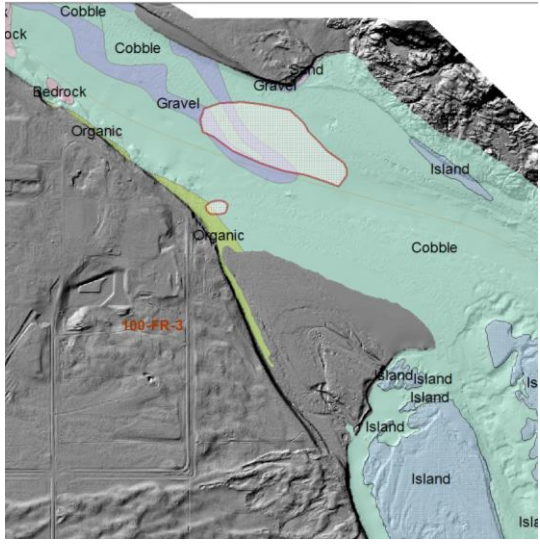


# Oregon Department of **ENERGY**

## Natural Resource Damage Assessment at Hanford

Sara Lovtang  
March 22, 2021



# OUTLINE OF PRESENTATION

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- Brief explanation of Natural Resource Damage Assessment
- History of Hanford Natural Resource Trustee Council
- Examples of past and current work
- How to value ecosystem services
- Challenges in estimating injury
- Questions

# NATURAL RESOURCE DAMAGE CLAIMS

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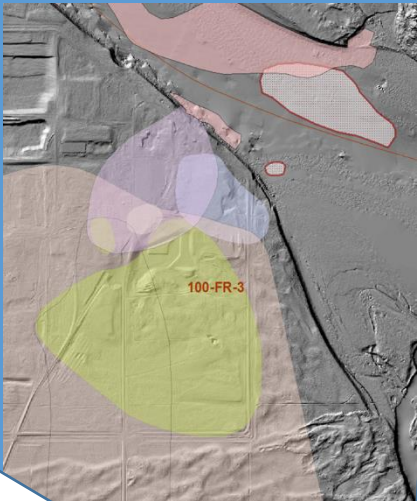
- NRD claims are brought by governments on behalf of their public for harm to natural resources
- Hanford trustees use CERCLA guidelines to determine injury:
  - From exposure to contaminants;
  - From physical damage caused by cleanup;
  - From time of release (or 1980);
  - Until ecosystem services are restored.

# NATURAL RESOURCE DAMAGE CLAIMS

Source Release



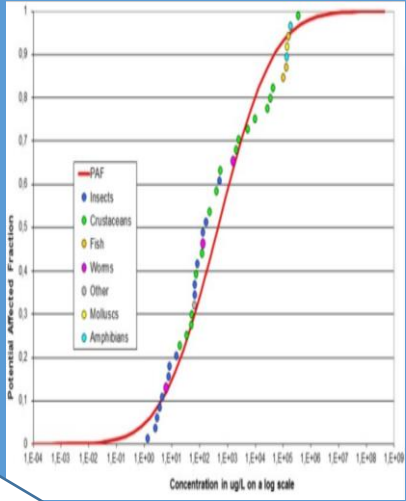
Pathway Migration



Quantify exposure Receptor



Dose estimate Risk/Injury



\$ damages Restoration



# NRDA AT HANFORD

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## Eight trustees in the Hanford Natural Resource Trustee Council

- 2 states (Oregon and Washington)
- 3 Native American tribes (Confederated Tribes of the Umatilla Indian Reservation, Nez Perce Tribe, Yakama Nation)
- 3 federal agencies (US Department of Energy, US Fish and Wildlife Service, National Oceanic and Atmospheric Administration)



# NRDA AT HANFORD

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- 1993: HNRTC trustee organizations invited by DOE
  - Advise in cleanup and future use of Site
- 2005-2012: legal settlement requires DOE to fund trustee participation upfront (not at end)
  - HNRTC becomes more active
- 2007: Pre-assessment screen and determination
  - Decision to proceed with formal NRDA
- 2012: Injury Assessment Plan complete



# TRUSTEE COUNCIL TASKED WITH:

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- Ensure habitat and resources returned to baseline (as if no releases occurred);
- Restore ecosystem services (not based on human-health thresholds);
- Define the scope and scale of restoration through scope and scale of injury;
- Work cooperatively, but be prepared for litigation.



# WORKING GROUPS of HNRTC

- Groundwater
- Aquatic/near-shore
  - Assessing injury,
  - Debiting/crediting systems
- Terrestrial
  - Assessing injury from physical disturbance and contamination
  - Debiting/crediting systems
- Tribal service loss





# GROUNDWATER CLAIM

Completed 2017

- Total unconfined aquifer at Hanford Site
  - volume = 3.5 km<sup>3</sup> (2.84 million acre-ft.)
- 2014 contaminated aquifer
  - volume = 0.55 km<sup>3</sup> (445,890 acre-ft.)
  - 0.04 km<sup>3</sup> in the 100 area
  - 0.51 km<sup>3</sup> south of 100 area
- 17% of aquifer contaminated above thresholds *in perpetuity*
- Estimated annual recharge is 6,000-18,000 acre-feet per year



# GROUNDWATER CLAIM

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- Under a “no release” scenario:
  - 1989 federal regulations & policies direct DOE to dispose of land no longer needed for original mission.
  - Would have disposed 266 mi<sup>2</sup> (~170,000 acres) that could be used for industry, residential, or agriculture.
  - 21.8 sq. miles of agricultural irrigation area
  - 51.3 sq. miles of residential area (32,161 households)
- All groundwater would have been used “but for the release.”



# Current focus on physical disturbance

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- Developed an inventory of physical injuries from cleanup
- “baseline” = “but for the release of hazardous substances”
  - Facilities and operations part of baseline
  - Imagine world where plutonium was produced without releases



- Injury includes:
  - Cribs/trenches/solid waste
  - Facilities built for cleanup (monitoring wells)
  - Other disturbance caused during remediation (roads)

# How to value terrestrial services

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- Hard to equate planting shrubs with soil contamination
  - Need a common “metric”
  - Assigning dollar value is thorny
- Many ways to place value on natural resources
  - Market value (timber, grazing permits, minerals, etc)
  - Non-market value difficult (surveys of “willingness to pay”)
  - Non-use value (preserve for future generations)
- Much of it comes down to negotiation



# How to value ecosystem services

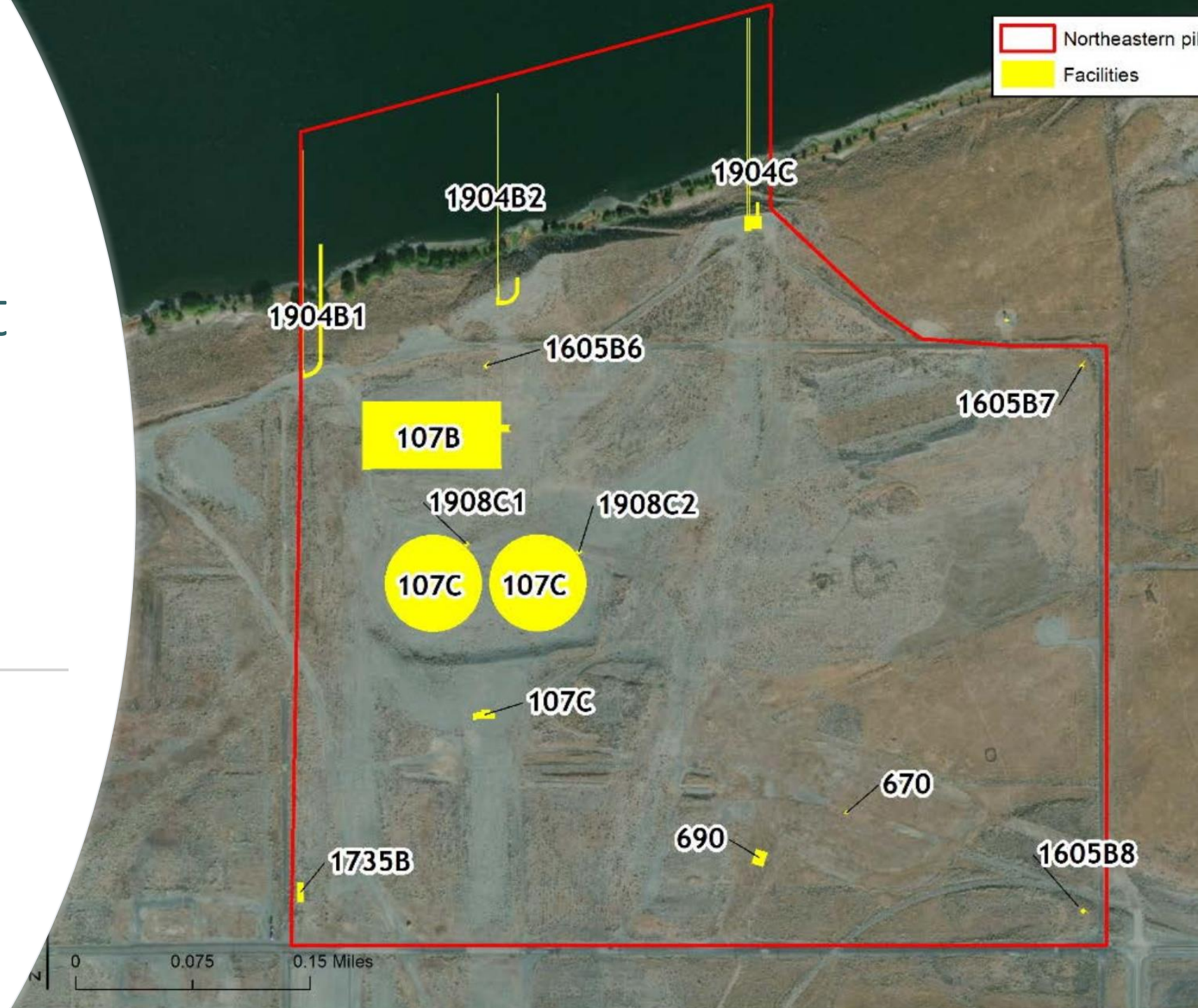
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- Discounted Service Acre Years (DSAYs): values services provided by 1 acre over 1 year.
- Habitat Equivalency Analysis (HEA):
  - Assumes equivalent habitats will provide equivalent services,
  - Assumes years of lost-services (DSAYs lost due to injury) can be compensated for by providing acres of additional habitat (DSAYs gained by restoration)
- Trustees will try to make restoration = lost services:
  - Service Acre Years lost during injury (Debits, owed to public)
  - Service Acre Years gained by certain restoration (Credits)

# Pilot HEA for part of 100-B/C

(140 acres in NE  
section near river)

Final number of  
DSAYs calculated:  
415 - 5,338  
(mean=2,067)



# ESTIMATING INJURY COMPLICATED

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- Challenges in:
  - Getting data from DOE/contractors
  - Agreeing on assumptions (legal and technical)
  - Estimating past injury
  - Estimating future injury (cleanup is not complete)
  - Estimating “but for the release” (differing interpretations)
  - Estimating recovery time to baseline state
  - Simplifying complicated injury in large legal settlement
  - Trusting responsible party, who controls data and contracts



• **Hanford Natural Resource  
Trustee Council**

[www.hanfordnrda.org](http://www.hanfordnrda.org)

• **U.S. Dept. of Energy  
Hanford web site**

[www.hanford.gov/page.  
cfm/HRRTC](http://www.hanford.gov/page.cfm/HRRTC)



# WHY HNRTC HASN'T MOVED FASTER

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- Under-funded: 2014 Project Execution Plan forecasts completion of Restoration Plan in 2024 – if fully funded.
  - PEP budget estimated NRDA cost of \$85 million, resulting in an annual average cost of \$ 8.5 million.
  - Budget allocations by the DOE for the NRDA have averaged \$3.1 million/year.
- All data/analyses must go through quality control
- Contracting through DOE is slow (sometimes non-starter)
- The HNRTC operates under consensus