U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

The Hanford Site-Wide Risk Review Project Overview

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Overview

David S. Kosson[1], Jennifer Salisbury, Charles W. Powers[1] (retired), Craig H. Benson[2], Kevin G. Brown[1], Lisa Bliss[1], Joanna Burger[3], Bethany Burkhardt[1], James H. Clarke[1], Allen G. Croff[1], Lyndsey Fern Fyffe[1], Michael Gochfeld[3], Michael Greenberg[3], Kathryn A. Higley[4], George M. Hornberger[1], Kimberly L. Jones[5], Steven L. Krahn[1], Eugene J. LeBoeuf[1], Henry S. Mayer[3], Jane B. Stewart[6], Richard B. Stewart[6], and Hamp Turner[1]

[1]Vanderbilt University, [2]University of Wisconsin – Madison, [3]Rutgers University,
[4]Oregon State University, [5]Howard University, [6]New York University

Pacific Northwest National Laboratory assistance:
Wayne Johnson, Elizabeth Golovich, Robert Bryce, Amoret Bunn, John Cary, Mickie Chamness, Janelle Downs, Vicki Freedman, Alicia Gorton, Jeannette Hyatt*, Ellen Kennedy, George Last, Peter Lowry, Michelle Niemeyer, Mary Peterson, Christine Ross, and Michael Truex

*Savannah River National Laboratory

CRESP
Consortium For Risk Evaluation with Stakeholder Participation

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Why the Risk Review?

David M. Klaus, Deputy Under Secretary, Jan. 16, 2014:

The goal of the Risk Review Project is to identify and characterize potential risks and impacts to the public, workers, and the environment…and to inform the efficient use of [DOE-EM] resources.

…to develop a summary level catalogue of risks and impacts … to rate or bin those risk and impacts according to the magnitude of potential risks …[considering] current and potential future impacts to human health (public and workers), land and river ecology, nuclear safety, natural resources, and cultural resources.

…Focus on risks associated with cleanup work that is currently on-going and remaining…recommendations should be prospective...

Methodology

1. Identification of Evaluation Units
   - 64 EUs derived from > 700 waste sites
   (1) legacy source sites, such as past practice liquid waste disposal and buried solid waste sites;
   (2) tank waste and farms and associated legacy contamination sources;
   (3) groundwater plumes;
   (4) inactive facilities undergoing decommissioning, deactivation, decontamination and demolition (D4); and
   (5) operating facilities used as part of the cleanup process.
2. Summary Evaluation Templates
3. Temporal Evaluation Periods
4. Initiating Events
5. Risk Ratings

   Rating Scale: Very High, High, Medium, Low, and Not Discernible (ND)

   Human Health: Facility Worker, Co-located Person, Controlled Access Person, Public

   Resources: Groundwater, Columbia River, Ecological, Cultural

Overarching Observations

1. **Members of the public**, whether located at the official Hanford Site boundary or at the controlled access boundary (river and highways**), usually have Low to Non- Discernible risks**, even if postulated radioactive contaminant releases from bounding scenarios were to occur.
2. **Timing of cleanup** of a specific evaluation unit **may reduce worker risk** (e.g., by radioactive decay) **or may increase worker risk** (e.g., by facility deterioration, insufficiently trained workforce availability).
3. **A major seismic event at the Hanford Site, which would likely affect multiple facilities simultaneously**, may release large quantities of radiological contaminants from multiple inactive canyon processing and other facilities that can pose greater risks to human health than contaminants in the legacy sites on the Central Plateau.
4. **Ecological resources on the Hanford Site are very important to the Columbia River Basin ecoregion**. The Site also contains some federal and state threatened and endangered species. DOE stewardship has helped protect and enhance these resources.
5. **The historical and cultural significance of the Hanford Site** to **Tribal Nations** stretches over 10,000 years. The Hanford Site also has important historical significance to **Western settlement**, which began in the early 1800s and the site played a major role during the **Manhattan Project Era** and during the **Cold War Era**. DOE's stewardship helps ensure continued recognition of the site's historical and cultural significance

Specific Observations that Inform Cleanup

1. Reduce threats posed by tank wastes
   - Hydrogen gas generation in event of loss of active ventilation
   - Tc-99 and I-129 are primary groundwater threat
   - Selective, risk-informed waste retrieval targets should be considered.
2. Reduce dependence on active controls (e.g., reliance on power, cooling water, active ventilation) to maintain safety for additional facilities with large inventories of radionuclides.
   - Waste Encapsulation and Storage Facility (WESF)
   - KW Basin Sludge
   - T Plant
3. Consider interim actions to reduce or eliminate cleanup actions that could cause substantial human health risks.
4. Address portions of specific evaluation units first before the whole.
   - 618 Burial Ground
   - Building 324
   - KE/KW Reactors
   - Plutonium Uranium Extraction Plant (PUREX)
   - Reduction-Oxidation Plant
5. Reduce or eliminate risks associated with external events and natural phenomena (fires, severe seismic events, loss of power for long duration)
6. Continue reducing groundwater threats
   - 200 West and 200 East (currently not addressed)