4.2.6.5 Geology and Soils

Construction and operation of the alternatives at SRS would have no impact on the geologic resources. Based on the seismic history of the area, a low seismic risk exists, and would be considered in the design of the proposed alternatives. The existing seismic risk does not preclude the safe construction and operation of the proposed alternative facilities. The facilities would be designed for earthquake-generated ground acceleration in accordance with DOE O 420.1, *Facility Safety.* Because there are no known capable faults at SRS, ground rupture as a result of an earthquake during the lifetime of the facility is minimal; ground shaking is more likely. Intensities of more than VII on the MMI scale are possible but infrequent and are not likely at SRS. Ground shaking could affect the integrity of inadequately designed or nonreinforced structures but would not affect newly designed facilities. Human health effects from accidents initiated by natural phenomena (for example, earthquakes) are discussed in Section 4.2.6.9. There is no evidence to suggest that seismically induced liquefaction of soils represents a hazard at SRS (DOE 1995p:4-23). Volcanic activity is improbable during the life of a facility and is not anticipated to affect the construction and operation of the alternatives. It is unlikely that landslides or other nontectonic events would affect the proposed alternatives. Calcium carbonate dissolution (within thin, discontinuous calcareous sand zones) may be an active process in the area, but no surface expression of sinkholes or fractures associated with calcium carbonate dissolution have been identified at SRS. Potential effects due to subsidence should be negligible because calcium carbonate dissolution is a slow process relative to human activities. Properties and conditions of soils underlying SRS typically have no limitations on construction. No economically viable geologic resources are known to be present at SRS.

Construction of the alternatives may involve ground-disturbing activities that could affect the soil resources. The amount of land disturbed is specified below for each alternative. Effects to the soil resource would depend on the specific soil units in the disturbed area, the extent of land disturbing activities, and the amount of soil disturbed. Within SRS, the soil erosion potential is directly related to the amount of land disturbed because soil and climatic conditions are similar throughout the site. Control measures would be employed to minimize soil erosion.

[Text deleted.]

No Action Alternative

[Text deleted.] Under this alternative, DOE would continue current and ongoing activities at SRS. There would be no ground-disturbing activities beyond those associated with existing and future site improvements. Because no new construction and the associated ground disturbance for potential soil erosion would occur, the No Action Alternative would have no effect to geologic or soil resources at the site.

Upgrade Alternative

Preferred Alternative: Upgrade With Rocky Flats Environmental Technology Site Non-Pit Plutonium Subalternative

Modify Actinide Packaging and Storage Facility for Continued Plutonium Storage

Construction would occur on previously disturbed land as described in Section 4.2.6.1. Soil disturbance would occur primarily from ground-disturbing construction activities (foundation preparation) and activities associated with building construction laydown areas that can expose the soil profile and lead to a possible increase in soil erosion as a result of wind and water action. Soil loss would depend on the frequency and severity of storms; wind velocities (increased wind velocities and durations increase potential soil erosion); and the size, location, and duration of ground-disturbing activities with respect to local drainage and wind patterns.

Net soil disturbance during operations would be considerably less than during construction because areas temporarily used for construction laydown would be restored. Although erosion by stormwater runoff and wind action could occur occasionally during operations, they are anticipated to be minimal.

[Text deleted.]

Upgrade With Rocky Flats Environmental Technology Site Plutonium and Los Alamos National Laboratory Plutonium Subalternative

Modify Actinide Packaging and Storage Facility for Continued Plutonium Storage

Construction and operation effects on geology and soil resources for this option would be the same as those described for the Upgrade With RFETS Non-Pit Pu Subalternative, because the amount of land disturbed during modification of the APSF would be the same.

Consolidation Alternative

Construct New Plutonium Storage Facility

No apparent direct or indirect effects on the geologic resource are anticipated because neither facility construction and operational activities nor site infrastructure improvements would restrict access to potential geologic resources. Analysis in this section is the same as that provided for the Upgrade Alternative.

[Text deleted.] Additional soil impacts would be expected from construction of the Consolidation Alternative. Construction would occur completely on undisturbed land, as described in Section 4.2.6.1. Approximately 58.5 ha (144 acres) will be disturbed during construction of the new facilities, affecting the soil profile and leading to a possible temporary increase in erosion as a result of stormwater runoff and wind action. Soil losses would depend on frequency of storms; wind velocity; location of the facility with respect to drainage and wind patterns; slope, shape, and area of the tracts of ground disturbed; and the duration of time the soil is bare.

Collocation Alternative

Construct New Plutonium and Highly Enriched Uranium Storage Facilities

No apparent direct or indirect effects on the geologic resource are anticipated, because neither facility construction and operational activities nor site infrastructure improvements would restrict access to potential geologic resources.

[Text deleted.] Additional soil impacts would be expected from the construction of the storage facilities which will occur completely on undisturbed land, as described in Section 4.2.6.1. During construction, approximately 89.5 ha (221 acres) would be disturbed for the new facilities, affecting the soil profile and leading to a possible temporary increase in erosion as a result of stormwater runoff and wind action. [Text deleted.]

Subalternative Not Including Strategic Reserve and Weapons Research and Development Materials

Excluding strategic reserve and weapons R&D materials would give almost the same effects to the geologic and soil resources. By excluding these materials, the size of a facility would be similar, thus not changing the amount of land disturbed by construction activities. No effect to the geologic resource is anticipated as a result of this option. [Text deleted.]

Phaseout

The phaseout of storage capacity would have no apparent effects on the geology resources. However, phaseout could result in beneficial effects on the soils of the area. Hazardous radioactive and mixed waste sources would be eliminated from the area, thus decreasing the potential for future soil contamination.

[Text deleted.]