

The Bechtel Hanford Inc./PNNL Partnership

...a summary of
Contributions
for FY03



CONTENTS

Decommissioning	1
<i>PNNL identified technology-based improvements and provided test procedures to evaluate contaminant fixative options for the excavation of the 105-H Reactor fuel storage basin.</i>	
<i>Reactors Interim Safe Storage</i>	1
Remedial Action and Waste Disposal	2
<i>PNNL applied the Enhanced Site Characterization System at the 618-5 burial ground. PNNL identified options for handling 618-7 burial ground drums and stabilizing the pyrophoric chips to support the remediation planning.</i>	
<i>Burial Ground Remediation</i>	2
Technical Assistance	3
<i>PNNL provided technology-related information for remediation project managers.</i>	



618-5 Burial Ground



105-H Reactor

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Pacific Northwest National Laboratory (PNNL), as part of the Bechtel Hanford Inc. Technology Application function, has supported the Environmental Restoration Contractor since fiscal year (FY) 1996 by assessing science and technology opportunities to improve on the Environmental Restoration Project baseline, identifying viable technology solutions, facilitating the deployment and demonstration of technologies, and providing technical assistance for technology-related issues. Specific support provided by PNNL in FY03 is summarized below.

Decommissioning Reactors Interim Safe Storage

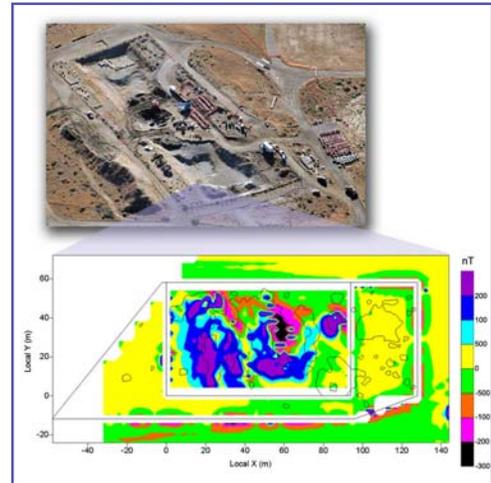
The 105-H Reactor fuel storage basin (FSB) is a reinforced-concrete basin (approximately 7,000 ft² and 20 ft deep) that was used as a collection, storage, and transfer facility for irradiated fuel elements discharged from the reactor. Excavation of contaminated materials from the 105-H Reactor FSB was completed in FY03. PNNL identified technology-based enhancements and provided test procedures to evaluate contaminant fixative options.



The Remote Retrieval System was used to remove high dose items from the bottom of fuel storage basins

Remedial Action and Waste Disposal Burial Ground Remediation

The wide variety of wastes disposed in burial grounds and inadequate waste disposal records make burial ground remediation technically challenging. A key issue for burial ground remediation is characterization prior to excavation to determine if any problematic waste forms are present. The Enhanced Site Characterization System (ESCS) had been successfully deployed by PNNL at the 618-4 burial ground in FY99 to define the outline of drummed uranium waste. In FY03, PNNL applied ESCS at the 618-5 burial ground prior to excavation. The ESCS characterization produced a map of the types of buried objects in the burial ground. Using the ESCS, PNNL successfully determined that there were no problematic waste forms (e.g., drums) in the burial ground. The map was then used to guide excavation activities.



PNNL deployed the Enhanced Site Characterization System to produce a map of buried objects to guide excavation activities

Drums containing pyrophoric zircaloy chips are in the 618-7 burial ground. Zircaloy chips must be stabilized after excavation for subsequent disposal at the Environmental Restoration Disposal Facility. PNNL identified technology options for handling the drums and stabilizing the pyrophoric chips to support the remediation planning for this burial ground.

Technical Assistance

PNNL supported a variety of remediation decisions by providing technology-related information to the project engineers. Specific letter reports produced in FY03 are shown in the table.

Fiscal Year 2003 Technology Review Reports

Project	Report Subject
Interim Safe Storage	Fixative Technologies
Interim Safe Storage	Arsenic Soil Treatment Options
Interim Safe Storage	Dust Suppression Alternatives
Decommissioning	Fogging Technology Alternatives
Decommissioning	Metal Decontamination Review
Remedial Action and Waste Disposal	Zircaloy Treatment Options
Remedial Action and Waste Disposal	100-BC Subsurface Pipeline Alternatives
Remedial Action and Waste Disposal	Portable Metal Analyzers Review
Remedial Action and Waste Disposal	618-4 Hydrocarbon Treatment Options

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Other examples of PNNL support to the Environmental Restoration Project are as follows:



*Environmental Restoration
Disposal Facility*

- Obtained information on the leachability of graphite carbon-14 for use by the Interim Safe Storage (ISS) Project in determining whether Environmental Restoration Disposal Facility would accept carbon-14 contaminated waste from 105-H Reactor.
- Provided the Decommissioning Project the technical basis for disposal for metal components by evaluating decontamination techniques versus Environmental Restoration Disposal Facility disposal.
- Obtained information for the ISS Project on a rock/concrete breaking technique called the "Rockcracker." The technique uses small charges in boreholes to generate high-pressure gases that crack the rock/concrete as the gases expand. The charges used are much lower in energy than those normally used for demolition. The technique is being considered to use in demolition of the 105-H Reactor Gas Ventilation Wing.

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