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**Office of River Protection**

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09-WTP-018

JAN 30 2009

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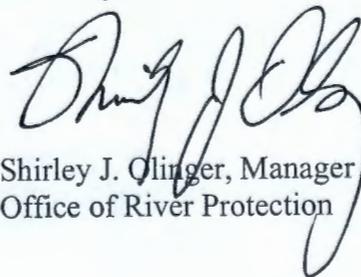
Addressees:

HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (HFFACO) (ALSO KNOWN AS TRI-PARTY AGREEMENT) INTERIM MILESTONE M-62-01, "SEMI-ANNUAL COMPLIANCE REPORT FOR THE WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP)," FOR JULY 1 THROUGH DECEMBER 31, 2008

This letter transmits the U.S. Department of Energy, Office of River Protection, Semi-Annual Compliance Report (Attachment) required by Interim Milestone M-62-01 for the period July 1 through December 31, 2008. As stipulated in the M-62-01 milestone, this report includes project summaries of accomplishments, issues encountered, and actions being taken.

If you have any questions, please contact me, or your staff may contact John R. Eschenberg, Assistant Manager, Waste treatment and Immobilization Plant Project, (509) 376-3681.

Sincerely,



Shirley J. Clinger, Manager  
Office of River Protection

WTP:RLC

Attachment

cc: See page 2

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Addressees  
09-WTP-018

-2-

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**U.S. DEPARTMENT OF ENERGY (DOE)  
OFFICE OF RIVER PROTECTION (ORP)  
SEMI-ANNUAL PROJECT COMPLIANCE REPORT FOR THE  
WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP)  
July 1, 2008 – December 31, 2008**



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**U.S. DEPARTMENT OF ENERGY  
OFFICE OF RIVER PROTECTION  
2440 Stevens Center Place  
Richland, Washington 99354**

**December 31, 2008**

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### LIST OF ACRONYMS

BNI	Bechtel National, Inc.
BOF	Balance of Facilities
CDR	conceptual design report
CPS	Cathodic Protection System
CSR	Craft Safety Representative
CY	calendar year
DAFW	days away from work
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EFRT	External Flowsheet Review Team
FY	fiscal year
HFFACO	<i>Hanford Federal Facility Agreement and Consent Order</i>
HLW	High-Level Waste [Facility]
HPAV	hydrogen in piping and ancillary vessel
HVAC	heating, ventilation and air conditioning
IRP	Issue Response Plan
LAB	Analytical Laboratory
LAW	Low-Activity Waste [Facility]
ORP	Office of River Protection
P&ID	piping and instrumentation drawing
PEP	Pretreatment Engineering Platform
PIP	Process Improvement Project
PJM	pulse jet mixer
PMB	performance measurement baseline
PT	Pretreatment [Facility]
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RPP	River Protection Project
TSG	Technical Steering Group
VPP	Voluntary Protection Program
WRPS	Washington River Protection Solutions, LLC
WTP	Waste Treatment and Immobilization Plant Project

**U.S. Department of Energy, Office of River Protection  
River Protection Project – Waste Treatment and Immobilization Plant Project  
Semi-Annual Compliance Report  
Per Hanford Federal Facility Agreement and Consent Order Milestone M-62-01**

## 1.0 INTRODUCTION

A Semi-Annual Project Compliance Report (M-62-01P) that reflects the status of the U.S. Department of Energy (DOE), Office of River Protection (ORP) Waste Treatment and Immobilization Plant (WTP) Project is required by the *Hanford Federal Facility Agreement and Consent Order* (HFFACO) (Ecology et al. 1989) Milestone M-62-01. As detailed in M-62-01, this report documents for the period from July 1, 2008, through December 31, 2008, ORP's compliance with the HFFACO Milestone M-62-00 series requirements; updates WTP Project progress, activities, and issues relative to those milestones; and identifies activities expected in the near future.

**Hanford Site Background:** Hanford tank waste consists of approximately 53 million gallons of mixed hazardous waste containing 190 million curies of radioactive waste stored in underground storage tanks at the Hanford Site in Richland, Washington. This tank waste will be remediated through treatment and immobilization to protect the environment and meet regulatory requirements. DOE determined through the "Record of Decision for the Tank Waste Remediation System, Hanford Site, Richland, WA" (62 FR 8693) that the preferred alternative to remediate the Hanford tank waste is to:

- Pretreat the waste to prepare it for processing and vitrification;
- Immobilize the low-activity waste for onsite disposal; and
- Immobilize the high-level waste for ultimate disposal in the national repository.

**WTP Complex Description:** The River Protection Project (RPP) WTP complex is being designed, constructed, and commissioned for DOE by Bechtel National, Inc. (BNI) at the Hanford Site under DOE Contract No. DE-AC27-01RV14136. The WTP will be designed, constructed, and permitted to treat and immobilize mixed waste to support the RPP mission.

The WTP complex will receive waste in batches from Hanford's double-shell tank system, operated by the Tank Operations Contractor (Washington River Protection Solutions, LLC [WRPS]<sup>1</sup>), through a pipeline system interface. The pretreatment process will separate (or continue to refine) the waste into low-activity and high-level waste fractions for vitrification. The vitrification process will combine pretreated tank waste with glass-forming materials and melt the mixture into a liquid that is poured into stainless steel containers, where the hot glass cools and hardens. Each container will then be sealed in preparation for storage and permanent disposal. The dangerous waste and radioactive constituents will be immobilized in this durable glass matrix through the WTP process. The immobilized low-activity containerized glass waste

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<sup>1</sup> Washington River Protection Solutions LLC (WRPS) replaced CH2M HILL Hanford Group, Inc. as the Tank Farms Contractor effective October 1, 2008.

will be disposed on site and the immobilized high-level containerized glass waste will be disposed at the national repository.

The WTP complex waste-processing facilities include the waste-separating Pretreatment (PT) Facility, the glass-making High-Level Waste (HLW) Vitrification Facility, and the glass-making Low-Activity Waste (LAW) Vitrification Facility. These process facilities are supported by the WTP complex Analytical Laboratory (LAB) for process testing and the WTP Balance of Facilities (BOF) for infrastructure and utility services.

This compliance report reviews each of the WTP Project functional areas, and the overall project. Financial data is through December 2008, unless otherwise noted. WTP Project status is also provided monthly through the Project Manager's Meeting and the Quarterly Milestone Review Meeting reports.

## 2.0 WTP PROJECT ACCOMPLISHMENTS AND ISSUES

### 2.1 Progress to Date

#### 2.1.1 ORP – Project Management

**Safety Record:** WTP management remains focused on safety through improvements in leadership, communication, and disciplined execution of existing programs, as well as continued implementation of workforce initiatives to achieve and sustain improved performance (see Section 2.2.4 for details). Through December 2008, the WTP Project achieved 12 consecutive months (365 days and over 6.8 million hours) without a days away from work (DAFW) injury. The calendar year (CY) 2008 cumulative recordable injury case rate total<sup>2</sup> through December was 0.98, compared to a rate of 1.51 in CY 2007 and to a rate of 1.72 for the same period in 2006. Although overall rates have improved, the recordable rates were uncharacteristically high in October 2008; there were seven in this month. The total of recordable cases for the months of October, May, and June was 18, which was half of the 36 recordable cases for the year. (See Section 2.2.4 for additional improvement information.)

#### 2.1.2 WTP Complex Design and Construction

**Project Overview:** Design, procurement, and construction activities continue for all of the facilities. Design for the WTP Project is 76% complete, construction is 40% complete, and the overall WTP Project is 47% complete. An average of about 1,575 personnel (950 craft and 625 non-manual staff) work onsite, an increase of more than 725 staff since November 2007, yet still below the peak of 2,050 personnel in March 2005.

Issues associated with the maturity of technology in the WTP design have been evaluated by independent DOE Review Teams and in DOE's design oversight process. The most notable evaluation was the "Comprehensive External Review of the Hanford Waste Treatment Plant Flowsheet and Throughput" (CCN 132846) completed in March 2006 by the External (Expert) Flowsheet Review Team (EFRT). The EFRT was a team of external, distinguished senior professionals from private industry and academia that BNI commissioned in December 2005 to evaluate the technological aspects of the WTP process and evaluate whether the plant will operate as designed. The EFRT identified 28 separate technical issues, some of which had not been previously identified by either BNI or DOE; 3 additional issues were raised by an internal ORP review for a total of 31 issues. In response, BNI developed Issue Response Plans (IRP) for each of the major issues. A Technical Steering Group (TSG) was formed collaboratively between DOE and BNI to develop issue closure criteria and accept the data object quality evidence verifying the closure of the EFRT-identified issues to date. DOE reviewed and approved the IRPs as they were completed; to date 26 of these implementation plans have been closed. (See Section 3.1 for further discussion.)

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<sup>2</sup> Recordable injury case rate total = Number of cases times 200,000 divided by cumulative hours; (Per the Occupational Safety and Health Administration, 200,000 represents the number of hours 100 employees working 40 hours per week, 50 weeks per year would work; this provides the standard base for calculating incidence rates.)

On December 8, 2008, DOE released an independent technical review of system planning for the treatment of low-activity waste at the Hanford Site. The final report includes prioritized actions for accomplishing the tank waste treatment mission. High-priority actions include sodium management, prioritization of projects to ensure completion of infrastructure systems to support the WTP facility operations (e.g., waste feed delivery systems), and improvements in systems planning. Further development of bulk vitrification was determined to be low priority because the need for developing supplemental treatment is not necessary at this time.

**Pretreatment Facility:** Design is approximately 68% complete with construction approximately 26% complete. PT construction activities have been focused on the civil/structural features at the west end of the facility. All of the wall sections between the 28' and 56' elevations have been placed and construction on the walls between the 56' and 77' elevations is now underway. Civil/Structural Engineering continues work on the design of the concrete walls and slabs at and above the facility's 77' elevation.

Many of the EFRT issues impacted the PT Facility. EFRT issue M-2, "Mixing Vessel Erosion," has been resolved, and it was determined that the vessels as designed had adequate erosion allowance. Consequently, none of the vessels will require modification to accommodate anticipated erosion associated with the pulse jet mixers (PJM). Per DOE's request, the Washington State Department of Ecology (Ecology) has released the hold they have placed on vessel fabrication due to erosion concerns.

The most technically challenging activity is the work associated with the waste leaching and ultrafiltration processes to be performed in the PT Facility (EFRT issue M12, "Undemonstrated Leaching Process"). To test these processes, a 1 to 4.5 scale-test platform, referred to as the Pretreatment Engineering Platform (PEP), was designed, fabricated, and assembled to ensure the facility can effectively process the range of waste streams the WTP will receive from the tank farms. Now that the PEP assembly is complete, site integrated testing has been initiated; Phase 1 testing is expected to begin in late January 2009 and be complete by April 2009. (See Section 2.2.3 for further discussion.)

BNI has completed analysis of the PT vessels and developed mixing requirements for each vessel as part of their response to EFRT issue M-3, "Inadequate Mixing System Design." Based upon this work, DOE determined there are no mixing concerns for most of the vessels. However, approximately six of the vessels appear to have issues that may cause them to be incapable of meeting the technical requirements for mixing as currently designed. The first phase of testing to underpin the mixing analysis has been completed and the second phase test plan is nearing completion.

The PT Facility summary structural report was finalized, with all Defense Nuclear Facilities Safety Board (DNFSB) issues addressed and resubmitted to the DNFSB for their review.

Mechanical Systems Engineering completed revision of the piping and instrumentation drawings (P&ID) for the facility based upon resolution of a number of technical issues. They released the final versions of these drawings, which allows the Plant Design group to prepare isometric drawings for piping and pipe support drawing. At this time, Plant Design is producing isometric

drawings at a rate of 60 to 70 drawings per week. This rate is consistent with completing the isometrics in 2011 as planned.

**High-Level Waste Vitrification Facility:** The design for the HLW Facility is approximately 86% complete, and construction is approximately 21% complete. The number of craft personnel at the HLW Facility has increased to approximately 170 to support the placement of concrete walls and slabs, erection of structural steel, and installation of other commodities. Over 1,987 cubic yards of concrete have been placed and 249 tons of structural steel and 484 tons of rebar have been erected to support construction efforts at various elevations of the facility.

Engineering activities for this period include the issuance of architectural, embed, structural steel and steel framing, piping, joggle, P&IDs, ventilation and instrument diagrams, and isometric drawings. Additional engineering activities include the disposition of Field Change Requests, development of system logic and system block diagrams, review of vendor submittals, and the development and review of engineering specifications for future procurements. The revised ground motion analysis and redesign activities for the HLW Melter are ongoing. The fabrication of the Melter Cave decontamination tanks was completed, and the tanks were delivered to the WTP in September 2008. The factory acceptance testing on the first melter cave shield door was completed at the vendor's facility.

Construction forces continue to install forms, decking, rebar, concrete embedments and beam clips at lower elevations, piping, heating, ventilation and air conditioning (HVAC) ductwork, and electrical cable tray throughout the facility.

**Low-Activity Waste Vitrification Facility:** Engineering design is approximately 95% complete and construction is approximately 64% complete. Construction continues to focus on installing piping, mechanical equipment, HVAC, and electrical components throughout the facility. Subcontractors are working on coatings, fire protection, and partition walls.

In November 2008, BNI completed the conceptual design report (CDR) for the processing of low-activity waste. The CDR identifies the requirements, such as utility needs, fencing, specific piping changes, etc., that would be required to operate the LAW Facility independent from the pretreatment system. WRPS is preparing the other component of this effort, a technology evaluation for an interim pretreatment system that would be required until the pretreatment system is brought online.

Title II Engineering<sup>3</sup> is complete. Title II design encompasses the initial release of designs needed for construction teams to construct the facility. While there are still significant field engineering activities to complete and vendor designs to review, the completion of Title II Engineering for the LAW Facility is a significant project-level milestone.

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<sup>3</sup> Title II Engineering is the preparation of all drawings and specifications necessary to construct and procure components for construction.

Accomplishments this period include: completion of melter #1 fabrication; placement of the export bay roof slab; completion of concrete mud mats for switchgear and loading dock structures; installation of over 5,000 linear feet of pipe at all elevations; and the release of over 42,000 linear feet of conduit for construction.

The critical path for LAW continues to be procurement and installation of the offgas treatment unit operation components including the thermal catalytic oxidizer. BNI has completed an analysis of the entire LAW offgas system and is analyzing the results of that review to determine the appropriate path forward and corresponding impacts.

**Balance of Facilities:** Overall design for BOF is approximately 75% complete and construction is approximately 65% complete. Construction forces completed the turnover package for the Cathodic Protection System (CPS) to the Startup organization. Startup testing began in late October/early November and will continue for approximately four months. The CPS provides corrosion protection for the underground plant service air lines, waste transfer lines between facilities, and the important-to-safety air lines. This was the second system turned over to Startup; the remaining turnover of all systems for the 13 BOF buildings will total approximately 130 systems.

In October 2008, the last of 13 silos was delivered and installed for the Glass Former Storage Facility. Each silo will hold a different glass-forming material that will be dispensed to the WTP vitrification facilities in the proper combinations for each batch of glass.

Construction forces substantially completed the Steam Plant building. Some issues with providing increased safety during operations are still being evaluated. These include the requirements for double block and bleed valves to isolate steam lines during maintenance activities. The evaluations are not complete at this time; however, they should be complete by March 2009. The transfer lines between the HLW and PT Facilities have been installed and the hydro-pressure testing of the domestic waste system line northeast of the LAW Facility is complete. The Chiller Compressor Plant is on track for completion as crews continue to install and energize temporary power to the building's lighting transformer and panel. Electrical cable is being pulled from the motor controllers to the Plant Service Air System compressors and installation of small and large bore piping is progressing.

**Analytical Laboratory:** LAB design is approximately 91% complete while construction is approximately 54% complete. Title II design activities are essentially complete. Additional engineering activities include the approval and issuance of over 100 support drawings, drawings for the waste transfer system (needed to support fabrication and shipment activities), and operations and maintenance manuals for the cell-to-cell trolley system (needed to release the remaining equipment for shipment). Other construction activities include: installation of interior partition walls, electrical raceway and piping, fire protection piping, and HVAC duct and liner plate.

The following activities were completed during this period: vendor print for the high-integrity fans; grout pouring in the hot cell troughs; and setting and aligning trolley support in the hot cell

on the west side. Other accomplishments include the placement of the emissions stack and installation of 65% of quality-level duct and supports.

### 2.1.3 Commodities Installations

Based on the construction activities, the total WTP Project commodities placed or installed through November 2008 are summarized in Table 1.

**Table 1. Key Commodity Quantity Progress**

Quantity Progress	Current Planned at Completion Quantity	Installed To-Date Through November 2008	Percent Complete
Concrete	258,890 cy	180,370 cy	70%
Structural Steel	35,251 ton	12,615 ton	36%
Piping (in buildings)	885,230 ft	141,510 ft	16%
Piping (underground)	113,440 ft	95,380 ft	84%
Conduit (in buildings)	782,010 ft	95,250 ft	12%
Conduit (underground)	188,160 ft	177,830 ft	95%
Cable Tray	96,580 ft	17,900 ft	19%
Cable and Wire	4,732,550 ft	223,240 ft	5%
Heating, Ventilation, and Air-Conditioning Ductwork	4,181,980 lb	921,150 lb	22%

### 2.1.4 Environmental Permits Required for Start of Construction

**Permitting and Licensing:** DOE and BNI continue to work with state and federal regulatory agencies to maintain permits, licenses, and authorizations needed to support WTP construction and commissioning. Permits required to support construction are in place. Permit modifications and revisions on evolving engineering designs are required and submitted on an ongoing basis. Non-radioactive and radioactive air permit applications containing updated design information have been approved: The Washington State Department of Health approved the radioactive air permit in June 2006, and Ecology approved the non-radioactive air permit in December 2006.

The DOE appeal to a 2006 Ecology-proposed permit modification has been resolved and the resulting revised permit conditions were released for a 45-day public comment period beginning October 20, 2008. To summarize, in October 2006, Ecology released a proposed permit modification to reflect the change in plant design to two HLW melter and two LAW melter and other changes (i.e., 2+2 modification). The public comment period ended January 5, 2007, and ORP and BNI provided comments on the proposed permit modification. Ecology issued its final

permit decision and related comment responsiveness summary on October 28, 2007. Specifically, DOE filed the appeal to Ecology's final permitting decision based on two of the new permit conditions: (1) application of the High-Level Vitrification Land Disposal Restriction and (2) requirement for DOE to ensure all waste streams generated at the WTP do not contribute to an exceedance of unspecified environmental standards on disposal at the Hanford Site.

The Dangerous Waste Permit includes a compliance schedule (*Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion*, Chapter 10, and Attachment 51, "Waste Treatment and Immobilization Plant" [Ecology 2007]) that requires the submittal of engineering and operational information. Commodity growth, hydrogen buildup in piping and ancillary vessels in the PT Facility, difficulty in mixing heavy fluids in the PT Facility, revised seismic criteria affecting structural design of the PT and HLW Facilities, and a reduced fiscal year (FY) 2006 funding level all contributed to increased project costs and schedule extension. As a result, the remaining scheduled compliance schedule item listed in Table 2 will not be met.

**Table 2. Compliance Schedule Items Expected To Be Missed**

<b>Item Number</b>	<b>Description</b>	<b>Due Date</b>
32.	Final Compliance Date.	02/28/2009

The following Dangerous Waste Permit Compliance Schedule items were completed this reporting period.

**Table 3. Dangerous Waste Permit (RCRA) Compliance Schedule Items Submitted/Completed**

Item Number	Description	Due Date
28 <sup>1</sup>	Submit engineering information for HLW Vitrification Miscellaneous Treatment Unit sub-system	06/18/06 <sup>2</sup>
29 <sup>1</sup>	Submit engineering information for equipment for each HLW Vitrification Miscellaneous Treatment Unit sub-system	06/18/06 <sup>2</sup>
41 <sup>1</sup>	Submit the following source drawings to complete HLW melter permit packages HLW-018 and HLW-019: <ul style="list-style-type: none"> <li>• P&amp;ID HLW Melter 1 System Film Cooler Utilities, 24590-HLW-M6-HMP-00012,</li> <li>• P&amp;ID HLW Melter 2 System Film Cooler Utilities, 24590-HLW-M6-HMP-20012,</li> <li>• HLW Melter Mechanical Drawings showing the melter physical attributes and overall dimensions.</li> </ul>	11/26/08
37 <sup>3</sup>	Submit Mechanical Handling Diagrams and Mechanical Handling Data Sheets for the following pieces of equipment: <ol style="list-style-type: none"> <li>a. HDH-CRN-00005</li> <li>b. HEH-CRN-00003</li> <li>c. HPH-CRN-00001</li> <li>d. HPH-CRN-00002</li> <li>e. HSH-CRN-00001</li> <li>f. HSH-CRN-00014</li> <li>g. LEH-CRN-00003</li> <li>h. LPH-CRN-00002</li> <li>i. HEH-CRN-00001</li> </ol>	9/30/08
36 <sup>4</sup>	Submit System Descriptions for Mechanical Handling Systems identified in Permit Table III.10.C.A, for incorporation into the Administrative Record.	12/31/09

<sup>1</sup> Letter, E. Fredenburg, Ecology, to S. Olinger, ORP, and W. Elkins, BNI, "Submittal of Dangerous Waste Compliance Schedule Item 41 to the Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion, for the Treatment Storage and Disposal of Dangerous Waste, Part III, Operating Unit 10 (Waste Treatment and Immobilization Plant), WA7890008967," dated December 17, 2008.

<sup>2</sup> Note: Compliance Schedule Item 41 completed this item.

<sup>3</sup> Letter, S. Olinger, ORP, and W. Elkins, BNI, to J. Manning, Ecology, "Submittal of Dangerous Waste Compliance Schedule Item 37 – Mechanical Handling Diagrams and Data Sheets," 08-ESQ-183, dated September 17, 2008.

<sup>4</sup> Letter, S. Olinger, ORP, to J. Hedges, Ecology, "Submittal of Completion of Dangerous Waste Compliance Schedule Item 36 – System Descriptions for Mechanical Handling Systems for Incorporation Into The Administrative Record," 08-ESQ-206, dated December 15, 2008.

## 2.2 Near-Term Issues

### 2.2.1 Pulse Jet Mixers Design Closure

New PJM testing is planned to address mixing concerns identified in the EFRT review of WTP. The work is defined in the EFRT IRP for issue M3, "Inadequate Mixing." PJM testing activities will be performed in scaled mixing platforms to: (1) demonstrate re-suspension of settled waste solids of Newtonian slurries<sup>4</sup>; (2) determine mixing times for various vessel mixing functions; (3) determine if a hydraulic "short circuit" could occur in non-Newtonian slurries, which would cause insufficient mixing; (4) confirm post-design basis event mixing of vessels; and (5) demonstrate that normal process mixing successfully meets the flowsheet mixing requirements. The schedule for the various related activities is detailed in the M3 IRP. The IRP is being revised to include the mixing issues identified in the ORP Technology Maturation Plan. Frequent meetings are being held between ORP and BNI to discuss the path forward.

### 2.2.2 Hydrogen in Piping and Ancillary Vessels (HPAV)

There has been concern regarding potential hydrogen detonations within WTP piping systems due to accumulations of flammable concentrations of hydrogen gas in piping and ancillary (small) vessels at the WTP, and designing safety controls to mitigate such events. The potentially flammable gas mixtures will be radiolytically and chemically generated, and ignition of significant accumulations is conservatively assumed. WTP is currently identifying and designing controls to prevent/mitigate hydrogen detonations. Where there is no potential for secondary impacts (i.e., impacts to adjacent important-to-safety components), detonations are allowed. However, where there is potential for secondary impacts, controls have been implemented to prevent detonation. Detonations are allowed in small piping, if it can be shown by analysis or testing that the piping system (pipe including hangers and supports) response to a detonation is elastic (i.e., no deformation). Safety controls are developed to prevent/mitigate detonations that result in an inelastic response regardless of pipe size.

BNI identified several safety controls to address this concern, including new and revised design features and administrative controls to prevent the accumulation of hydrogen concentrations that could cause detonations and deflagrations large enough to deform the piping or ancillary vessels. In addition, an HPAV database was developed to provide an electronic filing system to document final system designs meeting HPAV safety criteria. The HPAV database also provides a design tool that can be used to evaluate proposed systems changes to ensure the proposed design meets the safety criteria.

The most significant outstanding technical concern is designing the associated pipe hangers and supports to withstand the associated reaction loads from these detonations and deflagrations. Because there is little experimental data regarding such loads, ORP contracted with CalTech to conduct experiments to measure prototypical detonation loads on pipe hangers and supports.

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<sup>4</sup> Newtonian slurry has a low-viscosity like a liquid, whereas non-Newtonian slurry has a higher viscosity like a sludge.

Testing commenced in June 2008 and includes three testing phases to be completed by February 2009. In addition, BNI contracted with Dominion Engineering, who subcontracted to Southwest Research Institute, to perform HPAV testing to be completed in January 2009. Both testing programs will be used to evaluate any impacts (e.g., reduction in classification of systems, structures, or components) on the safety analysis and design. Follow-up experiments (if required), analysis, and design of the associated pipe hangers and supports are expected to extend into mid 2009. ORP has requested an HPAV Task Team be established to look at overall conservatism in the HPAV safety analysis and design strategy to ascertain if identified conservatism, either through testing or assumptions, can be reduced. Currently, the HPAV design contains a significant number of safety class and safety significant structures, systems and components that could significantly affect the ability to effectively operate the facilities. The intent is to identify those significant contributors to the HPAV hazard and provide a reasonable set of controls without unduly hampering operations.

### **2.2.3 Ultrafiltration System and Leaching Process Design**

The EFRT raised issues consistent with ORP's conclusions in its 2004 design oversight of the ultrafiltration system. EFRT Issue M12, "Undemonstrated Leaching Process," concluded the ultrafiltration system and leaching process have not been demonstrated beyond small-scale laboratory tests. In response, BNI is performing modeling to develop optimum ultrafiltration system operating approaches, testing tank waste samples using the optimized flowsheet, and developing simulants. These activities are complete or are in the final stages of report writing. Testing the ultrafiltration flowsheet with an integrated engineering scale system referred to as the Pretreatment Engineering Platform (PEP) is underway. The PEP is a 1:4.5 scale non-radioactive integrated test of the WTP ultrafiltration system. The PEP will demonstrate the ultrafiltration system including leaching process design, system scale-up, and improved projections of system capacity.

Simulant shakedown testing at the PEP is being performed and is planned to be complete the first week of January 2009. Phase 1 integrated testing is planned to begin in late January 2009 and by complete by April 2009. Phase 1 testing will consist of three integrated tests. These tests will provide critical information needed to confirm ultrafiltration system design by demonstrating caustic leaching, oxidative leaching, solids washing, and process control strategies. Evaluation of this data in conjunction with other laboratory testing and modeling will confirm ultrafiltration system design and provide improved estimates of system capacity and projection of mission duration. During testing, the PEP will process a non-radioactive waste simulant developed by Pacific Northwest National Laboratory. The PEP simulant will demonstrate all aspects of sludge solids concentration and the sludge treatment flowsheet (e.g., caustic and oxidative leaching, filtration, filter cleaning). Closure of the EFRT Issue M12 is expected to occur by June 2009.

### **2.2.4 Safety Culture/Safety Improvement Strategy**

The WTP safety performance indices continued to improve in FY 2008 while conducting a ramp-up in facility construction and the craft workforce. The Total Recordable Case (TRC), Days Away Restricted or Transferred (DART), and DAFW rates decreased during FY 2008.

This performance reflects the commitment to safety by BNI management, the WTP site supervisors, and craft personnel.

ORP found evidence of a non-systematic flow of requirements among procedures and inconsistent incorporation of controls resulting from the job hazard analysis into the Safety Task Analysis Risk Reduction Talk (STARRT) card. BNI developed a FY 2009 performance objective, measure, and commitment (POMC) to enhance the work control process and improve field work hazard screening, hazardous work planning, and hazardous work implementation within established controls.

A Process Improvement Project (PIP) Team was chartered to develop the WTP ergonomics program, create an ergonomics checklist for construction site activities, and test it by evaluating the construction site water and ice distribution center. This activity identified positive activities and areas for improvement. Safety Assurance issued the WTP Ergonomics Program Plan that was developed based on external guidance documents and the recommendations of the PIP Team. The WTP Ergonomics Program Plan contains the basis for all subsequent ergonomic improvement actions.

The WTP Daily Coordination webpage was updated to add an electronic score card and feedback system that consists of the following: (1) a reader board where important site announcements and highlights on Safety Education through Observation (SETO) leading indicators are displayed; (2) SETO leading indicators and safety statistics are available under the SETO Leading Indicators header; (3) Voluntary Protection Program (VPP) Bulletins and updates are available under their own VPP Bulletins header; and (4) Lessons Learned and Issues Management Bulletins are posted under the Issues Management Notifications header. Hard copies of the leading indicator postings are distributed to designated areas.

The Construction Utilities Group (CUG) has established a database to collect data on installation code violations for temporary power installations. Historical data were loaded into the system to baseline current performance. This information will be used to determine negative trends with the intention of issuing electrical bulletins to the craft providing feedback on negative trends.

BNI established a Craft Safety Representative (CSR) program in early CY 2008. A CSR is a craft worker that is elected by a craft-union panel. After the election, the union panel provides its selected candidate to BNI management for approval. Once approved, a CSR no longer primarily functions in their craft, but rather serves as a health and safety advocate for the craft work force. The CSR program is designed to complement the Safety Assurance organization in identifying and mitigating potential safety and health hazards identified by craft, and to provide an avenue to offer opportunities for continuous improvement as seen from the craft perspective.

The DOE Office of Worker Safety and Health Assistance (HS-12) completed its onsite VPP certification review of BNI and found BNI warrants DOE-VPP MERIT status. The DOE-VPP has three levels of recognition: (1) DEMONSTRATION – contractor demonstrates adherence to safety and health requirements; (2) MERIT – contractors with highly effective programs and who commit themselves to attain STAR status within a five-year period; and (3) STAR – contractors with programs that meet the requirements for outstanding safety and health programs, this is the highest achievement recognition level.

### 2.2.5 Quality Issues

**Preservation Maintenance Program (Update):** BNI completed the program improvements for maintenance required by its contract that involved the Federal Acquisition Regulations (FAR). The new set of procedures has been reviewed and approved for preservation and maintenance, and provides an adequate program from the time of receipt of the project until the commissioning program starts. At that time, the operational program maintenance under the maintenance implementation plan will take over as is provided in the contract and the Standards Requirement Document. BNI is now in a six-month effectiveness period that ends in January 2009, at which time BNI will perform a management self-assessment and provide it to DOE. DOE will in turn make an independent assessment of effectiveness upon receipt of BNI's assessment and consider closing the finding. This should be complete in the third quarter of FY 2009.

**WTP Black Cell Pipe Spool Issue (Update):** BNI's Authorization Basis and specifications required black cell pipe shop and field welds to include 100% radiography and positive material identification examination. However, until June 2005, neither piping isometric drawings nor the procurement specifications contained sufficient information for pipe fabricators to differentiate black cell spools from non-black cell spools. Black cells are areas where access will not be available after completion of construction because the areas will be sealed off for the life of the facility. BNI has discovered that some black cell pipe spools were shop-fabricated and sent to the WTP Project without the required examinations. BNI completed a formal root cause analysis and issued a revision to the report in response to ORP comments. In addition, BNI proposed examination requirements for pipe spool welds that are inaccessible because of high-radiation hazards or because the welds are in piping and components designated as hard-to-reach. The proposed inspection requirements for hard-to-reach piping and components are equivalent to the black cell. ORP reviewed the proposal and provided extensive comments. The comments were addressed and the final list of areas designated as hard-to-reach was incorporated into the Basis of Design by Basis of Design Change Notice 24590-WTP-BODCN-ENG-08-0008, *Revision of Black Cell and Hard-To-Reach Area NDE Requirements*.

Of the total inventory of approximately 14,000 black cells and hard-to-reach spools, all spools will be reviewed to ensure documentation of required examinations. To date, BNI has identified about 1,500 spools that will require additional verification to meet the necessary requirements. Of the 1,500 spools, approximately 200 to date will require physical re-work to bring them into compliance. BNI has completed its review and given final disposition on approximately 28% of the spools in question. None of these spools are installed at this time. A majority of the spools are on hold at the Marshalling Yard. Spools located on site are tagged and/or segregated. Additional corrective actions have been taken including updating isometric drawings to provide specific designation of black cell spools, and updating sub-tier project documents. ORP continues to closely monitor BNI's actions and will verify that the required examinations are performed.

**WTP Fire Protection with DOE-STD-1066, *Fire Protection Design Criteria* (Update):**

For most of 2008, ORP and BNI were pursuing a resolution strategy based upon equivalent fire protection features to the prescriptive requirements of DOE-STD-1066, Section 14. At 2008

year end, the analysis portion of this effort was nearly complete for the first facility (LAB), with analysis of the other three facilities (i.e., PT, HLW, LAW) and confirmatory testing to follow. However, also at year's end, ORP was re-evaluating this path forward and studying the feasibility of a risk-based approach that would address the objectives of DOE O 420.1B, *Facility Safety*. Preliminary analysis indicates there may not be a nuclear safety driver for application of Section 14 of DOE-STD-1066 to WTP ventilation systems. DOE is working with BNI to establish a revised path forward. It is estimated that work scope will be defined and a new level IV schedule established by March 15, 2009.

**WTP Structural Steel Fire Protection (Update):** On August 1, 2008, ORP formally submitted to the DNFSB the technical approach paper that addresses DNFSB's concerns for the WTP structural steel fire protection. This paper is based on calculations provided to DNSFB staff demonstrating that the progressive structural collapse of the WTP during and after a fire is not an issue. Subsequent to this paper, there were many discussions between DNSFB and ORP staff, and the Board conducted their own analysis. The Board concluded that from a radiological standpoint, the specified structural steel fire protection coatings for all the WTP facilities are adequate. However, the Board believes that it is necessary to validate that a design basis fire would not result in unacceptable toxicological consequences. Once this validation work has been completed, the issue of fire protection coating for structural steel in WTP can be closed. It is anticipated that during Board meetings held with ORP in February 2009, that this issue will be resolved.

### 3.0 ACTIONS TAKEN OR INITIATED TO RECOVER ANY AGREEMENT SCHEDULE SLIPPAGE

DOE and its contractor are working to resolve issues raised by various review teams, such as the EFRT, in order to successfully complete this project and begin plant operations. DOE continues to evaluate all of the major project management systems, project controls, business systems, and technical processes.

#### 3.1 External Review of Process Flowsheet

EFRT issue resolution has focused on near-term project impacts. To date, 26 of the 31 issues identified by the EFRT have been resolved and approved by the ORP Project Manager (Table 4). The remaining five issues are projected to be complete by late CY 2009. Table 5 provides background, current status, and plan of action for the remaining open issues. These remaining issues are the last of those issues identified in March 2006, when the EFRT completed a critical review of the WTP process flowsheet for BNI. The team identified 17 major issues and 11 potential issues that would prevent the WTP from meeting contract capabilities; 3 additional issues were raised by an internal ORP review, for a total of 31 issues. In response, BNI developed a project response plan describing the proposed actions to address the issues; IRPs were developed, issued, and approved for each issue. The IRPs include the actions required for issue resolution, a schedule for completion, integration with other issues, and integration with the overall project schedule. Examples of some of the identified issues include inadequate ultrafiltration area and flux, undemonstrated leaching process, plugging of process piping, mixing vessels erosion, inadequate mixing systems, instability of baseline ion exchange resin, PT Facility availability, lack of comprehensive feed testing in commissioning, and limited remotability demonstration.

**Table 4. Status of EFRT Issue Closure (as of December 2008)**

Issue No	EFRT Issue Title	Actual/Forecast Closure Date	Closure Status
M 7a	Lack of Spare LAW Melter	Nov-06(A)	CLOSED
M 7b	Lack of Spare HLW Melter	Nov-06(A)	CLOSED
P 3	Adequacy of Control Scheme	Dec-06 (A)	CLOSED
M 8	Limited Remotability Demonstration	Oct-07 (A)	CLOSED
M10	Critical Equipment Purchases	Oct-07 (A)	CLOSED
P10	Lack of Analysis of Silo Feeds	Oct-07 (A)	CLOSED
M16	Misbatching of Melter Feed	Oct-07 (A)	CLOSED
M 9	Lack of Comprehensive Feed Testing in Commissioning	Oct-07 (A)	CLOSED
M14	Baseline IX resin	Oct-07 (A)	CLOSED
P 8	Effectiveness of Cs-137 Breakthrough Monitoring System	Oct-07 (A)	CLOSED

**Table 4. Status of EFRT Issue Closure (as of December 2008)**

Issue No	EFRT Issue Title	Actual/Forecast Closure Date	Closure Status
P 6	Questionable Cross-Contamination Control	Oct-07 (A)	CLOSED
M 5	Must Have Feed Prequalification Capability	Oct-07 (A)	CLOSED
M10a	Questionable Column Design	Nov-07 (A)	CLOSED
P 2	Effect of Recycle on Capacity	Nov-07 (A)	CLOSED
M 4	Designed for Commissioning Waste vs. Mission Needs	Nov-07 (A)	CLOSED
M 7	Inconsistent Short-term vs. Long-term focus	Nov-07 (A)	CLOSED
P11	Incomplete Process Control design	Dec-07(A)	CLOSED
P 5	Inadequate Process Development	Dec-07(A)	CLOSED
M11	Loss of WTP Expertise Base	Mar-08(A)	CLOSED
P 7	Complexity of Valving	Mar-08(A)	CLOSED
P 1	Undemonstrated Decontamination Factor	Apr-08(A)	CLOSED
M17	HLW Film Cooler Plugging	Apr-08(A)	CLOSED
M15	Pretreatment Facility Availability	Apr-08(A)	CLOSED
M 1	Plugging in Process Piping	Feb-09	●
M 2	Mixing Vessel Erosion	Oct-08	CLOSED
M 6	Process Operating Limits Not Completely Defined	Dec-08(A)	CLOSED
P 4	Potential Gelation/Precipitation	Dec-08(A)	CLOSED
P 9	Undemonstrated Sampling System	Jun-09	●
M13	Ultrafilter Area and Flux	Jun-09	●
M 3	Inadequate Mixing System Design	Oct-09	●
M12	Undemonstrated Leaching Process	Jun-09	●

Green	Closure Package in Final Review
Yellow	Actions Complete, Package in Preparation
Orange	Actions Not Complete
Red	Closure in Dispute or Closure Package Needs Major Update
Margin	Behind projected completion date

**Table 5. Open EFRT Issues as of December 2008**

Issue/Topic	Background, Current Status, Plan of Action
M1 Plugging in Process Piping	<p><b>Background:</b> Concerns were raised that particle settling in WTP process pipelines could result in line pluggage.</p>
	<p><b>Current Status:</b> A revised design guide on minimum pipe flow velocities was prepared and issued. This design guide specifies the minimum flow velocities to prevent plugging due to particulate settling. An assessment of the design against these requirements was completed. Several design changes were identified. A review of tank waste data was performed to evaluate particle sizes and densities. Eighteen reference case tests varying fluid and particulate properties were performed to evaluate settling in pipelines. Five modular piping component tests providing information on potential plugging in piping features such as elbows, valves, jumpers and tees was performed. The testing information confirms the correlations presented in the design guides.</p> <p>A TSG Session was held on September 11, 2008, and it was agreed that ORP would review PNNL's final report and the update to the Design Guide before recommending closure.</p>
	<p><b>Plan of Action:</b> The PNNL report that supports closure was received December 3, 2008. The close issue date has been revised to February 2009 pending completion of document review.</p>
M3 Inadequate Mixing System Design	<p><b>Background:</b> Concerns were raised that fluids with quickly settling solids may not be adequately mixed by Pulse Jet Mixers in selected Pretreatment facility and HLW facility vessels.</p>
	<p><b>Current Status:</b> PJM mixing requirements were clarified for each PJM mixed vessel based on the function of process vessels. Parametric testing of mock PJMs using glass beads of varying sizes and densities was completed in early August 2008. Data is currently being evaluated to develop PJM mixing correlations. A second phase of testing is being planned to further test and evaluate the adequacy of PJM mixed vessels.</p> <p>A Design Assessment and a Gap Analysis have been initiated to identify those vessels that completely satisfy their mixing requirements, and those vessels at risk of not meeting their mixing requirements. Design improvements will be identified for those vessels at risk of not meeting their mixing requirements.</p>
	<p><b>Plan of Action:</b> Complete the Phase 2 testing program focused on evaluating cohesive simulants. Based on the Extent of Condition design assessment, and/or testing, initiate design or operational changes for the PJM mixed vessels. The Design Assessment was completed by October 31, 2008; the Gap Analysis in December. A technical testing plan has been defined and will be presented to ORP on January 30, 2009.</p>

**Table 5. Open EFRT Issues as of December 2008**

Issue/Topic	Background, Current Status, Plan of Action
<p>M12 Undemonstrated Leaching Process</p>	<p><b>Background:</b> Concerns were raised that the sludge leaching process has not been demonstrated beyond bench scale and the ultrafiltration equipment system may be undersized. The following activities were planned to resolve this issue:</p> <ul style="list-style-type: none"> <li>• Complete design studies to recommend PT facility changes to enhance throughput capability</li> <li>• Perform baseline process modeling using the baseline feed vector to project the vitrification campaign duration</li> <li>• Analyze actual radioactive waste samples and conduct small scale waste leaching experiments which represent the majority of Hanford wastes</li> <li>• Develop waste simulants for process testing based on the waste analyses</li> <li>• Perform integrated, pilot-plant testing using the PEP to demonstrate leach process scale-up with a selected waste simulant</li> </ul>
	<p><b>Current Status:</b> Simulant testing, which started on November 21, 2008, is approximately 80% complete. Tests that remain include washing and concentrating leached solids, high solids filter test matrix, and ultrafilter feed vessel short circuiting. Test objectives for the completed tests have been achieved. Data analysis will occur as sample characterization results are obtained and integrated tests are completed over the upcoming months. Phase 1 integrated testing is now expected to begin in late January 2009 and complete by April 2009. Data analysis to support issue closure is scheduled to be complete by June 2009. Final Research and Technology reports will be issued by December 2009.</p>
	<p><b>Plan of Action:</b> Complete the activities in the M12 Issue Response Plan and data analysis by June 2009. Key activities include:</p> <ul style="list-style-type: none"> <li>• Complete design studies to recommend PT facility changes to enhance throughput capability</li> <li>• Perform baseline process modeling using the baseline feed vector to project the vitrification campaign duration</li> <li>• Analyze waste samples which represent the majority of Hanford wastes</li> <li>• Develop waste simulants for process testing based on the waste analyses</li> <li>• Perform integrated PEP testing to demonstrate leach process scale-up with a selected waste simulant</li> </ul>

**Table 5. Open EFRT Issues as of December 2008**

Issue/Topic	Background, Current Status, Plan of Action
M13 Ultrafilter Area and Flux	<p><b>Background:</b> ORP and EFRT assessments concluded the ultrafiltration system as designed by BNI would not have adequate capacity to meet contract requirements and accomplish ORP's mission requirements.</p>
	<p><b>Current Status:</b> BNI issued a study showing how the filter surface area, using horizontal orientation filters, could be increased by a factor of two. Subsequently, a study looking at vertical filters was performed. BNI is currently retaining their horizontal filter design due to increased surface area, simpler draining, and simpler hydrogen venting relative to the vertical design.</p>
	<p>All closure criteria in the M13 plan appear to have been completed. Demonstration of viability of the design concept will occur in the Pretreatment Engineering Platform. Testing of the proposed configuration to confirm/project system performance is part of the M12 IRP effort.</p>
	<p><b>Plan of Action:</b> M13 will be closed following the successful completion of Phase 1 testing in the Pretreatment Engineering Platform (PEP). See Plan of Action for M12.</p>
P9 Undemonstrated Sampling Process	<p><b>Background:</b> Concerns were raised that the LAW and HLW melter feed sampling system (e.g. fluid samplers) may not prove adequate for handling slurries. This system is critical to the success of WTP operation. The completion of the planned testing is necessary to ensure sampling system adequacy. The capability of the current baseline sampling equipment needs to be confirmed.</p>
	<p><b>Current Status:</b> The testing program has been partially completed. Design changes to the prototypical sampler have been identified based on testing. Alternative designs are being evaluated. Closure package to be reviewed by BNI and ORP at the September TSG.</p>
	<p>A TSG Session was held on September 11, 2008 and BNI requested that ORP consider substituting ongoing work scope (B-57) for P-9 and close the P-9 action. However, this would transfer the scope and not close the EFRT action. The re-engineered sampler is being tested and is appearing to give reliable results.</p>
	<p><b>Plan of Action:</b> Redesign sample and confirm design by testing. Due to testing difficulties, the completion of this action, after review by the TSG, has been reset to June 2009 to allow critical sampling tests for HLW feed to be completed.</p>

#### 4.0 BUDGET AND COST STATUS

**Status:** On December 22, 2006, a new WTP Project baseline with a Total Project Cost (TPC) of \$12.263 billion was approved by the DOE Secretarial Acquisition Executive. The components of the TPC were a \$8.786 billion performance measurement baseline (PMB), \$3.477 billion in contingencies, fee, and other project costs. Through November 2008, DOE received a series of approved adjustments to the PMB that have increased the PMB and decreased contingencies by a total of \$709 million. Many of these adjustments were anticipated at the time of the performance baseline approval in December 2006, but were only rough estimates or based on Monte Carlo risk analysis (a multi-iteration, statistical technique) for the costs. The proposed adjustments were initiated to: (1) resolve issues resulting from an external technical review of the WTP process flowsheet; (2) implement facility capacity modifications in the PT Facility; and (3) complete early startup and commissioning of the LAW Facility.

In addition, there are about \$345 million of additional adjustments awaiting DOE approval. These adjustments, along with other changes to the baseline were provided to DOE on December 19, 2008. DOE is currently evaluating BNI's proposed revision to the PMB. Note that the funds for these proposed adjustments will be drawn from contingency pools. Contingency pool use is tracked and reported monthly to DOE. These proposed adjustments and strategies have not resulted in a change to the TPC of \$12.263 billion.

As part of the proposed baseline revision noted above, a delay of about two years for substantial completion of the LAW Facility construction is currently forecast by the contractor. BOF and LAB have also been similarly impacted. The commissioning of the LAW Facility and BOF and LAB will now be done in conjunction with commissioning of the PT and HLW Facilities. However, the dates for the turnover to the plant operations contractor and contract completion have not changed.

BNI continues to review work processes in an effort to mitigate future overruns. These include receipt of vendor information, document reviews, and identification, timely analysis, and closure of technical issues. Strong attention continues to be given to vendor performance through enhanced team and collaboration efforts with vendors. BNI has set up a focused equipment group with senior engineers to strengthen production focus on key equipment procurements.

**Budget:** Total funding available for the WTP Project in FY 2009 is \$1,030 million, which includes \$684 million new budget authority, and \$346 million of FY 2008 uncosted but committed carryover.

**Costs:** For FY 2009, contractor project costs through December 2008 are \$194 million with a forecasted fiscal year spend of about \$745 million. ORP anticipates an additional \$15 million in technical support costs, resulting in a total FY 2009 anticipated WTP Project spend of about \$760 million.

## 5.0 DOE/DOE CONTRACTOR COMPLIANCE/STATUS OF HFFACO MILESTONES

The December 2006 approved baseline assumes consistent Congressional appropriations of \$690 million from FY 2007 through construction and commissioning completion.

Negotiations regarding HFFACO milestones began in May 2007 with the public being provided the opportunity to review and comment on the draft schedule of Single-Shell Tank Retrieval and Closure and WTP activities/milestones. Negotiations continued through most of 2008, unsuccessfully, resulting in the State of Washington filing a Complaint in November. The State's lawsuit asserts that DOE has missed, or is certain to miss, the milestones listed in Table 6. These matters are now subject to that pending lawsuit.

**Table 6. Impacted HFFACO Milestones**

Milestone	HFFACO Date	Description
M-062-00	12/31/2028	Complete Pretreatment Processing and Vitrification of Hanford High-Level (HLW) and Low-Activity (LAW) Tank Wastes.  Compliance with the work schedules set forth in this M-62 series is defined as the performance of sufficient work to assure with reasonable certainty that DOE will accomplish series M-62 major and interim milestone requirements.
M-062-00A	02/28/2018	Complete WTP Pretreatment Processing and Vitrification of Hanford HLW and LAW Tank Waste.  Tank Waste processing shall complete the WTP pretreatment and vitrification of no less than 10% of Hanford's Tank waste by mass and 25% by activity.
M-062-07B	12/31/2007	Complete Assembly Of Low-Activity Waste Vitrification Facility Melter #1 So That It Is Ready For Transport And Installation In The LAW Vitrification Building (BNI Baseline Schedule Activity 4DL321A200 As Part Of DOE Contract No. DE-AC27-01RV14136).
M-062-08	06/30/2006	Submittal Of Hanford Tank Waste Supplemental Treatment Technologies Report, Draft Hanford Tank Waste Treatment Baseline, And Draft Negotiations Agreement In Principle (AIP).  DOE will submit a supplemental Treatment Technologies Report that describes the technical, financial, and contractual alternatives, which, in combination with the WTP and any required additional LAW vitrification facilities, are needed to treat all of Hanford's Tank Wastes.
M-062-09	02/28/2009	Start Cold Commissioning - Waste Treatment Plant.  DOE Will Start Cold Commissioning Of Its Tank Waste Treatment Plant. Start Of Cold Commissioning Is Defined As Introduction Of First Feed Simulant Into A Process Building.

**Table 6. Impacted HFFACO Milestones**

Milestone	HFFACO Date	Description
M-062-10	01/31/2011	<p>Complete Hot Commissioning - Waste Treatment Plant.</p> <p>DOE Will Achieve Sustained Throughput Of Pretreatment, Low-Activity Waste Vitrification And High-Level Waste Vitrification Processes, And Demonstrate WTP Treatment Complex Availability To Complete Treatment of no less than 10% of the tank waste by mass and 25% of the tank waste by activity by December 2018.</p>
M-062-11	06/30/2007	<p>Submit A Final Hanford Tank Waste Treatment Baseline.</p> <p>Following The Completion Of Negotiations Required In M-62-08, DOE Will Modify Its Draft Baseline As Required And Submit Its Revised Agreed-To Baseline For Treating All Hanford Tank Waste (HLW, LAW, and TRU) by 12/31/2028.</p>

## **6.0 AREAS OF NON-COMPLIANCE**

One Dangerous Waste Permit Compliance Schedule Item was missed this reporting period (see Section 2.1.4). The status of HFFACO milestones is addressed in Section 5.0.

## 7.0 REFERENCES

- 08-ESQ-183, letter, S. Olinger, ORP, and W. Elkins, BNI, to J. Manning, Ecology, "Submittal of Dangerous Waste Compliance Schedule Item 37 – Mechanical Handling Diagrams and Data Sheets," dated September 17, 2008
- 08-ESQ-206, letter, S. Olinger, ORP, to J. Hedges, Ecology, "Submittal of Completion of Dangerous Waste Compliance Schedule Item 36 – System Descriptions for Mechanical Handling Systems for Incorporation Into The Administrative Record," dated December 15, 2008
- 24590-WTP-BODCN-ENG-08-0008, 2008, *Revision of Black Cell and Hard-To-Reach Area NDE Requirements*, Bechtel National, Inc., Richland, Washington
- 62 FR 8693, 1997, "Record of Decision for the Tank Waste Remediation System, Hanford Site, Richland, WA," *Federal Register*, Vol. 62, pp. 8693-8704, February 26
- CCN 132846, letter, BNI to ORP, "Report of External Flowsheet Review Team for the Hanford Waste Treatment and Immobilization Plant-Final Report Titled: 'Comprehensive Review of the Hanford Waste Treatment Plant Flowsheet and Throughput'," dated March 17, 2006
- DOE Contract No. DE-AC27-01RV14136 between the U.S. Department of Energy and Bechtel National, Inc., dated December 11, 2000
- DOE O 420.1B, 2005, *Facility Safety*, U.S. Department of Energy, Office of Environment, Safety and Health, Washington, D.C.
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- Ecology 2007, *Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, WA7890008967, Rev. 8c, Washington State Department of Ecology, Olympia, Washington
- Ecology et al. 1989, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington
- Ecology letter, E. Fredenburg, to S. Olinger, ORP, and W. Elkins, BNI, "Submittal of Dangerous Waste Compliance Schedule Item 41 to the Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion, for the Treatment, Storage and Disposal of Dangerous Waste, Part III, Operating Unit 10 (Waste Treatment and Immobilization Plant), WA7890008967," dated December 17, 2008
- Resource Conservation and Recovery Act of 1976*, 42 USC 6901, et seq., as amended