0085117

DOE/EA-1682

Environmental Assessment

Upgrades and Life Extension of the 242-A Evaporator, Hanford Site, Richland, Washington Conducted Under the *American Recovery and Reinvestment Act of 2009*

U.S. Department of Energy
Richland, Washington

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Abbreviations and Acronyms

ALARA	As Low As Reasonably Achievable
ARRA	American Recovery and Reinvestment Act
CAA	*Clean Air Act*
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DART	Days Away from Work or Restricted Days
DOE	U.S. Department of Energy
DST	double-shell tank
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ETF	Effluent Treatment Facility
FONSI	finding of no significant impact
FTE	full time employee
FY	fiscal year
HEPA	high-efficiency particulate air
HFFACO	Hanford Federal Facility Agreement and Consent Order
HVAC	heating, ventilation, and air conditioning
HWMA	Hazardous Waste Management Act
LDE	Leak-detection Element
LERF	Liquid Effluent Retention Facility
MCC	Motor Control Center
MCS	Management Control System
NEPA	National Environmental Policy Act of 1969
ORP	Office of River Protection
PC	Process Condensate
PNNL	Pacific Northwest National Laboratory
RCRA	Resource Conservation and Recovery Act of 1976
ROD	record of decision
SEPA	*State Environmental Policy Act of 1971*
SST	single-shell tank
TC&WM EIS	*Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*
TEDF	Treated Effluent Disposal Facility
TPA	Tri-Party Agreement
TRC	Total Recordable Cases

WAC	Washington Administrative Code
WDOH	Washington State Department of Health
WRPS	Washington River Protection Services, LLC
WTP	Waste Treatment Plant

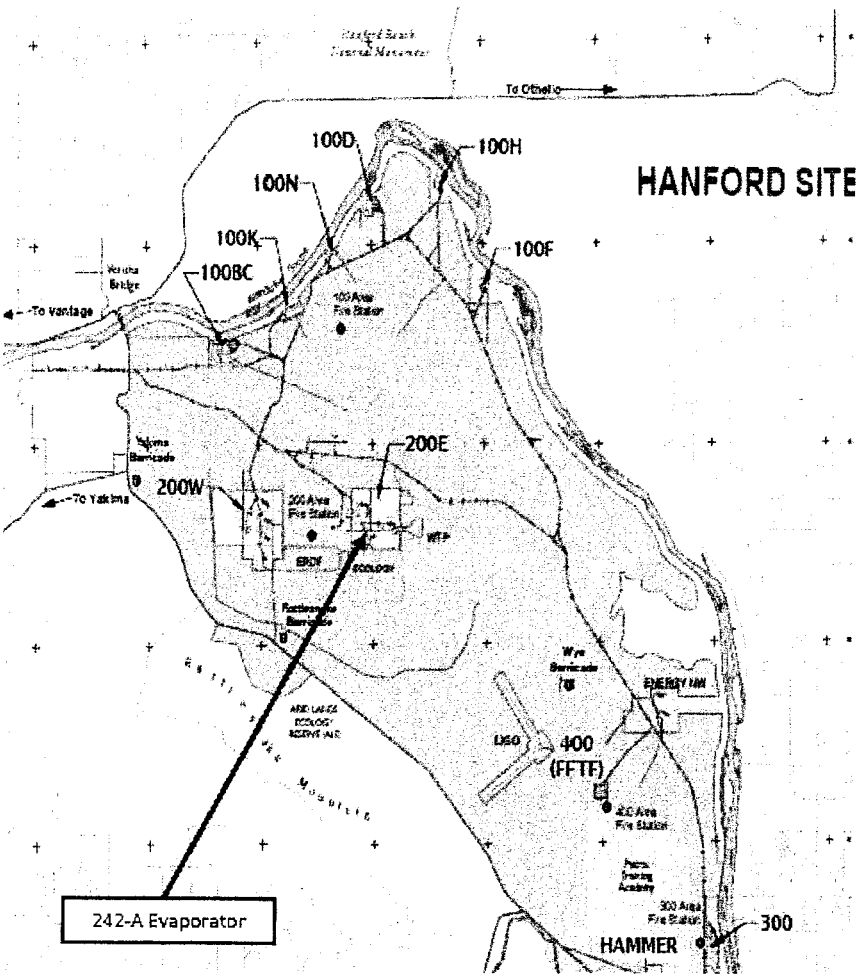
Units

Ci	curie
µCi/mL	microcuries per milliliter
ft	foot
in.	inch
ft^3	cubic feet
m^3	cubic meters
mg/l	milligrams per liter
mrem	millirem
rem	roentgen-equivalent man

1.0 INTRODUCTION

This Environmental Assessment (EA) has been prepared by the U.S. Department of Energy (DOE) in accordance with *The National Environmental Policy Act of 1969* (NEPA), as amended; the Council on Environmental Quality (CEQ) Regulations (Title 40, *Code of Federal Regulations (CFR)*, Parts 1500-1508, "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," [40 CFR 1500-1508]); and the DOE's NEPA Implementing Procedures (Title 10, *CFR*, Part 1021, "National Environmental Policy Act Implementing Procedures," [10 CFR 1021]). This EA evaluates the potential impacts from upgrading and extending the service life of the existing 242-A Evaporator located in the 200 East Area of the Hanford Site near Richland, Washington (see Figure 1).

Figure 1. Hanford Site Map.



This EA is prepared to assess potential environmental impacts associated with the proposed action of upgrading and extending the service life of the Hanford Site 242-A Evaporator. The DOE recently issued the Draft Tank Closure & Waste Management Environmental Impact Statement (TC&WM EIS) for the Hanford Site, Richland, Washington (DOE/EIS-0391, October 2009) to provide proposed actions as well as a comprehensive analysis of the cumulative impacts taking place or planned at the Hanford site, for a 140-day public comment period (74 FR 56194, 10/30/09). The DOE has prepared this interim action EA in order to facilitate needed upgrades to the existing 242-A Evaporator, taking advantage of the unique funding opportunity provided by the *American Recovery and Reinvestment Act of 2009* (ARRA). Consistent with the requirements of the CEQ regulations (40 CFR 1506.1 (c)), the DOE does not anticipate the proposed activities to upgrade the existing evaporator to prejudice or limit its ability to select from among the alternatives evaluated in the Draft TC&WM EIS. Therefore, this EA is being prepared to address whether proceeding with the proposed action is permissible as an interim action pending the decision to be reached following completion of the ongoing EIS.

The interim action EA will determine if the project would potentially cause significant adverse impacts to the environment or limit the choice of actions among the reasonable alternatives for the facility being considered in the ongoing TC&WM EIS. Refer to "*Guidance Regarding Actions that May Proceed During the National Environmental Policy Act (NEPA) Process: Interim Actions*", Office of NEPA Compliance, U.S. DOE, Washington D.C., June 17, 2003. If potentially significant adverse impacts are identified, and if they cannot be mitigated or avoided, then the interim action would not be permissible under NEPA regulations. If the adverse impacts are nominal and the interim action would limit the agency choices among the reasonable alternatives considered in the EIS, the interim action would not be permissible under NEPA regulations. If no significant impacts are identified, a Finding of No Significant Impact (FONSI) would be prepared by the DOE and made available to the public before the DOE authorizes construction to commence (see Section 1.3 for a discussion of the NEPA process).

The following is a description of each section of this EA.

1. **Purpose and Need for Action**. This section provides a brief statement concerning the problem or opportunity the DOE, Office of River Protection (ORP), is addressing with the Proposed Action. Background information is provided.

2. **Description of the Proposed Action and No Action Alternative**. This section provides a description of the Proposed Action with sufficient detail to identify potential environmental impacts. The section also describes reasonable alternative actions to the Proposed Action, which address the Purpose and Need. The alternative to the proposed action is a No Action Alternative, as required by 10 CFR 1021.

3. **Affected Environment**. This section provides a description of the locale in which the Proposed Action would take place.

4. **Environmental Impacts**. This section describes the range of environmental impacts, beneficial and adverse, of the Proposed Action and the No Action Alternative. This section provides a brief description of permits and regulatory requirements for the Proposed Action.

5. **References.** This section provides a list of documents used to contribute information or data in preparation of this EA.

1.1 BACKGROUND

The 242-A Evaporator facility is located on nearly one acre of land along the southern boundary of the A Farm in the 200 East Area of the Hanford Site (see Figure 1). The facility was constructed between 1974 and 1977. Since 1977, the facility has been used to concentrate liquid waste to maximize space used to store mixed waste in 28 double-shell tanks (DST).

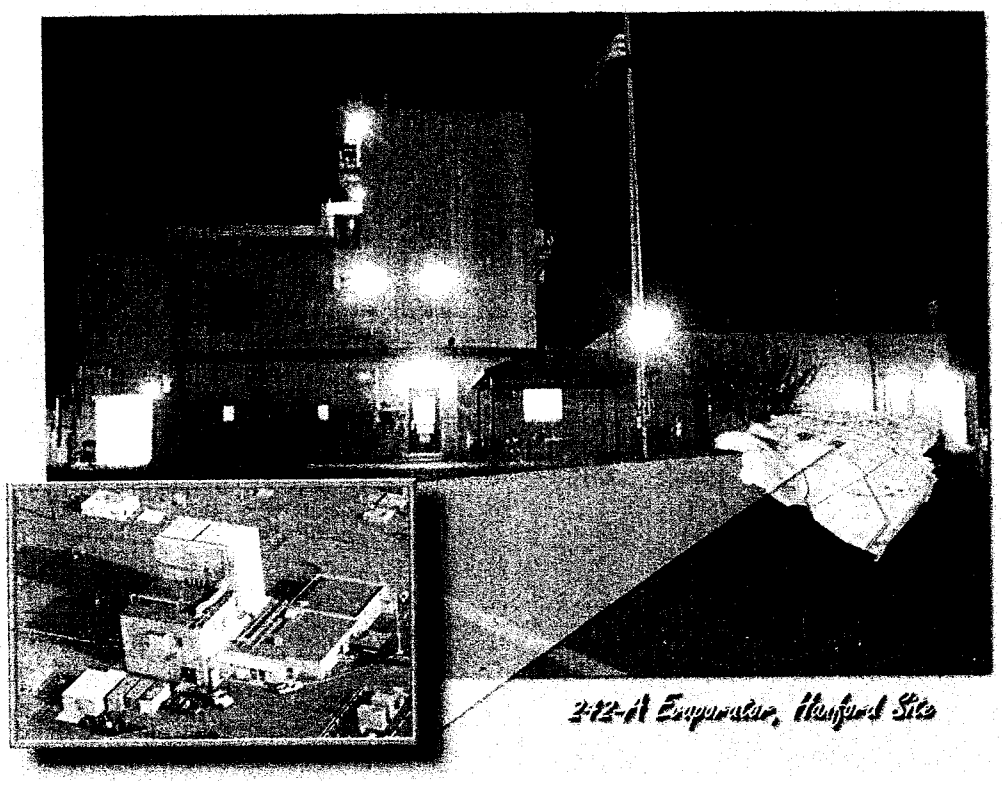
From 1977 through 2008, the evaporator completed more than 60 campaigns with a combined feed volume exceeding 105 million gallons (400 million liters). The campaigns successfully attained volume reductions of more than 67 million gallons of liquids (or about 64 percent). Additionally, periodically the evaporator conducts "cold" campaigns that are performed to meet training, testing and operation requirements.

The facility was substantially upgraded in 1987 and from 1989 to 1994 the facility was placed in standby status pending resolution of effluent discharge issues, completion of equipment upgrades, and completion of an Operational Readiness Review. Since 1994, there have been periodic upgrades to equipment to maintain and operate the facility in a manner consistent with its mission.

The 242-A Evaporator is a Hazard Category 2 nuclear facility (HNF-14755, *Documented Safety Analysis for the 242-A Evaporator*). The 242-A Evaporator, by regulation, is categorized as a set of *Hazardous Waste Management Act* (HWMA) Permitted Dangerous Waste Management units.

The principal process components of the 242-A Evaporator system are located in the 242-A Building, which is comprised of two adjoining, but independent structures (see Figure 2). The first structure contains processing and service areas and is a reinforced concrete shear wall and slab structure with a concrete mat footing in below grade regions and spread footings elsewhere. The second structure is separated from the first by a seismic joint and contains operating and personnel support areas.

Figure 2. 242-A Evaporator.



The original 242-A building is 75 foot (ft) wide by 108 ft long. The 242-AB building is an addition to the main structure of the 242-A building and is of similar design and construction and is 45 ft wide by 40 ft long. The 242-A Evaporator Facility footprint is 75 ft by 108 ft by 72 ft (main building) and 40 ft by 45 ft by 12 ft (support building) for a total of 604,944 cubic ft.

The 242-A Evaporator facility includes the substation and switchgear, diesel generator and underground fuel storage tank, 242-A Building (Main Process Building), 242-A-81 Water Services Building, 207-A Retention Basins (including the 207-A Building), 242-AB Evaporator Control Room addition, the process condensate (PC) discharge pipeline from 242-A to the Liquid Effluent Retention Facility (LERF) fence line including the entire electronic leak detection system, and other ancillary buildings associated with 242-A.

The facility concentrates liquid waste to maximize existing DST space to allow retrieval of SST waste. The following facility description and design information is taken from HNF-14755. Waste feed from the DST System is pumped in the 242-A Evaporator vessel via a double encased transfer line. Waste is processed under vacuum in the Evaporator vessel and heated to approximately 122 Fahrenheit (50.0 Celsius) as it passes through a steam reboiler using forced circulation. As the waste re-enters the vessel, water vapors from the boiling waste are drawn into the condenser system, cooled, and discharged to a secondary treatment facility as PC. Approximately 25,000 gallons (94,635 liters) of waste is continuously recirculated through the

vessel, recirculation loop, and reboiler to achieve a target specific gravity before the resultant slurry is pumped to a compatible DST for interim storage. Feed is continuously pumped into the Evaporator Vessel as the slurry is pumped out, maintaining a consistent level. When the feed is exhausted, the vessel is emptied and the vessel and associated piping are rinsed (deep flushed with hot water) before the facility is placed in shutdown mode.

Two waste streams leave the 242-A Evaporator following the treatment process. The first waste stream, the concentrated slurry (approximately 55 to 65 percent of the water is removed during evaporation along with a portion of the volatile organics), is pumped back into the DST system. The second waste stream, PC (containing a portion of the volatile organics removed from the mixed waste during the evaporation process), is captured, condensed in a series of condensers, filtered, sampled, and sent to the permitted LERF for storage and then to the permitted Effluent Treatment Facility (ETF) for treatment/disposal. Used raw water and steam condensate are transferred to the permitted Treated Effluent Disposal Facility (TEDF) for treatment and disposal. The waste feed is extensively tested to ensure safe processing and compatibility with other DST wastes when discharged. Evaporated waste (slurry) is sampled, transported to 222-S Laboratories, and analyzed. Offgasses from the process are routed through a deentrainment unit, a prefilter, and high-efficiency particulate air (HEPA) filters before being discharged to the environment.

In fiscal year (FY) 2009, the 242-A Evaporator employed approximately 40 full time employees (FTE) for direct operations in a year with nominal maintenance and upgrades. This includes engineers (chemical, plant, safety, electrical, environmental, etc.), craft workers (electricians, carpenters, millwrights, painters, pipefitters, etc), operators, technicians (health physics technicians, etc.), professionals (health physicists, industrial hygienists), managers and line supervisors, and administrative staff. The number of employees is projected to be approximately the same in out years to support maintenance, operations, and upgrade activities for the life of the facility.

Table 1. Routine Operations Annual Labor Profile.

Labor Category	Total FTE
Crafts	1.6 (4%)
Engineers	4.8 (12%)
Operators	16.4 (41%)
Technicians	6.8 (17%)
Professionals	4.4 (11%)
Managers	5.6 (14%)
Administrative	0.4(1%)

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The current and future mission of the Evaporator is to support environmental restoration and remediation of the Hanford Site by optimizing the 200 Area DST waste volumes in support of the Tank Farm Contractor and Waste Treatment Plant (WTP) Contractor. Waste volume projections performed in FY 2000 indicate the 242-A Evaporator is required through the year 2032 to support the current River Protection Project baseline including DST space management, SST waste retrieval and WTP waste feed delivery. The average Evaporator campaign processes 973,000 gallons (3,683,206 liters) of waste to remove 573,000 gallons of water and return 400,000 gallons (1,514,165 liters) of slurry to the DSTs (HNF-SD-WM-SP-012, *Tank Farm Contractor Operation and Utilization Plan*).

The 242-A Evaporator is currently the only method available to the DOE to concentrate liquid waste. The availability of ARRA funding in 2009 provided the DOE with an opportunity to identify actions which could be accelerated and accomplished earlier than previously planned. The proposed upgrades and life extension activities planned for FY 2010 through 2011 are consistent with the DOE's mission to provide safe storage of waste in the DST system pending treatment of the waste in the WTP. The TC&WM EIS would provide analysis that would support upgrades, life extension and continued operation of the facility. However, the EIS is still under development and unlikely to support a Record of Decision (ROD) until sometime in 2011. If the DOE does not complete design activities in FY 2009 and initiate construction in early 2010, funding provided through the ARRA would be in jeopardy. Loss of funding could further delay action increasing the risk of equipment failure that would make the 242-A Evaporator unavailable for use to support the DST space management mission.

1.3 NEPA REQUIREMENTS

The DOE prepared this EA to provide the public and responsible agencies with information about the project and its potential effects on the environment. NEPA requires federal agencies to take into account the potential consequences of their actions on both the natural and human environments as part of their planning and decision-making processes. If the findings of the EA indicate that no significant impacts would occur as a result of the Proposed Action, then the determination is formalized in a FONSI (Figure 3). The responsible lead agency circulates the EA and publicizes the FONSI. The NEPA process is complete when the FONSI is executed. However, if the DOE determines that there is significant impact that cannot be avoided or mitigated, the DOE would then proceed with an EIS.

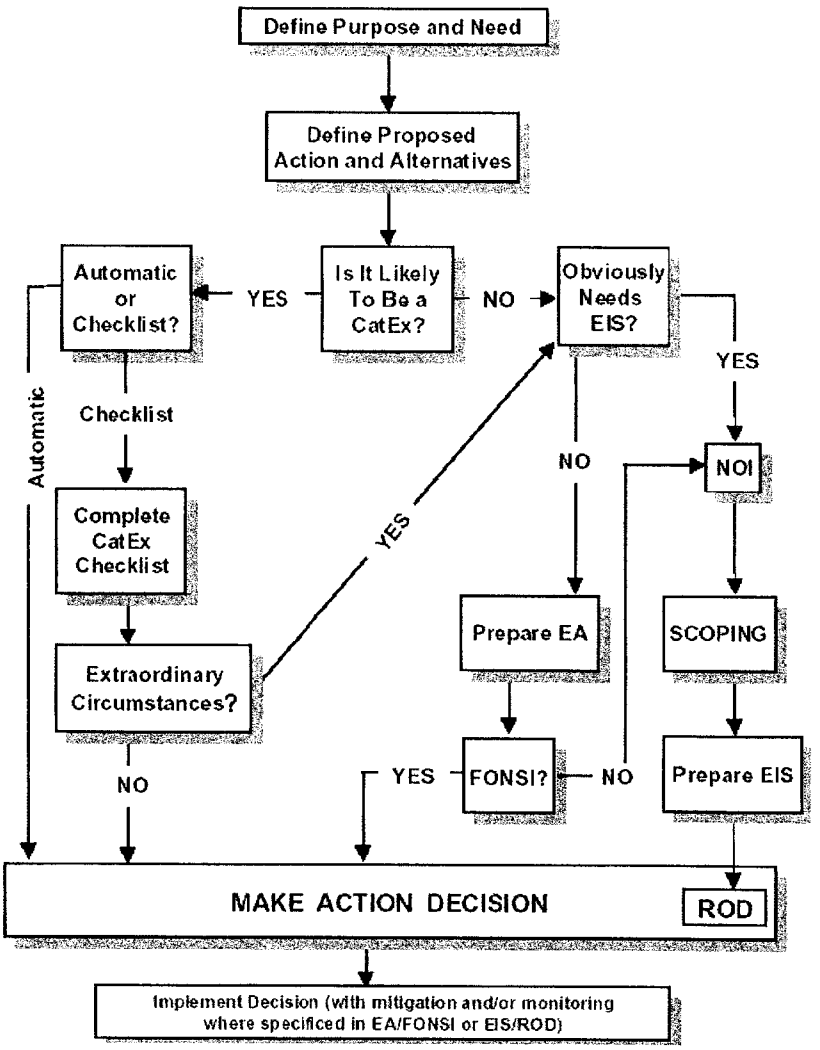
For this project, the DOE is the federal agency responsible for evaluating potential impacts under NEPA. The DOE must determine whether to proceed with design and construction activities prior to completion of the TC&WM EIS.

As required by NEPA, this EA examines the expected impacts of the project. When preparing a NEPA document (e.g., an EIS or an EA) CEQ and the DOE NEPA guidance recommends that document should be "adapted to the particular circumstances presented by each proposal, often by using a sliding-scale approach." The sliding-scale approach to NEPA analysis applies generally to all aspects for document preparation and analysis. This approach recognizes that agency proposals can be characterized as falling somewhere on a continuum with respect to environmental impacts. This approach implements CEQ's instruction that agencies "focus on

significant environmental issues and alternatives" (40 CFR 1502.1) and discuss impacts "in proportion to their significance" (40 CFR 1502.2(b)).

NEPA promotes a decision-making process that is open to the public and public comments on this EA were solicited and encouraged. To ensure that there were ample opportunities for public comment, the DOE followed the NEPA Implementing Procedures (10 CFR 1021). The DOE publicly announced the availability of the Draft EA in local media, copies of the Draft EA were available to the public, and a 15-day comment period was provided. At the end of the comment period, if no significant adverse impacts were identified, a Final EA and FONSI may be issued.

Figure 3. NEPA Process.



2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVE

Two alternatives were defined and support this analysis. These alternatives include the proposed action and the No Action Alternative (as required under NEPA regulations). Other alternatives were rejected from further analysis (e.g., replacing the existing 242-A Evaporator, portable evaporator) because their selection could prejudice potential decisions to be based on the TC&WM EIS.

2.1 PROPOSED ACTION

The proposed action includes upgrading and extending the service life of the 242-A Evaporator and is being conducted under the ARRA. The activities in the list below are ARRA funded project upgrades that will support continued operation of the 242-A Evaporator through 2032. Most planning and design activities took place in FY 2009 with procurement and construction planned for 2010. Testing, startup, and turnover will occur in FY 2011.

1. PC-5000 Leak Detection System Upgrades: The Evaporator uses the PC-5000 process discharge pipeline from 242-A to the LERF facility. The new system will have a local panel for maintenance located at the LERF basin instrument building. The probes will be installed to minimize condensation within the encasement and condensation effects on the equipment (which can activate false alarms). The existing leak detection system will be disconnected and cable removed from the encasement piping. The new system will include the installation of probes and wire. The activity will include digging up the existing junction boxes near the leak-detection elements (LDE) for removal. Existing conduit will be relocated to above ground junction boxes. This excavation includes trenches for the new conduit routed to the above ground junction boxes (Figure 4). There are 5 trenches for the LDE. Each trench is less than 8 ft in length and no deeper than 18 inches (in). The sixth leak detector wire will be installed in an existing above ground junction box.

2. 242-A Instrument Replacement: A majority of the process instrumentation in the 242-A Evaporator date from the original construction of the facility. Work under the proposed action will modify or upgrade the following instrumentations: flow indicating transmitters, flow transmitters, pressure transmitters, pressure differential transmitters, pressure switches, weight factor transmitters, and density transmitters.

3. Heating, ventilation, and air conditioning (HVAC) Exhaust Upgrades: A majority of the HVAC system components located at the 242-A Evaporator Building date from the original construction of the facility. This activity will modify/upgrade the HVAC exhaust system components to correct deficiencies and support facility operations and includes design, fabrication, installation, testing, and startup and turnover of two blowers and three filter trains. Construction activities include:

   - pouring a new slab,
   - installation of three HEPA filter trains,
   - installation of two new exhaust fans,

- fabrication and installation of a new stack with sampling and monitoring system,
- fabrication and installation of exhaust ductwork to tie-in to the existing underground ductwork and exhaust system,
- miscellaneous electrical and instrumentation wiring connected to the 242-A facility.

Figure 4. PC-5000 Discharge Pipeline from 242-A to Liquid Effluent Retention Facility.

The pins show all the LDE's and affected areas. The Basin LDE has no excavation involved.

2.1.1 Operations and Maintenance

During the period leading up to the currently anticipated start up of WTP operations, a number of routine maintenance and upgrade activities are anticipated. The specific schedule and scope of activities will be dependent on the project mission and evolving conditions. In addition to routine operations, there is a defined schedule for replacement of parts and equipment that are in-kind replacement or upgrades. Replacement of parts and equipment allows for facility operability, maintainability, and reliability of the Evaporator in support of the DOE mission and Tri-Party Agreement (TPA) requirements.

Table 2 and Table 3 outline operation and maintenance activities planned for the 242-A Evaporator. Table 2 and 3 are representative of the type of projects that will occur. They represent maintenance activities that are in-kind replacements of equipment. None of the activities described in Table 2 or 3 are currently anticipated to change the existing facility footprint. Some of the activities described in Tables 2 and 3 may have the affect of facilitating operations of the Evaporator beyond 2032 (in some cases as much as 2052). Additionally, all of the activities will be subject to engineering, environmental, and programmatic reviews that may modify the scope of the activity or eliminate them from implementation. However, the TC&WM EIS ROD and subsequent permits may result in changes to these activities or the implementation of other activities.

Table 2. Operation and Maintenance Upgrade Examples (Fiscal Year 2010-2011). (2 Sheets)

Title	Description
Dip Tube Manual Flush Valve	This activity will provide new flush valves with corresponding piping and controls that will provide an upgraded valve assembly. The necessary hardware (piping, valves, and controls) will be procured and installed as part of this activity.
Ductwork Asbestos Abatement	This activity replaces the condenser room supply duct and the roof ducting both of which are insulated with asbestos, partially blocked, and corroded.
Control Valves Upgrades	This activity will replace/rebuild 26 control valves throughout the process loop and upgrade associated piping connections and controls. Many control valves were replaced in 1990 by Project B-534, but a significant number were not, and their remaining life is unknown. Additionally, the actuators and controls associated with the older control valves are becoming obsolete and spare parts are no longer available. Due to the large number of control valves that are potentially past their design life, it is considered to be more cost-effective to replace all of these valves during a single scheduled maintenance outage.
Reboiler Condensate System Replacement	This activity will correct the numerous problems identified with the EA-1 reboiler steam and condensate steam system. These problems include obtaining maximum boil-off rates and the need to operate with the steam trap bypass valve open. These systems currently operate marginally at best. It is planned to reconfigure the boiler tie-in and replace the strainers, valves, piping and miscellaneous fittings to create an approximate 30% increase in pressure.

Table 2. Operation and Maintenance Upgrade Examples (Fiscal Year 2010-2011). (2 Sheets)

Sanitary Drain Upgrades	This activity will make necessary modifications to the existing sanitary piping to eliminate a strong unpleasant odor problem. Some wall and floor demolition and reconstruction will be required to change out the lines and bathroom furnishings. Piping in the areas where existing lines were cut and capped shall be located and examined first with a boroscope to the extent possible. Then the entire drain and vent system will be boroscoped to locate any other potential problem areas. Major problems exist with this system that impact continued safe operation of the facility. The sanitary drain system provides drainage of non-contaminated wastewater for the 242-A Evaporator sanitary systems (change room showers, drinking fountains, sink, etc).
Process Condensate Sampling Station	This activity will replace the PC sampling station and upgrade the associated piping connections and controls. The RC-3 radiation monitor is used to monitor the steam condensate, used raw water and PC before discharge from the facility. The radiation monitoring equipment has not been updated since facility construction, and replacement parts are not readily available from the manufacturer. Monitor failure would require and extended facility shutdown if spare parts are not available (current spares are almost depleted).

Table 3. Out Year Operation and Maintenance Upgrade Examples. (2 Sheets)

Slurry Jumper Replacement (Nozzle C to 13)	The current jumper contains two 3-way ball valves. Due to the cumulative radiation dose the existing teflon valve seats and body gasket have likely deteriorated. Failure of the seats or body gaskets would likely result in internal/external valve leakage. In addition, numerous problems have been experienced with this model of valve in Tank Farm applications.
Evaluate/Inspect Process Condensate Recirculation System Valves for Waste Compatibility	An indeterminate number of the existing PC valves contain brass or bronze wetted components. This material is not compatible with the ammonia concentrations commonly observed in the PC, resulting in both valve leak through and external leakage. It is recommended that a total of 39 valves be replaced having cast iron or wetted steel components. This activity involves an Engineering Evaluation for the valves and pumps, updating the Evaporator Pipe Codes and the actual replacement work.
Slurry Sampling Station Upgrades	This activity will upgrade the slurry sampling station and the associated piping connections and controls. The existing components (isolation valves and flowmeter) have limited life and are showing increased signs of deterioration. Slurry sampler accuracy and/or failure would directly impact space management objectives, As Low As Reasonably Achievable (ALARA) goals, cost and schedule, by requiring a more conservative approach to waste reduction and in tank grab samples to validate solids composition. The activity will also include a full scale mock-up to train personnel on taking samples and a review of new technologies to take safer samples.
Inspect & Certify Cover Blocks and Lifting Bales/Replace Roof	This activity will inspect cover blocks/lifting bales and replace the existing build up roofing system, including the insulation. The buildup roofing system is over 30 years old which is at the high end of its life expectancy.
Lead Glass Shielding Upgrades	Three windows are oil filled and all will need to be replaced by a contractor.
Steam Line Replacement	This activity provides a replacement of the 242-A steam lines. The lines are original facility equipment and have never been upgraded. This also includes the 90 & 10 pound steam lines as well as the 90 & 10 pound condensate lines. The replacement of the low pressure steam line within the Evaporator room to the reboiler is part of the reboiler replacement.
EC-1/2/3 Condenser Replacement	This activity will replace the condensers along with the associated equipment (piping, valves, and steam jets). The existing carbon steel condenser (EC-1) will be replaced with a new stainless steel condenser that is in storage. EC-2 & 3 will be considered for replacement at this time, although both components were replaced in 2004.

Table 3. Out Year Operation and Maintenance Upgrade Examples. (2 Sheets)

PB-2 Relief Valve and Jumper Replacement	This activity will replace the PB-2 relief valve, jumper, and jumper support. The current relief valve was installed as part of Project B-534 and has been in service for over 10 years without testing. Typically relief valves are periodically tested or replaced to ensure that the valve will perform as expected.
Motor Control Center (MCC) Upgrades	This activity includes removal and replacement in kind of MCCs 1, 2 & 3. The current MCCs have never been upgraded and date to original facility construction.
Underground Duct Replacement	This activity will replace underground exhaust ductwork that is corroding in order to support the facility through 2052.
DG Underground Storage Tank	This activity will replace the existing underground 550 gallon emergency diesel generator fuel storage tank and electrical panel to support 242-A through 2052.
Replace PB-1 & 2 Pumps	This activity will rebuild the contaminated PB-1 pump and replace the PB-2 pump and motor. The PB-1 pump will be rebuilt within the 242-A hot cell area. The PB-2 pump and associated jumpers will be replaced.
Raw Water Service Bldg Equipment Replacement	This activity will replace the 242-A water service building valves, filters, backflow preventers & strainers for both the primary and redundant 10" water line this will support the facility through 2052. This activity was initially completed in FY09.
Upgrade Slurry Feed Piping Wall Penetrations	This scope provides for the replacement of the three existing transfer lines within the 242-A Facility pump room.
Future Upgrades	This task will repair, replace, and/or upgrade 242-A tank components and/or systems to support Facility Operation. The scope will include the following as necessary: electrical upgrades, instrument upgrades, piping and ventilation system upgrades.
Vessel Vent Upgrades	This activity includes removal and replacement in kind of vessel vent piping and valves. The current system has never been upgraded and dates to original facility construction.
Management Control System (MCS) Hardware upgrades	This activity will upgrade the MCS approximately every ten years to keep it up to date. The system was last upgraded in FY2007/2008 and will need to be upgraded again in 2020.
Reboiler Replacement	This activity will remove and replace the existing reboiler and 16" diameter steam supply in the 242-A Evaporator room.
PC-5000 Transfer Line Replacement	This activity replaces the PC-5000 transfer line to support the 242-A life extension to 2052. This system is a single point of failure for facility operation.

2.2 NO ACTION ALTERNATIVE

The alternative to the proposed action is a no action alternative. No operation, maintenance, or upgrade activities would take place. This alternative would place the Evaporator in cold standby and it would be closed according to a NEPA/*State Environmental Protections Act of 1971* (SEPA) analysis and decisions and applicable Washington State permits. There would be no further campaigns to consolidate DST System tank waste. Under the No Action alternative, the 242-A Evaporator facility would be placed in cold standby, thereby directly impacting waste feed delivery to the Waste Treatment Plant and continued retrieval and closure of SST. In this EA, the DOE determined that "not going forward" with the proposed action provides the clearest basis for comparing of the environmental effects of "no action" with the effects of implementing the proposed action. Selection of the No Action alternative may initiate changes to the Hanford Federal Facility Agreement and Consent Order (HFFACO) milestones for retrieval and treatment of tank waste. The DOE may also be required to prepare a closure plan for the facility under state Dangerous Waste regulations. Siting, construction, testing, operation and future closure of an alternate means of waste concentration and/or additional double shell storage tanks would be required.

Routine surveillance of the 242-A Evaporator would occur until the DOE and Washington State Department of Ecology (Ecology) decide on the disposition of the facility under applicable state and federal regulations. Cold standby activities would include:

- Completion of any current campaigns
- Flushing systems to minimize residual contamination in vessel and process lines
- Draining water and diesel fuel from lines and tanks
- Isolate and lay up systems for long term standby
- Secure the facility
- Routine surveillance of the facility.

This process is assumed to require approximately six months to complete, using current facility staff and plant forces.

3.0 AFFECTED ENVIRONMENT

3.1 GENERAL HANFORD ENVIRONMENT

The environment of the Hanford Site has been described in several environmental reports, EISs, and EAs. The affected environment has been summarized from *Hanford Site National Environmental Policy Act (NEPA) Characterization Report (Hanford NEPA Characterization Report)* (Duncan 2007), unless otherwise noted. The 242-A Evaporator upgrades would be conducted in the 200 East Area of the Hanford Site.

3.1.1 Geology and Soils

The Hanford Site is underlain by basalt flows. Sedimentary layers referred to as the suprabasalt sediments lie on top of the basalt flows. A relatively thin layer of silt, sand, and gravel is found

on the surface across much of the site. Soil in the 200 Areas consists of sand, loamy sand, and sandy-loam soil types.

3.1.2 Surface Water Resources

There are no naturally occurring water bodies (including wetlands) or designated floodplains near the 242-A Evaporator. The Hanford Site and the surrounding communities draw all or most of their water from the Columbia River.

3.1.3 Groundwater Resources

The Hanford Site groundwater resource includes the vadose zone and the underlying saturated water table. Unconsolidated glacial-fluvial sands and gravel of the Hanford formation make up most of the vadose zone material. The regional groundwater contaminant plume (tritium, iodine-129, technetium-99, and nitrate) has sources within the 200 East Area. Smaller groundwater plumes originating from the 200 East Area include uranium, strontium-90, antimony, cadmium, thallium, and pentachlorophenol, DOE/RL-2008-66, *Summary of Hanford Site Groundwater Monitoring For Fiscal Year 2008*. Groundwater monitoring data indicates that nitrate levels are increasing but do not exceed the drinking water standard (45 milligrams per liter (mg/l), technetium-99 exceeds the drinking water standard (900 pCi/l) and levels continue to increase, and cyanide is present at low concentrations (<0.00018 mg/l) (PNNL-16346), *Hanford Site Groundwater Monitoring for Fiscal Year 2006.*

3.1.4 Air Resources

The *Clean Air Act* (CAA), as amended, requires that the U.S. Environmental Protection Agency (EPA) develop a national air operating permit program, including provisions for state programs to be authorized by EPA to issue permits for major sources of regulated pollutants. In 1994, the EPA approved the Washington State Air Operating Permit Regulation, promulgated as WAC173-401 "Operating Permit Regulation." This program, administered by the Washington State Department of Health (WDOH), includes the regulation of federal facilities to the extent provided for in Section 118 of the CAA, 42 USC § 7418, including the DOE Site Wide air-operating permit for the Hanford Site. The 242-A Evaporator is currently permitted for two minor stacks. The Evaporator is located in an industrial exclusive zone with multiple emission sources in close proximity to the facility.

3.1.5 Biological Resources

The Hanford Site is one of the largest shrub-steppe vegetation areas remaining in Washington State, and nearly half of the site's 1,520-km^2 (586-mi^2) area is designated as ecological study areas or refuges. Shrub-steppe areas are considered priority habitat by Washington State because of their relative scarcity and their importance to wildlife species. The undisturbed portions of the 200 Areas consist mostly of shrub-steppe habitat. The dominant plants on the Central Plateau are big sagebrush, rabbitbrush, cheatgrass, and Sandburg's bluegrass. Cheatgrass provides half of the total plant cover.

Threatened and endangered plants and animals identified on the Hanford Site, as listed by the federal government ("Endangered and Threatened Wildlife and Plants," 50 CFR 17) and Washington State (Washington Natural Heritage Program 2005, 2008), are presented in Table 4. While these species are known to occur on the Hanford Site, they have not been reported in the vicinity of the 242-A Evaporator.

3.1.6 Land Use

The Central Plateau (200 East and West Areas) was designated as an "industrial-exclusive" area capable of supporting waste treatment, storage, and/or disposal activities for hazardous, dangerous, radioactive, nonradioactive wastes and related activities, DOE/EIS-0222-F, *Final Hanford Comprehensive Land Use Plan, EIS* and "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)," 64 FR 61615.

3.1.7 Traffic

The Tri-Cities serves as a regional transportation and distribution center with major air, land, and river connections. The majority of air passenger and freight services in the local area go through the Tri-Cities Airport located in Pasco, Washington. Both Richland and Kennewick have small airports serving general aviation. The ports of Benton, Kennewick, and Pasco use the commercial waterways of the Snake and Columbia Rivers to provide access to the deep-water ports of Portland, Oregon and Vancouver, Washington. Burlington Northern Santa Fe, Union Pacific, and Amtrak provide rail service to the Tri-Cities.

The DOE maintains a paved two-lane road network within the Hanford Site that provides access to the various work centers. The primary access roads on the Site are Routes 2, 4, 10, and 11A. Primary access to the 200 Areas is by Route 4 South from Richland. Public access to the 200 Areas and interior locations of the Hanford Site has been restricted by manned gates at the Wye, Rattlesnake, and Yakima Barricades.

3.1.8 Socioeconomics

The Hanford Site is the largest single source of employment in the Tri-Cities. During FY 2009, the DOE Office of River Protection and its prime contractors (Washington River Protection Solutions, LLC, (WRPS), Bechtel National, Inc., and Advanced Technologies and Laboratories International, Inc.) and the DOE Richland Operations Office and its prime contractors (CH2M HILL Plateau Remediation Company, Washington Closure Hanford, LLC, Mission Support Alliance, and AdvanceMed Hanford); and Pacific Northwest National Laboratory (PNNL); employed an average of 10,000 to 11,000 employees.

Table 4. Hanford Site Threatened, Endangered, and Other Special Status Species. (3 Sheets)

Common Name	Scientific Name	Status	
		Federal	State
Plants			
Annual paintbrush	*Castilleja exilis*		Watch
Annual sandwort	*Minuartia pusilla* var. *pusilla*		Review Group [1]
Awned halfchaff sedge	*Lipocarpha (=Hemicarpha) aristulata*		Threatened
Basalt milkvetch	*Astragalus conjunctus* var. *rickardii*		Watch
Beaked spike-rush	*Eleocharis rostellata*		Sensitive
Bristly combseed	*Pectocarya setosa*		Watch
Brittle Prickly Pear	*Opuntia fragilis*		Review Group [1]
Canadian St. John's wort	*Hypericum majus*		Sensitive
Chaffweed	*Centunculus minimus*		Review Group [1]
Columbia milkvetch	*Astragalus columbianus*	Species of concern	Sensitive
Columbia River mugwort	*Artemisia lindleyana*		Watch
Coyote tobacco	*Nicotiana attenuata*		Sensitive
Crouching milkvetch	*Astragalus succumbens*		Watch
Desert dodder	*Cuscuta denticulate*		Threatened
Desert evening primrose	*Oenothera caespitosa* ssp. *caespitosa*		Sensitive
Dwarf evening primrose	*Camissonia (=Oenothera) pygmaea*		Sensitive
False pimpernel	*Lindernia dubia* var. *anagallidea*		Watch
Fuzzytongue penstemon	*Penstemon eriantherus whitedii*		Sensitive
Geyer's milkvetch	*Astragalus geyeri*		Threatened
Giant helleborine	*Epipactis gigantea*		Watch
Grand redstem	*Ammannia robusta*		Threatened
Gray cryptantha	*Cryptantha leucophaea*	Species of concern	Sensitive
Great Basin gilia	*Gilia leptomeria*		Threatened
Hedgehog cactus	*Pediocactus simpsonii* var. *robustior*		Review Group [1]
Hoover's desert parsley	*Lomatium tuberosum*	Species of concern	Sensitive
Kittitas larkspur	*Delphinium multiplex*		Watch
Loeflingia	*Loeflingia squarrosa* var. *squarrosa*		Threatened
Lowland toothcup	*Rotala ramosior*		Threatened
Medic milkvetch	*Astragalus speirocarpus*		Watch
Medick milkvetch	*Astragalus speirocarpus*		Watch
Miner's candle	*Cryptantha scoparia*		Sensitive
Mousetail	*Myosurus clavicaulis*		Sensitive
Persistent sepal yellowcress	*Rorippa columbiae*	Species of concern	Endangered
Piper's daisy	*Erigeron piperianus*		Sensitive
Porcupine sedge	*Carex hystericina*		Watch
Robinson's onion	*Allium robinsonii*		Watch
Rosy balsamroot	*Balsamorhiza roseum*		Watch

Table 4. Hanford Site Threatened, Endangered, and Other Special Status Species. (3 Sheets)

Common Name	Scientific Name	Status	
		Federal	State
Rosy pussypaws	*Calyptridium roseum*		Threatened
Scilla onion	*Allium scilloides*		Watch
Small-flowered evening primrose	*Camissonia (=Oenothera) minor*		Sensitive
Small-flowered nama	*Nama densum* var. *parviflorum*		Watch
Smooth cliffbrake	*Pellaea glabella var. simplex*		Watch
Snake River cryptantha	*Cryptantha spiculifera (=C. interrupta)*		Sensitive
Stalked-pod milkvetch	*Astragalus sclerocarpus*		Watch
Suksdorf's monkey flower	*Mimulus suksdorfii*		Sensitive
Thompson's sandwort	*Arenaria franklinii* var. *thompsonii*		Review Group [1]
Umtanum desert buckwheat	*Eriogonum codium*	Candidate	Endangered
White Bluffs bladderpod	*Lesquerella tublashensis*	Candidate	Threatened
White eatonella	*Eatonella nivea*		Threatened
Winged combseed	*Pectocarya penicillata*		Watch
Insects			
Columba River tiger beetle	*Cicindela columbica*		Candidate
Mollusks			
California floater	*Anodonta californiensis*	Species of concern	Candidate
Giant Columbia River limpet	*Fisherola (=Lanz) nuttalli*		Candidate
Giant Columbia River spire snail	*Fluminicola (=Lithoglyphus) columbiana*	Species of concern	Candidate
Fish			
Bull trout[b]	*Salvelinus confluentus*	Threatened	Candidate
Leopard dace[b]	*Rhinichthys flacatus*		Candidate
Mountain sucker[b]	*Catastomus platyrhynchus*		Candidate
River lamprey[b]	*Lampetra ayresi*	Species of concern	Candidate
Spring-run Chinook salmon	*Oncorhynchus tshawytscha*	Endangered[c]	Candidate
Steelhead	*Oncorhynchus myskiss*	Endangered[c] Threatened[d]	Candidate
Reptiles			
Northern sagebrush lizard	*Sceloporous graciousus*	Species of concern	Candidate
Striped whipsnake	*Masticophis taeniatus*		Candidate
Birds			
American white pelican	*Pelecanus erythrorhynchos*		Endangered
Bald eagle[e]	*Haliaeetus leucocephalus*	Species of concern	Sensitive
Burrowing owl	*Athene cunicularia*	Species of concern	Candidate
Common loon	*Gavia immer*		Sensitive
Ferruginous hawk	*Buteo regalis*	Species of concern	Threatened
Flammulated owl[b]	*Otus flammeolus*		Candidate

Table 4. Hanford Site Threatened, Endangered, and Other Special Status Species. (3 Sheets)

Common Name	Scientific Name	Status	
		Federal	State
Golden eagle	*Aquila chrysaetos*		Candidate
Lewis's woodpecker[b]	*Melanerpes lewis*		Candidate
Loggerhead shrike	*Lanius ludovicianus*	Species of concern	Candidate
Merlin	*Falco columbarius*		Candidate
Northern goshawk	*Accipter gentilis*	Species of concern	Candidate
Peregrine falcon	*Falco peregrines*	Species of concern	Sensitive
Sage sparrow	*Amphispiza belli*		Candidate
Sage thrasher	*Oreoscoptes montanus*		Candidate
Sandhill crane	*Grus Canadensis*		Endangered
Western grebe	*Aechmophorus occidentialis*		Candidate
Western sage grouse	*Centrocercus urophasianus phaios*	Candidate	Threatened
Mammals			
Black-tailed jackrabbit	*Lepus californicus*		Candidate
Merriam's shrew	*Sorex merriami*		Candidate
Townsend's ground squirrel	*Spermophilus townsendii*		Candidate
Washington ground squirrel[b]	*Spermophilus washingtoni*	Candidate	Candidate
White-tailed jackrabbit	*Lepus townsendii*		Candidate

[a] Probable but not observed on the Hanford Site
[b] Reported but seldom seen on the Hanford Site
[c] Protected as an Evolutionary Significant Unit for the upper Columbia River.
[d] Protected as an Evolutionary Significant Unit for the middle Columbia River.
[e] Removed from the list of threatened wildlife in the lower 48 states effective August 8, 2007 (72 FR 37346)

Federal:
Candidate: Current information indicates the probable appropriateness of listing as endangered or threatened.
Endangered: In danger of extinction throughout all or a significant portion of its range.
Species of Concern: Conservation standing is of concern, but status information is still needed (not published in the *Federal Register*).
Threatened: Likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

State:
Candidate: Current information indicates the probable appropriateness of listing as endangered or threatened.
Endangered: In danger of becoming extinct or extirpated from Washington State within the foreseeable future if factors contributing to its decline continue.
Review Group 1: Of potential concern; additional fieldwork is needed before a status can be assigned.
Review Group 2: Of potential concern; unresolved taxonomic questions.
Sensitive: Vulnerable or declining and could become endangered or threatened in Washington State without active management or removal of threats.
Threatened: Likely to become endangered in Washington State within the foreseeable future if factors contributing to its decline or habitat degradation or loss continue.
Watch: More abundant and/or less threatened than previously assumed, but still of interest to the state.

Source: Duncan 2007:4.106, 4.107, 4.109–4.113; USFWS 2007:2-35–2-37; WDFW 2008; WNHP 2005, 2008.

3.1.9 Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (59 FR 7629), directs federal agencies in the Executive Branch to consider environmental justice so that their programs will not have "disproportionately high and adverse human health or environmental effects" on minority and low-income populations. Executive Order 12898 further directs federal agencies to consider effects to "populations with differential patterns of subsistence consumption of fish and wildlife."

In 2000 approximately 488,900 people resided in the area within an 80-kilometer (50-mile) radius of the facilities in the 200 Areas. Minorities accounted for approximately 37 percent of the total population. Those who identified themselves as Hispanic or Latino accounted for approximately 84 percent of the minority population and 31 percent of the total population. The low-income population during 2000 was approximately 80,800 individuals, or 17 percent of the total population residing in the 80-km (50-mi) radius of the center of the Hanford Site, approximately the same percentage as the 1990 Census. The majority of these households were located to the southwest and northwest of the Site (Yakima and Grant counties) and in the cities of Pasco and Kennewick (Duncan 2007).

An estimated 160,600 people lived in Benton County and 64,200 lived in Franklin County during 2006, totaling 224,800, an increase of over 17 percent from the Census 2000 figure. During 2006, Benton and Franklin counties accounted for 3.5 percent of Washington's population (Duncan 2007).

3.1.10 Human Health and Safety

The DOE records occupational injuries and illnesses in two primary categories pertinent to the DOE NEPA analysis:

- Total recordable cases (TRC) are the total number of work-related injuries or illnesses that resulted in death, days away from work, job transfer or restriction, or "other recordable case" as identified in the Occupational Safety and Health Administration (OSHA) Form 300, *Log of Work-Related Injury and Illness* (OSHA 2007).
- Lost workday cases represent the number of cases recorded resulting in days away from work or days of restricted work activity, or both.

TRC rates for the DOE, Richland Operations Office averaged 1.1 cases per 200,000 worker hours during the period from 2003 through 2008, and DART (Days Away, Restricted or on Job Transfer) rates averaged 0.5 per 200,000 worker hours. Comparable average rates over the same period for all the DOE offices and contractors were 1.6 TRC and 0.7 DART cases per 200,000 worker hours. Rates for construction activities at the DOE facilities were slightly higher during the same period, at 1.8 and 0.7 cases per 200,000 worker hours, respectively (DOE 2009). For comparison, rates for U.S. industry during 2003-2007 were 4.6 TRC and 2.4 DART cases per 200,000 worker hours (BLS 2008).

3.1.11 Routine Radiological Exposure Risk

People have always been exposed to radiation from natural sources. The average resident of the United States receives an annual radiation dose from natural sources of about 300 millirem (mrem) [0.3 roentgen-equivalent man (rem)]. Exposure to large amounts of radiation (greater than 200,000 mrem [200 rem]) can cause serious illness or death. Although not confirmed by human studies, exposure to small doses of radiation, such as in medical x-rays, may cause a slight increase in the probability of cancer. At the Hanford Site, the DOE activities have involved manmade radiation sources from nuclear processing. The DOE annual radiation dose standard for the public is 100 mrem (0.1 rem).

When estimating health effects for radiation protection purposed it can be assumed that, for low-level exposures (i.e., less than 20 rem), the risk of one latent cancer fatality is 6 x 10-4 per rem (DOE/EH-412/0015/0802 Rev.1). For example, if 100,000 people receive a dose of 0.1 rem (100 mrem) or if 1,000,000 people receive a dose of 0.01 rem (10 mrem) six latent cancer fatalities would be expected.

The 242-A Evaporator activities require work in radiation zones. Due to the nature of radiation zone work, the workers could be exposed to and receive an occupational radiological dose from ionizing radiation. The DOE annual limit for occupational exposure is 5,000 mrem (5 rem). Hanford workers are administratively limited to an annual radiation dose of no more than 500 mrem.

3.1.12 Cultural Resources

The Hanford Site as a whole contains extensive prehistoric and historic archaeological sites. However, the 200 Areas contain very few known sites. A comprehensive cultural, archaeological and historical resources review for the fenced portions of the 200 Areas was conducted in 1987 and 1988. Four isolated historic artifacts, one isolated cryptocrystalline flake, and an extensive linear feature (i.e., the White Bluffs Road) were the only items discovered during the field survey (Duncan, 2007).

3.1.13 Visual Resources and Noise

Visually, the Hanford Site is characterized by wide-open vistas interspersed with over a dozen large industrial facilities (e.g., reactors and processing facilities). The 200 Areas contain several of these large processing facilities. Site facilities can be seen from elevated locations (e.g., Gable Mountain), a few public roadways (State Routes 24 and 240), and the Columbia River. Facilities in the 200 East Area can be seen only in the background from offsite locations.

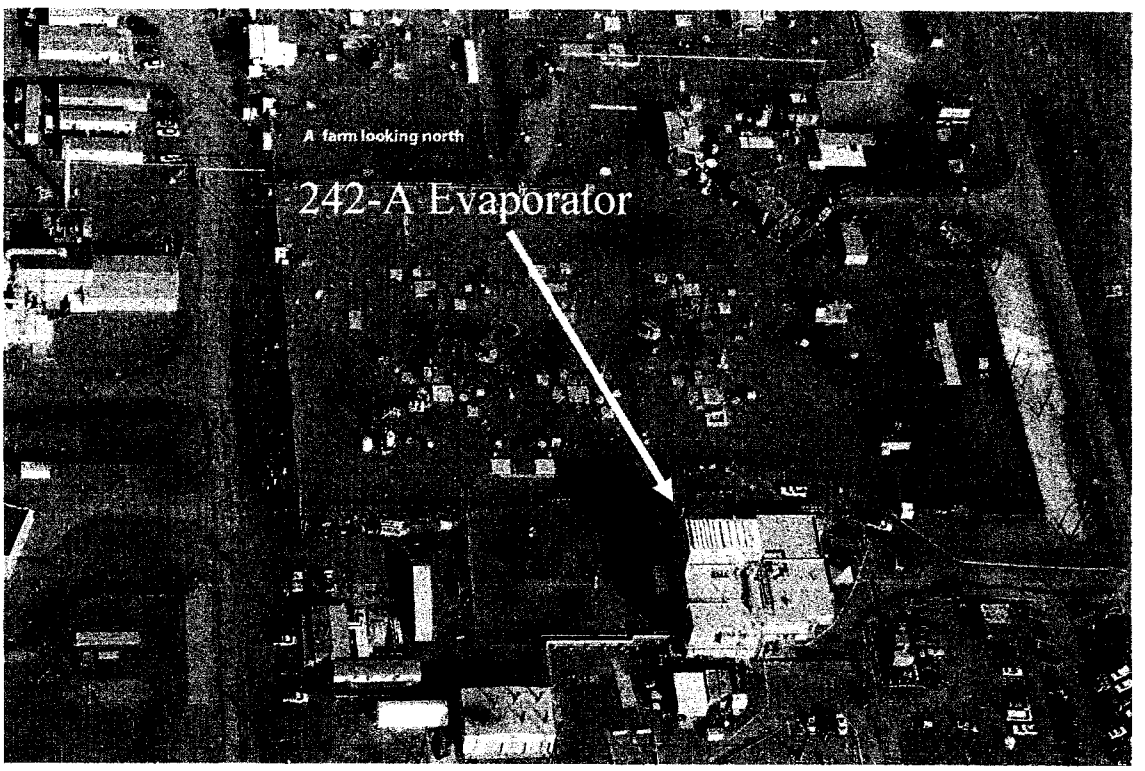
The Hanford Site is an industrial complex and generates noise at levels that are consistent with the various activities conducted within the complex boundaries. Noise levels are maintained within prescribed limits.

3.2 SPECIFIC SITE ENVIRONMENT

The 200 East Area is located in the central plateau of the Hanford Site. The 200 East area is highly industrialized from Cold War Era activities. The 200 East Area covers approximately 9.1 square kilometers (3.5 square miles). Historically, the 200 Area is where fuel irradiated in the old production reactors was chemically processed to separate and recover plutonium for use in nuclear weapons.

The 242-A Evaporator is located in between the A Farm to the North, and the AW Tank Farm to the South (See Figure 5). The original 242-A building is 75 ft wide by 108 ft long. The 242-AB building is an addition to the main structure of the 242-A building and is of similar design and construction and is 45 ft by 40 ft. The 242-A Evaporator Facility footprint is 75 ft x 108 ft 72 ft (main building) and 40 ft by 45 ft by 12 ft (support building) for a total of 604,944 cubic ft. The Evaporator is surrounded by paved parking lots, roads, and gravel cover. In the area where all proposed actions will take place, there are no native, biological, or ecological resources. The area is heavily disturbed by previous site activities and maintained to limit vegetative growth.

Figure 5. 242-A Evaporator Aerial View.



4.0 IMPACTS FROM ALTERNATIVES

The following sections present information on potential environmental impacts.

4.1 GEOLOGY AND SOILS

4.1.1 No Action Alternative

Placing the 242-A Evaporator into cold standby will not have any impacts on the geology or soils surrounding the 242-A Evaporator. The soil in the 200 East Area is predominately a sand and gravel mixture. All areas of the proposed action are in previously disturbed soils.

4.1.2 Proposed Action

The proposed Action will include digging up the existing junction boxes near the LDE for removal. This excavation includes trenches for the new conduit routed to the new above ground junction boxes (Figure 4). There are 5 trenches for the leak detection elements. Each trench is less than 8 ft in length and no deeper than 18 in. Only previously disturbed areas will be impacted.

4.2 SURFACE WATER RESOURCES

4.2.1 No Action Alternative

There would be no impacts to surface waters from the No Action Alternative. There are no naturally occurring water bodies near the 242-A Evaporator. Activities required for cold standby of the Evaporator do not involve dredging or filling activities in any surface water; therefore Section 404 of the CAA does not apply. The project would not require any new Section 402 discharge permits. No impacts to wetlands or designated floodplains are anticipated from this alternative. There are no wetlands or designated floodplains in the project area.

4.2.2 Proposed Action

There would be no impacts to surface waters from the proposed action. There are no naturally occurring water bodies near the 242-A Evaporator. Actions planned for operations, maintenance, and upgrades to the Evaporator do not involve dredging or filling activities in any surface water; therefore, Section 404 of the CAA does not apply. The project would not require any new Section 402 discharge permits. There are no wetlands or designated floodplains in the project area so no impacts to wetlands or designated floodplains are anticipated.

4.3 GROUNDWATER RESOURCES

Neither the Proposed Action, nor the No Action Alternative will impact groundwater resources. The water table in the 200 Areas is approximately 70 meters (230 ft) to 88 meters (290 ft) below the surface.

4.3.1 No Action Alternative

Under this alternative, the Evaporator would be placed in cold standby. The No Action Alternative would remove waste from the facility and ancillary equipment and would mitigate any potential for an unplanned release to surrounding soils.

4.3.2 Proposed Action

Under the proposed action, the Evaporator would continue to be operated according to its Resource Conservation and Recovery Act (RCRA) Part B Permit. The 242-A Evaporator complies with all waste handling requirements (i.e., secondary containment, leak detection). The facility will be operated in a manner such that tank waste will be appropriately handled. Ongoing activities send condensate to LERF or the ETF. The condensate is treated and discharged via the 200 Area ETF. Treated effluent is discharged to the ground under Washington State Discharge Permit 4500. No new dangerous or radiological releases to the vadose zone, or subsequently to the groundwater, are anticipated under this alternative.

4.4 AIR RESOURCES

4.4.1 No Action Alternative

Under the No Action alternative, the 242-A Evaporator would be placed in cold standby. Pending a final decision from regulatory agencies and the DOE, once placed in cold standby, the Evaporator would no longer have the potential for air emissions.

4.4.2 Proposed Action

For the proposed action, it is anticipated that currently planned upgrades will require notice of construction permits issued by the State of Washington. These permits limit allowable releases during construction and control the types of air pollution control equipment that is installed. The air operating permit limits emissions during operation of the facility.

During the construction period, there will be a change in emissions related to construction activities. However, all activities will be limited in compliance with Washington State regulatory permits. These activities will not result in exceedances of Washington State air standards.

Upgrades to the exhaust trains are expected to improve air emissions; these activities will not exceed the current emissions allowed under regulator permits. No further impacts to air emissions are anticipated.

Both radiological and non-radiological air monitoring requirements are implemented by WDOH and Ecology. These limits are established on the Hanford Site for specific facilities.

The radiological releases reported for 2007, are presented in Table 4 (HNF-EP-0527-17, *Environmental Releases for Calendar Year 2007*, Table 2-3 for the 242-A Evaporator). The 296-A-21 minor stack exhausted filtered air from the 242-A Building. The 296-A-22 minor stack exhausted filtered air from the 242-A Evaporator vessel ventilation system. Particulate emissions were sampled for both exhaust systems.

Table 5. 242-A Evaporator Radiological Air Emissions for Calendar Year 2007.

Stack	Average operating flow rate, cubic foot per minute (ft^3/min) (m^3/a)	Volume, ft^3 (m^3)	Radionuclide or type of radioactivity	Average operating concentration, microcuries per milliliter (µCi/mL)	Emissions, Curie (Ci)
296-A-21	14,680 (6.93)	7.7 E+09 (2.2 E+08)	gross alpha gross beta	5.3 E-16 1.6 E-15	1.5 E-07 4.4 E-07
296-A-22	444 (0.21)	1.9 E+08 (5.4 E+06)	Stronium-90 Cesium 137 Plutonium 238 Plutonium 239/240 Americium 241 Gross alpha Gross beta	≤ 0 4.1 E-16 ≤ 0 3.3 E-18 1.6 E-19 2.5 E-16 2.6 E-15	0 2.8 E-09 0 2.3 E-11 1.1 E-12 1.7 E-09 1.8 E-08

4.5 BIOLOGICAL RESOURCES

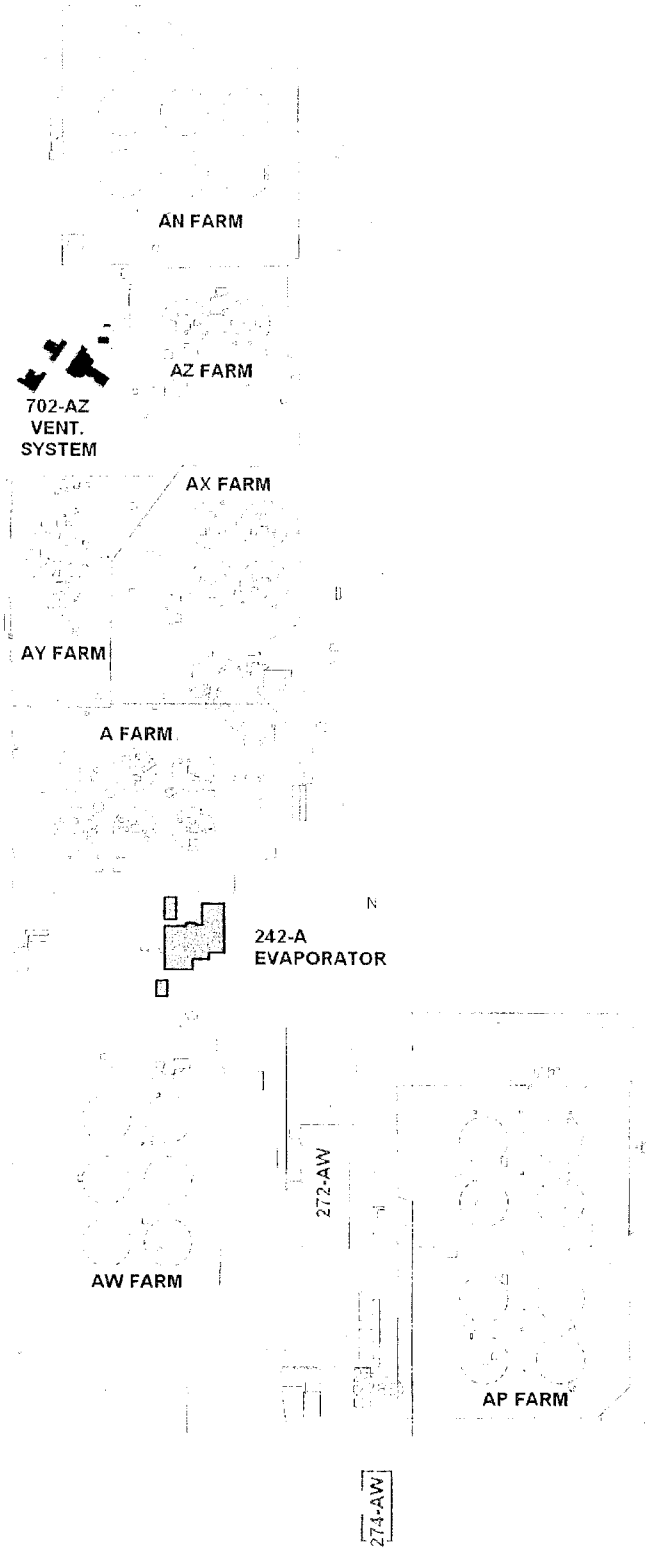
Neither the Proposed Action, nor the No Action Alternative will impact biological resources. A request for Cultural and/or Ecological Resources Review was made to PNNL. The review found that no biological resources would be impacted by either alternative (Sackschewsky, 2009 & 2010).

4.5.1 No Action Alternative

The land surrounding the 242-A Evaporator is heavily disturbed. The Evaporator is bounded by tank farms to both the North and South (see Figure 6). The tank farms underwent extensive excavation when the tanks were installed underground. The activities required to place the 242 Evaporator in cold standby would be conducted in these previously disturbed areas, so there would be no significant direct or indirect effect to biological resources or their habitat as a result. For the PC-5000 Leak Detection upgrades, the areas surrounding LDE sites 2, 3, 4, 5, 7, and 9, and the site at the LERF basin instrument building have been previously disturbed. The sites are primarily disturbed native soil (LDE sites 2, 3, 4, 5, 7, and 9) and gravel (LERF basin instrument building) with only sparse weedy vegetation. The biological survey of the 200 East Area (including LDE sites 2, 3, 4, 5, 7, and 9, and the LERF Basin Instrument Building) concluded that:

- No plant and animal species protected under the Endangered Species Act (ESA), candidates for such protection, or species listed by the Washington State were observed.
- No adverse impacts to species or habitats of concern are expected to occur from the maintenance, operation, or characterization activities at 200 East or West tank farms and associated support facilities.

Figure 6. Map of 242-A Evaporator and Surrounding Tank Farms.



4.5.2 Proposed Action

The activities planned under this action would take place inside the foot print of the existing 242-A Evaporator, in previously disturbed areas around the facility, or occur at seven specific locations along the eastern perimeter of the 200 East Area; LDE sites 2, 3, 4, 5, 7, and 9 and one site at the LERF Basin Instrument Building. There is no anticipated direct or indirect impact to biological resources or their habitat.

4.6 LAND USE

The Central Plateau (200 East and West Areas) are designated as an "industrial-exclusive" area capable of supporting waste treatment, storage, and/or disposal activities for hazardous, dangerous, radioactive, nonradioactive wastes and related activities. There would be no change in land use as a result either action. The proposed action is consistent with the current land use designation for the 200 Areas and would not affect the land use of the area.

4.7 TRANSPORTATION

At peak periods, commuter traffic is often heavy on all primary routes to and from the Hanford Site, including State Route 240. Impacts on traffic in the immediate area of the 242-A Evaporator are expected to be nominal under either action.

4.7.1 No Action Alternative

The current workforce at the 242-A Evaporator averages about 40 workers. This represents less than 0.5 percent of the Hanford workforce. No change in traffic density in the area near the Evaporator while the facility is placed into cold standby. Once the Evaporator is placed in cold standby, a nominal decrease in transportation density is anticipated as operations workers are reassigned to other work locations. It will not impact transportation corridors or resources.

4.7.2 Proposed Action

Under the Proposed Action, traffic on the roads near the Evaporator would increase slightly during the construction period. However, when construction activities end, traffic should return to current levels generated by a workforce of 40 FTEs. The construction workforce is expected to come from resources within the Hanford Site. It is not anticipated to cause an increase in the existing Hanford Site traffic. There would only be nominal changes in traffic due to material and equipment transportation activities. There would be no substantial impact to traffic volume, congestion or accidents resulting from the Proposed Action.

4.8 SOCIOECONOMICS

The 242-A Evaporator currently employs approximately 40 FTEs. The Hanford site as a whole employs on average 10,000 to 11,000 employees. Neither the Proposed Action, nor the No Action Alternative are expected to have socioeconomics impacts on surrounding communities (e.g. police, fire, school, and housing resources).

4.8.1 Environmental Justice

There would be no substantial impact to the environment of the Hanford Site or the surrounding communities. The Environmental Justice affected environment is identified in the Draft TC&WM EIS, Volume 1, Section 4.1.13, "Resource areas that could potentially be impacted and that may also affect populations residing off site include public and occupational health and safety, including normal operations and facility accidents, and air quality. These impacts were analyzed because of their potential for environmental justice concerns in the short term."

Under this alternative, there would be no substantial impact to the socioeconomics of the Hanford Site or the surrounding communities created by the cold standby of the Evaporator. The workforce for the Evaporator currently (FY 2009) averages about 40 workers. This is less than 0.5 percent of the existing Hanford Site workforce. There would be no high or disproportionate adverse health or socioeconomic impacts to minority or low-income populations as a result of this alternative.

4.8.2 Proposed Action

The workforce at the 242-A Evaporator averages about 40 workers. This represents less than 0.5 percent of the current workforce on the Hanford Site. No changes to the current operations workforce are expected under the Proposed Action. The construction workforce is expected to come from resources within the Hanford Site. As no significant changes to the current workforce would take place, no socioeconomic impacts are anticipated.

4.9 HUMAN HEALTH AND SAFETY

4.9.1 No Action Alternative

The No Action Alternative consists of short-term construction and operation activities to place the 242-A Evaporator into cold standby. Cold standby of the Evaporator would be conducted in a manner that maintained exposure to tank wastes ALARA through the use of engineering controls and protective equipment. It is assumed after the Evaporator is placed is cold standby (or closed) that the short-term human health risk will be fully mitigated and will not be considered further. This is consistent with the regulatory definition of closure of a treatment, storage, and/or disposal facility (i.e., no further active site management required).

4.9.2 Proposed Action

The 242-A Proposed action consists of short-term construction and long-term operation and maintenance activities. Short term human health risks will be encountered in the near future.

It is anticipated that operation, maintenance, and upgrade activities will be conducted in a manner that maintains exposure to tank waste ALARA through the use of engineering controls and protective equipment. All personnel working in the 242-A Evaporator would receive appropriate health and safety training.

The potential exists for accidents (e.g., cuts, falls) to occur resulting from construction and operation activities associated with component closure (i.e., tank closure). The occupational

injuries, illnesses, and fatalities resulting from potential accidents are calculated based on the following formula to determine the incidence rate for worker injuries and illness:

$$\frac{\text{(Number of Injuries \& Illness x (number of workers} \times \text{40 hours} \times \text{50 weeks)}}{\text{Employee hours worked}} = \text{incidence rate}$$

To determine an estimate of lost work time for the Evaporator under the Proposed Action, the TRC rate for the Hanford Site was used (DOE 2009, *Computerized Accident/Incident Reporting System (CAIRS)*). The DOE Hanford incidence rate was based upon the total workforce of the Hanford Site including managers, operators, construction forces, technicians and others. The Evaporator estimate of total employment included annual operations workers, as well as workers deployed to the facility to support construction of upgrades and life extension. Based upon a conservative annual estimate of 50 employees for the duration of Evaporator operation (2009 through 2032), there would be less than one recordable case of injury or illness resulting in lost work time attributable to the Proposed Action. Doubling the workforce at the 242-A Evaporator to 100 annual employees would still only result in 1 TRC.

4.10 CULTURAL RESOURCES

Neither the Proposed Action, nor the No Action Alternative will impact cultural resources. The cultural resource review found that no cultural resources would be impacted by either alternative (Crist, 9405630 & Till, 2010). A comprehensive cultural, archaeological and historical resources review for the fenced portions of the 200 Areas was conducted in 1987 and 1988. Four isolated historic artifacts, one isolated cryptocrystalline flake, and an extensive linear feature (i.e., the White Bluffs Road) were the only items discovered during the field survey (Duncan, 2007).

4.10.1 No Action Alternative

No ground disturbing activities would take place, or are anticipated under this alternative. Closing the Evaporator would require further NEPA analysis to evaluate impacts related to closure. However, no impacts to cultural resources are anticipated.

4.10.2 Proposed Action

There are no known cultural resources within the 242-Evaporator site. The Evaporator is bounded by tank farm to the North and South (See Figure 6). The tank farms underwent extensive excavation when the tanks were installed underground. The 242-A Evaporator is located in a previously disturbed area. The PC-5000 Line between 242-A Evaporator and the LERF Facility activity will include digging up the existing junction boxes near the LDE for removal in a previously disturbed area. This excavation includes trenches for the new conduit routed to the new above ground junction boxes (5 trenches 8 ft long and 18 in deep). Excavation permit # DAN-3895 has been obtained for the digging activities of the PC-5000 Line between 242-A Evaporator and the LERF Facility. If cultural resources were encountered, work would be halted and the DOE-Richland Operations Office Manager of the Hanford Historical and Cultural Resources Program would be notified to determine the appropriate disposition of the resource and any mitigative actions that would be required prior to continuing with the project.

4.11 VISUAL RESOURCES AND NOISE

4.11.1 No Action Alternative

Actions under this alternative would leave the Evaporator in its current configuration, resulting in no change to the current visual environment. Suspension of operations would remove any plumes associated with the 242-A minor stacks. These stacks are not visible from off of the Hanford Site. Noise levels would be slightly decreased in the immediate proximity of the facility. However, the Evaporator is located in a highly industrialized area and would not diminish the overall noise from surrounding facilities for current and planned tank farm activities.

4.11.2 Proposed Action

The vicinity of the 242-A Evaporator is highly industrialized; no changes to the general appearance of the current building or surrounding areas would take place under the proposed actions. No increase in visible emissions is anticipated under this action. The activities planned would use industrial equipment that would not substantially increase current noise levels in the vicinity of the Evaporator. Because of the size of the Hanford Site, its scattered facilities, and its largely undeveloped nature, site activities generally have no offsite noise impacts. Noise levels associated with activities on the Evaporator would be short-term, limited to the duration of the construction activities, and would not be permanent or long term.

4.12 CUMULATIVE IMPACTS

Only one area of concern shows potential adverse impact to human health or the natural environment. Placing the Evaporator in cold standby will reduce the volume of waste storage available in the DST System and consequently the ability to retrieve waste from the SST System which may result in additional releases of tank wastes to the environment from the aging SST Tank systems. It is not anticipated that either the proposed action or the No Action Alternative would change current or future cumulative environmental impacts.

4.13 MITIGATION OF ENVIRONMENTAL IMPACTS

There are no impacts to ecological/cultural resources. Any potential for an unplanned release will be appropriately mitigated and managed consistent with existing Hanford Site plans and procedures. Any potential health and safety risks encountered while implementing the proposed action would be managed in accordance with existing Hanford Site health and safety policies and procedures, with special measures taken as necessary to reduce the risks from working at the 242-A Evaporator.

5.0 AGENCIES CONSULTED

The following agencies and tribes were contacted during the preparations of this EA.

Federal Agencies

U.S. Environmental Protection Agency

Tribes

Nez Perce Tribe

Confederated Tribes and Bands of the Yakama Nation

Confederated Tribes of the Umatilla Indian Reservation

State Agencies

Oregon Department of Energy

Washington State Department of Ecology

Organizations

Hanford Advisory Board

6.0 REFERENCES

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APPENDIX A

FINDING OF NO SIGNIFICANT IMPACT

242-A EVAPORATOR

HANFORD SITE, RICHLAND, WASHINGTON

U.S. DEPARTMENT OF ENERGY

February 2010

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AGENCY: The U.S. Department of Energy.

ACTION: Finding of No Significant Impact.

SUMMARY: The U.S. Department of Energy (DOE) has prepared an Environmental Assessment (EA), DOE/EA-1682, Upgrades and Life Extension of the 242-A Evaporator, Hanford Site, Richland, Washington Conducted Under the *American Recovery and Reinvestment Act (ARRA) of 2009* . The proposed actions analyzed in the EA are within the scope of the recently issued draft Tank Closure & Waste Management Environmental Impact Statement (TC&WM EIS) for the Hanford site, Richland, Washington (DOE/EIS-0391, October 2009) and are referred to as "interim actions." The DOE prepared this interim action EA before completing the TC&WM EIS process to take advantage of the unique funding opportunity provided by the (ARRA) allowing the DOE to identify actions which can be accelerated and implemented earlier than previously planned. This EA evaluates needed upgrades and life extension activities to the existing 242-A Evaporator. Implementation of the proposed action evaluated in this EA will not prejudice decisions to be made based on the TC&WM EIS or limit the DOE's choices from among the alternatives evaluated in the EIS.

Based on the analysis in the EA, and considering public comments, the DOE has determined that the proposed action is not a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (NEPA). Therefore, the preparation of an EIS is not required.

ADDRESSES AND FURTHER INFORMATION:

The EA (DOE/EA-1682) is available at the DOE Public Reading Room, Consolidated Information Center at Washington State University-Tri-Cities, and may be accessed electronically at: http://www.hanford.gov/rl/?page=86&parent=52".

Requests for single copies of the EA or other related information may be referred to:

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DOE NEPA Document Manager
U.S. Department of Energy
Office of River Protection
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PURPOSE AND NEED: The DOE needs to upgrade and extend the service life of the 242-A Evaporator located in the 200 East Area on the Hanford Site. The proposed activities to upgrade and extend the service life of the 242-A Evaporator will support continued operation through 2032. The scope of this "interim action" EA as described in Section 1.0, page 2, was based on ensuring that the activities currently planned for FY2009-2011 and in the current baseline for the Tank Farm Contractor have NEPA coverage pending the publication of the Final TC&WM EIS and its associated Record of Decision (ROD).

BACKGROUND: The 242-A Evaporator facility was constructed between 1974 and 1977. Since 1977, the facility has been used to concentrate liquid waste in order to maximize space used to store mixed waste in 28 Double-shell Tanks (DSTs).

From 1977 through 2008, the evaporator completed more than 60 campaigns with a combined feed volume exceeding 105 million gallons (more than 400 million liters). The campaigns successfully attained volume reductions of more than 67 million gallons of liquids (or about 64 percent). Also, periodically, the evaporator conducts "cold" campaigns that are performed to meet training, testing and operation requirements.

The facility was substantially upgraded in 1987, and from 1989 to 1994, the facility was placed in standby status pending resolution of effluent discharge issues, completion of equipment upgrades, and completion of an Operational Readiness Review. Since 1994, there have been periodic upgrades to equipment to maintain and operate the facility in a manner consistent with its mission.

PROPOSED ACTION: The proposed action involves upgrading and extending the service life of the 242-A Evaporator. There are several activities planned for accomplishing the upgrades and life extension of the 242-A Evaporator as described below:

Replacing the PC-5000 Leak Detection between the 242-A Evaporator and Liquid Effluent Retention Facility (LERF) with a new monitoring system. The new system will have a local panel for maintenance located at the LERF basin instrument building. The new probes will be installed to minimize condensation within the encasement and condensation effects on the equipment (which can activate false alarms). The existing leak detection system will be disconnected and cable removed from the encasement piping. The new system will include the installation of new probes and wire. The activity will include digging up the existing junction boxes near the leak-detection elements (LDE) for removal. Existing conduit will be relocated to above ground junction boxes. This excavation includes trenches for the new conduit routed to

the new above ground junction boxes. There are 5 trenches for the LDE. Each trench is less than 8 ft in length and no deeper than 18in. The sixth leak detector wire will be installed in an existing above ground junction box.

The 242-A Evaporator still has instrumentation from the original construction of the facility that currently needs to be replaced. Work under the proposed action will modify or upgrade the instrumentation such as: flow indicating transmitters, flow transmitters, pressure transmitters, pressure differential transmitters, pressure switches, weight factor transmitters, and density transmitters.

A majority of the heating, ventilation, and air conditioning (HVAC) system components located at the 242-A Evaporator Building are from the original construction of the facility and are in need of upgrading. This activity will modify/upgrade the HVAC exhaust system components to correct its deficiencies and support facility operations. The work will include design, fabrication, installation, testing, startup and turnover of approximately two blowers and approximately three filter trains. Construction activities include: pouring a new slab, installation of three high-efficiency particulate air (HEPA) filter trains, installation of two new exhaust fans, fabrication and installation of a new stack with sampling and monitoring system, fabrication and installation of exhaust ductwork to tie into the existing underground ductwork and exhaust system, and miscellaneous electrical and instrumentation wiring connected to the 242-A facility.

Additionally, all of the activities including those identified in Tables 2 and 3 will be subject to engineering, environmental, and programmatic reviews that may modify the scope of the activity or eliminate them from implementation. However, the TC&WM EIS ROD and subsequent State of Washington permits may result in other activities in the future. The proposed activities to upgrade and extend the service life of the 242-A Evaporator will support continued operation through 2032. Most of the planning and design activities will take place in FY 2009 with procurement and construction planned for 2010. Testing, startup, and turnover will occur in FY 2011.

ALTERNATIVES CONSIDERED: Two alternatives were defined and support this analysis. These alternatives include the proposed action as described above, and the No Action Alternative (as required under NEPA regulations). Other alternatives were not considered in the EA because their selection could prejudice potential decisions to be made based on the TC&WM EIS.

No action: The No Action Alternative to the proposed action would include: no operation, maintenance, or upgrade activities taking place. This alternative would place the Evaporator in cold standby and it would be closed according to a NEPA/State Environmental Protections Act of 1971 (SEPA) analysis and decisions and applicable Washington State permits. There would be no further campaigns to consolidate DST System tank waste. If this alternative is chosen, the 242-A Evaporator facility would be placed in cold standby, thereby directly impacting waste feed delivery to the Waste Treatment Plant and continued retrieval and closure of Single-shell tanks (SST). Selection of the No Action alternative may initiate changes to the Hanford Federal Facility Agreement and Consent Order (HFFACO) milestones for retrieval and treatment of tank waste. The DOE would also be required to prepare a closure plan for the facility under the State Dangerous Waste regulations. Siting, construction, testing, operation and future closure of an alternate means of waste concentration and/or additional double shell storage tanks would be required.

Routine surveillance of the 242-A Evaporator would occur until the DOE and Washington State Department of Ecology (Ecology) decide on the disposition of the facility under applicable state and federal regulations. Cold standby activities would include:

- Completion of any current campaigns
- Flushing systems to minimize residual contamination in vessel and process lines
- Draining water and diesel fuel from lines and tanks
- Isolate and lay up systems for long term standby
- Secure the facility
- Routine surveillance of the facility.

This process is assumed to require approximately six months to complete, using current facility staff and plant forces.

Public Comments/Responses:

Before approval of this EA, a draft version was sent out for public comment. The comments and response to comments have been summarized below:

1. The No Action Alternative: should have included a closure plan. Placing the 242-A in cold standby would trigger the start of closure (require notice of the last receipt of waste), and would require preparation, submittal and approval of a closure plan.

   Response: The text has been modified at Page 13, Section 2.2: "Selection of the No Action alternative may initiate changes to the HFFACO milestones for retrieval and treatment of tank waste. The DOE may also be required to prepare a closure plan for the facility under state Dangerous Waste regulations."

2. Additional Alternatives Should be Considered: There are several other viable alternatives that should be considered. While there is little doubt that a major refurbishment is badly needed for continued long-term operation of the 242-A evaporator facility, this document does not explore any alternatives to the refurbishment and long-term operation of that facility.

   Response: The DOE continues to consider alternative technologies and facilities that would support the waste management, treatment and closure mission the for tanks. This EA only addresses in the proposed action those actions planned in the near future required to extend the life of the facility through 2032.

3. Support for Cleanup Mission for the 242-A Evaporator: The agreement between the states of Washington and Oregon and the United States government is that the Hanford Nuclear Reservation needs to be shut down completely and permanently. Should the upgrades and life extension of the 242-A Evaporator be necessary for the cleanup and closure of the nuclear site, there are several constraints that should be considered. Fast and effective cleanup should be followed with no new nuclear materials (from the date of the beginning of cleanup, to the present, and forward) being added to the site. No resulting materials from the Evaporator should be used in the future. If these conditions for the 242-A Evaporator cleanup and closure are necessary, the cleanup mission will be supported.

Response: The upgrades and life extension through FY2032 of the 242-A Evaporator is necessary for the cleanup and closure of the Hanford Site. The scope of this "interim action" EA as described in Section 1.0, page 2, was based on ensuring that the activities currently planned for FY2009-2011 and in the current baseline for the Tank Farm Contractor have NEPA coverage pending the publication of the Final TC&WM EIS and its associated ROD.

ENVIRONMENTAL IMPACTS:

Cultural and Biological Resources: It is expected that there would be no adverse effects on cultural resources from the proposed action. In addition, no Federal or State-listed, proposed, candidate, threatened, or endangered species are expected to be affected.

Human Health & Safety Impacts: No significant impacts are expected. Total recordable cases (TRC) rates for the DOE, Richland Operations Office averaged 1.1 cases per 200,000 worker hours during the period from 2003 through 2008, and Days Away from Work or Restricted Days (DART) rates averaged 0.5 per 200,000 worker hours. Comparable average rates over the same period for all the DOE offices and contractors were 1.6 TRC and 0.7 DART cases per 200,000 worker hours. Rates for construction activities at the DOE facilities were slightly higher during the same period, at 1.8 and 0.7 cases per 200,000 worker hours, respectively (DOE 2009). For comparison, rates for U.S. industry during 2003-2007 were 4.6 TRC and 2.4 DART cases per 200,000 worker hours (BLS 2008).

Routine Radiological Exposure Risk: The general population is exposed to radiation from natural sources. The average resident of the United States receives an annual radiation dose from natural sources of about 300 mrem (0.3 rem). Exposure to large amounts of radiation (greater than 200,000 mrem [200 rem]) can cause serious illness or death. Although not confirmed by human studies, exposure to small doses of radiation, such as in medical x-rays, may cause a slight increase in the probability of cancer. At the Hanford Site, the DOE activities have involved manmade radiation sources from nuclear processing. The DOE annual radiation dose standard for the public is 100 mrem (0.1 rem).

When estimating health effects for radiation protection it can be assumed that, for low-level exposures (i.e., less than 20 rem), the risk of one latent cancer fatality is 6 x 10-4 per rem (DOE/EH-412/0015/0802 Rev. 1). For example, if 100,000 people receive a dose of 0.1 rem (100 mrem) or if 1,000,000 people receive a dose of 0.01 rem (10 mrem) six latent cancer fatalities would be expected.

The 242-A Evaporator activities require work in radiation zones. Due to the nature of radiation zone work, the workers could be exposed to and receive an occupational radiological dose from ionizing radiation. The DOE annual limit for occupational exposure is 5,000 mrem (5 rem). Hanford workers are administratively limited to an annual radiation dose of no more than 500 mrem annually, or about one-tenth the occupational exposure limits that are imposed.

Socioeconomic Impacts: The 242-A Evaporator currently employs approximately 40 full-time equivalent staff. The Hanford site as a whole employs on average 10,000 to 11,000 employees. The Proposed Action is not expected to have socioeconomics impacts on surrounding communities (e.g. police, fire, school, and housing resources).

Environmental Justice: Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (59 FR 7629), directs federal agencies in the Executive Branch to consider environmental justice so that their programs will not have "disproportionately high and adverse human health or environmental effects" on minority and low-income populations. Executive Order 12898 further directs federal agencies to consider effects to "populations with differential patterns of subsistence consumption of fish and wildlife."

In 2000, approximately 488,900 people resided in the area within an 80-kilometer (50-mile) radius of the facilities in the 200 Areas. Minorities accounted for approximately 37 percent of the total population. Those who identified themselves as Hispanic or Latino accounted for approximately 84 percent of the minority population and 31 percent of the total population. The low-income population during 2000 was approximately 80,800 individuals, or 17 percent, of the total population residing in the 80-kilometer (50-mile) radius of the center of the Hanford Site, approximately the same percentage as the 1990 Census. The majority of these households were located to the southwest and northwest of the Site (Yakima and Grant counties) and in the cities of Pasco and Kennewick (Duncan 2007).

An estimated 160,600 people lived in Benton County and 64,200 lived in Franklin County during 2006, totaling 224,800, an increase of over 17 percent from the Census 2000 figure. During 2006, Benton and Franklin counties accounted for 3.5 percent of Washington's population (Duncan 2007).

The proposed action would not have disproportionately high or adverse health or socioeconomic impacts on minority or low-income populations. There would also be no substantial impact to the natural or human environment of the Hanford Site or the surrounding communities.

Cumulative Impacts: Cumulative environmental impacts were considered but no significant cumulative impacts are expected from implementation of the proposed action.

MITIGATION OF ENVIRONMENTAL IMPACTS:

There are no impacts to ecological/cultural resources, any potential for an unplanned release will be appropriately mitigated and managed consistent with existing Hanford Site plans and procedures, including the Biological Resources Management Plan. Any potential health and safety risks encountered while implementing the proposed action would be managed in accordance with existing Hanford Site health and safety policies and procedures, with special measures taken as necessary to reduce the risks from working at the 242-A Evaporator.

DETERMINATION:

Based upon the analyses of potential environmental impacts in the final EA and considering the public comments received on the draft EA, the DOE concludes that the proposed action to upgrade and extend the life of the 242-A Evaporator does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA. Therefore, an EIS for the proposed action is not required. Within this determination, the DOE can proceed with the upgrades and life extensions to the 242-A Evaporator.

Issued in Richland, Washington, this 3RD day of FEBRUARY, 2010.

Shirley J. Olinger
Manager, Office of River Protection