



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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NOTE TO: William Ott, Section Leader
Facility Performance Section

FROM: Michael B. McNeal
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SUBJECT: COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
HANFORD SITE (BWIP)

There are two major points on which I believe the subject document is misleading. The first has to do with groundwater chemistry, the second with waste package design.

On P 2-15, the last paragraph says "the equilibrium condition that now exists between the iron oxides in the basalt and the available oxygen present in the groundwater is very low oxidation potential (E_H)". "Low" is vague but on P 3-33 and 3-36 we find it stated as a fact that E_H is $-.45 \pm .07v$ (presumably versus hydrogen electrode).

The E_H of $-.45 \pm .07v$ is not a fact; it is not even very probable for real groundwater. It is the potential for groundwater in equilibrium with freshly broken basalt surfaces in the absence of extraneous oxygen. The groundwater in a system such as BWIP presumably will reach the container at a time of geologic control not by passing over basalt freshly cracked in an inert atmosphere, but by passing through cracks and pores whose surfaces have been oxidized by water over millions of years. What is needed here are actual measurements of E_H of groundwaters over a reasonable sample of the geology, and these are not offered.

The E_H of $-.45v$, incidentally, is in conflict with the values of E_H given in the BWIP Site Characterization Report for basalt groundwaters (Table 5.53). Furthermore, groundwaters near the mean pH value for basalt groundwater cited in Table 5.51 of the SCR are unstable at this E_H and would spontaneously generate hydrogen.

The groundwater pH values given in Table 3.2, P 3-33 of the Environmental Assessment are very far from the mean pH cited in Table 5.51 of the SCR. This discrepancy is not explained, and the suspicious reader might think that this very basic pH was chosen for Table 3.2 because a less basic pH would mean that groundwater would spontaneously decompose at the E_H being claimed.

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The question of what the E_H and pH values^{are} for the geologically controlled regime are not settled; making really conclusive measurements is very difficult. But the numbers cited in the Environmental Assessment are pure conjectures, the "error bars" associated with them give the very misleading impression that they are rather accurately known.

On P 2-15, paragraph 2 says: "The waste package is being designed... to provide containment of the waste (for 300 to 600 years)". Presumably the waste package is being designed for this purpose, but that is not the point. DOE has not yet submitted a design with convincing arguments that it will fulfill this requirement. From the environmental standpoint what matters is not DOE's intentions with regard to the package; but convincingly documented projections of package behavior, and these are lacking.



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