Explanation of Significant Differences

for the

100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision

Hanford Site
Benton County, Washington

March 2011

SITE NAME AND LOCATION

U.S. Department of Energy 100-NR-1 Operable Unit
Hanford Site
Benton County, Washington

INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

Remediation of waste sites at the 100-N Area of the Hanford Site (Figure 1) is being conducted under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA, 42 U.S.C. 9601 et seq.) in accordance with two Interim Action Records of Decision (RODs). One ROD, issued in January 2000, selects remedial actions for two *Resource Conservation and Recovery Act* (RCRA) regulated units and an associated waste site within the 100-N Area. The other ROD (and the subject of this Explanation of Significant Difference [ESD]) addresses waste sites, unplanned releases, spills, and associated piping in the 100-NR-1 Operable Unit (OU) and underlying groundwater, designated as the 100-NR-2 OU. The Washington State Department of Ecology (Ecology – the lead regulatory agency), the U.S. Environmental Protection Agency (EPA – the non-lead regulatory agency), and the U.S. Department of Energy (DOE – the responsible agency), hereinafter referred to as the Tri-Parties, are issuing this ESD to provide public notice of significant changes to the ROD for the 100-NR-1 OU located on the Hanford Site (Figure 1). The ROD is as follows:

- The *Interim Remedial Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-NR-1/100-NR-2 ROD) (EPA 1999). This ROD was approved on September 30, 1999 and revised via an ESD in 2003 (EPA 2003).

The location of the OU addressed in the ROD is shown in Figure 1.

An ESD is required when a remedial action differs significantly from the remedy selected in the ROD with respect to scope, performance, or cost, but the overall cleanup approach is not fundamentally altered. Under this ESD, 45 additional waste sites will potentially be remediated via the Remove, Treat (if necessary) and Dispose (RTD) remedy selected in the original ROD. Inclusion of these additional waste sites will significantly change the scope and cost of the remedy, but will not fundamentally alter the cleanup approach selected in the 100-NR-1/100-NR-2 ROD. The ROD, as amended by this ESD, remains protective and continues to meet ARARs as determined at the time of issuance of the ROD.

Statutory Citation for an Explanation of Significant Differences

The Tri-Parties are issuing this ESD in accordance with Section 117(c) of CERCLA and Section 300.435(c)(2)(i) of the "National Oil and Hazardous Substances Pollution Contingency Plan" (NCP) (40 CFR 300). This ESD provides public notice of the changes, identified herein,

to the remedy selected in the ROD. DOE will publish notice of the availability and a brief description of this ESD, which includes the reasons for the differences, in the *Tri-City Herald*. A detailed description of the waste sites being added through this ESD is available in the annual Waste Management Units Report (DOE/RL-88-30, Rev 20, available in the Administrative Record or online at www.hanford.gov/files.cfm/DOERL-88-30_R20.pdf [DOE-RL 2011]). In accordance with Section 300.435(c)(2)(i)(A) and 300.825(a)(2) of the NCP, this ESD will become part of the Administrative Record for the 100-NR-1 and 100-NR-2 Interim Remedial Action ROD (100-NR-1/100-NR-2 ROD), which is available for review at the following location:

U.S. Department of Energy, Richland Operations Office
Administrative Record
2440 Stevens Center Place, Room 1101
Richland, Washington 99354
Telephone: (509) 376-2530
URL: http://www2.hanford.gov/arpir/
Hours of operation, Monday through Thursday 7:00 am – 4:40 pm

This ESD will also be available electronically for review at the following information repositories:

Public Information Repositories

Public Access Room 2440 Stevens Center, Room 1101 P.O. Box 950, Mail Stop H6-08 Richland, WA 99354	Phone: (509) 376-2530 Fax: (509) 376-4989 POC: Heather Childers URL: http://www2.hanford.gov/arpir/
Suzzallo Library University of Washington P.O. Box 352900 Seattle, WA 98195-2900	Phone: (206) 543-4664
DOE-RL Public Reading Room Washington State University Consolidated Information Center Room 101L 2770 University Drive Richland, WA 99354	Phone: (509) 372-7443

Gonzaga University
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East 502 Boone
Spokane, WA 99258-0001

Phone: (509) 323-3834

Portland State University
Branford Price Millar Library
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Portland, OR 97207-1151

Phone: (503) 725-4709

SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

Nine water-cooled, graphite-moderated reactors were constructed along the Columbia River at the Hanford Site between 1943 and 1963. The 100-N Reactor, the last plutonium production reactor to be built at Hanford, is situated in the 100 Area in the northern part of the Hanford Site on a broad strip of land along the Columbia River about 48 km (30 mi) northwest of the city of Richland, Washington. The 100-N Reactor differs from the other reactors at Hanford, not only because of its closed-loop cooling system, but because it was designed as a dual-purpose reactor capable of producing both special nuclear material and steam generation for electrical power.

The N Reactor operated between 1963 and 1987. Byproduct steam generated from reactor operation was used to produce electricity in the adjacent Hanford Generating Plant (HGP), a Bonneville Power Administration switching station. The 100-N Reactor went into production in December 1963. The HGP was completed and started producing electrical power in April 1966. Both the reactor and the generating plant operated continuously, except during periodic shutdowns for maintenance and repairs, until January 1987. The reactor was retired in October 1989, and was permanently shut down in October 1991.

Activities conducted in support of operation of the nine reactors within the 100 Area resulted in the creation of hundreds of waste sites and contamination of the soil and groundwater. Primary contaminants include radionuclides and inorganic constituents. In November 1989, the 100 Area was listed on the National Priorities List under CERCLA. Since then, sampling and remediation activities have been ongoing in the 100 Area, and several interim remedial action RODs have been issued to address cleanup of contaminated soil, structures and debris.

Two CERCLA interim remedial action RODs have been issued for the 100-N Area. One, issued in January 2000, addresses cleanup of contaminated soils, structures, and pipelines associated with two *Resource Conservation and Recovery Act* (RCRA) treatment, storage and disposal (TSD) units and an associated waste site. The other CERCLA interim remedial action ROD (the 100-NR-1/100-NR-2 ROD [EPA 1999]) was issued in September 1999, and addresses cleanup of 100-NR-1 Operable Unit (OU) source waste sites (e.g., contaminated soil, in-ground structures, and debris disposal waste sites) as well as the underlying groundwater (the 100-NR-2 OU). It is the 100-NR-1 portion of the 1999 ROD that is being significantly changed by this ESD.

The selected remedy for the 100-NR-1 source waste sites (excluding the deep and shallow petroleum-contaminated waste sites and shoreline waste sites) established in the ROD consists of the following components:

- Per the Tri-Party Agreement, DOE is required to submit the remedial design report, remedial action work plan, and sampling and analysis plan as primary documents. These documents and associated documents concerning the planning and implementation of remedial design and remedial action shall be submitted to Ecology for approval prior to the initiation of remediation. The 100 Area remedial design report and remedial action work plan may be revised as an alternative to submitting new documents. All work required under this approved remedial action must be done in accordance with approved plans and ARARs. [Note: The remedial design and remedial action work plan previously approved by Ecology will be used to perform remediation work associated with the waste sites added in this ESD.]

- Prior to beginning remedial action or excavation, a cultural and natural resources review will be conducted.

- Remove and stockpile any uncontaminated overburden that needs to be moved to gain access to contaminated soils and, to the extent practicable, use this overburden for backfilling excavated areas.

- The extent of remediation of the waste sites will be as follows:

  - For remediation of the top 4.6 m (15 ft) below surrounding grade or the bottom of the engineering structure, whichever is deeper, remove until contamination levels are (1) demonstrated to be at or below MTCA Method B levels for nonradioactive chemicals, and achieve 15 mrem/year above background for radionuclides for rural residential exposure, and (2) demonstrated to provide protection of the groundwater and Columbia River. Contaminant levels will be reduced so concentrations reaching the groundwater or the Columbia River do not exceed MTCA Method B levels, federal and state MCLs, or federal and state ambient water quality criteria (AWQC), whichever is most restrictive.

  - For waste sites where the engineered structure and/or contaminated soil and debris begins above 4.6 m (15 ft) and extends to below 4.6 m (15 ft), the engineered structure (at a minimum) will be remediated so the contaminant levels are demonstrated to be below MTCA Method B levels for nonradioactive chemicals and the 15 mrem/yr residential dose level and are at levels that provide protection of groundwater and the Columbia River. Any residual contamination present below the engineered structure and at a depth greater than 4.6 m (15 ft) shall be subject to several factors in determining the extent of remediation, including reduction in risk by decay of short-lived radionuclides (half-life less than 30.2 years), protection of human health and the environment, remediation costs, sizing of the ERDF, worker safety, presence of ecological and cultural resources, the use of institutional controls, and long-term monitoring costs. The extent of remediation must ensure that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. For nonradioactive contaminants, MTCA as it was in effect at the time of the interim action ROD signature specified that concentrations of residual

contaminants in soil are considered protective of groundwater if levels do not exceed 100 times the groundwater cleanup levels established in accordance with WAC 173-340-720. [former WAC 173-340] [Note: Subsequent changes to this and other ARARs will be considered at the time of final ROD issuance.] If residual concentrations exceed cleanup levels calculated using the 100 times rule, site specific modeling will be performed to provide refinement on contaminants found to simulate actual conditions at the waste site. For radionuclides, groundwater and river protection may be demonstrated through a technical evaluation using the computer model RESRAD. The decision of whether to proceed with the remove/dispose alternative below 4.6 m (15 ft) or the bottom of the engineered structure, whichever is deeper, will be made by Ecology on a site-by-site basis. A public comment period of no less than thirty (30) days will be required prior to making any determination on the balancing factors.

- The measurement of contaminant levels during remediation will rely on field screening methods. Appropriate confirmational sampling of field screen measurements will be taken to correlate and validate the field screening. After field screening activities have indicated that cleanup levels have been achieved, a more extensive confirmational sampling program will be undertaken that routinely achieves higher levels of quality assurance and quality control that will support the issuance of an interim remedy CERCLA closeout report for the waste site.

- After a site has been demonstrated to achieve cleanup levels for RAOs, it will be backfilled and re-vegetated. To the extent practicable, removed and stockpiled uncontaminated overburden will be used for backfilling of excavated areas. Re-vegetation plans will be developed as part of remedial design activities. Efforts will be make to avoid or minimize impacts to natural resources during remedial activities, and the Natural Resources Trustees and Native American Tribes will be consulted during mitigation and restoration activities.

- Pipelines associated with the units will be removed and disposed or sampled to determine if they meet remedial action objectives and can be left in place.

- Treatment of excavated soils will be conducted before disposal, as required, to meet RCRA land disposal restrictions and the ERDF waste acceptance criteria.

- Excavated contaminated soils, structures, and pipelines will be transported to ERDF for disposal. Excavation activities will follow all appropriate construction practices for excavation and transportation of hazardous materials and will follow as low as reasonably achievable (ALARA) practices for remediation workers. Dust suppression during excavation, transportation, and disposal will be implemented as necessary.

- Post-remediation monitoring of the vadose zone and groundwater will be performed to confirm the effectiveness of remediation efforts and accuracy of modeling predictions associated with the selected remedy.

- Institutional controls and long-term monitoring will be required for waste sites where wastes are left in place and preclude an unrestricted land use. Institutional controls selected as part

of the remedy are designed to be consistent with the interim action nature of this ROD. Additional measures may be necessary to ensure long-term viability of institutional controls if the final remedial actions selected for the 100 Area does not allow for unrestricted land use. Any additional controls will be specified as part of the final remedy. The following institutional controls are required as part of this interim action:

- DOE will continue to use a badging program and control access to the waste sites associated with this ROD for the duration of the interim action. Visitors entering any of the waste sites associated with this Interim Action ROD are required to be escorted at all times.

- DOE will utilize the on-site excavation permit process to control land use, well drilling and excavation of soil within the 100 Area OUs to prohibit any drilling or excavation except as approved by Ecology.

- DOE will maintain existing signs prohibiting public access.

- DOE will provide notification to Ecology upon discovery of any trespass incidents.

- Trespass incidents will be reported to the Benton County Sheriff's Office for investigation and evaluation for possible prosecution.

- DOE will take the necessary precautions to add access restriction language to any land transfer, sale, or lease of property that the U.S. Government considers appropriate while institutional controls are compulsory, and Ecology will have to approve any access restrictions prior to transfer, sale, or lease.

- Until final remedy selection, DOE shall not delete or terminate any institutional control requirement established in this Interim Action ROD unless Ecology has provided written concurrence on the deletion or termination and appropriate documentation has been placed in the Administrative Record.

- DOE will evaluate the implementation and effectiveness of institutional controls for the 100-NR-1 and 100-NR-2 OUs on an annual basis. The DOE shall submit a report to Ecology by July 31 of each year summarizing the results of the evaluation for the preceding calendar year. At a minimum, the report shall contain an evaluation of whether or not the institutional control requirements continue to be met and a description of any deficiencies discovered and measures taken to correct problems. (Note: The reporting requirement was modified by the 2003 ESD [EPA 2003] and the *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions* [DOE-RL 2002] to establish reporting as part of the CERCLA 5-year review, along with an annual IC assessment update during the EPA and Ecology Are Unit Manager's Meetings every September.)

- Because this is an interim action and wastes will continue to be present in the 100 Area until such time as a final ROD is issued and final remediation objectives are achieved, a five (5)-year review will be required.

BASIS FOR THE DOCUMENT

As described in the 100-NR-1/100-NR-2 ROD (EPA 1999), the 100-NR-1 OU includes waste sites contaminated as a result of intentional discharges of contaminated liquid effluents to operational facilities such as cribs, neutralization basins, septic systems, and french drains; unplanned releases or leaks from piping systems and storage tanks; and the placement of (sometimes burning) construction debris, used equipment, and office/industrial waste at surface disposal areas. The principal contaminants of concern for the 100-NR-1 OU are radionuclides, metals, and petroleum hydrocarbons.

The 1999 100-NR-1/100-NR-2 ROD selected the remedial action for 81 waste sites and associated pipelines. Since the time of the ROD, 45 newly discovered waste sites have been identified during ongoing remedial activities at the 100-N Area. Details of these waste sites are included in Table 2. As with the waste sites in the original ROD, these waste sites consist of facilities such as french drains and septic systems that received intentional discharges, as well as unplanned release waste sites from leaks and spills, and surface disposal areas. Radionuclides, metals, petroleum hydrocarbons, and other chemical contaminants may be present at these waste sites, consistent with the contaminants of concern identified for waste sites in the original ROD.

The waste sites addressed in this ESD, have been determined by the Tri-Parties to either require remediation or to potentially require remediation ("candidate waste sites") due to the release or threat of release of hazardous substances into the environment. For candidate waste sites, additional characterization is needed to confirm whether the waste sites require remediation, as well as to confirm that the contaminants are consistent with those addressed in the original ROD (and thus the waste site is eligible for remediation using the selected RTD remedy). Candidate waste sites will be characterized in accordance with the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92 [DOE-RL 2007]), which is approved by EPA and Ecology. Following receipt and evaluation of analytical data, candidate waste sites will be addressed as follows:

- **Waste sites that meet RAOs and cleanup levels.** These waste sites will be proposed to Ecology for closeout with no remediation based upon a finding that contaminant levels are below the RAOs and cleanup levels established in accordance with the 100-NR-1/100-NR-2 ROD.

- **Waste sites that require remediation and that qualify for the RTD remedy.** Waste sites that are shown, through sampling and analysis, to be consistent in nature and contaminants with the waste sites identified in the 100-NR-1/100-NR-2 ROD and that have contaminant levels above RAOs and cleanup levels will be remediated in accordance with the RTD remedy selected in the ROD. No prior Ecology approval will be required to implement the remedy for these waste sites. Closeout of remediated waste sites will follow the process established in the ROD and approved remedial design report/remedial action work plan.

- **Waste sites that may require remediation, but that do not meet the criteria for implementation of the RTD remedy.** Waste sites that are shown through sampling and

analysis to exceed RAOs and cleanup levels, but that are not consistent in nature and contaminants with the waste sites identified in the 100-NR-1/100-NR-2 ROD, will be identified to Ecology for consideration under future CERCLA decisions (e.g., in the final ROD for the 100-N Area).

The Tri-Parties have determined through visual inspection, use of process knowledge, and/or sampling (as described in the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites [DOE-RL 2007]) that the waste sites identified for RTD in Table 2 are consistent in nature and contaminants with the waste sites identified in the 100-NR-1/100-NR-2 ROD, and that most of the candidate waste sites in the table will be shown through sampling and analysis to be consistent in nature and contaminants with waste sites in the ROD. The summary information included in Table 2, in conjunction with the annual Waste Management Units Report (DOE/RL-88-30, Rev 20, available in the Administrative Record or online at www.hanford.gov/files.cfm/DOERL-88-30_R20.pdf [DOE-RL 2011]) demonstrate that the waste sites identified for RTD meet the site profile and will be included in the ROD. Therefore, the Tri-Parties conclude that the RTD remedy selected in the ROD is appropriate for addressing cleanup of these waste sites. Adding these wastes sites is, however, expected to result in a significant increase in the waste volume and remediation cost identified in the original ROD. As a consequence, issuance of this ESD is necessary. Table 1 shows the estimated waste volume and remediation costs associated with the original ROD, the waste sites added by this ESD (assuming all the waste sites meet the criteria for implementation of the RTD remedy and require remediation), and the difference. (Note: At the current time, remediation activities associated with the 1999 100-NR-1/100-NR-2 ROD are just beginning. As a consequence, at this time there are no changes to the estimated waste volume and costs indicated in the ROD for the waste sites included therein.) Cost estimates for each individual waste site are listed in Table 2.

Table 1. Estimated Waste Volume and Remediation Cost Comparisons.

Parameter	1999 100-NR-1/100-NR-2 ROD	Added by this ESD	Total	% Increase
Waste Volume (Bank Cubic Feet)	4,582,998	2,020,512	6,603,510	44%
Cost ($)	48,745,386	18,765,000	67,510,386	38%

DESCRIPTION OF SIGNIFICANT DIFFERENCES

The Tri-Parties have determined that the 45 waste sites identified in Table 2 either contain or may contain CERCLA hazardous waste above cleanup levels identified in the 100-NR-1/100-NR-2 ROD, thus requiring remedial action. Additionally, the Tri-Parties conclude that these waste sites are consistent in nature and contaminants (or, for candidate waste sites, will be sampled to determine if they are consistent in nature and contaminants) with the waste sites identified in the 100-NR-1/100-NR-2 ROD, and therefore RTD is suitable for remediation of these additional waste sites. Candidate waste sites found to meet RAOs and cleanup levels established for the 100-NR-1/100-NR-2 ROD will be proposed to Ecology for no further action. Any candidate waste sites found to be inconsistent in nature or contaminants with the waste sites

in the 100-NR-1/100-NR-2 ROD will be considered for remediation, if appropriate, in accordance with a future CERCLA decision document.

Remediation of these 45 additional waste sites in accordance with the RTD remedy selected in the 100-NR-1/100-NR-2 ROD represents a significant difference in scope and cost from the original ROD. The estimated total cost for the 100-NR-1 waste site remediation (assuming all 45 newly identified waste sites require remediation via the RTD remedy) has increased from $48,745,386 to $67,510,386. The estimated remediation volume associated with the additional 45 waste sites is 2,020,512 bank cubic feet (BCF), raising the total estimated volume to 6,603,510 BCF, a 44% increase from that estimated in the original ROD.

Other than cost, waste volume, and number of waste sites, implementation of this ESD is not anticipated to result in any change to the expected outcome of remediation as established in the 100-NR-1/100-NR-2 ROD. RAOs, cleanup levels, and applicable or relevant and appropriate requirements established in the ROD are not being changed via this ESD, nor are implementation aspects associated with the RTD alternative. Subsequent changes to ARARs will be considered at the time of final ROD issuance. Although the number of waste sites to be addressed is increased from 81 (plus pipelines) to a maximum of 126, all waste site remediation actions are expected to be completed by the year 2018, the completion date identified in the original 100-NR-1/100-NR-2 ROD.

NON-LEAD REGULATORY AGENCY COMMENTS

EPA, as the non-lead regulatory agency, concurs with the ESD to the 100-NR-1/100-NR-2 ROD (EPA 1999).

STATUTORY DETERMINATIONS

This remedy satisfies CERCLA Section 121. The interim action remedy selected in the 100-NR-1/100-NR-2 ROD (EPA 1999), as modified by this ESD, remains protective of human health and the environment, complies with applicable or relevant and appropriate federal and state requirements as determined at the time of the ROD, is cost effective, and uses permanent solutions and alternative treatment technologies to the maximum extent practicable. In addition, the remedy employs treatment (as appropriate) to meet land disposal restrictions, as well as the ERDF waste acceptance criteria.

PUBLIC PARTICIPATION

The public participation requirements set forth in 40 CFR 300.435(c)(2)(i) of the NCP are met through the issuance of this ESD, and associated informational sheet, and through notification to the public via newspaper publication placed in the *Tri-City Herald* on April 25, 2011.

REFERENCES

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, as amended.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq.

DOE-RL, 2002, *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions*, DOE/RL-2001-41, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2007, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites*, DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2011, *Hanford Site Waste Management Units Report*, DOE/RL-88-30, Rev. 20, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1999, *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Seattle, Washington.

EPA, 2003, *Explanation of Significant Difference for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Seattle, Washington.

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq., as amended.

WAC 173-340, "Model Toxics Control Act – Cleanup Regulation," *Washington Administrative Code*, January 1996.

Figure 1. Location of the 100-NR-1 and 100-NR-2 Operable Units.

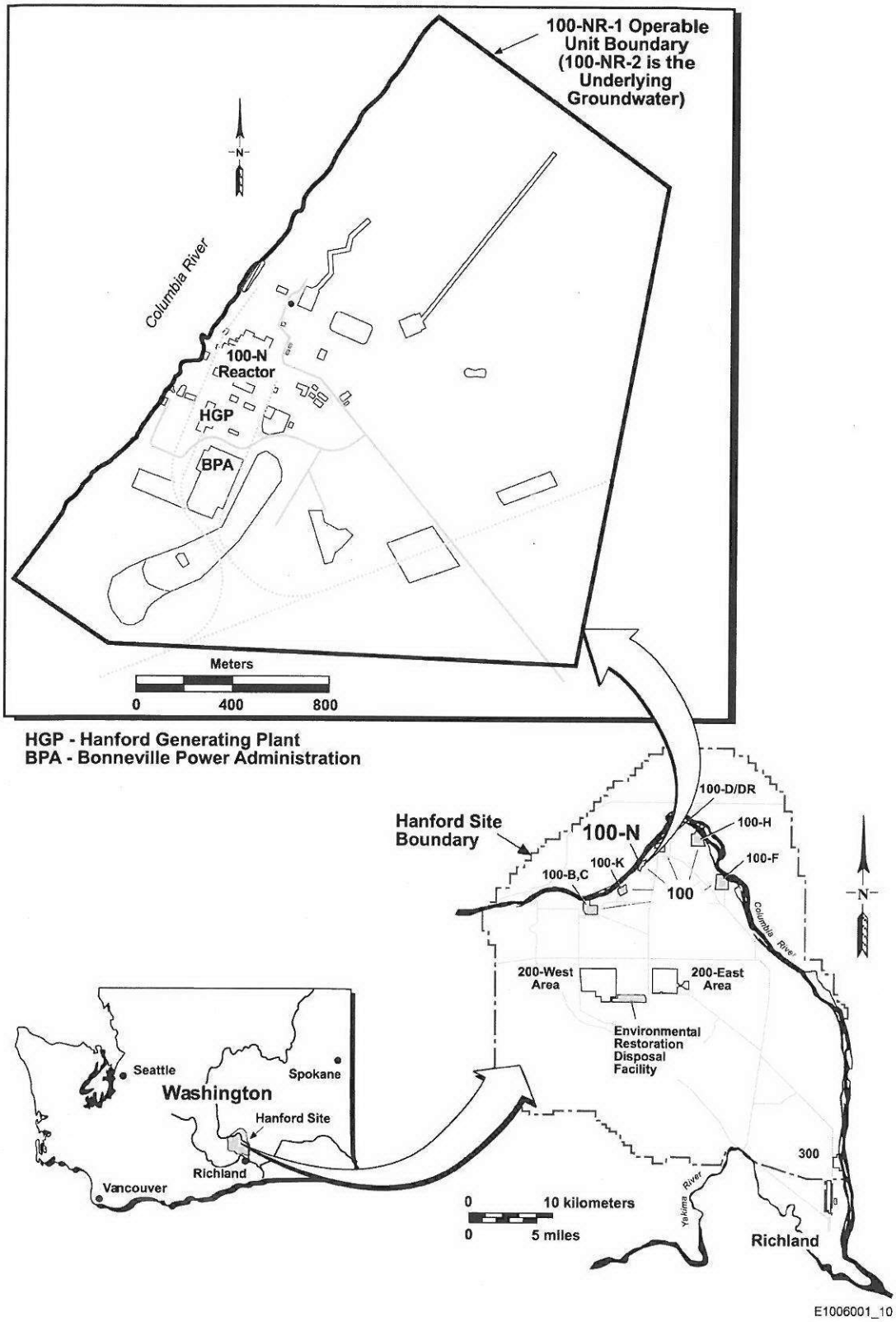

Table 2. Waste Sites Being Added to the 100-NR-1/NR-2 Interim Remedial Action Record of Decision. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge/Comment	Media/ Material	Known or Potential Contamination	Estimated Cost of Site Remediation
100-NR-1	100-N-53, 181-N Building Waste Oil Tank [a]	The site contained an above-ground waste oil tank east of the 181-N pumphouse.	Soil, debris	Chemical contaminants	$177,097
100-NR-1	100-N-54, 151-N Building Drywell, Miscellaneous Stream #727 [a]	French drain made of 1.2-m (4-ft)-inner diameter and 1.65-m (5.42-ft)-outer diameter concrete pipe with steel cover that drained a sink from the 151-N Building.	Soil, debris	Radiological and chemical contaminants	$389,825
100-NR-1	100-N-55, 153-N Building Drywell, Miscellaneous Stream #728 [a]	French drain with 1.2-m (4-ft) steel cover. The site received steam condensate from a condensate pump and drainage from a service sink in the 153-N Building.	Soil, debris	Radiological and chemical contaminants	$389,333
100-NR-1	100-N-57, 1304-N Emergency Dump Tank [b]	Soils remaining under formerly removed 1,892,700-L (500,000-gal) above-ground storage tank with a dome-shaped top.	Soil, debris	Radiological and chemical contaminants	$959,509
100-NR-1	100-N-59, Radioactively Contaminated Soil Northeast of 105-NB Building [b]	Broken underground contaminated pipeline associated with an underground radioactive material location.	Soil, debris	Radiological contaminants	$81,249
100-NR-1	100-N-60, 1314-N Drywell [b]	Drywell that received decontamination fluid from a catch tank.	Soil, debris	Radiological and chemical contaminants	$174,801
100-NR-1	100-N-61, 100-N Water Treatment and Storage Facilities Undergrnd Pipelines [b]	The site encompasses all underground water pipelines used to transport reactor cooling water between water treatment facilities and the 105-N Reactor Building.	Soil, debris	Chemical contaminants	$2,794,395
100-NR-1	100-N-68, N Basin Low Level Radioactive Water Spill [a]	1998 unplanned release of basin water.	Soil, debris	Radiological and chemical contaminants	$201,175

Table 2. Waste Sites Being Added to the 100-NR-1/NR-2 Interim Remedial Action Record of Decision. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge/Comment	Media/ Material	Known or Potential Contamination	Estimated Cost of Site Remediation
100-NR-1	100-N-81, 100-N Kaiser Shops Garnet Sandblasting Material [a]	The site consists of garnet sand and any underlying contaminated soil surrounding the former 1517-N Paint Shop. The garnet sand is purple and covers an area approximately 577 m^2 (690 yd^2).	Soil	Chemical contaminants	$195,003
100-NR-1	100-N-82, 100-N Decontamination Pad [b]	The waste site is composed of the decontamination pad and any underlying soil contamination should it be found to exist.	Soil	Radiological and chemical contaminants	$120,159
100-NR-1	100-N-83, Two Contamination Areas Found Near 116-N-1 [a]	The site consists of two radiologically contaminated areas identified during remediation of the 116-N-1 Crib and Trench.	Soil, debris	Radiological contaminants	$195,003
100-NR-1	100-N-84, 100-N Miscellaneous Pipelines [a]	The site consists of subsites representing all the remaining pipelines in the 100-N Area. Subsites associated with this ESD exclude those contaminated pipelines already included within the scope of the 1999 ROD.	Soil, debris	Radiological and chemical contaminants	$1,756,290
100-NR-1	100-N-85, Gas Station Fuel Tanks [b]	The site is soil contaminated with gasoline and diesel that remained after the removal of two underground fuel storage tanks at the former 1716-NA service station.	Soil	Chemical contaminants, TPH	$95,753
100-NR-1	100-N-86, 151-N Substation Transformer and Oil Circuit Breakers [a]	This site consists of concrete support pedestals for a 230-13.8 kV transformer, the concrete pad for three oil circuit breakers, and any underlying contaminated soils. Analogous sites at other reactor operational areas have had releases of polychlorinated biphenyls and petroleum hydrocarbons to the underlying soil due to routine maintenance and accidental releases during their operations.	Concrete, soil	Chemical contaminants, PCBs	$214,577
100-NR-1	100-N-87, 116-N Ventilation Stack Piping and French Drain [a]	The site consists of the drain piping and french drain for the 116-N ventilation stack.	Soil, pipe, concrete, and debris	Radiological and chemical contaminants	$412,508

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Operable Unit	Site Name	Current Site Knowledge/Comment	Media/ Material	Known or Potential Contamination	Estimated Cost of Site Remediation
100-NR-1	100-N-88, 1143-N French Drain [a]	The site consists of a 0.61-m (24-in.)-diameter french drain and its associated 5.1-cm (2-in.) drain pipeline and underlying soil. Until about 1997, a sink within the facility discharged to this site. The potential existed for the site to have inadvertently received paint solvents and other hazardous liquids from the activities within the building. The sink was removed about 1997 and discharges to this site ceased.	Soil, pipe and debris	Chemical contaminants	$984,334
100-NR-1	100-N-89, 117-NVH French Drain [b]	The french drain is a 61-cm (24-in.)-diameter concrete pipe buried to 91 cm (36 in.) that received discharge from back flushing a raw water supply line in the 117-NVH Valve House. The top of the pipe is at grade and it is filled with gravel. An additional 46 cm (18 in.) of gravel is beneath the pipe. A metal plate covers the pipe.	Soil, concrete, and debris	Chemical contaminants	$308,317
100-NR-1	100-N-90, 100-N Reactor Rod Caves [b]	The rod cave is two 30.5-cm (12-in.) carbon steel pipes buried in the earth berm on the north side of the 117-N Air Filter Building. The west ends of the pipes have aluminum covers; the east ends are buried in the berm. Two vertical pipes for monitoring radiation levels extend through the berm. The rod cave was the temporary storage for used control rods from N Reactor.	Soil, pipe	Radiological contaminants	$120,159
100-NR-1	100-N-91, 100-N Battery Debris [b]	The site consists of a 0.6-m (2-ft)-diameter battery dump. The exterior of the batteries have degraded and the contents mixed into the soil. There is no vegetation growing in the affected area.	Soil, debris	Chemical contaminants	$120,159
100-NR-1	100-N-92, 100-N Stain Area #1 [a]	The site consists of a 3-m (10-ft)-diameter area stained with a white substance resembling dried paint and two 4-L (1-gal) cans.	Soil, debris	Chemical contaminants	$214,577
100-NR-1	100-N-93, 100-N Stain Area #2 [a]	The site consists of potentially contaminated soil. It includes concrete, metal, glass debris, stained soil, suspected friable asbestos, and garnet sand with areas lacking in vegetation.	Soil, debris	Chemical contaminants, asbestos	$214,577
100-NR-1	100-N-94, 100-N Oil Filters #1 [b]	The site consists of the underlying soil and approximately 50 oil filters.	Soil, debris	Chemical contaminants, TPH	$120,159

Table 2. Waste Sites Being Added to the 100-NR-1/NR-2 Interim Remedial Action Record of Decision. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge/Comment	Media/ Material	Known or Potential Contamination	Estimated Cost of Site Remediation
100-NR-1	100-N-95, Hanford Generating Plant (185-N) Septic Tank [b]	This feature consists of a septic tank, associated piping, and underlying soil. The tank received sanitary waste and laboratory waste influent from the 185-N Building via a 2.5-cm (8-in.) cast iron pipe.	Soil, debris	Chemical contaminants	$597,503
100-NR-1	100-N-96, 100-N Military Camp Disposal Pits [a]	This site consists of three separate suspect disposal pits located southwest of the 100-N-47 military camp. The suspect disposal pits were located outside the boundary of the military camp.	Soil, debris	Chemical contaminants	$195,003
100-NR-1	100-N-97, 100-N Oil Filters #2 [b]	This site consists of underlying soil and three oil filters. There is no vegetation growing within the release area.	Soil, debris	Chemical contaminants, TPH	$120,159
100-NR-1	100-N-98, 100-N Stain Area #3 [a]	The site consists of two locations where the surface is stained and no vegetation is growing in the affected area. One location consists of multiple stained spots in a 30-m (98-ft)-diameter area. The other location is a single stained spot approximately 3 m (9.8 ft) in diameter.	Soil, debris	Chemical contaminants	$195,003
100-NR-1	100-N-99, 100-N Oil Filters #3 [b]	The site consists of two locations where oil filters were discarded. The affected areas are lacking vegetation and appear stained.	Soil, debris	Chemical contaminants, TPH	$120,159
100-NR-1	100-N-100, 100-N Oil Filters #4 [b]	This site consists of petroleum-based material released to the ground surface and the underlying soils. The soil is crusted and no vegetation is growing in the affected area. There are four oil filters at this location.	Soil	Chemical contaminants, TPH	$120,159
100-NR-1	100-N-101, 100-N Stain Area #4 [a]	The site consists of the underlying soil. The soil has no vegetation growing in the affected area.	Soil	Chemical contaminants, TPH	$195,003
100-NR-1	100-N-102, 100-N Potentially Contaminated French Drains [a]	This site consists of two discrete locations and underlying soil of potentially contaminated french drains and their associated below-grade piping components.	Soil, debris	Chemical contaminants	$390,907

Table 2. Waste Sites Being Added to the 100-NR-1/NR-2 Interim Remedial Action Record of Decision. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge/Comment	Media/ Material	Known or Potential Contamination	Estimated Cost of Site Remediation
100-NR-1	100-N-103, 100-N Steam Condensate French Drains [a]	This site consists of 12 discrete locations and underlying soil of steam condensate french drains and their associated below-grade piping components.	Soil, debris	Chemical contaminants	$390,907
100-NR-1	116-N-2, 1310-N Chemical Waste Storage Tank, The Golf Ball, 1310-N Waste Storage Area [b]	Soil and debris remaining after demolition of the 1310-N Golf Ball, piping, and ancillary structures.	Soil, debris	Radiological and chemical contaminants	$341,640
100-NR-1	120-N-4, 1310-N Hazardous Waste Storage Area, 1310-N Waste Oil Storage Pad, 1310-N Non-Hazardous Waste Pad [b, c]	The site was a pad approximately 20 by 25 m (70 by 80 ft) surrounded by a concrete berm (curb) and locked chain link fence located immediately south of the 1310-N Facility.	Soil, debris	Chemical contaminants	$120,1597
100-NR-1	120-N-7, 108-N Acid Unloading Facility French Drain [b, c]	The site appears as a vertical broken vitrified clay pipe extending well above grade on a discolored soil mound. The french drain was used to collect sulfuric acid drips from overhead transfer lines via a lead pipe and funnel.	Soil, pipe, and debris	Chemical contaminants	$308,317
100-NR-1	124-N-1, Septic Tank System [b, c]	The site is a septic tank, drain field, and related piping that supported the 163-N Water Treatment Building.	Soil, debris	Chemical contaminants	$597,503
100-NR-1	124-N-9, Septic Tank System [b, c]	The site consists of two septic tanks and a drain field. Each tank has a volume of 11,356 L (3,000 gal), and the drain field has an infiltration surface area of 325 m^2 (3,500 ft^2).	Soil, debris	Chemical contaminants	$597,503
100-NR-1	124-N-10, Sanitary Sewer System [b, c]	The site is a three-pond sewage lagoon facility, a trunk line and other pipelines, two lift stations, manholes, and associated instrumentation.	Soil, debris	Chemical contaminants	$1,880,854

Table 2. Waste Sites Being Added to the 100-NR-1/NR-2 Interim Remedial Action Record of Decision. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge/Comment	Media/ Material	Known or Potential Contamination	Estimated Cost of Site Remediation
100-NR-1	130-N-1, 183-N Backwash Discharge Pond, 126-N-1, 183-N Filter Backwash Pond [b, c]	The site is a natural marsh-like pond that received filter backwash from the 183-N Water Filter Plant.	Soil	Chemical contaminants	$365,977
100-NR-1	600-339, 100 Area Fire Station Drywell [a]	This site consists of a 1.8-m (6-ft)-diameter dry well and associated inlet piping located west of the 609 Building.	Soil, pipe, and debris	Chemical contaminants	$390,907
100-NR-1	600-340, 100 Area Fire Station Soil Stained Areas [a]	This site consists of two locations, one with discolored topsoil and the other with a white granular stained surface area.	Soil	Chemical contaminants	$195,003
100-NR-1	600-347, 100 Area Fire Station Burn Pit [a]	The site consists of an engineered burn pit located north of the 609 Building (Central Industrial Fire Station).	Soil, debris	Chemical contaminants	$195,003
100-NR-1	600-348, 100 Area Fire Station Underground Storage Tanks [a]	The site consists of two locations. The first is the underlying soil from the original 1894-L (500-gal) fire station gasoline tank removed in late 1987. The second site is a 7,571-L (2,000-gal) diesel fuel oil tank and underlying soil used to supply the 609 Building hot water boiler.	Soil, debris	Chemical contaminants	$182,407
100-NR-1	628-2, 100 Area Fire Station Burn Pit [b]	The site is an unmarked pit composed of sand and dirt with sparse vegetation showing signs of stress. The site has ash, debris and soil discoloration.	Soil, debris	Chemical contaminants	$195,003
100-NR-1	1908-N, 1908-N Outfall [b, c]	The site consists of the soils remaining after removal of the concrete outfall structure by D4. The site adjoins the river effluent pipelines (100-N-77) and an emergency outfall flume (100-N-79).	Concrete, soil	Radiological and chemical contaminants	$308,317

Table 2. Waste Sites Being Added to the 100-NR-1/NR-2 Interim Remedial Action Record of Decision. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge/Comment	Media/ Material	Known or Potential Contamination	Estimated Cost of Site Remediation
100-NR-1	2607-FSM, 609 Building Septic Tank 2607-FSM, 100 Area Fire Station Septic Tank, 1607-FSM, 6607-FSM [b]	The 6607-FSM septic tank is a single-chambered, reinforced concrete tank and associated drain field	Soil, pipe and debris	Chemical contaminants	$597,159

[a] Candidate site, further sampling and/or evaluation needed prior to making remove, treat, and dispose (RTD) determination.

[b] Remove, treat, and dispose (RTD) site, site scheduled to go directly to RTD.

[c] Sites included in the original Interim ROD; however, these sites were dismissed in the corrective measures study either because there was believed to be no source of contamination or because it was an active system.

March 2011

Signature sheet for the *Explanation of Significant Differences for the Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units* between the U.S. Department of Energy and Washington State Department of Ecology, with concurrence by the U.S. Environmental Protection Agency.

Daniel D. Opalski, Director
Office of Environmental Cleanup
U.S. Environmental Protection Agency, Region 10

3/9/2011
Date

Signature sheet for the *Explanation of Significant Differences for the Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units* between the U.S. Department of Energy and Washington State Department of Ecology, with concurrence by the U.S. Environmental Protection Agency.

Joe R. Franco
Assistant Manager for River Corridor
U.S. Department of Energy

3/11/2011
Date

Signature sheet for the *Explanation of Significant Differences for the Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units* between the U.S. Department of Energy and Washington State Department of Ecology, with concurrence by the U.S. Environmental Protection Agency.

Jane A. Hedges, Program Manager
Nuclear Waste Program
Washington State Department of Ecology

3/7/11
Date