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Office of River Protection

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JAN 31 2008

08-WTP-024

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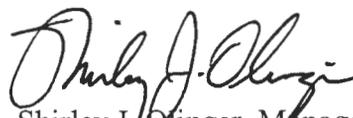
Addressees:

HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER INTERIM MILESTONE M-62-01, "SEMI-ANNUAL COMPLIANCE REPORT FOR THE WASTE TREATMENT AND IMMOBILIZATION PLANT," FOR JULY 1 THROUGH DECEMBER 31, 2007

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, 2007. As stipulated in the M-62-01 Milestone, the attached report includes project summaries of accomplishments, issues encountered, and actions being taken.

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

Sincerely,


Shirley J. Olinger, Manager
Office of River Protection

WTP:BLN

Attachment

cc: See page 2

Addressees
08-WTP-024

-2-

JAN 31 2008

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m-062-01, H-0-8

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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, 2007 – December 31, 2007**



**U.S. DEPARTMENT OF ENERGY
OFFICE OF RIVER PROTECTION
2440 Stevens Center Place
Richland, Washington 99352**

December 31, 2007

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LIST OF ACRONYMS

ABAR	Authorization Basis Amendment Request
AFA	antifoam agent
AIP	agreement in principle
ANSI	American National Standards Institute
AWS	American Welding Society
BNI	Bechtel National, Inc.
BOF	Balance of Facilities
CAR	Corrective Action Request
CGD	Commercial Grade Dedication
CIO	Continuous Improvement Opportunity
CTE	critical technology element
CY	calendar year
DAFW	days away from work
DART	days away or restricted time
DBVS	Demonstration Bulk Vitrification System
DCMA	Defense Contract Management Agency
DNFSB	Defense Nuclear Facilities Safety Board
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
EAC	estimate at completion
Ecology	Washington State Department of Ecology
EFRT	External Flowsheet Review Team
EIA	Electronic Industries Alliance
EVMS	Earned Value Management System
FY	fiscal year
HFFACO	<i>Hanford Federal Facility Agreement and Consent Order</i>
HGR	hydrogen generation rate
HLW	High-Level Waste [Facility]
HPAV	hydrogen in piping and ancillary vessel
ICE	independent corrosion engineer
IRP	Issue Response Plan
JHA	Job Hazard Analysis
LAB	Analytical Laboratory
LAW	Low-Activity Waste [Facility]
LBL	LAW Facility, BOF, and LAB
LMI	LMI Government Consulting
MAP	melter assembly pad
MOB	multiple overblow
MTR	material test report
NDE	non-destructive examination
NQA-1	Nuclear Quality Assurance
OECM	Office of Engineering and Construction Management
OEM	Office of Environmental Management
ORP	Office of River Protection
OSHA	Occupational Safety and Health Administration

PEP	Pretreatment Engineering Platform
PJM	pulse jet mixer
PNNL	Pacific Northwest National Laboratory
PT	Pretreatment [Facility]
PVS	Paxton Vierling Steel
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RF	resorcinol formaldehyde
RGM	revised ground motion
RPP	River Protection Project
SBP	Seismic Boreholes Project
SETO	Safety Education through Observation
TCO	thermal catalytic oxidizer
TLFL	times to lower flammability limit
TRA	Technology Readiness Assessment
TRL	Technology Readiness Level
VPP	Voluntary Protection Program
WCM	weld control manual
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

As required by the *Hanford Federal Facility Agreement and Consent Order* (HFFACO) (Ecology et al. 1989) Milestone M-62-01, this Semi-Annual Project Compliance Report (M-62-01P) reflects the status of the U.S. Department of Energy (DOE), Office of River Protection (ORP) Waste Treatment and Immobilization Plant (WTP) Project for the period from July 1, 2007, through December 31, 2007. As detailed in M-62-01, this report documents 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 190 million curies contained in 53 million gallons of mixed hazardous 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-AC27-01RV14136.¹ The WTP will be designed, constructed, and permitted to treat and immobilize mixed hazardous 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 Farm Contractor (CH2M HILL Hanford Group, Inc. [CH2M HILL]), through a pipeline system interface. The pretreatment process will separate (or continue to refine) the waste into low-activity waste 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

¹ Contract No. DE-AC27-01RV14136 between the U.S. Department of Energy and Bechtel National, Inc., dated December 11, 2000.

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 services.

This compliance report reviews each of the WTP Project functional areas, and the overall project. Financial data is through December 2007, 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: Improving the safety culture at the WTP Project has been a team effort among DOE, BNI, Washington Group International (BNI's main subcontractor), the building trades, union leadership, and manual and non-manual employees. This effort has resulted in the WTP Project reaching two significant safety milestones as of December 5, 2007:

1. Two Million Safe Construction job hours for the Construction and Marshalling Yard workforce (non-manuals, manuals, and subcontractors).
2. Five Million Safe job hours without a day away from work incident project-wide (including satellite offices in Oakland, California, and Frederick, Maryland). The last safety incident that resulted in an employee missing a day of work occurred on December 14, 2006.

In addition, the WTP Project achieved 11 consecutive months without a days away from work (DAFW) injury through November 2007. The calendar year (CY) 2007 cumulative recordable injury case rate through November was 1.52, compared to a rate of 1.72 for the same period in 2006. Although overall rates have improved, the recordable rates were uncharacteristically high in September and October 2007, which is when the Project resumed full construction. There were 14 incidents, 12 of which were related to routine physical activities. See Section 2.2.7 for additional information on how ORP and BNI continue to work together to reinforce and improve the WTP safety culture among its workforce.

From project inception through the end of November 2007, WTP employees have worked in excess of 35 million hours with only 234 Occupational Safety and Health Administration (OSHA) recordable injuries. Thus, the cumulative OSHA recordable injury rate for the entire project is 1.3 injuries per 200,000 hours worked. By comparison, the OSHA recordable rate is 5.6 injuries for the construction industry nation-wide (by the Bureau of Labor and Industry as of December 2005), and 2.2 injuries for DOE construction contractors.

2.1.2 WTP Complex Design and Construction

Project Overview: Design for the WTP Project is 74% complete and construction is 32% complete (based on hours). An average of 862 personnel (545 craft and 317 non-manual staff) was working on site, down from a peak of about 2,050 personnel in March 2005.

Design, procurement, and construction activities continue at the LAW Facility, BOF, and LAB (LBL). Design, limited procurement, and site maintenance are continuing at the PT and HLW Facilities. Construction on PT and HLW Facilities resumed following the Secretary of Energy certification to the Congressional Defense Committees that the Secretary had approved the final seismic and ground motion criteria based on Pacific Northwest National Laboratory's (PNNL) evaluation of the seismic response spectra from the Seismic Boreholes Project (SBP). Upon certification, the WTP Project Contracting Officer formally directed that the approved seismic criteria be used for the final design of the PT and HLW Facilities. BNI conducted and DOE

oversaw readiness reviews for the PT and HLW Facilities to ensure that construction activities could be resumed safely and efficiently.

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 Expert (External) 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 the WTP Contractor or DOE. A number of these issues originated from limited understanding of the technologies that comprise the WTP flowsheet. 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; BNI is in the process of implementing the plans.

One waste processing option involves the LAW Vitrification Facility where the seismic issues (and other issues) identified in 2005 did not impact construction. This has given rise to the concept known as "Start LAW First" where the LAW Vitrification Facility would start operations in 2014, approximately 5 years earlier than the WTP PT Facility and the HLW Vitrification Facility. The LAW Vitrification Facility is designed to receive pretreated feed from the WTP PT Facility in accordance with its waste feed specifications. Hence, alternate tank farm-based pretreatment facilities are needed to implement this concept. This concept has been approved and received CD-0 in December 2007. While a decision to start operations of LAW early has not been made, the WTP Project has developed a revised baseline schedule to incorporate the "Execution Revision" (ER) strategy for completing construction of the LAW Facility first.

In FY 2007, a Congressional restriction was placed on the amount of funds that can be used for the WTP Project, pending a recommendation by the Defense Contract Management Agency (DCMA) to approve the Contractor's Earned Value Management System (EVMS), as well as subsequent approval by the Secretary of Energy. In November 2006, the WTP Contractor underwent an EVMS certification review conducted by the DCMA. In May 2007, Tecolote Research, Inc, a nationally recognized firm under contract to DOE to conduct EVMS certifications, conducted a follow-up review; Tecolote delivered its report to DOE on July 2, 2007. Tecolote has indicated that all previous DCMA findings have been resolved and the EVMS meets the intent of the ANSI standard. The FY 2007 Authorization Act required DCMA to recommend acceptance of the WTP EVMS. With Tecolote now conducting DOE EVMS certifications, FY 2008 National Defense Authorization Bill language, when adopted, would allow DOE acceptance of Tecolote's recommendations in lieu of DCMA. EVMS certification is pending the passage of the FY 2008 National Defense Authorization Bill (see Section 2.2.1).

Pretreatment Facility: ORP received Secretarial certification of the final seismic ground motion criteria was received on August 10, 2007. This certification allowed construction at the PT Facility to resume following a complete readiness review to ensure work could be resumed safely and efficiently. The PT readiness review was completed successfully the first week of December 2007. The first construction activities started in December with the erection of structural steel on the south side of the building and placement of concrete in a wall below the 56' elevation.

While construction was suspended, the project has been busy resolving issues raised by EFRT. The most technically challenging activity is the waste leaching and ultrafiltration processes to be performed in the PT Facility. In order to test these processes, a scale-test facility is being designed and fabricated. This facility, the Pretreatment Engineering Platform (PEP), formerly called the Engineering Scale Pretreatment System, will test a variety of conditions to ensure the facility can effectively process the range of waste streams that the WTP will receive from the Tank Farms. The platform is being designed and fabricated in a number of modules referred to as skids. The subcontractor is located in Carlsbad, New Mexico. These skids will be trucked to Richland, Washington, where they will be assembled into a completed test facility. Good progress was made earlier in the design and fabrication processes; however, technical difficulties and a shortage of qualified welders has slowed progress on the PEP. The delivery of the skids is expected to be complete in April 2008 rather than in January as originally planned.

In response to EFRT recommendations, BNI is evaluating the issues of line plugging and mixing in the various systems within the PT Facility. In doing so, BNI re-evaluated the capabilities of the plant as designed and found that between 1% and 3% of the waste could cause mixing or line plugging difficulties. Modification to the facility to accommodate these larger particles may prove to be more difficult and costly than establishing waste acceptance criteria that will exclude these particles from the plant. The integration team (BNI, CH2M HILL, and DOE) for the Interface Control Document for Waste Feed (ICD-19) completed a draft engineering study that provides alternative ways of dealing with this issue. This team is on track to develop the engineering study results and brief a joint management team in early 2008.

Other technical issues being resolved relative to the PT Facility include pulse jet mixer (PJM) overblow, vessel mixing, vessel erosion, hydrogen in piping and ancillary vessels (HPAV), capacity modifications, and the revised ground motion seismic issue. BNI has determined that there is a possibility that more than one PJM could overblow simultaneously; this is referred to as a multiple overblow (MOB). In order to validate the current design criteria, tests using two PJM arrays and simulants have been designed. These tests are complete and the raw data have been provided to a subcontractor to convert the information into hydrodynamic loads for the vessels designer to ensure that the vessel internals are properly sized to resist these forces. With the exception of cooling jackets, PJM cones, and vessel nozzles installation, vessel fabrication has been on hold pending resolution of technical and permitting issues surrounding safety margins for erosion. Preparation and approval of the erosion test specification and plan have been the major activities associated with testing to determine the adequacy of the vessels to withstand the erosive effects of the waste during their design lifetime. BNI completed the test specification, which was reviewed and commented upon by DOE and the Washington State Department of Ecology (Ecology). The testing subcontractor has prepared a draft testing plan, which is being reviewed by BNI, DOE, and Ecology. The subcontractor is also procuring

components for the simulant that will be used in the upcoming tests and a specification for hard-faced test coupons is being prepared by BNI.

DOE has directed BNI to proceed with a number of facility modifications to increase the WTP capacity. The major changes involved increasing the size of the ultrafilters, modifying process vessels to allow leaching to be initiated earlier in the process and at a higher temperature, and increasing the capacity of the cesium ion exchange columns. BNI continues to re-assess the design and the changes that will be necessary to accommodate these capacity modifications.

Civil/Structural Engineering continued work on the design of the concrete walls and slabs at and above the 56' elevation in the building in anticipation of construction resumption. There is sufficient design completed to put engineering nearly a year ahead of construction activities. The design of the major structural steel members has been completed through the 98' elevation.

Mechanical Systems is involved in executing the IRPs associated with EFRT comments. Since many of the EFRT issues involve the PT Facility, it is critical these issues be resolved quickly so that PT Engineering can resume activities with confidence in the sound technical basis of their work.

BNI's assessment program identified recurring problems with the lack of non-destructive examination (NDE), material test reports (MTR), and configuration management of both commercial material (CM) and "Q" piping spools to be installed in black cells at the WTP. Over 95% of the piping spools (prefabricated piping segments) in question are for the PT Facility (the remainder belongs to HLW). These issues require the inspection of approximately 17,000 piping spools before the pipe spools can be cleared for installation in the black cells. BNI completed a root cause analysis, and concluded there were two root causes for this problem:

- The Project did not establish processes to ensure that the supplier understood and would implement enhanced requirements for black cell piping.
- The Project did not have an adequate process to recognize the importance, significance, and consequences of previously identified issues.

PT Facility procurement activities have remained at a low level but the filter cave shield doors were delivered to the site in December. With the delivery of these doors, all the major shielding doors for the PT Facility are now on site. The filter cave bridge crane fabrication was completed and factory acceptance testing of the crane will be accomplished during the first quarter of CY 2008.

Low-Activity Waste Vitrification Facility: Construction of the LAW Facility structures is progressing. Basemat placement and structural steel erection is complete for both the annex and the container import bay. All export bay concrete placements have been completed. All structural concrete placements are complete but miscellaneous concrete placements will continue.

Construction crews continue to install permanent lighting on the -21' elevation; conduit, piping, and hanger on the -21', 3', and 28' elevations; cable tray at the 28' and 48' elevations; ventilation ducting and insulation at the -21' and 48' elevations; ventilation ducting, insulation,

cable tray, crane rail clips, and workshop cranes on the 48' elevation; and lightning protection components at the 68' elevation. Fireproofing repairs are underway at the -21', 3', 28', and 48' elevations. Structural steel and decking is being painted on the -21', 28', and 48' elevations. Chilled water pumps and piping are being aligned on the -21' elevation. Container import bay top mat rebar is being installed. Ducting and hangers are being installed in the south finishing line. Annex structural steel installation continues on the north side of the LAW Facility. Container export bay door drives are being installed.

The melter structure fabricator identified a number of surface cracks in the melter electrodes. The electrodes are large Inconel forgings that extend from outside the melter through the refractory and into the melt glass pool. The surface cracks were identified in a rough casting, not the final electrode shape. Final machining of the electrode eliminated or greatly reduced the surface cracks. BNI has requested that the melter structure fabricator ensure there are no cracks in the melter pool transition zone of the electrode. There is a large temperature gradient in the melter pool transition zone (between the internal portions of the refractory to the center of the melt pool). Weld repair of the electrode is the current approach for repairing cracks. The current design for one of the melter electrodes calls for welding so there is no apparent degradation of the electrode due to weld repairs.

BNI is walking through the processes necessary for the construction of the melter. There are three structural elements (the shield lid, gas barrier lid, and the wall modules) that must be assembled within design tolerances to successfully construct the melter. The gas barrier lid is placed on the wall module, then the shield lid is installed on the wall module. The alignment tolerances between the shield lid and gas barrier lid must be maintained simultaneously with the wall module and shield lid tolerances. Construction of the melter will be difficult. BNI is proactively addressing these issues now to understand craft training requirements and if additional construction aides are required.

High-Level Waste Vitrification Facility: ORP received Secretarial certification of the final seismic ground motion on August 10, 2007. BNI completed the HLW readiness review to ensure safe construction, and construction resumed at the HLW Facility on August 23, 2007.

Unfinished installation of rebars and conduits was completed and the first concrete slab on-grade was placed on September 20, 2007, three months ahead of schedule. This marked the first concrete placement at the HLW Facility since 2005. Since then, construction has increased steadily, with about 85 craft persons currently working at HLW. A third craft team was added to accelerate placement of slabs and wall from the current baseline. Construction forces have worked on rebar, conduit, and embedment installations and placed the second slab on-grade, annex wall, and mud mats under the slab on-grade on two walls on the southeast side of HLW. Work on the grounding and conduit is progressing. Crews are also working on the rebar installation for walls around the melter cell, and planning for installation of multi-commodity support steel structures at the -21' elevation. In addition, winterization activities have been completed throughout the facility.

Engineering activities continued support of construction. BNI Engineering updated the seismic non-conformance reports for the slabs and walls at 0' to 14' elevations. Engineering issued revised drawings, specifications, and/or datasheets for a number of plant systems, including

floor-framing drawings for the 14' and 37' elevations, which incorporated RGM. Engineering also issued architectural floor plans and equipment location drawings for the 58' and 72' elevations; flow diagrams for HLW receipt and feed preparation associated with the Concentrate Receipt Process, Glass Formers Reagent, Melter Feed Process, and Canister Decontamination systems; instrument datasheets to purchase 38 level transmitters and 4 flow control valves; and 3 design proposal drawings for the C2/C5 confinement system and HLW Melter Feed Process System air ejector assemblies. Fabrication of 27 near-term electrical joggles for 0' to 14' elevation walls was received, and the balance of the joggles for 0' to 14' and 14' to 37' elevation walls issued.

The HLW Facility summary structural report incorporating RGM was issued and forwarded to the Defense Nuclear Facilities Safety Board (DNFSB), completing one of the key deliverables towards closing DNFSB issues with the facility structural design. Environmental Qualification (EQ) calculations for accident temperatures and other parameters have been completed; relevant EQ data will be forwarded to the equipment vendors in the next few months. A complete revision of the -21' elevation ventilation and instrumentation diagrams was issued. This revision brings the form in line with the newly released waste acceptance impacting procedure.

DOE completed an extensive review of a major revision to the Waste Form Compliance Plan and provided comments. This revision brings the plan into compliance with the expectations of the Office of Environmental Management (EM-12) by incorporating the requirements established in the Memorandum of Agreement between EM and the Office of Civilian Radioactive Waste Management signed in February 2007. This document sets forth the strategies for compliance with statutory, regulatory, and DOE requirements. The waste screening form for the HLW canister processing operations was also revised. DOE received draft revisions for the production canister drawings and anticipates transmitting issued drawings for inclusion in the integrated ICD.

To enhance glass performance, DOE awarded two additional testing contracts for various glass compositions to evaluate increasing glass production rates by varying different parameters. Increasing average bulk glass temperature from 1150C to 1200C increases the production rate; however, operating at the higher temperature affects Inconel-690™ components, bubblers, temperature probes, and electrodes. In addition, current glass formulation efforts have been conservative in terms of achievable waste loadings.

Melter fabrication has been going well, and delivery is anticipated ahead of schedule, by July 2008. The shield door fabricator completed and submitted the draft physical configuration audit report on the melter cave shield doors, which noted that some of the partially fabricated doors may have to be replaced due to lack of sufficient documentation by the previous vendor, who declared bankruptcy. Cost evaluations of various options are ongoing. Significant efforts are being exerted to improve the Commercial Grade Dedication (CGD) process at both BNI and the vendor shops to ensure that Nuclear Quality Assurance (NQA-1) requirements are met. The contract for QL systems, thermal catalytic oxidizer (TCO), and preheaters was awarded to a commercial vendor.

Balance of Facilities: There have been major accomplishments at the BOF in the last six months. Construction forces completed the rework of the waste feed transfer lines between the

HLW and PT to repair the pipes' inadequate slope. The stainless steel pipe was welded and the slope verified to ensure it has a minimum 0.5% slope. Crews have started to backfill the piping trenches, which are scheduled to be complete in the first quarter of CY 2008. Five Chiller Compressor Plant air dryers were received and installed. BNI has worked with the fabricator for several months to resolve technical and workmanship issues. The dryers are the last major mechanical component that needs to be installed in the facility.

Construction forces continue to install large diameter pipes, hangers, and cable tray hangers in the Chiller Compressor Plant. Construction craft continues to install piping between the firewater tanks and the pump buildings. Steam piping and intra-yard piping support steel installation is progressing. The intra-yard structure extends from the west side of the LAW Facility, to the north side of LAW, then back to the steam plant. Grounding is being installed in the Water Treatment Building and the Fuel Oil tank.

Issues continue with the delivery of the Glass Former Storage Facility silos. BNI's subcontractor has been working at near 100% capacity meeting ethanol production facility needs and has not been motivated to meet the BNI schedule. BNI assigned a senior procurement expeditor to work directly with the contractor to get the silos completed and ready for delivery. The first two silos have been received. All 13 silos will be onsite by March 2008 and silo installation will start in April 2008.

Embeds have been installed in the melter assembly pads (MAP) located south of the LAW Facility. BOF Engineering's MAP design used in stock embeds to reduce the material procurement time and cost, and to reduce the number of in stock embeds. This is a small example, but it is representative of the efforts to effectively use available resources to support construction.

Cathodic protection system installation for the waste feed transfer piping continues. Coating and shrink sleeve installation is proceeding on the newly repaired piping.

Analytical Laboratory: The LAB has seen the most visible measure of progress in the last six months. Crews completed structural steel erection, and roofing and siding installation. In the next six months, the LAB stack will be constructed and installed on the facility.

LAB Construction declared that the Erect Structural Steel gatepost milestone was completed on October 11, 2007, approximately three weeks earlier than the milestone date. This milestone excluded the stack erection consistent with the LAW structural steel erection milestone.

Placement of the 17' decking has been completed and all air-handling units have been staged.

Construction forces continue to install: HVAC and electrical supports in the hot cell; piping hangers, permanent conduit, and lighting throughout the facility; and leak detection boxes in the C3 pit. The air lock doors on the south side of the hot cell are being installed. The air lock doors actuators and retractable rails on the south side of the hot cell are being installed. The hot cell wall panel center post installation is ongoing.

Stainless steel welding on the Process Vacuum System (PVA) has started. PVA provides vacuum service to the radiological laboratory area fume hoods and room record air samples.

2.1.3 Commodities Installations

Based on the construction activities, the total WTP Project commodities placed or installed through November 2007 are summarized in Table 1.

Table 1. Key Commodity Quantity Progress

Quantity Progress	Current Planned at Completion Quantity	Installed To-Date Through November 2007	Percent Complete
Concrete	260,450 cy	171,830 cy	66.0%
Structural Steel	35,700 ton	10,980 ton	30.8%
Piping (in buildings)	889,000 ft	107,070 ft	12.0%
Piping (underground)	124,900 ft	104,250 ft	83.5%
Conduit (in buildings)	781,660 ft	82,300 ft	10.5%
Conduit (underground)	187,810 ft	176,670 ft	94.1%
Cable Tray	96,180 ft	16,260 ft	16.9%
Cable and Wire	4,690,110 ft	178,930 ft	3.8%
Heating, Ventilation, and Air-Conditioning Ductwork	4,170,820 lb	664,470 lb	15.9%

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.

In October 2006, Ecology released a proposed permit modification to reflect the 2+2 melter design and other changes. The public comment period ended January 5, 2007, and ORP and BNI provided comments on the proposed permit modification. Ecology issued their final permit decision and related comment responsiveness summary on October 28, 2007. DOE filed an appeal to Ecology's final permitting decision, specifically appealing two of the new permit conditions:

- Application of the High Level Vitrification Land Disposal Restriction; and
- 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, performance deterioration in engineering and construction, 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 FY 2006 funding level all contributed to increased project costs and schedule extension. In the December 2006 approved baseline, the estimated completion date for hot commissioning is May 2019. As a result, the remaining scheduled compliance schedule items listed in Table 2 will not be met.

**Table 2. Dangerous Waste Permit (RCRA)
Compliance Schedule Items**

Item Number	Description	Due Date
1.	Submit documentation stating the WTP has been constructed in compliance with the Permit.	03/01/2008
32.	Final Compliance Date.	02/28/2009

No Dangerous Waste Permit Compliance Schedule items were due this reporting period.

2.2 Near-Term Issues

2.2.1 Earned Value Management System Certification

In November 2006, BNI underwent an EVMS certification review conducted by the DCMA against the 32 elements of American National Standards Institute (ANSI)/Electronic Industries Alliance (EIA)-748, *Earned Value Management Systems*. The EVMS review resulted in eight corrective action requests, three major and five minor findings, and three continuous improvement opportunities. In February 2007, BNI submitted its Corrective Action Plan for review. In May 2007, Tecolote Research, Inc, a nationally recognized firm now contracted by DOE to conduct EVMS certifications, conducted a follow-up review; Tecolote delivered its report to DOE on July 2, 2007. Tecolote has indicated that all of the previous DCMA findings have been successfully resolved and the EVMS meets the intent of the ANSI standard.

The FY 2007 Authorization Act was specific in requiring DCMA to recommend acceptance of the WTP EVMS. With Tecolote now conducting DOE EVMS certifications, FY 2008 National Defense Authorization Bill language allows DOE to accept Tecolote's recommendations in lieu of DCMA.

2.2.2 Revised Ground Motion

The uncertainties about the WTP seismic design criteria were resolved on August 10, 2007, when the Secretary of Energy certified the RGM, used by the WTP since February 2005, as the final seismic design criteria for the WTP. Secretarial certification was based on the detailed soil

characterization of the WTP specific soil strata gathered as part of the Seismic Boreholes Project (SBP) initiated by DOE in mid-2006. The SBP performed deep bore drilling to approximately 1,400 feet below the ground level, collected samples, performed seismic wave velocity measurements, and re-evaluated logic tree analysis. The evaluation was complete in June 2007, demonstrating that the RGM was significantly conservative. This evaluation was reviewed and concurred upon by a team of nationally recognized experts, the U.S. Army Corps of Engineers, and the DNFSB. Based on the Secretarial certification, ORP notified BNI that the restriction on the construction at the PT and HLW Facilities were resolved, and BNI resumed construction at the HLW Facility on August 23, 2007, after completion of its HLW readiness review. BNI completed its readiness review for the resumption of construction at the PT Facility the first week of December 2007; construction resumed at the PT Facility on December 13, 2007.

2.2.3 Pulse Jet Mixers Design Closure

New PJM testing is being 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; (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.

2.2.4 Issues with Use of Antifoaming Agent in WTP Pretreatment Vessels

During design of the WTP PT Facility, seven tanks were projected to contain non-Newtonian slurries. Mixing of these complex fluids is required for processing and to prevent hazardous volumes of flammable gases generated by radiolytic decomposition of water and chemical reactions. PJMs are planned for mixing most vessels in the WTP because they contain no moving parts; however, testing indicated their effectiveness for non-Newtonian fluids was low. Therefore, air spargers were added to promote better mixing.

An antifoam agent (AFA) is required to prevent foaming in five non-Newtonian feed tanks in the PT Facility that use mixing spargers during normal operations. Preliminary small-scale tests completed in December 2006 showed evidence that gas retention increased and release rates were retarded, which could pose a safety or secondary operational concern that might force a change to the current mixing strategy post-design basis event. The 1/4-scale prototypic testing is now complete and results show that the addition of AFA to waste simulant (waste tank AZ-101) has gas retention similar to clay without AFA. Because the WTP safety strategy is based on clay data, no additional air compressors or frequent sparging is needed beyond what is currently planned. Furthermore, testing has confirmed, using a small-scale test stand, that alternate AFA 1520 (currently used at Tank Farms) is a viable alternative, although at a higher concentration to provide a similar effect. Testing also confirmed, using a bench-scale test stand, that iron-hydroxide is a key non-Newtonian component contributing to gas hold-up and that AZ-101 simulant is bounding. PNNL and Savannah River National Laboratory completed AFA testing on September 27, 2007; the final reports are due by December 31, 2007.

2.2.5 Hydrogen in Piping and Ancillary Vessels (HPAV)

BNI has been investigating the buildup of HPAV and developing methods for preventing flammable gases (including hydrogen) from accumulating in quantities sufficient to cause damage to affected systems due to explosions. BNI found that similar conditions existed in a number of locations throughout the HLW and PT Facilities. A combination of active and passive control strategies were developed to address each affected ancillary vessel and piping flowpath. These strategies are described in ABARs 05-0040 and 05-0041. The active strategies used venting, flushing, or draining of vessels and piping to remove flammable gases before it reached explosive quantities. In some locations, BNI relied on passive controls including, in some small bore piping, withstanding the loads from an explosion provided the system could withstand the resulting explosion loads without any circumferential inelastic deformation.

BNI's explosive consultant previously calculated the explosion effects that would be large enough to cause piping deformation. These calculations were based on new experimental data DOE provided from research done for this problem in 2006. This research focused on the most vigorous type of explosion in hydrogen mixtures, a detonation-to-deflagration transition near an obstacle in the piping (such as a bend, closed valve, etc.). The probability of such explosions is not known, so it is assumed to be equal to one, for additional safety margin. The absence of a clear mechanism to ignite an explosive mixture indicates that any explosions, if they occur, are probabilistically very infrequent (a few times in the life of the facility, at most). In cases where the hydrogen hazard developed very slowly, over hundreds of hours, administrative controls will be relied upon to ensure operators remove hydrogen from affected piping and ancillary vessels before explosive concentrations can occur; otherwise, automatic removal systems or passive strategies will be used.

ORP has reviewed these controls and considers them acceptable, once BNI includes more complete descriptions of the proposals in their submittal (the clarifying information has been made available for review, but not yet formally submitted). Final approval of these ABARs will occur in early 2008.

As a result of design changes to improve the processing capability of the facility, BNI is updating the suite of controls it will use for the HPAV hazard, and will propose these in a new ABAR in late December 2007. In addition, BNI has developed a strategy for how to model pipe longitudinal loads and liquid slug loads for explosions. Understanding these loads is necessary to design pipe supports (number, size, and location) while providing adequate safety from this hazard. DOE has asked a supporting university to perform fundamental research that will underpin BNI's design. The intent of this combined effort is to optimize the pipe support design, and determine whether additional active controls to flush or vent selected piping runs is advantageous where excessively large pipe supports would otherwise be necessary. This research effort is scheduled for completion in early 2009.

2.2.6 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, developing simulants, and testing the ultrafiltration flowsheet with an integrated engineering scale system referred to as the Pretreatment Engineering Platform (PEP).

The PEP is a 1:4.5 scale non-radioactive integrated test of the WTP ultrafiltration system. The PEP will demonstrate the ultrafiltration system, leaching process design, system scale-up, and improve projections of system capacity. Design and fabrication of the PEP is being performed in Carlsbad, New Mexico. The PEP will be assembled on 16 skids that will be shipped to Richland for final assembly in the spring of 2008. Integrated testing with simulant in the Process Demonstration Laboratory-West Facility will be performed in Richland in late summer/ early fall 2008.

The following modifications have been made to the ultrafiltration system design to improve the ultrafiltration leaching process:

- The caustic leaching process used to remove aluminum from HLW solids and reduce the quantity of HLW glass produced over the mission has been modified to use additional caustic to keep aluminum in solution following cooling to 25C and filtration. This will reduce the risk of aluminum precipitation in the ion exchange system.
- The leaching process was modified to perform leaching at 100C. This will enhance the quantity of Boehmite that is removed from HLW solids relative to the earlier flowsheet design that was limited to approximately 85C.
- The capability to perform caustic leaching in the ultrafiltration feed preparation vessels was added. The prior design limited caustic leaching to the ultrafiltration feed vessels. This capability reduces the duty cycle on the ultrafiltration feed vessels increasing throughput and stabilizing permeate composition, which will also reduce the risk of post-filtration precipitation.
- The capability to add reagents and wash solutions in transfer and recirculation lines was added. This will enhance mixing effectiveness and reduce mixing time.

Testing of tank waste samples is underway. In addition, crews have composited archived tank farm waste characterization samples from the 222-S Laboratory, representing approximately 80% of the waste, and initiated testing. Parametric tests to determine kinetics and testing in a bench-scale ultrafiltration system with liter size samples are also taking place.

2.2.7 Safety Culture

During the past two quarters, ORP has observed an increase in the rate of OSHA recordable injuries at the WTP; however, the injury rate resulting in days away or restricted time (DART) has actually declined. BNI has aggressively pursued the early identification and treatment of occupational injuries thus decreasing the severity of OSHA recordable injuries.

Due to the increase, the Safety Assurance Manager and Project Director conducted a Project-wide safety pause on October 1, 2007, to refocus attention on safety and individual responsibility for working safely at the WTP. Actions derived from the safety pause include assessing

suggested physical modifications to facilities to reduce hazards, and recommitting to safe behaviors through updated personal safety plans and active intervention and response to observed hazards and behaviors. Safety Assurance and Office Services have evaluated suggested facility improvements and are implementing them as appropriate. In November, the Project experienced comparatively fewer (3) recordable injuries. While these results are encouraging, WTP management remains focused on safety leadership, communication, and disciplined execution of existing programs, as well as continued implementation of workforce initiatives to achieve and sustain improved performance.

Other actions already taken to assist in meeting this goal included:

- A process improvement initiative to apply ergonomics in the workplace to address the occurrence of soft tissue injuries on the project.
- A revision to the WTP causal analysis process and associated guide to establish a uniform cause coding system and a graded approach for performing causal analysis.
- A campaign to take the leading indicators data from a Safety Education Through Observation (SETO) Team and provide it to supervision to use in coaching opportunities with workers.

The WTP construction site workforce continues to work toward the achievement of the DOE-VPP Star Status. On November 15, 2007, the DOE Headquarters review team notified Intermech, Inc. (subcontractor to BNI) that, based upon their review, they would recommend Intermech's VPP program be recognized as Star Status. DOE Headquarters is reviewing the application and has scheduled a March 2008 review. DOE created its VPP to recognize and encourage excellence in occupational safety and health protection. DOE VPP consists of three programs with the Star Program as the core; this program is aimed at truly outstanding protectors of employee safety and health.

In January 2008, BNI will also resume the Safety Leadership Workshop Series for craft supervision. These workshops are held off-site and outside of normal business hours. Sessions will address foremen and general foremen leadership skills for implementing safety requirements in the field as well as how to notice and compensate for error-likely conditions and causes.

2.2.8 Quality Issues

Structural Steel Fabricator Sub-tier Supplier Qualification Issue: BNI/ORP concluded the subcontractor had met minimum NQA-1 requirements for procuring steel for fabrication of safety-related structural steel members and authorized the subcontractor to ship non-safety related structural steel member to the WTP for use at the LAB. However, before this fabricator was allowed to resume fabrication of any additional safety-related structural steel members, the fabricator was to improve its overall quality program including improving procedures and recordkeeping to address this and other quality issues. The fabricator has notified BNI that improvements have been implemented and a BNI fabricator site survey is scheduled for mid December. Once a successful survey is completed, BNI plans to authorize the fabricator to begin additional fabrication of safety-related structural steel members. ORP will perform a follow-up site visit to review the fabricator's quality program shortly after BNI makes this authorization.

Preservation Maintenance Program: Although ORP had previously identified issues with BNI's program for maintaining procured and installed equipment in 2005, and BNI had committed to take actions to address these issues, a recent preservation maintenance program review again identified a number of significant issues with the BNI Property Preservation Program, indicating that corrective actions were inadequate. In August 2007, ORP issued a Finding for failure to maintain and preserve government property. BNI has been directed to perform a major re-evaluation of their maintenance program and subsequently has re-assigned the maintenance of components to the Commissioning and Test organization versus the Construction organization. By January 2008, BNI has committed to have an approved program with a defined date to make maintenance current. ORP has closely followed the progress of this effort and requested BNI protect all components from the point they are procured, through receipt and storage, and continue the program through installation. ORP is also re-evaluating the need to impose full DOE Order compliance via DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*.

WTP Black Cell Pipe Spool Issue: BNI's Safety Requirements Document and specifications required black cell pipe shop and field welds to include 100% radiography and positive material identification (PMI) examination. However, neither piping isometric drawings nor the procurement specifications contained sufficient information for pipe fabricators to differentiate black cell spools from non-black cell spools until June 2005. Black cells are areas where access will not be available for the life of the plant after completion of construction. 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 is reviewing black cell pipe spool procurement information to determine extent of condition and corrective actions. To date, BNI has identified about 1,150 spools that will require additional examinations to meet the necessary requirements. None of these spools are installed in the black cells at this time. ORP is closely monitoring BNI's actions and will verify that the required examinations are performed. Furthermore, BNI and ORP are reviewing the examination requirements for pipe spool welds inaccessible because of high-radiation hazards. Special examination of this inaccessible piping was not specifically required by the Contract but may be necessary to ensure plant reliability.

Waste Treatment and Immobilization Plant (WTP) Thin Metal Welding Pause Update: BNI placed a "pause" on any welding of material less than 1/8 inch thick after determining their Weld Control Manual (WCM) and engineering specifications did not contain provisions to weld metals thinner than 1/8 inch thick. BNI continues to review site welding activities to determine extent of condition. BNI has reviewed electrical work package weld records, most with multiple welds, where 12-gauge unistrut (less than 1/8 inch) was welded. Some supplier welds were also found to include thinner material; BNI's Purchasing Group is following up on supplier thin metal welding processes to ensure proper weld procedures were used. BNI is reviewing changes to its engineering specification to allow for the welding of thinner metals. Once approved, BNI's Weld Control Manual (WCM) will need revision. The proposed specification changes will modify the minimum American Welding Society (AWS) D1.1, *Structural Welding Code—Steel*, metal thickness requirement and allow for the welding of thinner metals at the WTP site; i.e., from 1/8-inch to 1/32-inch or 22-gauge thick steel.

3.0 ACTIONS TAKEN OR INITIATED TO RECOVER ANY AGREEMENT SCHEDULE SLIPPAGE

3.1 Actions and Status: External Review of Process Flowsheet – Report Dated March 17, 2006

In March 2006, 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. In response, BNI developed a project response plan describing the proposed actions to address the issues; IRPs were developed for each issue; and all IRPs have been issued and approved. 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. Issue resolution has focused on near-term project impacts. Eight of the major issues and seven of the potential issues have been resolved and approved by the ORP project manager.

3.2 Congressional Interactions

DOE prepares quarterly reports to House and Senate Committees on Authorization and Appropriations on the activities and financial status of each of the five subprojects within the WTP Project.

3.3 Summary

In summary, DOE and its contractor are working to resolve issues raised by various review teams 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.

4.0 BUDGET AND COST STATUS

Status: On December 22, 2006, the new WTP Project performance baseline of \$12.263 billion was approved by the DOE Undersecretary. In April 2007, BNI incorporated a resequencing effort that accelerated completion of the LBL facilities by one year, and incorporated the impacts of the recommendations from the EFRT review regarding the processing capacity of the PT Facility. The sum of these impacts transferred over \$575 million of management reserve and project contingency to the performance measurement baseline. However, as these impacts were anticipated in the May 2006 EAC through contingency allowances, there is no effect on the total project cost. Through November 2007, the WTP Project has a cumulative negative schedule variance of \$28.4 million and a positive cost variance of \$10.3 million on \$3,798 million of completed work. Most of the positive cost variance is attributed to the amount of work done by construction field craft in the PT and HLW Facilities prior to the work curtailment in January of 2006. It is anticipated that this positive cost variance will begin to erode as construction resumes in the PT and HLW and gets into the more difficult-to-construct areas.

Budget: The WTP Project received \$690 million of FY 2007 funding divided into separate control accounts for each of the five main facilities. With the carryover funds of \$250 million from FY 2006, the WTP Project had \$940 million of available funding. However, per FY 2007 Congressional language, ORP was required to hold back 10% (\$69 million) of funding from BNI pending certification of BNI's EVMS. The DOE Secretary is expected to certify the BNI EVMS in CY 2008 now that the FY 2008 Congressional budget has been approved. Once certification occurs, it is anticipated that ORP will request and receive back the \$69 million. For FY 2008, ORP again requested in the Congressional Budget, and anticipates receiving, \$690 million of funding for the WTP Project.

Costs: The final total WTP Project spend for FY 2007 was \$551 million, which includes approximately \$13 million of technical support costs to ORP. This gives the project about \$320 million of carryover funding. However, with full construction resuming at the PT and HLW Facilities in early FY 2008, BNI anticipates spending significantly more in the next few years. Consequently, the planned carryover funding will mostly be spent over the next couple of years. In addition, most of the carryover funds have either been committed by BNI to a subcontract or reserved for BNI termination liability.

5.0 DOE/DOE CONTRACTOR COMPLIANCE

The new performance baseline was approved on December 22, 2006, and included a cost of \$12.263 billion and completion date of November 2019 for the WTP Project. The cost to complete the project is \$8.62 billion and the project has already been appropriated \$3.64 billion for design and construction. This December 2006 baseline assumes consistent Congressional appropriations of \$690 million from FY 2007 through construction and commissioning completion.

Now that the revised WTP cost and schedule have been approved by DOE's Secretarial Acquisition Executive, discussions are proceeding with the regulators to try to resolve the HFFACO and *Resource Conservation and Recovery Act of 1976* (RCRA)/Dangerous Waste Permit schedule issues (refer to Table 3 for a listing of affected milestones).

Table 3. 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 3. 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

1. No Dangerous Waste Permit Compliance Schedule Items were due this reporting period. The status of HFFACO milestones is addressed in Section 7.0.

7.0 STATUS OF HFFACO MILESTONES

The status of the HFFACO M-62-00 milestone series for the WTP is as follows:

7.1 M-62-00 – COMPLETE PT PROCESSING AND VITRIFICATION OF HANFORD HIGH LEVEL AND LOW ACTIVITY TANK WASTES

Milestone Date: December 31, 2028

Description: 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.

DOE internal work schedules (e.g., DOE approved schedule baselines) and associated work directives and authorizations shall be consistent with the requirements of this agreement. Modification of DOE contractor baseline(s) and issuance of associated DOE work directives and/or authorizations that are not consistent with agreement requirements shall not be finalized prior to approval of an agreement change request submitted pursuant to agreement action plan, Section 12.0.

Status: Unrecoverable/To Be Missed.

7.2 M-62-00A – COMPLETE WTP PT, PROCESSING AND VITRIFICATION OF HANFORD HLW AND LAW TANK WASTES

Milestone Date: February 28, 2018

Description: 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.

*[In meeting this requirement DOE will pretreat and vitrify no less than 6,000 metric tons of sodium (in the instance of LAW feed) and 800 metric tons of waste oxides (in the instance of HLW feed)].

Status: Unrecoverable/To Be Missed.

7.3 M-62-07B – COMPLETE ASSEMBLY OF LAW MELTER #1 SO THAT IT IS READY FOR TRANSPORT AND INSTALLATION IN THE LAW VITRIFICATION BUILDING (BNI BASELINE SCHEDULE ACTIVITY 4DL321A3200 AS PART OF DOE CONTRACT NO. DE-AC27-01RV14136), AND COMPLETE SCHEDULE ACTIVITY ID 4DH46102A2 – MOVE #1 MELTER INTO THE HLW VITRIFICATION FACILITY

Milestone Date: December 31, 2007

Description: This milestone represents (1) the assembly of LAW Melter #1 to the point it is ready for refractory as part of BNI baseline activities 3EL3212A00 "Specifications and Analysis," 4DL321A000 "LAW - Procure Material & Equipment for Melters," and 4DL321A200 "LAW- Assemble Melter #1," (Contract No. DE-AC27-01RV14136). In addition, activities 4DL121U100 "LAW - Elev +3 South Melter FREP," and 4DL131D000

“LAW - Elev +28 Columns, Beams & Q-Decking at +48,” shall be substantially completed; and (2) moving the first HLW melter into the HLW Facility as defined in BNI baseline activities ID 4DH46102A2.

Completion of this milestone will be met when (1) LAW melter #1 will have been fully fabricated, assembled, and ready for refractory material to be installed. Assembly of the melter is scheduled to occur near the end of LAW construction when the facility is most ready to have the assembled melter moved into the LAW cell where the refractory material will be installed. Meeting this milestone therefore represents significant accomplishment of the engineering, design, and construction of the LAW Facility; and (2) HLW melter #1 has been fully fabricated and moved into the HLW Vitrification Facility.

Status: Missed.

7.4 M-62-08 – SUBMITTAL OF HANFORD TANK WASTE SUPPLEMENTAL TREATMENT TECHNOLOGIES REPORT, DRAFT HANFORD TANK WASTE TREATMENT BASELINE, AND DRAFT NEGOTIATIONS AGREEMENT IN PRINCIPLE (AIP)

Milestone Date: June 30, 2006

Description: 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. The report will identify and describe viable path(s) forward to complete treatment of all tank wastes by December 31, 2028. The report shall apply the same selection criteria to all options and include the second LAW vitrification facility as an option. The report will include the results of all waste form performance data (compared against the performance of borosilicate glass) for all the treatment technologies being considered; performance data will be adequate to make decisions as to the acceptability of any proposed waste form for the waste being considered; and description of the considered treatment technologies (including size, throughput, technical viability, and life cycle cost estimates).

This report will also include a discussion of waste treatment plant throughput commitments and the realistic potential for enhancing the throughput of currently planned melters, proposed additional melters and potential second generation melters installed at first melter change out.

The draft baseline will contain DOE’s proposed approach for treating all Hanford Site tank wastes (high-level, low-activity, and transuranic) by December 31, 2028, including life-cycle cost estimates that indicate projected funding requirements through completion of the RPP mission; a schedule for construction and operation of proposed new facilities and/or enhancements to the WTP; and projected throughput for each facility.

The report and baseline will be accompanied by a draft negotiations agreement in principle (AIP) and draft agreement change request containing milestones and associated agreement requirements sufficient to effectively drive all required work. These, include but are not limited to: (1) the establishment of requirements regarding any necessary WTP modification(s); (2) the establishment of requirements scheduling the acquisition and operation of any approved

treatment technology systems; (3) the establishment of production metrics for treatment complex (WTP plus any supplemental treatment system or second LAW vitrification facility) consistent with completion of treatment by December 31, 2028; and (4) the establishment of requirements scheduling acquisition and operation of feed delivery systems for any approved supplemental technology (M-47 milestones). The AIP will be finalized within 30 days of submittal and provide for negotiations to be completed within 180 days of AIP finalization, and will provide that, in the event the parties do not reach agreement within this timeframe, the negotiations will be resolved as a resolution of a dispute via final determination of the Director of Ecology pursuant to HFFACO Article VIII. Unless otherwise agreed by the parties, this final determination will be issued within seven months of AIP finalization.

Status: Missed. Milestone M-62-08 was missed, due to (1) lack of supplemental technology process design and cost information that was to have been obtained from the Demonstration Bulk Vitrification System (DBVS) project; and (2) lack of information on enhancements to the WTP, including a second LAW vitrification facility.

7.5 M-62-09 - START COLD COMMISSIONING - WASTE TREATMENT PLANT

Milestone Date: February 28, 2009

Description: 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.

Status: Unrecoverable/To Be Missed.

7.6 M-62-10 - COMPLETE HOT COMMISSIONING - WASTE TREATMENT PLANT

Milestone Date: January 31, 2011

Description: DOE will achieve sustained throughput of PT, LAW vitrification, and HLW 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.

Status: Unrecoverable/To Be Missed.

7.7 M-62-11 - SUBMIT A FINAL HANFORD TANK WASTE TREATMENT BASELINE

Milestone Date: June 30, 2007 (See M-62-10)

Description: 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 (high-level, low-activity, and transuranic) by December 31, 2028.

Status: Missed.

8.0 REFERENCES

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- 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.
- Calculation of Hydrogen Generation Rates and Times to Lower Flammability Limit for WTP, 24590-WTP-M4C-V11T-00004, Rev. C, dated May 18, 2006.*
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Nolte, William L., et al., 2003, *Technology Readiness Level Calculator*, Air Force Research Laboratory, presented at the National Defense Industrial Association Systems Engineering Conference, October 20, 2003.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq., as amended.

SRS 2006, *Ultrafiltration Process (UFP) Caustic Leaching Antifoam Performance*, WSRC-TR-2005-00564, Rev. 0, Savannah River National Laboratory, Aiken, South Carolina.