4.3.2.2.2 Shut Down and Deactivate

Surface-water impacts under this alternative would be the same as those discussed for No Action except DOE would lose the capability to restart the river water pumps and refill Par Pond to an appropriate level if one of the monitored indicator values (e.g., a water quality parameter or a biotic index) exceeded established threshold levels.

4.3.2.2.3 Shut Down and Maintain

Surface-water impacts to Par Pond under this alternative would be the same as those discussed for No Action.

4.3.3 GROUNDWATER

This section describes the site-specific groundwater conditions near the Par Pond aquifers.

4.3.3.1 Affected Environment

Aquifer Units

Section 4.1.3 discusses the regional hydrogeology. The water table aquifer discharges along the edges of Par Pond (Hiergesell 1996). Based on a review of Well No. P24 on cross sections (Aadland, Gellici, and Thayer 1995), the first confined aquifer occurs at approximately 100 feet (30 meters) above mean sea level and approximately 100 feet below the mean reservoir water elevation.

Groundwater Flow

The water table aquifer flows away from P-Area (west to east) (see Figure 4-12) and discharges to the west side of Par Pond. Specific hydraulic properties for the water table aquifer are limited in the Par Pond area, so Table 4-1 uses sitewide hydraulic properties of the water table aquifer. According to the pontentiometric surface map of the first confined aquifer (Figure 4-12), groundwater flows in a south/ southeast direction below and away from Par Pond. Data on the hydraulic properties of the first confined aquifer in the Par Pond area are also limited and sitewide data are used here as well (Table 4-2). Water from Par Pond recharges both aquifers below the dam. Therefore, water in Par Pond does not directly affect the first confined aquifer. According to assumptions used in Hiergesell (1996), there is a leakage from Par Pond through the water table aquifer and into the first confined aquifer. Based on a review of hydrostratigraphic cross sections and maps (Aadland, Gellici, and Thayer 1995), groundwater is apparently not connected (i.e., a groundwater mound exists between lakes) between Par Pond and L-Lake aquifers. TE

Groundwater Quality and Usage

The quality of groundwater has been adversely impacted in P- and R-Areas west of Par Pond (WSRC 1996e). However, the extent of that impact is not fully known and is under investigation. The SRS does not use the water table aquifer or first confined aquifer in the area of Par Pond. TE

4.3.3.2 Environmental Impacts

4.3.3.2.1 No Action

Currently, Par Pond receives no River Water System outfall discharges. Therefore, the River Water System has no current effect on either aquifer in the vicinity of Par Pond. By continuing the operation of the River Water System, DOE does not anticipate any future effects on either aquifer at Par Pond.

4.3.3.2.2 Shut Down and Deactivate

The outfall from the River Water System does not currently contribute to the groundwater in either aquifer at Par Pond. Therefore, the groundwater flow rates, flow direction, and water quality in both aquifers would not be affected by a shutdown alternative. The overall groundwater contribution to the lake elevation would remain essentially constant, and there would be no change in the current groundwater contribution from Par Pond to the water table aquifer and the first confined aquifer in Lower Three Runs.

4.3.3.2.3 Shut Down and Maintain

The impacts described in Section 4.3.3.2.2 would also apply to this alternative.

4.3.4 AIR RESOURCES

4.3.4.1 Affected Environment

DOE assumes that the climate, meteorology, and ambient air quality for Par Pond are equivalent to those for the SRS, which are discussed in Section 4.1.4.1.

4.3.4.2 Environmental Impacts

4.3.4.2.1 No Action

DOE is allowing the level of water in Par Pond to fluctuate, as discussed in Section 4.3.2.2.2. The estimated lowest water elevation for Par Pond is 197 feet (60 meters) above mean sea level, which could expose up to 340 acres (1.4 square kilometers) of sediment (Gladden, Paller, and Mackey 1995). Winds could cause the exposed sediment to become resuspended as airborne particulates.

DOE used the MEPAS model to estimate quantities of resuspended particulates originating from exposed sediment (Droppo et al. 1995), incorporating joint frequency wind data from the L-Area wind tower for the period from 1986 to 1991 (Simpkins 1996a). Data from the L-Area tower is representative of Par Pond due to its proximity. The algorithm used by MEPAS to calculate the particulate emission factor has a parameter for the frequency of disturbances to the dried shoreline sediment. For conservatism, a factor of 30 disturbances per month was used by DOE to estimate a worst-case particulate emission rate. By using a factor of 30 disturbances per month, the 24-hour period of interest is modeled.

Table 4-50 lists the maximum concentration in air of nonradiological constituents at the boundary of the SRS. Included in the table is a column that shows the maximum allowable concentrations established by the South Carolina Department of Health and Environmental Control (SCDHEC 1976). As can be seen from the table, the resuspension of particulate matter from Par Pond produces only minimal concentrations by comparison to the allowable concentration.

Table 4-50. Maximum ground-level concentrations of nonradiological air constituents at the SRS boundary under the No-Action Alternative.

Nonradiological constituent	Modeled maximum air concentration[a] ($\mu g/m^3$)	Maximum allowable concentration[b] ($\mu g/m^3$)
Manganese	2.5×10^{-6}	1.0
Mercury	1.2×10^{-6}	0.25
PM_{10}[c]	15	50 (annual average) 150 (24-hour average)

a. DOE assumed 30 disturbances per month (i.e., once per day) of the lakebed so that the calculated air concentration is an upper bound of the concentration over any time period (e.g., week, month, year).

b. Source: SCDHEC (1976).

c. PM_{10} is particulate matter with a diameter of 10 microns (0.00001 m) or less.