Waste Treatment and Immobilization Plant (WTP)
Communications Approach

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Issue Managers: Suyama, Mattson, Niles, Hudson, Leckband

Summary
The Hanford Advisory Board, following discussions conducted by the Board’s Tank Waste and Public Involvement and Communication committees with the U.S. Department of Energy, Office of River Protection (DOE), has prepared this assessment and recommendations for a communications approach regarding the High Level Waste (HLW) Authorization to Proceed and the Low Activity Waste Pretreatment System (LAWPS). This review was performed at the request of the DOE Waste Treatment Plant (WTP) Assistant Manager, as described in the Hanford Advisory Board 2015 and 2016 Work Plans. Specifically, the Committee’s discussions focused on the areas as requested by DOE. These areas include:

- Describe the Board’s perception (local and regional) of the High-Level Waste (HLW) Authorization to Proceed and Direct Feed Low Activity Waste (DFLAW) Project.

- Review information about HLW and DFLAW that has been provided to the Board and propose approaches and techniques that may be used to effectively communicate information related to these facilities with both highly technical audiences and the general public.

Each of these topics is discussed separately in this document.

This document is not a communication plan. It is an assessment by the Board of the current status of the Board’s and the public’s perception of the WTP facility and the information needed by the public to better understand DOE activities related to the WTP path forward. There is a high level of inherent uncertainty that exists in these highly complex projects. It is hoped that this communication approach will serve as an informational baseline document for stakeholder outreach.

The following white paper attempts to provide input for WTP Management and Communications staff as they continue to update their comprehensive communications plan. There is much uncertainty regarding the path forward for WTP. This uncertainty will be a challenge to convey, and the DOE Communications Plan will need to consider strategies for working through these uncertainties. The strategies that DOE is currently following will likely continue to evolve as the work on the WTP progresses.
In general, the Board believes the public's perception of the HLW Authorization to Proceed and DFLAW Project can be summarized as follows:

The WTP's very public history of delays, lack of transparency, technical showstoppers, and cost overruns have damaged DOE's overall credibility and believability.

The Board's perception of the HLW Authorization to Proceed is skepticism. The history of technical issues with the HLW and Pretreatment facilities has repeatedly stopped or greatly slowed WTP progress.

The Board's perception of the DFLAW Project is hopeful. The DFLAW provides hope that DOE may begin to vitrify some of the low activity component of some of the Tank Waste significantly earlier the current operational date of the WTP.

Some Potential techniques that may prove useful to effectively communicate WTP information include:

The Board understands that DOE is currently under legal restrictions as to what may be communicated to the public. However, once these restrictions are lifted, DOE should be prepared to actively communicate what they can and be fully prepared to discuss the full scope of the vitrification process from the origins of the waste in the tanks to its final disposal in a deep geologic repository.

No discussion of any of the WTP facilities would be complete without discussing the waste in the tanks and the urgent need to get this waste into a safe, stable form for final disposition.

Presenters need to ask prior preparing for a presentation; "What does this audience want to hear?"

Effective communication with a general audience requires establishing common background information and inviting dialogue about the path forward and asking for feedback and questions.

Effective communication with a technical audience needs to engage out-of-the-box thinking and invite participation in puzzling through the challenges inherent in solving the technical challenges facing DOE and the WTP.
Waste Treatment and Immobilization Plant Communications Approach

Table of Contents

Describe the Board’s Perception of the High-Level Waste (HLW) Authorization to Proceed and Direct Feed Low Activity Waste (DFLAW) Project ........................................................................................................................................... 4
  Overview ............................................................................................................................................................................. 4
  High-Level Waste ................................................................................................................................................................ 5
  Direct Feed Low-Activity Waste (DFLAW) Project ........................................................................................................... 5
Review information about HLW and DFLAW that has been provided to the Board and propose approaches and techniques that may be used to effectively communicate information related to these facilities with both highly technical audiences and the general public ................................................................. 5
  Overview: ............................................................................................................................................................................. 5
  Tank Waste Origins and History ........................................................................................................................................ 6
  Effective Communication with a General Audience ........................................................................................................ 6
  Effective Communication with a Technical Audience ................................................................................................... 6
  High-Level Waste ............................................................................................................................................................. 7
  Direct Feed Low Activity Waste Project ....................................................................................................................... 7
Appendix ............................................................................................................................................................................. 9
  The following is a list of information that should be available on-line and/or as pre-approved presentations ............................................................................................................................................................................. 9
Waste Treatment and Immobilization Plant Communications Approach

Describe the Board’s Perception of the High-Level Waste (HLW) Authorization to Proceed and Direct Feed Low Activity Waste (DFLAW) Project

Overview
Over the years, the Board believes that the public, in general, has formed a perception of the Department of Energy, Office of River Protection’s (DOE) lack of progress toward the safe immobilization of Hanford’s tank waste. The Waste Treatment and Immobilization Plant’s (WTP) very public history of delays, lack of transparency, technical showstoppers, and cost overruns have damaged DOE’s credibility and believability.

This view is based on a long history of: leaking waste tanks, tank vapor and safety issues in the Tank Farms; work stoppages and delays in WTP construction progress; critical public statements by congressional and state leadership; significant Governmental Accountability Office reports and Defense Nuclear Facilities Safety Board issues concerning the WTP technical design and safety culture; Washington State and other lawsuits over safety and whistleblower concerns; and missed major TPA construction milestones and the impacts of the information restrictions imposed during the extended Consent Decree negotiations.

The fast track approach to the construction of the WTP, with numerous construction stops, starts and delays due to design and technology issues has reinforced the feeling that DOE’s path forward is flawed. The imposed secrecy on the expert technical teams charged with resolving the WTP technical issues; long periods of little to no public information during the cycle of legal actions and court imposed restrictions; and the lack of DOE participation at many public meetings has reinforced the public feeling that DOE is not fully sharing information on the numerous issues surrounding the WTP. The on-going litigation between Washington State and DOE is an issue that greatly impedes the communication of progress being made at the WTP.

Given this public environment, it will be a challenge for DOE to once again attain the public’s trust and support. This trust can be rebuilt, but only if DOE can demonstrate that it fully understands all of the issues and is making measurable progress on a workable and achievable path forward.

The Board understands that DOE is currently under legal restrictions as to what may be communicated to the public. The Board is aware that review and approval by DOE Headquarters and the Department of Justice are routinely required before presentations/information can be released for public access. This, at times, restricts the timeliness and responsiveness of the local DOE office in responding to the Board’s and the public’s requests for information. However, once these restrictions are lifted, DOE should be prepared to actively communicate what they can and be fully prepared to discuss the full scope of the vitrification process from the origins of the waste in the tanks to its final disposal in a deep geologic repository.
Waste Treatment and Immobilization Plant Communications Approach

**High-Level Waste**
The Board’s perception of the HLW Authorization to Proceed is **skepticism**. Technical issues related to the high-level waste vitrification facility have on two occasions stopped or greatly slowed construction progress. DOE was previously directed by the Court to commit to a schedule for WTP construction completion. Due to a lack of WTP progress, the WTP completion schedule is once again the subject of legal action and is entangled in information restrictions imposed during the on-going Consent Decree discussions.

**Direct Feed Low-Activity Waste (DFLAW) Project**
The Board’s perception of the DFLAW Project is **hopeful**. Given that the State of Washington does not believe the WTP can be fully operational prior to 2034 (and DOE maintains 2039 under the best-case scenario), DFLAW provides hope that at some point in the foreseeable future, DOE may begin to vitrify the low-activity component of some of Hanford’s tank waste.

This DFLAW approach was proposed the Hanford Tank Waste Retrieval, Treatment, and Disposition Framework (Framework) document. On September 24, 2013, DOE released this document which describes a strategic framework for addressing the risks and challenges to completing the DOE mission by implementing a phased approach. The approach outlined in the document proposes to construct the necessary facilities to start the immobilization of the low activity component of the tank waste through the use of the DFLAW process. Thus, separating and vitrifying a significant portion of the tank waste as low level waste. Once this process is fully operational, there is the potential to create some much needed capacity in the existing double shell waste storage tanks. The early operation of the DFLAW will allow time to resolve the technical issues impacting the construction of the Pretreatment (PT) and High-Level Waste (HLW) Facilities.

**Review information about HLW and DFLAW that has been provided to the Board and propose approaches and techniques that may be used to effectively communicate information related to these facilities with both highly technical audiences and the general public.**

**Overview:**
The Framework document describes a strategic framework for addressing the risks and challenges to completing the DOE mission by implementing a phased approach that would:

- Begin immobilization of the tank waste as soon as practicable through the DFLAW process.
- Process transuranic (TRU) tank wastes for disposal at the Waste Isolation Pilot Plant (WIPP).
Waste Treatment and Immobilization Plant Communications Approach

- Resolve technical issues for the Pretreatment (PT) and High-Level Waste (HLW) Facilities, including determining how to adequately mix and sample the waste prior to processing, to enable design completion, and the safe completion of construction, startup and operations of these facilities.

The complexity of both the waste itself as well as the WTP facilities has led to difficult, and to date, unresolved technical issues for portions of the PT Facility and to a lesser extent the HLW Facility. Because the current design of WTP anticipates that all waste will be processed through the PT Facility, immobilization of any waste could not occur per the current plan until the technical issues involving the PT Facility are resolved.

DOE’s current emphasis is to focus on the DFLAW approach and does not appear to be pursuing the disposal of tank waste in WIPP alternative.

Tank Waste Origins and History
No discussion of any of the WTP facilities would be complete without discussing the waste in the tanks and the urgent need to get it into a safe, stable form for final disposition. All presenters should be prepared and have backup materials to at least address these topics at a summary level should questions arise during their discussions. This material should be pre-approved and consistent with the information available online at a level that the general public could easily access and understand.

Individuals who are requested to make presentations should be able to access this library to quickly obtain consistent and reliable background information that they could use to supplement or as backup material for their presentations.

A listing of some of the information that should be pre-approved and available to the general public or for presenters is itemized in the attached Appendix.

Effective Communication with a General Audience
Effective communication with a general audience requires establishing common background information and inviting dialogue about the path forward and asking for feedback and questions. Too often DOE overlooks both the general kinds of questions people want answered as well as the kinds of answers they are being provided in social media. Presenters should be provided, prior to a scheduled meeting, the answer to the question; “what will this audience want to hear?” and be fully prepared to discuss that subject in-depth.

Given the history of delays, technical showstoppers, and cost overruns, special attention should be given to establishing what is different in the current environment that will negate the previous pattern.

Effective Communication with a Technical Audience
Effective communication with a technical audience needs to engage out-of-the-box thinking and invite participation in puzzling through the challenges inherent in solving the technical challenges at the High-
Waste Treatment and Immobilization Plant Communications Approach

Level Waste and Pretreatment Facilities. The backgrounds and levels of technical knowledge of the audience can vary greatly depending on the topic to be addressed. The presenter should identify the nature and background of the subject being addressed before launching into the topic proper. This tends to produce a more disciplined discussion and a more engaged audience.

High-Level Waste
The High Level Waste (HLW) Facility function is to vitrify the HLW slurry from the WTP Pretreatment Facility into a stable glass form. This vitrified glass is then stored in sealed containers for future shipment to an offsite repository.

Engineering, construction, and procurement activities for the HLW facility have been limited since 2012 due to unresolved technical issues. This technical issues concern the pulse-jet mixer performance, erosion-corrosion validation, vessel structural integrity, high-efficiency particulate air filter adequacy, and design and operability review vulnerabilities.

The HLW was authorized to begin production engineering in 2014. Currently process improvements, technical and design issue resolution, and nuclear safety basis alignment are being implemented.

Due to this significant delay in facility construction, Bechtel National is in the process of revising the WTP project baseline. The WTP completion schedule is the subject of legal action and is being subjected to information restrictions imposed during the current Consent Decree discussions.

Direct Feed Low Activity Waste Project
In order to begin the process of vitrifying waste as soon as practicable and at the same time creating much needed waste tank capacity, the DFLAW project was created.

An alternative approach for immobilizing waste as soon as practicable, while simultaneously resolving the remaining technical challenges, was identified. By adopting the DFLAW option, in which the waste bypasses the PT Facility, waste immobilization could begin significantly earlier than if treatment of the waste is delayed until all technical issues are resolved and the PT and HLW Facilities are completed.

DOE divided the 56 million gallons of high-level tank waste into three major categories for treatment.

(1) Low-activity waste;
(2) High-level waste, not requiring special handling (easier to process)
(3) High-level waste requiring special handling (harder to process).

The low-activity waste consists primarily of the supernate (liquid) portion of the tank waste with most of the solids and radioactivity removed before vitrification. Low-activity waste will be the largest tank waste stream by volume (approximately 90% of the volume), but the lowest in radioactivity content (approximately 10% of the curies). Since the low-activity waste makes up approximately 90% of the
Waste Treatment and Immobilization Plant Communications Approach

total volume of waste to be treated, it has the greatest influence on the total duration of the Hanford tank waste mission. The liquid form of this waste makes it susceptible to leakage.

Beginning LAW Facility operations before the PT Facility is operational would require a capability to remove the cesium and miscellaneous solids from the waste stream so that low-activity waste could be directly fed to the LAW Facility.

DOE’s analyses of this approach indicate that a standalone Low Activity Waste Pretreatment System (LAWPS) Facility would best address this need. It would be located between the tank farms and the LAW Facility and would remove the solids and cesium and possibly other radioactive elements from the liquid waste stream. The LAWPS facility would provide the processing capability to support a DFLAW operation prior to the completion of PT. As this option uses mature technologies, it is felt that the technical risks associated with this alternative are low. The cesium and solids are currently planned to be returned to the tanks.

The DFLAW will require the supernate stream to be transferred to the LAW Facility for vitrification following interim pretreatment. Secondary liquid wastes generated from the LAW Facility offgas system would then be transferred back to the tank farms and likely volume-reduced through evaporation activities using the existing 242-A Evaporator in the tank farms.
The following is a list of information that should be available on-line and/or as pre-approved presentations for use by the general public. This material should be available at a level that the general public can easily access and understand. Individuals who are requested to make presentations should be able to access this library to quickly obtain consistent and reliable background information.

**General History of the Hanford Site**
- Tank Storage History
- Origins of the waste in the tanks
- Tank age and condition of the tanks
- Single Shell Tank Integrity
- Double-Shell Tank Integrity
- Tank capacity needed to be able to safely store waste
- Leaking Tanks and the threat to the environment
- Tank Retrieval (leaking and non-leaking) Progress and Plans

**History and Scope of the WTP**
- WTP Facilities
- Map of WTP Site with WTP Facilities shown
- Brief Description of function of each facility
- Current Construction Photos and Status
- WTP Technical Issues
- High-Level Waste Authorization to Proceed
- Proposal for fixing problems
- Timeline
- Budget
Waste Treatment and Immobilization Plant Communications Approach

Systemic changes that ensure this project will work

**Direct Feed Low Activity Waste Facility**

- Proposal
- Timeline
- Budget

Systemic changes that ensure this project will work

**Final Waste Disposition**

- Deep Geologic Repository
- Interim Storage

**Timeline and Budget**

- Design and Construction
- Technical Issues and Resolution
- Remaining Open Issues

**Safety Culture, Safety Conscious Work Environment, and Safety Foundation**

- Tank Vapor Issues & History
- Reporting of Concerns