

<u>ALIGNMENT</u>	<u>STATION</u>	<u>PROPERTY OWNER</u>
-L-	250+43	Dexter Locklear & wife
-L-	275+40	Wilbert Graham
-Y8-	26+86	Cecil L. Thompson

## 4.0 PHYSIOGRAPHY AND GEOLOGY

### 4.1 Regional Geology

The project is located within the southwestern portion of the Inner Coastal Plain Physiographic Province of North Carolina. The Inner Coastal Plain lies between the Tidewater Region to the east and the fall line to the west.

Stuckey (1965) recognized three subdivisions of the Inner Coastal Plain. The project lies within the second subdivision which, as presented by Winner and Coble (1989), consists of the eastern part of the Inner Coastal Plain south of the area north of Craven, Lenoir, and Wayne Counties. In this area, broad, flat uplands between major streams are commonly swampy and very similar to those in the Tidewater area. Numerous circular to elliptical depressions known as Carolina bays occur throughout the region. These depressions typically have their long axis oriented in a northwest to southeast direction. Sand ridges are often located along the east and southeast margins of the depressions. Although a number of the bays contain water, many have been drained for agricultural purposes. The land near major rivers tends to be highly dissected and may be incised as much as 15 meters or more into the flat swampy uplands. The uplands near dissected valleys are swampy attesting to the lack of extensive drainage of the swamps through the shallow aquifers. In general, predominantly clastic rocks ranging from clays to gravels with lesser amounts of marine limestones characterize Coastal Plain sediments. Sediments in this region dip generally eastward with a thickening and increase of individual beds in the seaward (eastward) direction indicative of deposition in marine or near-shore environments (Winner & Coble, 1989).

### 4.2 Site Topography and Geomorphology

Relief of the project area is relatively flat and is consistent with what is typically observed in the eastern section of the Inner Coastal Plain physiographic province. Land surface elevations along the project corridor range from approximately +39m mean sea level (MSL) within the numerous creeks and manmade drainage ditches located throughout the project site, to a high of approximately +44m MSL. Elevations within the project corridor exhibit low relief with an overall average elevation of approximately +43m MSL. The project corridor traverses residential and agricultural areas, typical Inner Coastal Plain upland areas, and wetland areas.

### 4.3 Surface Drainage

The project lies within the Lumber River drainage basin that is defined by a network

of naturally occurring and manmade streams, creeks, and channels, which drain into the Lumber River. Overall, the drainage pattern of the area is dendritic which is typical for the Inner Coastal Plain Physiographic Province. Drainage along the project corridor is provided by a series of small creeks and manmade ditches that drain into the numerous swamps in the surrounding area and eventually discharge to the Lumber River. Surface drainage throughout the project varies, but averages good to fair. However, near-surface soils are typically saturated, presumably due to the high water table and the relatively flat terrain.

### 4.4 Site Geology

The surficial materials consisting of very fine to medium grained sandy clay and clayey sand are Coastal Plain sediments of the early to late Pliocene aged Duplin Formation. Many of the surficial sediments appear to have been reworked through natural weathering mechanisms such as flooding. To assist in consistency between subsurface nomenclature, all shallow surficial (<3m BLS) materials are considered to be part of the Duplin Formation.

The Duplin beds consist of sands, sandy and silty clays, and very shelly sands which commonly overlie a phosphatic basal conglomerate (Ward, Bailey and Carter, 1991). The Duplin formation within the area of investigation is comprised of an approximate two to five meter thick layer of silty sand and sand containing shelly quartz sand and a diverse molluscan assemblage, gastropods, and other fossils. This layer is underlain by approximately two meters of grayish-blue, sandy clay which contains a low diversity molluscan assemblage and overall reduction in abundance of fossils and fossil fragments present. The basal portion of this formation is a thinner (<1m) bed of sand containing abundant detrital phosphate, rip-up clasts, and lignitized wood fragments.

Underlying the Duplin Formation is the Cretaceous aged Peedee Formation. The formation is dominantly a dark-greenish to gray, sparingly micaceous and glauconitic, argillaceous sand that commonly appears to be massive. Calcareous cemented concretions occur both sporadically or aligned at a uniform stratigraphic level. Dark marine clays are decidedly subordinate although locally they would be up to two meters thick (Sohl and Owens, 1991). Boring depths did not exceed the extent of the Peedee Formation; therefore, the underlying formations are not discussed in this document.

## 5.0 SUBSURFACE DESCRIPTION

Surficial soils encountered across most of the project area consist primarily of interfingering layers of clayey sands and sand/clay mixtures (A-2-6, A-6, and A-7). These sediments typically exhibit fair to poor engineering properties which include relatively high moisture content, moderate to high percentage on average passing 200 sieve, moderate to high