Waste Treatment and Immobilization Plant (WTP) Design Changes

The Washington State Department of Ecology (Ecology) is proposing a change to the *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit*, Revision 8C.

This change affects the *Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste* for the Waste Treatment and Immobilization Plant (WTP Permit). The proposed changes are located in Part III, Operating Unit 10.

The permittees are:

United States Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

This proposal is one of many changes to the original WTP Permit. Periodic updates allow the permittees to continue construction while designing other parts of WTP.

The proposed design change package addresses the design of High Efficiency Particulate Air (HEPA) preheaters for the offgas/vessel vent process (LVP) system miscellaneous unit subsystems in the Low-Activity Waste (LAW) facility at the +48 ft.-elevation.

Ecology invites you to review, ask questions, and comment on this WTP Permit change. The comment period begins September 2, 2014, and ends October 20, 2014.

WTP overview

WTP has three facilities that will separate and process Hanford's tank waste for long-term disposal:

- Pretreatment (PT). Waste will be pumped from the Hanford tanks via underground pipes to the PT Facility's interior waste

WHY IT MATTERS

The proposed permit changes affect the Waste Treatment and Immobilization Plant (WTP). WTP will immobilize in glass 56 million gallons of dangerous radioactive and chemical waste stored in 177 underground storage tanks at Hanford.

Some waste from the tanks has polluted groundwater that flows toward, and can seep into, the Columbia River.

Safely treating tank waste is an important goal to help protect people and the environment.

PUBLIC COMMENT PERIOD

September 2, 2014 –
October 20, 2014

To Submit Comments

Please send comments by email (preferred), U.S. mail, or hand deliver them to:

Heather John
3100 Port of Benton Blvd.
Richland, WA 99354
Hanford@ecy.wa.gov

Public Hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

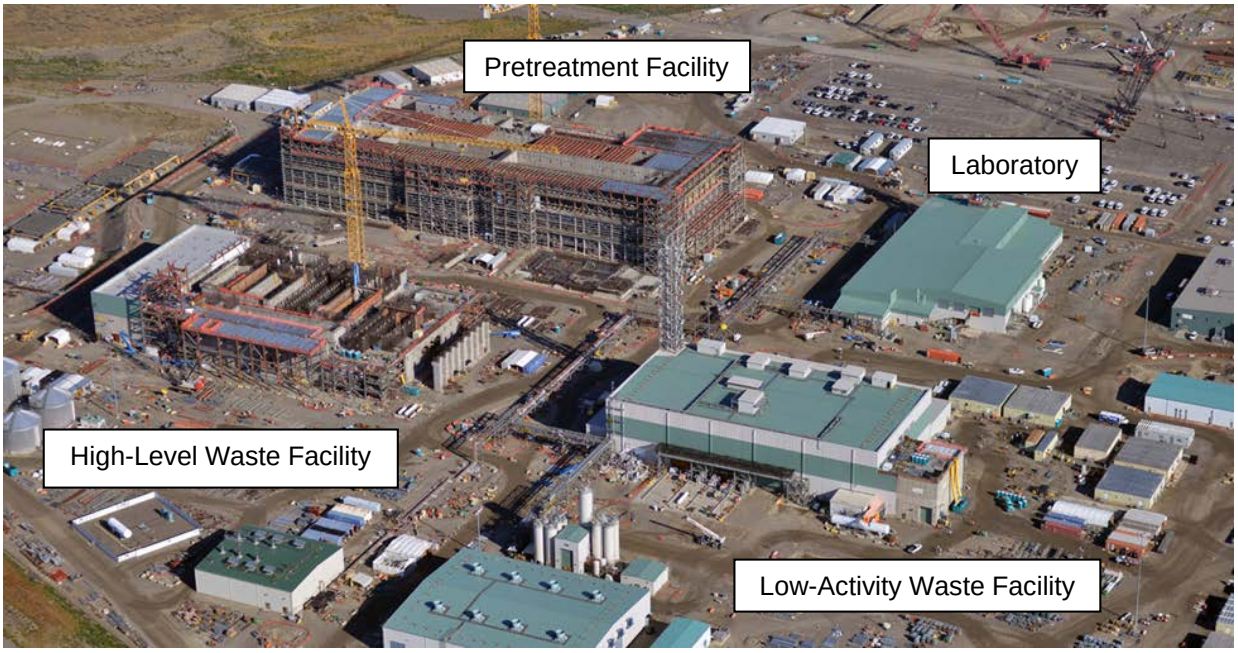
Heather John
800-321-2008
Hanford@ecy.wa.gov

Please see page 4 for definitions of specialized terms used in this publication.

feed receipt vessels. The waste treatment process will begin in the PT Facility, where waste will be divided into high-level solids and low-activity liquids.

- LAW treatment. In the LAW Facility, concentrated low-activity waste will be mixed with silica and other glass-forming materials. The mixture will be fed into the LAW's melters and heated.
- High-Level Waste (HLW) treatment. In the HLW Facility, high-level waste will be mixed with glass-forming materials in two 90-ton melters and heated to 2,100 degrees Fahrenheit.

At the heart of treatment is vitrification, or immobilizing waste in glass. In the PT Facility, tank waste will be separated into LAW and HLW. The waste is then sent to the appropriate vitrification facility, mixed with glass formers, and piped to large heating containers called melters.



The Waste Treatment Plant, commonly called the vit plant or WTP, in September 2013 (photo courtesy of Bechtel).

During vitrification, the melters will heat tank waste and silica glass formers to 2,100ºF (1,150ºC). Then, the molten liquid will be poured and sealed in stainless-steel disposal containers. In these containers, the vitrified waste will cool into solid glass logs.

In glass form, the waste is still radioactive. However, the solid waste will be extremely durable and waterproof. This will protect people and the environment for thousands of years as the radioactivity decays. The proposed change to the WTP Permit includes the following permit design package. This package will allow new construction in the LAW Facility.

Design Package No. LAW-026A, Rev. 0, LAW Facility LVP System Miscellaneous Unit (HEPA Preheaters LVP-HTR-00001A/B & -00003A/B)

The LAW Vitrification Facility permit package LAW-026A addresses the design of offgas/vessel vent process (LVP) system. The design focuses on miscellaneous unit subsystems in the LAW facility at the

+48 ft.-elevation for the HEPA preheaters. Offgas is a gaseous radioactive and hazardous byproduct of tank waste treatment.

The purpose of the LVP system is to remove particulates from the combined primary offgas and vessel vent streams. The LVP system consists of preheaters, HEPA filters, mercury adsorbers, a catalytic oxidizer/reducer, a caustic scrubber, a caustic collection tank, and exhausters.

HEPA preheaters heat offgas to raise the offgas above the dew point. Gases created by the melter combine with gases from vessels in the rest of the facility and are treated before they are discharged. The HEPA preheaters heat and dry the gas so that it can pass through the HEPA filters safely. The offgas then passes through the HEPA filters which remove particulates.

The offgas is treated to remove mercury, iodine, and acid gases. It is then directed through the LAW melter offgas caustic scrubber which removes residual acid gases and provides final offgas cooling. The exhausters are fans that pull offgas through the primary and secondary offgas treatment systems. The exhausters safely discharge the offgas the atmosphere through the LAW stacks.

Millwrights carefully measure alignment holes for ventilation equipment outside of the Low-Activity Waste (LAW) Facility, in May 2014 (photo courtesy of Bechtel).

View the full proposal

This document is a summary of the proposed WTP Permit changes. The full proposal is available beginning September 2, 2014, on Ecology's Nuclear Waste Program website (www.ecy.wa.gov/programs/nwp/commentperiods.htm) or at Hanford's public information repositories. (see locations on page 4)

Public Information Repositories

Ecology Nuclear Waste Resource Center
3100 Port of Benton Blvd.
Richland, WA 99354
Contact: Valarie Peery 509-372-7950

U.S. Dept. of Energy Administrative Record
2440 Stevens Drive, Room 1101
Richland, WA 99354
Contact: Heather Childers 509-376-2530

U.S. Department of Energy Reading Room
2770 Crimson Way, Room 101L
Richland, WA 99354
Contact: Janice Parthree 509-375-3308

Portland State University
Branford Price Millar Library
1875 SW Park Avenue
Portland, OR 97207
Contact: Claudia Weston 503-725-4542

University of WA Suzzallo Library
P.O. Box 352900
Seattle, WA 98195
Contact: Hilary Reinert 206-543-5597

Gonzaga University Foley Center
502 E Boone Avenue
Spokane, WA 99258
Contact: John Spencer 509-313-6110

TERMS TO KNOW

Dangerous Waste Permit: A State-issued permit allowing facilities to store, treat, and/or dispose of dangerous chemical or mixed radioactive and chemical waste.

Deep geologic repository: A long-term nuclear waste disposal site excavated underground, below 980 feet, in a stable geologic environment.

High-level waste: Results from reprocessing spent nuclear fuel. This includes liquid produced during reprocessing and solids derived from this liquid waste that contain fission products in sufficient concentrations and other highly radioactive material that, by law, requires permanent isolation.

Low-activity waste: Remains after as much radioactivity as is technically and economically practical has been separated from high-level waste. When vitrified, it may be disposed of as low-level radioactive waste in a near-surface facility at Hanford.

Offgas: A gaseous radioactive and hazardous byproduct of tank waste treatment.

Resource Conservation & Recovery Act (RCRA): Federal law authorizing the U.S. Environmental Protection Agency (EPA) to manage hazardous waste, including the generation, transportation, treatment, storage, and disposal of hazardous and other solid waste and waste in underground tanks. At Hanford, EPA has delegated regulatory authority to the State.

Underground storage tank: A tank that is entirely below the surface of and covered by the ground. At Hanford, two types of underground storage tanks have capacities ranging from 50,000 to one million gallons. The single-shell tanks have one steel liner encased in reinforced concrete, and do not comply with State environmental laws. The double-shell tanks have two steel liners in reinforced concrete and are in compliance with the law.

Vitrification: Immobilizing waste by mixing it with glass formers and melting the mixture into a glass form that cools into a solid.

Waste Treatment and Immobilization Plant: Facility to thermally treat and vitrify tank waste.

DEPARTMENT OF ECOLOGY
State of Washington

3100 Port of Benton Blvd.
Richland, WA 99354

Public Comment Period on Hanford's Waste Treatment Plant Permit Modification

September 2, 2014 – October 20, 2014

Submit questions or comments to:

Hanford@ecy.wa.gov

Special accommodations:

To request ADA accommodation for disabilities, or printed materials in a format for the visually impaired, call Ecology at 509-372-7950. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.