4.1-2 and 4.1-4).

A heavy haul road would be constructed from STP 3 & 4 to the existing road to the barge slip to accommodate large construction vehicles (Subsection 3.9S.3.2). This heavy-haul road would be approximately 2.5 miles long and approximately 50 feet wide and provide access from the east side of the site to the west side of the site where construction of STP 3 & 4 would take place. The construction workforce would use the existing south extension from Farm-to-Market (FM) 521 to access STP 3 & 4 (see Figure 3.9S-1). The construction workforce would avoid the existing East Site Access Road in order to minimize disruption of traffic patterns to STP 1 & 2 (Subsection 3.9S.3.2).

Approximately 90 acres of the approximately 770 acres disturbed during site preparation and construction would be dedicated permanently to the new units and their supporting facilities (power block, cooling tower, switchyard)(see Figure 3.9S1). The remaining disturbed acreage would be used for temporary construction facilities, laydown areas, construction parking areas, and borrow/spoil storage (Subsection 3.9S.3). Temporary construction laydown areas would be located to the north and south of the STP 3 & 4 power block construction area. Temporary construction facilities would also be located south of the STP 3 & 4 power block construction area. Construction parking lots and borrow/soil storage would generally be to the west of the new STP 3 & 4 construction area. The acres of land that would be dedicated to the new units and their supporting facilities are indicated in Table 4.1-1. The permanent structures and facilities include:

- Road and rail construction
- Security construction
- Reactor Building

- Control Building
- Turbine Building
- Fire Protection pump house
- Radwaste Building
- Service Building
- Switchyard and installation of the main transformers
- Administration, simulator, and training facility buildings
- Circulating water intake, discharge, and pump house
- Ultimate ~~heat sink~~ Heat Sink (UHS) basin, cooling towers and UHS pump houses (hereafter called cooling tower)
- Yard tanks

No existing utilities cross the STP property. Upon completion of construction activities, surface and subsurface features would be restored in accordance with landowner and permit/consent requirements (Subsection 3.9S.2.11).

All site preparation and construction activities would be conducted in accordance with federal, state, and local regulations. As described in Subsection 3.9S.2, STPNOC would acquire all necessary permits and authorizations and implement environmental controls (such as a Storm Water Pollution Prevention Plan [SWPPP] in accordance with Texas Pollutant Discharge Elimination System [TPDES] program) before earth disturbing activities begin. Site preparation and construction activities that would affect land use include clearing, grubbing, excavating, grading and stockpiling. Measures used to limit adverse impacts during construction are outlined in Table 4.6-1.

Permanently disturbed areas within the site would be contoured and stabilized in accordance with design specifications. When necessary, revegetation would comply with site maintenance and safety requirements. Methods to stabilize areas, prevent erosion and sedimentation, and reduce polluted runoff would comply with applicable laws, regulations, permit requirements, good engineering and construction practices, and recognized Best Management Practices (BMPs). The State of Texas does not have their own Storm Water Management BMP handbook; however, all construction sites with a disturbed area of one acre or larger are required to comply with the Clean Water Act requirements to reduce polluted runoff. These requirements include coverage under the State of Texas TPDES permit, development and implementation of a SWPPP, weekly inspections and documentation of runoff controls, and notification of regulatory authorities when the site has been stabilized. Applicable industry guidance would be followed to reduce stormwater quantity, improve stormwater quality, and protect receiving water and downstream areas.

Construction activities within the site would not take place within a floodplain (Reference 4.1-5). However, the STP property is located almost entirely within the coastal zone as defined by the Texas Coastal Management Program (CMP) ~~Coastal Management Zone (CMZ)~~ (Figure 2.2-1), therefore SMALL to MODERATE construction impacts would take place within ~~a~~ the coastal zone (Subsection 2.2.1.1). Additional impacts to land secondarily affected by construction~~, as related to the CMZ,~~ are discussed in ~~Subsection 4.1.1.2~~ Section 4.1. To mitigate impacts, STPNOC would maintain communication with local and regional governmental and nongovernmental organizations (e.g., LCRA, FEMA, etc.) to verify that construction activities comply with the CMP.

Approximately 114 acres (110 manmade and 3.9 non-jurisdictional) of both non-jurisdictional and man-made wetlands can be found on the STP site (Figure 2.4-3). The man-made wetlands totaling 110 acres (Reference 4.1-1) are located approximately 1800 feet north of the essential cooling pond. These wetlands would not be disturbed by construction activities. Non-jurisdictional wetland areas (a total of 12, equaling 3.9 acres) are found primarily on the STP site approximately 5000 feet southwest of STP 2, and approximately 500 feet northwest of the ~~main cooling reservoir~~ Main Cooling Reservoir berm. One wetland (wetland No. 001), 0.165 acre in size, is located in the cooling tower footprint and will have to be filled. The other non-jurisdictional wetlands are located in areas designated as temporary laydown and spoil areas. To the extent practical, these sites will be avoided during the construction phase, thus limiting direct impacts. STP would use silt fences and other erosion control devices, as needed, to help mitigate the possibility of surface water runoff from proposed construction activities impacting the STP site's surface water drainage features. (for more information, see Subsection 4.3.1.1).

Care would be taken so that sensitive areas are not impacted by other construction activities. As shown in Figure 3.9S-1, where possible, locations for temporary construction facilities have been carefully selected to avoid man-made or non-jurisdictional wetland areas within the STP property.

STPNOC has surveyed this area for threatened and endangered species as described in Subsection 2.4.1 and has found that permanent and temporary land use changes at the site as a result of construction of STP 3 & 4 would not result in adverse impacts to either federal or state-list of endangered or threatened species, nor critical habitats (see Subsection 4.3.1.1).

NUREG-1555 acknowledges that impact on less than 500 (1235 acres) usually has minor effects. Since the expected impact at STP encompasses only 770 acres of land the impact is expected to be minor.

4.1.1.2 Land-Use Plans

There are no federal, state, regional, or county land-use plans for this area. Since there is no zoning in Matagorda County, no rezoning would be required for this project (Reference 4.1-3). The Matagorda County Economic Development Corporation (MCEDC) has prepared a Strategic Plan for Economic Development (Reference 4.1-6) that covers the communities of: Bay City and Van Vleck, Blessing, Markham and

Midfield, City of Matagorda, Matagorda County, Selected Rural Areas, Palacios, Sargent, and Wadsworth. The intent of the plan is to help bring new business activity to Matagorda County and actively plan for future economic development (to include planning for infrastructure needs to support economic growth). A portion of the plan also highlights the need for regional land use planning. Subsection 2.5.2.3 provides an analysis of land-use impacts attributed to potential increased population and tax revenues to Matagorda and Brazoria Counties.

STPNOC concludes that impacts to land-use planning in the vicinity would be SMALL, but would maintain communication with local and regional governmental and nongovernmental organizations to disseminate project information in a timely manner. Recipients of this information would be given the opportunity to perform their decision-making with the understanding that, (1) a percentage of the land converted for this construction project could be permanently dedicated to its new use and, (2) other converted land could become available for other uses upon construction completion, and they would be able to plan accordingly.

4.1.1.3 Site Restoration and Management Actions

Mitigation measures, designed to lessen the impact of construction activities, would be specific to erosion control, controlled access roads for personnel and vehicular traffic, and restricted construction zones. The site preparation work would be completed in two stages. The first stage would consist of stripping, excavating, and backfilling the areas occupied by the structure and roadways. The second stage would consist of developing the site with the necessary facilities to support construction, such as construction offices, warehouses, trackwork, large unloading facilities, water wells, construction power, construction drainage, etc. In addition, temporary structures would be razed and holes would be filled. Grading and drainage would be designed to avoid erosion during the construction period.

Action would be taken to restore areas consistent with existing and natural vegetation. A total of approximately 770 acres would be required for construction facilities including permanent facility structures and laydown. To the extent possible, STP roads would be used for construction traffic. If necessary, temporary stone roads would be installed along with site grading and drainage facilities. This would permit an all weather use of the site for travel and storage of materials and equipment during construction.

Other potential environmental impacts that may be created by preconstruction and construction activities as well as associated measures and controls to limit those impacts are discussed in Section 4.6.

4.1.2 Transmission Corridors and Off-Site Areas

As discussed in Subsection 2.2.2, no new off-site transmission corridors are planned for STP 3 & 4. A study completed by the Electric Reliability Council of Texas concluded that the existing transmission system from STP into Houston is acceptable with some changes to conductor size from STP to the Hillje switchyard and on some transmission lines to Houston.

Within the STP site boundary, STP 3 & 4 would require the addition of a 345 kilovolt switchyard and the rerouting of one 345 kV transmission line that is currently connected to Bay No. 1 of the existing switchyard for STP 1 & 2. The transmission lines would run from the new switchyard for STP 3 & 4, back into the switchyard for STP 1 & 2 (which would be expanded) and then run offsite. The new onsite transmission corridor right-of-way between the new switchyard for STP 3 & 4 and the existing switchyard for STP 1 & 2 would be approximately 600 feet wide and take up approximately 12 acres of land. Construction activities associated with the new onsite switchyard and connecting transmission lines would occur in areas disturbed for construction activities associated with STP 1 & 2. Therefore, STPNOC concludes that impacts would be SMALL and not warrant mitigation.

Because additional offsite transmission corridor rights-of-way would not be required as a result of construction of STP 3 & 4, STPNOC estimates that land use impacts to transmission corridors and offsite areas would be SMALL and not warrant mitigation.

4.1.3 Historic Properties

Cultural resource investigations conducted in 1975 before construction of STP 1 & 2 determined that the study area did not include any resources that were listed on or eligible for listing on the National Register of Historic Places. Based on a review of the National Historic Preservation Act as applicable to the STP site, no resources of local, regional, or state significance were located in the study area. The study area in the 1975 investigations included sufficient acreage to construct two additional reactor units. Those findings and a determination that no historical properties or other significant cultural resources would be impacted by the proposed construction on STP 1 & 2 were included in the FES issued by the NRC in March 1975 (Reference 4.1-7).

Construction activities associated with STP 3 & 4 would be conducted immediately adjacent to the current STP plant on ground that was evaluated for cultural resources in 1975 and subsequently disturbed for construction activities associated with STP 1 & 2. As discussed in Subsection 2.5.3.1, it is unlikely that any historical properties or other significant cultural resources are within the area that would be impacted by construction of STP 3 & 4. A possible grave site is southeast of the lake, but it is more than four miles south-southwest of the proposed construction area. As discussed in Subsection 2.2.2.2, STP anticipates no changes to offsite corridors; therefore, there would be no impacts due to construction on the transmission corridors.

One historical property is 8.9 miles from the project site, other significant cultural resources are between 6.0 and 9.2 miles away, and 35 archaeological sites are between 4.1 and 10 miles away (Reference 4.1-8). Because the closest known cultural resource is 4.1 miles from the proposed project site, and the new reactors would be constructed next to the existing STP 1 & 2, there would be no impact to the historical cultural setting of these resources due to construction of STP 3 & 4.

STPNOC concludes that construction impacts to historical or cultural resources would be SMALL and not warrant mitigation.

The Texas Historical Commission replied on January 19, 2007 that no historic properties would be affected by STP 3 & 4 (See Appendix A [Reference 4.1-9]). During any ground-disturbing activities for the proposed project, if cultural resources are discovered, activities would cease in the vicinity of the discovery and STPNOC would consult with the Texas State Historic Preservation Office (SHPO).

4.1.4 References

4.1-1 "2005 Annual Environmental Operating Report," STPNOC (South Texas Project Nuclear Operating Company) 2005.

4.1-2 United States Department of Agriculture and Natural Resources Conservation Service 2001. Soil Survey of Matagorda County, Texas. Available at http://soildatamart.nrcs.usda.gov/Manuscripts/TX321/0/Matagorda.pdf, accessed January 16, 2007.

4.1-3 Texas Comptroller of Public Accounts Property Tax Division 2005. Appendix 7 – Matagorda County Appraisal District Self Evaluation Questionnaire. Available at http://www.window.state.tx.us/taxinfo/proptax/cadreports/asr/matagorda/appendb.htm, accessed March 20, 2007.

4.1-4 STPNOC (South Texas Project Nuclear Operating Company) 1981. Historic Aerial Photos dated 10-28-75. 11-20-81, and undated (c. early 1980s).

4.1-5 "Ecological Survey Report Unit 3 and 4 Licensing Project, South Texas Project Electric Generating Station," Prepared for STP Nuclear Operating Company by ENSR Corporation, Houston, Texas, March 2007.

4.1-6 Matagorda County Economic Development Corporation (MCEDC) 2004, Strategic Plan for Economic Development, Matagorda County, 2005–2010.

4.1-7 "Final Environmental Statement for STP 1 & 2," NUREG-75/019.

4.1-8 "Matagorda County Project," Texas Archaeological Research Laboratory 2007. Letter with enclosures to Katherine Roxlau, TetraTech NUS, Inc., received from Jean L. Hughes, Records Conservator, Texas Archaeological Research Laboratory, University of Texas at Austin, Texas, January 19, 2007.

4.1-9 William Martin (Texas Historical Commission) January 19, 2007 response (stamp of approval) to letter from S. L. Dannhardt (STP) December 12, 2006 regarding STP 3 & 4.

Table 4.1-1 South Texas Project Construction Area Acreage

Construction Area	Construction Acreage (approx)
Proposed STP 3 & 4 Power Block	54
Concrete Batch Plant, Material Storage	(including in facilities area)
Proposed Switchyard	15
Construction Laydown/Facilities Area	320
Construction Parking Area	89
Cooling Tower Area	14
Connector transmission lines (on site)	12
Heavy Haul Road	15
Borrow and Spoil areas	249
Total Acreage	**768**