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STATE OF WASHINGTON  
DEPARTMENT OF HEALTH  
DIVISION OF RADIATION PROTECTION  
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September 17, 1996

Dave Olson  
U.S. Department of Energy  
Richland Operations Office  
P. O. Box 550, MSIN HO-12  
Richland, Washington 99352

Dear Mr. Olson:

The Washington State Department of Health, Division of Radiation Protection has received and reviewed the document *In Situ Treatability Test Plan* (DOE/RL-95-107). Enclosed are our comments. If you have any questions, please contact either Scott Van Verst (360-586-3585) or me (360-586-3306).

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Sincerely,

Debra McBaugh, Acting Head  
Environmental Radiation Section

DM:seg

cc: Phillip R. Staats, Ecology  
Allen Danielson, Health

**DOH Review of  
In Situ Treatability Test Plan - ISTZ for N-Springs**

**1.) General**

The stated purpose of the present Test Plan is to evaluate the effectiveness of a technology to prevent the discharge of Strontium-90 contaminated groundwater into the Columbia River near N-Springs. This implies that Sr-90 contaminated water in the Columbia River imposes a health risk. Yet, from a public health standpoint, it has not been adequately shown that a dose problem presently exists. Furthermore, the plan will concentrate Sr-90, effectively generating a low level waste disposal site quite near the Columbia River.

**2.) Absence of Risk Assessment**

To our knowledge, no dose or risk assessments exist for Sr-90 in the Columbia River near the N-Springs. It is well established that away from N-Springs, Sr-90 levels in the river are typically indistinguishable from levels up-river of Hanford. A 1993 Battelle report found that Sr-90 levels in the river are driven by world-wide fallout from tests of nuclear weapons. In fact, that report finds that only about 10% of the Sr-90 in the Hanford Reach of the Columbia River is attributed to Hanford liquid effluent discharge.

There is widespread doubt among professionals concerning excessive doses from the Columbia River near N-Springs, although the subject is controversial. Many of the springs have since dried up, and seeps that do exist are often under water, exposed typically at night when power consumption and river levels are low. Currently, a Columbia River Impact Assessment is being carried out which will address dose and risk assessment from near shore Sr-90 in the Columbia River. Since controversy exists over the issue of health risks from the Columbia River near N-Springs, it seems premature to carry out remediation tests before such risk assessments are complete.

Currently, it is difficult to find data relevant to near shore dose calculations for Sr-90 concentration levels in the river water. Most data come from wells about 10 meters inland, from caissons at the river bank, directly from seeps when they are exposed, or from river transect data. Readings from these sources are not necessarily indicative of concentration levels in the near shore river water. The wells, caissons, and seeps will obviously have higher concentrations than those found in river water where mixing has occurred. Transect data is mostly taken far from shore, also not indicative of concentration levels near shore. Complex models must be used to evaluate Sr-90 levels in the river from the ground water discharge. The evaluation of near shore contamination is also complicated by the constant recharge and bank storage effects due to daily water levels changes.

### 3.) Technical comments on ISTZ - Concentrated Zone of Sr-90

Of equal concern, this plan will concentrate Sr-90 in the Clinoptilolite in a zone very close to the river and not far below ground level. This appears to be in direct conflict with accepted remediation strategies in the 100 Area which call for excavation and disposal, as opposed to buildup, of contaminated zones at shallow depth. In this light, the Clinoptilolite appears to serve the purpose of a low level waste disposal site.

Furthermore, most dose calculations carried out for remediation purposes, for example those of the EPA, call for any contamination within the first 15 feet below ground to be considered as if the highest concentration existed on the surface. From figure 2.2 in the plan, it appears that the top of the Clinoptilolite is approximately 10 feet below ground level. Within this accepted, albeit controversial framework and according to Table 2-5 of the Test Plan, dose calculations need to be carried out assuming 20600 pCi/g exist at the surface. Unless the criteria for dose calculations concerning contamination at depth change, it is unlikely these levels would be accepted for implementation of this remediation technology.

### 4.) Summary

Realistic risk assessments need to be carried out and more extensive data for river water contamination near N-Springs needs to be collected before large expenditures are directed towards this project. Upcoming transect studies and the Columbia River Impact Assessment may provide this additional information.

Even assuming that risk assessments indicate eliminating or reducing Sr-90 discharge is necessary, the present plan will concentrate Sr-90 in a manner inconsistent with accepted cleanup criteria.