

**Gamache, Lori M**

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**From:** Conrad, Jill A  
**Sent:** Friday, February 15, 2013 1:05 PM  
**To:** Alex Nazarali (alexnazarali@ctuir.org); Alyssa Buck (Abuck1@gcpud.org); HNRTC - Smith, Anthony; 'Bambi Rodriguez (bambirodriguez@ctuir.org)'; 'Barbara Harper (barbaraharper@ctuir.com)'; HNRTC - Landeen, Dan; Dana Miller (dmiller@ynerwm.com); Darla Jackson (darlaj@nezperce.org); Dave Rowland (dave.rowland@[redacted]); davidb@nezperce.org; Doreen Dogsleep (ddogsleep@ynerwm.com); HNRTC - Bohnee, Gabriel; 'George Klinger (georgeklinger@ctuir.org)'; Jack Bell (jackb@nezperce.org); Jean Vanni (jvanni@ynerwm.com); John Stanfill (johns@nezperce.org); Josiah Pinkham (josiahp@nezperce.org); Julie Longenecker (jlongene@[redacted]); Leah Sue (lsue@ynerwm.com); 'lynnettep@nezperce.org'; Marlene Shavehead (mshavehead@ynerwm.com); Michelle Burke (michelleburke@ctuir.com); Mike Sobotta (mikes@nezperce.org); Natalie Swan (nswan@ynerwm.com); Rex Buck (rbuck@gcpud.org); HNRTC - Cruz, Rico; Rose Ferri (rferri@ynerwm.com); Rose George (rgeorge@ynerwm.com); Russell Jim (rjim@ynerwm.com); 'Ryan Ashley (ryanashley@ctuir.org)'; HNRTC - Lilligren, Sandra; Steven Link (Stevenlink@ctuir.com); Stuart Harris; Teara Farrow Ferman (TearaFarrowFerman@ctuir.org); Ted Repasky (tedrepasky@ctuir.com); Wade Riggsbee (wriggsbee@[redacted])  
(b)(6)  
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**Cc:** Gamache, Lori M; Ballinger, Kimberly S; Lutz, Karen  
**Subject:** DOE/ORP Press Release  
**Attachments:** SST T111 Liquid Level Decrease FINAL (2).pdf

Please find attached a press release issued today by the Office of River Protection regarding liquid levels in tank T-111 decreasing.

Jill A. Conrad  
Tribal Affairs Program Manager  
DOE Richland Operations Office  
(509) 376-0288 (office)

(b)(6) (cell)



# U.S. DEPARTMENT OF **ENERGY**

**MEDIA CONTACTS:**  
Lori Gamache, ORP, (509) 372-9130

**FOR IMMEDIATE RELEASE:**  
February 15, 2013

## **OFFICE OF RIVER PROTECTION CONFIRMS A DECREASE OF LIQUID LEVEL IN HANFORD SINGLE-SHELL TANK**

**RICHLAND** – The U.S. Department of Energy (DOE) Office of River Protection (ORP) and its Tank Farms operations contractor Washington River Protection Solutions (WRPS) have determined that liquid levels in Hanford single-shell tank (SST) T-111 are decreasing. The specific cause of the liquid level decrease in Tank T-111 has not been determined.

Monitoring wells in the T Tank Farm, where Tank T-111 is located, have not identified significant changes in concentrations of chemicals or radionuclides in the soil. DOE is continuing to monitor its network of monitoring wells in the area of T Tank Farm and is evaluating possible next steps.

This tank was classified as an assumed leaker in 1979. In February 1995, interim stabilization was completed for this tank. In order to achieve interim stabilization, the pumpable liquids were removed in accordance with agreements with the State of Washington.

Data indicates the current rate of loss of liquids from the tank could be in the range of 150 to 300 gallons over the course of a year.

Tank T-111 is a 530,000-gallon capacity underground storage tank built between 1943-44, and put into service in 1945. T-111 currently contains approximately 447,000 gallons of sludge, a mixture of solids and liquids with a mud-like consistency. There are a total of 177 tanks at the Hanford site.

The cleanup of radioactive and chemical tank waste at Hanford and protection of the environment, public and workers remains a top priority for the Department and its Environmental Management mission. The Department will continue to work closely with the State of Washington, Congress and other key stakeholders to address this situation and continue progress on this important mission at Hanford.

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**Gamache, Lori M**

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**From:** Ballinger, Kimberly S  
**Sent:** Friday, February 22, 2013 4:52 PM  
**To:** 'Abuck1@gcpud.org'; 'AlexNazarali@ctuir.org'; Rodriguez, Annabelle L; Conrad, Jill A; Gamache, Lori M; 'MichelleBurke@ctuir.com'; Wright, Mona K; HNRTC - Cruz, Rico; 'RodSkeen@ctuir.com'; 'TearaFarrow@ctuir.com'; 'asmith@enterprise.nezperce.org'; 'barbaraharper@ctuir.com'; HNRTC - Harper, Barbara; 'darlaj@nezperce.org';  
(b)(6) 'dave.rowland@' 'dmiller@ynerwm.com'; HNRTC - Bohnee, Gabriel;  
(b)(6) 'jlongene@' 'johns@nezperce.org'; 'josiahp@nezperce.org'; Lutz, Karen; 'kris@yakama.com'; 'kristieb@nezperce.org'; 'laleck@yakama.com'; 'lynnettep@nezperce.org'; 'mikes@nezperce.org'; 'mshavehead@yakama.com'; 'prigdon@yakama.com'; 'rbuck@gcpud.org'; 'rferri@ynerwm.com'; HNRTC - Russell, Jim; HNRTC - Lilligren, Sandra; 'stans@nezperce.org'; HNRTC - Harris, Stuart; 'tedrepasky@ctuir.com'; 'wriggsbee@' (b)(6)  
**Subject:** Message from the Department of Energy Office of River Protection

"The Department of Energy has determined based on data gathered through the single shell tank monitoring program that there are six tanks at the Hanford site in eastern Washington State, including the one announced last week, that show declining levels of fluid. There is no immediate public health risk. The Department is working with the State of Washington and other key stakeholders to address the issues associated with these tanks."

Erik Olds  
Chief of Staff  
U.S. Department of Energy, Office of River Protection  
509-372-8656 office

(b)(6) cell

**Gamache, Lori M**

**From:** Conrad, Jill A  
**Sent:** Wednesday, March 06, 2013 3:23 PM  
**To:** Alex Nazarali (alexnazarali@ctuir.org); Alyssa Buck (Abuck1@gcpud.org); HNRTC - Smith, Anthony; Bambi Rodriguez (bambirodriguez@ctuir.com); Barbara Harper (barbaraharper@ctuir.com); HNRTC - Landeen, Dan; Dana Miller (dmiller@ynerwm.com); Darla Jackson (darlaj@nezperce.org); Dave Rowland (dave.rowland@ [redacted]) davidb@nezperce.org; Doreen Dogsleep (ddogsleep@ynerwm.com); HNRTC - Bohnee, Gabriel; George Klinger (georgeklinger@ctuir.org); Jack Bell (jackb@nezperce.org); Jean Vanni (jvanni@ynerwm.com); John Stanfill (johns@nezperce.org); Josiah Pinkham (josiahp@nezperce.org); Julie Longenecker (jlongene@ [redacted]) Leah Sue (b)(6) (lynnettep@nezperce.org); Marlene Shavehead (mshavehead@ynerwm.com); Michelle Burke (michelleburke@ctuir.com); Mike Sobotta (mikes@nezperce.org); Natalie Swan (nswan@ynerwm.com); Rex Buck (rbuck@gcpud.org); Rose Ferri (rferri@ynerwm.com); Rose George (rgeorge@ynerwm.com); Russell Jim (rjim@ynerwm.com); HNRTC - Lilligren, Sandra; Steven Link (Stevenlink@ctuir.com); Stuart Harris; Teara Farrow Ferman (TearaFarrowFerman@ctuir.org); Ted Repasky (tedrepasky@ctuir.com); Wade Riggsbee (wriggsbee@ [redacted])  
**(b)(6)**  
**Cc:** Meyer, Carrie C; Gamache, Lori M  
**Subject:** FW: DOE Announces Preference for Disposal of Hanford Transuranic Tank Waste at WIPP

**From:** DOE EM [mailto:doeem@public.govdelivery.com]  
**Sent:** Wednesday, March 06, 2013 11:05 AM  
**To:** Conrad, Jill A  
**Subject:** DOE Announces Preference for Disposal of Hanford Transuranic Tank Waste at WIPP



**EM News Flash | March 6, 2013**

**DOE Announces Preference for Disposal of Hanford Transuranic Tank Waste at WIPP**

**WASHINGTON, D.C.** – Today the U.S. Department of Energy (DOE) announced its preferred alternative to retrieve, treat, package, characterize and certify certain Hanford tank waste for disposal at the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico, if such waste is properly classified in the future as defense-related mixed transuranic tank waste (mixed TRU waste).

This preferred alternative, which may cover up to approximately 3.1 million gallons of tank waste contained in up to 20 tanks, will provide DOE with an option to deal with recent information about possible tank leaks and to expedite the overall tank waste retrieval effort at the Hanford Site in southeastern Washington State.

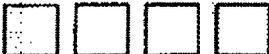
“This alternative, if selected for implementation in a record of decision, could enable the Department to reduce potential health and environmental risk in Washington State,” said Dave Huizenga, head of the EM program. “WIPP is a national resource for the disposal of mixed TRU waste generated from defense activities, and this alternative, if implemented, would not impact the continued safe operations and performance of the WIPP facility in New Mexico.”

Retrieving and processing candidate mixed TRU waste was evaluated in the Tank Closure and Waste Management Environmental Impact Statement issued for the Hanford Site in December 2012. Initiating retrieval of tank waste that has been properly classified as defense-related mixed TRU waste would be contingent on DOE's obtaining the applicable and necessary permits, ensuring that the WIPP Waste Acceptance Criteria and all other applicable regulatory requirements have been met. Further, retrieval of waste would not commence until a Record of Decision (ROD) had been issued. DOE may issue such a ROD regarding the candidate mixed TRU wastes no sooner than 30 days from the date of publication of this notice in the Federal Register.

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This email was sent by GovDelivery, Inc. on behalf of DOE Office of Environmental Management - 1300 Independence Ave., SW Washington, DC 20535 - (202) 854-7799

## Gamache, Lori M

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**From:** Gamache, Lori M  
**Sent:** Monday, March 18, 2013 9:01 AM  
**To:** Gamache, Lori M  
**Subject:** FW: T-111 follow up

**From:** Johnson, Jeremy M  
**Sent:** Friday, February 22, 2013 11:03 AM  
**To:** 'David Bernhard'  
**Cc:** 'Stan Sobczyk'; Kemp, Christopher J; 'John Stanfill'; Gamache, Lori M; Braswell, Sharon M; Ballinger, Kimberly S; Conrad, Jill A  
**Subject:** RE: T-111 follow up

David and Stan,

Thank you for your input regarding T-111. We are in the process of evaluating further actions related to the tank and I can work with our communications department to provide an update on the progress at a later date. I will ensure your recommendations are considered as we continue to evaluate the path forward.

Sincerely,

Jeremy Johnson  
DOE-ORP  
Programs Division  
509-376-1866

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**From:** David Bernhard [<mailto:davidb@nezperce.org>]  
**Sent:** Thursday, February 21, 2013 3:59 PM  
**To:** Johnson, Jeremy M  
**Cc:** 'Stan Sobczyk'; Kemp, Christopher J; 'John Stanfill'  
**Subject:** T-111 follow up

Hi Jeremy,

Thank you the presentation on tank AY-102 and the information on the tank T-111 leak that you provided on Tuesday, February 19.

Based on the limited current information that is available to us, we recommend that DOE/ORP take the following actions:

- 1) Reinstitute saltwell pumping of tank T-111 to remove the interstitial liquid. We recognize that this process will proceed slowly due to the impermeable nature of the sludge. A shielded tanker car will also likely be necessary to collect the waste due to lack of infrastructure.
- 2) Assess the tank's contents for potential criticality. Review of WHC-EP-0806 indicated from core data the top ~50,000 gallons of T-111 was T plant cleanout waste. This waste was largely undocumented waste. The 222-S data for that layer was biased 2-5 times low for plutonium and 2 times low for uranium. The bias was determined from samples comparison with PNNL analysis at 325. This would indicate there is up to 50 Kg

plutonium and 9,000-18,000 Kg of uranium in the top 50,000 gallon layer of the tank. A boron wash or other neutron absorber addition may be warranted. When sluicing this waste boron addition to sluicing medium would be advised.

- 3) Log the tank's surrounding drywells with HPGe, passive neutron and neutron-moisture sondes. When a ~662 photopeak is identified, evaluate the spectrum for additional photopeaks associated with Am-241 instead of assuming the presence of Cs-137.
- 4) Take the steps necessary to prevent the continued intrusion of water into the tank.

In DOE's February 15 press release, the following is stated:

"Monitoring wells in the T Tank Farm, where Tank T-111 is located, have not identified significant changes in concentrations of chemicals or radionuclides in the soil. DOE is continuing to monitor its network of monitoring wells in the area of T Tank Farm and is evaluating possible next steps."

We were not aware that DOE was able to routinely monitor changes in chemical concentrations in the soil. Please inform us as DOE is accomplishing this monitoring. We don't consider groundwater monitoring results as an appropriate form of vadose zone monitoring. We are aware of the HRR survey that was collected in T Farm; however, we believe that his survey in itself is insufficient to monitor changes in the subsurface. We are aware that DOE does have the ability to monitor changes in gamma-emitting radionuclides via the drywells in the tank farms. We have electronic copies of the geophysical log data that has been collected in the drywells through 2008. Please email to us electronic copies of the geophysical drywell data that have been collected in T farm since January 1, 2009.

Thank you for your continued efforts in the tank integrity program.

David Bernhard and Stan Sobczyk

Nez Perce Tribe ERWM  
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## Gamache, Lori M

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**From:** Conrad, Jill A  
**Sent:** Tuesday, March 26, 2013 4:53 PM  
**To:** 'David Bernhard'  
**Cc:** Kemp, Christopher J; Trenchard, Glyn D; Grindstaff, Joanne F; Fletcher, Thomas W; Ballinger, Kimberly S; 'Stan Sobczyk'; 'John Stanfill'; HNRTC - Bohnee, Gabriel; Johnson, Jeremy M; Gamache, Lori M  
**Subject:** RE: Thoughts on possible SST liquid losses/gains

Hi Dave -- Jeremy is out of the office, but asked me to forward the following response:

David,

These 6 tanks were chosen for further evaluation based on the decreasing surface level trends you have plotted with the TWINS data. Based on initial assessment of these tanks there were no known explanations that could account for the decreases. We have performed a visual inspection in T-111 and verified that both level monitoring devices appear to be reading the interstitial liquid level. We have not yet inspected the other 5 tanks to determine whether the instruments are tracking liquid levels accurately.

**I pulled up the interstitial liquid levels for T-111 and TY-105 from TWINS and they show liquid going down in both tanks about 2.4 inches. Is this all thought to be liquid loss?**

No. Some of this would be due to evaporation. That is dependent on tank waste temperatures, ambient temperatures, tank barometric breathing rate and the amount of surface that is liquid. In equating the level decrease to a waste volume amount, we also consider the relative amount of surface liquid and the porosity of the waste. This allows us to equate how much liquid waste is in 1 inch of tank waste. The level drop in T-111 equates to approximately 150 – 300 gallons per year.

**T-203, T-204, B-203, and B-204 only have decreases of less than 1 inch in the surface level. There is no interstitial liquid level that I can see for these tanks. Is it not likely these decreases in 200 surface levels are the ENRAF plumb making a divot in the solid waste surface?**

We do not have a Liquid Observation Well (LOW) in these tanks, so we do not have an indication of the interstitial liquid level. When we perform the in tank video, we will be able to see whether the ENRAF is measuring a liquid level or a solid waste level.

**Is there any more data for the 200 series to show a liquid loss? Is there any more data for T-111 and TY-105?**

We have performed video of T-111. At this point though, we have used the ENRAF and LOW readings, combined with tank temperatures (to determine the extent of potential evaporation).

Jeremy

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**From:** David Bernhard [mailto:davidb@nezperce.org]

**Sent:** Friday, March 15, 2013 4:10 PM

**To:** Johnson, Jeremy M

**Cc:** Kemp, Christopher J; Trenchard, Glyn D; Grindstaff, Joanne F; Fletcher, Thomas W; Conrad, Jill A; Ballinger, Kimberly S; 'Stan Sobczyk'; 'John Stanfill'; HNRTC - Bohnee, Gabriel

**Subject:** Thoughts on possible SST liquid losses/gains

Hi Jeremy,

I thought I would send you an email about some of our technical staff thinking about the recent SST levels changes. I have copied some of your coworkers because I did not know the actual team working on this issue. The views I am stating may not be the official position of the Nez Perce Tribe and are only opinion, thoughts and "guesses" of the technical staff.

**Problem Estimate:** We have been studying interstitial and surface liquid levels in SSTs. The data used was from TWINS. Our initial estimate or guess at the approximate number of SSTs that a leaking waste to the ground is around 15-16 tanks. This may be high or low but is a general ballpark number. This is estimate based on tank data which show possible indications of an actual leak and then applying it to other tanks.

The largest issue in determining a possible leak rate is determining an estimated rate of water intrusion rates for tanks. Some possible ideas for measuring water intrusion rates are:

- 1) If intrusion water is mostly on the top of liquid waste it may show up in the rate of change in neutron return signal per the rate of neutron probe insertion. Basically purer water is more moderating and will give greater signal return with higher water concentration and less neutron poisons. It may be worth looking at actual neutron probe data for past tank measurements for this possible effect. This effect may be grasping at straws but at least the data is already gathered.
- 2) Similarly, any density scan such as with an acoustic density measurement tool will show decreases in density and distribution with intrusion water. Doing some density scans on tanks with known water intrusion and comparing the results to past data or lab data of that tank waste may be a worth a check.
- 3) Intrusion water has less radionuclides in particular deuterium, tritium, oxygen 17, and maybe oxygen 18. Less radioactive volatile components especially tritium should be easily detectable in tank gas head space. This may take sampling of tank gas headspace with a specialized rad. detector or a mobile tandem mass spectrograph/mass spectrograph to determine isotopic ratios. Comparing the changes versus past or expected ratios with an known water intrusion tank might be a good starting point. The advantages of this method is there no liquid sample taken/no liquid waste and it is more representative of the average result for a tank.

These are just some possible ideas, but an additional estimate of intrusion water extent would be needed to better estimate the extent of the problem. Also having a suitable approximate method for intrusion water estimation would be good press. It does look like there are possible examples of tank water intrusion with liquid level increasing followed by a liquid levels decreasing and a possible leak. See attached spreadsheet for B-104 and TY-103.

**Actions:** We believe the best solution is to remove the liquid waste with small self-priming pumps. Ideally the pump would be in a drill pipe shaft that can act as its own auger tool when inserted through the solid waste. Considering the length of mission of the SSTs these pumps should be permanently installed in the SST. This would likely mean plumbing coming off the pump would be welded steel to last. We are aware of budget constraints. So installing pumps on the fastest leaking/highest impact tanks should be a priority. Certainly T-111 and few others would be good this fiscal year. Covering the tank farms with rhino liner would be good. We were wondering why whole tank farm was not covered in the past examples.

**Impact Estimate:** Although it is generally felt that the leak rate is low for potential leaks to the environment; the actual number of tanks and the time over which they leaked occurred is not really known. Big hitters will be technetium-99, nitrate, nitrite, and chromium 6 for groundwater. A very very rough first pass estimate is given. Loss rates for tanks B-110, U-110, TY-105, B-104, TY-103, T-111 and SX-112 were used over 10 years at 30% porosity of liquid in waste. The total volume was doubled to represent the loss of other unknown tanks. A supernatant composition was determined for each tank. This may not be right since there will be supernatant loss then salt cake dissolution. Total volume is about 32 kgals. Estimated undecayed environmental release results based on HDW5:

Technetium-99	6 Curies
Nitrate	15,000 kg
Nitrite	4,800 kg

Chromium	215 kg
Strontium-90	500 Curies
Cesium-137	15,000 Curies
Americium	1 Curie
Uranium	4 kg
Plutonium	12 grams

See spreadsheet page "Release Estimate". Results are highlighted in blue.

**Data request:** 1) Evaluation of in-tank evaporation requires ventilation flow rates of a tank over time. If you have a spreadsheet with an estimated ventilation flow rate for each SST per year or per flow change that would be helpful. Any official guess or estimate of active and/or passive ventilation rates of the SST is needed. 2) C Farm interstitial liquid levels using neutron probe measurements in liquid observation wells is not in TWINS. It seems once a tank farm is in retrieval process then its old data disappears such as interstitial liquid levels for C Farm. Can we get this data for C Farm or have this data that is available be posted on TWINS?

Thanks, David

David Bernhard  
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