



Hanford Natural Resource Damage Assessment Project Execution Plan for Injury Assessment and Restoration Planning

Prepared by the
Hanford Natural Resource Trustee Council

Final

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1. Introduction

Consistent with the Natural Resource Damage Assessment provisions of the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Hanford Natural Resource Trustee Council (Council) has initiated a Natural Resource Damage Assessment (NRDA) for the Hanford Site. This document provides the Project Execution Plan (PEP) and has the following purposes:

- Provide a technical description of the scope of work for the project
- Establish the cost and schedule baseline for the project;
- Describe organizational roles and responsibilities of the project;
- Describe how the project will be managed and controlled;
- Guide the technical, managerial and administrative participants in the project

This Updated PEP is based on the Department of Energy Guide for Project Execution Plans (DOE M 413.3-15). Per DOE's Guidance Plan, a graded approach is followed. The plan is a living document and updates will be made as necessary, typically on an annual basis, based on new information and interim results of injury/damage assessment activities undertaken during the preceding year.

The scope described in this PEP is framed by the NRDA process defined in the Department of Interior's NRDA regulations (43 CFR 11); it includes injury assessment and restoration planning. The PEP is inclusive of restoration planning that is scheduled to be completed by 2024. The restoration plan provides a basis for scoping outstanding NRDA activities, including primary restoration, compensatory restoration, monitoring and operations/maintenance. It is premature to plan a timeline or estimate total costs for restoration at this time, because the total scope of restoration work will not be known until completion of the injury assessment and determination of damages.

It is critical to recognize that the PEP was developed to describe an ongoing, iterative planning process rather than as a definitive plan for work that will be conducted during the assessment. The Council will use the results of early studies to frame and guide decisions regarding whether and how to do follow-on studies. The PEP is based on the Injury Assessment Plan (IAP) for the Hanford injury assessment, adopted by the Council in 2013, in addition to other information. The IAP identified an initial list of potential studies, but that list is provisional. Some studies are underway; the status of others as to whether they are appropriate, necessary, and sufficient to assess damages for injuries to natural resources will be determined based on the results of ongoing work. It is likely some studies on the list will not be implemented, but others not on the existing list might be needed.

It is also essential to recognize that, while one purpose of injury assessment is to identify and measure the nature and extent of natural resource injuries, decreasing marginal benefits from increasing precision or accuracy in injury determination from the potential suite of studies may cause certain studies to not be cost-effective. The actual number and kind of studies needed to cost-effectively resolve the injury assessment will be determined in large part by the extent to which the trustee organizations and the Responsible Party can agree on the reasonableness of

simplifying assumptions, estimates, and models (e.g. reasonable worst case scenarios) in determining the nature and extent of specific injuries on the Hanford Site, and in quantifying damages for restoration planning purposes. To the fullest extent practicable, the Council will actively pursue cost and schedule efficiencies, including streamlining the injury assessment process, and will develop early restoration project plans to address resource injuries (measured or reasonably assumed to have occurred) based on the best information available now and as developed along the way. Such early restoration project plans are intended to support initiation of restoration activities before the completion of all phases of the NRDA.

2. Project Description

2.1 Background

Congress passed CERCLA in 1980 to ensure timely cleanup and restoration of contaminated sites and to require responsible parties to fund or reimburse the associated cleanup and restoration costs. CERCLA has two main parts, 1) the response process to clean up contamination and 2) the NRDA process, which mandates restoration to recover ecological functions and services to baseline condition. At the Hanford Site, the Environmental Protection Agency (EPA) and Washington Department of Ecology oversee cleanup actions, while federal, state and tribal governments are charged by CERCLA to serve as natural resource Trustees for damage assessment and restoration under NRDA. As part of NRDA, CERCLA provides for the recovery of the "...damages for the injury to, destruction of, or loss of natural resources, including reasonable costs of assessing such injury, destruction or loss resulting from the release." Consistent with current NRDA regulations, the focus of the Hanford NRDA will be on restoration of injured resources.

CERCLA provides that the liability of a party responsible for natural resources damages runs to the United States, States, and/or Indian Tribes depending on the resources affected. The United States, states and tribes are to act on behalf of the public as Natural Resource Trustees for natural resources under their respective trusteeship [CERCLA §107(f)(1)]. For the Hanford Site, trustee organizations include the U.S. Department of Energy, U.S. Fish and Wildlife Service on behalf of the U.S. Department of the Interior (DOI), National Oceanic Atmospheric Administration on behalf of U.S. Department of Commerce, State of Washington, State of Oregon, the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce Tribe. The Hanford NRDA is designed to evaluate and quantify the extent to which natural resources in and around the Hanford Site have been injured by hazardous contaminants released from the Hanford Site. To the extent such injuries result in damages, the Council will undertake various types and quantities of restoration necessary to compensate for the injured natural resources and the lost services provided by the injured resources.

Although final determination of the damages will not be possible until completion of the remedial action, there is no reason to delay injury assessment. Indeed, it is possible to reduce the ultimate damages by working to minimize injuries when choosing among remedial options, and by conducting early NRDA restoration where possible and appropriate. Damages have a

temporal component and accrue over time. Therefore, starting some “early restoration” before injury assessment is complete, where such activity will not unduly complicate cleanup or impair injury assessment, could significantly reduce total injury liability, and thus the costs of restoring the site. Consistent with this idea, DOE policy guidance (DOE P 140.1, Natural Resource Damage Assessment Cooperation and Integration) calls for considering and mitigating natural resource injuries concurrently with response actions. One of the Council’s primary goals is to ensure that cleanup decisions consider, address, and minimize natural resource injuries whenever practicable. Therefore, this PEP supports coordination of the NRDA with related cleanup work to the greatest extent practicable in order to minimize injury while increasing efficiency of the cleanup and optimizing life cycle costs.

The Council’s NRDA process is primarily based on DOI regulations and guidance (43-CFR-11) for a Type B assessment, supplemented by appropriate guidance in the Oil Pollution Act (OPA) regulations for NRDA (15 CFR Part 990). The principal elements for the Type B NRDA process are as follows:

1. Pre-assessment Phase
2. Assessment Plan Phase
 - a. Phase I - Conceptual Site Model (completed June, 2009)
 - b. Prepare Injury Assessment Plan (completed in 2013)
 - c. Injury Determination (started in 2011)
 - d. Injury Quantification
 - e. Damage Determination
3. Post-Assessment Phase
 - a. Restoration Planning
 - b. Restoration
 - c. Post Restoration

While these steps as outlined have typically been conducted in a phased fashion, updates to the CERCLA regulations, methods employed in NRDA cases under OPA, and case history suggest that a more iterative and restoration focused-approach may be more efficient. The Hanford Council has adopted a Statement of Guiding Principles for protection of natural resources on the Hanford Site that is applicable regardless of the approach taken. These principles define the Council’s expectations for cleanup and future uses at Hanford as they relate to natural resource restoration. In broad terms they are to:

1. Achieve a cleanup that will avoid or minimize residual injuries to natural resources and the services they provide to people and ecosystems.
2. Achieve cost-effective restoration through coordination with post-cleanup activities where practicable.
3. Post-cleanup land use decisions should not constrain, or preclude, effective natural resource restoration.

While not mentioned explicitly in the Statement of Guiding Principles, on or off-site compensatory restoration will also be considered when primary restoration of injured sites is not

possible or practicable or when primary restoration alone is insufficient to compensate for damages.

2.2 Mission Need and Project Objectives

2.2.1 Mission Need

The mission of the Hanford NRDA project is to identify and restore natural resources and their services injured by hazardous releases from Hanford and to compensate for lost services. In December 2012, litigation regarding funding the natural resource damage assessment at Hanford was settled. The settlement agreement expressed a commitment to proceed with a cooperative injury assessment and for the DOE to fund the work. It describes a transparent process for developing a project baseline. The “project baseline” delineates the scope, schedule and cost estimate for the project. The project baseline is intended to provide a basis for an annual budget request for technical work developed using a rolling, three-year timeframe. This PEP provides a project baseline for the Hanford NRDA and describes the approach developed by the Council for organizing and managing the project in a controlled manner based on DOE planning and budgeting requirements.

2.2.2 Project Vision

The Council will, by 2024, identify and quantify the extent of natural resources injured, assess the damages associated with natural resource injury, plan restoration to compensate for damages, and begin restoration of injured resources and services.

2.2.3 Procedural Objectives

The procedural objectives of this PEP are to:

1. Provide a management framework for timely and cooperative decisions to ensure NRDA progress continues.
2. Maintain a collaborative process to achieve common NRDA goals while respecting the differing interests represented by the Council members.
3. Use strategic planning to ensure an effective, transparent process to secure funding.
4. Prioritize funding of injury assessment and restoration activities according to strategic planning goals.
5. Integrate information on the effectiveness of cleanup to the greatest extent practicable.
6. Implement the Final Injury Assessment Plan by conducting injury assessment, quantification, and restoration in a comprehensive, thorough, and cost effective manner.
7. Plan for Damage Determination, including restoration alternative selection and scaling.

2.2.4 Project Objectives

1. Complete analysis of injured natural resources and their services.

In order to perform an analysis of the injury to natural resources and their services caused by the release of contaminants, it is necessary to, as much as possible, gather existing information relevant to the release of contamination and the impact on natural resources, including information relating to baseline environmental conditions. The Council will use existing data and results of injury studies, together with best professional judgment, to estimate injury and the condition of injured resources but for the release of contaminants from the Hanford Site.

Collected data will be entered into a data management system to strengthen the certainty of estimates of the temporal and geographic scope of the injury. It is also envisioned the data analyses will confirm data gaps.

The Council will collaborate to define resource-specific injuries and the associated data requirements, by developing criteria for identifying and prioritizing stressors (substances and activities), fate and transport pathways, and resources of concern.

The Council has developed criteria for selecting studies and, with guidance from the Injury Assessment Plan, will plan future injury assessment studies based on the review of existing information and the results of ongoing studies. We will use that information to revise/revisit the study prioritization list. As noted above, based on initial results, the Council has already determined that some of the proposed studies need to be modified and that some likely will not be undertaken; it also remains likely that some new studies will be added.

2. Complete analysis of past, interim and permanent lost services.

The NRDA damage quantification process includes an assessment of injuries in the past, present, and into the future. At this time, the Council anticipates use of Habitat Equivalency Analysis (HEA) and Resource Equivalency Analysis (REA) as primary methods for modeling ecological injuries through time. Past injuries will be determined based on various inputs to the models including, but not limited to, analysis of historical data, extrapolation of current data to past conditions, analysis of LandSat and other photography, and best professional judgment. Likewise, future injuries will be evaluated using a variety of methods, including but not limited to effectiveness of remediation, estimated timeframe for long-duration cleanups (e.g., groundwater pump and treat), and identification of areas injured in perpetuity due to infeasibility of full cleanup to environmental baseline (e.g., Environmental Restoration and Disposal Facility).

Tribal service losses will be determined through future studies. The methodologies have yet to be determined.

3. Complete quantification of damages.

To complete the quantification of damages, both the damages associated with injured resources and the services they provide must be quantified. Methods used will incorporate results of HEA and REA modeling described above, plus additional analyses as needed, focused on human service losses.

4. Develop and scale restoration alternatives

The identification of restoration needs and opportunities is central to the goal of NRDA, and of key importance in planning studies and damage determination approaches. The Council will also develop criteria for the selection and prioritization of future restoration projects, identify opportunities for early restoration (including outreach to stakeholders), and will identify success criteria and monitoring requirements for future restoration projects. Upon completion of the injury assessment, the Council will complete a Restoration Plan and will solicit public input on the Plan. The Restoration Plan effects and alternatives will be subject to NEPA review. The Council will also oversee early restoration activities and plan for the long-term protection and stewardship of restoration projects.

2.2.5 Major Project Assumptions and Uncertainties

There are a number of assumptions and corresponding uncertainties that affect the scope, schedule and budget information presented in the PEP. As the project evolves and more information is gained through the injury assessment process, the project scope, schedule and cost will be adjusted. Below is the list of assumptions used in the development of the schedule and cost for this PEP. Each assumption is discussed in detail in Section 5.3.

1. Technical Basis
2. Schedule Basis
3. Funding
4. Data Management
5. Geographic Scope
6. Temporal Scope
7. Contaminants of Concern (COC)
8. Resources of Concern

2.3 Project Scope, Activities and Work Breakdown Structure

2.3.1 Project Scope and Activities

The ultimate goal of the natural resource damage assessment process is to restore, replace, or acquire the equivalent of natural resources injured due to the release of hazardous substances, and to provide compensation for any loss of services that occurs while natural resources are in an injured state (43 CFR § 11.80(b)). Trustees will determine the scope and magnitude of natural resource injuries. DOI regulations under CERCLA define services as: “the physical and biological functions performed by the resource, including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource” (43 CFR § 11.14). The DOI regulations divide the assessment process into three sequential phases - pre-assessment, assessment, and post-assessment. However, the regulations do not prevent the Council from collaboratively modifying the sequence of NRDA activities at the Hanford site. The Council plans to seek efficiencies to promote cost effectiveness and timely restoration of natural resource services and may depart from the prescribed phasing when and where adequate injury assessment can be achieved by an approach that is not strictly sequential.

2.3.2 Pre-Assessment Phase

The pre-assessment phase begins with a review of readily available information conducted to allow the Trustees to make an early decision on whether a natural resource damage assessment can and should be performed. During this phase, the Trustees determine whether an injury is likely to have occurred and a pathway of exposure exists. The pre-assessment phase is a prerequisite to conducting a formal assessment.

The Hanford Trustees completed the pre-assessment phase of the assessment in 2009. The Yakama Nation and the Confederated Tribes of the Umatilla Indian Reservation each released a PAS, in 2006 and 2007 respectively. The PAS determined there was a reasonable probability of making a successful claim for damages for injuries to natural resources. Specifically, the PAS concluded:

- Releases of hazardous substances from the Hanford Site have occurred;
- Natural resources for which the Trustees may assert trusteeship under CERCLA and/or the CWA may have been adversely affected by the discharge or release of hazardous substances;
- The quantity and concentration of the released hazardous substances are sufficient to potentially cause injury to natural resources;
- Data sufficient to pursue an assessment are readily available or likely to be obtained at a reasonable cost; and
- Response actions may not sufficiently restore, replace, or provide compensation for injured natural resources without further restoration action.

2.3.3 Assessment Phase

The current phase of the process is focused on injury assessment. An injury assessment plan (IAP) for Hanford was completed late in 2012. It and supporting documents (e.g., Data Gaps Analysis, Data Management Plan, QA Plan) were reviewed and approved by the Council early in 2013. The IAP describes studies and other approaches to determine injury. Future Council decisions and documents will identify a process for quantifying specific injuries and calculating damages. There are three main components of the Assessment Phase:

1. **Injury Determination:** The purpose of this phase is to establish that one or more natural resources have been injured as a result of the release of hazardous substances from the site.
2. **Injury Quantification:** The purpose of this phase is to quantify the extent of the injury to the resource(s), including loss of services that the injured resource(s) would have provided had the release not occurred.
3. **Damage Determination:** The purpose of this phase is to establish the appropriate compensation expressed as restoration requirements to compensate for injuries identified in the Injury Determination phase and measured in the Quantification phase.

For each of these components, the Council undertakes a planning effort, then a subsequent implementation effort. Increasingly, these components tend to be conducted in an iterative rather than a strictly sequential manner, depending on various factors, such as findings of interim studies, uniqueness of sub-areas within a larger site and resources and contaminants of concern. The Council approved the IAP to guide the assessment in a systematic manner and at a reasonable cost (43 CFR § 11.30(b)). Similarly, to help further refine injury study selection and to design and guide the injury quantification and damages determination phases, other documents, such as a Restoration and Compensation Determination Plan (RCDP), will likely be drafted.

2.3.4 Post -Assessment Phase

As injury quantification is completed for all or parts of the site, the Council will establish the amount of restoration necessary to restore, replace, or acquire the equivalent of the lost services. While restoration implementation activities are not addressed in detail in this PEP, restoration (including early restoration) will be continuously evaluated, and may be reflected in future PEP updates. Any early restoration and final restoration projects and plans will be described in a Restoration Plan, along with the appropriate NEPA alternatives analysis. Final restoration determination and planning will be completed once the injury quantification and damages determination phases are finished. In addition to a Restoration Plan, the Council may also choose to prepare a “Report of Assessment” that outlines in one document the results of the Injury Assessment Phase.

The Restoration Plan will describe how future restoration projects will be done to compensate for damages. Where appropriate, the Restoration Plan will detail how restoration credits are balanced against injury liabilities and will also describe success and monitoring measures for restoration projects. The public will have the opportunity to review and comment on the final draft Restoration Plan and associated NEPA alternative analyses. If the Council uses a phased restoration approach, substantive changes to the restoration plan will include additional public notice and comment. The key piece of the post-assessment phase will be implementation of restoration projects and associated activities (e.g., evaluation of success based on criteria, monitoring and maintenance).

2.3.5 Key Performance Metrics

Three key metrics will be used to track the performance of the Hanford NRDA project: technical, schedule and cost. The Council will assess performance in each of these three areas on a routine basis.

Technical

The technical performance metrics measure how effectively the Council implements and manages the technical aspects of the project. This PEP takes the proposed list of data analyses and studies compiled in the IAP to constitute the initial technical baseline. Interim success for the project under the PEP will be defined by completion of data analyses and injury studies, and subsequent completion of the Restoration Plan by 2024. A subsequent measure of success will be

successful implementation and monitoring of restoration activities as laid out in the Restoration Plan. Assessment activities listed in the IAP may be expanded or contracted as new information becomes available through the injury assessment phase. The Restoration Plan provides a basis for completing the final phase of NRDA at Hanford by identifying potential projects involving primary restoration and/or compensatory restoration, pre-defining success criteria, NEPA compliance, monitoring and operations/maintenance requirements.

Schedule

Schedule performance metrics describe how effectively the Trustees are able to manage to the baseline project schedule, and are contingent on funding for the project. The Schedule baseline is described in Section 4.2.

Cost

The cost performance metrics describe how effectively the Trustees are able to manage to the baseline project cost. The Cost baseline is described in Section 4.1.

2.3.6 Work Breakdown Structure

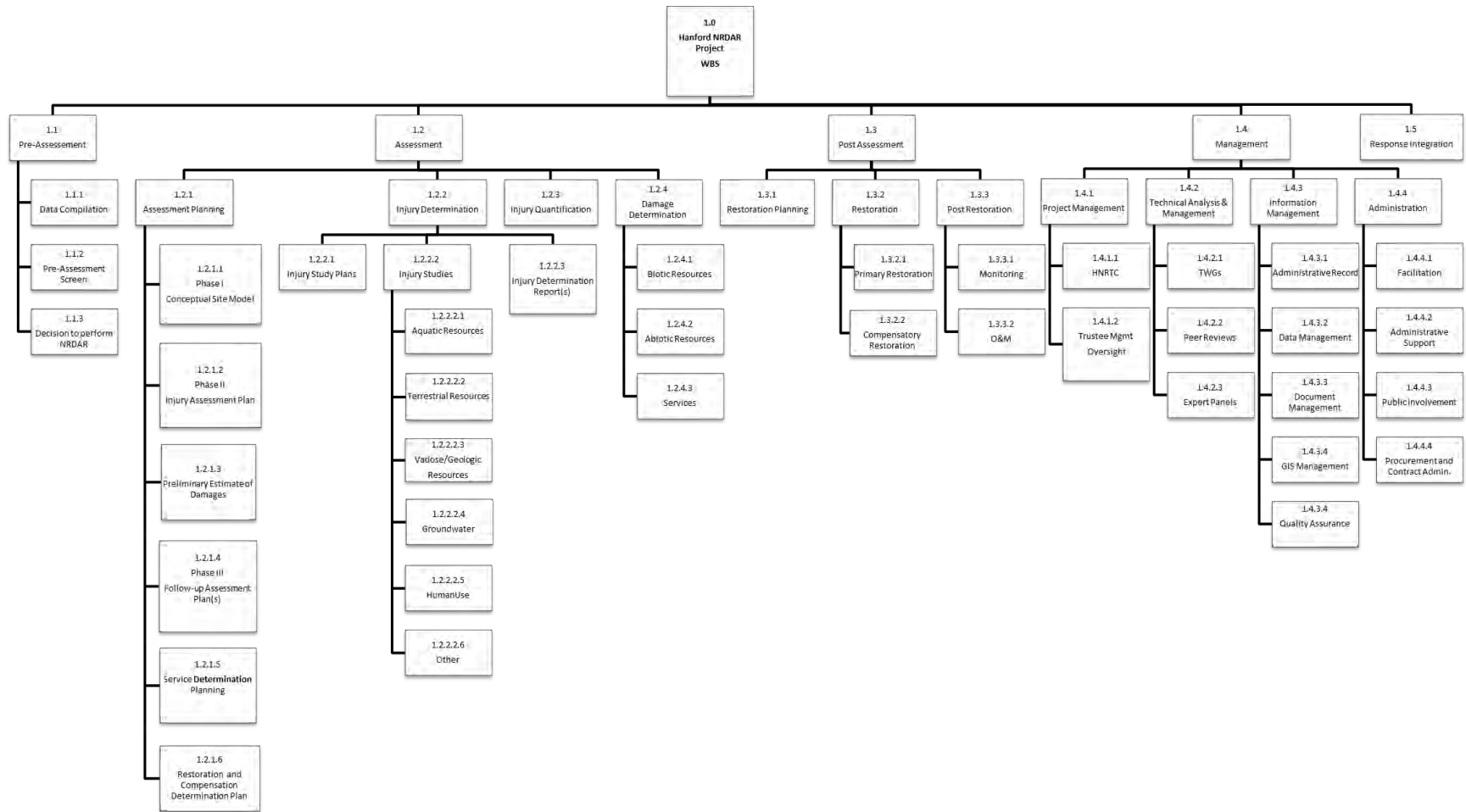
Figure 1 provides the Hanford NRDA Work Breakdown Structure (WBS). Elements of the project cost estimate and schedule will be consistent with the WBS. The WBS will be expanded as necessary to further define various element of the project.

2.4 Project Management Approach

A phased approach will be utilized in the execution of the Hanford NRDA project. Careful consideration will be given to the overall project objectives, timeline, and cost, as well as the roles and responsibilities of all participants and stakeholders. Each phase will consist of initiation, planning, execution, monitoring/controlling and completion. There will likely be some overlap in phases if/when early restoration projects are implemented. As part of the planning process, an effort will be made to educate decision-makers to facilitate timely decisions on early restoration projects. The Council has overall responsibility for managing the project including assuring technical, cost and schedule objectives are met.

Annual budgets for overall Council activities, and for participation costs for individual Trustees, will be prepared in accordance with the settlement agreement discussed earlier. The budgets will be consistent with the project baseline and Council determined work efforts, and shall cover a rolling three-year time frame. The budgeting process shall cover the fiscal year currently in progress (FY+0), the fiscal year to be executed next (FY+1), and the fiscal year being formulated in the active planning process (FY+2). The work scope, schedule, and budget recommendation for (FY+2) shall be adopted by consensus vote of the Council and will be forwarded to the DOE by March 31, or as otherwise agreed by DOE and the Council, for consideration in the annual budget submission by DOE. Section 6 provides more details on how the project will be managed and controlled. Final budget allotments are subject to change from those recommended by the Council, based on numerous factors, many of which are outside the control of DOE.

Figure 1. Work Breakdown Structure for the Hanford NRDA Project



3. NRDA Project Organization, Roles and Responsibilities

3.1 Organizational Setting

The Hanford Site occupies 586 square miles in southeastern Washington State, near the City of Richland. The Federal Government, through the Department of Energy, owns the land that forms what was known in 1943 as the Hanford Nuclear Reservation. The U.S. Fish and Wildlife Service manage the Hanford Reach National Monument, which covers about half the Hanford Site. President Clinton designated the Monument in 1999 within the border of the original Hanford Reservation. In addition, several smaller parcels of Hanford are leased to other government and private groups - The Washington Department of Fish and Wildlife Service (boating access points, etc.); Energy Northwest (ca 1000 acres occupied by the Columbia Generating Station); and Washington Department of Ecology (US Ecology site, a disposal site for low-level nuclear waste, on about 100 acres in Central Hanford).

DOE is responsible for remediation of the site under the Hanford Federal Facility Agreement and Consent Order, more commonly known as the Tri Party Agreement (TPA). The TPA is a legally binding accord that was signed by DOE, Washington State and the Environmental Protection Agency in 1989; it outlines a process and timeline for planning and implementing cleanup of the site, including shared regulatory authority between Ecology and EPA. The TPA includes enforceable milestones for Hanford cleanup and compliance, over several decades, that are necessary to satisfy federal and state environmental laws, notably CERCLA, the Resource Conservation and Recovery Act (RCRA), and the Washington Model Toxics Control Act (MTCA).

The Hanford Natural Resource Trustee Council is conducting the Hanford NRDA. The individual trustee organizations entered into a Memorandum of Agreement (MOA) in 1995 to guide the collective work of the Hanford Natural Resource Trustee Council. The Council operates on a consensus basis with the intent to reach cooperative decisions based on common goals. Each member organization off the Council is a sovereign government – Tribal, State, or Federal – and participates in Council activities as guided by the MOA and By-Laws. Council members represent the governments and citizens of their respective organizations, and act as trustees to protect and restore the natural resources within their jurisdictions in accordance with CERCLA. Each trustee works with the Council and with their specific constituency to assure their values are identified and incorporated into the Council’s NRDA decision-making.

When the Council was formed in 1993, DOE-RL was selected to serve as an administrative coordinator. Initially, the primary objective of the Council was to provide technical support to DOE for CERCLA response activities. The Council now serves as a venue for cooperation and coordination of work on NRDA with a secondary focus on remedial/response activities. The original Council objectives were:

- To help ensure natural resource values are fully reflected in decision-making related to the Hanford Site;

- To encourage, to the extent practicable, natural resource restoration into cleanup actions and to minimize additional injuries to natural resources during cleanup;
- To restore injuries and services lost as the result of releases of hazardous substances from the Hanford Site.

DOE Policy 140.1, Natural Resource Damage Assessment Cooperation and Integration, was issued on June 19, 2012. The policy states, “Where DOE determines that one or more natural resource(s), for which another Federal, state, or tribal entity is a trustee, has been potentially harmed by a release for which DOE may be responsible, it is the policy of DOE to participate in a cooperative NRDA. Such participation is subject to mutual agreement on the design, scope, and objectives of the proposed assessment, and the availability of funding from an appropriate funding source.” DOE and the trustees are currently working to draft a superseding MOA to reflect the Council’s current focus on NRDA and restoration.

3.2 Roles and Responsibilities of the NRDA Team

3.2.1 Senior Trustees

The Senior Trustees are managers, designated by their organizations, who represent their organization and oversee the work of their individual trustee organization’s technical participation in the Council. Senior trustees also decide trustee policy issues and are from time to time are asked to resolve disagreements that the technical representatives to the Trustee Council are unable to resolve.

3.2.2 Hanford Natural Resource Trustee Council (technical trustees)

Technical trustees conduct day-to-day business of the HNRTC in planning and implementing the Hanford NRDA. Senior trustees select technical staff to represent their organizations on the Council. Many organizations also identify an alternate trustee to participate in Council activities, and some employ additional technical staff internally or through a contractor to provide support for the Council and Technical Working Groups (TWGs). Staff roles and level of authority are defined by the individual trust organizations. Each Trustee representative is responsible for coordinating issues and agreements within his/her organization in a timely manner. The work of the Council represents the best efforts of the organizations to cooperatively evaluate injury to natural resource and determine the related loss of ecological functions and services provided by those resources that would have otherwise been available.

In April 2007, the federal, state, and tribal trustees agreed to proceed with the injury assessment phase for the Hanford site. The primary goal of the Council is to use the NRDA process to make the public whole for the natural resource losses suffered due to the release of contamination from the Hanford Site. The Council is committed to resolving different perspectives and priorities regarding natural resources on the Hanford Site. This includes addressing technical issues related to concepts, such as, but not limited to: defining the baseline condition of the Site (habitats and resources) prior to the release of contamination; agreement on thresholds for measuring natural

resource injury and service loss; and defining desired end-states for restoration of the Hanford Site.

Along with their role as trustees, several governments participating in the HNRTC have additional roles at the Hanford Site. US DOE has the most complex role. In addition to serving as a trustee, DOE is owner/manager of the Site and the lead response agency for response actions under CERCLA and RCRA. It is also the nominal responsible party for cleanup and NRDA actions at the Site, and in that role provides funding for the NRDA activities. The State of Washington also has a dual responsibility at Hanford. In addition to its role as a trustee, the state is one of the primary regulators (along with US EPA) of cleanup at the Site. The US Fish and Wildlife Service, in addition to serving as a trustee, manages the Hanford Reach National Monument, which covers almost half the area of the Hanford Site

As part of the cooperative process, attorney involvement is important to the Council to help resolve complex legal and policy issues. Attorney involvement and the costs associated with involvement in the NRDA process is intended to further the evaluation and assessment of natural resource injury, not for the purpose of preparing for litigation.

3.2.3 Technical Working Groups

- Technical Working Groups (TWGs) were established to provide technical support to the Council in implementing the NRDA at Hanford. Typical activities include overseeing data collection and analyses which inform estimates of potential injury to various resources across the Site, and planning/prioritizing proposed injury studies for their respective resources. In some cases, TWGs directly perform data collection and analysis. There are five TWGs, including: Restoration, Tribal Use, Groundwater/Contaminant Source & Pathway, Aquatic and Terrestrial Resources, and Data Management. TWG members include staff from trustee organizations. The TWGs serve in an advisory capacity to the Council, but do not have decision authority. They are accountable to the Council for developing recommendations for action and have responsibilities including:
 - Develop definition of resource-specific injury
 - Identify metrics and methods for quantifying injury
 - Review data for quality and relevance
 - Plan and conduct data analyses and summarization
 - Work closely/oversee and review work of NRDA contractors funded by the Council
 - Prioritize studies to be conducted
 - Develop plans for injury assessment studies (including QA/data management)
 - Organize peer reviews
 - Oversee/carry out/review injury assessment studies
 - Review/update Conceptual Site Model (CSM)
 - Identify opportunities for integration with CERCLA response activities

3.2.4 Contractors

The Council has employed, and will continue to utilize, contractors for various parts of the injury assessment process, including development of the IAP, planning and performing injury studies such as the biota contamination report and the mussel toxicity study, and developing and implementing the framework for a database that the Trustee Council will use to store and analyze data. Additional contractors may be needed to provide technical support as the Council proceeds with the assessment process. Section 6.1 and 6.2 provide additional discussion of the acquisition strategy and contract management approach.

3.2.5 Expert Panels

The Council may employ expert panels from time to time to inform the decision-making process and to ensure that the Trustee Council has reliable information from independent subject matter experts. They will be utilized when making decisions with high risk or where trustees are in disagreement on the extent or scope of injury to natural resources. They may also be utilized when trustees seek additional expertise to help inform the planning or review process for a specific topic

4. COST AND SCHEDULE

4.1.1 Cost

The Council began the NRDA for the Hanford Site in Fiscal Year (FY) 2008, with an initial budget of \$1.3 million for four major budget elements; Assessment Planning, Technical Analysis, Project Management, and Administration. Budget elements have since been expanded to include Injury and Service Loss Studies, Restoration Planning, Technical Analysis, and Information Management. Each budget element is described below.

Effective in November 2012, the United States and the non-federal Trustees agreed to undertake “project baselining.” based on Department of Energy planning policies and methods, consistent with Department of Interior NRDA regulations. DOE capital asset planning and acquisition policies and guidance generally provide for integration of scope, schedule and cost baselines into a project baseline. For capital projects the project baseline is set out in the Project Execution Plan. For environmental management projects, DOE management provides special guidance for development of baselines because of uncertainties presented by remedial investigations and potential alternatives. Notwithstanding those uncertainties, remedial actions are “projectized” for management purposes, including baseline development and change control. Near term actions and costs can be more precisely determined, so baseline development is divided into a near term component (“near term baseline” or “NTB”) and a long-term component (“out year planning estimate range” or “OPER”).

Similar to projectized DOE remedial action processes, it is not possible to foresee the all potential future activities in this project with consistent detail over the entire period of the

project, particularly since the precise approach or resource requirements for future activities is dependent or conditioned on the information developed by, and decisions made through, near-term activities. Therefore, project baseline development and management will be done using a "rolling wave" approach, with the activities in the near term scoped, scheduled and budgeted in detail in a Near Term Baseline, and out year activities scoped on a conceptual basis with a recognition of the contingent nature of such activities. The costs of out year activities are addressed as a range of costs consistent with the OPER approach, and the overall cost of the injury assessment process is accordingly expressed as a range. This rolling wave approach is sensitive to the funding actually allocated to the NRDA by DOE in each fiscal year.

The Council plans to complete injury assessment actions described in the IAP and Table 4.2 by 2024; estimated costs in Tables 4.1a and 4.1b are based on this overall schedule. The final product of injury assessment will be an approved Restoration Plan. The PEP does not include work scope or costs for implementing restoration projects.

The near term project baseline for scope, schedule, and cost is updated annually, as described in Section 6.3.1. The needs for additional information, and the costs of obtaining it, will depend on results of prior studies and other NRDA analyses. Decisions by DOE to allocate funds for injury assessment in recent fiscal years at a level below that presumed in PEP planning and recommended by the HNRTC have compromised the schedule for injury assessment studies and put at risk the Council's ability to timely develop a Restoration Plan. The Council will continue to use the PEP as the management framework for the injury assessment process unless it determines that the schedule and budget baselines are not tenable.

During the course of the injury assessment process (before all of the planned injury assessment is completed), the Council may develop sufficient information regarding scope of injury or damages to support agreements with the United States for resolution of some potential damages claims presented by conditions at the site. Similarly, the Council may identify restoration opportunities to support such agreements. In addition, the Council may reach agreements on early restoration projects that address potential injury claims. As a consequence, some of the originally proposed injury studies or portions of those studies (listed in Table 4.2) may reasonably be determined to not be necessary. Under such circumstances, the out year planning estimate ranges associated with the planned studies may be reduced accordingly, thus reducing the overall cost estimate (as well allowing some potential truncation of the schedule baseline) for injury assessment. Conversely, the Council may develop new information or analysis that indicates greater uncertainties in defining and quantifying injury, resulting in the type and number (and cost) of studies being greater than originally planned. As noted, these changes in circumstances will be addressed in annual updates of the PEP.

4.1.2 Contingency and Escalation

The Council did not apply a specific contingency percentage to the development of the project costs. A major source of uncertainty at this point in time is the number and cost of injury studies. The IAP identified 49 studies with a total estimated cost of \$10,270,000 to \$28,195,000. The

Council agreed to use the average estimated cost for each study in the IAP (2013) when estimating the costs of injury studies unless a more accurate estimate based on more detailed evaluation by the Council. Because of high uncertainty in estimated study costs, trustees did not adjust these estimates for inflation. Estimating a 3% annual rate of inflation for the Project Management, Technical Analysis, Information Management, and Administration budget elements controls escalations of all other costs.

4.1.3 Project Funding Profile

The updated Near Term Cost Baseline based on the “rolling wave” process is detailed in Table 4.1A. It should be noted that the estimated baseline costs were developed in 2012 and may need to be escalated over time. Funding amounts for FY2008 through FY2016 are based on actual levels of funds allocated to the NRDA project by DOE. FY2017 and FY2018 numbers reflect the FY (+1 and +2 year) requests made by DOE on behalf of the Council to DOE Headquarters. The Council has agreed to use the average estimated study cost from the IAP (2013) or other Council approved estimate for budgetary planning purposes. Specific projected annual costs for FY2019 and beyond have not been estimated due to the uncertainty in making these estimates. Out year Planning Estimate Ranges and associated overall project cost estimate ranges are set out in Table 4.1B. The uncertainty is based on several aspects of this project. First is the need to examine and analyze existing data collected during the Remediation Investigation/Feasibility Study and post-remediation phases of the cleanup effort; as a result, the number and aggregate cost of needed injury studies is uncertain. Second, as stated earlier, the Council is investigating alternatives to the phased assessment approach, with restoration planning and implementation occurring earlier than the current 10-year timeframe. Finally, the Council may utilize streamlined assessment methods that rely on reasonable worst-case assumptions to quantify some injuries to natural resources. This methodology would reduce the need for detailed ecotoxicology and/or habitat injury studies, which could reduce the estimated costs and schedule for the project. The following sections are narrative descriptions for each budget element.

Assessment Planning

The deliverables in this element include the IAP, the Preliminary Estimate of Damages (PED), and future Service Determination Plan. The IAP and PED have been completed. Since assessment planning is expected to be an iterative process, funding is included in FY2017 through FY2018 for a contractor to provide ongoing technical support and expertise in the NRDA process including assistance with injury study selection (and prioritization and study design), monitoring the quality of work in those studies, reviewing and interpreting study results, and updating documents.

Service Determination Planning will establish the approach to identify and quantify human and ecological services/values that have been potentially impacted as a result of injury to natural resources due to Hanford releases. Other costs may include possible modification to the IAP based information gathered through studies conducted in the injury assessment. Any significant modification of the IAP requires a public review process, with the results documented in the Administrative Record.

Table 4.1a. Hanford NRDA Near Term cost baseline (2008-2018)

Budget Elements	2008-09	2010	2011	2012	2013	2014	2015	2016	2017	2018	Subtotal
Assessment Planning	480,000	1,278,155	133,000	100,000					652,900	672,500	3,316,555
Injury and Service Loss Studies			1,300,000		202,013	136,000	880,751	900,000	2,844,400	1,312,900	7,576,064
Restoration Planning			50,000						200,000	200,000	450,000
Technical Analysis (TWGs)	635,000	1,200,000	1,937,500	1,750,000	1,542,091	1,977,500	1,421,000	1,335,600	2,457,900	2,531,700	16,788,291
Project Management (HNRTC)	635,000	518,000	800,135	750,000	660,896	847,500	609,000	572,400	1,053,400	1,085,100	7,531,431
Information Management			30,000	540,000	100,000		100,000	200,000	429,000	438,000	1,837,000
Administration	80,000	195,000	335,000	360,000	195,000	210,000	169,000	172,000	200,900	207,000	2,123,900
Total by Year	1,830,000	3,191,155	4,585,635	3,500,000	2,700,000	3,171,000	3,179,751	3,180,000	7,838,500	6,447,200	39,623,241

Table 4.1b. Hanford NRDA out-year planning budget estimates for Low (2008-2024) and High (2008-2025) Ranges

Budget Elements	Low range estimate			High range estimate		
	2008-2018 subtotal	2019-2024 subtotal	2008-2024 total	2008-2018 subtotal	2019-2025 subtotal	2008-2025 total
Assessment Planning	\$3,316,555	\$672,500	\$3,989,055	\$2,836,555.00	\$1,365,200.00	\$4,201,755.00
Injury and Service Loss Studies	\$7,576,064	\$0	\$7,576,064	\$14,113,213.00	\$8,529,800.00	\$22,643,013.00
Restoration Planning	\$450,000	\$1,500,000	\$1,950,000	\$450,000.00	\$2,400,000.00	\$2,850,000.00
Technical Analysis (TWGs)	\$16,788,291	\$19,399,900	\$36,188,191	\$11,265,790.90	\$19,982,100.00	\$31,247,890.90
Project Management (HNRTC)	\$7,531,431	\$8,315,700	\$15,847,131	\$11,783,931.10	\$8,565,500.00	\$20,349,431.10
Information Management	\$1,837,000	\$2,541,000	\$4,378,000	\$1,837,000.00	\$2,541,000.00	\$4,378,000.00
Administration	\$2,123,900	\$1,586,900	\$3,710,800	\$2,043,900.00	\$1,586,900.00	\$3,630,800.00
Sub-total	\$39,623,241	\$34,016,000		\$44,330,390.00	\$44,970,500.00	
Totals		low range	\$73,639,241	high range		\$89,300,890.00

Injury and Service Loss Studies

Detailed scoping and planning for injury studies began in FY2014 and is expected to continue through FY2018. As noted earlier, a “rolling wave” planning process will be utilized to update the cost and schedule for injury studies. Tables 4.2 provides a list of proposed studies; Table 4.2a identifies studies regarded by trustees as essential for informing critical decisions in completing the assessment, while Table 4.2b and 4.2c list follow-on studies that might be needed, based on results of the work identified in Table 4.2a. The studies listed in Table 4.2a include analyses of existing data and studies to define the legal/policy context for determining injury; also included are studies already funded by the Council. Tables 4.2b and 4.2c identify follow-on studies identified in the IAP and by TWGs; these studies describe focused analyses of specific resources and injury types, and include field and laboratory studies of aquatic or terrestrial resources. Decisions whether to implement each of these studies will be determined by the results of analyses of existing data, and by the ability of trustees and the RP to agree on reasonable worst-case scenarios or other means of streamlining the assessment.

This past year the Council went through extensive review of the studies and associated costs listed in Table 4.1a, using the TWG’s analyses based on past experience and available information. Factors considered were: perceived cost effectiveness; technical study sequencing requirements; likelihood of demonstrating injury; likely contribution to damages determination and the selection and scaling of restoration alternatives; and/or anticipated concerns of the general public and of publics served by tribal Trustees. No new studies were added, but descriptions and priorities of several studies have changed based on data analyses to date and the Council’s evolving understanding of injury and information needs. The status of each study in Table 4.2a are listed as complete, in progress, or the year to start the study is listed along with total projected cost, past expenditures and cost for FY2016. Study numbers are from the IAP and some of the original studies have been broken down into logical divisions, noted by the addition of an alphabetic character to the number, based on costs, technical limitations, or other factors.

Also, several studies included in Table 4.2a in the FY 2015 PEP have been moved into Table 4.2b. This reflects a reprioritization of studies by the Council, partly in response to DOE funding allocation decisions that failed to provide funding consistent with Council’s FY 2015 and FY 2016 budget recommendations.

Table 4.2 a. Priority studies for completion of the Hanford injury assessment

Study ID	Resource/Use	Study description	Status	Expected Cost for Completion	Cost Previously Funded	Costs for FY17 and beyond	Source of Funds	Source of Labor
1	Aquatic - surface water	Compare contaminant concentrations in water to water quality criteria and literature-based injury threshold concentrations for aquatic biota.	In Progress	0	0	0	Technical Analysis	Trustee(s)
2	Aquatic - sediment	Compare contaminant concentrations in sediments to sediment quality criteria and literature-based injury threshold concentrations for aquatic biota.	In Progress	0	0	0	Technical Analysis	Trustee(s)
3	Aquatic - sediment	Literature review - Evaluate results of existing Hanford sediment and pore water toxicity studies to identify evidence of injury. Contaminated sediments in river or upwelling zones. (#4 precursor to #10).	2016	200	0	200	Technical Analysis, Injury Studies	Trustee(s), Science-on-Demand (SOD) Contractor
4	Aquatic - sediment	Literature review - Evaluate results of existing Hanford sediment and pore water toxicity studies to identify evidence of injury	2016	58	0	58	Technical Analysis	Trustee(s)
5	Aquatic - biota	Compile and analyze information needed to quantify lost aquatic ecological services	2017 +	225	0	225	Injury Studies	Contractor
8	Aquatic - biota	Evaluate sensitivity of native mussel species to chromium and other Hanford contaminants	Complete	0	0	0	Injury Studies	Contractor
10a	Aquatic - biota	Assess habitat characteristics and contaminant exposure regimes at known and potential spawning locations for Chinook salmon in the Hanford Reach (#4 prerequisite for #10).	2017	750	0	750	Technical Analysis, Injury Studies	Trustee(s), SOD Contractor
10b	Aquatic - biota (integrated nearshore aquatic injury)	Integrated nearshore aquatic injury proposal. Peer/expert review & study design.	2016	50	50	0	Technical Analysis, Injury Studies	Trustee(s), SOD Contractor
14	Terrestrial - soil	Compare contaminant concentrations in Hanford soils to literature-based injury threshold concentrations for terrestrial biota	in progress	136	136	0	Technical Analysis	Trustee(s)
15a	Terrestrial - soil	Characterize spatial distribution of Hanford contaminants in soils on the Site to identify focal areas for additional sampling and study.	2017	250	35	215	Technical Analysis	Trustee(s), SOD Contractor
15b	Terrestrial - soil	Phase I: DDO for Confirmatory Terrestrial Sampling in Non-Process Areas) Breaking down the site into NRDA-based categories. Targeted/limited sampling in areas with little existing data. Non-process synonymous with non industrial areas.	In Progress	150	150	0	Technical Analysis, Injury Studies	Trustee(s), SOD Contractor
16	Terrestrial - biota	Compare site-based contaminant concentrations in terrestrial biota to literature-based injury threshold concentrations. Refer to IAP.	In Progress	225	0	225	Technical Analysis, Injury Studies	Trustee(s), Science-on-Demand (SOD) Contractor
17	Terrestrial - biota	Literature review - Evaluate results of existing Hanford soil toxicity studies to ID evidence of injury. Refer to IAP.	2016	50	0	50	Technical Analysis, Injury Studies	Trustee(s), Science-on-Demand (SOD) Contractor
18a	Terrestrial - habitat	Compile information on occurrence, type, size and nature of remedial activities that adversely affect habitat; estimate nature and duration of injury. (Phase I Preliminary Disturbance Inventory: Pre-Proposal for Quantifying Habitat Disturbance Injury). Physical disturbance focus. Broad categories: 100% disturbed/loss, temporarily disturbed/some recovery, contamination disturbance. Not in scope to establish level of contamination; initial starting point. Coarse scale look at general categories. Preliminary Institutional Controls map layer (#38) part of map product.	2016	225	50	175	Technical Analysis, Injury Studies	Trustee(s), Science-on-Demand (SOD) Contractor
18b	Restoration	Multiple Trajectories -- A number of different tasks can be identified that use existing data, new field observations, and active restoration experiments in order to estimate/predict recovery curves (trajectories) for habitat types from various starting conditions, with a wide range of revegetation treatments. This information is needed to (a) define injury based on metrics to be developed, and quantify injury (area under the recovery curve), and (b) design restoration projects.	2016	305	305	0	Technical Analysis, Injury Studies	Trustee(s), Science-on-Demand (SOD) Contractor
19	Terrestrial - habitat/biota	Compile terrestrial resource information to identify, analyze, and quantify lost services	2017 +	225	0	225	Injury Studies	Contractor
28	Groundwater	Compile existing Hanford groundwater contaminant data in a comprehensive data base, to be used to assess exceedance of regulatory thresholds and to assess spatial/temporal changes (Agree to use HBS data)	Complete	0	0	0	Injury Studies	Trustee(s), Science-on-Demand (SOD) Contractor
29	Groundwater	Evaluate reliability of DDE groundwater contaminant plume mapping; independent contractor will review methods and regenerate plume information using DDE data	Complete	0	0	0	Injury Studies	Federal Contractor
36	Groundwater	Describe services provided by groundwater under baseline conditions at Hanford and analyze how services may have been adversely impacted by contaminants	In progress	190	190	0	Technical Analysis, Injury Studies	Trustee(s), Science-on-Demand (SOD) Contractor
38	Human uses and services	Inventory the nature and extent, and planned duration of institutional controls on the Hanford Site to assess potential impacts on human and ecological services	2017	175	0	175	Injury Studies	Contractor
39a	Human uses and services - YH	Phase I & II: YH tribal lost services study.	In Progress	900	400	500	Technical Analysis, Injury Studies	Trustee, Contractor
39b	Human uses and services	Assess Nez Perce tribal lost services -- identify losses not accounted for in other studies.	in progress	400	400	0	Technical Analysis, Injury Studies	Trustee, Contractor
39c	Human uses and services	Assess CTUIR tribal lost services -- 100F Pilot project.	in progress	421	400	21	Technical Analysis, Injury Studies	Trustee, Contractor
40	Human uses and services	Resource characterization for restoration of lost services -- characterize contaminant concentrations in natural resources to verify potential for restoration of lost services	2017	550	0	550	Injury Studies	Contractor
41	Data management	Non-detects - understand how non-detects have been reported and used in Hanford literature and data; evaluate options for handling non-detects in data analyses	Complete	0	0	0	Injury Studies	SOD Contractor
42	Human uses and services	Long-term inventory -- characterize the potential nature and inventory of long-lived contaminants following completion of cleanup, to estimate potential for residual long-term injury and service losses	2017	250	0	250	Injury Studies	Contractor
37	Groundwater	Quantify the nature, extent, and duration (past and future) of groundwater contamination at Hanford.	2017 +	200	0	200	Injury Studies	Contractor
43	Human uses and services	Identify traditional cultural properties (TCPs). This analysis must be completed prior to conducting field studies or restoration on lands that might be identified as TCPs	2017 +	300	0	300	Technical Analysis, Injury Studies	Trustee, Contractor
estimated total cost for essential studies				\$6,235	\$2,116	\$4,119		

Table 4.2b. Follow-on injury studies identified and described in the injury assessment plan

Study ID	Resource/Use	Study description	estimated cost (from IAP)
6	Aquatic - biota	Evaluate toxicity of site sediments to aquatic invertebrates	1150
7	Aquatic - biota	Collect data on mussel communities in the Columbia River - relate contaminant concentrations to community metrics, habitat quality, and histopathology endpoints	1150
9	Aquatic - biota	Evaluate in-situ toxicity of Hanford water and sediments, using caged mussels	650
11	Aquatic - biota	Using artificial redds, assess effects of Hanford contaminants on habitat utilization and successful development of eggs and juveniles	650
12	Aquatic - biota	For a resident fish, assess effects of contaminant concentrations in water and sediment on habitat utilization, abundance and population age/size structure	650
13	Aquatic - biota	In lab exposure studies, assess effects of Hanford contaminants on early life stages of resident fish (e.g., sculpin, white sturgeon)	650
20	Terrestrial – biota	Evaluate potential phytotoxic effects of Hanford soils and contaminants on native vegetation	650
21	Terrestrial – biota	Characterize and compare health of native plant species and communities on the Hanford Site and at suitable reference locations	1150
22	Terrestrial – biota	Evaluate suitability of Hanford soils as habitat, using nematodes as an indicator species	650
23	Terrestrial – biota	Assess abundance and diversity of soil invertebrate species and guilds across contaminant concentration gradients	650
24	Terrestrial – biota	Assess abundance and diversity of avifauna (birds) species and guilds across contaminant concentration gradients using visual and auditory metrics	650
25	Terrestrial – biota	Evaluate the exposure of avian species to contaminants, and resulting uptake and possible injury	375
26	Terrestrial – biota	Identify extent of exposure of small mammal communities to Hanford contaminants, and assess effects on populations	650
27	Terrestrial – biota	Quantify exposure of great basin pocket mice and other small mammals to carbon tetrachloride; assess effects on populations and correlation to histopathology lesions	750
31	Aquatic	Sample selected wells in the river corridor to determine relationship between river stage and well levels and chemistry	750
32	Aquatic	Characterize spatial and temporal variability of selected upwelling plumes to assess potential exposure and injury to biota	750
33	Groundwater	Evaluate strengths and limitations of existing models of contaminant inventory and migration in the Hanford vadose zone	100
34	Groundwater	Construct wells in key locations to better understand and quantify the vertical distribution of contaminants in groundwater	0
35	Groundwater	Develop seismic and geophysical profiles and drill boreholes to determine presence of contaminant plumes near and beneath the Columbia River and to assess potential for contaminant migration	0
estimated total cost for follow-on studies included in the IAP			\$12,025

Table 4.2c. Follow-on injury studies identified and described in TWG work plans

Study ID	Resource/Use	Study description	estimated cost
30	Groundwater	Evaluate existing Hanford groundwater/contaminant transport models to assess/validate predictions of present/future nature and extent of contamination.	200
44	Aquatic - surface water and sediments	Field study to assess concentrations of contaminants of concern in water and sediments of slough areas in the Hanford Reach	300
45	Aquatic - biota	Assess lamprey presence/absence and habitat utilization in the Hanford Reach	150
46	Aquatic - biota	Map habitat suitability in water and sediments of the Hanford Reach for aquatic species of concern	250
47	Terrestrial - soils	Assess lead and arsenic concentrations in soils and biota in old orchard lands in the Hanford 100 Area	900
48	Groundwater	Assess contaminant exposure and impacts on biota (invertebrates) in Hanford groundwater	250
49	Groundwater	Characterize and quantify contaminant inventory and mobility in the deep vadose zone to assess injury to geologic materials and as source of long-term injury to groundwater	775
estimated total cost for follow-on studies in TWG work plans			\$2,825

Restoration Planning

Restoration of natural resources and the services they provide is the ultimate goal of the NRDA process. The Restoration Planning budget element includes project development and integration with response activities when practicable. It is anticipated that preliminary information from the injury assessment effort will also facilitate planning for some early restoration projects. The Council recognizes it can be more cost effective to integrate restoration into response actions rather than perform restoration incrementally after remediation is complete. Other early restoration projects, not directly associated with ongoing remediation, will also be considered, including on- and off-site restoration, along with conservation easements or land acquisition.

Funding through FY2018 under Restoration Planning is for early restoration planning. It is recognized by the Council that early restoration projects would reduce temporally based damage liability for DOE and benefit natural resources and the services they provide. The development of a draft restoration plan has already started, focusing on approaches for evaluating and prioritizing early restoration projects, methods for debiting and crediting injuries and restoration, and review/prioritization of candidate restoration projects. Continuing work on the overall Restoration Plan will focus on the scope of work that will identify data needs for the actual Restoration Plan to insure that appropriate kinds of data are identified and collected during injury assessment studies. The Restoration Plan will list a number of possible alternatives for (1) the restoration or rehabilitation of the injured natural resources to a condition where they can provide the level of services available at baseline (primary restoration), or (2) the replacement and/or acquisition of equivalent natural resources capable of providing such services (compensatory restoration). The Restoration Plan will set forth the compensable value of restoration alternatives and analyze the alternatives by giving the rationale for selecting that alternative; identifying the methodologies that will be used to determine the costs of the selected alternative, and presenting the compensable value of the services lost to the public associated with the selected alternative.

Technical Analysis

The estimated costs in this budget element are for Trustee participation in TWGs. Each Trustee has unique interests and associated levels of participation in the Hanford NRDA process, which accounts for varying costs for individual Trustees. From FY2008 through FY2016, each Trustee received funding for 1-2.5 full-time equivalents (FTE) for work described by this element. Funding recommendations in the PEP for FY2017 and FY2018 reflect an increase to 2-3 FTE per Trustee. The increase is required to manage the injury assessment process as currently anticipated by the Council.

The seven TWGs comprise representatives from the Trustee organizations, and are responsible for technical analysis and overseeing contractor performance and work products related to injury assessment and early restoration planning. The TWGs are described in detail in Section 3.2.3.

Project Management

The Project Management budget element covers staffing costs for Trustee participation in the Council, and Trustee Management Oversight. In FY2008 to FY2016, Trustees received funding for 0.5-1.0 FTE for this element. The increased request for FY17 and FY18 is based on the Council's assessment of staffing needs for management of injury assessment studies and for early restoration planning.

The NRDA project at Hanford is being conducted as a collaborative Trustee effort. However, each Trustee has unique interests and levels of participation in the Hanford NRDA process, along with individual labor rates, all of which account for varying costs for individual Trustees. Each Trustee for their respective participation in the Hanford NRDA estimated these costs.

The Council has responsibility for overall management of the Hanford NRDA project in accordance with the MOA and By-Laws established by the Trustees. Trustee management oversight costs include participation by senior management and legal staff, for support of policy and legal analyses for the Hanford NRDA process.

Information Management

This element includes the costs to support management of the Council Administrative Record (AR), document management, tabular data management, geographic information system (GIS) management, computer hardware and software services, and quality assurance.

The AR houses public documents and information generated by the Council that are used to support and document NRDA decisions. The Council AR is not intended by the Council to constitute the administrative record that may be required by laws applicable to a particular Trustee in making its NRDA decisions under its administrative authority, though that Trustee may choose to incorporate the AR into any required administrative record.

A considerable amount of existing and new data is being utilized in the injury assessment process. A Data Management Plan, Data Management Framework Plan, and Quality Assurance Plan were created and approved by the Council as part of the IAP. The Data Management Plan recommended 6 positions (described in section 6.5), with aggregate staffing of up to 2.5 FTEs to meet the labor needs of the data management system (DMS) that is described in the subsequent paragraphs. The Council has approved a software-as-a-service (SaaS) solution for the data management framework to meet the requirements of the data management plan. A web-based environmental database management vendor, ddms, was selected to provide software and services for the Council's data management system (DMS). The services are provided over the Internet to manage a centrally hosted cloud based system.

The DMS will handle all document, environmental data, geographic information system (GIS) data, calendar and schedule records, and tracking information for the Council. The Council approved combining of the existing Data Management Plan with the Quality Assurance Management Plan. This will improve the management of data in a reliable, consistent and effective manner for use in making decisions. A Data Manager/Quality Assurance Coordinator position has been approved by the Council and is the process of being hired by the DOE. The incumbent in this position will be responsible for assisting TWGs, contractors, and Council for subject matter data management decisions. The position will coordinate getting data processed by the DMS contractor following protocols of the DMP.

Detailed scoping and implementation of the information management system, and staffing to support the work, was initiated in FY 2013 and will continue in subsequent years. The initial labor estimate for full implementation of the DMS was estimated to be 1.5 FTE possibly increasing to 2.5 FTE in the future. Current estimated staffing for the DMS is expected to be 0.5 FTE, plus the costs for the DMS contractor, which will be dependent on the amount of data entered into the DMS and on the level of contractor support services.

Administration

This element includes funding for Facilitation, Administrative Support, Public Involvement, and Procurement/Contract Administration. Current costs in this budget element are for Facilitation services provided under contract with DOE.

To date, procurement and administration of contracts for NRDA activities have been performed by DOE on behalf of the Trustees, with no direct service costs for the project. The Council has considered using an independent non-governmental organization (NGO) for procurement and contract administration. If the mechanism is implemented, a transaction cost would be incurred, and is estimated to be 3% - 9% of the total value of contract(s) managed by the NGO. This activity is not funded in the proposed FY 2017 or out year budgets.

4.2.1 Critical Path

Table 4.3 provides a breakdown of the schedule for implementing a sequential injury assessment leading to development of a final restoration plan in FY2024. The approval of the IAP (2013) was a major step forward in the process. Injury Assessment studies and data analyses are projected to take 5 years and would be completed by FY2020, with an approved Restoration Plan by FY2024. As noted earlier, meeting this schedule is contingent on reasonable funding over the life of the project. Future costs and schedule may be adjusted based on use of reasonable assumptions (i.e. reasonable worst-case scenarios) and/or early restoration carried out during the injury assessment process.

4.2.2 Milestones

Table 4.4 lists the milestones for completing the injury assessment and restoration plan for the Hanford NRDA. Many of the milestones represent policy-level decisions that must be made by the Council before completing the major reports and plans required by CERCLA. Each milestone is planned for completion within the last fiscal year listed in the table. The Council recognizes meeting the milestones will rely on a flexible, iterative process. The milestones are based on the assumption the schedule will follow a sequential procedure for injury assessment and restoration planning. If funding from DOE is lower than necessary to meet this schedule, the planning timeline for the project may need to be extended to allow completion of priority assessment studies and data analyses. Planning for studies carries a high degree of uncertainty at this time. As noted in the IAP, the current list of studies follows from a compilation exercise based on our current understanding of potential injuries on the Hanford site. As studies are completed, the Council will routinely reassess the need for additional studies and related milestones. Milestones could be shortened or lengthened depending on the results of the investigations. Interim findings might suggest the need for new or additional work to assess specific injuries or the elimination of studies

Table 4.3 Schedule for the Hanford NRDA

Lead: Steve Wisness 376-3898 Scheduler: Tracy Kim 373-0067 Project: Hanford NRDAR Project (Natural Resource Damage Assessment, Restoration)				1 of 2												26-Jan-16 11:19				
Activity ID	Activity Name	Rem Dur	Start	Finish	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Hanford NRDAR Project (Natural Resource Damage Assessment)																				
Hanford NRDAR Project Planning																				
<i>Pre-Assessment</i>																				
<i>Data Compilation</i>																				
A10	Data Compilation	0	02-Jan-06 A	29-Dec-06 A																
<i>Pre-Assessment Screen</i>																				
A25	Pre-Assessment Screen	0	02-Oct-06 A	30-Sep-10 A																
A30	Pre-assessment Screen completed	0		30-Sep-10 A																
<i>Decision to Proceed with NRDA</i>																				
A15	Decision to Proceed with NRDA	0	30-Apr-07 A	30-Apr-07 A																
<i>Assessment</i>																				
<i>Assessment Planning</i>																				
Phase I - Conceptual Site Model																				
A20	Phase I	0	01-May-08 A	30-Jun-09 A																
Phase II - Injury Assessment Plan																				
A50	Phase II	0	23-Jun-10 A	31-Jan-13 A																
A45	Injury Assessment Plan completed	0		31-Jan-13 A																
Preliminary Estimate of Damages																				
A40	Preliminary Estimate of Damages (PED)	0	15-Dec-11 A	04-Jan-13 A																
A35	Preliminary Estimate of Damages completed	0		04-Jan-13 A																
Phase III - Follow-up Assessment Plan(s)																				
A130	Phase III	1965	01-Feb-13 A	30-Sep-21																
A135	Complete Report of Assessment	0		30-Sep-21																
Service Determination Planning																				
A60	Service Determination Planning	413	01-Oct-12 A	13-Oct-15																
Restoration and Compensation Determination Plan																				
A190	Restoration Plan	2413	01-Oct-14*	18-Jan-24																
<i>Injury Determination</i>																				
Injury Study Plans																				
A95	Injury Study Plans	1195	03-Jan-11 A	18-Oct-18																
Injury Studies																				
A85	Injury Studies	1181	01-Oct-12 A	28-Sep-18																
A55	Establish timeframe for beginning of injury	405	01-Oct-13 A	30-Sep-15																

Driven
 Actual Work
 Remaining Work
◆ Milestone
◆ Completed Milestone

Hanford Natural Resource Damage Assessment & Restoration Project Schedule

Data Date: 02-Mar-14
 Layout: NRDAR
 Filr: TASK filter: All Activities

Table 4.3 Schedule for the Hanford NRDA (continued)

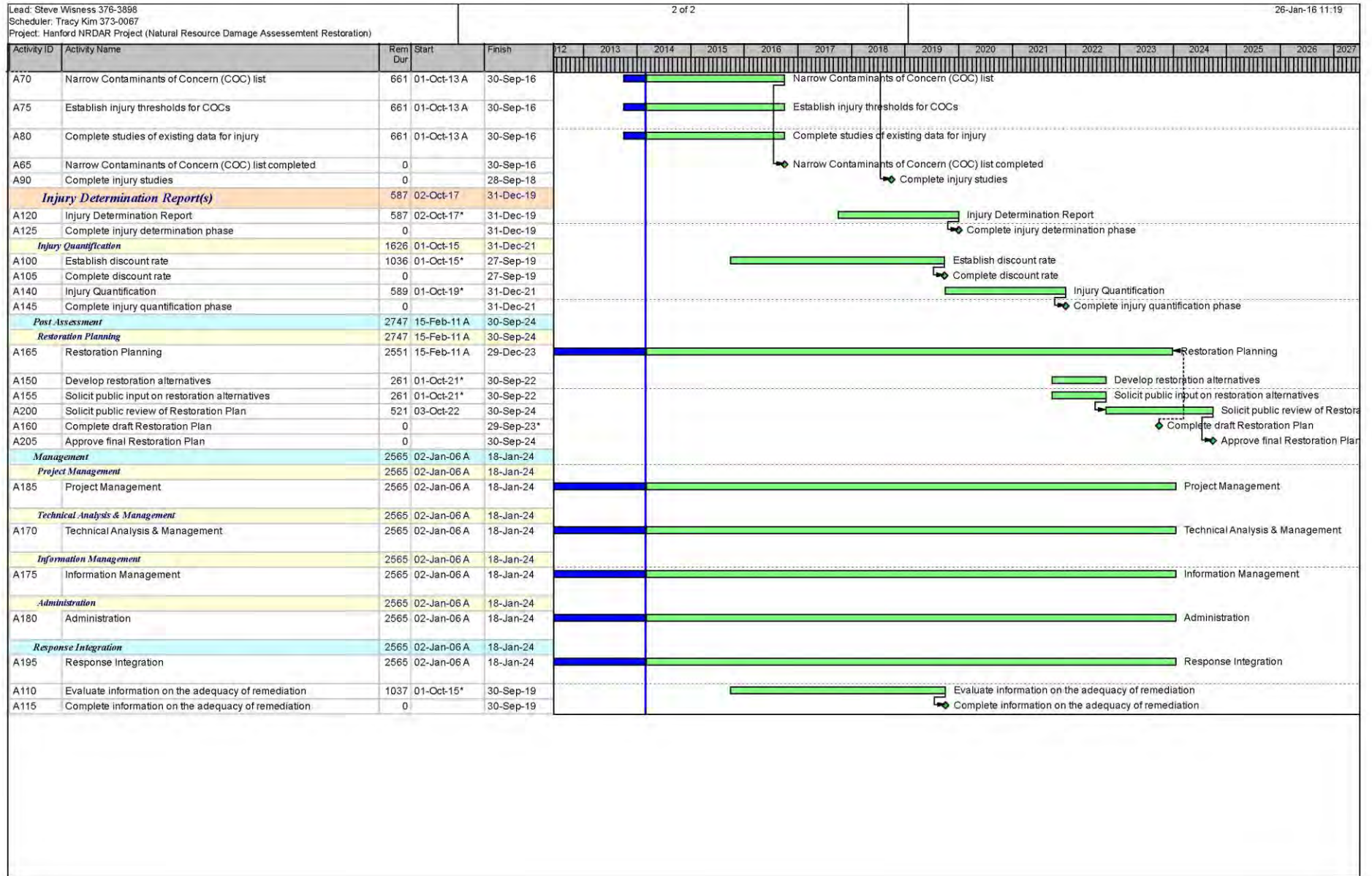


Table 4.4 Milestones for the Hanford NRDA

Fiscal Year	Milestone
2010	Pre-assessment Screen completed
2013	Injury Assessment Plan completed
2013	Preliminary Estimate of Damages completed
2014-2016	Narrow Contaminants of Concern (COC) list
2014-2016	Establish injury thresholds for COCs
2014-2016	Complete studies of existing data for injury
2014-2015	Establish timeframe for beginning of injury
2014-2018	Implement injury studies
2016-2019	Establish discount rate
2016-2019	Evaluate information on the adequacy of remediation
2019	Complete injury determination phase
2021	Complete injury quantification phase
2021	Complete Report of Assessment
2022	Develop restoration alternatives
2022	Solicit public input on restoration alternatives
2023	Complete draft Restoration Plan
2024	Solicit public review of Restoration Plan
2024	Approve final Restoration Plan

5. RISK MANAGEMENT, CONSTRAINTS, AND ASSUMPTIONS

In planning the Hanford assessment, one of the complicating factors is that there are, and will continue to be, many inherent uncertainties that will influence the nature of work done as part of the assessment. Unlike many projects (e.g. construction of a facility), the ultimate nature of work done as part of a NRDA cannot be specifically defined at the start of a project, but can be defined only in general terms and as broad project goals (i.e., identify and quantify injuries to natural resources caused by releases of hazardous substances). At a large complex site like Hanford, neither the fate of hazardous substances, nor their effects on natural resources, is known at the outset of the assessment. The results of injury studies, whether analyses of existing data or new field/laboratory studies, cannot be known in advance. Accordingly, the assessment process at Hanford has been planned as an iterative process; as the results of studies become known, their implications for injury analyses will be appraised, and priorities and “next steps” will routinely be evaluated and adjusted.

Along with the uncertainties inherent in injury assessment, trustees recognize that there are, and will continue to be, many constraints that will limit or change the nature, pace, and ultimate scope of the injury assessment for the Hanford Site. The constraints are varied in their nature and implications. The Council has, and will continue to, work hard to identify actual and potential limitations, and to resolve or at least manage them to minimize impacts on the assessment process. Some of the limitations are internal to the Council and member governments, some are external issues over which the Council has limited influence. Some are already upon us as we

plan and begin to implement the assessment; others will not have significant impacts until the future. Some can be resolved; others must be managed on an ongoing basis to minimize adverse effects. To the extent possible, trustees are working to resolve constraints or to develop contingencies to minimize their effects. Table 5.1 summarizes important issues that could constrain the overall injury assessment at Hanford, identifying issues and briefly describing why they are of concern.

5.1 Risk Management

The potential inability to achieve project objectives within anticipated parameters (scope, schedule, and cost) is a concern for any project, including the Hanford NRDA. Risk management has been described by DOE (DOE-M-413.3.1) as “the art and science of planning, assessing, and handling future events to ensure favorable outcomes.” Risk management should be an integral component of project planning and implementation, with the goal in early planning of identifying potential risks and their consequences, then taking actions to minimize the likely occurrence of adverse events and to manage consequences if (when) such events occur.

The Hanford NRDA does not have a formal risk management plan, and we do not anticipate developing such a document. This should not be interpreted as indicating trustees are not aware of risk issues in the Hanford NRDA, or are not taking steps to minimize risk.

An important consideration for the Hanford NRDA is that the “product” of the project is fundamentally different from that of DOE capital projects, so the approach to risk management is also different. For a construction project, project components (sometimes in parallel, sometimes sequentially) contribute to development of one final product. In such a project, an adverse event in one component can compromise success of the entire project. For NRDA, particularly at a large complex site like Hanford, injury assessment often involves quasi-independent studies to document and quantify injuries for many different contaminants, resources (media and biota) and locations.

Similarly, ecological restoration at Hanford - the final step of the NRDA process – will consist not of one large project, but of many smaller, nominally independent projects, likely performed by multiple contractors and over many years.

In planning and implementing the NRDA at Hanford, trustees are utilizing a number of approaches to recognize and minimize risks to the process. These include:

- Diversity of perspectives in planning and design – The Council includes eight trust governments, with a breadth of values, perspectives, and goals. Individual injury studies are thoroughly vetted by each of these governments, both for work that is proposed, and for study elements perceived as “missing” by one or more trust governments. Approval of plans requires consensus of all trustees.
- Use of experts in planning and study design – Two consulting companies that are highly experienced in NRDA contributed to development of the injury assessment plan, which includes a prioritized list of recommended injury studies. In addition, the Council and consultants used panels of outside technical experts to help frame specific issues to guide development of parts of the assessment plan. We will also rely on independent peer

review of study plans and interpretive reports of study findings to insure technical soundness of injury studies and other NRDA activities.

- Implementation of a DQO and QA/QC processes - Plans for injury studies will be developed using a data quality objective process and will be subject to rigorous quality assurance and quality control to ensure that studies provide the needed information and that information developed by each study is technically reliable.
- Use of a structured, iterative process to select injury studies and develop other quantification and damage determination approaches – The Hanford IAP identified more than 40 potential injury studies. We recognize that not all of those studies are likely to be implemented, and we likewise recognize there are studies not on that list that may be implemented. While occurrence of injury to some resources is unequivocal, we anticipate that for a variety of reasons, not all lines of study would prove fruitful because, for instance: data do not indicate occurrence of substantive injury; historic data are too sparse for reliable analysis; data are too erratic or too highly variable to establish “measurable adverse consequences;” technical problems with studies (e.g., poor survival of test organisms); or because the perceived magnitude of some injuries might be less than the costs of assessing them.
- Regular review of project approach and schedule - The selection of studies must be appropriately rigorous to assure costs of the assessment are “reasonable” relative to the value of injured resources. Trustees consider several factors in planning and prioritizing next steps for the assessment; these include funding, results of interim studies, cost-effectiveness of proposed new studies, and the ability of trustees and the RP to agree to reasonable scenarios that might streamline the assessment. Studies unlikely to establish injury, or studies determined by the Council to likely have low benefit:cost ratios may be dropped (or follow-up studies not recommended for additional funding), and the resources planned to be applied to those studies shifted to other work. Alternatively, when new areas of study appear important, funds can be shifted to address them. The Council’s continuous goal is to maximize efficiency of injury studies and to get the greatest benefit consistent with NRDA objectives.
- Maximizing use of available data – A constraint common to all NRDA’s is the limited availability of certain kinds of data, especially historic data, and ecotoxicology data for contaminants and species of concern. The Hanford site has extensive amounts of existing data, and data that meet the Council’s quality management goals are being used in assessment work. The Council is actively searching archived material and speaking to experienced Hanford and contractor staff in a quest for relevant Site data. The Council also continues to compile and review ecotoxicology literature. It will make the best possible use of existing data. Where necessary or advantageous, the Council will rely on models, best professional judgment, and explicitly stated assumptions/estimates and reasonable worst-case scenarios for estimating injury.
- Use of a collaborative process with the responsible party – Hanford injury assessment is a collaborative process involving eight trust government organizations or agencies, with DOE having a dual role as trustee and as responsible party. Each government entity has its own values, perspective and process for making decisions, which imposes unavoidable risks – delays in decisions, difficulty in reaching consensus, etc. Although we recognize that the collaborative process could break down, trustees believe it to be the most effective and efficient path forward for the assessment. In collecting and analyzing data, however,

the Council will define and address contingency data needs in case the collaborative approach is not successful.

In summary, Hanford trustees are actively working to identify and address potential risks to the scope or pace of Hanford injury assessment, and are conducting the assessment in a manner intended to minimize and manage risk. Throughout this assessment, we are regularly reassessing plans, including a reassessment of risks, to modify and re-prioritize our activities to maximize success of assessment while minimizing risks to project success.

5.2 Constraints

As summarized in Table 5.1, there are an array of issues that could constrain the nature and pace of the Hanford injury assessment. Issues are identified to help delineate both the nature, origins, and recommended resolution of each issue.

Table 5.1 Constraints with the potential to adversely affect the schedule and/cost or of the Hanford natural resource injury assessment.

	Nature of constraint	Reason for concern	Recommended Solution
1	Cleanup plans have not been defined for many waste areas on the Site, especially in the Central Plateau. The scope and schedule of many response activities is undefined.	This kind of uncertainty can occur often in some NRDA's. The nature, extent and duration of injury, and thus the amount of damages requiring restoration, cannot be fully determined until the nature and effectiveness of remedies is known.	Make plausible assumptions and estimates (e.g., best guess, worst case) regarding the scope, schedule and effectiveness of cleanup actions, based on existing plans and milestones, and on default cleanup plans. We will use best professional judgment to estimate timing/extent of injury where necessary. To reduce uncertainty, DOE must resolve cleanup plans and schedules for response actions. NRDA on the Central Plateau could be deferred until remedial decisions are made.
2	Consensus-based decision making can be inefficient.	As defined in the MOA and by-laws under which the Council is organized, major decisions are made by consensus. This can be a challenging and sometimes slow process, which can delay some decisions, and extend the assessment timeline.	The HNRTC decision process is unlikely to change. We will continue to work in a collaborative manner and strive to make timely, consensus decisions.
3	There has been limited involvement or discussion of legal topics by counsel for some trustees – some trust governments lack resources or are disinclined to engage legal counsel in routine discussions.	A number of substantive issues at Hanford should be framed by legal guidance. Absent discussion/decision among counsel, trustees may receive conflicting guidance, complicating and slowing the decision process.	Legal counsels for trust governments have conference calls on an as-needed basis. Formation of a legal working group requires clear legal questions framed by the Council as a whole.
4	Inconsistent decision processes among trust governments (e.g., some trustees give broad authority to technical trustees, whereas	Discussion and resolution of some issues (e.g., prioritization and work scope of injury studies, budget compromises) can be complicated and slowed by inability of some	Decision processes for individual trust governments are not expected to change, so this issue cannot be completely resolved. Trustees are aware of the need of

	others require decisions at be made at a very high level (e.g., tribal council).	trustee representatives to adjust positions during meetings.	some members to refer decisions to their management; we attempt to allow sufficient lead time for discussion and decision by each government to make decisions. Strengthening government to government dialogue might help to mitigate this risk.
5	Trust governments have diverse perspectives and priorities regarding the NRDA process. Accordingly, Council has not yet come to consensus on all issues such as the nature of injury, ecological baseline, or injury thresholds.	The Council is a very diverse group; getting consensus on Council priorities and on implementation of some assessment activities will be difficult. Our consensus-based decision process is critical to the collaborative process. Until trustees agree on many issues, it will not be possible to quantify extent of some injuries.	Trustees are using historic information (e.g., for baseline condition), white papers, data summaries, etc. to frame these kinds of topics. Field or lab studies may be needed to resolve some issues. Sensitivity analyses might also be used to evaluate importance of uncertainty.
6	Large size and complexity of Hanford, with thousands of waste sites, dozens of contaminants of concern, and uncertain cleanup plans/schedules, complicates the injury assessment and quantification process	It is not practicable to address all possible effects of all COCs on all media and biota across the Hanford Site, or to eliminate uncertainty. Some injuries will be quantified with high certainty, but uncertainty and damages in other cases will likely need to be resolved by use of reasonable scenarios and negotiation.	Trustees are working to maximize efficiency and to focus on the most important injuries, balanced against not missing or ignoring injuries perceived as relatively small or overly complex to quantify. Trustees are using analyses of existing Hanford data to evaluate evidence of injury and to help frame/prioritize injury studies.

5.3 Assumptions

5.3.1 Technical Basis

The current technical basis for the project includes the Conceptual Site Model (CSM) completed in 2009, the IAP completed and approved by the Council in January 2013, and documents prepared in support of the IAP (e.g. Data Gaps Report, Data Management Plan, Quality Assurance Plan, Resource Review Reports, and Injury Thresholds Report), also approved by the Council.

5.3.2 Schedule Basis

The IAP identified 49 potential studies for the injury assessment. The goal of Trustees is to complete the studies determined to be necessary to quantify injury (and damages), to complete the injury and damage assessment by 2020, then to prepare a restoration plan no later than 2024. The schedule is based on an orderly progression of implementing studies with the understanding that studies may be dropped, added or modified as new information is gained through the assessment process. The Council may determine directly or through agreement with the RP that use of best professional judgment in analyses of existing data provides an adequate basis for cost-effective determination of some injuries. Restoration implementation and associated costs are not included in the plan, as we will not know the entire scope of needed restoration until the injury and damage assessment is completed. The Restoration Plan, when completed, will provide the basis for determining the remainder of the Hanford NRDA project including development of a timeline and budget for primary restoration, compensatory restoration, monitoring and operations/maintenance. This does not preclude the Council from implementing early restoration projects when feasible and appropriate

5.3.3 Funding

The schedule and overall project cost are contingent on annual appropriations and allocations of funding based on the profile shown in Tables 4.1a and 4.1b. Any reductions or increases in funding may necessitate corresponding adjustments to the project schedule. In addition, deferral of necessary injury assessment activities due to funding allocation decisions by DOE may produce a “bow wave” of additional funding requirements in the later years.

The Trustees are using existing Hanford environmental data to the greatest extent possible before collecting new data. A dedicated Hanford NRDA data management system has been developed and is being implemented to house and manage new and existing data.

5.3.5 Geographic Scope

The planned geographic scope of the project includes all of the Hanford Site, as well as the Columbia River from Priest Rapids Dam to McNary Dam. Because CERCLA cleanup and NRDA injury are tied to “where the contaminants have come to reside,” the spatial extent of assessment activities could change if potential injuries are identified outside the planned geographic area.

5.3.6 Temporal Scope

Injury and damages due to releases of hazardous substance from Hanford likely began in the 1940's, some of which continue today. However, consistent with the promulgation of CERCLA in 1981 and current U.S. Department of Interior legal interpretations of CERCLA and NRDA, damages calculations will initially begin at 1981 and will extend forward in time until the natural resources and/or the services they provide reach baseline condition. The non-federal trustees retain the option of choosing a date prior to 1981 to evaluate potential injuries and related damages that started before 1981 but continued after the enactment of CERCLA. The Council anticipates the scope of some Hanford claims will also extend into the future.

5.3.7 Contaminants of Concern

The COCs in the assessment area are those hazardous substances and oil (as defined by Section 101(14) of CERCLA, and in the Oil Pollution Act of 1990, respectively) to which trust resources have been exposed as a result of hazardous releases from the Hanford Site. These contaminants include both organic (e.g., pesticides, petroleum derivatives, synthetic carbon-based chemicals) and inorganic (e.g., metals) contaminants, as well as radionuclides. A tentative list of COCs for the assessment is included in the IAP. The Council will narrow the list as the assessment progresses, and it may vary by media.

5.3.8 Resources of Concern

The presence of elevated levels of contaminants may have resulted in injury surface water, groundwater, soil, sediments, aquatic, riparian, and terrestrial habitats, and associated biota. Natural resources of concern include all trust resources within the assessment area including groundwater, surface water, sediment, soil, plants, insects and other invertebrates, fish, amphibians, reptiles, birds, and mammals.

6. PROJECT MANAGEMENT

6.1 Acquisition Strategy

Injury assessment studies, other activities, and resource restoration projects are, and will continue to be, performed by qualified personnel selected by the Council, based to the greatest extent possible on competitive bidding and cost effectiveness. Work scope for projects will be developed and approved by the Council. The Council will likewise make selection of contractors and authorization for project funding. Fixed price contracts are preferred over cost reimbursable contracts. Injury studies and other NRDA activities may be performed by trust organizations as determined by the Council if cost effective and technically justified. Procurement and administration of contracts shall comply with federal acquisition regulations.

DOE has been the primary procurement organization for Council activities. Trustee participation and injury studies are performed under a variety of funding instruments procured through DOE including grants, cooperative agreements, inter agency agreements and technical contracts. The Council has discussed, but taken no action on, a proposal to use a non-governmental organization for procurement.

6.2 Contract Management

Selection of contractors will be competitive, and based on criteria including demonstrated technical expertise, qualifications, capability, cost, and resource availability to meet schedule requirements. Procurement and administration of contracts will be performed by an assigned Trustee organization on behalf of the Council (Project Steward). Day to day technical oversight of specific contracts will be performed by a designated “project steward” on behalf of the Council, with support from one or more TWGs. As the lead for each contract this individual is responsible for:

- Developing and coordinating approval of the Statement of Work
- Participating in the review of contractor proposals
- Providing general oversight of contractors including monitoring cost, schedule and technical performance
- Providing or coordinating technical direction to the contractor as allowed by the contracting officer
- Reporting status to the Council on a regular basis.

6.3 Project Controls and Reporting

6.3.1 Project Controls

The scope, schedule and cost described in Sections 2 and 4 of this plan form the project baseline against which performance will be measured and controlled. Throughout the various phases of this project, the project baseline will be updated and refined to reflect the sequence of activities required to be accomplished within specified milestone completion dates and planned costs. The project baseline will be updated annually to document progress with respect to schedule and cost following the process established in Table 6.1. Any changes to the project baseline require approval of the Council.

Table 6.1 Timeframe and outcome for updating the PEP

Timeframe	Purpose	Outcome
October 1 to November 30	<ul style="list-style-type: none"> • Evaluate the PEP cost projections and milestones based on the awarded FY funding for the current year compared to the funding request 2 years prior (Table 4.1) and knowledge gained from the past year studies and TWG research • Determine which studies to add, delete, or modify based on criteria in 4.1.3 and other relevant information. Revise priorities for the updated list of injury assessment studies as appropriate. • Update restoration planning activities and priorities and integrate into funding decisions and recommendations. 	<ul style="list-style-type: none"> • Updated list of injury studies. • If funding is below requested amount, make decision to increase FY(+1) and FY(+2) funding to make up for reduction, extend PEP time period to complete projected work, or negotiate alternative solution with DOE. Update PEP Table 4.1 and Table 4.4 to reflect decision and establish the new project baseline.
December 1 to January 31	Notification period for individual trustees participation costs in FY(+2) budget request	Each trustee will have agreed with DOE on participation costs for the Council's FY(+2) budget request.
February 1 to March 31	Develop the Council's FY(+2) budget request to DOE	Approve the FY(+2) budget request based on the negotiated participation costs and updated PEP.
July 1 to July 31	Individual trustees submit their FY(+1) budget to DOE based on the PEP (Table 4.1).	DOE negotiates and reaches final decision on the funding for each trustee in FY(+1).
August 1 to September 30 (contingent on finalizing the budget for Hanford NRDA by DOE)	Allocate FY (+1) funding to budget elements; Administration, Information Management, Assessment Planning, Injury and Service Loss Studies, and Restoration Planning.	Approve the budget for FY(+1) funding.

6.3.2 Project Reporting

Overall cost/budget reporting is being accomplished through the DOE Financial system and is reported to the Council at least quarterly. Each Trustee is responsible for managing their participation budgets/costs and technical contracts assigned to them and reporting status to the DOE on a quarterly basis. The Council will also review the project schedule regularly with emphasis on activities scheduled for the current fiscal year. Individuals assigned to oversee technical contracts (project stewards) will provide regular reports to the Council on status and issues.

An annual report for the assessment will be prepared in December of each year, summarizing key activities, accomplishments and cost/budget status.

6.3.3 Project Meetings

The Council holds regular meetings to review and discuss project technical, schedule, cost/budget status, and to address any emerging issues that may have an adverse impact on the project. Participants include the Council members, support personnel, and contractors as deemed

appropriate. Meeting summaries will be prepared to record decisions, actions items and synopses of discussions held at the meeting.

6.4 Quality Assurance

Many analyses undertaken and decisions made as part of the NRDA at Hanford require the use of environmental data. The collection, compilation, evaluation and reporting of environmental data are necessary to carry out the functions of the NRDA. It is necessary that the origin and quality of the data used to make these decisions is of known and documented quality so that data gaps can be identified; assessments of the nature, location and extent of injury are accurate, so that appropriate decisions can be made as to the needed type and scale of restoration actions. The Council recognizes that careful study design and implementation, including interpretation of results, requires consideration of uncertainty.

A Quality Assurance Management Plan (QAMP) has been developed in order to ensure that all environmental data and related information relied upon in this NRDA are of the quality needed to ensure the integrity of the data such that the data are scientifically valid, legally defensible, and are of known and documented quality. The validity, defensibility, and quality of the data are known when all components associated with their derivation (methods, precision, bias, completeness, comparability, sensitivity, and representativeness) are documented and compared to appropriate criteria. This requires the development of appropriate work plans along with study-specific Quality Assurance Project Plans (QAPPs), as well as data management processes and data review processes.

To achieve these objectives, quality assurance (QA) practices are being incorporated into all phases of study design and data collection (including assembly of historical data as well as new data generation), from the planning stages through implementation, assessment and ultimately dissemination of data products and services.

It is also the policy of the Council to disseminate information in an accurate, clear, complete, and unbiased manner. The Council recognizes that the implementation of a quality assurance program requires Trustee commitment and support as well as the involvement of the entire staff involved in the NRDA, and that every participant in the NRDA plays an integral part in quality assurance.

During the NRDA, valid data is desirable but may not always be available to decision-makers in a cost-effective manner. In such cases, the Council will consider the need to prolong the assessment while new data is collected, or alternatively whether to reach decisions based on reasonable worst case assumptions that compensate for greater uncertainty.

6.5 Information Management

The overarching goal of data management for the Hanford Injury Assessment is to compile and maintain an accurate, efficient, well-documented, and accessible data set (and supporting meta-data), to support the Hanford injury assessment analyses. In addition, the data management system will maintain a library of documents prepared by the Council that documents planning and results of the assessment, and other materials that support the Hanford NRDA. The

following set of documents will be used to facilitate the goal of effective data management for the Hanford Injury Assessment:

- Data Management Plan (DMP) - Describes how data will be identified, compiled, integrated and ultimately stored and accessed through the Hanford DMS.
- Data Management System Conceptual Framework (Conceptual Framework) - Describes how the Data Management System (DMS) would be structured and developed.
- Quality Management Plan (QMP) –Provide a blueprint for how the Council will plan, implement, and assess its quality systems for work performed by or on behalf of the Council.
- Data Gap Report – Describes and assesses the topical, geographic, and temporal coverage of readily available, known electronic sources of Hanford environmental data.

Since the Hanford Reservation was established in 1943, a tremendous volume of environmental data has been collected both at the site and from adjacent lands and waterways. These data are presently stored in a disparate array of electronic and hard copy repositories held by dozens of entities. These account for millions of records. The Council’s Data Management Plan was developed to guide the identification, acquisition, consolidation, maintenance, and sharing process for information across multiple data repositories, as well as to provide structure for the collection and storage of newly-collected data.

A contractor has been hired to implement, operate and maintain the DMS. Following the guidelines set forth in the DMS Conceptual Framework, the contractor is responsible for integrating, validating, and storing data in a repository designed in conjunction with the Council. Data relevant to the Hanford NRDANRDA will be compiled from other DOE programs and contractors (who are managing recent and historic Hanford information), and from other available sources identified by the Council and TWGs. The data system will also incorporate data from Council contractors and cooperators generating new information as part of the NRDA, including information from injury assessment studies and derived maps, along with findings and summaries of data analyses. The contractor will access this data, metadata, models, and will validate and store it in the DMS. The data transferred to the DMS and provided to the Trustees will be prepared for use in data analysis, geospatial analysis, and habitat modeling in Phase II of the injury assessment. The DMS has been designed using standard “off the shelf” hardware and software for ease of use, access, and maintenance by the Council. The DMS will be transportable to the Council or other contractors if the contract is terminated. The DMS and all information within the DMS will remain the property of the Council during the contract and after fulfillment of the contract. The contractor will be responsible for:

- Data Management
- Data Stewardship for GIS and Non-GIS Data
- Document Management
- Data Access Coordination

The Council Administrative Record will be maintained to facilitate the NRDA process by providing a publicly available, permanent repository for materials documenting the Council’s process and information basis for making final, consensus-based decisions about damage assessment and restoration actions. The Administrative Record may also contain sufficient

information to support potential judicial review of respective Trustee's decision-making processes in making NRDA decisions.

The Hanford NRDA Administrative Record Procedures Manual, which provides detailed information and guidance regarding the collection, arrangement, and indexing of records within the Administrative Record, is included in the Council Administrative Record.

6.7 Public Involvement

One goal of public participation activities is to increase public awareness, understanding of, and support for the Hanford NRDA process. Another goal is to solicit comments and feedback from the interested public on the NRDA process and key documents/plans that guide the process at Hanford. The Council will communicate with the public at each major step of the process by releasing documents for public review and soliciting discussion and comments; the Council will modify their approach as appropriate based on public comment. The first major step of the Hanford NRDA process was development of the IAP. The IAP was issued for public review in November, 2012 and a public meeting was held in Richland in December 2012 to discuss comments and answer questions. Public comments were compiled and resolved by the Council. The plan was modified and finalized accordingly.

Analogous to process used for review and comment on the IAP, the public will be invited to comment and provide input on any substantive future changes in the IAP and on other key NRDA planning documents and reports as required. Drafts of each of these documents will be made available for review by stakeholders, including other affected Federal or State agencies or Indian Tribes, and other interested member of the public for a period of at least 30 calendar days. Public comments received during this comment period will be considered for inclusion in the final planning documents.

Consistent with 43 CFR § 11, a 30-day minimum notice period will be offered following the release of the documents described above. When necessary, formal notice will be achieved by publication in the *Federal Register*. Informal notice will also be given on Trust organization websites, through press releases and paid notices in local newspapers in the region, and by direct mailings. Mailing lists will be developed from existing federal and state lists. Public meetings will be scheduled approximately half way through review period(s) to answer questions on the documents and collect comments. Documents will be available directly from designated Trustee contacts and on the Trustee websites (<http://www.hanfordnrda.org/>). Documents will also be available at DOE information repositories, at the Hanford NRDA Administrative Record, housed at 2440 Stevens, Richland WA and on the DOE Hanford web site at www.Hanford.gov.

The Hanford NRDA Public Involvement Plan provides additional detail on public involvement and is available on the Hanford NRDA web site.

6.8 Project Closeout and Transition

The purpose of the closeout effort is to ensure the Trustees that resources injured as a result of hazardous contaminants will be restored, Council participation in this phase of the project is complete or, if items remain to achieve completion, they are clearly and definitively identified. Documentation relied upon for decision making will be stored in accordance with the Hanford Administrative Record Procedures Manual, and with the records retention processes of individual trust governments.

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