

ENVIRONMENTAL MONITORING AT HANFORD BY THE STATE OF WASHINGTON

A. W. Conklin, R. R. Mooney, and J. L. Erickson

Environmental Radiation Section, Division of Radiation Protection, Department of Health, Olympia, Washington

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ABSTRACT

The Department of Social and Health Services' Office of Radiation Protection (ORP), Washington State's radiation control agency, has a mandate to protect the public from radiation. In 1985, ORP was instructed by the legislature to establish a statewide environmental radiological base line, beginning with Hanford, to verify federal environmental programs, and to enforce federal and state Clean Air Acts. The primary mission of the agency is to protect public health by active involvement in Hanford monitoring and oversight. The state's program was designed not to duplicate but to supplement existing programs and to identify any sampling gaps or problems. Split, side-by-side, and independent samples are collected, with analysis performed by the state's own laboratory. Media sampled have included surface and drinking water, seep and ground water, fruits and vegetables, milk, soils, and air particulates; ambient radiation levels have been determined.

Special activities have included split sampling of river seeps with multiple agencies, preliminary dose assessment of early Hanford releases, investigations of ¹²⁹I in the environment and in Franklin County drinking water, verification of U.S. Department of Energy (DOE) data on erroneous alarms at the Hanford Plutonium Uranium Extraction Plant, split sampling with a DOE headquarters survey, and participation in several General Accounting Office investigations and a National Academy of Sciences review. The independence of ORP programs guarantees that the public has access to environmental data on the activities of DOE and its contractors. We will describe the interrelationship of ORP and Hanford programs and present results of ORP activities.

BACKGROUND

The Washington State Department of Health (WSDH) has dual legislative responsibilities: first as a public health agency and second as a radiation control agency (RCW, 1986). This legislation results in a monitoring agency with built-in independence because its primary mission is public health. This is important at Hanford where the Department of Energy's (DOE) mission is weapons production and

radioactive waste disposal. The presence of the WSDH adds credibility to Hanford environmental monitoring results. To ensure the health and safety of the public, it is necessary not only to monitor independently but to validate other programs by assessing and verifying their data.

Environmental pathways associated with Hanford operations include: (1) the water pathway for effluents from liquid-waste disposal and (2) the air pathway for releases from fuel reprocessing, research and development activities and waste-handling and storage facilities. The State's environmental monitoring stations at Hanford are shown in Figure 1.

The air pathway is monitored under the state's Radioactive Air Emissions Program. The program was established to ensure compliance with the federal Clean Air Act, which requires federal facilities to comply with applicable state laws (WAC, 1986). DOE has now accepted the state's regulatory authority over Clean Air Act issues. The scope of the State program that is now being implemented includes: reviewing source registrations and issuing permits; reviewing new and modified source plans; environmental monitoring of air; reviewing and inspecting stack monitoring systems; reviewing emission data; evaluating models used for dose assessments; evaluating environmental monitoring and emissions reports; issuing periodic reports; investigating anomalies and accidents that potentially affect the public via air pathways; and keeping the public informed.

An effective means of verifying monitoring data collected by DOE contractors is to split and analyze the same samples where possible. Most sample splitting has been with the Pacific Northwest Laboratory, DOE's environmental monitoring contractor. Many split samples have also been obtained through a coordinated effort of the Environmental Radiation Quality Assurance Task Force, which the WSDH chairs. The Task Force includes most state and federal agencies and research organizations that conduct environmental radiation monitoring programs in the Pacific Northwest.

A unique sampling activity was conducted in 1987 in conjunction with a DOE headquarters survey, in which 10% (60) of the samples collected were split. Complete results are not yet available.

Another split sampling effort involves routine sampling of seeps, where low-level waste water from DOE waste-disposal activities empties into the Columbia River. In 1988, sampling was expanded to include

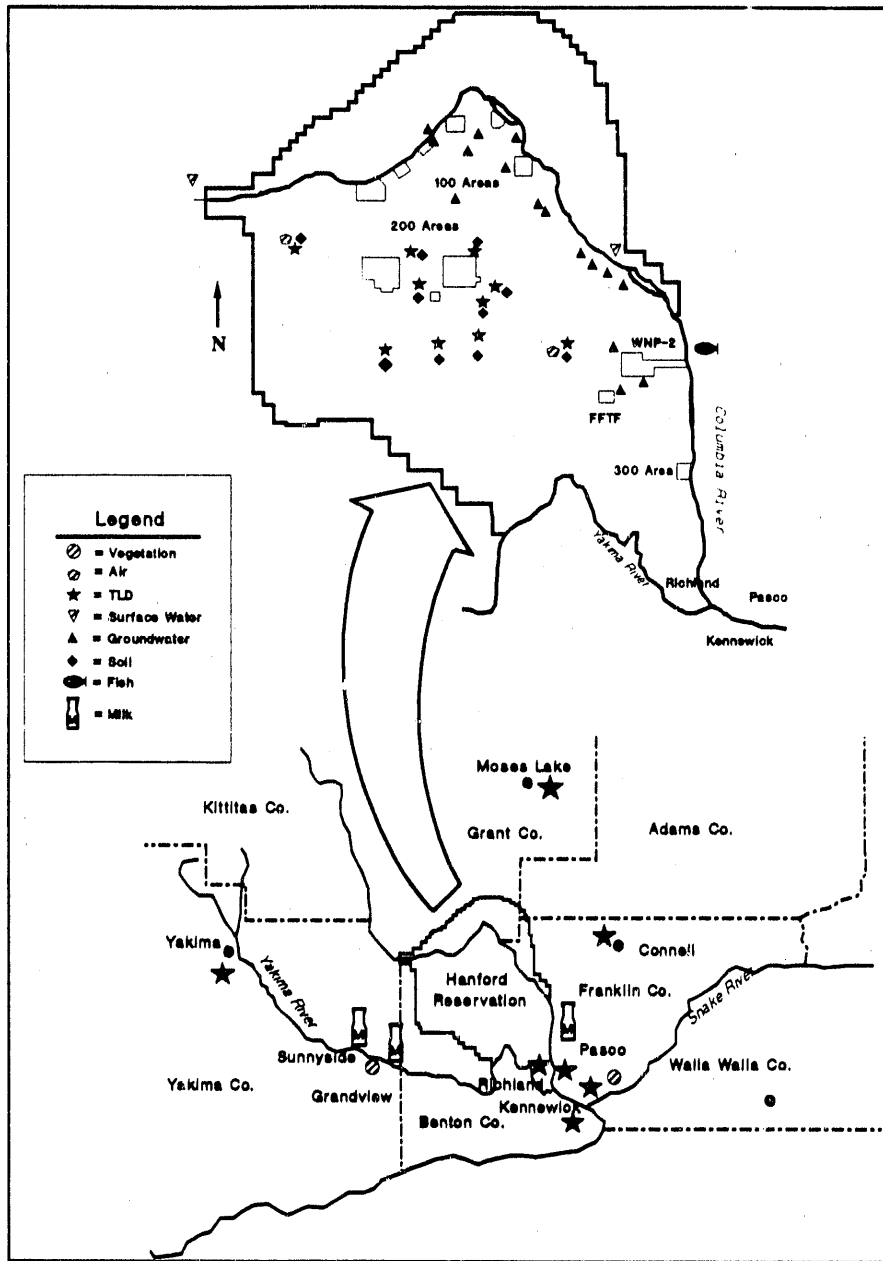


Figure 1. Washington State radiation monitoring stations at Hanford.

sediments and comparisons of data from thermoluminescent dosimeters and portable ion chambers. In addition to Task Force members, a public interest group (the Hanford Education Action League) was also invited to participate in split sampling.

At Hanford, the state's environmental monitoring efforts concentrate on ground water and river seeps that may contain contamination from soil-column disposal of liquid wastes. Although monitoring of the air pathway is minimal, expansion is planned as the Radioactive Air Emissions Program is implemented.

In addition to routine environmental monitoring at Hanford, special investigations are conducted by the state as required. Examples include:

1. **Iodine-129 in the environment:** Allegations were made that aquifer intercommunication was occurring that potentially affected the suitability of Hanford for a repository. The state assessed the available data to ensure there were no adverse health impacts from ¹²⁹I.
2. **Uranium in the Ground Water:** The state evaluated contamination that occurred when water from an active waste site flowed to an adjacent retired site, potentially driving uranium into the ground water. The investigation continued until there was assurance that removal of contaminated water was eliminating further impact.
3. **Uranium in Drinking Water:** Uranium was found in ground water used for drinking across the Columbia River from Hanford. The state investigated to assure the public that this uranium did not originate from Hanford. Isotopic analysis showed that the uranium occurred naturally.
4. **Lost Waste Sites:** A state legislator inquired whether the location of all Hanford wastes was known. The state evaluated records, concluding that selected wastes could not be accurately accounted for. DOE committed to evaluate the situation.
5. **Wastes Seeping into the Columbia River:** The state, along with other members of the Quality Assurance Task Force, continues to evaluate impacts on the Columbia River from waste management operations in the center of the reservation and from waste sites adjacent to the river.
6. **Verification of Data on Erroneous Alarms:** After continuous air monitors continued to alarm at the Plutonium-Uranium Extraction plant, the state was requested to examine data and to verify for

the public that the problem was build-up of radon daughters rather than airborne plutonium.

The state has also participated in several investigations conducted by the General Accounting Office (GAO), including one on the environment (GAO, 1986a) and one on waste management practices (GAO, 1986b). The state also provided information for a National Academy of Sciences review of Hanford's environmental monitoring programs; their report is scheduled for distribution in late 1989.

We do not contend that the state's program is technically better than that of DOE contractors. However, the state's program has credibility because its mission is to ensure public health. The state has demonstrated objectivity and a willingness both to criticize and credit DOE operations and activities.

CONCLUSION

Nuclear fuel reprocessing activities and radioactive waste disposal are publicly sensitive issues requiring the presence of an independent monitoring organization to represent the public. This is especially true at Hanford, where nuclear operations are varied and numerous, and where control of radioactivity has been lost in the past.

The WSDH, as both the public health agency and the radiation control agency, provides an additional level of independence and public credibility to verify DOE's environmental radiation monitoring program and to assure the public that it is safe.

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