predominantly consist of shale with interbedded siltstone, limestone, and conglomerate, and are locally of low water-producing capacity. Extensive rock coring of the Conasauga in the plant powerhouse area indicates that limestone accounts for only about 20% of the total cored material, and is present in relatively thin beds ranging from an inch to several feet in thickness (Benziger and Kellberg, 1951). This accounts for the absence of local evidence of karstification in areas underlain of the Lower Conasauga. The Rome formation which lies beneath the northwestern edge of the proposed disposal area consists of interbedded shale, sandstone, and siltstone.

The elevation of the top of rock directly beneath the proposed disposal area is relatively uniform, ranging from approximately 700 to 715 ft and averaging about 705 ft (Figure 2-2). Outside this area the bedrock surface rises steeply to the west and southwest. The lower bedrock terrace corresponding to the disposal area apparently represents an erosion surface associated with the ancestral Emory River. The upper few feet of bedrock generally consists of weathered fissile shale with occasional limestone fragments.

A mantle of predominantly alluvial soils (Quaternary age) generally lies above bedrock in the ash pond area as indicated in the hydrogeologic profiles presented on Figures 2-3 and 2-4 and the soil isopachous map of Figure 2-5. Soil thickness is highly variable, ranging from about 5 ft along a portion of the northern perimeter of the site to a maximum of 65 ft on the western boundary. The alluvial deposits are unconsolidated and heterogeneous mixtures of clay, silt, sand, and gravel that typically grade coarser with depth. Laboratory testing of recently collected alluvial soil samples from the site typically fall into the CL and SM classifications (MACTEC, 2004). A thin, discontinuous layer of residuum, composed of clay and silt with weathered shale fragments, is present directly above bedrock.

The ash and ash-soil fill present above the alluvial/residual soils range up to 83 ft in thickness. Ash deposits consist almost entirely of fly ash, with bottom ash comprising less than 10% of the ash fill. Particle size analysis indicates the existing ash is generally composed of silt and sand size particles with lesser amounts of clay and gravel size material (MACTEC, 2004). Ash pond dikes are constructed of mixtures of fly ash, bottom ash, and silty clay soil. The phreatic surface generally lies within the ash deposits.

Appendix C provides a compilation of grain-size data for unconsolidated soil and ash samples associated with several previous investigations. Atterberg limits and natural moisture content data are included where available along with a description of laboratory testing procedures.

While the number and density of soil borings and rock coreholes in some areas may be below the minimum requirements of the Division of Solid Waste Management's (DSWM's) Hydrogeologic Guidance Document, we believe the available data are sufficient to characterize subsurface conditions at the proposed CCB disposal site. A total of 30 soil borings have been completed within and immediately around the footprint of the proposed site in the unconsolidated ash and underlying alluvial deposits. Drilling has been limited by necessity to locations along perimeter dikes bounding the existing ash pond, stilling pond, and dredge cells. Characterization of the unconsolidated overburden should be adequate because coal ash, which comprises the upper 20 to 80 ft of overburden and represents the "natural" geologic buffer, exhibits a high-degree of homogeneity requiring fewer borings/samples for adequate characterization. In addition, available information indicates the thickness of the underlying alluvium and top-of-rock surface elevation to be relatively uniform, reducing the need for further exploratory drilling. Only two coreholes (i.e., 13B and 16B) have penetrated the underlying bedrock to depths ranging from 7 to 17 ft. However, three additional coring sites (9B, 12B, and 15B) are located within about a 1000 ft of the proposed disposal site, and extensive coring data are available from foundation studies in the plant powerhouse situated approximately 0.5 mile to the southwest.

2.2 Groundwater Occurrence

The first occurrence of groundwater below the proposed CCB disposal areas is generally within the existing ash fill. Under present conditions, groundwater is derived from infiltration of precipitation, seepage from various ash-related impoundments, and from lateral inflow along the western boundary of the reservation. Groundwater movement, as inferred from potentiometric maps developed from water-level measurements in shallow monitoring wells primarily located outside of existing ash disposal areas, is generally eastward from Pine Ridge toward Swan Pond Creek embayment, the Emory River and the plant intake channel (Figure 2-6). However, continuous recharge by ash sluice water in the active ash pond and dredge cells produces local mounding of the water table that is largely undetected by peripheral monitoring wells. Accounting for the measured water surface levels in Ash Dredge Cell 2, the ash pond, and stilling pond results in the alternative potentiometric surface shown on Figure 2-7. This figure indicates radial movement of groundwater away from the surface impoundments, including movement from Cell 2 toward Pine Ridge. Groundwater movement from the dredge cells toward Pine Ridge converges with groundwater flowing down slope. Groundwater entering the region of convergence either discharges into the ephemeral drainage feature paralleling Swan Pond Road on the northwest side,