3.0 Responses to Revised Draft HSW EIS Comments

Affected Environment

Comments

L-0028/003

The dumping of nuclear waste in the state of Washington is particularly hazardous because of the high risk of earthquakes.

P-0142/002

I am deeply concerned with the storage of mobile forms of radioactive waste because of the Hanford location at the edge of a very active seismic zone with cataclysmic potential.

Response

Earthquakes and seismicity are discussed in Volume I Section 4.4.4 of the HSW EIS. Though there are active fault lines throughout the State and the northwest region in general, Hanford is in an area considered to be of low seismic activity (in terms of intensity). DOE's extensive programs for safety and safeguarding of nuclear materials consider a variety of possible worst-case scenarios. Safety analysis reports and other safety documentation were used to assess impacts resulting from reasonably foreseeable catastrophic events.

Comments

L-0055/018

DOE has understated the earthquake potential in this area. Recent NEHRP [National Earthquake Hazard Reduction Program] studies in the Yakima fold belt, including Toppenish, Ahtanum, and Rattlesnake Ridge have shown earthquakes in this area with a magnitude of at least 7.3. These fold belts are still considered active since some of these events occurred within the past 10,000 years. Are faults addressed in the current SAC model?

Response

Earthquakes and seismicity are discussed in Volume I Section 4.4.4 of the HSW EIS. Though there are active fault lines throughout the State and the northwest region in general, Hanford is in an area considered to be of low seismic activity (in terms of intensity). DOE's extensive programs for safety and safeguarding of nuclear materials consider a variety of possible worst-case scenarios. Safety analysis reports and other safety documentation were used to assess impacts resulting from reasonably foreseeable catastrophic events.

Studies of seismicity at the Hanford Site have shown that the depth of seismic activity is related to crustal stratigraphy (layers of rock types) (Hartshorn et al. 2002). The main geologic units important to earthquakes at Hanford and the surrounding area are: the Miocene Columbia River Basalt Group; pre-basalt sediments of Paleocene, Eocene, and Oligocene age; the crystalline basement consisting of 2 layers composed of Precambrian and Paleozoic craton; and Mesozoic accreted terranes.

Since records have been kept, most of the earthquakes at the Hanford Site have originated in the Columbia River Basalt Group. The crystalline basement has had the next greatest amount of earthquakes followed by the pre-basalt sediments. However, the stratigraphic distribution of earthquakes will vary on a yearly basis. For example in FY 1999, 39 earthquakes occurred in the basalt layer, 6 were in the pre-basalt sediments, and 27 were in the crystalline basement (Hartshorn et al. 2000). In contrast, for FY 2002, there were 13 earthquakes in the basalt layer, 12 earthquakes in the pre-basalt sediments, and 17 earthquakes in the crystalline basement (Hartshorn et al. 1999, Hartshorn et al. 2002).

The basalt was assigned a very low hydraulic conductivity and was essentially treated as an impermeable unit in the SAC model. Therefore, we did not include fault zones. Including faults in the model would be expected to reduce contaminant concentrations in groundwater over the long-term due to additional recharge (upwelling of water) from the confined aquifer.

Comments

TLG-0006/003

The last thing that I'd like to point out is that we need to find different methods of storing this nuclear waste at the facility, because it's sitting on a patch of columnar basalt, which most of you know. And that columnar basalt does not stop nuclear waste from going straight down in the groundwater, which it's continuing to do, if we bring in more nuclear wastes.

Response

Information about the geology and hydrology at the Hanford Site is contained in Volume I Sections 4.4 and 4.5 of the HSW EIS and references for that section. In general, soil and gravel deposits separate the waste units from the basalt. The unconfined aquifer is above the basalt layer.