SUBSECTION 2.5.5
COMBINED LICENSE INFORMATION FOR STABILITY OF SLOPES

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2.5.5 COMBINED LICENSE INFORMATION FOR STABILITY OF SLOPES

Add the following text to the end of Subsection 2.5.5.

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Information on the slopes at Units 2 and 3 that could adversely affect the safety of the units is provided in this section. The information has been developed in accordance with NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants,* Section 2.5.5.

2.5.5.1 Slope Characteristics

Based on the finished grade plan and the foundation excavation sections, as shown on Figure 2.5.4-245 and Figures 2.5.4-220, 2.5.4-221, 2.5.4-222, and 2.5.4-223, respectively, the permanent and temporary cut slopes and man-made fill slopes that exist in the site vicinity would not compromise the operation of the safety-related plant facilities were they to fail. These slopes are described in the next subsections.

2.5.5.1.1 Permanent Slopes Beyond the Plant Perimeter

Units 2 and 3 are located approximately 1 mile southwest of Unit 1. (Directions and coordinates used in this section are with reference to true north.) Referring to the finished grade plan (Figure 2.5.4-245), the main plant and cooling tower areas are located on an irregularly shaped, essentially level plateau with maximum dimensions approximately 2800 feet by 5400 feet, and nominal finished grade at just above 400 feet. (All elevations in this subsection are with respect to North American Vertical Datum of 1988 (NAVD88).) The plateau is graded for drainage, typically reaching about 390 feet at the perimeter. The plateau is located in an area that formed a ridge through the site where bedrock was at its highest point. The plateau results from mostly cutting the higher elevations of the ridge, with some limited filling.

The existing grade generally drops off beyond the perimeter of the plateau. These drop-offs are graded and filled where necessary to form a (typical) 3-horizontal to 1-vertical (3H:1V) slope. The largest slope descends to around 315 feet beyond the southwestern perimeter of the site. There are limited areas where the ground rises beyond the perimeter, notably around the parking lot to the west of Unit 3. This is a 3H:1V (typical) slope, with a maximum height of approximately 25 feet.

Referring to Figure 2.5.4-245, the closest perimeter slope to the Unit 2 nuclear island is to the northwest. This is a 45-foot high 3H:1V (typical) slope that descends from 390 feet at the site perimeter down to 345 feet. The top of this slope is approximately 600 feet from the closest point of the nuclear island. The closest perimeter slope to the Unit 3 nuclear island is to the southwest. This is a 70-foot high 3H:1V (typical) slope that descends from 390 feet at the site perimeter down to 320 feet. The top of this slope is approximately 700 feet from the closest point of the nuclear island. Considering that each nuclear island is founded on sound rock (or on concrete placed on the sound rock), failure of the perimeter slopes at least 600 feet away would have no impact on the stability of the nuclear island.

The seismic Category II annex building for each unit is founded on 30- to 45- foot thickness of compacted structural fill (depending on location), on top of sound rock. The distance from the nearest point of the top of the 45-foot high slope to the Unit 2 annex building is about 500 feet, while the distance from the nearest point of the top of the 70-foot high slope to the Unit 3 annex building is over 800 feet. The height of each of these slopes is less than 10% of the distance from the top of the slope to the nearest edge of the annex building. As with the nuclear island, failure of a perimeter slope would have no impact on the stability of the annex building.

The impact of groundwater and seepage on the perimeter slopes is discussed in Subsection 2.5.5.1.3.

2.5.5.1.2 Temporary Slopes for Plant Construction

The excavation sections Figures 2.5.4-220, 2.5.4-221, 2.5.4-222, and 2.5.4-223 show excavation from finished grade (approximately 394 feet at the edge of the excavation) down to bedrock. The estimated contours of the top of bedrock are shown on these figures. The deepest construction excavation is made to the north of the Unit 2 nuclear island, where the top of rock slopes down towards the north and the excavation has to go deeper to reach top of rock. The construction slope will be 2H:1V (typical) with a 10-foot wide berm placed approximately every 20 feet of slope height. The maximum height of slope is approximately 85 feet.

Failure of a temporary slope created for construction of the plant will have no effect on the safety of the nuclear power plant facilities.

2.5.5.1.3 Groundwater and Seepage

A detailed discussion of groundwater conditions, including water levels and in situ soil and rock hydraulic conductivity, is provided in Subsection 2.4.12. Groundwater is present in unconfined conditions in both the saprolitic soils and in the underlying bedrock at Units 2 and 3. Four sets of groundwater contours given in Subsection 2.4.12 present quarterly levels based on the monthly measured data. Figure 2.5.4-237 provides a representative piezometric level contour map for the shallow wells and shows the contours for the first quarter of 2007.

The groundwater contour map indicates that groundwater flows in all directions from the ridge (now plateau) top. Drainage swales are present to the northwest, southwest, and east of the site. All these drainage swales are tributaries that eventually lead to the Broad River, located about 1 mile to the west of the site. The groundwater gradient in the saprolite/shallow bedrock ranges from 0.001 to 0.003 ft/ft on the ridge, to 0.037 to 0.05 ft/ft on the ridge flanks. Although the saprolite is classified mostly as a sand, it is a silty sand with a tight interlocking fabric, and has relatively low permeability.

From the foregoing, it can be concluded that significant seepage does not occur on the perimeter slopes. Although the saprolitic soils are subject to erosion (as shown by existing gullies on the site), the perimeter slopes are covered with vegetation. Some local gullying and even minor cutting back of the slopes could occur during periods of heavy runoff. However, this is limited in extent, and does not produce any significant change in slope geometry over the lifetime of the plant.

2.5.5.2 Stability of Slopes Conclusions

The permanent perimeter slopes are at least 600 feet away from the nearest point on the nuclear islands, and at least 500 feet away from the nearest point on the annex buildings. Thus, failure of these slopes, under any of the conditions to which they could be exposed during the life of the plant, does not affect the safety of the nuclear power plant facilities. There is no significant impact of seepage through the slopes or erosion of the slopes.

The temporary slopes installed for plant construction do not adversely affect the safety of the nuclear power plant facilities.
