AR TARGET SHEET

The following document was too large to scan as one unit, therefore, it has been broken down into sections.

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ATTACHMENT 48

Engineering Evaluation/Cost Analysis for the 100-N Area Ancillary Facilities and Integration Plan

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2.0 SITE CHARACTERIZATION

2.2.1.5 Remedial Unit Five

2.2.1.5.1 185-N HGP Turbine Generator Building

The 185-N HGP Turbine Generator Building is a 19,065-m^2 (205,000-ft^2) facility owned by the Washington Public Power Supply System (WPPSS) that housed two 430-megawatt, low-pressure steam turbine generators and associated equipment for generating electrical energy from steam supplied by the 100-N Reactor facility. The land under the HGP is owned by DOE and is part of the 100-N Area. The HGP operated continuously from April 1966 to December 1986. In 1996, Tri-Party Agreement Milestone M-16-01A was modified to require the submittal of necessary CERCLA documentation to support a cleanup decision of the HGP. This document fulfills that milestone. Currently, the responsibilities of the cleanup plans are being negotiated between WPPSS and DOE.

Radiological contamination resulting from transferring 100-N Reactor steam is present in the building. The three SWMUs described below are located within of the 185-N HGP facility and are known to be contributors to the hazardous contamination identified in the facility. Additionally, asbestos-containing materials (ACMs) (e.g., insulation used in piping and floor tiles) are expected to have been used in the facility.

2.2.1.5.2 Description of the SWMUs

- SWMU #2 HGP Building oil storage - Along the interior northwest was of the HGP building is a cinder block building approximately 2.4 by 7.6 m (8 ft by 25 ft). Drums and smaller containers of products (e.g., petroleum, oil, and lubricants) are stored on the floor and shelving. One drum is labeled for used oil. A blind concrete sump (no outlet) is located below the grated floor.

- SWMU #3 HGP Building floor drains, sumps, all piping to the settling pond and outfall - Several floor drains in the basement level of the HGP building collect spills, leaks, and any flood waters and direct them to two main sumps. The sump contents were then discharged to the settling pond (the settling pond is SWMU # 6, which is addressed in the 100-NR-1 and 100-NR-2 CMS).

- SWMU #4 Turbine oil filter unit - The turbine oil cleaning systems are in the basement of the HGP building along the northeast and southeast walls. Each unit consists of a steel tank, 0.7 m^2 by 1.2 m (8 ft^2 by 4 ft) tall as well as a below-grade sump approximately 0.5 m^2 by 1.8 m (6 ft^2 by 6 ft) deep. The tank has a series of filters used when moving the oil from the turbines and is surrounded by a concrete berm that is approximately 15 cm (6 in.) high.

2.2.1.5.3 1908-NE HGP Outfall Structure

The 1908-NE HGP Outfall Structure is a reinforced concrete, box-shaped structure that extends deep into the ground. This facility was used as a sump for several discharge lines and to drop the liquid discharge level for overflow to the river. An unknown amount of radioactive contamination exists within the structure because the discharge lines were associated with the reactor operations. The structure is no longer operational. The 1908-NE HGP Outfall Structure is also identified as SWMU #7.

2.2.1.5.4 1716-NE Maintenance Garage (Storage Garage Building)

The 1716-NE Maintenance Garage is an approximately 190-m^2 (2,100-ft^2), 5-m (17-ft) tall, structural-steel-frame building with metal siding and insulated wall panels. The garage is similar in design to a commercial gas station with a front office area, four vehicle bays with roll-up doors, and a back room in the northeast corner used to store paint and maintenance supplies, used oil, and solvents. The back room contains unknown amounts of miscellaneous hazardous materials and is known as SWMU #8. The facility is no longer used.

Table 2.1. Suspected Contaminants in 100 N Area Ancillary Facilities

RU	Facility	Hazardous Substances
Ancillary Facilities that Interfere with Waste Site Remediation		
RU-1	105-N to 107-N Pipe Trench	Radioactive contamination
RU-1	107-N Basin Recirculation/Cooling Building	Radioactive contamination Miscellaneous chemicals Potential mercury (gauges, switches, drains) Lead (shielding/bricks) PCBs (in light ballasts and gear oils) Oil/petroleum products Potential asbestos
RU-1	1300-N Emergency Dump Basin	Radioactive contamination Potential asbestos (insulation)
RU-1	1304-N Emergency Dump Tank	Radioactive contamination
RU-1	1722-N Decontamination Building	Potential radioactive contamination Potential miscellaneous chemicals Potential solvents Potential asbestos
RU-1	1303-N Spacer Silos	Radioactive contamination Potential lead (paint shielding)
RU-2	184-N Power House	Oil/petroleum products Asbestos (insulation) Potential radioactive contamination Potential lead Potential solvents Mercury (gauges, switches, drains)
RU-2	184-NA Power House Annex	Oil/petroleum products Asbestos (insulation) Potential radioactive contamination
RU-2	184-NB Air Handler Main Building	Miscellaneous chemicals Potential radioactive contamination Potential asbestos
RU-3	163-N Demineralized Water Plant	Oil/petroleum products Radioactive contamination Miscellaneous chemicals Potential mercury Potential asbestos (insulation)
RU-4	116-N Ventilation Stack	Radioactive contamination Asbestos

RU	Facility	Hazardous Substances
Ancillary Facilities that Interfere with Waste Site Remediation		
RU-4	119-N Air Sample Facility	Radioactive contamination Potential miscellaneous chemicals Potential asbestos
RU-4	13-N Storage Facility	Potential radioactive contamination Potential lead (paint) Miscellaneous chemicals
RU-4	1310-N Radioactive Liquid and Waste Treatment Facility	Radioactive contamination Asbestos (insulation) Miscellaneous chemicals Lead (shielding/bricks)
RU-4	1314-N Liquid Disposal Building	Lead (shielding/bricks) Solvents Radioactive contamination Potential asbestos (insulation)
RU-4	1322-N Waste Treatment Pilot Facility	Lead (shielding/bricks) Potential solvents Radioactive contamination Potential asbestos (insulation)
RU-4	1322-NA Effluent Water Pilot Plant	Lead (shielding/bricks) Potential solvents Asbestos (insulation) Radioactive contamination
RU-5	185-HGP Turbine Generator Plant	Oil/petroleum products Potential PCB (gear oil) Potential radioactive contamination Asbestos (insulation) Mercury (gauges, switches) Lead
RU-5	1908-NE HGP Outfall	Potential radioactive contamination
RU-5	1716-NE Maintenance Garage	Miscellaneous chemical solvents Oil/petroleum products Lead (paint) Potential asbestos

Facility	Hazardous Substances
100-N Facilities that do not Interfere with Waste Site Remediation	
105-NA Emergency Diesel Enclosure	Oil/petroleum products Potential radioactive contamination Potential asbestos (insulation)
105-NE Fission Products Trap	Radiological contamination Potential oil/petroleum products Potential mercury Asbestos Potential solvents Potential miscellaneous chemicals Potential lead (shielding)
108-N Chemical Unloading Facility	Miscellaneous chemicals Potential oil/petroleum products Potential radioactive contamination Lead piping Potential asbestos (insulation)
117-NVH Valve Control House	Radioactive contaminations Solvents Potential asbestos (insulation)
119-NA Stack Air Sampling and Monitoring	Potential radioactive contamination Potential miscellaneous chemicals Potential asbestos (insulation)
166-N Fuel Oil Storage Building	Asbestos (insulation) Oil petroleum products Potential PCB (light ballasts) Potential miscellaneous chemicals
181-N River Pumphouse	Oil/petroleum products Potential asbestos (insulation)
181-NA Pumphouse Guard Tower	Oil/petroleum products Potential asbestos (insulation)
181-NB #3 Diesel Pumphouse	Oil/petroleum products Asbestos (insulation)
182-N High Lift Pumphouse	Oil/petrolcurn products Asbestos (insulation) Mercury (switches, gauges) Potential radioactive contamination Potential solvents
184-NF Chemical Injection	Miscellaneous chemicals
1312-N Liquid Effluent Retention Facility	Potential radioactive contamination
1313-N Change Control Building	Radioactive contamination Potential miscellaneous chemicals Potential asbestos (insulation) Potential oil products
1315-N Diversion Valve House	Radioactive contamination Potential oil/petroleum products Potential asbestos
1316-N Valve House	Radioactive contamination Potential oil/petroleum products Potential asbestos

Facility	Hazardous Substances
100-N Facilities that do not Interfere with Waste Site Remediation	
1316-NA Valve Vault	Radioactive contamination Potential oil/petroleum products Potential asbestos
1316-NB Magnetic Flowmeter Vault	Radioactive contamination Potential oil/petroleum products Potential asbestos
1316-NC Turbine Meter Vault	Radioactive contamination
1322-NB Crib Effluent Iodine Monitoring Building	Lead (shielding/pigs) Mercury (gauges, switches) Miscellaneous chemicals Radioactive contamination Potential asbestos
1322-NC Crib Sample Pump Pit	Potential solvents Radioactive contamination Potential asbestos
1327-N Diversion Valve House	Radioactive contaminants Potential oil/petroleum products Potential asbestos
1715-N Oil Tanks	Oil/petroleum products Potential radioactive contamination
1802-N Pipe Trestle (109-N to 185-N Building)	Asbestos Potential radioactive contamination
1900-N Water Supply Tanks	Asbestos (insulation) Potential radioactive contamination
1908-N Outfall Structure	Potential radioactive contamination
181-NE HGP River Pump House	Oil/petroleum products Potential asbestos (insulation)
1714-NB Warehouse	Potential oil/petroleum products Potential asbestos Potential radioactive contamination Potential solvents
1712-N Insulator Shop	Miscellaneous chemicals Lead (paint) Solvents Potential asbestos
1703-N Patrol Headquarters	Asbestos (insulation)
1701-NE Gatehouse	Potential asbestos (insulation)
1605-NE Observation Post	Potential asbestos (insulation)
117-N Ventilation Filter Facility	Radioactive contamination

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5.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

5.2 COMPLIANCE WITH ARARS

The ARARs are standards, requirements, criteria, or limitations promulgated under Federal or state environmental laws that must be met or waived for actions conducted under CERCLA. Only the substantive provisions of requirements that are ARARs must be met (or waived) for actions conducted entirely onsite (CERCLA, Section 121 [d][2]). Such onsite actions are exempted from obtaining Federal, state, and local permits (CERCLA, Section 121 [e][1]). Also, to be considered requirements are nonpromulgated standards, including DOE orders, proposed regulations, and regulatory guidance that may be referenced to the extent necessary for the response action to be adequately protective.

Because no action is being taken, Alternative One would not meet ARARs for cleanup. All other alternatives would meet ARARs requiring protection of human health and the environment. Key ARARs for the other alternatives include waste management standards, air emission control standards, radiation control standards, and standards for protection of cultural and ecological resources. Proposed environmental cleanup standards for remediation of the 100-N Area soil (proposed soil cleanup standards of 15 mrem/yr above background and MTCA Method B) are addressed in the 100-NR-1 and 100-NR-2 CMS; therefore, they are not discussed in this document. Other standards to be met by the response action include various DOE, Federal, and state worker safety standards.

5.2.1 Columbia River Protection Standards

40 CFR 122 addresses technology-based limitations and standards, control of toxic pollutants, and monitoring for discharges to United States waters, including stormwater. Public Law 100-605, *Study of the Hanford Reach of the Columbia River*, requires new activities near the Columbia River to minimize direct and adverse effects on the values being studied for the Columbia River.

No wastewater discharges to the Columbia River are planned under any of the alternatives. Erosion and stormwater controls would be used as necessary for alternatives involving demolition.

5.2.2 Cultural and Ecological Resource Protection Standards

The *National Historic Preservation Act of 1966* (implemented via 36 CFR 800) requires Federal agencies to evaluate and mitigate adverse effects of Federal activities on any site eligible for inclusion on the National Register of Historic Places. The PA for the maintenance, deactivation, alteration, and demolition of the built environment allows RL to prepare a treatment plan that provides for the mitigation of historic structures at 100-N Area. The PA requires that all mitigation activities identified in the treatment plan must be completed prior to any demolition, alteration or removal of artifacts from the 100-N facilities.

The cultural resource protection requirements apply because of the presence of potentially significant archaeological sites or artifacts in the 100-N Area, and the potential historical significance of facilities in the area. The cultural significance of the 100-N Area facilities has been evaluated and mitigation has been established under the PA. It is unlikely that archaeological sites would be impacted by demolition activities.

The *Native American Graves Protection and Repatriation Act* (40 CFR 10) requires agencies to consult and notify culturally affiliated Tribes when Native American human remains are inadvertently discovered during project activities. The 100-N restoration activities could inadvertently uncover previously disturbed or intact graves associated with archaeological sites.

The President's Executive Order 1300.7 requires agencies to consider impacts of actions on sacred sites. An area at 100-N called *Mooli Mooli* may be a sacred site that will require consultations with affected Tribes.

The *National Archaeological and Historical Preservation Act of 1974* requires action to recover and preserve artifacts in areas where activity may cause irreparable harm, loss, or destruction of significant artifacts. The *Endangered Species Act of 1973* (implemented via 50 CFR 402) and WAC 232-012-297) prohibit activities that threaten the continued existence of listed species or destroy critical habitat. The *Migratory Bird Treaty Act* makes it illegal to remove, capture, or kill any migratory bird, or any part of nests or the eggs of any such birds.

Threatened and endangered species are known to be present in the 100 Area, but no adverse impacts on protected species or critical habitat resulting from implementation of any of the alternatives is anticipated. Facility-specific ecological reviews would be conducted to identify potentially adverse impacts prior to the performance of any demolition work.

5.2.3 Waste Management Standards

The RCRA regulates management and disposal of hazardous (dangerous) waste. Authority for much of RCRA has been delegated to the State of Washington. Implementing state regulations contained in WAC 173-303 requires identification and appropriate management of dangerous wastes and dangerous components of mixed wastes, and identifies standards for treatment and disposal of these wastes. These requirements are applicable to any existing wastes or any wastes that are generated during D&D of the ancillary facilities that are designated, in accordance with WAC 173-303, as a dangerous or mixed waste. Similarly, WAC 173-304 requires identification and appropriate management of solid wastes. It is applicable to any solid waste generated during D&D of the ancillary facilities. Except for Alternative One, each of the alternatives would generate waste that would be subject to WAC-173-303, -304, and -460.

Performance objectives for land disposal of low-level radioactive waste are provided in 10 CFR 61, Subpart C. Although not applicable to DOE facilities, these standards are relevant and appropriate to any disposal facility for low-level and mixed waste generated during D&D of the ancillary facilities.

All alternatives, except for Alternative One, would generate solid, dangerous, low-level, and/or mixed waste. For each of these alternatives, actions proposed to manage such waste would satisfy the waste management ARARs and all wastes would be evaluated and managed in compliance with the appropriate requirements. Prior to disposal, dangerous, low-level, or mixed wastes would be managed in a manner that prevents releases or inadvertent exposure to workers, and is protective of the environment. The ERDF is engineered to meet RCRA minimum technological requirements for landfills, including standards for a double liner, a leachate collection system, leak detection, and final cover. The ERDF also meets the appropriate performance standards under 10 CFR 61 for disposal of low-level waste (LLW) and mixed waste. Treatment requirements including land disposal restriction requirements, if any, necessary to dispose of wastes in the ERDF would be identified to meet the ERDF waste acceptance criteria. Treatment may include stabilization, dewatering, encapsulation, or other readily available treatment methods. Packaging and transportation requirements for waste generated during D&D of the ancillary

facilities would be identified and implemented prior to movement of any wastes. Any offsite facility receiving dangerous wastes would meet all RCRA administrative and substantive requirements. Any offsite shipment of waste would comply with appropriate U.S. Department of Transportation requirements (49 CFR 171-173).

At this time, no listed dangerous wastes are expected to be generated as a result of implementing any of the alternatives. Wastes designated as characteristic may be generated and would be subject to the dangerous waste management standards in WAC 173-303.

5.2.4 Air Emission Standards

The *Clean Air Act* regulates both toxic and radioactive airborne emissions. Under implementing regulations found in 40 CFR 61, Subpart H, and WAC 246-247, radionuclide airborne emissions from all combined operations at the Hanford Site may not exceed 10 mrem/year effective dose equivalent to the hypothetical offsite maximally exposed individual. WAC 246-247 requires verification of compliance, typically through periodic confirmatory air sampling. WAC 173-400 establishes requirements for the control and/or prevention of the emission of air contaminants, including dust.

The radionuclide emission standards would apply to any fugitive, diffuse, and point-source air emissions of radionuclides generated during activities associated with any of the D&D alternatives. If there is a potential for a non-zero radioactive emission, best available radionuclide control technology would be required. If the action would increase emission of toxic air pollutants to the atmosphere above the small quantity emission rates, implementation of best available control technology for toxics would be required. Alternatives Three and Four propose using decontamination of surfaces to control radiological contaminants and standard construction techniques to provide dust control during demolition.

Standard construction techniques are used at the ERDF to control fugitive emissions during placement of wastes. The in situ burial operations would also use standard construction techniques to control fugitive emissions during placement of wastes. These methods should adequately control fugitive radionuclide emissions and toxic air pollutants. Therefore, standard construction techniques would be considered the best available radionuclide control technology and the best available control technology for toxics for any of the proposed activities as demonstrated during the 100-N Area treatability study (DOE-RL 1996a).

5.2.5 Radiation Protection Standards

Occupational Radiation Protection (10 CFR 835) establishes radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities. It also requires that measures be taken to maintain radiation exposure as low as reasonably achievable (ALARA). This regulation is applicable to activities considered under each of the four alternatives.

A combination of personal protective equipment, personnel training, physical design features (e.g., confinement, remote handling, shielded containers), and administrative controls (e.g., limiting time in radiation zones) would be used to ensure that the requirements for worker and visitor protection are met by all alternatives. Alternatives Three and Four would also meet the requirements to maintain exposure ALARA by decontaminating surfaces prior to demolition and by providing personal protective equipment, training, and administrative controls. For all alternatives, individual monitoring would be performed as necessary to verify compliance with the requirements.

5.2.6 Polychlorinated Biphenyls

The *Toxic Substance Control Act of 1976* (TSCA) and WAC 173-303 regulates the management and disposal of PCBs and PCB waste. The implementing regulations in 40 CFR 761 contain requirements for the management of spills and remediation of materials suspected to contain PCB waste. The ERDF is authorized to accept certain PCB waste for disposal. All waste suspected to contain PCBs would be evaluated to determine whether the waste meets the ERDF waste acceptance criteria. Any PCB waste that does not meet the ERDF waste acceptance criteria would be sent to an onsite PCB storage area meeting the substantive requirements for TSCA storage, and would be transported for disposal at a TSCA-approved disposal facility.

5.2.7 Asbestos

Removal and disposal of asbestos and ACM are regulated under the *Clean Air Act* (40 CFR 61, Subpart M) and Occupational Safety and Health Administration (OSHA) (29 CFR 1910.1101 and WAC 296-62). These regulations provide for special precautions to prevent environmental releases or exposure to workers of airborne emissions of asbestos fibers during removal actions. 40 CFR 61.52 identifies packaging requirements. Alternative One would not remove asbestos. If ACM was encountered during routine S&M, as would be conducted under Alternative Two, it would be removed and disposed in accordance with applicable regulations. Alternatives Three and Four, since they involve decontamination, would be expected to include actions that would encounter and disturb ACM. These alternatives shall comply with the requirements for management and disposal of asbestos or ACM.

5.2.8 Environment, Safety, Quality, and Health Requirements

Worker protection standards are described in OSHA regulations, national consensus standards, and DOE orders (e.g., 29 CFR 1910, 29 CFR 1926, National Fire Protection Association [NFPA] 1990, WAC 296-62, and DOE Order 5400.5 [DOE 1993b]). Exposure limits, personnel protection requirements, and decontamination methods for hazardous chemicals are established by 29 CFR 1910. Additionally, 29 CFR 1910 requires identification and mitigation of physical hazards to workers posed by a facility, including but not limited to, confined spaces, falling hazards, fire, and electrical shock. The 29 CFR 1926 reference provides requirements for worker safety during construction activities.

The DOE orders establish requirements relating to safety, health, and environmental protection. The substantive requirements of these orders would be met for any S&M or D&D activities. Known and suspected inventories in each building will be screened during the design phase against the criteria in DOE Standard 1027 (DOE 1992a) to determine the appropriate DOE environmental safety and health order requirements. Site- and activity-specific requirements and controls would be identified in final design and work plan documents, including contingency plans and emergency response plans. In addition, the following DOE order requirements have been determined to contain requirements that are to be considered for one or more of the alternatives:

- The requirements in DOE Order 5400.5, *Radiation Protection of the Public and the Environment* (DOE 1993b), limiting exposure of the public to radioactive releases, are relevant and appropriate to all alternatives.
- The requirement in DOE O 451.1, *National Environmental Policy Act Compliance Program* (DOE 1995), to address *National Environmental Policy Act of 1969* values are relevant and appropriate to all alternatives.

- The requirement in DOE Order 5480.3, *Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances and Hazardous Waste* (DOE 1985), to comply with U.S. Department of Transportation or equivalent packaging standards is relevant and appropriate to each alternative that generates waste for disposal. The requirements of the order for special handling of plutonium-bearing wastes could be relevant and appropriate for Alternatives Three and Four if facilities contain plutonium-bearing wastes (which is not likely).
- The requirements in DOE Order 5820.2A, *Radioactive Waste Management* (DOE 1988), for management of LLW are relevant and appropriate to all alternatives except Alternative One. The requirements for the management of TRU waste would be relevant and appropriate to the demolition alterative if activities to implement the alternative generated one or more packages of waste that contain greater than 100 nCi/g of TRU constituents at the time of assay (although it is not expected that TRU waste will be generated).
- The requirements in DOE Order 5480.20A, *Personnel Selection, Qualification, and Training* (DOE 1994), are relevant and appropriate for all alternatives except Alternative One for facilities that are classified as nuclear by the preliminary hazard classification analysis.
- The requirements in DOE Order 5480.23, *Nuclear Safety Analysis Reports* (DOE 1992b), to identify hazards, analyze hazards and accidents, and identify controls and mitigation measures to safely manage the hazards are relevant and appropriate to all alternatives for facilities that are classified as nuclear by the preliminary hazard classification analysis.
- The requirements in DOE Order 5480.28, *Natural Phenomena Hazards Mitigation* (DOE 1993a), to analyze potential hazards from natural phenomena and identify appropriate mitigation measures are relevant and appropriate to all alternatives for facilities that are classified as nuclear by the preliminary hazard classification analysis.

5.2.9 Draft Radiological Criteria for Decommissioning

Two agencies (U.S. Nuclear Regulatory Commission [NRC] and EPA) have proposed standards to establish acceptable levels of residual radioactivity for environmental remediation. These are nonpromulgated standards and are to be considered.

The draft NRC *Radiological Criteria for Decommissioning* (10 CFR 20, proposed revision) provides a regulatory basis to determine the extent to which lands and structures must be remediated before a site can be considered decommissioned.

The draft EPA *Radiation Site Cleanup Regulation* (40 CFR 196, Draft) will set the standards for remediation of soils, groundwater, surface water, and structures at Federal facilities. These proposed standards would not apply to Alternatives One and Two, because these alternatives do not decommission or demolish any facilities. Alternatives Three and Four would comply with these proposed standards.

5.10 OTHER CONSIDERATIONS

In accordance with DOE Order 451.1 (DOE 1995) and NEPA policy, DOE CERCLA documents are required to incorporate NEPA values such as analysis of cumulative, offsite, ecological, and socioeconomic impacts to the extent practicable.

Cumulative impacts may occur in both the short term and long term because of interrelationships among other activities occurring in the 100 Area. Other activities in the 100 Area include the following:

- Remediation of waste sites and groundwater in the reactor areas
- Safe storage activities for the 105-C Reactor (to be followed by safe storage activities for the other reactors)
- Storage and removal of spent fuel contained in basins at the 100-K Area
- Removal of ancillary facilities in the other reactor areas.

Each of these activities contributes to the goals of 100 Area remediation including protection of the Columbia River. However, due to the increasing scarcity of resources to accomplish the work, each of these activities also competes with the others for priority allocation of funding.

Near-term decontamination and demolition of the facilities addressed in this EE/CA would require significantly greater commitment of budget resources (including disposal costs, workers, equipment and supplies) during the time necessary to accomplish the removal action than would be required to continue S&M. Therefore, in the near term, Alternative Three and Four would impose a greater cumulative burden in terms of additional competition for remediation dollars and work force resources than either Alternatives One or Two.

In the long term, the overall cumulative effect of the 100 Area activities is to enhance the protection of workers, the public, and the environment, which is consistent with the values expressed by the regulators, stakeholders, affected tribes, and the public. Long-term S&M will not provide a permanent remedy consistent with these cumulative benefits. In the long term, completion of either Alternatives Three or Four would be consistent with and supportive of the overall cumulative benefits that will be derived from the remedial activities in the 100 Area.

Offsite impacts include affects on the public or the environment due to release of contaminants resulting from an activity. Alternatives One and Two are not expected to result in negative offsite impacts in the near term. Continued confinement of hazardous substances in the facilities would become more difficult with time, increasing the potential for offsite impacts. Alternatives Three and Four would potentially result in airborne emissions of hazardous substances, but significant or long-term impacts are not expected.

None of the alternatives are expected to affect existing natural resource conditions. Although bald eagles frequent the Columbia River during the winter, there are no identified roosts near the 100-N Area. Surveys indicate that all proposed activities are unlikely to disturb sensitive plant or animal species. Prior to initiation of any specific field activity, an ecological review of the facility and surrounding area would be conducted to ensure there would be no impacts to natural resources (e.g., migratory birds).

There would be no unmitigated impacts to cultural resources with implementation of any of the alternatives.

Socioeconomic impacts from any of the alternatives would be minimal. The work force required for current S&M activities is small. Personnel required to accomplish either Alternative Three or Alternative Four would be selected from the existing S&M and remediation work force at the Hanford Site or would be made available to subcontractors.

In evaluating Alternatives Three and Four, consideration should be given to potential future land-use planning needs and values expressed by the regulators, stakeholders, public, and the Tribes, with regard to the preferred future use of the 100-N Area.

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Table 5.1. Summary of Estimated Costs for Alternatives[a]

Description	Summary Cost Estimates[a]
Alternative Two - Long Term Surveillance and Maintenance	
Remedial Unit 1	$ 15,140
Remedial Unit 2	$ 57,040
Remedial Unit 3	$ 40,000
Remedial Unit 4	$ 31,920
Remedial Unit 5	$ 324,030
Other Facilities	$ 141,000
Total (annual costs)	$ 609,130
Alternative Three - D&D with Disposal at ERDF and Other Landfills	
Remedial Unit 1	$ 5,541,000
Remedial Unit 2	$ 2,574,000
Remedial Unit 3	$ 2,172,000
Remedial Unit 4	$ 5,553,000
Remedial Unit 5	$ 12,308,000
Other Facilities	$ 27,813,000
Total	$ 55,961,000
Alternative Four - D&D, ERDF Disposal and In Situ Burial	
Remedial Unit 1	$ 5,332,000
Remedial Unit 2	$ 2,115,000
Remedial Unit 3	$ 1,814,000
Remedial Unit 4	$ 5,359,000
Remedial Unit 5	$ 6,210,000
Other Facilities	$ 20,759,000
Total	$ 41,589,000

[a]These estimates do not account for escalation or contingency.

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6.0 RECOMMENDED ALTERNATIVE

Based on implementability, short-term effectiveness, and cost, the recommended alternative to address the contaminated ancillary facilities (listed in Table 2.1 of this EE/CA) is to implement Alternative 2, which involves performing S&M until such time that D&D work could be planned and executed. At that time, Alternative Four would be implemented, which involves performing D&D work in accordance to the process and priority order established by the attached proposed integration plan (i.e., interfering facilities in RU 1 first, then interfering facilities in RU 4, etc., as listed in Table 2.1). Alternative Four provides a protective, permanent solution and is more effective than Alternative Two; however, in the interim, S&M provides adequate protection until final remedial actions can be scheduled in coordination with the overall 100 Area remedial priorities established in the Tri-Party Agreement based on values expressed by regulators, stakeholders, affected tribes, and the public.

It should be noted that Alternative 1 is not considered to be effective. Alternative Three provides protection of human health and the environment equal to Alternative 4 but it is not cost effective.

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Appendix A

Integration Plan for Decontamination and Demolition and Remedial Action in the 100-N Area

Contents

Figures

Tables

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A1.0 INTEGRATION PLAN FOR DECONTAMINATION AND DEMOLITION AND REMEDIAL ACTION IN THE 100-N AREA

A1.1 INTRODUCTION

This appendix (hereafter referred to as the Integration Plan) was developed to ensure that decontamination and demolition (D&D) and remediation activities associated with the 100-N Area would be coordinated and conducted in an efficient manner. The intent of the Integration Plan is to minimize the cost and optimize the efficiency of environmental remediation of contaminated waste sites and the removal of the facilities in the 100-N Area. Integration of 100-N Area D&D and remediation activities has been recognized by the U.S. Department of Energy, Richland Operations Office (RL) and the Washington State Department of Ecology (Ecology) as a critical step in ensuring effective and efficient environmental remediation of the 100-N Area.

The plan includes (1) assumptions used to develop the Integration Plan, (2) the criteria used to group waste sites into remedial units (RUs) and to establish remediation priority of the waste site groups, (3) the general work sequence established for the remediation of the 100-N Area, and (4) the proposed integrated schedule of the D&D of the 100-N facilities and the remediation of the RUs.

The prioritization and sequencing of the waste sites within a RU, and the detailed planning and design for the D&D of facilities and remediation activities are considered beyond the scope of this Integration Plan and will be provided in the remedial design report/remedial action work plan document.

A1.2 ASSUMPTIONS

This section identifies the assumptions used to develop the Integration Plan. They are based on direction and scoping assumptions provided by RL and are based on current project planning strategies for the Environmental Restoration Program. These assumptions are:

- A ten-year duration was used for completion of D&D and remediation activities.
- The proposed schedule presented in the Integration Plan is a duration-only schedule (i.e., does not include specific start or end dates) and allows for flexibility for determining the start of the remedial activities.
- The recommended alternatives, as described in Section 6.0 of the Engineering Evaluation/Cost Analysis (EE/CA) will be implemented to address the 100-N Area ancillary facilities.
- For 100-N Area facilities, the D&D cost estimates, schedule and durations, and waste volume estimates were derived from the U.S. Army Corps of Engineers' Micro Computer-Aided Cost Estimating System (MCACES).
- For waste sites, the cost estimates, schedule and duration, and waste volume estimates were taken from the 100-NR-1 and 100-NR-2 Corrective Measures Study (CMS).
- The Integration Plan only addresses the liquid and solid waste disposal sites in the 100-N Area identified for the remedial action and D&D of the 100-N ancillary facilities.
- The 105-N Reactor Facility and the 109-N Heat Exchanger Facility (hereafter referred to as the Reactor Complex) are not addressed in this Integration Plan. These facilities are part of the Interim Safe Storage (ISS) Project and will be addressed with the long-term disposition of the 100-N Reactor.
- Remediation activities of waste sites in the buffer zone (defined as the facilities needed to support the reactor until the ISS program is implemented and all waste sites within 15.25 m [50 ft] of the 105-N

and 109-N facilities) will not be conducted until a decision is made on the future disposition of the 100-N Reactor. The remediation activities will be according to the recommended alternative identified in the 100-NR-1 and 100-NR-2 Record of Decision (ROD). The facilities in the buffer zone will be limited to surveillance and maintenance until a decision is made on the future disposition of the 100-N Reactor. Then, the facilities will be removed according to the recommended alternative identified in this document. These facilities and waste sites are included in the integrated schedule. This will allow early action on these sites and facilities should the opportunity occur but in no case later than the ISS.

- The Hanford Generating Plant Complex is addressed in the Integration Plan.
- Identification of the waste sites in the Integration Plan was based on the most current information available in the Corrective Measures Study for the 100-NR-1 and 100-NR-2 Operable Units, Draft A, DOE/RL-95-111 (DOE-RL 1996) and 100-NR-1 Treatment, Storage, and Disposal (TSD) Units Corrective Measures Study/Closure Plan, Draft A, DOE/RL-96-39 (DOE-RL 1997). The remediation cost estimates, schedule and durations, and waste volumes for the waste sites were also derived from the current information available in these documents.
- After the 100-NR-1 and 100-NR-2 Operable Units ROD is issued, the remedial design/remedial action process will be used to establish the detailed schedule for the integrated activities and the remedial design report/remedial action work plan will document the negotiated schedule dates.

A1.3 REMEDIATION PRIORITIZATION AND SEQUENCING CRITERIA

This section provides the criteria used to establish the remediation prioritization for the waste sites and a sequence in which the work activities could be performed without causing interferences between activities.

A1.3.1 Remediation Prioritization

The 100-N Area waste sites have been grouped into six RUs, the treatment, storage, and disposal (TSD) unit, and the Columbia River shoreline. Subdividing the 100-N Area waste sites by geographic location and type of contamination was found to be an effective management tool to plan and implement the remediation activities. In other words, when individual waste sites were in close proximity to one another, a common-sense approach was applied in considering their inclusion in a particular grouping. The contaminants of concern at the 100-N Area waste sites include radionuclides, petroleum hydrocarbons, and inorganic chemicals such as acids, nitrate, chromium, and lead. Grouping the waste sites increased flexibility for scheduling, funding, and contracting. The RUs do not have an established boundary, but are defined as:

Table A.1. Comprehensive List of the Waste Sites Grouped by RUs

RU 1	Radioactive sites located between the 105-N Reactor and the Columbia River.
RU 2	Petroleum and fuel oil spills and leaks in the vicinity of the 184-N Powerhouse, which is directly east of the 105-N Reactor.
RU 3	A mixture of sites, mostly spills and releases of acids and caustics with potential radioactivity, south of the 105-N Reactor and near the water treatment facilities.
RU 4	A mixture of sites, mostly radioactive or diesel, and fuel oil spills and leaks in the vicinity of the 1310-N Chemical Storage Tank and the oil storage tank farm, north of the 105-N Reactor and near the Columbia River.
RU 5	Sites associated with the Hanford Generating Plant.
RU 6	Miscellaneous solid waste sites not included as part of another RU.
TSD Unit	Group of the four sites designated as TSD units under the Resource Conservation and Recovery Act of 1976 (RCRA).
River Shoreline	The river shoreline area adjacent to the N-Springs Area up to approximately the 123 m (402 ft) elevation. (The river shoreline is not addressed in the Integration Plan. No schedule has been proposed pending selection of the final groundwater remedial action alternative.)

Table A.1 provides a comprehensive list of the waste sites grouped by RUs, and Figures A.1 to A.6 illustrate the RU groupings. The TSD units are shown in Figure A.7. The remediation prioritization of the six RUs and the TSD unit was based on the following considerations:

- Potential short-term impact to the public and/or the environment
- Inventory of contaminants
- Potential of contaminant migration to the groundwater
- Proximity to the Columbia River
- Input by RL and regulators.

After evaluating the impacts of these factors, it was determined that, in the short term, there are no significant negative impacts to the public or the environment. This is based on the current administrative and institutional controls that are in place for the purpose of protecting the public and environment. Therefore, the first consideration did not weigh heavily in the prioritization process.

The type and quantity of contaminants were considered when prioritizing remedial units. It was determined that, in general, those sites contaminated with high inventories of radionuclides would receive a higher priority than sites that contain other hazardous substances, such as petroleum-product contamination or acids/caustics. However, because these factors are not considered independently of one another, there may be some sites without radioactive contamination that received a higher priority than some sites with radioactive contamination. Because petroleum is immiscible, petroleum contamination was also considered to be an important factor in determining priorities, particularly in terms of impact on groundwater. Another consideration was the recognition that the TSD units and certain ancillary facilities may be considered contributors to the "skyshine" that exists at the 100-N Area. Skyshine is a phenomena created by 100-N Area facilities and waste sites containing significant inventories of gamma emitting

radionuclides (primarily cobalt-60). Skyshine is produced by the interaction of gamma rays with the atmosphere and the subsequent downward scatter of the gamma rays. Skyshine results in an increase in the ambient radiation over background conditions in the 100-N Area. The following TSD units and ancillary facilities have been considered contributors:

- 1304-N Emergency Dump Tank
- 1310-N Liquid and Waste Treatment Facility
- 1314-N Liquid Disposal Building
- 107-N Basin Recirculation Cooling Facility
- 105-N Fuel Basin
- 1301-N Liquid Waste Disposal Facility
- 1325-N Liquid Waste Disposal Facility.

The recognition that these units and ancillary facilities could potentially contribute to skyshine supports the prioritization/sequencing criteria established in Section A3.0. The 1301-N and 1325-N facilities are within the TSD unit and the remaining facilities except for the 105-N, which is part of the ISS Program are within RU 1 and RU 4. These three units are the highest priority.

In conjunction with other considerations, waste sites in close proximity to the Columbia River were given a relatively higher priority because of the major importance to the community and public concern about this resource. RL and the regulators have confirmed during a planning meeting that these are valid factors for prioritizing remediation of waste sites.

Based on the considerations described above, the following is the priority ranking for the RUs and the TSD unit:

Table A.2. Priority Ranking for the RUs and the TSD Unit

Priority	Unit	Reason
1	TSD	Largest radionuclide inventory/regulator input
2	RU 1	Radionuclide inventory/proximity to the Columbia River
3	RU 4	Radionuclide and petroleum inventories/proximity to the Columbia River
4	RU 2	Petroleum inventory/proximity to the Columbia River
5*	RUs 3, 6, and 5	Radionuclide and acid/caustic inventory plus solid waste

Note: Based on the applicable considerations, RUs 3, 6, and 5, scheduled in that order, were determined to be the lower priority units. However, the schedule is flexible to allow for reprioritization of these RUs. Remediation work associated with these units will be scheduled in a way that accomplishes efficient funding and contracting over the designated duration of the project.

A1.3.2 Sequencing of Work

In establishing the sequence of work to integrate facility D&D and waste site remediation, several factors were considered: (1) proximity of facilities to waste sites, (2) 100-N Area active facilities and infrastructure requirements, and (3) impact of the ISS Program on the 100-N Reactor and the buffer zone.

A1.3.2.5 Proximity of Facilities to Waste Sites

Several facilities in the 100-N Area are in close proximity to or will interfere with waste site remediation. If the selected remedy for the 100-NR-1 and 100-NR-2 operable units is the remove and dispose alternative, the facilities that are located adjacent to, or overlap, the waste site excavation footprint would need to be demolished prior to remediation. The facilities requiring D&D before remediation of a waste site (see Table A.2) were determined by assuming that excavation of a waste site would be 4.6 m (15 ft) below surrounding grade and would have a safety zone of approximately 7.6 m (25 ft) around the excavation footprint to provide protection from slope failure.

A1.3.2.6 Critical Infrastructure Systems

Several facilities in the 100-N Area will remain active to support 100-Area D&D and remediation activities. These facilities will be operated until it is determined that they are no longer needed, at which time they will be decommissioned and demolished. Contaminated ancillary facilities will be decommissioned and demolished according to the decision documented in the Action Memorandum, a CERCLA decision document; a CERCLA decision document is not required for noncontaminated facilities. The noncontaminated facilities will be decommissioned and demolished under the existing NEPA categorical exclusion for decommissioning of small buildings according to 10 CFR 1021, B1.23. CERCLA applies to management of hazardous substances; therefore, no *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) documentation, such as an EE/CA, is required for addressing facilities that contain only nonhazardous substances.

Critical infrastructure systems (e.g., potable and sanitary water lines, electrical power utilities, and fire suppression pipelines), which must be maintained to protect and service active facilities, are expected to be near or within the excavation footprint of waste sites to be remediated. To avoid possible interferences with the remediation work, wherever possible, these utilities will be isolated, rerouted, and/or partially removed prior to remediation of the waste sites. However, it is recognized that some factors associated with the isolation of the infrastructure systems could potentially impact the waste site remediation sequence. These factors are identified below so the potential impacts to remediation of waste sites may be considered in the remedial design.

Electrical

Removal of electrical systems is typically the last isolation activity performed because power would be needed to support the D&D and remediation activities. However, if the underground conduit poses a threat to workers during excavation to isolate another utility (e.g., raw water), the electrical system would be deactivated first and alternative power supplies (e.g., generators, temporary overhead lines) would be used.

There are two areas of buried conduit banks that could impact the D&D and remediation activities. One area is located between the 1705-N and the 105-NB facilities, north of the 105-N Reactor facility, which feeds the office complex and machine shops in the 1705-N Building. There are no waste sites in the immediate vicinity. However, waste site 100-N-22 is located north of the area and the exact location of the conduit line would need to be determined to ensure that safety would not be jeopardized during excavation of the waste site. The other electrical conduit line begins on the north side of the 183-N, continues around the facility, then branches west toward the clearwell and south to the 1137-N and 163-NA facilities. Waste sites 100-N-27 and UPR-100-N-34 could be impacted by this conduit line.

Fire Protection

Fire protection pipelines, considered the most important underground utility at the site, would be a long-term requirement for the 100-N Area until all the facilities are removed. Once facilities have been decommissioned and demolished to the extent necessary to alleviate the need for fire suppression, the facilities would be isolated/removed from the buried fire line system. Therefore, the only buried fire pipes that could impact remediation are those supporting facilities during S&M. It is expected that D&D and remediation activities will interfere with buried fire lines, during which time acceptable temporary systems may be utilized (e.g., portable wheeled units using dry chemicals or carbon dioxide).

Potable Water and Sanitary Sewer

The 100-N area currently maintains a potable water supply system which serves several facilities. Additionally, several facilities are serviced by sanitary sewer systems. Isolation/removal of these systems would not impact the D&D and remediation activities because temporary sanitary systems (e.g., port-a-systems) would be installed, and bottled drinking water would be supplied.

Railroads

Prior to segregating the rail spur, railroad cars containing the contaminated shipping casks would need to be dispositioned and/or moved out of the area. The rail lines lying on the west side of the 100-N Reactor complex could impact the remediation of waste sites located in RUs 1 and 4. However, at this time there is no justification to keep the rail lines functional, therefore, they would be removed.

Roadways and Paved Areas

It is preferable to use existing paved and gravel roads because construction of new roads would potentially impact cultural and ecological resources. However, if roads interfere with D&D and remediation activities, the roads would be removed. Alternative transportation routes would be selected to minimize impacts to undisturbed areas.

Communications and Alarm Systems

Telephone and Hanford local area network (HLAN) fiber-optics lines are located throughout the 100-N Area and may be rerouted at relatively little expense and with short notice without impact to D&D and remediation activities. The public address system is not considered a critical system since the 105-N Reactor facility is currently being deactivated. An alarm tower on the 184-N facility would remain operable. The alarm system would be relocated prior to D&D of the facility.

A1.3.2.7 ISS of the 100-N Reactor and the Buffer Zone

The 105-N Reactor Facility and the 109-N Heat Exchanger Facility are considered part of the ISS Program for the N Reactor. The ISS Program delays remediation of the N Reactor until sometime in the future. Associated with the 105-N and 109-N facilities are three other facilities, the 116-N Air Stack, the 117-N Exhaust Filter House, and the 119-N Stack Air Sampling Monitor Building, which support the ventilation system for the 105-N and 109-N facilities until the ISS Program is implemented. Additionally, 15 contaminated waste sites have been identified as sites that cannot be remediated until the facilities that interfere with these sites have been decommissioned and demolished. This sequence of D&D and remediation will preserve the integrity of the 105-N and 109-N Reactor buildings. Remediation of the 15 waste sites (in the buffer zone) that are identified in the 100-NR-1 and 100-NR-2 ROD will not

be conducted until a decision is made on the future disposition of the 100-N Reactor. Additionally, the 116-N, 117-N, and the 119-N facilities (in the buffer zone) will be limited to surveillance and maintenance until a decision is made on the future disposition of the 100-N Reactor. The facilities will then be removed according to the recommended alternative identified in this document. The facilities and waste sites are included in the integrated schedule. This will allow early action on these sites and facilities should the opportunity occur but in no case later than the ISS.

The buffer zone consists of the waste sites identified below within 15.25 m (50 ft) of the 105-N and 109-N Reactor buildings and the following facilities:

Waste Sites		**Facilities**
100-N-29[1]	UPR-100-N-10	116-N Air Stack
100-N-30[1]	UPR-100-N-12	117-N Exhaust Filter House
100-N-31	UPR-100-N-3	119-N Stack Air Sampling Monitor Building
100-N-32	UPR-100-N-35	1300-N Emergency Dump Basin
100-N-38	UPR-100-N-39	1303-N Spacer Silos
116-N-4	UPR-100-N-9	
118-N-1	UPR-N-100-7	
UPR-100-N-14		

A1.3.3 General Work Sequence

An evaluation of the sequencing factors (which were identified in Sections 3.2.1 through 3.2.3) indicates that initiation of remediation activities is dependent on the reconfiguration of interfering critical infrastructure systems and the D&D of interfering facilities. In addition, the sequence or timing of remediation of a small number of waste sites will be dictated by future decisions regarding the need for various 100-N active support facilities (e.g., water systems, electrical power) and final disposition of the 100-N Reactor. These considerations result in the following general work sequence applicable to each RU:

1. Reconfiguration of interfering critical infrastructure systems
2. D&D of interfering facilities
3. Remediation of waste sites
4. D&D of active facilities
5. Final remediation of waste sites associated with the active facilities and the 100-N Reactor.

A1.4 SCHEDULE

Figure A.8 illustrates the integrated schedule for completing the remediation of the TSD unit, the six RUs (which include waste sites and interfering facilities), and D&D of the facilities independent of waste sites. This integrated schedule was developed based on the prioritization and sequencing discussed in Section A3.0 (e.g., remediation of the TSD unit was identified as the highest priority and therefore appears first on the schedule followed by RU 1, then RU 4). The remediation of the TSD units with the remaining RUs and interfering facilities was determined to encompass the first four years, and the independent facilities and underground piping system remediation was scheduled to begin during year four and continue through year ten.

[1] Waste sites 100-N-29 and 100-N-30 are in close proximity to 116-N-4 and may need to be remediated as part of 116-N-4.

The sequencing of the interfering facilities and waste sites within the RUs was based on the following logical order:

1. Deactivated interfering facilities
2. Associated waste sites
3. Active facilities
4. Associated waste sites
5. Independent facilities and underground piping systems.

The primary driver was to develop a schedule with a relatively even distribution of funding requirements across the remaining six years. Generally, this sequence was followed, except when the independent facilities and underground piping systems were scheduled to accomplish the relatively even funding distributions. Work durations and cost for the TSD units and the RU waste sites were taken from the 100-NR-1 and 100-NR-2 CMS and the 100-NR-1 TSD CMS/CP. Work duration and cost for all the facilities were taken from the MCACES data sheets.

Refined scheduling within these subgroups will be accomplished during detailed remedial design and documented in the remedial design report/remedial action work plan. The schedule assumes a critical path sequencing where first, initial infrastructure requirements, (e.g., isolating or rerouting underground utilities) will be completed at the affected waste site(s) followed by D&D of interfering facilities, and finally waste site remediation.

A1.5 REFERENCES

10 CFR 1021, *National Environmental Policy Act Implementing Procedures*, Code of Federal Regulations, as amended.

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

DOE-RL, 1996, *Corrective Measures Study for the 100-NR-1 and 100-NR-2 Operable Units*, DOE/RL-95-111, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1997, *100-NR-1 Treatment, Storage, and Disposal (TSD) Units Corrective Measures Study/Closure Plan*, DOE/RL-96-39, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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

1

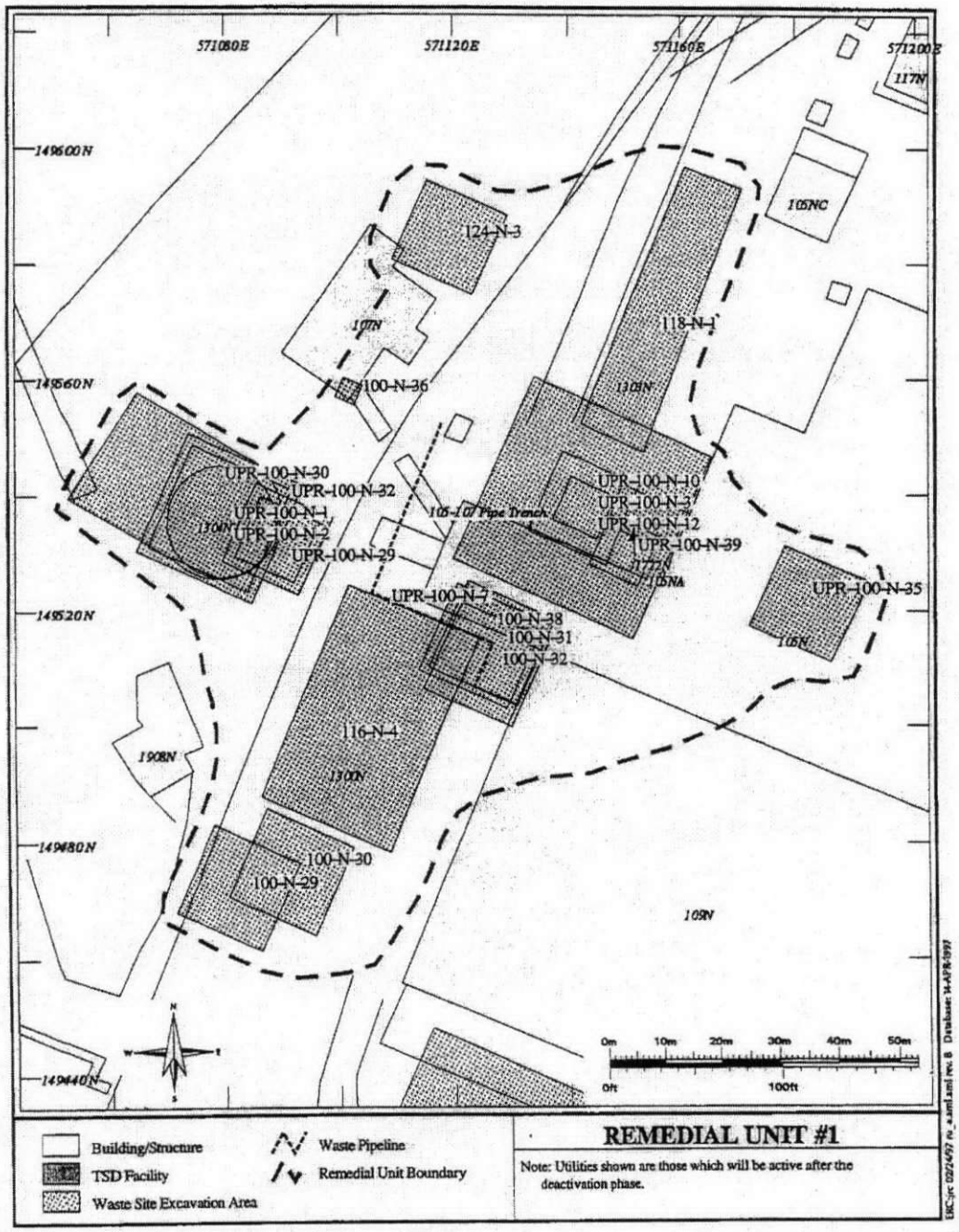
Table A.3. Interfering Facilities by Remedial Unit

Remedial Unit 1
1300-N Emergency Dump Basin
105-N to 107-N Pipe Trench
1304-N Emergency Dump Tank
1722-N Decontamination Hot Shop
107-N Recirculation Cooling Building
1303-N Spacer Silos
Remedial Unit 2
184-N Powerhouse
184-NA Powerhouse Annex
184-NB Air Handlers Main Building
184-NC Sample Shack
Remedial Unit 3
163-N Demineralization Water Treatment Plant
183-N Water Filter/Treatment Plant
Remedial Unit 4
13-N Storage Facilities
1310-N Radioactive Liquid and Waste Treatment Facility
1314-N Liquid Disposal Building
1322-N Waste Treatment Pilot Plant Facility
1322-NA Effluent Water Treatment Pilot Plant Annex
116-N Exhaust Air Stack
119-N Stack Air Sampling and Monitoring
Remedial Unit 5
185-N HGP
1716-NE Maintenance Garage
1908-NE HGP Outfall

Note: Remedial Unit 6 and the TSD sites do not contain facilities that would interfere with waste sites.

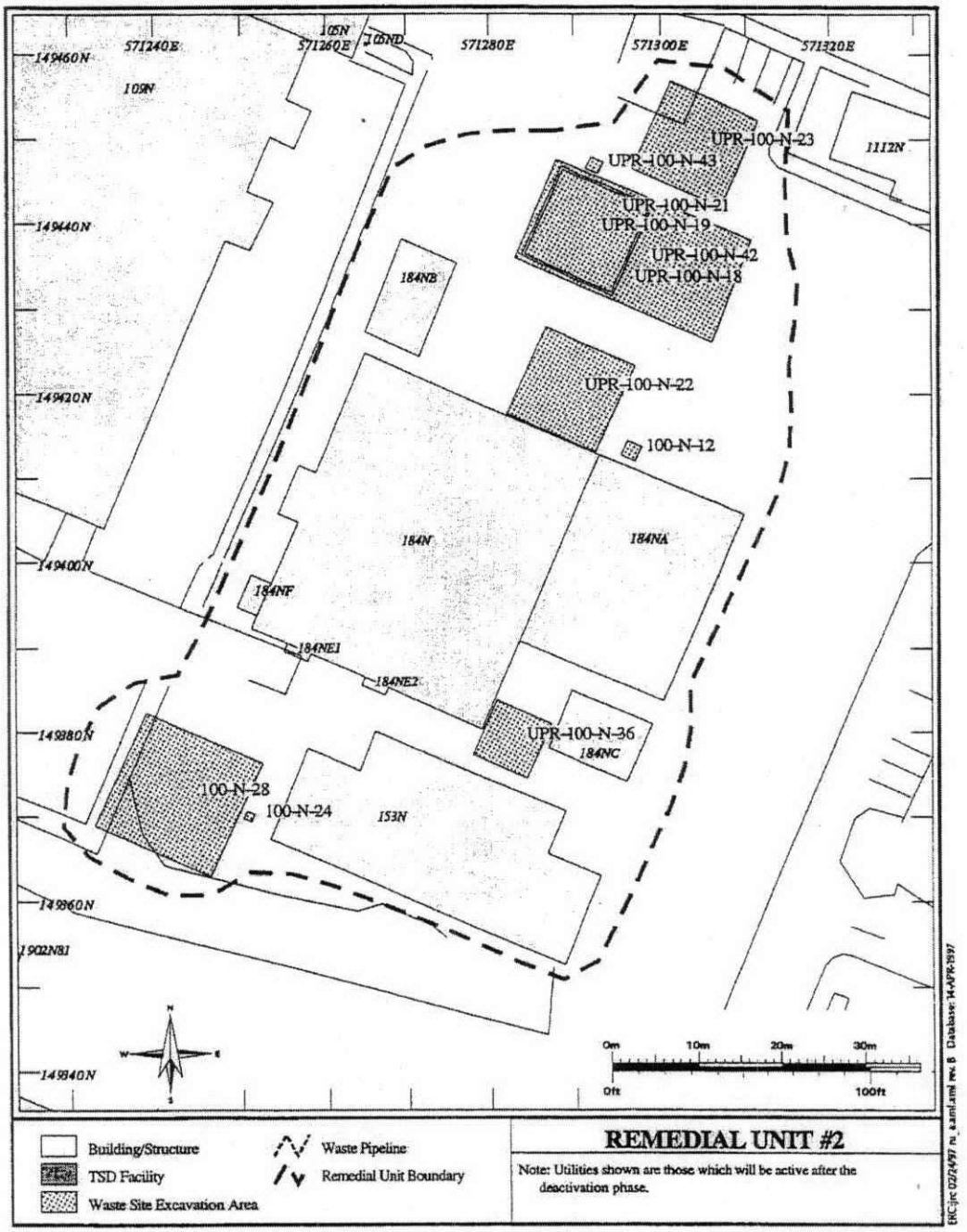
2

Figure A.1. Remedial Unit Number 1



1
2

Figure A.2. Remedial Unit Number 2



1

Figure A.3. Remedial Unit Number 3

2

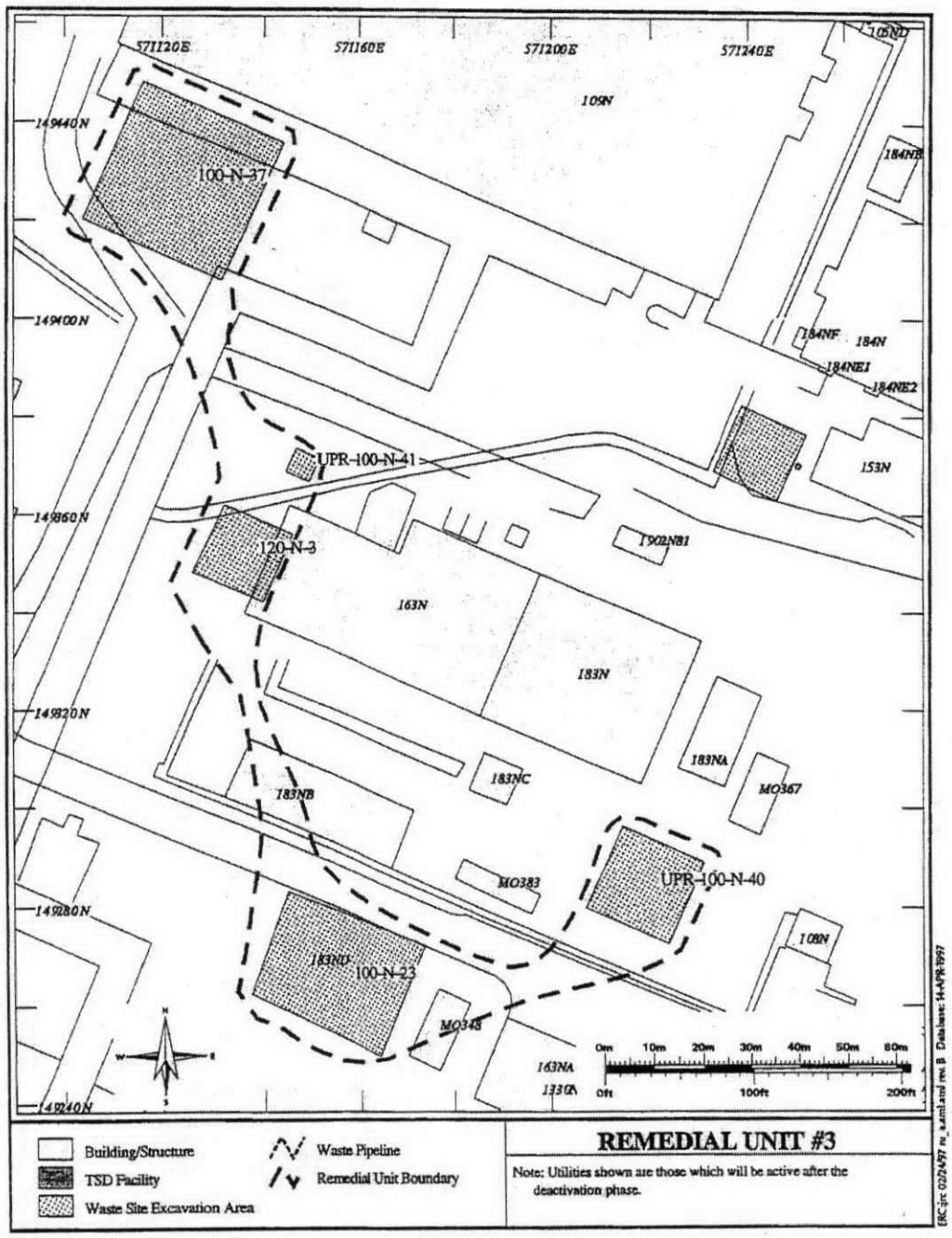
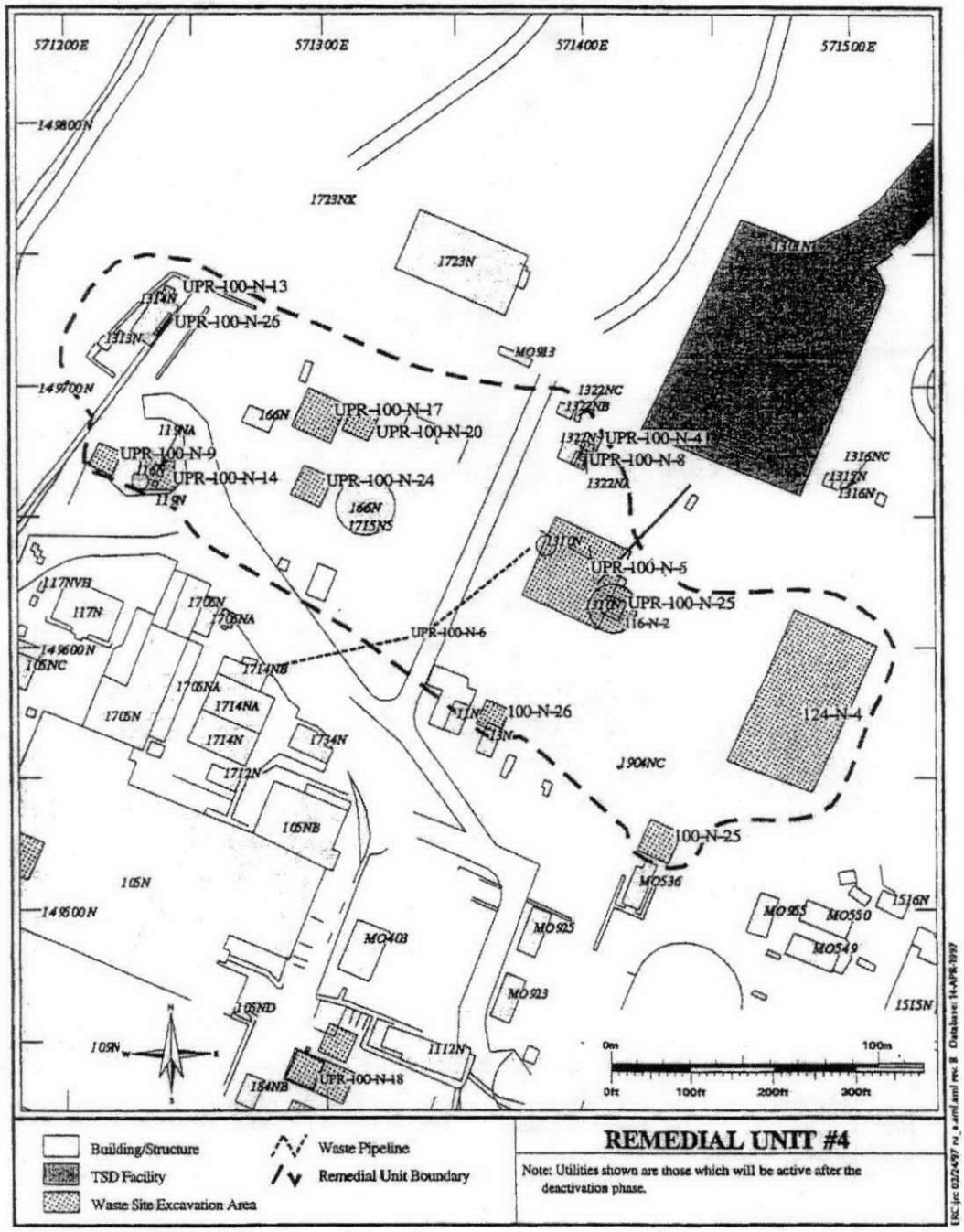


Figure A.4. Remedial Unit Number 4



1

Figure A.5. Remedial Unit Number 5

2

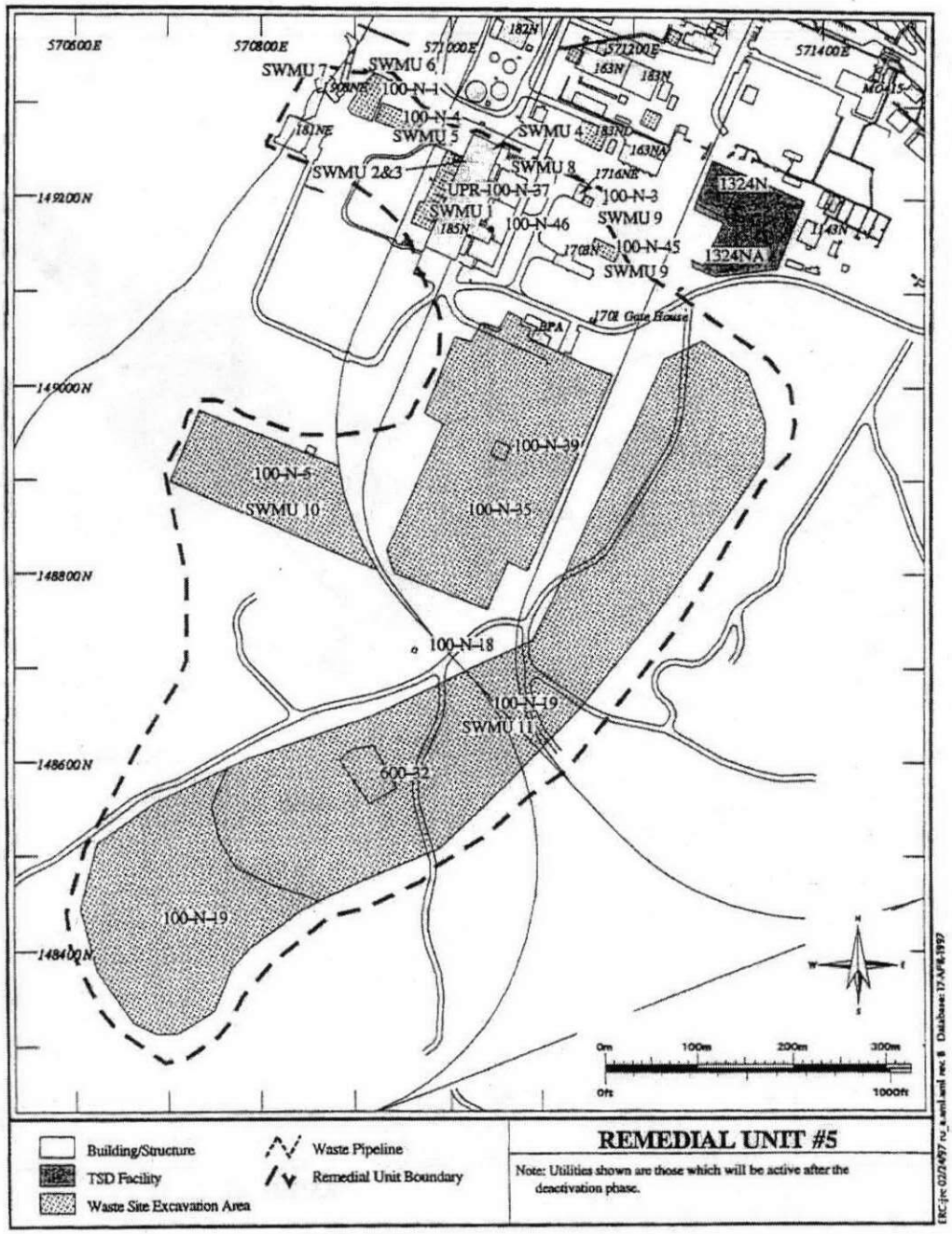


Figure A.6. Remedial Unit Number 6

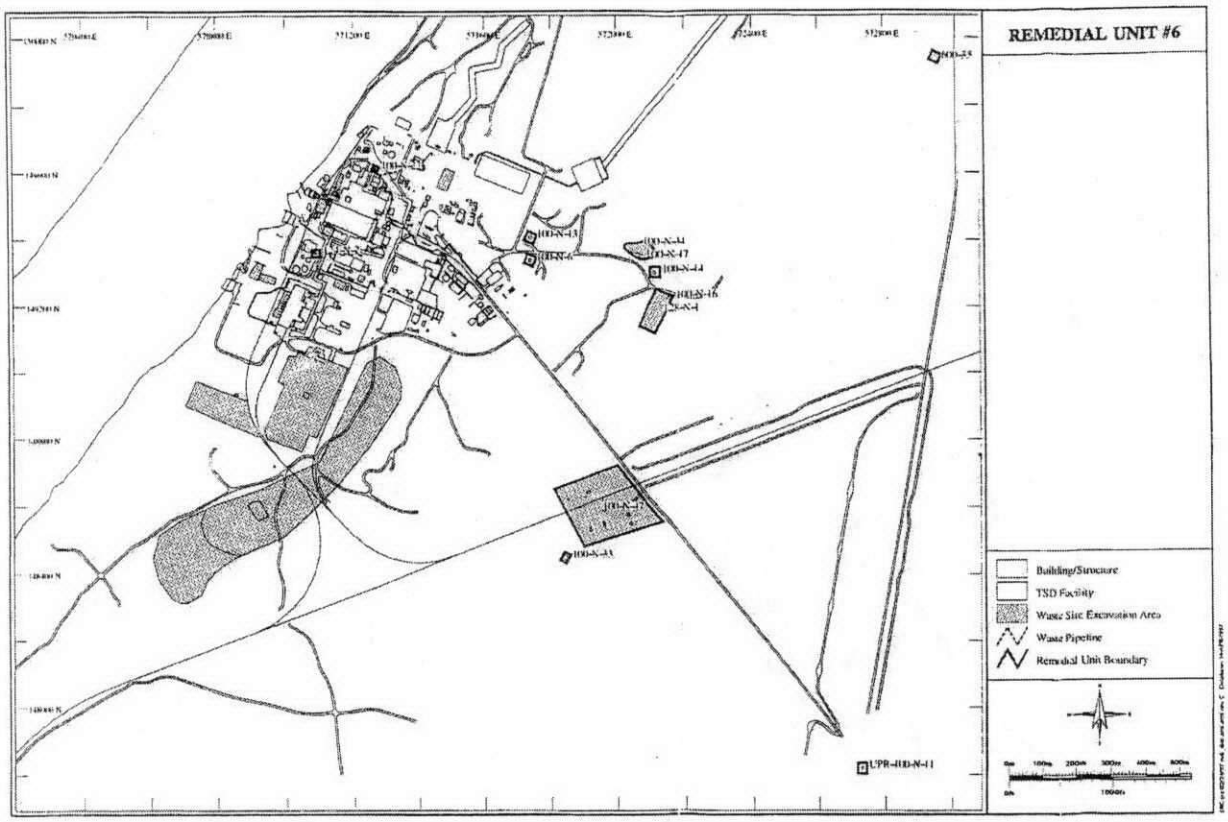


Figure A.7. TSD Waste Sites at the 100-N Area

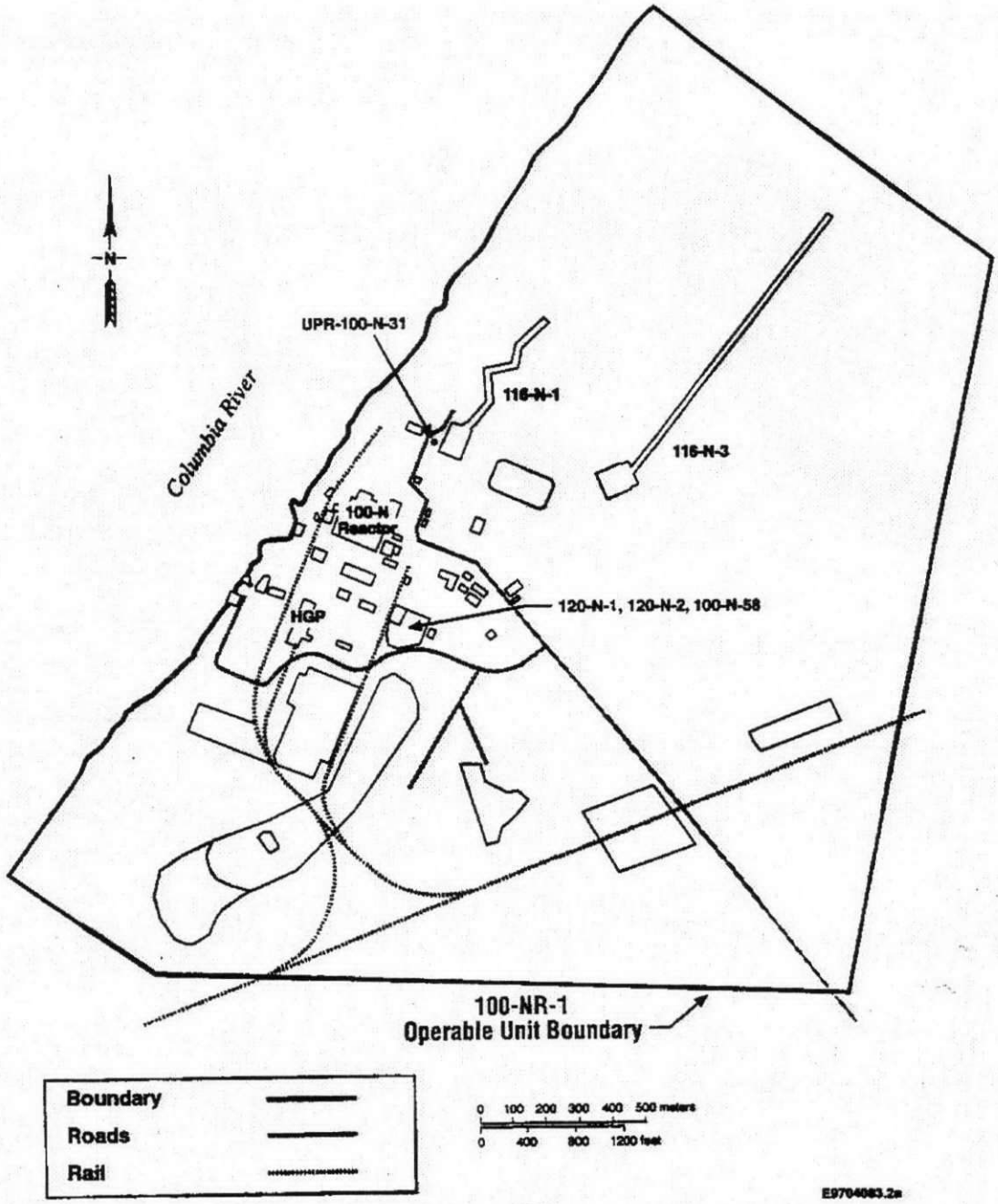


Figure A.8 Integrated Schedule for the 100-N Area D&D Facilities and Remediation Activities

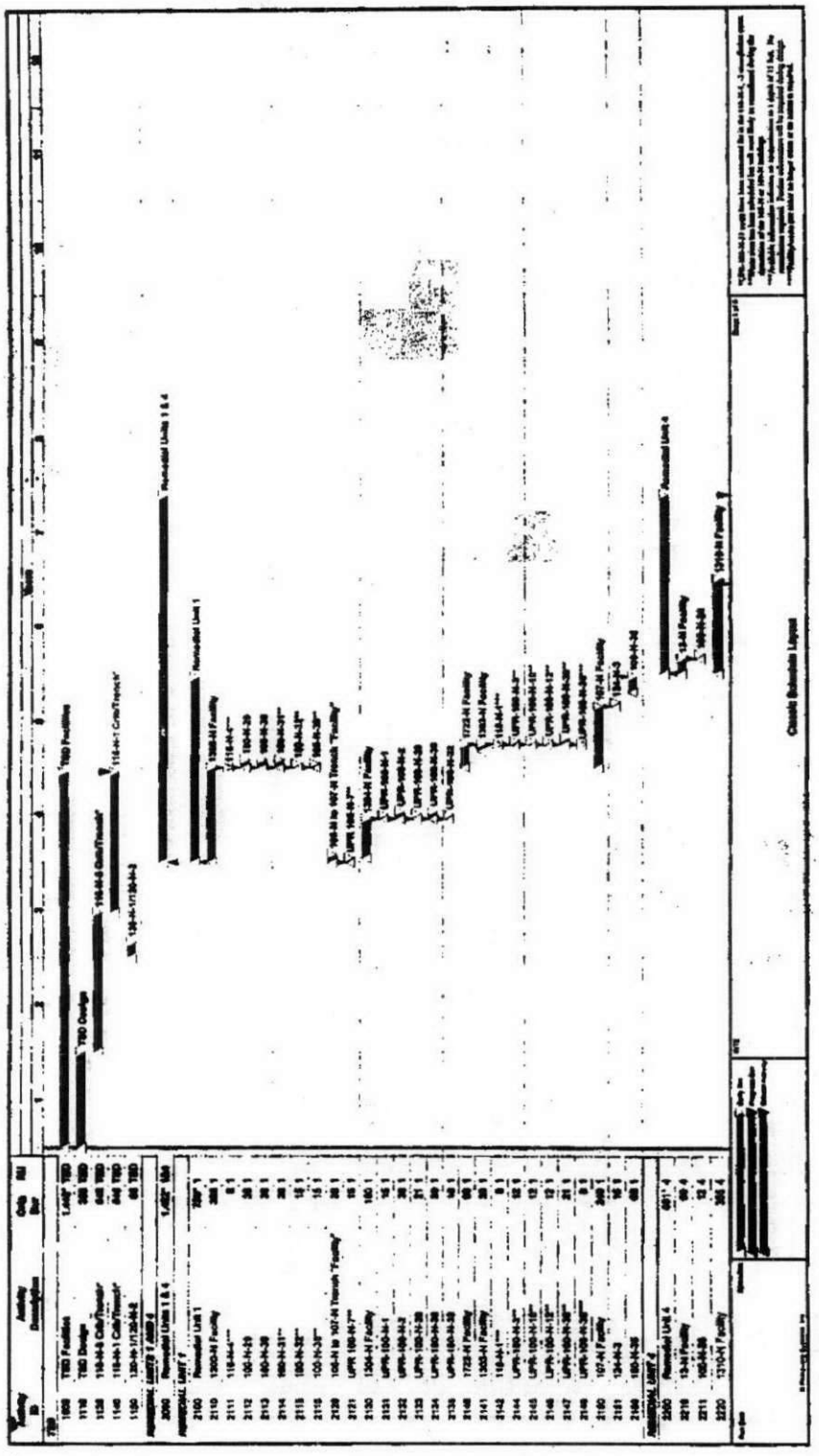


Figure A.8. Integrated Schedule for the 100-N Area D&D Facilities and Remediation Activities

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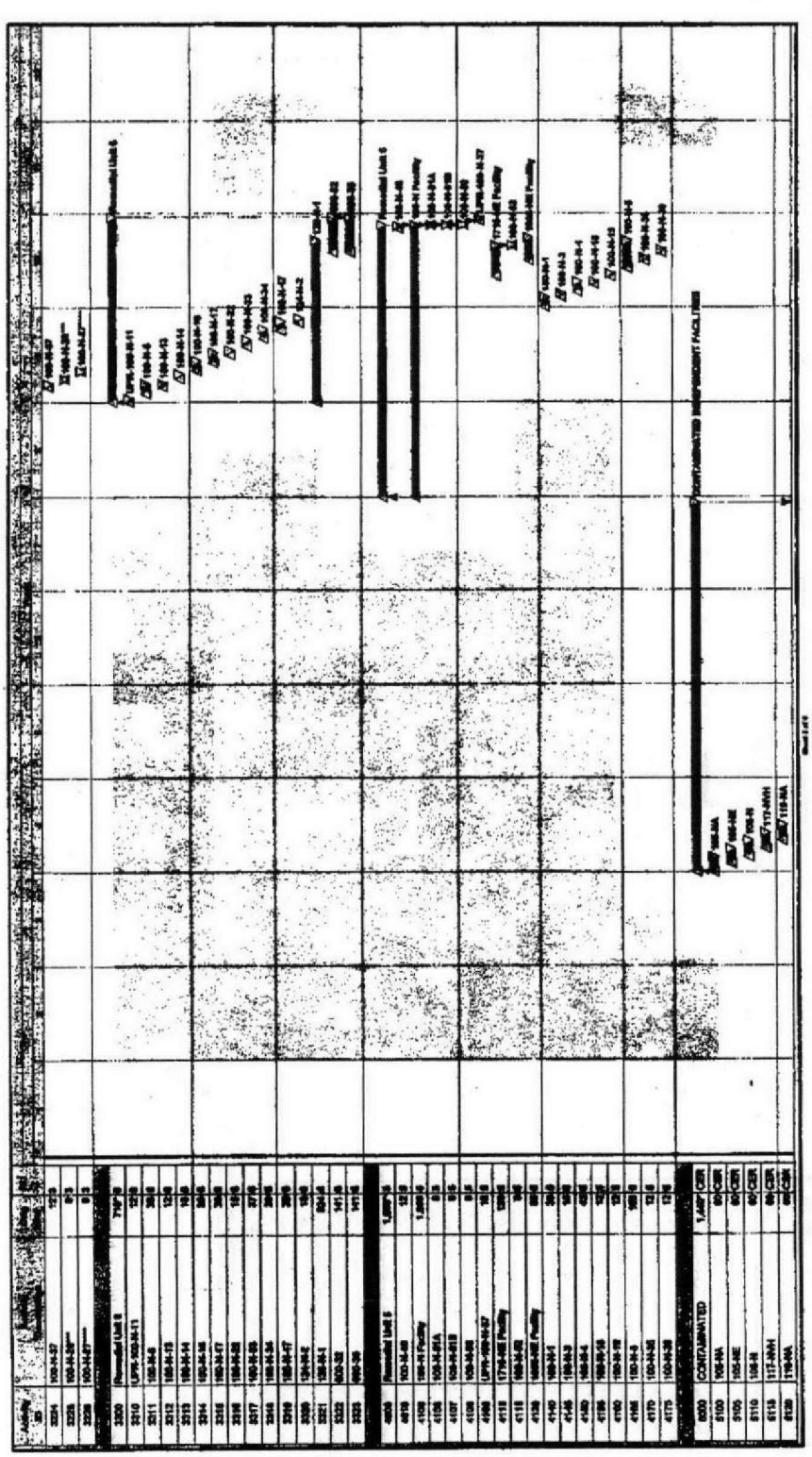

Figure A.8 Integrated Schedule for the 100-N Area D&D Facilities and Remediation Activities

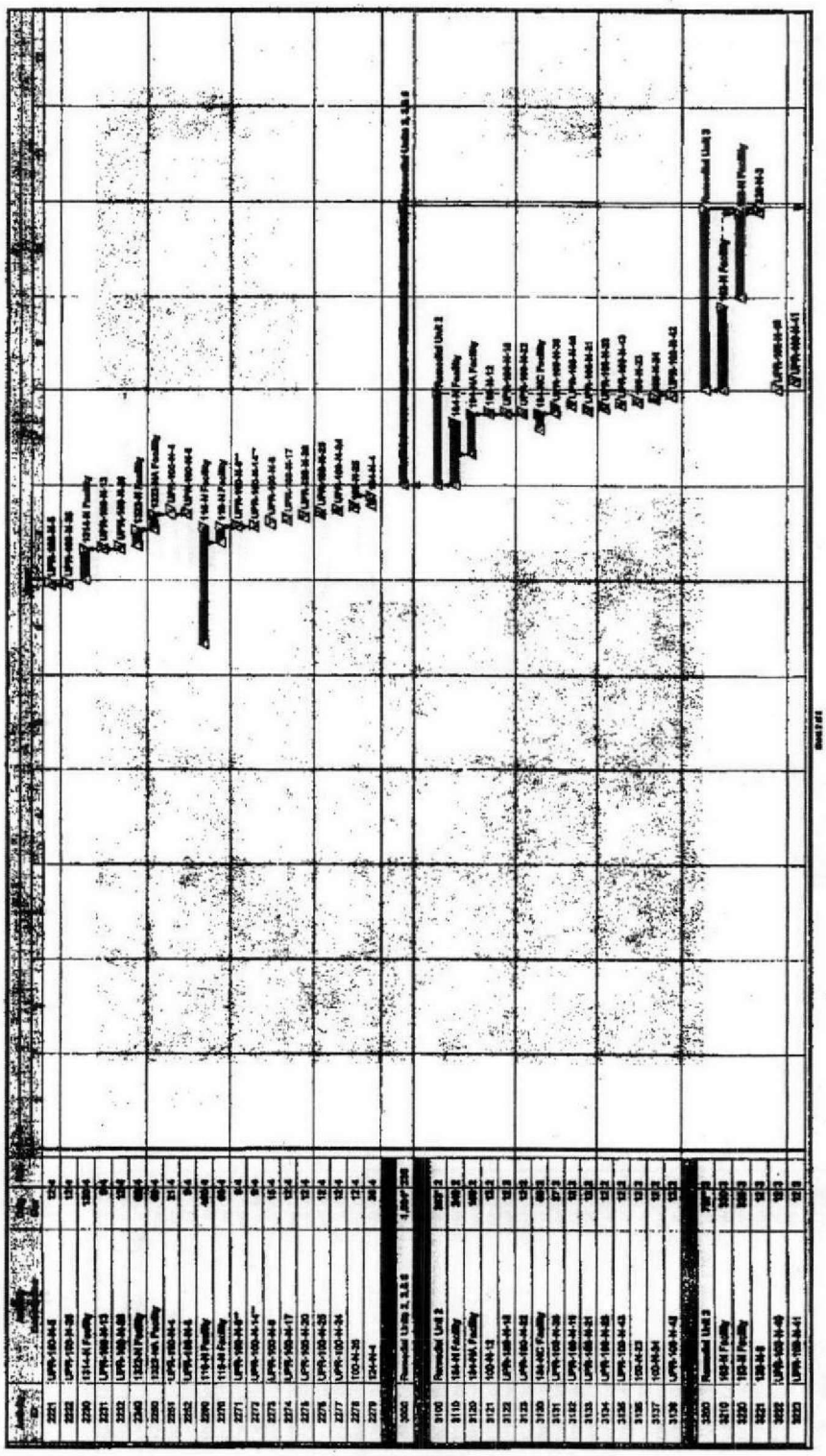

Figure A.8 Integrated Schedule for the 100-N Area D&D Facilities and Remediation Activities

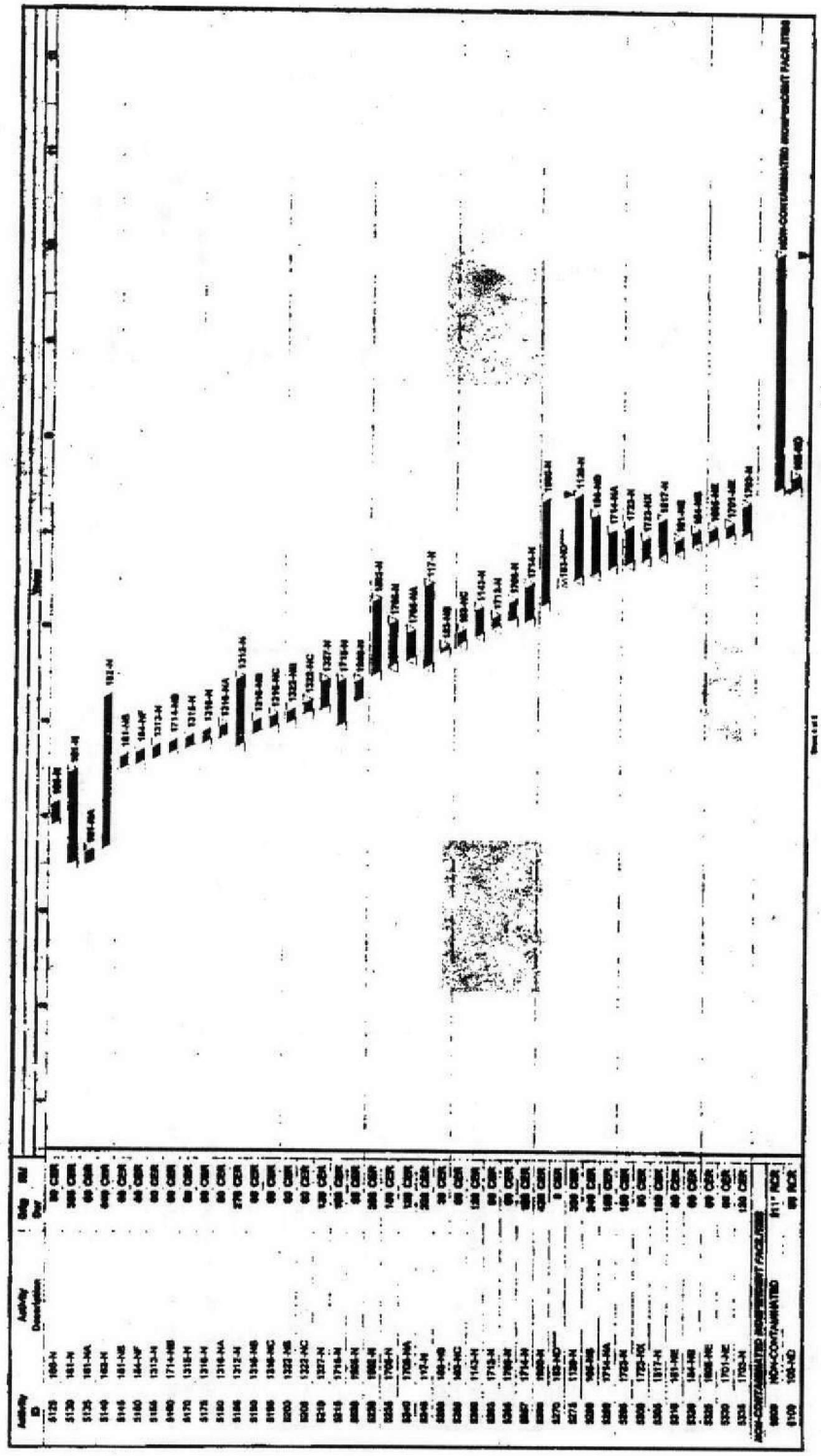

Figure A.8 Integrated Schedule for the 100-N Area D&D Facilities and Remediation Activities

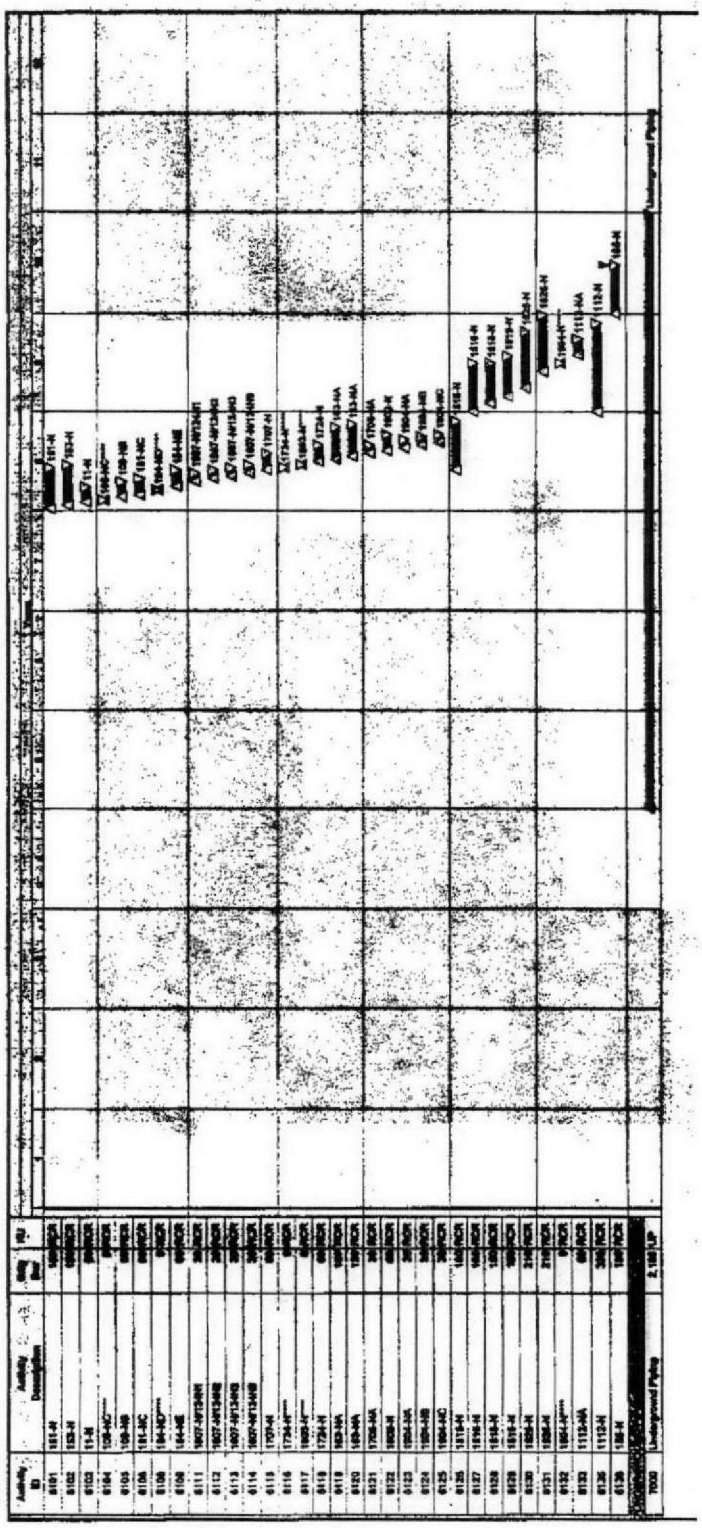

Table A.4. 100-N Area Remedial Action Waste Sites

Remedial Unit No. 1	Remedial Unit No. 2	Remedial Unit No. 3	Remedial Unit No. 4	Remedial Unit No. 5	Remedial Unit No. 6	River Shoreline	TSD Facilities
100-N-29[a]	100-N-12	100-N-23	100-N-25	100-N-1 (SWMU 6)	100-N-6	100-N-65	116-N-1
100-N-30[a]	100-N-28	100-N-37	100-N-26	100-N-3 (SWMU 9)	100-N-13	Shoreline	116-N-3
100-N-31[a]	100-N-24	120-N-3	124-N-4	100-N-4 (SWMU 5)	100-N-14	Site	120-N-1
100-N-32[a]	UPR-100-N-18	UPR-100-N-40	UPR-100-N-4	100-N-5 (SWMU 10)	100-N-16		120-N-2
100-N-36	UPR-100-N-19	UPR-100-N-41	UPR-100-N-5	100-N-18	100-N-17		100-N-58 (South Pond)
100-N-38[a]	UPR-100-N-21		UPR-100-N-6	100-N-19 (SWMU 11)	100-N-22		UPR-100-N-31
116-N-4[a]	UPR-100-N-22		UPR-100-N-8	100-N-35	100-N-33		
118-N-1[a]	UPR-100-N-23		UPR-100-N-9[a]	100-N-39	100-N-34		
124-N-3	UPR-100-N-36		UPR-100-N-13	100-N-45 (SWMU 9)	100-N-47		
UPR-100-N-1	UPR-100-N-42		UPR-100-N-14[a]	100-N-46	124-N-2		
UPR-100-N-2	UPR-100-N-43		UPR-100-N-17[b]	UPR-100-N-37 (SWMU 1)	128-N-1		
UPR-100-N-3[a]			UPR-100-N-20	1908-NE (SWMU 7)[c]	600-32		
UPR-100-N-7[a]			UPR-100-N-24	100-N-50 (SWMU 4)[c]	600-35		
UPR-100-N-10[a]			UPR-100-N-25	100-N-51a (SWMU 2)[c]	UPR-100-N-11		
UPR-100-N-12[a]			UPR-100-N-26	100-N-51b (SWMU 3)[c]			
UPR-100-N-29				100-N-52 (SWMU 8)[c]			
UPR-100-N-30							
UPR-100-N-32							
UPR-100-N-35[a]							
UPR-100-N-39[a]							

[a] Buffer zone sites; 13 buffer zone sites in RU 1 out of 15 total sites and 2 buffer zone sites in RU 4 out of a total of 15 sites.

[b] This site has been subdivided into two sites: UPR 100-N-17 is the leak and 100-N-65 is now the petroleum burn pit. 100-N-17 includes 100-N-65.

[c] Waste site contained within a facility.

1