Hanford Environmental Dose Reconstruction Project

Monthly Technical Report

January 1988

Prepared for the Technical Steering Panel

Work supported by
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
by Battelle Memorial Institute

Battelle
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Pacific Northwest Laboratory
Richland, Washington 99352
HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION PROJECT

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This monthly report summarizes the technical progress and project status for the Hanford Environmental Dose Reconstruction (HEDR) Project being conducted at Pacific Northwest Laboratory (PNL) under the direction of a Technical Steering Panel (TSP). The TSP is composed of experts in numerous technical fields related to this project and represent the interests of the public. The Department of Energy (DOE) funds the project and represents the interests of the federal government and the public. The organization for the project is outlined below.

HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION PROJECT ORGANIZATIONAL STRUCTURE
MANAGEMENT SUMMARY

OBJECTIVE

The objective of the Hanford Environmental Dose Reconstruction (HEDR) Project is to develop estimates of potential radiation doses that the public could have received from radioactive materials released from Hanford operations beginning in 1944.

PROGRESS

This summary report covers progress for the month of January 1988, including the following:

• continued collecting preliminary data to support uncertainty and sensitivity analyses
• conducted uncertainty and sensitivity analyses.

MAJOR ISSUES AND ACTION TAKEN

As noted in the December monthly report, the preliminary draft HEDR work plan has not been approved due to delays in the formation of the Technical Steering Panel (TSP). The work plan assumed that the TSP would review and approve project direction by the end of calendar year 1987. The proposed project scope, schedule, budget, and key staff assignments will be adversely impacted if the TSP is not available by early February 1988.

The delay of the proposed project schedule has resulted in the loss of some staff, as those affected have accepted interim work. Staff have been directed to continue work related to task planning.

This issue was resolved in late January when the Department of Energy (DOE) directed the laboratory to proceed with the project.
PLANNED WORK FOR SUBSEQUENT MONTHS

Work planned for February 1988 includes the following:

- start project pending formal notification from DOE
- continue to collect preliminary data in support of uncertainty and sensitivity analyses
- continue uncertainty and sensitivity analyses
- reallocate resources based on uncertainty and sensitivity analyses.
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TASK 03  SOURCE TERMS

OBJECTIVE

The objective of this task is to develop quantitative estimates of all significant emissions of radionuclides from Hanford operations during the period 1944 to the present.

PROGRESS

Well-characterized releases of iodine-131 are being identified as potential input to uncertainty and sensitivity analyses. One potential event was the "Green Run" in December 1949. The release rate and amounts do not appear to be sufficiently documented to provide the basis for an accurate test. Other possible well-characterized releases of iodine-131 are being investigated.

Work during January 1988 has also included the following:
• attended a meeting on the possible uses and benefits of a Geographic Information System (GIS)
• began developing a list of possible questions for consultants on the early-day operations at Hanford
• began using a database collection system.

MAJOR PROBLEM AREAS AND ACTION TAKEN

Delays in the project startup have interfered with the employment of retired engineers familiar with Hanford operations.

PLANNED WORK FOR SUBSEQUENT MONTHS

The work to be completed in future months includes the following:
• continue entering documents in the database
• complete inquiry into possible candidate releases for additional uncertainty and sensitivity analyses
• complete schematics of "typical" effluent systems for Hanford facilities
• complete inquiry into Savannah River computer code for fission product inventory.
TASK 04 ENVIRONMENTAL TRANSPORT

OBJECTIVE

The objective of this task is to reconstruct the movements of radioactive materials from operating areas to potentially exposed populations via the atmosphere, surface water, and ground water.

PROGRESS

Input was provided concerning the appropriate structure for a preliminary GIS.

Surface-water studies centered on understanding the Columbia River based on historical observations. A general picture of flow has been developed.

Atmospheric dispersion studies emphasized the sensitivity of predicted air concentrations to the quantity and quality of input data. A promising concept relating upper-air winds to ground-level wind fields has been proposed and is being investigated further. This concept may result in the requirement for much less data for the early years, and thus save considerable data entry costs.

MAJOR PROBLEM AREAS AND ACTION TAKEN

The indication in late January that the project will start in February will allow some staff to remain committed to the project. This should help avert delays in the near future caused by lack of staffing.

PLANNED WORK FOR SUBSEQUENT MONTHS

A project "influence diagram" is being prepared to relate the necessary data and processes to the final outcome. This will help in resource reallocation. Revised schedules and budgets will be prepared to respond to the current project status.
TASK 05 ENVIRONMENTAL MONITORING

OBJECTIVE

The objectives of this task are to assemble, evaluate, and report historical environmental monitoring data and to use the data to estimate the contributions of Hanford operations to radionuclide concentrations in environmental media.

PROGRESS

A more detailed examination of the vegetation data for 1944-1947 was made to compare and check sources of data in support of uncertainty and sensitivity analyses. A more detailed inventory of air monitoring data through 1957 was completed and additional effort was directed to a detailed inventory of river monitoring data.

Work to evaluate errors and uncertainties in vegetation data concerning iodine-131 continued by extending the review of documentation into the mid-1950s. Also, the review was expanded to start examining the errors and uncertainties in air concentration measurements of iodine-131 using the caustic scrubber method, which became routine in about 1949.

Plans were initiated to secure the assistance of key former Hanford employees to answer questions about past environmental, worker, and emission monitoring data.

Initial discussions were held concerning the pilot application of GIS methods for storing, manipulating, and displaying environmental monitoring data.

MAJOR PROBLEM AREAS AND ACTION TAKEN

Staff time available in February and March will be limited by the need to produce the Hanford Site Environmental Monitoring Report, a major DOE milestone. Hiring to offset this slow down has been delayed due to delays in the startup of the HEDR project.
PLANNED WORK FOR SUBSEQUENT MONTHS

Work will continue to focus on inventorying data and building a database of iodine-131 data that can be used for uncertainty and sensitivity analyses. The assistance of former key Hanford employees will be sought.
TASK 06 DEMOGRAPHICS, AGRICULTURE, FOOD HABITS

OBJECTIVE

The objective of this task is to develop the population and agricultural data needed to estimate the population doses that may have resulted from releases of radioactive materials from Hanford operations.

PROGRESS

Work was initiated to collect population and agricultural data from the early 1960s in support of uncertainty and sensitivity analyses. Estimates of school-age populations from 1945 to 1948 were delivered to the project office.

A literature search was conducted at Washington State University on the lifestyle and consumption patterns of Indians in the study area during the 1940s and 1950s.

MAJOR PROBLEM AREAS AND ACTION TAKEN

Most of the literature on Plateau Indians concerns the traditional culture and lacks information needed to support the HEDR project. Specific information may need to be gathered by interviewing Indians that were living during the study period.

PLANNED WORK FOR SUBSEQUENT MONTHS

Spreadsheets for consumption and agriculture production from 1963 will be compiled when data is obtained.

The information from the literature search will be combined into a brief report on the traditional lifestyles and consumption patterns of the Plateau Indians.

Future work plans will be developed based on the results of the project startup meeting and the uncertainty/sensitivity analyses.
TASK 07 DOSE ESTIMATES

OBJECTIVE

The objective of this task is to use information developed by Tasks 03 through 06 to estimate potential radiation doses to populations from past releases of radioactive materials from Hanford operations.

PROGRESS

Work during January was limited to attending three meetings related to uncertainty and sensitivity analyses, one project team meeting, and a GIS meeting.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

This task will continue to focus attention on the uncertainty and sensitivity analyses. A new initiative is planned to review the historical records on measurements of biomass of range and pasture grasses around Hanford and to identify any information that will provide insight on the deposition of iodine-131 on forage.
TASK 08 INFORMATION RESOURCES

OBJECTIVE

The objectives of this task are to meet HEDR project information needs and to develop and maintain a microcomputer-based tracking and retrieval system.

PROGRESS

Input to the Information Resources Tracking Database continued. More than 300 records are now in the database.

Additional early-day series (1944-1946) of environmental related documents have been reviewed and declassified both with and without deletions. This task is working closely with Task 03 to fill in as many blanks as possible on the draft chronology, which addresses details of operations from startup (September 1944).

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Input to the Information Resources Tracking Database will continue. We will continue to assist other tasks in identifying and locating information they need to meet their objectives. We still plan to exchange databases with other tasks that have already established their own databases.
TASK 09  RECORDS MANAGEMENT

OBJECTIVE

The objectives of this task are to provide storage and control of completed project records, maintain an automated inventory of all project documentation, and provide a reference service to project staff and others.

PROGRESS

Task Indexes and Records Inventory and Disposition Schedules (RIDS) have been received from all tasks and are in the process of being approved.

We received the duplicating machine and will begin to make copies for the Public Documents Room as soon as we determine the duplicating and transfer procedure.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

• continue processing incoming project records
• continue work on the optical disk feasibility study
• coordinate procedures for duplication and transfer of completed project reports and supporting documents to the Public Documents Room at the Federal Office Building
• conduct a study to establish the number of records that the Records Center can process during a specific amount of time.
TASK 10  QUALITY ASSURANCE

OBJECTIVE

The objectives of this task are to ensure continuous quality assurance (QA) support and coordination with all project tasks. These objectives are met through the identification and documentation of QA requirements in the form of a QA Plan and periodic monitoring of project activities during the life of the project to ensure compliance with these requirements.

PROGRESS

Revision of QA Plan OHE-3, Rev. 0 was initiated in December and a draft of the revision routed for comments. Uncertainties in the formation of the TSP caused the QA Plan revision (and most other Task 10 activities) to be stalled in January.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Activities anticipated in upcoming months include the following:

- discussions with Task 04 personnel concerning QA measures to be applied to planned tracer experiments
- address comments and issue revision to QA Plan OHE-3
- brief project contributors on a task-by-task basis on QA Plan OHE-3 requirements focusing on how they apply to each task
- assist in implementation of QA program requirements.
APPENDIX A

Communications Log
<table>
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<th>INITIATED BY</th>
<th>CONTACT</th>
<th>AFFILIATION</th>
<th>TYPE</th>
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**None**
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