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REGULATORY STRATEGY FOR 105-B REACTOR PRESERVATION
JUNE 2009

EXECUTIVE SUMMARY

This document contains the regulatory strategy for continued surveillance and maintenance (S&M) of the 105-B Facility (105-B Reactor) and maintaining it as a historic place with public access beyond the 2012 time frame established in the 2001 Engineering Evaluation/Cost Analysis and Action Memorandum (DOE/RL, 2001) and the *Action Memorandum for the 105-B Reactor Facility, Hanford Site, Benton County, Washington* (EPA, 2002) that documented the EE/CA recommendations. The recommended regulatory documentation would provide an appropriate forum for the development and selection of alternatives that would enhance the safety and utility of the 105-B Reactor for continued public use until DOE develops the final disposition approach.

This strategy concludes with the recommendation that the regulatory approach continue with the non-time-critical (NTC) removal path under the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), optimized for site conditions and work already completed. Major regulatory components include Approval Memorandum, EE/CA, Action Memorandum, and Removal Action Work Plan (RAWP). The "center piece" of this strategy is the preparation of a new EE/CA to support extending the 105-B Reactor mission beyond 2012. The EE/CA is expected to address structural modifications and other upgrades required to provide adequate protection of human health and the environment until such time 105-B Reactor transitions from the S&M phase to the final disposition phase of the facility decommissioning process described in the Section 8.0 of the Hanford Federal Facilities Agreement and Consent Order Tri-Party Agreement, (TPA) Action Plan. The EE/CA should be prepared in accordance with *Conducting Non-Time Critical Removal Actions under CERCLA* (EPA, 1993) and *Non-Time-Critical Removal Actions* (DOE/EH, 1998). These documents provide guidance for EE/CA preparation including enforcement, public involvement, and preparation of Approval and Action Memoranda.

SITE HISTORY OVERVIEW

This section provides an overview of the 105-B Reactor history. Additional historic details relevant to the regulatory status of the 105-B Reactor are provided in Attachment 1.

Groundbreaking for the 105-B Reactor began in October 1943 (DOE-RL, 2001b) by the U.S. Army Corps of Engineers as a part of the Manhattan Project effort to bring an end to World War II. In only 16 months (DOE/RL, 2001b), the reactor was fully constructed and operational. The first indications of radioactivity were observed on September 26, 1944, with the reactor achieving full power on February 4, 1945.

The 105-B Reactor was the world's first full-scale production reactor. The reactor produced plutonium fuel for the world's first nuclear device, detonated at the Trinity test site in Alamogordo, New Mexico, on July 16, 1945. The facility also produced the plutonium fuel used in the atomic bomb, named "Fat Man," detonated at Nagasaki, Japan, on August 8, 1945, which hastened the end of World War II five days later.

Comment [PJK1]: Kudos for the thorough research and compilation of the history. Because the history section is very substantial (somewhat overwhelming) – you might consider scaling it down to more of a time-line and providing the additional details for the attachment.



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In the absence of wartime pressures for plutonium and with continued problems with reactor graphite expansion, the B Reactor was shut down on March 16, 1946, and remained out of service until 1948. In June 1948, the 105-B Reactor was restarted with a 10% increase in power rating. The facility continued to operate with increased power output and plutonium production until 1968. Between 1948 and 1968, the B Reactor power rating increased to 10 times its original design capacity. In addition to its legacy as a plutonium production reactor, the 105-B Reactor produced tritium for weapons in America's nuclear arsenal.

Final shutdown of the reactor occurred on February 12, 1968. In the 12 years following the initial shutdown order, the 105-B Reactor was held in standby status, with a restart capability of 18 to 24 months duration. The reactor support facilities, including the 115-B Gas Purification Building, 181-B River Pump house, 182-B Reservoir and Pump house, and the 184-B Powerhouse, were left in service to support the reactor in the 100-B/C Area, the C Reactor. The 105-B Reactor was finally declared excess property in the early 1980s. In 1998, portions of the C Reactor were demolished and the reactor block was encapsulated in an interim safe storage enclosure awaiting final disposal of the reactor block consistent with DOE/EIS 0119F, *Final Environmental Impact Statement: Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington* and the associated Record of Decision (58 Federal Register 48509). Support facilities for the B and C Reactors, with the exception of the 181-B River Pump house and the 182-B Reservoir and Pump house, have been demolished.

Four areas of the Hanford Site (100, 200, 300, and 1100 Areas) were officially listed on the Environmental Protection Agency (EPA) National Priorities List (NPL) on November 3, 1989. This action triggered the initiation of Hanford Site remedial investigation/feasibility study (RI/FS) activities and the establishment of an interagency agreement [i.e., the Tri-Party Agreement (TPA)]. The TPA establishes approaches for implementing *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* activities at the Hanford Site, including ~~officially put the 105-B Reactor in the federal Superfund regulatory process under *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* authority. The TPA, the Federal Facility Agreement between DOE, Washington State, and EPA, was signed shortly thereafter.~~ The TPA is the legal document that binds DOE to environmental compliance and cleanup actions pursuant to compliance with the Resource Conservation and Recovery Act (RCRA), CERCLA, and the State of Washington Hazardous Waste Management Act (HWMA).

Section 8.0 of the TPA Action Plan, *Facility Decommissioning Process*, defines the approach that DOE will take, with involvement of the lead regulatory agencies, to transition a facility from an operational status to its end state condition (i.e., final disposition) at Hanford. This approach is consistent with the joint DOE and EPA policy for decommissioning DOE facilities under CERCLA and is accomplished in three phases by the completion of facility transition, S&M, and final disposition activities.

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When the 105-B Reactor was shut down in 1968 it did not proceed through a formal transition phase, but instead was put initially in standby status and then into the S&M phase which continues. Documentation has been prepared for systems and structural integrity of the facility, remaining hazardous and radioactive material in the facility, facility history for the shutdown systems, and an S&M Plan has been approved by the EPA (DOE/RL, 2002b). The S&M Plan outlines facility specific activities taken to address essential systems monitoring, maintenance, and operation requirements necessary to ensure efficient, cost effective maintenance of the facility in a safe condition that presents no significant threat of release of hazardous substances into the environment and no significant risk to human health until such time a decision is made regarding the final disposition of 105-B Reactor.

In 1992 and 1993, the DOE issued an EIS (DOE, 1992) and Record of Decision (ROD) (58 FR 48509), respectively, for the decommissioning of the eight surplus production reactors along the Columbia River; including 105-B Reactor. The EIS and associated ROD recommended "interim safe storage followed by one-piece removal" for the surplus production reactors. The interim safe storage period is up to 75 years or until the year 2068. Following the 75 year interim safe storage period, one piece removal of the reactor cores would occur with disposal on the 200 Area Plateau. The ROD acknowledged the nomination and inclusion of 105-B Reactor on the *National Register of Historic Places* and goes on to note that specific actions to mitigate cumulative impacts of decommissioning on the historic preservation of 105-B Reactor will be determined later per 36 CFR 800, *Protection of Historic Properties*.

~~In September 1995, the 105-B Reactor Facility Museum Phase I Feasibility Study Report (BHI-00076) was issued. Consistent with the NEPA EIS Since the issuance of the surplus reactor ROD in 1993 (58 FR 48509), a decision was made to place 105-B Reactor on the *National Register of Historic Places*. As a result of strong and growing public support to preserve 105-B Reactor as a public tour facility, steps were taken towards preservation; including the installation of visitor displays, conducting hazard mitigation activities along the tour route, and conducting public tours of accessible areas. Some areas contain residual contamination and are not on the tour route. In September 1995, the 105-B Reactor Facility Museum Phase I Feasibility Study Report (BHI-00076) was issued. This study was conducted to define activities necessary to continue using 105-B Reactor as a public tour facility, evaluate the technical feasibility of those activities, examine the cost effectiveness of a public tour facility versus dismantlement, and evaluate options to improve 105-B Reactor as a public tour facility attraction.~~

Comment [PJK2]: Should we mention that no Proposed Plan or ROD have been issued?

In November 1999, the Final Hanford Comprehensive Land Use Plan Environmental Impact Statement (HCLUP-EIS) Record of Decision (DOE, 1999) was issued. The HCLUP-EIS based its cleanup strategy on the assumption that "... the reactor blocks for the eight plutonium reactors will be kept in their present sites for up to 75 years ..." The HCLUP-EIS also made allowance for 105-B Reactor to be converted into a museum and the surrounding area made available for museum support facilities.

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In June 2000, BHI issued *105-B Reactor Museum Feasibility Assessment (Phase II) Project* (BHI-01384) to meet TPA Milestone M-93-05. The purpose of this report was to provide the basis and supporting documentation necessary to prepare 105-B Reactor as a facility open for partial, unescorted-access public tours. Hazards and deficiencies in 105-B Reactor and proposed corrective actions were provided in this report. The selected measures reduce or eliminate risk to persons touring the facility, provide for appropriate accessibility under the Americans with Disabilities Act, and retain the character of the building to the maximum extent possible as dictated by its National Register of Historic Places status.

Comment [PJK3]: Should we mention that no Proposed Plan or ROD have been issued?

In June 2001, the *Engineering Evaluation/Cost Analysis (EE/CA) for the 105-B Reactor Facility* (DOE/RL 2001) was prepared to support and implement the DOE's decision to preserve the 105-B Reactor as a cultural resource for a period of up to 10 years and to support decisions on the final configuration of 105-B Reactor. The 2001 EE/CA was followed by the *Action Memorandum for the 105-B Reactor Facility, Hanford Site, Benton County, Washington* (EPA, 2002) that documented the EE/CA recommendations and the *Removal Action Work Plan and Surveillance and Maintenance Plan for the 105-B Reactor Facility* (DOE/RL 2002b) that provides the guide for implementing the approved removal actions and S&M activities.

In February 2003, the *Evaluation of Final Configuration Alternatives for the 105-B Reactor Facility* (DOE/RL 2002), was issued. Although the previous 2002 Action Memorandum (EPA 2002) called for hazards mitigation and preserved the ability to use 105-B Reactor for public access, the alternatives evaluated in (DOE/RL 2002) do not include this option. In accordance with previous commitments, the DOE continues to seek a sponsor with interest in preserving all or part of 105-B Reactor for historical purposes. However, such a sponsor has not yet been identified, and the alternatives summarized in this evaluation assume that there will be no long-term public use or structural preservation of the facility.

In July 2004, the *Engineering Evaluation/Cost Analysis for the Final Configuration of the 105-B Reactor Facility* (DOE/RL 2004), was issued in accordance with TPA Milestone C-16-06E, *Final Configuration of B-Reactor* and based on the assumption that a long-term sponsor cannot be found and there will be no long-term public use or structural preservation of the facility. Also, in October 2004, President Bush signed Public Law 108-340 directing the Secretary of the Interior, in conjunction with the DOE, to commission the National Park Service (NPS) to conduct the *Manhattan Projects Sites Special Resources Study* to evaluate options for preserving and interpreting facilities at four sites that were in the World War II Manhattan Project (i.e., Oak Ridge, Tennessee; Los Alamos, New Mexico; Dayton, Ohio; and Hanford, Washington). The study is intended to evaluate the potential for selected facilities at these sites to be included into the NPS system and/or to identify other management options.

Comment [PJK4]: Should we mention that no Action Memo has been issued? I think this is addressed in the attachment.

In August 2005, the *Surplus Reactor Final Disposition Engineering Evaluation* (DOE/RL 2005) was issued in response to TPA Milestone M-93-25, "Submit an Engineering Evaluation of the Final Surplus Reactor Disposition to EPA and Ecology." The 105-B

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Reactor is currently in a hazard mitigation and public access mode and will not be to the point of final disposition until decisions regarding its use as a museum (Public Law 180-340) and its role as a historic place are resolved.

In the summer of 2009, the NPS Denver Office plans to issue a draft of the *Manhattan Projects Sites Special Resources Study* that will include a description of 105-B Reactor alternatives, the evaluation of the alternatives, and recommended option. Public comment will be invited on the results of the study (including the 105-B Reactor recommended option) through a series of public meetings to be held in Richland. Following the final revision of the draft study to incorporate public comments, the final study will be published, along with the associated ROD. The Secretary of the Interior will present the study results to Congress and the report will be released to the public.

EVALUATION OF REGULATORY OPTIONS

All the 100 Area, including the 105-B Reactor were placed on the NPL in 1989 and are currently being addressed under the CERCLA regulatory process, in conjunction with the commitments and milestones in the TPA and associated Action Plan that drive the timetable for the process. Furthermore, the DOE and EPA established a policy an approach for decommissioning surplus DOE facilities consistent with the requirements of CERCLA. This policy is the result of a joint effort by EPA and DOE to develop an approach to decommissioning surplus facilities that ensures protection of worker and public health and the environment; is consistent with CERCLA authority; provides for stakeholder involvement; and achieves risk reduction and hazards mitigation without unnecessary delay. The policy establishes that decommissioning activities will be conducted as non-time-critical removal actions under CERCLA authority, unless the circumstances at the facility make it inappropriate. Use of non-time-critical removals for conducting decommissioning activities effectively integrates EPA oversight responsibilities; DOE lead agency responsibilities; and state and stakeholder participation.

For purposes of this joint policy, decommissioning includes those activities that take place after a facility has been deactivated and placed in an ongoing surveillance and maintenance program, like 105-B Reactor. Decommissioning can include decontamination and dismantlement. Decontamination encompasses the removal or reduction of radioactive or hazardous contamination from facilities. Dismantlement involves the disassembly or demolition, and removal of any structure, system, or component and the interim or long-term disposal of waste materials in compliance with applicable requirements.

The National Contingency Plan (NCP) recognizes DOE as lead agency for the purpose of determining whether CERCLA response action is necessary to protect health, welfare, or the environment, and what type of response is most appropriate under the circumstances presented by the site. Response action may be taken when DOE determines that the action will prevent, minimize, stabilize, or eliminate a risk to public health and welfare or the environment. When DOE determines that CERCLA removal action is necessary, DOE is authorized to evaluate, select, and implement the removal action that DOE

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determines is most appropriate to address potential risks posed by the release or threat of release. The selection and implementation of such response should comply with the requirements of CERCLA, the NCP, and other applicable authorities. EPA has responsibility to oversee compliance with these requirements.

Although the full range of CERCLA response actions may be applicable to decommissioning activities, non-time-critical removal actions should be used for decommissioning, consistent with the joint DOE and EPA policy. Non-time-critical removal action requirements provide greater flexibility to develop decommissioning plans that are appropriate for the circumstances presented. Most importantly, non-time-critical removal actions usually will provide benefits to worker safety, public health, and the environment more rapidly and cost-effectively than remedial actions.

DOE Operations Offices will determine that removal action is appropriate for a particular project before proceeding. ~~The DOE documents and document~~ this determination in an Approval Memorandum, pursuant to 40 CFR 300.415(n)(4)(i). The scope of activities that qualify as removal actions under CERCLA includes, but may not be limited to, -site security or control precautions to reduce access or migration, stabilization of structures or buildings, consolidation or removal of substances or structures, and any other actions deemed necessary by the DOE. Any activity that reduces risks or potential risks in a relatively short time-frame and can be identified as appropriate with a relatively limited amount of analysis of alternatives may be taken under removal action authority. CERCLA requires that removal actions should, to the extent practicable, contribute to the efficient performance of any long-term remedial action conducted at the site.

Section 8.0 of the TPA Action Plan, *Facility Decommissioning Process*, is consistent with the joint DOE and EPA policy, and defines the approach that DOE will take, with involvement of regulatory agencies, to transition a facility from an operational status to its end state condition (i.e., final disposition) at Hanford. This approach is accomplished in three phases by the completion of facility transition, S&M, and final disposition activities.

Section 8.0 of the TPA Action Plan applies to the transition, S&M, and disposition of "key" facilities located on the Hanford Site that are not fully addressed under Section 6.0 (Treatment, Storage, and Disposal Unit Process) or Section 7.0 (Past- Practice Unit Process). The 105-B Reactor is listed as a key facility subject to the Section 8.0 process. For key facilities like 105-B Reactor which did not proceed through formal transition, S&M Plans will be submitted in accordance with negotiated TPA milestones.

The advantages of the CERCLA process are substantial and include:

- Involvement of the public and stakeholders in the regulatory decision making process
- Implementation of processes and policies that have been previously established between EPA and DOE
- Conforms with approaches established in the TPA

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- Integrates the various applicable or relevant and appropriate requirements into the work activities
- Considers multiple factors in the cleanup decision making process, including but not limited to: threat of release, cost, technology, consistency with long term cleanup plans, etc.
- Access to the Environmental Restoration Disposal Facility (ERDF), a dedicated CERCLA waste disposal facility on the Hanford Site.
- The requirement to meet only the substantive intent of other Applicable or Relevant and Appropriate Requirements (ARARs) (e.g., Clean Air Act, RCRA, etc.) and not the administrative requirements.
- The ability to address National Environmental Policy Act (NEPA) "values" (i.e., analysis of cumulative, offsite, ecological, and socioeconomic impacts) in CERCLA documentation without the need for separate NEPA documentation to support work activities.
- The ability to conduct decommissioning activities at DOE facilities as NTC removal actions under an EE/CA and associated Action Memorandum as opposed to a full blown remedial investigation/feasibility study (RI/FS) process.

It is the last advantage listed above that is perhaps the most significant to the developing the path forward for the 105-B Reactor as discussed in the following. The CERCLA and the NCP authorize two types of responses to releases of hazardous substances into the environment: remedial and removal actions. Remedial actions involve the study, design, and construction of long-term actions directed toward permanent remedy. In contrast, removal actions are usually short-term actions taken to "abate, prevent, minimize, stabilize, mitigate, or eliminate the release (DOE/EH, 1998, pg. 2). Justification has been provided and precedent has set for using the removal action response (DOE/RL, 2001). The hazards, configuration, and condition of the 105-B Reactor are well known based on process and facility knowledge (DOE/RL, 2001b and DOE/RL, 2002b) and since 1998, the 105-B Reactor has been in a (S&M) mode that has allowed for completion of hazard studies and some limited material removal (i.e., removal of accessible hazardous substances from areas of potential public access along tour routes). Finally, some key staff that operated or maintained the 105-B Reactor are still present in the area and are available to provide information about the facility.

Three types of removal actions are available under CERCLA and the NCP: (1) emergency, (2) time-critical, and (3) non-time-critical. The categorization of a removal into one of these three types is based largely on the urgency of the situation (DOE/EH, 1998, pg. 2). Non-time-critical removal actions respond to releases where a planning period of at least six months is available before onsite activities must begin and the need is less immediate. Removal actions at the 105-B Reactor are being implemented as non-time-critical (DOE-RL, 2002) primarily for the reasons discussed above and DOE's pending decision on the final configuration of the 105-B Reactor that may include preservation of all or parts of the facility structure until such time a decision is made consistent with the surplus production reactor EIS and ROD.

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Non-time-critical removal actions generally attempt to control the source of contamination and are sometimes followed by a remedial action to complete site response. This allows DOE to consider alternatives for continued safe public access to the 105-B Reactor to be followed by some future remedial action to complete site response. DOE is a lead Federal agency under CERCLA, and consistent with TPA provisions, has the authority, in coordination with EPA and Ecology, to pursue removal actions, including NTC removal actions without formal regulatory concurrence (DOE/EH, 1998, pg. 2). In the case of B-Reactor, the NTC removal path is appropriate and consistent with the joint DOE and EPA policy for decommissioning of DOE facilities, as previously discussed. At the same time, DOE is also working within the agreements of the TPA and has been seeking to build consensus on the need and scope of the B-Reactor removal action. DOE has coordinated 105-B Reactor removal actions with EPA to ensure that removal actions are consistent with and will not preclude final actions (DOE/RL, 2001, page 1-4).

REGULATORY PATHFORWARD AND RECOMMENDATIONS

The recommended path forward is to continue with the NTC removal path optimized for site conditions and work already completed. DOE has been implementing NTC removal actions combined with S&M activities under the 2001 EE/CA (DOE/RL, 2001) and associated Action Memorandum (EPA, 2002) and is approaching a juncture where it must consider decisions on the breadth and scope of continued removal activities to prevent, abate, or mitigate potential threats until such time a decision is made regarding the final disposition of the 105-B Reactor consistent with the surplus production reactor EIA and ROD. Typically, a NTC removal action would involve four major components (DOE/EH, 1998). These components are as follows:

- First is a site evaluation consisting of a removal site evaluation (RSE), preliminary assessment (PA) and if warranted, a removal site inspection (SI). ~~Alternatively, in accordance with 40 CFR 300.415(n)(4)(i) and EPA guidance on conducting NTC removal actions under CERCLA, an Approval Memorandum can be used in lieu of an RSE to document that the site meets NCP criteria for initiating an NTC removal action.~~ The Approval Memorandum supports the establishment of an administrative record of proposed NTC removal actions and their implementation (DOE/EH, 1998, pg. 3).
- Second is the Engineering Evaluation/Cost Analysis (EE/CA) consisting of development of the EE/CA, conducting community relations activities, and documentation of the recommended removal action decision in an Action Memorandum. The Action Memorandum is not required by law or regulation but serves as the official documentation of the removal action decision (DOE/EH, 1998, pg. 4).
- Third is the removal action which ~~triggers~~ requires several supporting CERCLA documents including an Removal Action Work Plan, and air monitoring plan (may be an appendix to the RAWP), and a waste management plan (may be an appendix to the RAWP).

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- Finally closeout of the NTC removal action to document that all objectives have been met.

Some optimization of the four components is warranted based on conditions at the 105-B Reactor and work already completed under the CERCLA process. A PA/SI has been completed and the site placed on the NPL. Also, the hazards, configuration, and condition of the 105-B Reactor are well known based on process and facility knowledge. An EE/CA for the 105-B Reactor has been prepared and implemented through an Action Memorandum, and since 2001 the 105-B Reactor has been in a S&M mode that has allowed for completion of hazard studies and some limited material removal (i.e., removal of accessible hazardous substances from areas of potential public access along tour routes). Thus, another detailed RSE is unwarranted is not required. A streamlined RSE and an Approval Memorandum would be appropriate and a draft for DOE's consideration is provided in Attachment 2. The RSE and Approval Memorandum is based on the results of the ongoing S&M activities combined with completion of hazard studies and some limited material removal that have been ongoing since 2001.

The second component, consisting of development of the EE/CA, conducting community relations activities, and documentation of the recommended removal action decision in an Action Memorandum should be implemented in general accordance with the guidance (EPA, 1993). A new EE/CA is recommended because the 2001 EE/CA (DOE/RL, 2001) covers a nominal 10-year period in which DOE could pursue development of options for hazards mitigation and continued public access to the 105-B Reactor. The 10-year period is nearly over and it is appropriate to begin developing a new EE/CA that can be used to engage public participation in the decision process. Pursuant to 40 CFR 300.415(m)(4) the Contractor would support the DOE with its conduct of community relations concurrent with preparation of the EE/CA and Action Memorandum. Major community relations activities include the following:

- Establishment of a local information repository at or near the 105-B Reactor site that would contain a copy of the administrative record file available to the public for inspection and copying. The Approval Memorandum would be placed in this repository before it is signed (DOE/EH, 1998, pg. 3)
- Interviews of local community representatives and preparation of a formal community relations plan before the EE/CA is completed.
- Publication of notice of availability in local newspaper when the EE/CA is made available for public review and comment. This is then followed by a 30-day public comment period.

The third and fourth components, consisting of implementing of the removal actions and closeout would proceed generally in accordance with and TPA provisions and applicable the guidance (EPA, 1993).

SCHEDULE AND ASSOCIATED COSTS

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The summary schedule for preparing the major regulatory documents is shown in Figure 1. Detailed schedules for the EE/CA, Action Memorandum, and RAWP are provided in Attachment 3.

The estimated costs apply to the DOE Contractor and correlate to preparation and processing the regulatory documentation. Some of the regulatory document processing steps will directly involve/include DOE and regulatory agency personnel (i.e., document reviews, public involvement activities, etc.) The estimates herein do not address the component costs for the activities directly performed by DOE and/or other regulatory agencies during the document processing activities. ~~are Contractor cost to prepare the documents and do not include any Federal Agency costs.~~ The major regulatory documents, assumptions, their sequence, schedule and estimated cost are as follows:

Approval Memorandum. The Approval Memorandum is provided by the lead Agency (DOE) and documents the DOE's decision and basis for the preparation of an EE/CA for the evaluation of NTC removal action alternatives for the 105-B Reactor. In this case the alternatives, except for no action, are focused on continued hazards mitigation and use of the 105-B Reactor as a historic place with public access. A draft Approval Memorandum for DOE consideration is provided in Attachment 2. It is assumed that DOE would have minimal changes to the draft Approval Memorandum and that DOE would issue the Approval Memorandum by about July 23, 2009 which is approximately two months after EE/CA preparation is assumed to start. Because of the above assumptions, no additional Contractor costs are included for the Approval Memorandum.

Engineering Evaluation/Cost Analysis. The EE/CA is prepared for Regulatory Agency (EPA) and public review and comment. The EE/CA provides and evaluates a range of alternatives. These alternatives, except for no action, are focused on the continued hazards mitigation and operation of the 105-B Reactor as a historic place with public access. Preparation of the EE/CA also is assumed to include support for maintenance of the Administrative Record. The Contractor would provide support to DOE for community relations activities upon request but costs associated with such support are not included in the estimate. The Rev. 1 EE/CA would be approved by EPA by about August 30, 2010, assuming the initial alternative scoping begins the week of June 22, 2009 and public involvement is limited to the involvement in 1) the scoping meeting and 2) review of the Rev 0 EE/CA as shown in schedule in Attachment 3. The Contractor cost (in FY09 dollars) is estimated to be approximately \$173,000 where about \$90,000 would be incurred in FY09 and \$83,000 in FY10.

Action Memorandum. The Action Memorandum serves as the official documentation of the removal action decision. Preparation of the Action Memorandum is assumed to begin by about July 28, 2010 that is near the same date that the Rev. 1 EE/CA is transmitted to EPA for approval. The Rev. 1 Action Memorandum would be approved by EPA by about July 5, 2011 assuming public involvement is limited to the involvement shown in schedule in Attachment 3. The Contractor cost (in FY09 dollars) is estimated to be approximately \$36,000 where about \$7,000 would be expended in FY10 and about \$29,000 in FY11.

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Removal Action Work Plan. The RAWP implements the alternative recommended in the EE/CA and Action Memorandum, and provides specific guidance, either directly or by reference, related to the details of the removal action. The RAWP is assumed to include an air monitoring plan (as an appendix) and a waste management plan (as an appendix). There is no requirement for public involvement but the RAWP must be approved by EPA. Preparation of the RAWP is assumed to begin on about June 2, 2011 that is near the same date that the Rev. 1 Action Memorandum is transmitted to EPA for approval. The Rev. 0 RAWP would be approved by EPA on about May 10, 2012. The estimated Contractor cost (in FY09 dollars) is approximately \$118,000 with about \$45,000 expended in FY11 and about \$73,000 in FY12.

	FY09	FY10	FY11	FY12	TOTAL
EE/CA	\$90K	\$83K	0	0	173K
Action Memorandum	0	7K	29K		36K
RAWP	0	0	40K	78K	118K
Totals by FY	90K	90K	69K	78K	327K

Table 1. Estimated Cost to Prepare Key Regulatory Documents by Fiscal Year.
 Notes: 1) Costs are in FY09 dollars. 2) Costs do not include activities performed directly by Federal Agency or other regulatory agencies costs.

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REFERENCES

36 CFR 800, Title 36, *Parks, Forests, and Public Property*, Part 800, *Protection of Historic Properties*, Authority: 16 U.S.C. 470s, Source: 65 FR 77725, United States Code of Federal Regulations, December 12, 2000.

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ATTACHMENTS

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ATTACHMENT 1
HISTORIC DETAILS RELEVANT TO THE REGULATORY STATUS
OF THE 105-B REACTOR

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FY 1989

Four areas of the Hanford Site (100, 200, 300, and 1100 Areas) were officially listed on the Environmental Protection Agency (EPA) *National Priorities List* (NPL) on November 3, 1989. The TPA was signed shortly thereafter.

Section 8.0 of the TPA Action Plan, *Facility Decommissioning Process*, defines the approach that DOE will take, with involvement of the lead regulatory agencies, to transition a facility from an operational status to its end state condition (i.e., final disposition) at Hanford. This approach is accomplished in three phases by the completion of facility transition, S&M, and final disposition activities.

Section 8.0 of the TPA Action Plan applies to the transition, S&M, and disposition of "key" facilities located on the Hanford Site that are not fully addressed under Section 6.0 (TSD Process) or Section 7.0 (Past- Practice Process). The 105-B Reactor is listed as a key facility subject to the Section 8.0 process. For key facilities like 105-B Reactor which did not proceed through formal transition, S&M Plans will be submitted in accordance with established TPA milestones.

The 105-B Reactor was shut down in 1968 and although the facility did not proceed through a formal transition phase, the facility is currently in the S&M phase. Documentation has been prepared for systems and structural integrity of the facility, remaining hazardous and radioactive material in the facility, facility history for the shutdown systems, and an S&M Plan has been approved by the EPA (see FY 2002). The S&M Plan outlines facility specific activities taken to address essential systems monitoring, maintenance, and operation requirements necessary to ensure efficient, cost effective maintenance of the facility in a safe condition that presents no significant threat of release of hazardous substances into the environment and no significant risk to human health until such time a decision is made regarding the final disposition of 105-B Reactor.

In accordance with Section 8.0 of the TPA Action Plan, biennial evaluations of long-term S&M and disposition plans and schedules for 105-B Reactor will be performed throughout the S&M phase. These evaluations will be performed to identify, evaluate, and assess the status of Hanford Site priorities as well as tribal and stakeholder values. Ongoing S&M activities will be conducted in accordance with the EPA approved S&M plan and associated TPA commitments until a decision is made by DOE to initiate the disposition phase, or actions are required by the lead regulatory agency pursuant to the terms of Section 8.0 of the TPA Action Plan.

FY 1992/1993

In December 1992, the DOE issued the *Final Environmental Impact Statement (EIS): Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington* (DOE, 1992). In September 1993, the DOE issued the *Record of Decision: Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington* (58 FR 48509), which calls for the implementation of the recommendation

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for "interim safe storage followed by one-piece removal" of the surplus reactors as described in the final surplus reactor EIS.

The ROD states the DOE will implement interim safe storage followed by deferred one-piece removal as the final disposition alternative for the eight surplus reactors. The interim safe storage period is for 75 years (until 2068). Following the 75 year interim safe storage period, the graphite block reactor cores will be removed as one-piece and transported to 200 West Area for disposal along with remaining contaminated portions of the facility. Uncontaminated structures and equipment will be demolished and placed in landfills.

The ROD acknowledges the nomination and inclusion of 105-B Reactor on the National Register of Historic Places. The Federal Register states that specific actions to mitigate cumulative impacts of decommissioning on the historic preservation of 105-B Reactor will be determined later per 36 CFR 800, Protection of Historic Properties, and may include extensive recordation by photos, drawings, models, exhibits, written histories, and preservation of some portions of 105-B reactor for display on or near its present location or at some other selected location.

FY 1995

In September 1995, Bechtel Hanford, Inc. issued the *105-B Reactor Facility Museum Phase I Feasibility Study Report* (BHI-00076). Since the issuance of the surplus reactor ROD in 1993, a decision was made to place 105-B Reactor on the *National Register of Historic Places*. As a result of strong and growing public support to preserve 105-B Reactor as a museum, steps were taken towards preservation; including the installation of visitor displays, conducting hazard mitigation activities along the tour route, and conducting public tours of accessible areas. Some areas contain residual contamination and are not on the tour route. This study was conducted to define activities necessary to continue using 105-B Reactor as a museum, evaluate the technical feasibility of those activities, examine the cost effectiveness of a museum versus dismantlement, and evaluate options to improve 105-B Reactor as a museum attraction.

Comment [PJK5]: Should we mention that no Proposed Plan or ROD have been issued?

FY 1999

In November 1999, the *Final Hanford Comprehensive Land Use Plan Environmental Impact Statement (HCLUP-EIS) Record of Decision* (DOE, 1999) was issued. The HCLUP-EIS provided a strategy for future land use on the Hanford Site. This decision helped provide a framework for cleanup standards and cleanup methodologies for the Hanford Site, including the reactor sites. The HCLUP-EIS based its cleanup strategy on the assumption that "... the reactor blocks for the eight plutonium reactors will be kept in their present sites for up to 75 years ..." The HCLUP-EIS also made allowance for 105-B Reactor to be converted into a museum and the surrounding area made available for museum support facilities.

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FY 2000

In June 2000, BHI issued *105-B Reactor Museum Feasibility Assessment (Phase II) Project* (BHI-01384). This report was issued to meet TPA Milestone M-93-05. The purpose of this report was to provide the basis and supporting documentation necessary to prepare 105-B Reactor as a facility open for partial, unescorted-access public tours. To prepare the facility for unescorted access, potential hazards and deficiencies had to be identified by performing a walk-through with professionals representing the architectural, electrical, mechanical, and structural engineering disciplines; industrial and radiological health and safety; and fire and life safety. On the basis of a review of past evaluations and information gained from this walk-through, identification of the hazards and deficiencies in 105-B Reactor and proposed corrective actions were provided in this report. The selected measures reduce or eliminate risk to persons touring the facility, provide for appropriate accessibility under the *Americans with Disabilities Act*, and retain the character of the building to the maximum extent possible as dictated by its *National Register of Historic Places status*.

Comment [PJK6]: Should we mention that no Proposed Plan or ROD have been issued?

FY 2001

In June 2001, the *Engineering Evaluation/Cost Analysis (EE/CA)* for the 105-B Reactor Facility (DOE/RL 2001) was prepared to analyze removal actions that may be performed at 105-B Reactor to protect human health and the environment. This EE/CA was intended to support and implement the DOE's decision to preserve the 105-B Facility as a cultural resource for a period of up to 10 years. Based on this unique intended use, the interim removal action recommended in the EE/CA and selected in the associated Action Memorandum (EPA, 2002) was hazard mitigation and public access for a period of up to 10 years. The hazard mitigation activities required to support public access included the removal of accessible hazardous substances from 105-B Reactor tour routes while performing surveillance and maintenance (S&M) activities such as routine radiological and hazard monitoring and safety inspections.

The interim removal action EE/CA analyzed removal action alternatives for a period of up to 10 years with the expectation that a final removal action, or "final configuration," would be determined during the 10-year period. Activities and associated costs for structural upgrades to allow safe public access were identified during this interim time period to assess the feasibility of sustained public use and the associated risks to human health and the environment due to hazardous substances that remain in the facility. The 10 year time period is consistent with the DOE's Columbia River Corridor Initiative, the goal of which is to complete many cleanup and access decisions by the year 2012 and to restore the river corridor per the TPA M-93 milestone series.

In addition to identifying and analyzing interim removal actions for 105-B Reactor, supplemental information was provided in the interim removal action EE/CA to support decisions on the final configuration of the facility. The supplemental information included the activities needed and estimated cost for mitigating hazards in all interior and exterior areas of 105-B Reactor to enable full public access for a 75-year period.

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FY 2002

In June 2002, the *Removal Action Work Plan and Surveillance and Maintenance Plan for the 105-B Reactor Facility* (DOE/RL 2002b) was issued pursuant to TPA Milestone M-93-06. The EPA approved the RAWP/SMP on August 16, 2002. The purpose of the RAWP/SMP was to support implementation of the 2001 EE/CA Action Memorandum by:

- Providing upgrades to facility infrastructures to ensure that risks to the public and workers from remaining hazardous substances are minimized;
- Removing, decontaminating, containing, or encapsulating hazardous substances in publicly accessible areas of 105-B Reactor;
- Performing routine S&M activities in all areas of 105-B Reactor to protect workers and the public and prevent releases of hazardous substances to the environment during and after the removal action for a period of up to 10 years;
- Managing and disposing of all waste generated during these actions.

The S&M Plan was prepared, and approved by the EPA, in response to the requirements of Section 8.0 of the TPA Action Plan to support transition of 105-B Reactor into the S&M phase of the facility decommissioning process.

FY 2003

In February 2003, the *Evaluation of Final Configuration Alternatives for the 105-B Reactor Facility* (DOE/RL 2002), was issued. This document presents the results of an evaluation of three final configuration options (no action, interim safe storage, and long-term S&M) for 105-B Reactor pending eventual one-piece removal and disposal of the reactor core on the Central Plateau around the 2068 time frame. The "no action" alternative assumes all short-term and long-term maintenance of 105-B Reactor are terminated and the facility is locked to prevent entry. The "interim safe storage" alternative includes decontamination and demolition of 105-B Reactor up to the shield walls that surround the reactor block, the construction of an interim safe storage enclosure, and reduced surveillance and maintenance. The "long-term surveillance and maintenance" alternative includes an extended period of facility monitoring with major and minor repairs, as necessary, followed by eventual decontamination and demolition of 105-B Reactor.

Although the previous 2002 Action Memorandum called for hazards mitigation and preserved the ability to use 105-B Reactor for public access, the alternatives evaluated in this document do not include this option. In accordance with previous commitments, the DOE continues to seek a sponsor with interest in preserving all or part of 105-B Reactor for historical purposes. However, such a sponsor has not yet been identified, and the alternatives summarized in this evaluation assume that there will be no long-term public use or structural preservation of the facility.

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FY 2004

In July 2004, the *Engineering Evaluation/Cost Analysis for the Final Configuration of the 105-B Reactor Facility* (DOE/RL 2004), was issued. This document presents the results of an evaluation of three removal action alternatives (no action, interim safe storage, and long-term S&M) for the final configuration of 105-B Reactor pending eventual disposition of the reactor core by 2068.

This EE/CA was prepared in accordance with TPA Milestone C-16-06E, *Final Configuration of B-Reactor*. The alternatives evaluated in this document support the planning and budgeting process for the final configuration of 105-B Reactor with the assumption that a long-term sponsor cannot be found and there will be no long-term public use or structural preservation of the facility. The recommended removal action alternative for 105-B Reactor was interim safe storage to begin at the conclusion of the 10 year interim hazard mitigation and public access period or when deemed appropriate by the DOE and regulatory agencies. There is no evidence that an Action Memorandum was ever issued in response to this EE/CA.

However, in October 2004, President Bush signed Public Law 108-340 directing the Secretary of the Interior, in conjunction with the DOE, to commission the National Park Service (NPS) to conduct the *Manhattan Projects Sites Special Resources Study* to evaluate options for preserving and interpreting facilities at four sites that were in the World War II Manhattan Project (i.e., Oak Ridge, Tennessee; Los Alamos, New Mexico; Dayton, Ohio; and Hanford, Washington). The study is intended to evaluate the potential for selected facilities at these sites to be included into the NPS system and/or to identify other management options. The facilities being studied at the Hanford Site include 105-B Reactor and T-Plant, the chemical processing plant used to extract plutonium from the irradiated fuel produced in 105-B Reactor during World War II. The total study is being managed by the NPS Denver office, with the Hanford Site portion being conducted by the NPS Pacific West Region in Seattle.

FY 2005

In August 2005, the *Surplus Reactor Final Disposition Engineering Evaluation* (DOE/RL 2005), was issued. This engineering evaluation was prepared in response to TPA Milestone M-93-25, "Submit an Engineering Evaluation of the Final Surplus Reactor Disposition to EPA and Ecology." The engineering evaluation reviews the original assumptions and information contained in the final surplus reactor EIS and ROD, including cost estimates and radiological inventories. The status of the DOE's progress implementing interim safe storage for the surplus reactors and cost estimates for completion of associated activities for all nine surplus reactors (including N Reactor) is presented. The report also evaluates the reactor final disposition alternatives proposed in the final surplus reactor EIS (i.e., one-piece removal, reactor dismantlement, and in situ decommissioning).

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These alternatives remain viable final disposition alternatives following interim safe storage. No new technical innovations, environmental values, regulatory requirements, or advances in the decommissioning process were identified that would significantly impact the original assumptions and conclusions of the final surplus reactor EIS and ROD. The applicable cost estimates and dose estimates presented in the final surplus reactor EIS are updated to reflect current values and estimates. Finally, several follow-on actions are presented for continued implementation of interim safe storage and preparing to select and implement a final disposition alternative for the nine Hanford Site surplus reactors. Completion of interim safe storage is considered the first step of implementing the safe storage alternative followed by deferred one-piece removal of the reactor core as selected by the final surplus reactor EIS and ROD.

The 105-B Reactor is currently in a hazard mitigation and public access mode awaiting a final configuration determination on the facility. No final configuration has been determined for 105-B Reactor. As discussed previously, Congress has directed the NPS to evaluate the feasibility of operating and maintaining 105-B Reactor as a museum (Public Law 180-340). Determination of the final configuration of 105-B Reactor is expected within the 10 year interim removal action period since issuance of the EE/CA Action Memorandum (i.e., by 2012).

FY 2006 to Present

The NPS *Manhattan Projects Sites Special Resources Study* teams conducted two public meetings with stakeholders in each of the study areas. The objective of the meetings was to present and describe the purposes and goals of the special resources study and to obtain input on the issues, concerns, and vision for the future for the various sites. The Hanford Site meetings were held in Richland in March 2006 with more than 150 people participating in the two meetings.

The Richland participants expressed a high level of concern over the fate of 105-B Reactor, with strong support for its preservation as an interpreted historical exhibit. Participants would like to see public access to the reactor from the Vernita Bridge over the Columbia River at the west end of the *Hanford Reach National Monument*. They would like interpretation and access of the Hanford Site tied into the development of the *Hanford Reach National Monument Heritage and Visitor Center* to be built on Columbia Point located in Richland at the confluence of the Yakima and Columbia Rivers. Train, bus, and boat tours of the Hanford Site and 105-B Reactor from Richland were also suggested.

The public scoping meetings were followed by an evaluation by the NPS teams for each site to determine if each of the candidate facilities meet the *National Significance, Suitability and Feasibility Criteria* for new sites to be added to the NPS system. The NPS determined in their evaluation that 105-B Reactor and T-Plant both meet the criteria for significance and suitability, but only 105-B Reactor meets the feasibility criterion. T-Plant was not judged to be feasible for inclusion in a *New National Parkland* because

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DOE expects to continue to use T-Plant for temporary storage of contaminated materials and nuclear decontamination activities for many years to come.

In February 2007, the Seattle NPS team conducted a two-day workshop in Richland to review the results of their significance, suitability, and feasibility evaluation and to develop a set of alternative management options for the preservation and public use of the Hanford Site facilities. Since T-Plant did not meet the feasibility criterion, management options were considered only for 105-B Reactor during the workshop. There were five management alternatives identified at the workshop, with a series of pros and cons developed for each of the options, in order to assist the NPS Seattle Office in evaluating the alternatives.

The NPS Seattle office will be preparing a written draft of the description of each 105-B Reactor alternative, an evaluation of the options, and a recommended option. The 105-B Reactor options analysis will be performed in consultation with the Native American Tribes and the State Historical Preservation Office.

In the summer of 2009, the NPS Denver Office plans to issue a draft of the *Manhattan Projects Sites Special Resources Study* that will include a description of 105-B Reactor alternatives, the evaluation of the alternatives, and recommended option. Public comment will be invited on the results of the study (including the 105-B Reactor recommended option) through a series of public meetings to be held in Richland. Following the final revision of the draft study to incorporate public comments, the final study will be published, along with the associated ROD. The Secretary of the Interior will present the study results to Congress and the report will be released to the public.

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ATTACHMENT 2
DRAFT APPROVAL MEMORANDUM

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TO: Hanford Site CERCLA Administrative Record

FROM: P. M. Pak, Assistant Manager for Mission Support, DOE-RL

SUBJECT: Removal Site Evaluation and Approval Memorandum to Proceed with Preparation of an Engineering Evaluation/Cost Analysis for the 105-B Reactor

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This document serves two purposes:

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- (1) Document a removal site evaluation pursuant to 40 CFR 300.410(g).
- (2) Document an EE/CA approval memorandum pursuant to 40 CFR 300.415(n)(4)(i), EPA/540/R-93/057, *Guidance on Conducting Non-Time-Critical Removals under CERCLA*, U.S. Environmental Protection Agency (EPA), and DOE/EH-413-9811, *Non-Time-Critical Removal Actions*.

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Comment [PJK7]: (<http://homer.ornl.gov/nuclearsafety/env/guidance/cercla/ntc-removals.pdf>)

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Some optimization of the CERCLA non-time critical removal action process is appropriate based on site conditions at the 105-B Reactor and work already completed under the CERCLA process. A PA/SI has been completed, and the Hanford Site has been placed on the NPL. An EE/CA for the 105-B Reactor has been previously prepared and implemented through an Action Memorandum. Since 2001, the 105-B Reactor has been in a S&M mode that has allowed for completion of hazard studies and some limited material removal (i.e., removal of accessible hazardous substances from areas of potential public access along tour routes). Thus, another detailed RSE is unwarranted. The RSE and Approval Memorandum herein are based on the results of the ongoing S&M activities combined with completion of hazard studies and some limited material removal that have been ongoing since 2001.

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Information regarding this RSE/approval memorandum documents the U.S. Department of Energy (DOE), Richland Operations Office (RL), decision to prepare an Engineering Evaluation/Cost Analysis (EE/CA) to analyze options for continued hazards mitigation and operation of the 105-B Reactor as a public tour facility. This approval memorandum is prepared in lieu of a Removal Site Evaluation required by 40 CFR 300.410(b), as provided in EPA/540/R-93/057, *Guidance on Conducting Non-Time-Critical Removals under CERCLA*, U.S. Environmental Protection Agency (EPA).

BACKGROUND

The 105-B Reactor is in a surveillance and maintenance (S&M) phase, undergoing hazards mitigation and operation as a public tour facility for up to 10 years in accordance with an EE/CA Action Memorandum issued in 2001. A decision is needed regarding actions to be taken at the 105-B Reactor beyond the year 2011 and until such time the reactor is dispositioned in accordance with the *Record of Decision (ROD): Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington*.

The proposed EE/CA will evaluate options for the 105-B Reactor to continue hazards mitigation and operation as a public tour facility. The hazards mitigation options include structural, electrical, mechanical, and other upgrades required to provide safe long-term operations as a public tour facility. The EE/CA will address the time period up to, but not including, final

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disposition of the 105-B Reactor in accordance with the surplus production reactor ROD. Performance of the activities described herein will be in accordance with the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) as amended by the *Superfund Amendments and Reauthorization Act of 1986* (SARA). Proposed actions will be consistent with the joint DOE and EPA policy on decommissioning of DOE facilities under CERCLA which establishes the "non-time-critical removal action" process as an acceptable regulatory approach. Furthermore, Section 8.0, *Facility Decommissioning Process*, of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) Action Plan defines the approach DOE will take, with involvement of the lead regulatory agency, to transition facilities from operational status to end state conditions (i.e., final disposition) at Hanford. This approach is accomplished in three phases including facility operational transition, S&M, and final disposition activities.

Section 8.0 of the Tri-Party Agreement Action Plan addresses operational transition, S&M, and disposition of "key" facilities on the Hanford Site that are not addressed under Section 6.0 (Treatment, Storage, Disposal Unit Process) or Section 7.0 (Past-Practice Unit Process). The 105-B Reactor is listed as a key facility in the Tri-Party Agreement Action Plan subject to the Section 8.0 process.

This approval memorandum opens an administrative record for information supporting selection of a preferred option for continued hazards mitigation and operation of the 105-B Reactor as a public tour facility beyond the 2011 time period.

HISTORY

The 105-B Reactor was constructed in 1943 to provide nuclear materials for the war effort. The 105-B Reactor generated the plutonium used in the atomic weapons that ultimately ended World War II. The 105-B Reactor was shut down in 1968 and transitioned from an operating mode to the S&M phase where it currently remains.

In December 1992, the DOE issued the *Final Environmental Impact Statement (EIS): Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington*. In September 1993, the DOE issued the ROD for the eight surplus production reactors which calls for "interim safe storage followed by one-piece removal" of reactor cores in the 2068 time frame. Interim safe storage has been completed for the majority of the eight surplus production reactors. The ROD acknowledges the nomination and inclusion of the 105-B Reactor on the *National Register of Historic Places*.

In September 1995, the *105-B Reactor Facility Museum Phase I Feasibility Study Report* was issued. This study was conducted to define activities necessary to continue using 105-B Reactor as a public tour facility, evaluate the technical feasibility of those activities, examine the cost effectiveness of a public tour facility versus dismantlement, and evaluate options to improve 105-B Reactor as a public tour attraction. As a result of strong and growing public support to preserve 105-B Reactor as a public tour facility, steps were taken towards preservation; including the installation of visitor displays, conducting hazard mitigation activities along the tour route, and conducting public tours of accessible areas. Some areas are not on the tour route because they contain residual contamination.

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In November 1999, the *Final Hanford Comprehensive Land Use Plan Environmental Impact Statement (HCLUP-EIS) Record of Decision* was issued. The HCLUP-EIS ROD makes allowances for the 105-B Reactor to be converted into a public tour facility and the surrounding areas made available for support facilities.

In June 2000, the *105-B Reactor Museum Feasibility Assessment (Phase II) Project* was issued. This report satisfied Tri-Party Agreement Milestone M-93-05 and provides the basis and supporting documentation to prepare the 105-B Reactor as a partially unescorted public tour facility. Potential hazards and deficiencies were identified by performing a walk-through with professionals representing the architectural, electrical, mechanical, and structural engineering disciplines; industrial and radiological health and safety; and fire and life safety.

In June 2001, an *Engineering Evaluation/Cost Analysis (EE/CA) for the 105-B Reactor Facility* was prepared to analyze removal actions to be performed at the 105-B Reactor to protect human health and the environment. This EE/CA was intended to support and implement DOE's decision to preserve the 105-B Reactor as a historic resource. The EE/CA Action Memorandum called for hazard mitigation and public access for up to 10 years. The hazard mitigation activities included the removal of accessible hazardous substances from the 105-B Reactor tour route while performing S&M activities such as routine radiological and hazard monitoring, and safety inspections.

In June 2002, the *Removal Action Work Plan and Surveillance and Maintenance Plan (RAWP/SMP) for the 105-B Reactor Facility* was issued pursuant to TPA Milestone M-93-06. The EPA approved the RAWP/SMP on August 16, 2002. The purpose of the RAWP/SMP was to support implementation of the 2001 EE/CA Action Memorandum.

In February 2003, the *Evaluation of Final Configuration Alternatives for the 105-B Reactor Facility* was issued. This document presents the results of an evaluation of three final configuration options (no action, interim safe storage, and long-term S&M) for the 105-B Reactor pending eventual disposal of the reactor core on the Central Plateau around the 2068 time frame. Although the 2001 EE/CA Action Memorandum called for hazards mitigation and operation of 105-B Reactor as a public tour facility for up to 10 years, the final configuration alternatives evaluated did not include this option since a sponsor for long-term public use and structural preservation of the reactor had not been identified.

In July 2004, an *Engineering Evaluation/Cost Analysis for the Final Configuration of the 105-B Reactor Facility* was issued. This EE/CA was prepared in accordance with TPA Milestone C-16-06E. The alternatives evaluated in this document support the planning and budgeting process for the final configuration of 105-B Reactor with the assumption that a long-term sponsor cannot be found and there will be no long-term public use or structural preservation of the facility. The recommended removal action alternative for the 105-B Reactor was interim safe storage to begin at the conclusion of the 10 year interim hazard mitigation and public access period or when deemed appropriate by the DOE and regulatory agencies.

In October 2004, President George W. Bush signed Public Law 108-340 directing the Secretary of the Interior, in conjunction with the DOE, to commission a National Parks Service (NPS) *Manhattan Projects Sites Special Resources Study* to evaluate options for preserving and interpreting facilities at four sites that were in the World War II Manhattan Project (i.e., Oak

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Ridge, Tennessee; Los Alamos, New Mexico; Dayton, Ohio; and Hanford, Washington). The study is intended to evaluate the potential for selected facilities at these sites to be included into the NPS system and/or to identify other management options. The Hanford Site's 105-B Reactor and T-Plant are being considered in the NPS study.

In August 2005, the *Surplus Reactor Final Disposition Engineering Evaluation* was issued. This engineering evaluation was prepared in response to Tri-Party Agreement Milestone M-93-25. The engineering evaluation reviews the original assumptions and information contained in the final surplus production reactor EIS and ROD, including cost estimates and radiological inventories.

In 2006, The NPS *Manhattan Projects Sites Special Resources Study* team conducted two public meetings with stakeholders in each of the study areas. The objective of the meetings was to present and describe the purpose and goals of the special resources study and to obtain input on the issues, concerns, and visions for the future for the various sites. The Hanford Site participants expressed strong support for preservation of the 105-B Reactor as an interpreted historical exhibit.

In February 2007, the NPS team conducted a two-day workshop at the Hanford Site to review the results of their significance, suitability, and feasibility evaluation, and to develop a set of management options for the preservation and public use of the Hanford Site facilities. Since T-Plant did not meet the feasibility criterion, management options were considered only for the 105-B Reactor.

In the summer of 2009, the NPS plans to issue a draft of the *Manhattan Projects Sites Special Resources Study* for public review that will include a description of the 105-B Reactor alternatives, the evaluation of the alternatives, and recommended option. Following the revision of the draft study to incorporate public comments, the final study will be published, along with the associated ROD. The Secretary of the Interior will present the study results to Congress and the report will be released to the public.

Threat to Public Health, Welfare, or the Environment and Imminent Endangerment

The 105-B Reactor is expected to contain one or more of the hazardous materials known to be present in most Hanford Site facilities, including polychlorinated biphenyls (PCBs) in oils and light ballasts; lead paint and shielding; mercury switches, gauges, and thermometers; mercury or sodium vapor lights; used oil from motors and pumps; friable and non-friable forms of asbestos; sodium dichromate from water treatment chemicals; and cadmium from oxidation of reactor control rods. The results of facility risk assessments indicate that the 105-B Reactor also contains roughly 13,500 curies of radionuclides which are primarily activation products contained in the graphite core. Key radionuclide contaminants are transuranics, including plutonium-239 and americium-241, mixed fission products such as strontium-90 and cesium-137, and activation products such as carbon-14 and cobalt-60. Contaminants are most likely to be contacted as adherent films and residues encrusted in or on deactivated process equipment, piping, and ventilation system ductwork.

In general, the majority of hazards found in the 105-B Reactor are identical to those found in industrial facilities similar in age. While potential hazards may not pose a direct threat to the

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health and safety of facility occupants until the materials are disturbed, potential hazards should be removed or securely contained in areas that are accessible to the general public or tour staff. The radiological hazards can be addressed by decontaminating the area or preventing access.

A structural analysis was conducted to evaluate the 105-B Reactor building and the 116-B Reactor exhaust stack against potential natural phenomena hazards at the Hanford Site. Failure of all or portions of the structures pose a potential risk to human health and the environment. The authorization basis states that the likelihood for a seismic event is occasional or likely to occur sometime in the life of the 105-B Reactor. The consequence will be an unplanned release resulting in minor spread of environmental contamination.

The original concrete roof panels are still in place at the 105-B Reactor. Damaged and deflected roof panels have been identified. Several roof panels have been strengthened with reinforcing brackets to provide panel stability and integrity until such time the roof can be replaced.

The walls above the top of the 105-B Reactor core may be unreinforced concrete blocks. There is some damage to load bearing walls in the fuel storage basin area and cracks in fuel transfer area walls. There is no heating in much of the building. Electrical problems include missing insulation on energized wiring, improper use of temporary extension cords, improper grounding of enclosures, inadequate breaker service and testing, inconsistencies in tagging and labeling, and poor illumination. The 105-B Reactor has emergency lights and fire extinguishers, but the sprinkler system is inactive and a fire hazard analysis is recommended.

Statutory Basis for Action

The 2001 EE/CA and Action Memorandum analyzed removal actions to support and implement DOE's decision to preserve the 105-B Reactor as a historic resource and conduct hazards mitigation activities and public tours for up to 10 years (i.e., until the year 2011). A decision regarding the fate of the 105-B Reactor beyond 2011 is needed through the CERCLA non-time-critical removal action EE/CA process. This decision and associated Action Memorandum must consider the ongoing *Manhattan Projects Sites Special Resources Study* being conducted by the NPS and be consistent with the surplus production reactor EIS and ROD.

Factors for Determining Appropriateness of Action

Section 300.415(b)(2) of the National Contingency Plan (NCP) provides factors for determining the appropriateness of a removal action performed under CERCLA. The factor most applicable to conditions at the 105-B Reactor is the potential contamination of the environment should there be a failure of the structural integrity of the facility given its age and construction methods. Other factors that may be applicable include potential exposure and harm to onsite and nearby human populations or the food chain from hazardous substances or pollutants that could be released from the facility should a structural failure occur. In accordance with 300.415(b)(4) of the NCP, a planning period of at least six months exists before onsite activities can be initiated at the 105-B Reactor; therefore, an EE/CA must be conducted for a non-time-critical removal action decision under CERCLA.

Enforcement/Proposed Action/Cost Estimate

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There is no regulatory enforcement action currently related to the 105-B Reactor. The proposed actions are consistent with the provisions of the Tri-Party Agreement Action Plan, Section 8.0, for the decommissioning of key facilities on the Hanford Site. The EE/CA will evaluate options for the 105-B Reactor to continue hazards mitigation and operation as a public tour facility.

The range of alternatives, associated cost estimates, and schedule for proposed actions will be developed as part of the EE/CA prepared in support of an Action Memorandum.

Public Involvement

The current schedule is to issue the EE/CA for public review and comment by May 10, 2010. The CERCLA process requires public review of an EE/CA and consideration of comments before issuance of an Action Memorandum. The Action Memorandum will consider public comments and document selection of the preferred non-time-critical removal action alternative for the 105-B Reactor.

Approval to Conduct EE/CA

Approval is hereby granted to conduct a non-time-critical removal action EE/CA for the 105-B Reactor in accordance with EPA guidance provided in EPA/540/R-93/057. The non-time-critical removal action and associated activities will be conducted in accordance with relevant requirements of the NCP [40 CFR 300.415(b)(4)(i)] and pursuant to Section 104(a) of CERCLA, as provided by Executive Order 12580, "Superfund Implementation." A signed Action Memorandum will be required as authorization to proceed with the selected non-time-critical removal action alternative identified in the EE/CA.

P. M. Pak, Assistant Manager for Mission Support, DOE-RL

Date

CONCURRENCE:

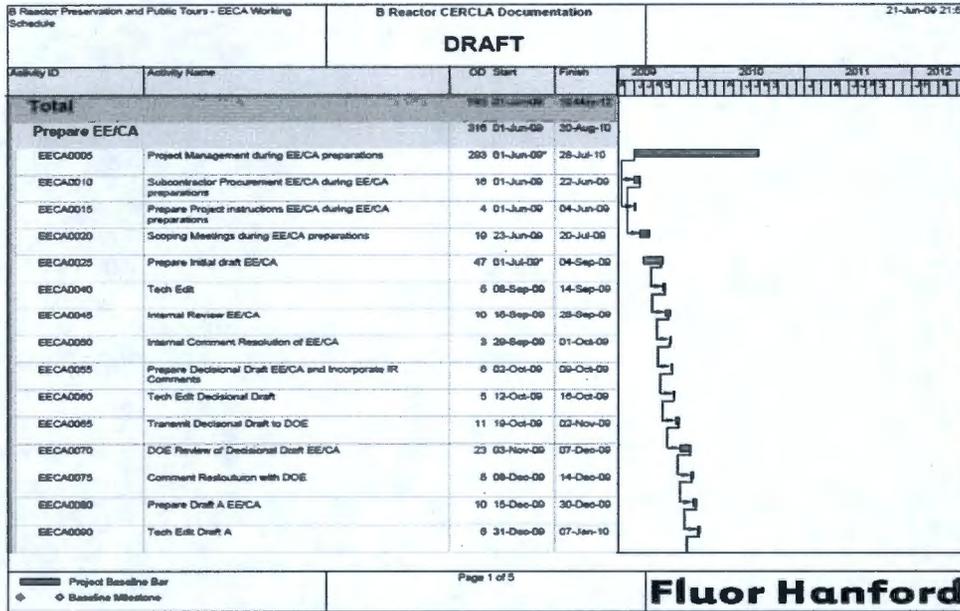
D. A. Faulk, Environmental Protection Agency, Region 10

Date

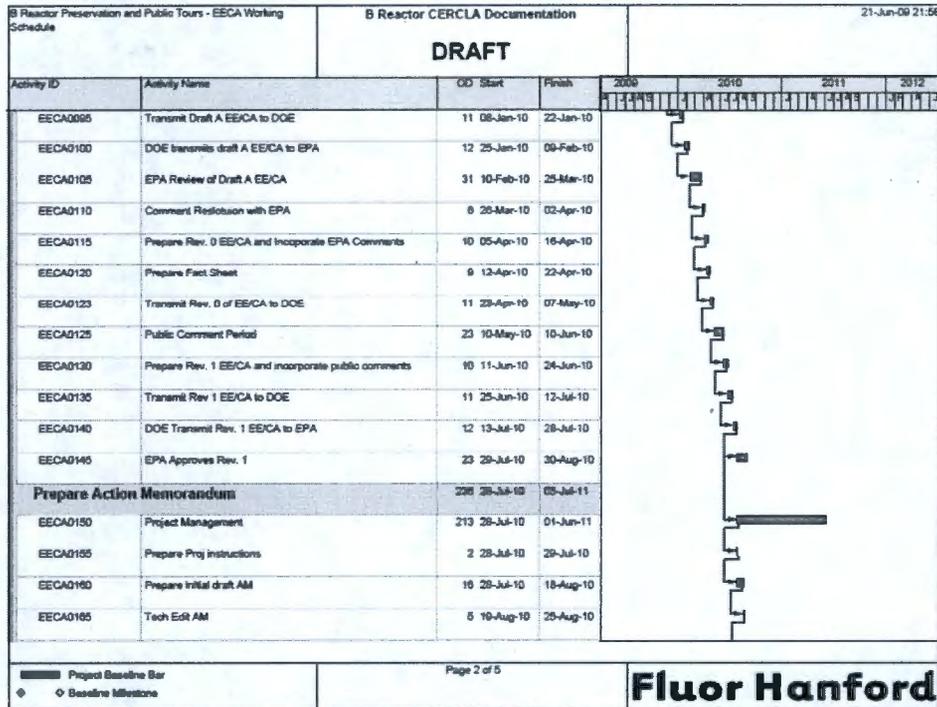
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**ATTACHMENT 3
DRAFT PROPOSED SCHEDULE**

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B Reactor Preservation and Public Tours - EEOA Working Schedule		B Reactor CERCLA Documentation		21-Jun-09 21:58			
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Activity ID	Activity Name	OD	Start	Finish	2009	2010	2011
EEOA0170	Internal Review AM	10	29-Aug-10	09-Sep-10			
EEOA0175	Internal Comment Resolution of AM	2	10-Sep-10	13-Sep-10			
EEOA0180	Prepare Decisional draft AM and incorporate IR Comments	6	14-Sep-10	20-Sep-10			
EEOA0185	Tech Edit Decisional Draft AM	5	21-Sep-10	27-Sep-10			
EEOA0190	Transmit Decisional Draft AM to DOE	11	28-Sep-10	12-Oct-10			
EEOA0195	DOE review of Decisional Draft AM	23	13-Oct-10	12-Nov-10			
EEOA0200	Comment Resolution with DOE	9	16-Nov-10	22-Nov-10			
EEOA0205	Prepare Draft A AM	6	23-Nov-10	02-Dec-10			
EEOA0210	Tech Edit Draft A AM	5	03-Dec-10	09-Dec-10			
EEOA0215	Transmit Draft A AM to DOE	11	10-Dec-10	28-Dec-10			
EEOA0220	DOE transmits draft A AM to EPA	12	20-Dec-10	14-Jan-11			
EEOA0225	EPA Review of Draft A AM	33	17-Jan-11	03-Mar-11			
EEOA0230	Comment Resolution with EPA	6	04-Mar-11	11-Mar-11			
EEOA0235	Prepare Rev. 0 AM and Incorporate EPA Comments	10	14-Mar-11	25-Mar-11			
EEOA0240	Public Comment Period	21	28-Mar-11	25-Apr-11			
EEOA0245	Prepare Rev. 1 AM and incorporate public comments	6	26-Apr-11	03-May-11			
EEOA0250	Transmit Rev 1 AM to DOE	11	04-May-11	18-May-11			

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B Reactor Preservation and Public Tours - EECA Working Schedule		B Reactor CERCLA Documentation		21-Jun-09 21:58											
DRAFT															
Activity ID	Activity Name	OO Start	Finish	2009 2010 2011 2012											
EECA0255	DOE Itinerary Rev 1 AM to EPA	0 19-May-11	01-Jun-11	[Gantt chart bar]											
EECA0260	Rev 1 AM Approved	23 02-Jun-11	05-Jul-11	[Gantt chart bar]											
Prepare Removal Action Work Plan				[Gantt chart bar]											
EECA0265	Project Management for Removal action work plan	23 02-Jun-11	10-May-12	[Gantt chart bar]											
EECA0270	Subcontractor Procurement	18 02-Jun-11	23-Jun-11	[Gantt chart bar]											
EECA0275	Prepare Proj Instructions	2 24-Jun-11	27-Jun-11	[Gantt chart bar]											
EECA0280	Prepare initial draft RAWP	20 28-Jun-11	28-Jul-11	[Gantt chart bar]											
EECA0285	Tech Edit Internal Draft	5 27-Jul-11	02-Aug-11	[Gantt chart bar]											
EECA0290	Internal Review RAWP	10 03-Aug-11	16-Aug-11	[Gantt chart bar]											
EECA0295	Internal Comment Resolution	3 17-Aug-11	19-Aug-11	[Gantt chart bar]											
EECA0300	Prepare Decisional draft RAWP and incorporate IR Comments	10 22-Aug-11	02-Sep-11	[Gantt chart bar]											
EECA0305	Tech Edit Decisional Draft	8 06-Sep-11	12-Sep-11	[Gantt chart bar]											
EECA0310	Transmit Decisional Draft RAWP to DOE	11 13-Sep-11	27-Sep-11	[Gantt chart bar]											
EECA0315	DOE review of Decisional Draft RAWP	23 28-Sep-11	28-Oct-11	[Gantt chart bar]											
EECA0320	Comment Resolution with DOE	8 31-Oct-11	07-Nov-11	[Gantt chart bar]											
EECA0322	Prepare Draft A RAWP	10 09-Nov-11	21-Nov-11	[Gantt chart bar]											
EECA0325	Tech Edit Draft A	5 22-Nov-11	30-Nov-11	[Gantt chart bar]											

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