FINAL
Design Analysis Report

Washington Recreation Sites—Starr Road Site
Bunker Hill Mining and Metallurgical Complex OU 3

Spokane River, Washington

E-18-5-01

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21 March 2006

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EXECUTIVE SUMMARY

The Environmental Protection Agency (EPA), with assistance from the Seattle District, U.S. Army Corps of Engineers (USACE), and in coordination with the Washington State Department of Ecology (Ecology), is performing the remediation of metals contamination at various recreational sites located on the Spokane River. The Starr Road Recreation Area is located on the river's northern shoreline, approximately 2.5 miles west of the Washington and Idaho state line. The Starr Road Recreation Area (Starr Road) is one of the ten shoreline areas identified for potential cleanup in the Record of Decision (ROD) for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (USEPA, 2002).

The contaminants present at Starr Road are associated with historic mining operations in the Coeur d'Alene Basin. The metals of principal concern for protection of human health are lead and arsenic. The project goal is to reduce the risk of human exposure to identified contaminants of concern (COCs), specifically lead and arsenic, in accordance with the ROD for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (the Bunker Hill OU3 ROD).

This final (100%) design analysis document was prepared by USACE to support EPA's conceptualization of the remedy, document its discussions with identified stakeholders, and the bidding and contracting of the remediation work. This document describes the design objectives, approach and methods that established the nature and extent of the remedial actions, the design of the remedy, and the contract documents for bidding and awarding the remedial action contract for the Starr Road site.

EPA's remedial action addresses 3.5-acres of land at the approximately 85-acre Starr Road Recreation Area, including approximately 2.5-acres located along the north side of the Spokane River where historic deposition and accumulation of metals-contaminated soil and sediment pose a human health risk to recreational users of the property. Approximately 1.95 acres of the work is located below the ordinary high water elevation of the Spokane River. Portions of the work will be performed in seasonally inundated portions of the shoreline, and the majority of the remediation activities are occurring within the 100-year floodplain.

The remedy concept includes work above and below the ordinary high water elevation in the Spokane River. The key elements of the remediation are as follow:

- Excavate 1,600 cubic yards of metals-contaminated soil and sediment from approximately 1.0-acre of a gravel bar (seasonally exposed during the summer's dam-controlled low water event) and replacing it with an equivalent quantity of clean, similarly graded gravels in the Spokane River. The fill consists of two gravel gradations selected for restoration of rainbow trout spawning habitat disturbed by the excavation work. The contaminated soil excavated from the bar will be disposed of at an offsite commercial landfill.

- Place 3,000 cubic yards of fill over a 1.77-acre nearshore area to create a barrier-type soil cap over contaminated sediment and soils that are not spawning habitat. Approximately 0.95-acres of the cap is located below the ordinary high water (OHW) elevation; 0.82-acres of the cap is above the OHW elevation. The fill includes approximately 2,550 cubic yards of clean capping material and 450 cubic yards of topsoil for revegetation of cap areas located above the OHW elevation.

Other activities occurring above the OHW elevation, in upland portions of the recreation area, include the construction of a new access point near the intersection of Starr Road and River Road, consisting of a paved turn-out along River Road (0.06 acres); a permanent pathway (0.09 acres) leading from the turn-out to the capped areas located along the Spokane River; and the use of various landscaping techniques to revegetate unwanted paths (0.43 acres) and modify foot traffic routes. Plantings of "hostile vegetation" (0.16 acres of thorny, dense-growing plants) will occur in a steeper, limited access area of the site in lieu of capping.

This final design analysis document, approved by EPA and distributed to project stakeholders for review and comment, contains the design drawings and contract documents completed by USACE on 19 August 2005. EPA authorized USACE to prepare the final (100%) design analysis document on January 5 2006. The remediation contract was bid under USACE's Multiple Award Remediation Contract and awarded on February 22, 2006. EPA and USACE anticipate that the Starr Road construction period will extend from 4 August 2006 (mobilization and temporary facilities) through 30 September 2006 (demobilization). The remediation includes excavation/fill and capping activities in the seasonally exposed nearshore areas of the Spokane River, requiring that the remedy construction be completed during the river's low flow period, which is controlled by upstream dams. The next window of opportunity for completing these construction activities is expected to occur during the period of 1 August to 15 September, 2006.

1 INTRODUCTION

The Environmental Protection Agency (EPA), with assistance from the Seattle District, U.S. Army Corps of Engineers (USACE), and in coordination with the Washington State Department of Ecology (Ecology), is proceeding with the remediation of metals contaminated soil and sediment at Washington State recreational areas located near Spokane, Washington. The Starr Road Recreation Area (Figure 1), located approximately 2.5 miles west of the Washington and Idaho state line, is one of ten shoreline sites on the Spokane River identified for cleanup in the Record of Decision (ROD) for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (USEPA, 2002). Operable Unit 3 (OU3) includes contaminated areas in the Coeur d'Alene corridor, adjacent floodplains, downstream water bodies, tributaries, and fill areas, as well as the 21 square mile Bunker Hill "Box" surrounding the historic smelting operations.

The contaminants present in the Starr Road area are associated with historic mining operations in the Coeur d'Alene Basin. The metals of principal concern for protection of human health are lead and arsenic. The project goal is to reduce the risk of human exposure to identified contaminants of concern (COCs), specifically lead and arsenic, in accordance with the ROD for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (the Bunker Hill OU3 ROD).

1.1 Project Approach

In April 2005, EPA distributed a 65 percent (%) design document outlining the proposed remedial actions for the Starr Road and Island Complex areas. Issues identified during subsequent discussions with project stakeholders required significant revisions to the proposed actions, including the decision to address the Starr Road and Island Complex areas as separate projects. The Starr Road area was prioritized for design and construction activities. The Island Complex area is being addressed as a separate project.

This final (100%) design analysis document for the Starr Road area was prepared by USACE under an Interagency Agreement with EPA (IAG DW96957343) to support EPA's conceptualization of the remedy, discussions with identified stakeholders, and contracting of the remediation work. This document describes the design objectives, approach and methods for designing the remedy, bidding the work, and awarding a remedial action contract for the Starr Road area. The document is organized as follows:

- **Section 1, Introduction**—The project sites and the remedial action objectives, as developed for the conceptual (10%) design document, dated January 10, 2005, are discussed in this section.

- **Section 2, Remedy Concept**—This section describes the scope revisions to the remedy proposed by EPA and documented in this final design analysis report for the Starr Road site.

- **Section 3, Design Issues**—The three design-related topics that are the framework for the Starr Road remediation are discussed: engineering issues, applicable or relevant and appropriate requirements (ARARs), and USACE's design process. The section discusses the influence of these issues on the remedy, as well as describing the process used by USACE to bid and award construction of the remedy.

- **Section 4, Remedy Design**—This section describes the major design features of the Starr Road remedy, including engineering assumptions and the analyses performed to design the remedy.

- **Section 5, References**—Site data and quoted information sources are identified.

Appendix 1 is a checklist of design-related work required for Bunker Hill projects, and summarizes the status of this design submittal.

The stakeholders for these recreational areas include the Spokane and Coeur d'Alene Tribes, Ecology, the Washington State Parks and Recreation Commission, the Washington State Department of Natural Resources, Spokane County, and the Washington Citizens Advisory Committee, which is the community advisory group for the Spokane River.

1.2 Site Background

1.2.1 Bunker Hill OU3 and the Washington Recreation Sites

The Bunker Hill Mining and Metallurgical Complex (Bunker Hill) was placed on EPA's National Priorities List in 1982. Mining and mineral production occurred in the Bunker Hill area from 1883 to 1981. The major products over this 100-year period were lead, antimony, zinc, cadmium, silver, gold, sulfuric acid, phosphoric acid, and dry fertilizer. Mining and mineral production resulted in heavy metal contamination of soil, sediment, surface water, groundwater, and air throughout the site. The mine tailings and contaminated soil from the various mining operations were discharged and/or eroded into the local streams and rivers, transporting contamination through Coeur d'Alene Lake to the Spokane River, and have been deposited in various locations along the river within the States of Idaho and Washington. Reference documents concerning the investigations and remedial actions associated with the Bunker Hill site and the Coeur d'Alene Basin are available on EPA's web site (www.epa.gov).

The Starr Road area is located on approximately 85-acres of land owned and operated by the Washington State Parks and Recreation Commission (Spokane County Parcel No.'s 55024.0701 and 55012.0122). The seasonally submerged areas of the Starr Road area on the Spokane River are controlled by the Washington State Department of Natural Resources.

EPA's remedial investigation/feasibility study for the Coeur d'Alene Basin (USEPA, 2001), which include the results of a limited sampling effort in these recreations sites in 1999 and 2000, documented the presence of metals contamination. Protection of human health is the principle objective for the remedial actions at the Starr Road area, although it is recognized that inundated areas of Starr Road also contain rainbow trout spawning habitat.

In 2004, USACE performed site-specific sampling of the Starr Road site to confirm conditions in the areas identified by EPA and Ecology for remediation and provide field data for design activities. Appendix 2 contains the USACE sampling results documented in the *Washington Recreational Sites, Starr Road and Island Complex Field Sampling Report*, dated January 7, 2005 (USACE, 2005).

EPA has prioritized the remediation of the Starr Road and Island Complex recreation areas due to the presence of lead above the action level indicated in the ROD and their relative accessibility and popularity for use by the public. Nine additional shoreline sites on the Spokane River, identified for cleanup in the

ROD for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (USEPA, 2002), will be addressed by future projects.

1.2.2 Starr Road

The Starr Road recreation area is a popular destination for local residents, located on the north bank of the Spokane River (Figure 1) and managed under the Washington State Parks system. The approximately 85-acre property is used during the summer for sport fishing and picnics, and is accessible year-round by foot or horseback. Off-road vehicles are frequently also used to access the site, eroding the hillsides and disturbing the native vegetative cover. The most popular destination in the park is a low lying area along the river, located south of the intersection of Starr Road and River Road, which contains a seasonally accessible gravel bar, a quiet backwater lagoon, and a gravelly beach. The riverside area is about 2.77 acres, of which 1.95 acres is located below the river's ordinary high water elevation.

For investigation and design purposes, the Starr Road site was broadly divided into four areas (Figure 2):

1. General access routes, including foot paths and unimproved road tracks used by people and illegal off-road vehicles to reach various areas of the site.

2. Gravel Bar, a seasonally inundated gravelly zone extending downstream along the main channel of the river; the gravel bar contains rainbow trout spawning habitat.

3. Backwater Lagoon and Beach (a heavily vegetated and little used area on the north bank of the Spokane River).

4. Uplands, a seasonally inundated shoreline zone that provides a gently sloping access to the river and is popular with recreational users that come to the site to fish and wade in the backwater lagoon.

Soil and sediment samples collected in 1999 by URS Corporation (USEPA 2001) and in 2004 by the U.S. Army Corps of Engineers (Appendix 2) documented elevated levels of lead and arsenic in portions of the Starr Road area that exceeded human health thresholds established in the Bunker Hill OU3 ROD. The highest levels of arsenic and lead documented by USACE (62 mg/kg and 2,520 mg/kg, respectfully) were found in the backwater beach area, which is heavily vegetated and little used by the public. The recreational shoreline use primarily occurs within the Uplands area.

1.3 Remedial Action Objectives

As defined in Part 2, Section 8 of the Bunker Hill OU3 ROD (USEPA, 2002), the remedial action objectives (RAOs) describe the goals of the overall cleanup. The primary RAO for the Starr Road site is to reduce human exposure to lead-contaminated soils and sediments. The RAOs for the protection of human health are defined in the Bunker Hill OU3 ROD for soil, sediments, and source materials. Protection of aquatic habitat has been incorporated into the Starr Road remedy due to the presence of locally important rainbow trout spawning gravels in the bar. Short-term construction impacts to ecological receptors (e.g., rainbow trout) are expected to be minimized. The selected remedy uses active and passive remedial actions to achieve the RAOs.

The selected remedies for the Spokane River (USEPA, 2002) are to accomplish the following:

1. Reduce human health and ecological exposures at selected shoreline sediment depositional areas,

2. Stabilize existing contamination to minimize release of contaminated sand and gravel to the river,

3. Minimize the possible exposure of recreational users of the site to heavy metals by a combination of capping, removals, and possibly future performance monitoring.

For the Spokane River, the Bunker Hill OU3 ROD, signed September 12, 2002, identified ten popular river-side recreational sites that may require remediation to create safe, well defined areas for recreational users and the river's aquatic life. The ROD envisioned applying a combination of access controls, capping and removal to remediate the sites. The soil and sediment action level for protection of human health was defined in the ROD as 700 mg/kg for lead (USEPA, 2002). The ROD did not provide a sediment action level for arsenic. To be protective of human health, the cleanup action level for arsenic for the Starr Road area was set at 20 mg/kg, consistent with MTCA Method A.

2 REMEDY CONCEPT

This section describes the remedy selected by EPA for the Starr Road site, specifically the project scope and revisions to the planned work that have been carried forward for final design and construction.

2.1 Design Standards

The 10% design, completed on January 10, 2005, established the following design performance standards for the Washington recreation area projects:

1. Construct structurally sound bank stabilization features, designed to withstand a 20-25 year flood event.

2. Protect environmental and human health.

3. Meet the requirements of the Bunker Hill OU3 ROD for lead contamination.

4. Consider future use of the site.

5. Zero net fill (amended in later design phases to allow use of capping as part of the remedy).

6. Meet substantive permitting and construction requirements of the State of Washington.

These standards continue to be reflected in the project planning, with modifications, including the further definition of substantive compliance issues with assistance from the project stakeholders. These issues have required modifications to the remedy concepts, which are discussed below.

2.2 Starr Road Remediation Concepts

The 2004 USACE site investigations of the Starr Road area (Appendix 2) documented lead levels exceeding the human health goals in the top one-foot of soil and sediments along portions of the gravel bar and seasonally inundated areas along the shore of the Spokane River. The backwater lagoon, the gravel bar and the seasonally inundated upland areas are commonly used by recreational visitors. The backwater beach area is underwater during high water stages of the river. A locked gate prevents direct road access to the site, but off-road recreational vehicles can enter the site from a variety of points along River Road. There are currently no designated parking areas for visitors to the Starr Road site or guard rails and barriers to discourage unauthorized and destructive access with off-road vehicles.

To protect human health, Starr Road's remedy included eliminating lead exposure at the most heavily used or potentially-used recreational areas of the site by a combination of active and passive remedial actions. The remedy included contaminated soil removal and replacement with clean fill; construction of clean, well-defined trails to focus recreational use to specific areas within the site; and the use of various landscaping techniques to abandon unwanted paths and direct foot traffic away from other portions of the park property. These concepts were presented to the project stakeholders on April 1, 2005.

EPA and Ecology hosted a stakeholder meeting on April 14, 2005, which revealed significant differences in understanding and expectations among the stakeholders regarding the remedial actions. Three major issues

emerged from the discussions: the areal extent of the shoreline to be addressed by the remedy, the nature of the replacement gravel to bé placed within the trout habitat zone, and the location and configuration of an onsite repository for the metals-contaminated gravels removed from the shoreline.

Subsequent discussions between EPA and the stakeholders resulted in a re-evaluation of the project's nature and scope, the design elements to be addressed by the remedy, and execution requirements to assure substantive compliance with stakeholder issues. Re-evaluation of the 2004 sampling data (USACE, 2005) resulted in concurrence by EPA and Ecology to designate additional portions of the Starr Road shoreline for remediation. In addition, the onsite management of contaminated soil to be excavated from the gravel bar was not accepted by the Washington State Parks & Recreation Commission, requiring offsite disposal in a permitted landfill.

EPA's remedial actions address 3.5-acres of land at the approximately 85-acre Starr Road site, including approximately 2.5-acres located along the north side of the Spokane River where historic deposition and accumulation of metals-contaminated soil and sediment pose a human health risk to recreational users of the property. Approximately 1.95 acres of the work is located below the ordinary high water elevation of the Spokane River. Portions of the work are located in seasonally inundated portions of the shoreline, and the majority of the remediation activities are occurring within the 100-year floodplain (Figure 3).

The remedy includes work above and below the ordinary high water elevation in the Spokane River. The key elements of the proposed remediation are as follows:

- Excavate 1,600 cubic yards of metals-contaminated soil and sediment from approximately 1.0-acre of a gravel bar (seasonally exposed during the summer's dam-controlled low water event) and replacing it with an equivalent quantity of clean, similarly graded gravels in the Spokane River. The fill consists of two gravel gradations selected for restoration of rainbow trout spawning habitat disturbed by the excavation work. The contaminated soil excavated from the bar will be disposed of at an offsite commercial landfill.

- Place 3,000 cubic yards of fill over a 1.77-acre nearshore area to create a barrier-type soil cap over contaminated sediment and soils that are not spawning habitat. Approximately 0.95-acres of the cap are located below the ordinary high water (OHW) elevation; 0.82-acres of the cap are above the OHW elevation. The fill includes approximately 2,550 cubic yards of clean capping material and 450 cubic yards of topsoil for revegetation of cap areas located above the OHW elevation.

Other activities occurring above the OHW elevation, in upland portions of the Starr Road area, include the construction of a new access point consisting of a paved turn-out along River Road (0.06 acres); a permanent pathway (0.09 acres) leading from the turn-out to the capped areas located along the Spokane River; and the use of various landscaping techniques to revegetate unwanted paths (0.43 acres) and modify foot traffic routes. Plantings of "hostile vegetation" (0.16 acres of thorny, dense-growing plants) will occur in a steeper, limited access area of the site in lieu of capping.

3 DESIGN ISSUES

This section discusses the general design issues identified for this project. The discussions are organized into three topics: engineering issues, applicable or relevant and appropriate requirements (ARARs), and design approach. These issues were considered during the development of the design features discussed in Section 4, Remedy Design.

3.1 Engineering Issues

3.1.1 Waste Characterization

Historic mining, milling, and smelting activities in the Coeur d'Alene Basin are the primary source of the metals contamination present at the Starr Road area and the other identified sites along the Spokane River. The contamination found at the recreation areas is the result of transportation of mining-related sources of metals into the Spokane River, particularly during winter storm events and spring runoff, and deposition of contaminated sediments in shoreline and subaqueous areas of the river. As mining-related sources, the Bevill Amendment to the Resource Conservation and Recovery Act is applicable; specifically, this October 1980 amendment to RCRA added section 3001(b)(3)(A)(ii), known as the Bevill exclusion, to exclude "solid waste from the extraction, beneficiation, and processing of ores and minerals" from regulation as hazardous wastes under Subtitle C of RCRA. The contaminated soil at the Starr Road site is therefore classified as a solid waste and exempted from classification as a hazardous waste (40 CFR 261.4(b)(7)).

Appendix 2 contains soil and sediment testing results for the Starr Road recreation area, specifically metals analyses using the toxicity characteristic leaching procedure (TCLP; EPA SW-846, Method 1311), as described in 40 CFR 261.24, and the synthetic precipitation leaching procedure (SPLP; EPA SW-846, Method 1312), specifically developed for EPA to evaluate the leachability of metals at the Bunker Hill Superfund site. The test results indicate the soil and sediment media, and their contaminants, are not highly leachable and would not risk remobilization of metals if the contaminated media was managed with an onsite remedy. The analytical results also indicate that the excavated soil and sediment would not be classified as Dangerous Wastes under Washington's Model Toxics Control Act (MTCA). The waste characteristics of the contaminated soil and sediment targeted for remediation by this project are consistent with the Bunker Hill OU3 ROD, including the applicability of onsite remedies for protection of recreational users of the area.

3.1.2 Contaminated Soil Removal and Replacement

EPA proposed the removal of contaminated soil and sediments from select areas of the Starr Road recreation sites. The identification of areas to be excavated was based on prior investigations of the site, including the 2004 USACE samples discussed in Appendix 2, and the cleanup goals established in the Bunker Hill OU3 ROD. At the Starr Road area, soil removal will occur within the Gravel Bar area, which contains locally-important rainbow trout spawning habitat. Discussions with the various project stakeholders, and in particular the Washington Department of Fish and Wildlife, determined that excavation of the contaminated soil would be required to remediate this portion of the site. Based on historic sampling results, an estimated 1,600 cubic yards of gravel and sediment will be removed from the Gravel Bar area of the Starr Road area. While the soil characteristics are acceptable for onsite management, EPA and Ecology agreed to a request by the landowner, the Washington State Parks &

Recreation Commission, that this contaminated soil be transported to an offsite commercial disposal facility. Approvals required for offsite disposal are documented in Appendix 3.

Following removal of the contaminated soil, restoration of the gravel bar will be done by replacing the excavated gravels with clean, select fill materials that are representative of the original soil conditions and matching the pre-remediation elevations and grades of the gravel bar surface. These activities are believed to be important to retain a quality habitat for rainbow trout spawning.

3.1.3 Capping of Contaminated Soil

The remedy for the Starr Road area also addresses portions of the nearshore that are not rainbow trout spawning habitat. The uplands portion of the backwater lagoon, the backwater beach area, and a larger open area that extends above the river's ordinary high water mark contain lead and arsenic contaminated soil. This portion of the Starr Road area will be capped with one foot (1-foot) of clean, imported fill material that provides a physical barrier to protect recreational users from contact with the lead and arsenic in the native soil. This protective soil cap will be placed over approximately 1.77 acres (8,500 square yards) of the nearshore area. The barrier system is consistent with the ROD's recommendations for reducing human exposure to surface soil contamination. Approximately 3,000 cubic yards of imported fill will be placed within this area.

The capped area is located within the 100-year floodplain. Approximately 0.95-acres of the cap is located below the ordinary high water (OHW) elevation; 0.82-acres of the cap is above the OHW elevation. Areas below the ordinary high water (OHW) mark will be capped with an unvegetated gravelly fill, which is similar to the existing site condition. Areas above the OHW mark will receive 8-inches of capping material and 4-inches of topsoil (1-foot total thickness); this cap area will then be hydroseeded. The imported fill to create the 1-foot cap will consist of approximately 2,550 cubic yards of clean capping material and 450 cubic yards of topsoil (above the OHW elevation).

3.1.4 River Access to Gravel Bar Area

Access to the nearshore areas of the Starr Road recreation area, specifically the Gravel Bar area, is affected by seasonal water levels in the Spokane River. During moderate to high flow periods, the nearshore areas of Starr Road targeted for remediation are below the river's water line.

Access to remediate Starr Road's gravel bar is controlled by the river elevation. To reach the agreed limits of the remediation, the work must occur during the low flow period in late summer. The seasonal water level in the Spokane River is controlled by the Post Falls Hydroelectric Development, consisting of three dams operated by Avista Utilities (Spokane, WA). Avista's management of the water levels in Coeur d'Alene Lake (located approximately 9 miles upstream) and its hydroelectric power production needs directly affect the river conditions and the actual timing of remedial actions at Starr Road.

In 2005, Avista restricted discharges to the Spokane River from 1 August through 12 September. During this period, the river reached its lowest water level of 2005 and allowed access to the targeted cleanup area on the gravel bar. A similar timing is anticipated for the summer of 2006.

3.1.5 Recreation Area Access

The northern boundary of the Starr Road area lies along River Road. This is a portion of the site where foot traffic and illegal off-road vehicle access has historically damaged the surface vegetation, causing soil erosion and increased sediment transport via stormwater runoff. Controlled access to the site, including creation of new access routes for foot traffic and preventing direct access to the nearshore areas of the park lands, is important to protect the remediated areas along the river.

EPA and Ecology, in coordination with the Washington State Parks and Recreation Commission, proposed the creation of new access point for the Starr Road park lands. The intent was to focus foot traffic along a "clean" corridor that leads users to the remediated areas of the site, which are located in a portion of the park what is already heavily used by the public. The creation of a turnout area along the southern edge of River Road leads recreational users onto an engineered pathway into the park and the most frequently used nearshore area on the river. Design concepts include space for parallel parking of up to three vehicles along the road shoulder, paved surfaces, surface drainage of precipitation (i.e., sloping and contouring surfaces for gravity drainage), and a defined access route to the park for pedestrians.

3.1.6 Recontamination of Remediated Areas

The ten recreational sites selected for remedial action along the Spokane River were identified as areas of net sediment deposition. These sites accumulate sediments, to varying degrees, carried down the river from upstream sources. During large flood events, contaminated sediment from upstream areas of the Spokane River can be re-suspended and potentially transported to the Starr Road site. The rate at which such recontamination could or would occur is as yet unanswered for this river, but the historic upstream mining activities and the transport of contamination by the river are widely viewed as the sources of the elevated background metals observed in the Spokane River. The remedial actions proposed for the Starr Road recreation area have therefore focused on a specific portion of the park with high recreational use (i.e., the gravel bar, backwater lagoon, and the adjacent access points) to reduce potential exposures and protect human health.

The continued presence of metals contamination in other portions of the Starr Road recreation area, i.e., with less use or with lower potential for disturbance by recreational users, is recognized by EPA and the stakeholders. As such, these portions of Starr Road could reintroduce contamination into remediated areas by disturbance of the soil, erosion, or transport in stormwater runoff. The presence of existing vegetation, the planned revegetation of bare areas along paths and road tracks, and the creation of permanent access routes (a parking pull-out and engineered paths) are expected to mitigate or control the most significant routes for recontamination.

3.1.7 Timing of Work

The construction season for this project must occur during a period of low water within the Spokane River. The construction schedule for this project therefore reflects historic data and the need for coordination with other entities that affect water levels within the river. As discussed in Section 3.1.4, Avista Utilities operates three dams that control the summer discharges to the Spokane River. In December 2004, Avista indicated that the period of 1 August through 15 September would be the low flow period for the summer of 2005. The actual low water period was approximately 1 August to 12 September, with increasing discharges through the remainder of September and October. The summer is also a peak time for recreational usage of the Starr Road area. For safety, the portions of the recreational sites needed for

access, staging and storage, and active remediation (excavation/replacement or capping) will be closed to the public during construction activities. Appropriate measures will be taken, with stakeholder involvement, to ensure that the public is informed of the closures and that public safety is a priority. Construction would occur over an approximately two month period (including mobilization/demobilization), with excavation below the normal water line occurring during the low water period in the river (1 August to 15 September), when the work area is well above the river's seasonal waterline.

3.2 Applicable or Relevant and Appropriate Requirements

3.2.1 Biological Impacts

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended, the Corps is required to assure that its actions have taken into consideration impacts to federally listed or proposed threatened or endangered species for all federally funded, permitted, or licensed projects. Section 7 of the Endangered Species Act (ESA) also requires that a federal agency must consult with NOAA Fisheries and/or the US Fish and Wildlife Service if a project would result in an effect on threatened and/or endangered species within the project area.

The segment of the Spokane River affected by the Starr Road remediation was evaluated for the presence of threatened and/or endangered species. The following is the list of federally designated threatened and endangered species that may exist within the vicinity of the project:

- Grizzly Bear (*Ursus arctos horribillis*) – Threatened
- Gray Wolf *(Canus lupus)* - Endangered
- Canada lynx (*Lynx Canadensis*) - Threatened
- Bald Eagle *(Haliaeetus leucocephalus)* - Threatened
- Water Howellia (*Howellia aquatilis*) - Threatened
- Ute ladies'-tresses *(Spiranthes diluvialis)* – Threatened

The results of this biological evaluation are documented in the August 25, 2005 Memorandum for Record in Appendix 4. The Corps has determined that the project will have ***no effect*** on any of these listed species.

Consultations with the Washington Department of Fish and Wildlife identified the presence of locally important spawning habitat for rainbow trout in the Spokane River, specifically the gravel bar area targeted for remediation at the Starr Road site. No threatened and/or endangered fish species are present in the Spokane River.

3.2.2 Clean Water Act, Section 401/404 Compliance

The remediation of the Starr Road area requires the excavation and placement of fill material within the Spokane River, which is considered a water of the United States under the Clean Water Act. This would typically trigger a requirement for the proposing agency/entity to obtain Department of the Army (US Army Corps of Engineers) permits under Sections 401 and 404. The Clean Water Act is also an ARAR under Superfund. EPA's CERCLA policy for the Clean Water Act ARAR Consistency is to demonstrate compliance by preparing an evaluation of consistency with the Section 404(b)(1) Guidelines. USACE has

prepared a site-specific Decision Document (Appendix 5) based upon Nationwide Permit (NWP) 38, which addresses project compliance with the National Environmental Policy Act and Subparts C through F of the 404(b)(1) Guidelines (40 CFR 230). This consistency evaluation is part of the Administrative Record for the project.

The Clean Water Act also requires that any 'discharge' to waters of the United States demonstrate consistency with State Water Quality Standards (as developed by each state). EPA's CERCLA policy for the Clean Water Act ARAR Consistency is to demonstrate compliance by preparing a Water Quality Certification, in coordination with the appropriate state agency, specifically the Washington Department of Ecology. The EPA-prepared Water Quality Certification (Appendix 5) includes water quality monitoring requirements that are included in the construction specifications for this project. The certification is part of the Administrative Record.

Under CERCLA, the substantive requirements of state or local permits must also be satisfied, including state hydraulic and shoreline permitting requirements (Appendix 6). The substantive requirements of Spokane County's Floodplain Development Permit and Approach Permit were identified as relevant and addressed for the Starr Road project. The State of Washington's Shoreline Management Act of 1971 (RCW 90.58), and its local implementation through the Spokane County Shorelines Master Program Update (July 6, 2005), are relevant to the extent that pastoral and conservancy shoreline environments are present in the area of this project; the limited actions in uplands portions of the site are not anticipated to conflict with its requirements. Substantive requirements identified by the Washington Department of Fish and Wildlife, including state hydraulic project approval (HPA) requirements, are in Appendix 6.

3.2.3 Cultural Resources and Historic Preservation

The National Historic Preservation Act (NHPA) and the Native American Graves Protection Act (NAGPRA) require that federal agencies involved with activities that may affect tribal interests coordinate their activities with the affected Tribes. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, also directs federal agencies to establish regular and meaningful consultation and collaboration with tribal officials regarding actions by the federal agency.

The Spokane and Coeur d'Alene Tribes are the potentially affected tribal governments. EPA's consultation, with assistance from USACE, included both written and oral solicitation regarding their interests and concerns. A cultural resources assessment was conducted by a USACE contractor, Jones & Stokes, at the site on June 15 – 17, 2005, with participation by a representative of the Spokane and Coeur d'Alene Tribes. As the Federal agency responsible for evaluating compliance with Section 106 of the NHPA, EPA determined the project would result in No Historic Properties Affected. The Washington Department of Archaeology and Historic Preservation (state historic preservation office [SHPO]) concurred with this determination (Appendix 6). Recognizing the cultural importance of this area to both tribes, EPA is supporting tribal monitoring by a representative of the two tribes during earth moving activities.

3.3 Design Approach

The Starr Road project was developed by USACE using a four-stage design approach: 10% design (conceptual design, completed January 10, 2005), 65% design (design development, completed April 1, 2005), 95% design (draft final design analysis, final drawings and technical specifications, completed on November 7, 2005), and 100% design (this document). The design team consisted of USACE staff representing a range of disciplines and professional qualifications. Each stage of the design was a project

milestone for USACE's progress in converting the remedial concepts from the ROD into construction drawings and contract documents for execution of the project. Each stage allowed EPA and the project stakeholders to provide guidance and direction to USACE to ensure that the remedial objectives and goals of the project are met.

4 REMEDY DESIGN

This section of the final design analysis discusses the major design features of the Starr Road project and the engineering assumptions, standards, and criteria used for the bid-ready design drawings and technical specifications.

4.1 Design Features

The main design features of the Starr Road remedy are described in this section. Where engineering analyses have been completed to support the final design analysis, the referenced calculations and data are in Appendix 8.

4.1.1 Excavation/Fill in Gravel Bar

The remedial actions for the Gravel Bar address human exposures to the near-surface contamination present in the finer grained fractions of the native gravels. This 1-acre portion of the Starr Road site is a high recreational use area during the summer. The bar is also locally important as spawning habitat for rainbow trout, which lay their eggs within the gravels.

This area of the site will be remediated by excavating and removing lead- and arsenic-contaminated soil and sediment to a depth of one foot (1-foot) below the existing grade. The total quantity of excavated soil/sediment is estimated to be 1,600 cubic yards (CY). The excavated soil will be transported to an offsite commercial disposal facility (Appendix 3). The limits of the excavation were delineated based on field sampling results, physical soil characteristics, and existing topography. The southern edge of the excavation zone is characterized by a transition from sandy gravels to larger cobbles with limited fines along the seasonal river's edge, while the northern and western extent is limited by the approximate seasonal low water mark of the backwater lagoon and a transition to sediments that are normally submerged on a year-round basis. The eastern limit reflects a transition from spawning gravels to siltier seasonally inundated areas that are not usable as spawning habitat.

The excavated area will be backfilled with imported clean fill. The existing soil gradations documented in the USACE Field Sampling Report (Appendix 2), supplemented by additional samples collected in June 2005 (Appendix 8), were used to select replacement fill materials that would not be damaged by seasonal river flows and create habitat conditions similar to the existing materials. The total quantity of replacement soil/sediment is estimated to be 1,600 bank cubic yards (CY). Two backfill gradations, Gravel Bar Fill Types A and B, were selected after extensive coordination with the Washington Department of Fish and Wildlife. This coordination included defining imported material gradations that mimic existing site conditions created by years of washing, sorting and distribution of the bar materials by water flow. The characteristics of concern included the size distribution of the gravels, the geological sources of the replacement materials, and fines content (passing No. 200 screen) of less than 5 percent. The characteristics of the imported clean fill are discussed in Section 4.1.7. The excavation and replacement activities, specifically the intent to return the work area to the original topography and grades, will result in no net fill within the gravel bar area.

4.1.2 Capping of Contaminated Soil

The remedial actions for the Uplands area address human exposures to contamination in a 1.77-acre area that has significant recreational use. The lead- and arsenic-contamination is present in the native soil of the seasonally inundated (below the OHW zone) and nearshore (above the OHW) portions of the Uplands. The limits of the remedial action were delineated based on field sampling results, physical soil and vegetation characteristics, and existing topography. EPA, Ecology, and the Washington State Parks and Recreation Commission reached agreement that excavation and offsite disposal of soil from this area would be too expensive; however, excavation and onsite disposal in areas above the 100-year floodplain was not acceptable to the Washington State Parks & Recreation Commission.

EPA and Ecology agreed to address this area in accordance with the soil capping remedy described in the ROD. The soil cap provides a 1-foot thick physical barrier of clean soil to prevent direct human contact with the underlying contaminated soil, while keeping surface conditions similar to the existing site conditions. The cap is recognized to be vulnerable to future damage from illegal vehicle access and/or erosion by flood events in the Spokane River. Maintenance of the cap will be the responsibility of the State of Washington after one year. To preserve the physical appearance of the Uplands, two soil cap types were selected for this area:

- Cap System Type A consists of a non-vegetated, 1-foot thick soil barrier (Uplands fill) for the 0.95-acres of the Uplands area located below the OHW mark. The imported soil gradations are similar to the existing soil characteristics.
- Cap System Type B consists of a 1-foot thick soil barrier that is intended to support vegetation over the 0.82-acres of the Uplands area located above the OHW mark. The imported soil barrier consists of 8-inches of soil similar to the existing surface soil (Uplands fill), topped by 4-inches of topsoil capable of short-term stabilization by hydroseeding with a local grass seed mix (Section 4.1.7). Recolonization of the area by other native species of vegetation is expected to occur within a few years after remediation.

The placement of 3,000 CY of fill in the 1.77-acres of the Uplands resulted in a net fill condition within the Spokane River's floodplain. USACE's designers used the original HEC-2 computer model and inputs for the Federal Emergency Management Agency (FEMA) floodplain maps of the Spokane River to evaluate the impacts of the fill (Appendix 8). The analysis showed that the 1.77-acre cap would raise the floodplain elevation by 0.15 feet for approximately 0.1 miles (530 feet) at river miles 94.9 to 95.0 of the Spokane River. This exceeds a substantive requirement of Spokane County's floodplain development permit process that limits impacts to 0.10 feet. USACE's evaluation indicated that the nominal 500 feet of upstream and downstream reaches affected by the Uplands caps are entirely within the park's properties, which has no development within or close to the 100-year floodplain elevation (2034 feet, NAD 1988). The fill placement will not cause any detrimental impact on the river floodplain.

4.1.3 Site Access from River Road

EPA, Ecology, and the Washington State Parks and Recreation Commission have agreed to construction of a new access point for the Starr Road recreation area as part of the remedial actions. The 65% design

included a new access point focusing on a proposed parking area overlying an onsite repository for disposal of contaminated gravels from the gravel bar remediation. The onsite repository and creation of a dedicated parking area was unacceptable to the Washington State Parks and Recreation Commission, and subsequently deleted from the project.

After extensive discussions with EPA and Ecology, the access concept was re-examined and EPA agreed to proceed with the design of an asphalt turn-out area on the south shoulder of River Road. The turn-out includes the following features:

- The turn-out provides approximately 0.06-acres of paved off-road parking, allowing parallel parking of up to three vehicles along River Road. The turn-out also is the access point for a new gravel-surfaced path leading into the park lands (Section 4.1.4).

- The design meets Spokane County's substantive requirements for an approach permit, including site distance and stopping distance.

- The turn-out is located within the road right-of-way owned by Spokane County and, at its widest point, within the park property. Spokane County and the Washington State Parks and Recreation Commission signed a License Agreement allowing construction of the turn-out. The turnout is located above the 100-year floodplain (elevation 2,034 feet in this segment of the river; see Figure 3).

Subsequent discussions between EPA, Ecology, Washington State Parks and Recreation Commission, and Spokane County have discussed the merits and responsibility for installing guard rails along the south shoulder of River Road. EPA has declined to include these features in the Starr Road remediation due to federal limitations regarding use of Superfund money for non-remedy related site improvements. However, the turn-out design included space along the edge of the paved surface where future installation of guard railing will be performed by others. Ecology and Spokane Country are designing and constructing these features as a separate (non-remediation) project.

4.1.4 Permanent Access Pathway

A new access ramp will lead pedestrians from the turn-out area on River Road to the remediated areas along the Spokane River. This gravel-surfaced access ramp will be 7.5-feet wide and constructed of 3/8-inch minus crushed rock. The ramp will begin on the east end of the parking area and descend to the west at a 12H:1V slope with grade breaks on 30-foot centers, complying with the requirements of the Americans with Disabilities Act.

The pedestrian path from the parking area's access ramp to the Uplands and Gravel Bar areas will be 7.5-feet wide, with a 6-inch compacted lift of crushed rock (3/8-inch minus) placed directly on a filter fabric (Mirafi 700X, or equivalent). The path width of 7.5 feet was chosen to facilitate foot traffic in both directions and to help reduce the temptation for people to wander off the path. With a 2H:1V transition from the fill to the surrounding native ground surface, the finished path will have a nominal width of 9.5 to 10 feet. This is sufficiently narrow to discourage vehicle access from the paved turn-out area. The filter fabric underlying the crushed gravel isolates the gravel surface from the underlying native soil (preventing loss into the soil during compaction) and provides a visual warning if the gravel surface erodes (or is damaged) and exposes the underlying soil. Approximately 0.09 acres of the park land will be allocated for this permanent access pathway.

4.1.5 Abandoned Foot Paths and Roads

A number of existing foot paths and off-road tracks at the Starr Road site will be remediated by re-establishing vegetation. For estimating purposes, the typical path and/or road track was assumed to be a 10-foot wide disturbed area. These existing foot paths and roads will be scarified to a depth of 6-inches and 6-inches of topsoil will be spread on the scarified surface. These abandoned paths and roads will then be mulched and seeded with a native blend of grasses. As indicated in the design drawings, approximately 0.43-acres of the park land containing unwanted paths and road tracks will be revegetated at this site.

4.1.6 Hostile Vegetation and Barriers

"Hostile vegetation" has physical characteristics such as thorns or thick growth that discourage people from walking into or using areas where the plants are present. The two planting areas are in portions of the backwater beach that are steep and don't have a high recreation use, but contain elevated metals concentration in the surface soil. These two areas represent 0.16-acres located on the north shore of the backwater lagoon.

Dense plantings of wild rose (*Rosa woodsi*), snowberry (*Symphoricarpos albus*), golden current (*Ribes aureum*), and black hawthorn (*Crataegus douglasii*) will be placed in select areas along the backwater beach's shoreline.

Boulders and large rocks will be placed in 5 locations to permanently abandon historic roads and shortcuts from the park's existing access road leading to other nearshore areas of the Spokane River.

4.1.7 Material Selections

The imported fill materials selected for the Starr Road remedy are described below:

- **Imported Fill (replacement) for Gravel Bar**—Appendix 8 contains plotted gradation curves for representative soil samples collected from the Gravel Bar area. Additional grain size testing results are contained in Appendix 2 (Appendix C of the USACE Field Sampling Report). The gradations were developed in consultation with the Washington State Department of Fish and Wildlife, as well as general stream habitat restoration guidelines (www.wdfw.wa.gov/hab/ahg/shrg), to select appropriate replacement fill materials for import from an offsite borrow source. Two imported gradations were specified for this site, designated as Gravel Bar Fill Type A (90% of the replacement fill quantity) and Type B (10% of the fill quantity).

Gravel Bar Fill Type A

U.S. Standard Sieve	% Passing by Weight
3 inch	100
2 inch	100-85
1 inch	95-60
½ inch	85-50
No. 4	60-30
No. 10	45-20
No. 40	15-5
No. 200	5-0

Gravel Bar Fill Type B

U.S. Standard Sieve	% Passing by Weight
6 inch	100
3 inch	90-70
2 inch	75-50
1 inch	60-40
½ inch	50-25
No. 4	35-15
No. 200	5-0

- **Imported Fill (barrier cap) for Uplands**—Appendix 8 contains plotted gradation curves for representative soil samples collected from the Uplands area. Additional grain size testing results are contained in Appendix 2 (Appendix C of the USACE Field Sampling Report). The gradations were developed in consultation with the Washington State Department of Fish and Wildlife to select an appropriate replacement fill material for import from an offsite borrow source. The selected gradation, designated as Uplands Fill, is used in the construction of Cap System Type A (the full 1-foot cap section) and Type B (8-inches of the 1-foot cap section).

Uplands Fill

U.S. Standard Sieve	% Passing by Weight
3 inch	100-60
2 inch	80-45
1 inch	65-30
½ inch	50-25
No. 4	35-15
No. 10	25-10
No. 40	10-0
No. 200	5-0

- **Topsoil**—The selected topsoil source must be uncontaminated and support good vegetation growth; acceptable topsoil typically contains 3 to 6% organic matter, no more than 10% by weight stones greater than ½-inch, and is free of sticks, stones, roots and other debris. Soil conditioners and lime (pH adjustment), if required, should be added prior to delivery.

- **Crushed Gravel (3/8-inch minus)**—This gravel will be used to construct the access ramp and designated pathway.

U.S. Standard Sieve	% Passing by Weight
3/8 inch	100
No. 4	66-44
No. 40	24-8
No. 200	10 max.

- **Turn-out Fill**—Washington State Department of Transportation material gradations will be used for the base course (WSDOT M41-10, paragraph 9-03.9(3)), subbase (WSDOT M41-10, paragraph 9-03.10), and bedding sand (WSDOT M41-10, paragraph 9-0312(3)). Class II riprap will be used for surface armoring of the turn-out's sideslopes.

- ***Class II Riprap***—These large, angular rocks will be used at the edge of the pullout area to allow steep transitions to the existing ground surface.

100%	Smaller than 500 pounds
50%	Size = 200 pounds
90%	Larger than 100 pounds
10%	Between 25 to 100 pounds
Tolerance	+6-inches

4.2 Procurement Strategy

USACE used a pre-placed remedial action contract, the Multiple Award Remediation Contract (MARC), for this project that has pre-established contract terms and conditions with three remedial action contractors. Each of the MARC contractors has the required experience, and trained personnel, to perform hazardous, toxic, or radiological waste (HTRW) remediation and has demonstrated their capabilities in other USACE projects. The contractors are also experienced in complying with USACE contract and construction quality requirements. The contract required competitive bidding by the three contractors, with a streamlined acquisition process of 30 to 45 calendar days, ensuring that the contract would be awarded for the 2006 field season. USACE's Eastern Environmental Resident Office (Coeur d'Alene, Idaho) will administer the contract and provide site supervision during construction.

4.3 Construction Documents

The contract documents (final drawings and technical specifications) developed by USACE for bidding and awarding the Starr Road remediation are described below.

4.3.1 Drawings

Appendix 7 contains the design drawings (site plans, sections and details) developed by USACE to contract the remedial actions planned for the Starr Road site. The drawing index, and the planned content of each drawing, is as follows:

- **G-1, Title Sheet, Drawing Index, Vicinity/Location Map**—Project title, drawing index, and vicinity/location map.

- **G-2, Key Map, Legend, and Construction Requirements**—Aerial photography-based key map identifying the Starr Road area and access routes; legend/symbols and abbreviations; survey control information; general construction requirements (notes).

- **G-3, Survey**—Topographic survey and utilities identified by licensed surveyor.

- **C-1, Starr Road Site Plan**—Existing site conditions, excavation/fill areas and quantities, parking/turnout lot location, revegetation of foot paths and roads, permanent access path.

- **C-2, Starr Road Turnout Area**—Site plan for paved turnout and access path.

- **C-3, Starr Road Turnout Area Details**—River Road/Starr Road turnout area details and sight/stopping distance analysis.

- **C-4, Starr Road Pathway, Excavation and Cap Area Details**—Starr Road site cross-sections of excavation/fill areas, cap details, permanent access path, revegetation of foot paths and roads.

- **C-5, Starr Road Excavation and Cap Areas**—Site plan with cross-sections identified, key map for excavation/fill areas (two types) and cap systems (two types).

- **C-6, Starr Road Excavation and Cap Area Sections**—Cross-sections (east to west).

- **C-7, Starr Road Excavation and Cap Area Sections**—Cross-sections (east to west).

- **C-8, Starr Road Excavation and Cap Area Sections**—Cross-sections (north to south).

- **C-9, Starr Road Excavation and Cap Area Sections**—Cross-sections (north to south).

- **C-10, Starr Road Excavation and Cap Area Sections and Hostile Vegetation Layout**—Cross-sections (north to south), planting schedule and details.

4.3.2 Technical Specifications

The technical specifications are based on USACE templates maintained under the Unified Facilities Guide Specifications (UFGS) system, an on-line technical support system jointly operated by the Army, Navy, and Air Force. The technical specifications for this project are as follow:

Division 1—General Requirements

01110	Summary of Work
01140	Supplementary Requirements
01145	Site Specific Supplementary Requirements
01250	Modification Procedures
01270	Measurement and Payment
01330	Submittal Procedures
01351	Safety, Health and Emergency Response (HTRW/UST)
01355	Environmental Protection
01401	Remedial Action Management
01450	Chemical Data Quality Management
01451	Contractor Quality Control
01501	Construction Facilities and Temporary Controls
01570	Soil Erosion Stabilization
01720	Field Engineering
01782	Project Records
01785	Warranty of Construction

Division 2—Site Work

02111	Excavation and Handling of Contaminated Material
02120	Transportation and Disposal of Excavated Materials
02230	Clearing and Grubbing

02300 Earthwork
02515 Hot-Mix Asphalt Pavement
02921 Planting and Seeding

Division 3—Division 16 (not used)

These technical specifications are edited to match site-specific conditions and coordinated with the MARC contract requirements. The technical specifications are not included in this 95% design analysis document.

4.4 Project Schedule

The project schedule for this project is as follows:

- Draft final (95%) design analysis document distributed to project stakeholders, 7 November 2005
- Preparation of final (100%) design analysis document authorized by EPA, 5 January 2006
- Issue contract for bid by contractors using Multiple Award Remediation Contract, 13 January 2006
- Contract Award issued, 22 February 2006
- Notice to Proceed issued, 23 March 2006
- Construction period, 4 August – 30 September; river excavation and fill, capping completed between 1 August and 15 September, expected dam-controlled low flow period for Spokane River in 2006
- Contractor close-out submittals, 30 December 2006.

5 REFERENCES

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USEPA, 2002. Record of Decision, The Bunker Hill Mining and Metallurgical Complex, Operable Unit 3. USEPA Region 10, Seattle, WA. September 2002.

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VICINITY MAP
WASHINGTON RECREATION SITES

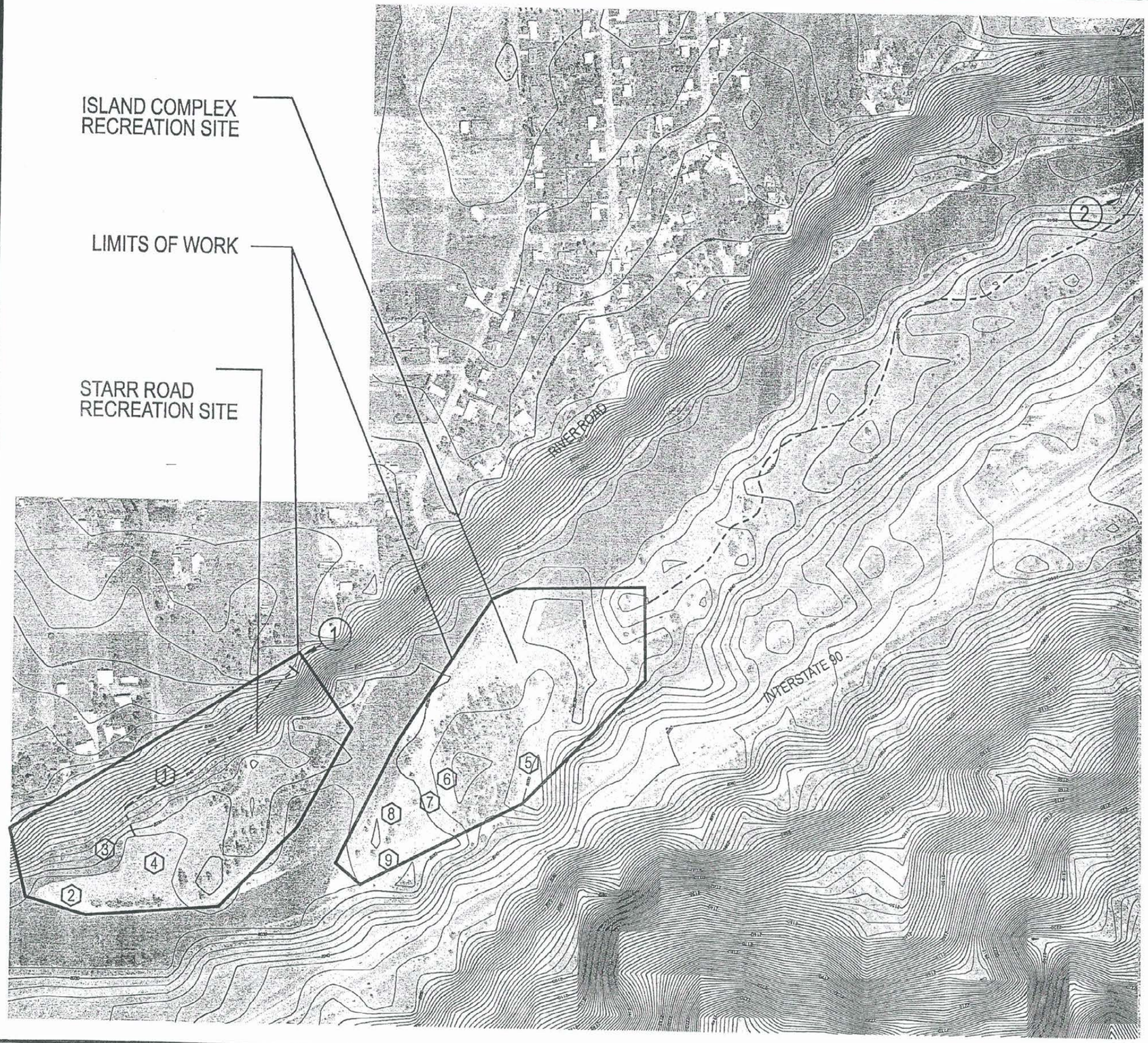
NOT TO SCALE

FIGURE 1

ISLAND COMPLEX RECREATION SITE

LIMITS OF WORK

STARR ROAD RECREATION SITE



N

LEGEND

- CONTRACTOR ACCESS ROUTE FOR SITE
- (1) CONTRACTOR ACCESS VIA RIVER ROAD AND UNIMPROVED SERVICE ROAD
- (2) CONTRACTOR ACCESS VIA COUNTY PARKING AREA, E APPLEWAY LANE
- ROAD BLOCKED OFF

STARR ROAD AREAS

- (1) ACCESS ROUTES
- (2) GRAVEL BAR
- (3) BACKWATER BEACH
- (4) UPLANDS

ISLAND COMPLEX AREAS

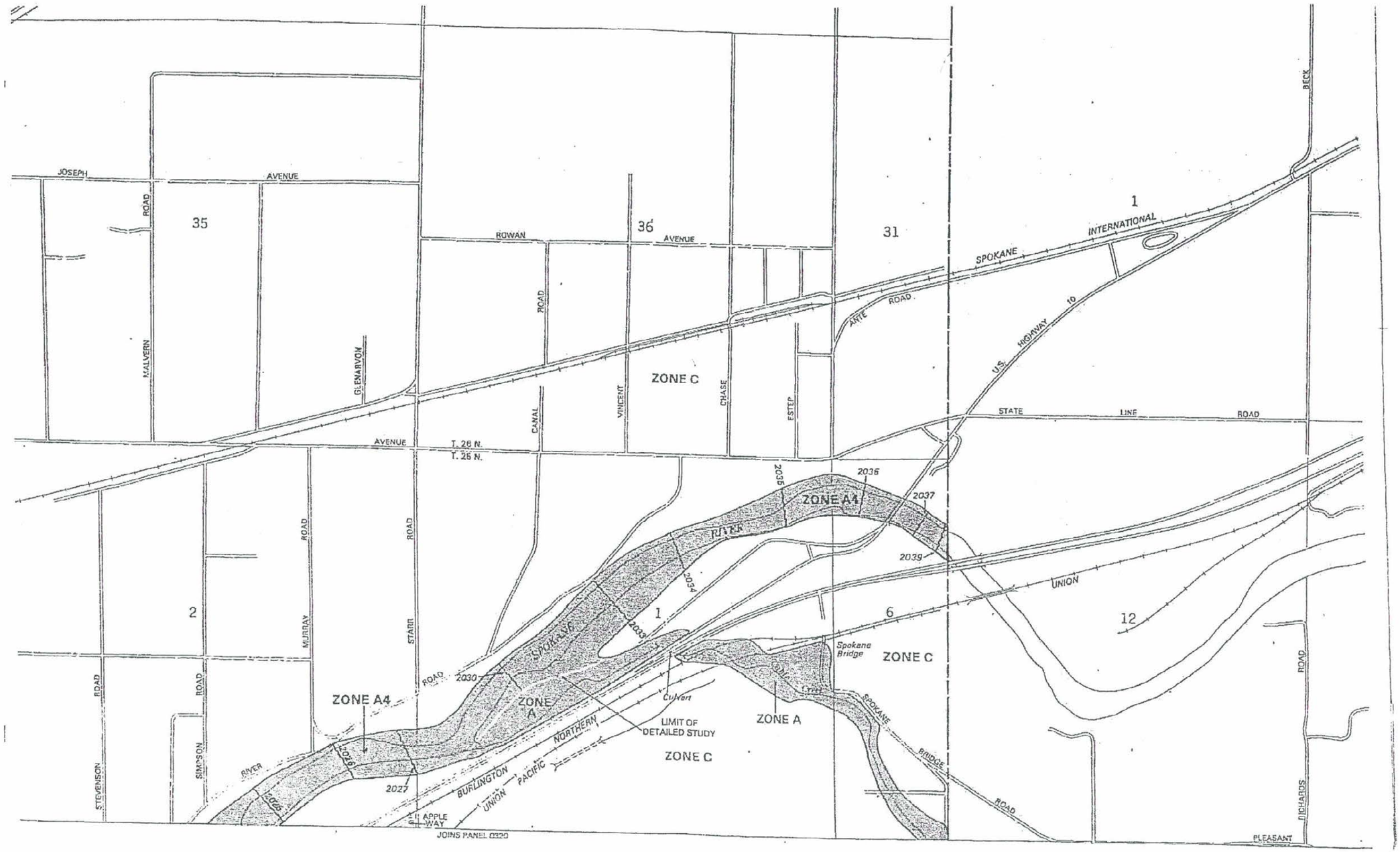
- (5) UPLAND PATH
- (6) BANK STABILIZATION
- (7) LITTLE BANK SEPARATION
- (8) BAR DEPOSIT
- (9) FINE SANDY BEACH

LOCATION MAP
STARR ROAD AND ISLAND COMPLEX SITES

1" = 200' 200' 100' 0 200' 400'

FIGURE 2

DATE AND TIME PLOTTED: 31-MAR-2005 13:48 DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE\CIV\SHT02.DGN



FEMA 100-YEAR
FLOOD PLAIN MAP

NO SCALE

SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY,
FLOOD INSURANCE RATE MAP, SPOKANE COUNTY, WASHINGTON,
(UNINCORPORATED AREAS), PANEL 310 OF 625, COMMUNITY PANEL
NO. S30174-0310-C (MAP REVISED: SEPTEMBER 30, 1992)

FIGURE 3

APPENDIX 1: PROGRAM MANAGERS CHECKLIST FOR REVIEW OF BUNKER HILL DESIGN PRODUCTS

Project Title: Bunker Hill, Washington Recreation Sites—Starr Road (100% Design)

Check	Yes/No/Notes	Action Remaining for this Submittal?
Project Name Correct	Yes	No
Identifies Site as Superfund and has Lead Contaminated Soil?	Yes	No
Site Location Clear	Yes	No
Specifies H&S Plan	Yes	No
Import Fill Requirements Include Sampling For Clean	Yes	No
Estimated Soil Concentrations Are Given	Yes	No
Utilities Are Shown Or Addressed	Yes	No
Disposal of Excavated Materials Are Addressed Appropriately And Repository Location Coordinated	Yes	No
In Water Work Addresses Turbidity	Yes	No
Consultation with Corps on In-water Work has Been Completed	Yes	No
ESA Issues Have Been Identified and Addressed	Yes	No
Consultation With Tribes Have Been Completed	Yes	No
Consultation With SHPO Has Been Completed	Yes	No
Potential for PTM has been addressed	Not Applicable	No
Minimizes cut/fill balance	Yes	No
Generally Consistent With Other Projects	Yes	No
All Landowners Have Received Copies For Review	Yes; EPA, stakeholders	No
Rights of Construction Acquired	Yes	No
Noxious Weed Control For First Year, Noxious Weeds Identified	Yes	No
Record Drawings Identified as a Requirement	Yes	No
Demolition Requirements are Called Out	Yes	No
Submittal List is Called Out	Yes	No
Project Objectives are Covered	Yes	No
Access to Starr Road Addressed	Yes	No
Stakeholders Identified	Yes	No
Recontamination Discussed and Addressed	Yes	No
Design Analysis Documents, Calculations, Comments, and Comment Resolution.	Yes	No
Timing of Work	Yes	Yes; coordinate with Avista/dam operator for 2006 work

APPENDIX 2: USACE FIELD SAMPLING REPORT

Insert CD with .pdf of

2004 USACE Field Sampling Report

V:\HTRW\Coeur d'Alene Basin, ID\WA Rec Sites\Planning\Field Report

APPENDIX 3: WASTE DISPOSAL DATA

WASTE MANAGEMENT, INC ...NON HAZARDOUS WASTE DISPOSAL SOLUTIONS FOR THE PACIFIC NORTHWEST

Graham Road Recycling and Disposal Facility

1820 S. GRAHAM ROAD, MEDICAL LAKE, WA 99022 (509) 244-0151

PERMIT # 1142

PERMIT TO DISPOSE OF NON-HAZARDOUS / NON- DANGEROUS MATERIALS

This permit authorizes disposal of Customer's waste materials in accordance with the Industrial Waste & Disposal Services Agreement dated *Government*.

EXPIRES: 11/12/05

GENERATOR: USEPA, REGION 10

DESCRIPTION: *METALS AFFECTED SOILS* ☐ PCS	TONS: *3000*
LOCATION: *OTIS ORCHARDS, WASHINGTON*	COUNTY: *Spokane*
CONTACT: *HARRY EHLERS*	PHONE: *206-764-6712*

BILLING: *Landfill account USEPA, REGION 10*	PO#:	JOB#:

We accept business checks, cash, or charge(with prior approval)

SPECIAL HANDLING :

APPROVED:	*GARY FISHER*	DATE: *08/12/05 3:59:10 PM*
APPROVED:	*Site Manager*	*Approval #:*

THERE IS A MINIMUM CHARGE OF $50 FOR EACH LOAD OF SPECIAL WASTE

WASTE MANAGEMENT

HAZARDOUS / DANGEROUS

WASTE IS STRICTLY PROHIBITED

SPOKANE REGIONAL HEALTH DISTRICT

Environmental Health
1101 West College Avenue, Room 402
Spokane, WA 99201
Phone 509-324-1560
FAX 509-324-3603 or 324-1567

Fax

To: GRAHAM ROAD RECYLING & DISPOSAL FACILITY	**From:** SPOKANE REGIONAL HEALTH DISTRICT
Fax: (509) 244-0207	**Phone:** (509) 324-1560
Phone: (509) 244-0151	**Date:** 08/18/2005
Re: WASTE DISPOSAL APPROVAL	**Pages including cover:** 1

☐ *Urgent* ☐ *For Review* ☐ *Please Comment* ☐ *Please Reply* ☐ *Please Recycle*

Comments:

☒ **BASED ON THE INFORMATION PROVIDED BY WASTE MANAGEMENT, THE WASTE MATERIAL FOR PERMIT #1142 Metals affected soils Spokane River Starr Rd. Otis Orchards USEPA, Region 10 ;**

IS SUITABLE FOR DISPOSAL AT GRAHAM ROAD RECYCLING AND DISPOSAL FACILITY.

MICHAEL LA SCUOLA, REHS/R.S.
ENVIRONMENTAL HEALTH DIVISION
(509) 324-1574 *DIRECT*
(509) 324-3603 *FAX*

APPENDIX A

WASTE CHARACTERIZATION DATA (WCD) FORM - Electronic

Waste Management Approval Code ____

Important: This form is to be completed by a representative of the generator. Please read the instruction page prior to the completion of this form. This form must be typewritten or legibly handwritten in ink, signed and dated.

Salesperson: ____
Telephone: ____
Fax: ____

☒ New Waste Approval
☐ Update Approval - Previous Approval Number: ____
Disposal Site Requested: Graham Road Recycling and Disposal, Medical Lake, Washington

1. Generator Information

Generator's Name: US Environmental Protection Agency, Region 10
Point of Origin/ Address: Starr Road State Park, WA State Parks And Recreation Commission, Township 25 North, Range 45 East, Section 1 And 2 (Intersection Of Starr Road And River Road)
City: Otis Orchards State: WA Zip: 99027
Generator's Representative: Harry Ehlers
Title: Project Manager, US Army Corps Of Engineers, Seattle District
Telephone: 206/764-6712
Fax: 206/764-3706
Emergency/Information Contact: Ravi Sanga
Title: Epa Rpm
Telephone: 206/553-4092

EPA ID #: N/A (EPA obtaining)
State Registration Number: N/A

TNRCC Waste Code Number: N/A
County: Spokane SIC Code: N/A
Customer's Name: Environmental Protection Agency, Region 10 - Office Of Environmental Cleanup
Customer's Mailing Address: 1200 Sixth Avenue, ECL-113
City: Seattle State: WA Zip: 98101
Representative: Ravi Sanga
Telephone: 206/553-4092
Fax: 206/553-0124

Transporter Information

Transporter's Name: TBD (USACE competitive bid contract - contractor to be identified upon award)
Mailing Address: TBD
City: ____ State: ____ Zip: ____

Transporter ID: TBD

Telephone: ____
Fax: ____

3. Waste Stream Information

Waste/Waste Stream Name: Metals-affected soil from mining-related sources
Process Knowledge [Describe materials and process(es) generating the waste]: Historic mining operations in upstream drainages of the Spokane River and Coeur d'Alene River, associated with Operable Unit 3 of the Bunker Hill Mining and Metallurgical Complex (Bunker Hill Superfund Site)
Is this waste a characteristically hazardous waste as per 40 CFR 261.21-24? ☐ Yes ☒ No
Is this waste an F, K, P, or U listed hazardous waste as per 40 CFR 261.30-33? ☐ Yes ☒ No
Is this a waste regulated by the Railroad Commission? ☐ Yes ☒ No
Estimate Quantity: 1,600 ☐ Tons ☒ Cubic Yards ☐ Drums ☐ Gallons ☐ Other ____
Frequency: ____ ☒ One Time ☐ Monthly ☐ Quarterly ☐ Semi-Annual ☐ Annual ☐ Other ____

4. Physical Characteristics

Physical State at 72°F: ☐ Combination of ☐ Solid ☒ Liquid ☐ Semi-solid ☐ Powder
Appearance/Texture: ☒ Granular/Lump ☐ Powder/Fine ☐ Free Flowing Liquid ☒ Other Gravelly sands, sandy gravels
Color(s): Varies
Odor: ☐ Strong - Describe: ____ ☐ Mild ☒ None
Corrosivity (pH): ☐ ≤2 ☐ 2.1 - 7.0 ☐ 7.1 - 12.4 ☐ ≥12.5 ☐ Actual ____ ☒ N/D
Bulk Density: 3,400.00 ☐ lbs./gal. ☒ lbs./yd³ ☐ Other ____ ☐ N/D
Ignitability (Flashpoint, °F): ☐ ≤72 ☐ 73 - 140 ☐ 141 - 200 ☐ ≥201 ☒ Actual 0 ☐ N/D

WASTE CHARACTERIZATION DATA (WCD) FORM - Electronic

5. Chemical Composition

Based upon generator's knowledge of the process and expected contaminants, please provide a breakdown of the waste stream requesting disposal. Account for 100 % of the waste.

Components/Expected Contaminants	Range (%)
Arsenic - total metals, 10 to 100 mg/kg, TCLP <5.0 mg/l	<0.1
Barium – total metals N/A, TCLP <100 mg/l	<0.1
Cadmium - total metals, 5 to 50 mg/kg, TCLP <1.0 mg/l	<0.1
Chromium – total metals N/A, TCLP <5.0 mg/l	<0.1
Lead - total metals, 100 to 3,000 mg/kg, TCLP <2.0 mg/l	<0.1
Selenium – total metals N/A, TCLP <1 mg/l	<0.1
Silver – total metals N/A, TCLP <5 mg/l	<0.1
Zinc - total metals, 1,000 to 4,500 mg/kg, TCLP N/A	<0.1
Inert solids (silts, sands, gravels)	>99.2%

6. Additional Waste Components

Indicate if the waste contains any of the following. If any are marked, please include in the overall composition in Section 5.

☐ Used Oils ☐ Free Liquids ☐ Radioactive Materials ☐ Etiological Agents ☐ OSHA Substances
☐ Virgin Oils ☐ PCB's not regulated by TSCA 40 CFR 761 ☐ Organic Solvents ☒ None of the Above

7. Reactivity

Indicate if the waste exhibits any of the following properties:

☐ Water Reactive ☐ Acid Reactive ☐ Alkaline Reactive ☐ Pyrophoric ☐ Thermally Sensitive
☐ Explosive ☐ Autopolymerizable ☐ Shock/Vibration Sensitive ☒ None of the Above

8. Supplemental Documents

☒ Letter/Memo ☒ Analytical Data ☐ Chain of Custody ☐ Notice of Registration
☐ Process Diagrams ☐ Material Safety Data Sheets ☐ None ☐ Other: _____

9. Generator Certifications

I certify that the analytical data identified below is representative and attached as support to the information certified on this application form.

Lab Name(s): Manchester Environmental Laboratory, EPA Region 10

Report Date(s): 10/25/2004

Sample I.D.(s): As indicated in lab memorandum, chain of custody, and Form 1 analytical data reports (see enclosed .pdf file)

WASTE CHARACTERIZATION DATA (WCD) FORM - Electronic

By signing this form I certify that:

1. I am the legal generator of the waste described on this application.
2. The waste described is not a regulated Hazardous Waste as defined by the USEPA, State, or local Regulations.
3. All applicable underlying hazardous constituents (UHCs) and land disposal restriction (LDRs) regulatory issues have been evaluated for this waste stream and it has been determined that UHCs and LDRs are either not applicable or have been met.
4. This form and its attachments contain true and accurate information regarding this waste stream.
5. Any laboratory data used to support the information presented herein has been obtained from the analysis of a representative sample collected and preserved in a manner consistent with accepted technical standards.

Date: 8/10/05

Print Name: HARRY EHLERS, US ARMY CORPS OF ENG.* Phone: 206/764-6712

Signature: _____ Title: PROJECT MANAGER

* REPRESENTING GENERATOR, EPA REGION 10

Ehlers, Harald R NWS

From: Ehlers, Harald R NWS

Sent: Wednesday, August 10, 2005 3:54 PM

To: 'Castner, Kristin'

Subject: RE: Contact info and background information, lead-contaminated soil disposal acceptance at Graham Road Landfill, Spokane WA

Kristin,

I have placed two files on the USACE ftp site - a .pdf of the complete waste characterization data form and a second .pdf that contains background/analytical data that I also provided to Mike LaScuola, Spokane Regional Health District. Please use this path to reach the files - copy it into your Internet Explorer address block and click on "Go":

ftp://ftp.usace.army.mil/pub/nws/Starr%20Road%20Waste%20Profiling%20Data/

Please call me if you have any problem getting to the files. Thanks for your help. I'll look forward to hearing from you tomorrow.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

****
****

From: Ehlers, Harald R NWS
Sent: Wednesday, August 10, 2005 11:00 AM
To: 'LaScuola, Mike'
Subject: RE: Heavy Metal Waste

Mike,

I am enclosing a .pdf file with the following information for the metals-contaminated soil that EPA wishes to bring to the Waste Management - Graham Road facility. The soil is from the Starr Road Recreation Site, one of the cleanup areas of the Bunker Hill Superfund Site. Please review the information and let me know when you send your recommendations to Kristen Castner, Waste Management. The .pdf contains the following:

Attachment A (2 pages) - the source of the analytical data, a brief overview of the Starr Road site (note that we are not including any soil from the Island Complex site in this request).

Attachment B (2 pages) - location maps (8-1/2x11 of Starr Road only, 11x17 photo/sampling locations for Starr and Island Complex (no part of this project).

Attachment C (1 page) - TCLP/SPLP criteria for metals (for your reference).

Attachment D (2 pages) - table summary of available analytical data for Starr Road site.

Attachment E (3 pages) - geotechnical gradation curves for the materials to be sent to Graham Road (gravels with sands, sands with gravels)

Attachment F (14 pages) - analytical data reports for Starr Road.

Please let me know if you need anything else. I am working on the waste profile paperwork for Waste Management.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: LaScuola, Mike [mailto:MLaScuola@spokanecounty.org]
Sent: Monday, August 08, 2005 11:35 AM
To: Ehlers, Harald R NWS
Subject: Heavy Metal Waste

Good Morning Mr. Ehlers

I have been contacted by Waste Management Graham Rd. facility regarding the disposal of heavy metal contaminated soils. I have the arduous task of approval for the various wastes that enter this facility (hence my neck is very long from stretching). Please forward to me the analytical data especially the TCLP and the wastes point of origin and I will R & C and expedite the waste disposal approval process. Also within the RCRA exemption that was mentioned...does that account for the waste disposal destination? The Graham Rd. facility can typically handle this type of waste but for your information is a limited purpose landfill and not a subtitle D facility under RCRA.

Michael F LaScuola R.S.
Spokane Regional Health District
Environmental Resources Program
1101 W College Ave. Rm. 402
Spokane, WA 99201-2095
mlascuola@spokanecounty.org
Wk# (509) 324-1574
Fax# (509) 324-3603

From: Castner, Kristin [mailto:kcastner@wm.com]
Sent: Monday, August 08, 2005 10:11 AM
To: Ehlers, Harald R NWS
Subject: RE: Contact info and background information, lead-contaminated soil disposal acceptance at Graham Road Landfill, Spokane WA

Harold,

I have forwarded your e-mail to the Health District. In talking with Mike he didn't see any issues with accepting the waste. He is going to take a look at it and check with his local contacts. He will let me know as soon as possible.

In the mean time, here is the paperwork for profiling and setting up an account, if needed.

Thank you,

Kristin Castner
Industrial Technical Service Manager
Waste Management - NW Area
Phone (503) 493-7834, Fax (503) 493-7822

-----Original Message-----
From: Ehlers, Harald R NWS [mailto:Harald.R.Ehlers@nws02.usace.army.mil]
Sent: Friday, August 05, 2005 4:54 PM
To: Castner, Kristin
Subject: Contact info and background information, lead-contaminated soil disposal acceptance at Graham Road Landfill, Spokane WA

Kristin,

This is the information that you requested for coordination with the Spokane Health District. I am working on a Superfund-lead project for EPA in the Spokane area. If Spokane Health District has specific questions, they are welcome to call me directly. I would like to determine whether Graham Road's permit will allow acceptance of this soil, and then quickly move forward with waste profiling on behalf of EPA. I'd appreciate a call from you by noon on Monday, as well as copies of your waste profiling documents via e-mail. Thanks for your assistance.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Ehlers, Harald R NWS
Sent: Thursday, April 07, 2005 10:57 AM
To: 'fdowns@wm.com'
Subject: Harry Ehlers, US Army Corps of Engineers - contact info

Fred.

Thanks for your feedback this AM. I've summarized the verbal information that I gave you early this week below. I'd appreciate it if you'd look over again.

For follow up, the material is gravelly sands to sandy gravel, leans mostly to the gravels, about 1,600 CY - call it about 2,900 tons. I have analytical data that documents concentrations of lead < 3,000 mg/kg, arsenic < 100 mg/kg, as well as TCLP and SPLP analyses that show leachability is less than characteristic criteria. In addition, waste source is mining related, i.e., contaminated soil exempt from regulation under RCRA under the Bevill Amendment.

Had verbal discussion with you to check if the material type/concentrations sound acceptable under your landfill permit. Recognize that formal waste profiling is necessary to establish, but sounds like material could be accepted by WM at Graham Road.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District

P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

ATTACHMENT (A) 1/2

WA Recreational Sites
Starr Road and Island Complex

Field Sampling Report

Final

Prepared for:

U.S. Environmental Protection Agency
Region 10
1200 6th Avenue
Seattle, Washington 98101

Prepared by:

U.S. Army Corps of Engineers
Seattle District
4735 East Marginal Way South
Seattle, Washington 98134

7 January 2005

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE) recently conducted a HTRW field investigation focused on soil characterization to support remedial design and remedial action for the U.S. Environmental Protection Agency (EPA) Region 10 for the Starr Road and Island Complex Sites, located along the Spokane River just east of the city of Spokane. This work was performed to meet the requirements of the Record of Decision (ROD) for the Bunker Hill Mining and Metallurgical Complex Operable Unit (OU) 3 (USEPA 2002). The field investigation was designed to support selection of appropriate cleanup and site development options.

1.1 SITE DESCRIPTION AND HISTORY

The Starr Road and Island Complex Washington Recreation Sites designated for this field investigation are located approximately 2.5 miles west of the Idaho State line, adjacent to, and immediately north of Interstate 90, in Spokane County, Washington.

The Washington State Parks System owns the Starr Road recreational site. This primitive site is popular with local residents. The Starr Road site has been divided up into four areas, each with specific needs. These areas are the Gravel Bar, Upland, Backwater, and General Access. There is a sensitive trout-spawning habitat that is located around the Gravel Bar.

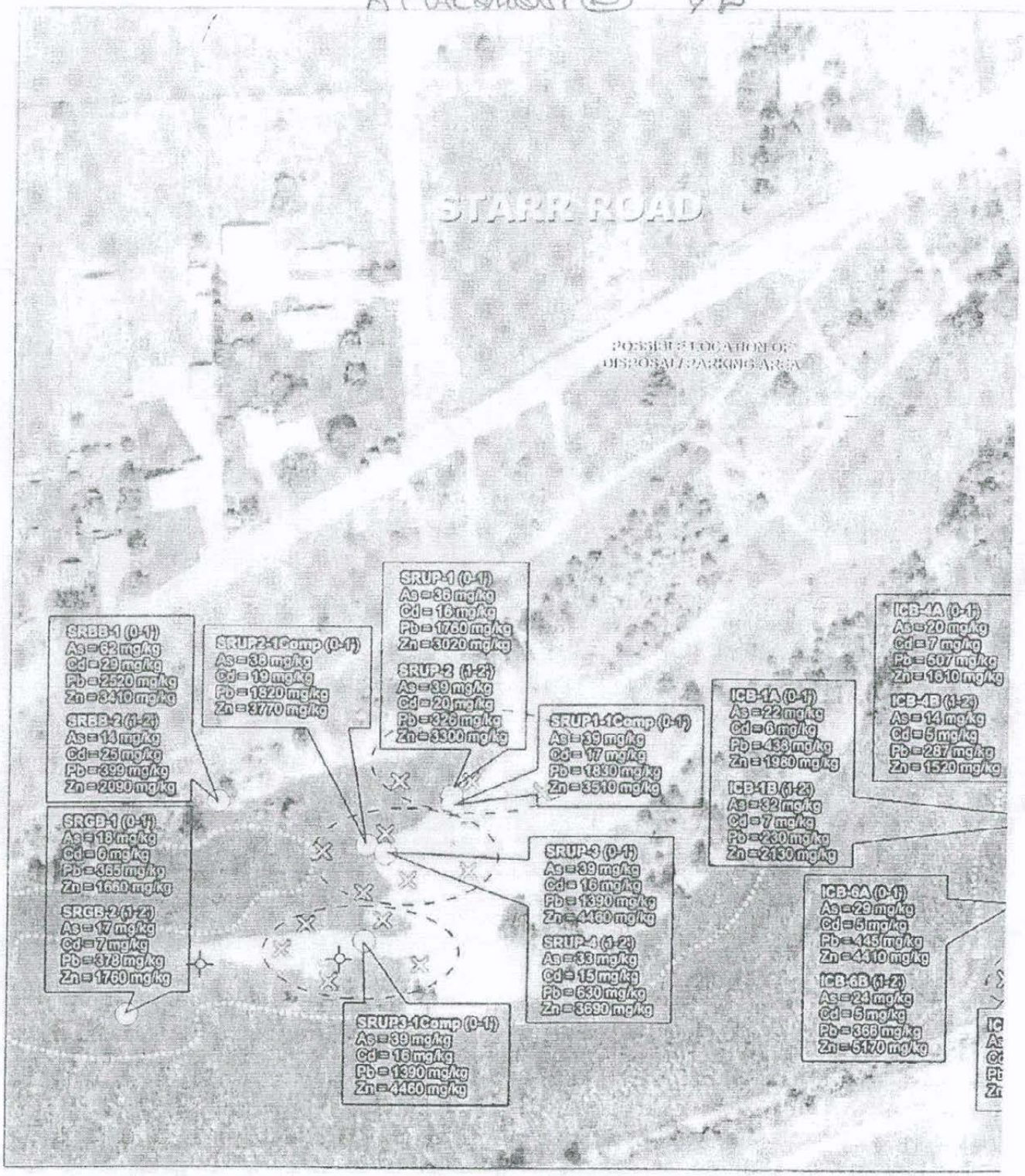
The Island Complex site is located a short distance upstream and south of the Starr Road site. The site is a long distance from the existing parking area and as such, currently has limited or low impact use. The site is directly adjacent to parkland open space recently acquired by Spokane County. This site is readily accessible to recreational users. Human health is the remediation driver for this site. The Island Complex site has been divided up into five areas; the Bar Deposit, Fine Sandy Beach, Bank Stabilization, Little Bank Separation, and Upland Path.

The goal is to reduce the risk of human exposure to contaminants of concern (COCs): lead, arsenic, zinc and cadmium. Soil action levels for protection of human health identified in the ROD are 700 mg/kg for lead. The ROD does not identify soil action levels for arsenic. Maximum contaminant levels identified by MTCA Method B for unrestricted land use are 80 mg/kg for cadmium and 24000 mg/kg for zinc.

1.2 OBJECTIVES

The objective of this project is to reduce human exposure to lead, arsenic, zinc, and cadmium contaminated soil and sediments exceeding the recreational area soil action levels and ecological goals identified in the ROD. The objective of the sampling and analysis effort is to provide data to support selection of appropriate cleanup and site development options. Specific objectives for each area of the site are described in the data quality objectives table and are summarized below.

ATTACHMENT (B) 1/2



Sample Locations August 2004

Observed Spawning Areas*

Composite Sample Increments

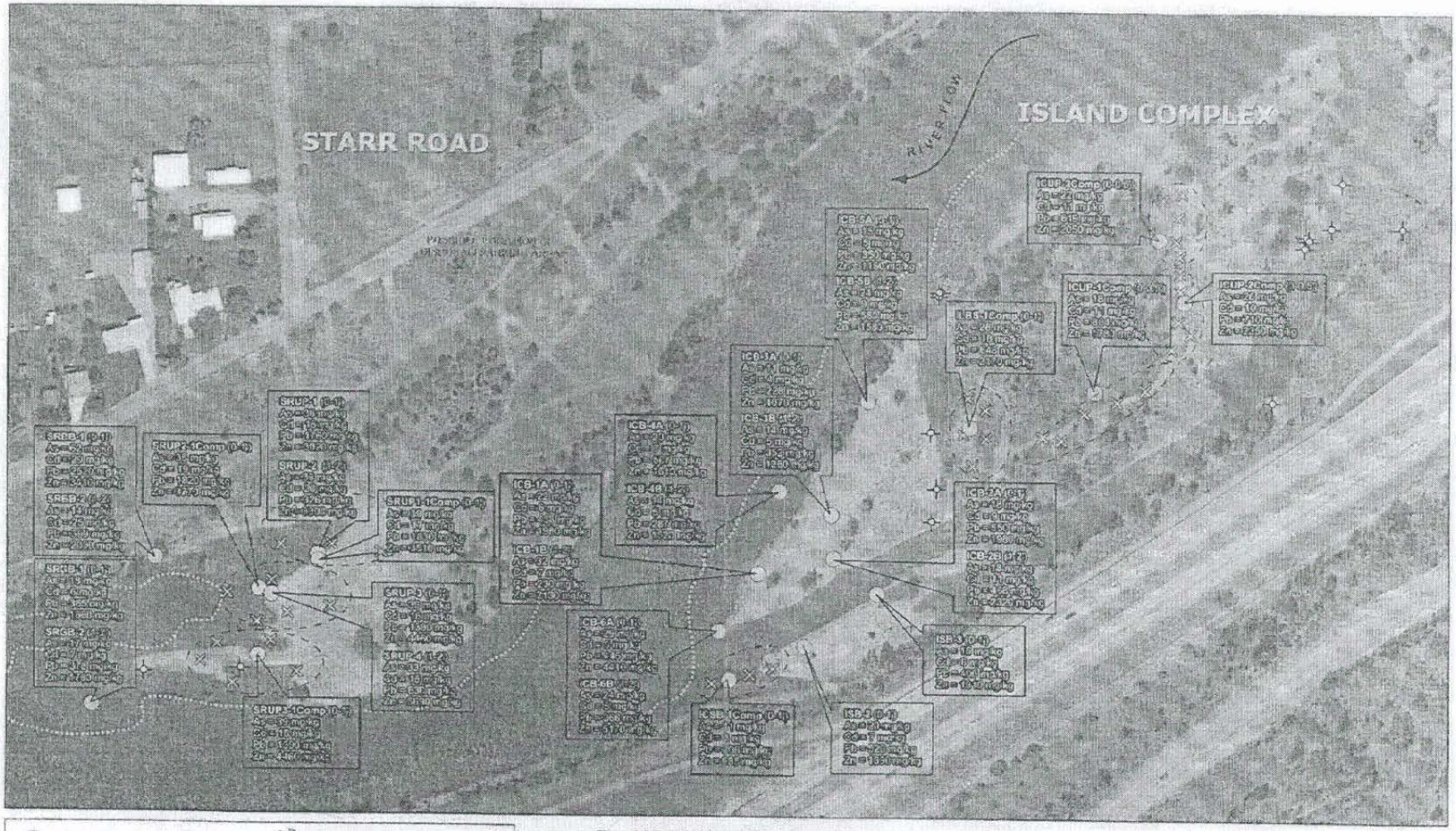
Composite Areas

Approximate Water Line at Time of Sampling**

Total Metals

Washington

Spokan



Sample Locations, August 2004

Observed Spawning Areas*

Composite Sample Increments

Composite Areas

Approximate Water Line at Time of Sampling**

* Rainbow Trout Spawning Survey, 2003 Final Report. Parametrix

** Due to fluctuating water levels, samples pictured here as water were actually collected on land.

Total Metals Sampling Results

Washington Recreation Sites

Spokane River, WA

0 50 100 200 300 Feet

1 inch equals 150 feet

Photo Source: Avista, August 2003

N W E S

US Army Corps of Engineers
Seattle District

ATTACHMENT © 1/1

Analytical Results Evaluation Values

Analyte	Total Metals - Human Health Criteria (mg/kg)	SPLP (mg/L)[3]	TCLP (mg/L)[4]
Cadmium	80[2]	0.08	1.0
Copper	NA	2.2	NA
Lead	700[1]	0.4	2.0
Zinc	24000[2]	28	NA
Arsenic	22[1]	NA	5.0
Barium	NA	NA	100.0
Chromium	NA	NA	5.0
Selenium	NA	NA	1.0
Silver	NA	NA	5.0

[1] – This value was changed from the value specified in the QAPP (10 mg/kg). The basis for the change is discussed in the Remedial Design Document.
[2] - MTCA Method B soil criteria for unrestricted land use.
[3] - SPLP criteria is based on Ambient Water Quality Criteria for the State of Washington, assuming an average hardness of 19 mg CaCO2/L, from data collected in this area of the Spokane River. As the ambient water quality criteria are more stringent than groundwater standards, the listed criteria are also protective of groundwater.
[4] – Waste disposal considerations comply with and will be consistent with Washington dangerous waste regulations. (WAC 173-303-100)

ATTACHMENT (D) 1/2

Metals and Moisture Content Results Cont'd.

Sample ID	Evaluation	04344320		04344325		04344326		04344327	04344331	04344332		04344333		04344334	04344335		04344336	
Sample Location	Value	ILBS-1Comp		SRGB-1		SRGB-2		SRGB-3 (F Dup)	SRUP-1	SRUP1-1Comp		SRUP1-2Comp		SRUP-2	SRUP2-1Comp		SRUP2-2Comp	
Date Sampled		8/17/04		8/18/04		8/18/04		8/18/04	8/18/04	8/18/04		8/18/04		8/18/04	8/18/04		8/18/04	
Analyte																		
TCLP Metals (ug/L)																		
Arsenic	5000	230	U	230	U	230	U			230	U	230	U		230	U	230	U
Barium	100000	426	J	340	J	324	J			552		611			464	J	467	J
Cadmium	1000	32.5		30.0		30.5				62.0		47.0			79.0		41.0	
Chromium	5000	50.0	U	50.0	U	50	U			50.0	U	50.0	U		50.0	U	50.0	U
Lead	2000	125	U	125	U	125	U			125	U	125	U		129		125	U
Selenium	1000	250	U	250	U	250	U			250	U	250	U		250	U	250	U
Silver	5000	50	UJ	50	UJ	50	UJ			50.0	UJ	50	UJ		50	UJ	50	UJ
SPLP Metals (ug/L)																		
Cadmium	80	13.6		9.30		9.60				36.6		25.4			36.2		20.3	
Copper	2200	5.00	U	5.60		6.60				23.5		8.00			13.0		9.60	
Lead	400	25.0	U	36.9		33.3				144		25.0	U		83.3		25.0	U
Zinc	28000	1300		816		827				2830		2110			2370		1440	
Total Metals (mg/kg)																		
Arsenic	22	27.8		18		17		19	35.5	39.3				38.7	38.4			
Cadmium	80	10.5		5.69		6.75		5.74	16.0	16.6				19.5	18.8			
Lead	700	648		365		378		374	1760	1830				326	1820			
Zinc	24000	2170		1660		1760		1670	3020	3510				3300	3770			
Moisture Content																		
% Water		7.2		6.3		6.2				6.6		6.2			6.5		6.9	

Data Qualifiers: U - The analyte was not detected at or above the reported value. Bold text indicates a detection.

J - The identification of the analyte is acceptable; the reported value is an estimate.

UJ - The analyte was not detected at or above the reported value. The reported value is an estimate.

Metals and Moisture Content Results Cont'd.

Sample ID	Evaluation	04344337		04344338		04344339		04344340		04344345		04344346	
Sample Location	Value	SRUP-3		SRUP3-1Comp		SRUP3-2Comp		SRUP-4		SRBB-1		SRBB-2	
Date Sampled		8/18/04		8/18/04		8/18/04		8/18/04		8/18/04		8/18/04	
Analyte													
TCLP Metals (ug/L)													
Arsenic	5000			225	U	230	U			230	U	230	U
Barium	100000			401	J	608	J			604		395	J
Cadmium	1000			38.5		57.5				112		53.5	
Chromium	5000			50.0	U	50.0	U			50.0	U	50.0	U
Lead	2000			125	U	125	U			167		125	U
Selenium	1000			250	U	250	U			250	U	250	U
Silver	5000			50	UJ	50	UJ			50	UJ	50	UJ
SPLP Metals (ug/L)													
Cadmium	80			12.4		35.2				3.00	U	35.2	
Copper	2200			7.10		13.5				5.00	U	8.30	
Lead	400			90.8		40.9				36.3		25.0	U
Zinc	28000			1110		3120				121	J	1700	
Total Metals (mg/kg)													
Arsenic	22	38.8		22				32.7		62.4		14	
Cadmium	80	16.2		8.90				14.5		29.1		24.5	
Lead	700	1390		661				630		2520		399	
Zinc	24000	4460		2040				3690		3410		2090	
Moisture Content													
% Water				6.4		6.9				11.7		7.1	

Data Qualifiers: U - The analyte was not detected at or above the reported value.

J - The identification of the analyte is acceptable; the reported value is an estimate.

UJ - The analyte was not detected at or above the reported value. The reported value is an estimate.

Bold text indicates a detection.

ATTACHMENT (E) 1/3

GeoEngineers

FAX TRANSMITTAL

523 E. Second Avenue, Spokane, WA 99202, Telephone: (509) 363-3125, Fax: (509) 363-3126 www.geoengineers.com

To: US Army Corps of Engineers, Seattle District

Date: July 5, 2005

File: 8000-001-50

Fax Number: 206/764-3706

Attention: Harry Ehlers, PE,

Regarding: Preliminary lab results for recent samples

Pages	Date	Description
1	7/5/05	Fax Transmittal
9	7/5/05	Preliminary lab results

Total Pages: 10

Comments:

Harry,

Please review the attached preliminary results from the samples you submitted to us a couple weeks ago. We have included the mechanical as well as the hydrometer gradation analyses.

Please call if you have questions, thanks,

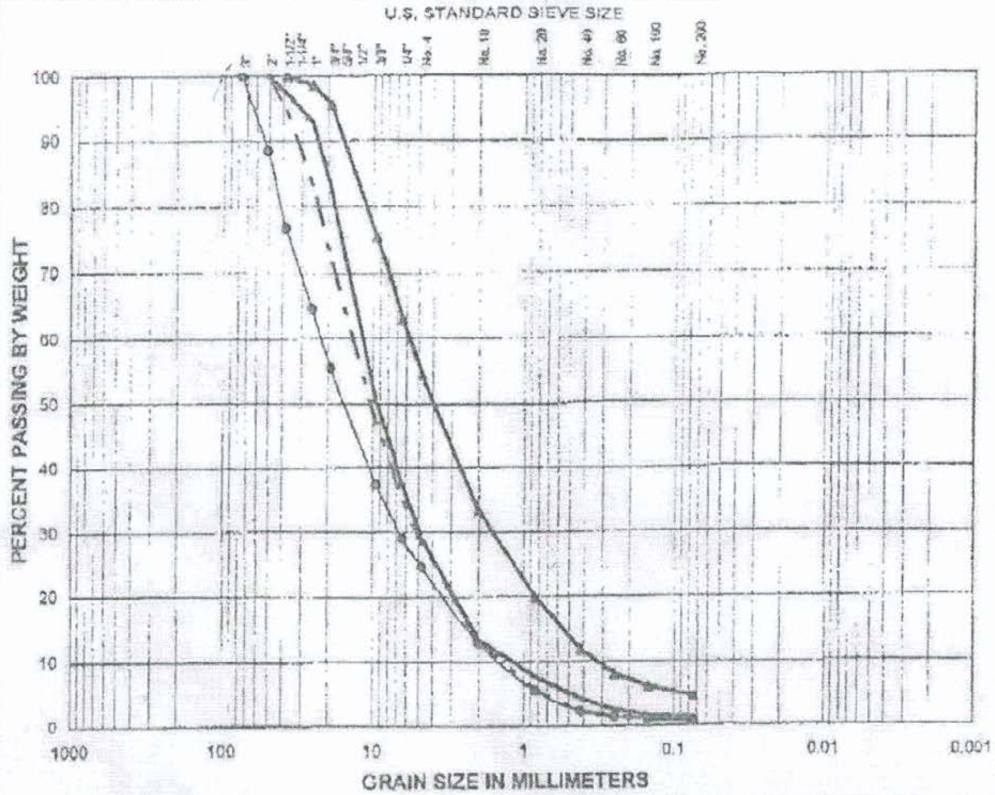
Matt

(3) LAB

Signed: _____

Matt Blankenship
mblankenship@geoengineers.com

2/3



COBBLES	GRAVEL		SAND			FINES - SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample No.	As Rec'd Water Content, %	C_u	C_c	Description/Classification
——	05-SS-01	7	8.67	1.28	Fine-coarse GRAVEL with sand (GW)
- - -	05-SS-02	3	8.82	1.02	Fine-coarse GRAVEL with sand (GW)
▲	05-SS-03	5	16.86	1.57	Medium-coarse SAND with gravel and trace silt (SW / GW)
●	05-SS-04	2	7.50	2.41	Fine-coarse GRAVEL with sand (GW)

Sample No.	Soil composition in percent			
	Gravel	Sand	Fines	Total
05-SS-01	71	28	1	100
05-SS-02	72	28	1	100
05-SS-03	46	50	5	100
05-SS-04	75	24	1	100

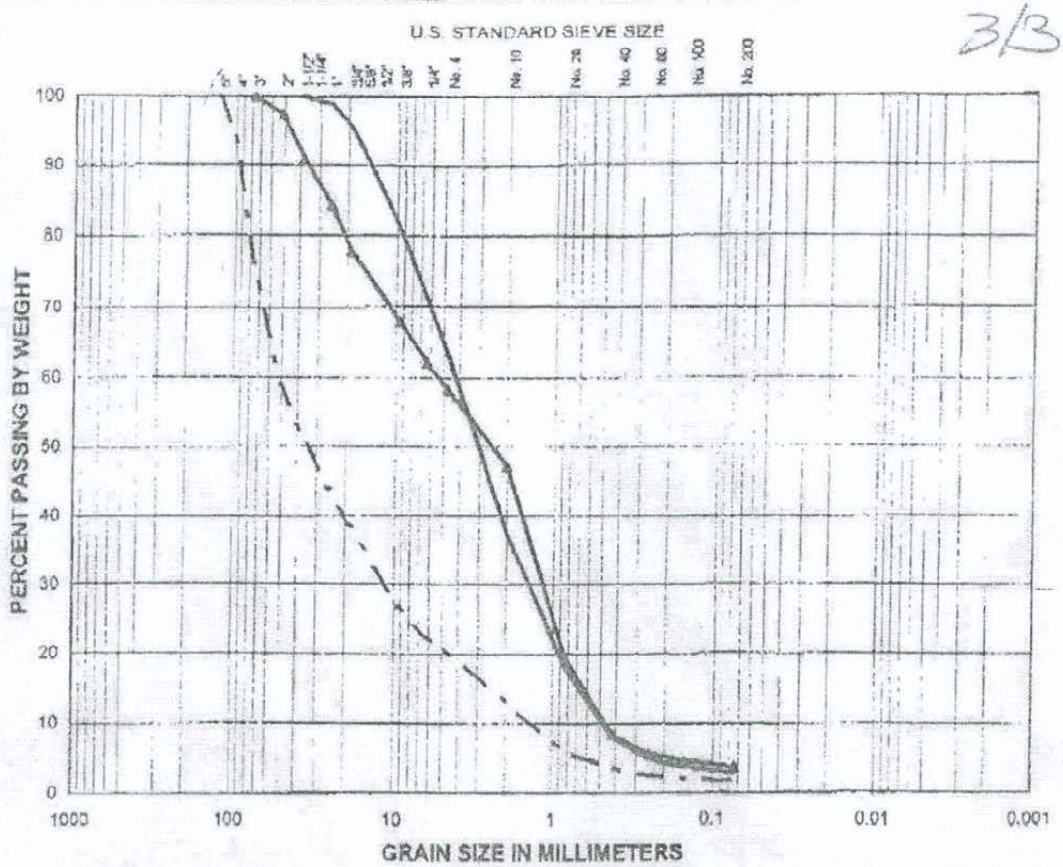
Test Method: ASTM C 136			
Project	U.S. Army Corps of Engineers	Date Tested	6-20-05
File No.	8000-001-50	Tested By	GT
Lab ID No.	NA	Checked By	

GEOENGINEERS
523 East Second Avenue, Spokane, WA 99202

GRAIN SIZE ANALYSIS

05-SS-01, 05-SS-02, 05-SS-03, & 05-SS-04

3/3



COBBLES	GRAVEL		SAND			FINES - SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample No.	As Rec'd Water Content %	C_u	C_c	Description/Classification
———	05-SS-05	4	8.60	1.19	Medium-coarse SAND with gravel and trace silt (SW)
– – –	05-SS-06	5	34.67	1.85	Fine-coarse GRAVEL with sand and trace silt (GW)
▲	05-SS-07	5	11.00	0.61	Medium SAND with gravel and trace silt (SP)

Sample No.	Soil composition in percent			
	Gravel	Sand	Fines	Total
05-SS-05	37	61	3	100
05-SS-06	79	19	2	100
05-SS-07	42	55	4	100

Test Method: ASTM C 136			
Project	U.S. Army Corps of Engineers	Date Tested	5-20-05
File No.	8000-001-50	Tested By	GT
Lab ID No.	NA	Checked By	

NOTE: Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes.

P:\8000\001\DWG\US Army Corps of Engineers\C-136_(7 errors).xls

GeoEngineers
523 East Second Avenue, Spokane, WA 99202

GRAIN SIZE ANALYSIS

05-SS-05,05-SS-06,& 05-SS-07

ATTACHMENT F V/14

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

MEMORANDUM

DATE: October 25, 2004

TO: Ravi Sanga, Project Manager, EPA Region 10

From: Katie Adams, Chemist, EPA Region 10
OEA, Manchester Environmental Laboratory

SUBJECT: Data Review of the Tier I TCLP and SPLP Analyses for the CDA BH Mining and Metallurgical Site

Project Code: TEC-618V
Account Code: 04T10P302DD2C102QLA00

CC: Sarah Bates, USACE

The following is a data review of the TCLP and SPLP analysis of 12 solid samples. The analyses were performed by ESAT chemists at the EPA Manchester Environmental Laboratory in Port Orchard, WA, following USEPA and Laboratory guidelines.

This review was conducted for the following samples:

Samples

04344304	04344320	04344325	04344326	04344332	04344333
04344335	04344336	04344338	04344339	04344345	04344346

Data Qualifications

The following comments refer to the quality control specifications outlined in the Laboratory's current Quality Assurance Plan, and the QAPP. These specifications are adapted from those in the National Functional Guidelines for Inorganic Data Review. The qualifications recommended herein are based on the information provided for the review.

1.0 Timeliness - Acceptable

The technical (40 CFR part 136) holding time from the date of collection until the date of analysis for metals in water is 180 days, except mercury (28 days). The holding time for solid samples is not defined, but the Laboratory applies the 180 day holding time to solid samples as well. Sample collection began on 08/17/2004, and the analyses were completed on 10/05/2004. No data qualification was required based on holding time criteria.

2.0 Sample Preparation - Acceptable

The samples were extracted following EPA Methods 1311 (TCLP) on 09/08/2004 and 09/09/2004, and EPA Method 1312 (SPLP) on 09/13/2004. The extracts were then digested following EPA Method 3010A on 09/15/2004, 09/16/2004, and 09/24/2004.

All sample preparation was in accordance with Manchester Laboratory protocols. No qualification of the data was required based on sample preparation.

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: R
Client No:

Region:	10	Date Shipped:	8/20/2004
Project Code:		Carrier Name:	Hand Delivery
Account Code:	TEC-618V 04T10P302DD2C102QLA00	Airbill:	
CERCLIS ID:		Shipped to:	EPA Manchester Laboratory 7411 Beach Drive East Port Orchard WA 98366 (360) 871-8728
Spill ID:			
Site Name/State:	CDA BH Mining & Metallurgical Complex OI		
Project Leader:	Ravi Sanga		
Action:	Remedial Investigation		
Sampling Co:	USACE		

Chain of Custody Record

Sampler Signature: Dave W. Bates

	Relinquished By (Date / Time)	Received By (Date / Time)
1	Dave W Bates 8/20/04 1624	Ravi Sanga 8/20/4 16:30
2		
3		
4		

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		QC Type
04344324	Subsurface Soil (>12")/ Bates, Dawag	/C	ASTM 4222 (21)	(Not preserved) (1)	ICB-GComp2B	S: 8/18/2004	9:30	-
04344325	Surface Soil (0"-12")/ Bates, Dawag	/G	ASTM D 221 (21), S-Metals (21), TCLP-Met (21), Total Meta (21)	(Not preserved) (5)	SRGB-1	S: 8/18/2004	13:23	-
04344326	Subsurface Soil (>12")/ Bates, Dawag	/G	ASTM D 221 (21), S-Metals (21), TCLP-Met (21), Total Meta (21)	(Not preserved) (4)	SRGB-2	S: 8/18/2004	13:25	-
04344327	Surface Soil (0"-12")/ Bates, Dawag	/G	Total Meta (21)	(Not preserved) (2)	SRGB-3	S: 8/18/2004	13:24	Field Duplicate
04344328	Surface Soil (0"-12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRGB-G1	S: 8/18/2004	12:50	-
04344329	Subsurface Soil (>12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRGB-G2	S: 8/18/2004	12:30	-
04344330	Surface Soil (0"-12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRGB-G3	S: 8/18/2004	12:45	-
04344331	Surface Soil (0"-12")/ Bates, Dawag	/G	Total Meta (21)	(Not preserved) (2)	SRUP-1	S: 8/18/2004	14:11	-
04344332	Surface Soil (0"-12")/ Bates, Dawag	/C	ASTM D 221 (21), S-Metals (21), TCLP-Met (21), Total Meta (21)	(Not preserved) (5)	SRUP1-1Comp	S: 8/18/2004	14:33	-

Shipment for Case Complete? N/Y	Sample(s) to be used for laboratory QC: 04344304, 04344345	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced?

ASTM 4222 = ASTM 422, ASTM D 221 = ASTM D 2216-98, S-Metals = SPLP-Metals, TCLP-Met = TCLP Metals (No Hg), Total Meta = Pb, As, Zn, Cd

TR Number: 10-533326683-081904-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

REGION COPY

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: R
Client No:

Region:	10	Date Shipped:	8/20/2004	Chain of Custody Record	Sampler Signature: Sarah Bates
Project Code:	TEC-618V	Carrier Name:	Hand Delivery	Relinquished By (Date / Time)	Received By (Date / Time)
Account Code:	04T10P302DD2C102QLA00	Airbill:		1 Sarah Bates 8/24/1024	Dawday 8/24/4 10:30
CERCLIS ID:		Shipped to:	EPA Manchester Laboratory	2	
Spill ID:			7411 Beach Drive East	3	
Site Name/State:	CDA BH Mining & Metallurgical Complex ID		Port Orchard WA 98366	4	
Project Leader:	Ravi Sanga		(360) 871-8728		
Action:	Remedial Investigation				
Sampling Co:	USACE				

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		QC Type
04344333	Subsurface Soil (>12")/ Bates, Dawag	/C	ASTM D 221 (21), S-Metals (21), TCLP-Met (21)	(Not preserved) (3)	SRUP1-2Comp	S: 8/18/2004	14:25	-
04344334	Subsurface Soil (>12")/ Bates, Dawag	/G	Total Meta (21)	(Not preserved) (2)	SRUP-2	S: 8/18/2004	14:06	-
04344335	Surface Soil (0"-12")/ Bates, Dawag	/C	ASTM D 221 (21), S-Metals (21), TCLP-Met (21), Total Meta (21)	(Not preserved) (5)	SRUP2-1Comp	S: 8/18/2004	14:51	-
04344336	Subsurface Soil (>12")/ Bates, Dawag	/C	ASTM D 221 (21), S-Metals (21), TCLP-Met (21)	(Not preserved) (3)	SRUP2-2Comp	S: 8/18/2004	15:00	-
04344337	Surface Soil (0"-12")/ Bates, Dawag	/G	Total Meta (21)	(Not preserved) (2)	SRUP-3	S: 8/18/2004	13:50	-
04344338	Surface Soil (0"-12")/ Bates, Dawag	/C	ASTM D 221 (21), S-Metals (21), TCLP-Met (21), Total Meta (21)	(Not preserved) (5)	SRUP3-1Comp	S: 8/18/2004	15:36	-
04344339	Subsurface Soil (>12")/ Bates, Dawag	/C	ASTM D 221 (21), S-Metals (21), TCLP-Met (21)	(Not preserved) (3)	SRUP3-2Comp	S: 8/18/2004	15:30	-
04344340	Subsurface Soil (>12")/ Bates, Dawag	/G	Total Meta (21)	(Not preserved) (2)	SRUP-4	S: 8/18/2004	13:52	-
04344341	Surface Soil (0"-12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRUP-G1	S: 8/18/2004	13:10	-

Shipment for Case Complete? N/Y	Sample(s) to be used for laboratory QC: 04344304, 04344345	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced?

ASTM 4222 = ASTM 422, ASTM D 221 = ASTM D 2216-98, S-Metals = SPLP-Metals, TCLP-Met = TCLP Metals (No Hg), Total Meta = Pb, As, Zn, Cd

TR Number: 10-533326683-081904-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

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Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case:
Client No:

R

Region:	10
Project Code:	TEC-618V
Account Code:	04T10P302DD2C102QLA00
CERCLIS ID:	
Spill ID:	
Site Name/State:	CDA BH Mining & Metallurgical Complex OI
Project Leader:	Ravi Sanga
Action:	Remedial Investigation
Sampling Co:	USACE

Date Shipped: 8/20/2004
Carrier Name: Hand Delivery
Airbill:
Shipped to: EPA Manchester Laboratory, 7411 Beach Drive East, Port Orchard WA 98366, (360) 871-8728

Chain of Custody Record

Sampler Signature: [signature]

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	8/20/04 10:[illegible]	[signature]	8/20/04 10:50
2				
3				
4				

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
04344342	Subsurface Soil (>12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRUP-G2	S: 8/18/2004 13:05	--
04344343	Surface Soil (0"-12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRUP-G3	S: 8/18/2004 13:00	--
04344344	Subsurface Soil (>12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRUP-G4	S: 8/18/2004 12:40	--
04344345	Surface Soil (0"-12")/ Bates, Dawag	/G	ASTM D 221 (21), S-Metals (21), TCLP-Met (21), Total Meta (21)	(Not preserved) (9)	SRBB-1	S: 8/18/2004 13:55	--
04344346	Subsurface Soil (>12")/ Bates, Dawag	/G	ASTM D 221 (21), S-Metals (21), TCLP-Met (21), Total Meta (21)	(Not preserved) (5)	SRBB-2	S: 8/18/2004 13:49	--
04344347	Surface Soil (0"-12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRBB-G1	S: 8/18/2004 12:15	--
04344348	Subsurface Soil (>12")/ Bates, Dawag	/G	ASTM 4222 (21)	(Not preserved) (1)	SRBB-G2	S: 8/18/2004 12:10	--

1/4

Shipment for Case Complete?(Y/N) Y	Sample(s) to be used for laboratory QC: 04344304, 04344345	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced?

ASTM 4222 = ASTM 422, ASTM D 221 = ASTM D 2216-98, S-Metals = SPLP-Metals, TCLP-Met = TCLP Metals (No Hg), Total Meta = Pb, As, Zn, Cd

TR Number: 10-533326683-081904-0001

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PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

Report by Parameter for Project TEC-618V

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344325
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRGB-1		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**340**	**ug/L**	**J**
	7440439	**Cadmium**	**30.0**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	**7440439**	**Cadmium**	**9.30**	**ug/L**	
	7440508	**Copper**	**5.60**	**ug/L**	
	7439921	**Lead**	**36.9**	**ug/L**	
	7440666	**Zinc**	**816**	**ug/L**	

Report by Parameter for Project TEC-618V

6/14

Project Code:	TEC-618V	Collected:	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	Matrix:	Solid
Project Officer:	RAVI SANGA	Sample Number:	04344326
Account Code:	04T10P302DD2C102QLA00	Type:	Reg sample
Station Description:	SRGB-2		

			Result	Units	Qlfr
MET					
Parameter :	Metals, ICP-TCLP				
Method :	1311	TCLP Extraction-Metals			
Prep Method :	1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**324**	**ug/L**	**J**
	7440439	**Cadmium**	**30.5**	**ug/L**	
	7440473	Chromium	50	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter :	SPLP-ICP				
Method :	6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method :	1312				
Analytes(s):	**7440439**	**Cadmium**	**9.60**	**ug/L**	
	7440508	**Copper**	**6.60**	**ug/L**	
	7439921	**Lead**	**33.3**	**ug/L**	
	7440666	**Zinc**	**827**	**ug/L**	

Report by Parameter for Project TEC-618V

7/14

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344332
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRUP1-1Comp		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**552**	**ug/L**	
	7440439	**Cadmium**	**62.0**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50.0	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	**7440439**	**Cadmium**	**36.6**	**ug/L**	
	7440508	**Copper**	**23.5**	**ug/L**	
	7439921	**Lead**	**144**	**ug/L**	
	7440666	**Zinc**	**2830**	**ug/L**	

Report by Parameter for Project TEC-618V

8/14

Project Code:	TEC-618V	Collected:	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	Matrix:	Solid
Project Officer:	RAVI SANGA	Sample Number:	04344333
Account Code:	04T10P302DD2C102QLA00	Type:	Reg sample
Station Description:	SRUP1-2Comp		

			Result	Units	Qlfr
MET					
Parameter :	Metals, ICP-TCLP				
Method :	1311	TCLP Extraction-Metals			
Prep Method :	1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**611**	**ug/L**	
	7440439	**Cadmium**	**47.0**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter :	SPLP-ICP				
Method :	6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method :	1312				
Analytes(s):	**7440439**	**Cadmium**	**25.4**	**ug/L**	
	7440508	**Copper**	**8.00**	**ug/L**	
	7439921	Lead	25.0	ug/L	U
	7440666	**Zinc**	**2110**	**ug/L**	

Report by Parameter for Project TEC-618V

9/14

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344335
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRUP2-1Comp		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**464**	**ug/L**	**J**
	7440439	**Cadmium**	**79.0**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	**Lead**	**129**	**ug/L**	
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	**7440439**	**Cadmium**	**36.2**	**ug/L**	
	7440508	**Copper**	**13.0**	**ug/L**	
	7439921	**Lead**	**83.3**	**ug/L**	
	7440666	**Zinc**	**2370**	**ug/L**	

Report by Parameter for Project TEC-618V

10/14

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344336
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRUP2-2Comp		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**467**	**ug/L**	**J**
	7440439	**Cadmium**	**41.0**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	**7440439**	**Cadmium**	**20.3**	**ug/L**	
	7440508	**Copper**	**9.60**	**ug/L**	
	7439921	Lead	25.0	ug/L	U
	7440666	**Zinc**	**1440**	**ug/L**	

Manchester Environmental Laboratory
Report by Parameter for Project TEC-618V

U/14

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344338
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRUP3-1Comp		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	225	ug/L	U
	7440393	**Barium**	**401**	**ug/L**	J
	7440439	**Cadmium**	**38.5**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	**7440439**	**Cadmium**	**12.4**	**ug/L**	
	7440508	**Copper**	**7.10**	**ug/L**	
	7439921	**Lead**	**90.8**	**ug/L**	
	7440666	**Zinc**	**1110**	**ug/L**	

Manchester Environmental Laboratory
Report by Parameter for Project TEC-618V

12/14

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344339
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRUP3-2Comp		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**608**	**ug/L**	**J**
	7440439	**Cadmium**	**57.5**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	7440439	**Cadmium**	**35.2**	**ug/L**	
	7440508	**Copper**	**13.5**	**ug/L**	
	7439921	**Lead**	**40.9**	**ug/L**	
	7440666	**Zinc**	**3120**	**ug/L**	

Report by Parameter for Project TEC-618V

13/14

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344345
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRBB-1		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	**604**	**ug/L**	
	7440439	**Cadmium**	**112**	**ug/L**	
	7440473	Chromium	50.0	ug/L	U
	7439921	**Lead**	**167**	**ug/L**	
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	7440439	Cadmium	3.00	ug/L	U
	7440508	Copper	5.00	ug/L	U
	7439921	**Lead**	**36.3**	**ug/L**	
	7440666	**Zinc**	**121**	**ug/L**	**J**

Manchester Environmental Laboratory
Report by Parameter for Project TEC-618V

14/14

Project Code:	TEC-618V	**Collected:**	8/18/04
Project Name:	CDA BH MINING & METALLURGICAL	**Matrix:**	Solid
Project Officer:	RAVI SANGA	**Sample Number:**	04344346
Account Code:	04T10P302DD2C102QLA00	**Type:**	Reg sample
Station Description:	SRBB-2		

			Result	Units	Qlfr
MET					
Parameter	: Metals, ICP-TCLP				
Method	: 1311	TCLP Extraction-Metals			
Prep Method	: 1311				
Analytes(s):	7440382	Arsenic	230	ug/L	U
	7440393	**Barium**	395	ug/L	J
	7440439	**Cadmium**	53.5	ug/L	
	7440473	Chromium	50.0	ug/L	U
	7439921	Lead	125	ug/L	U
	7782492	Selenium	250	ug/L	U
	7440224	Silver	50	ug/L	UJ
Parameter	: SPLP-ICP				
Method	: 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 (22 elements)			
Prep Method	: 1312				
Analytes(s):	**7440439**	**Cadmium**	**35.2**	**ug/L**	
	7440508	**Copper**	**8.30**	**ug/L**	
	7439921	Lead	25.0	ug/L	U
	7440666	**Zinc**	**1700**	**ug/L**	

APPENDIX 4: BIOLOGICAL EVALUATION

Ehlers, Harald R NWS

From: Director, Rustin A NWS
Sent: Tuesday, August 30, 2005 3:12 PM
To: Ehlers, Harald R NWS
Cc: Ziminske, Mark T NWS; Director, Rustin A NWS
Subject: Starr Road/Spokane River BE

Attachments: Starr Road BE.doc

Attached is the revised "No Effect" memo for Starr Road concluding our ESA responsibilities.

-RD

Rustin A. Director
Biologist, Environmental Coordinator
Seattle District, USACE
(206) 764-3636
rustin.a.director@usace.army.mil

Starr Road BE.doc
(70 KB)

Environmental Resources Section August 25, 2005

MEMORANDUM FOR: Record

SUBJECT: No Effect Determination for Threatened and Endangered Species Potentially Found Near the Starr Road Site, Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 Project

1. Project Description

The Environmental Protection Agency (EPA), with assistance from the Seattle District, U.S. Army Corps of Engineers (USACE), and in coordination with the Washington State Department of Ecology (Ecology), proposes the remediation of metals contaminated soil and sediment in a Washington State recreational site located east of Spokane, Washington. The Starr Road site (the Site) is a state park owned and operated by the Washington State Department of Parks and Recreation Commission, with river frontage on the Spokane River. The Site is located approximately 2.5 miles west of the Washington and Idaho state line. The Starr Road site is one of the ten shoreline sites on the Spokane River identified for cleanup in the Record of Decision (ROD) for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (USEPA, 2002). The metals contamination present in the Site is associated with historic mining operations in the Coeur d'Alene Basin.

Project activities are the result of Superfund actions in accordance with the Bunker Hill OU3 ROD. The metals of principal concern for protection of human health are lead and arsenic. The project goal is to reduce the risk of human exposure to identified contaminants of concern, specifically lead and arsenic, in accordance with the Bunker Hill OU3 ROD. The purpose is to clean up contaminated soils and sediments using a combination of excavation/removal and capping to meet the ROD requirements. Efforts will be made to replace the existing gravels with clean material of comparable size to encourage continued rainbow trout use at the site.

EPA proposes to remediate approximately 3.5 acres of land at the approximately 85 acre Starr Road site, including approximately 2.5 acres located along the north side of the Spokane River, where historic deposition and accumulation of metals-contaminated soil and sediment pose a human health risk to recreational users of the property. Approximately 1.95 acres of the work is located below the ordinary high water elevation of the Spokane River. The project will result in no loss of waters. The following work will occur above and below the ordinary high water elevation in the Spokane River:

- Excavate 1,600 cubic yards of metals-contaminated soil and sediment from approximately 1.0 acre of a gravel bar (seasonally exposed during the summer's dam-controlled low water event) and replacing it with an equivalent quantity of clean gravels in the Spokane River. The fill consists of two gravel gradations suitable for restoration of rainbow trout spawning habitat disturbed by the excavation work. The contaminated soil excavated from the bar will be disposed of at an offsite commercial landfill.
- Place 3,000 cubic yards of fill over a 1.77 acre area to create a barrier-type soil cap over contaminated sediment and soils that are not spawning habitat. Approximately 0.95 acres of the cap is located below the ordinary high water (OHW) elevation; 0.82 acres of the

cap is above the OHW. The fill includes approximately 2,550 cubic yards of clean capping material and 450 cubic yards of topsoil for revegetation of cap areas located above the ordinary high water elevation.

Ancillary activities occurring above the ordinary high water elevation, in upland portions of the Site, include the construction of a new access point for the Starr Road site, consisting of a paved pullout along River Road (0.06 acres), a permanent pathway leading (0.09 acres) from the pullout to the capped areas located along the Spokane River, and the use of various landscaping techniques to revegetate unwanted paths (0.43 acres) and modify foot traffic routes, including plantings of "hostile vegetation" (0.16 acres of thorny, dense-growing plants) in a steeper, limited access area of the site in lieu of capping.

2. Project Location

The site is located in Township 25 North, Range 45 East, Section 1 and 2. The upland areas of the Starr Road site are located on property owned and operated by the Washington State Parks and Recreation Commission (Spokane County Parcel No.'s 55024.0701 and 55012.0122). The seasonally submerged areas of the Spokane River adjacent to the Starr Road site are controlled by the Washington State Department of Natural Resources.

3. Potentially Affected Species

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended, the Corps is required to assure that its actions have taken into consideration impacts to federally listed or proposed threatened or endangered species for all federally funded, permitted, or licensed projects. The following is the list of federally designated threatened and endangered species that may exist within the vicinity of the project:

- Grizzly Bear (*Ursus arctos horribillis*) – Threatened
- Gray Wolf *(Canus lupus)* - Endangered
- Canada lynx (*Lynx Canadensis*) - Threatened
- Bald Eagle *(Haliaeetus leucocephalus)* - Threatened
- Water Howellia (*Howellia aquatilis*) - Threatened
- Ute ladies'-tresses *(Spiranthes diluvialis)* – Threatened

The Corps has determined that the project will have ***no effect*** on any of these listed species.

Grizzly Bear

The grizzly bear was classified as a threatened species under provisions of the Endangered Species Act on July 28, 1975 (40 FR 31736). In the conterminous 48 States, only five remaining areas have either remnant or self- perpetuating populations of Grizzly Bear. These remaining populations are principally located in mountainous regions in Montana, Wyoming, Idaho and Washington and are often associated with National Parks and wilderness areas. Grizzly bear populations persist in the Yellowstone Grizzly Bear Ecosystem, the Northern Continental Divide Ecosystem, the Cabinet-Yaak Ecosystem, and Selkirk Ecosystem. A small number of grizzly bears are believed to exist in the North Cascades of Washington.

Grizzly bear home range is between 10 and 380 square miles. A grizzly bear's home range is basically inland – away from major bodies of water. In most cases, a grizzly bear's home range includes an area of forested land or shrub cover, which is used mostly for escape (McNamee 1984).

Grizzly bears feed on berries (blueberries, bearberries, etc.), roots, bulbs of plants, ground dwelling rodents, and whitebark pine (*Pinus albicaulis*) nuts. Grizzlies may also prey on moose, elk, mountain goats and mountain sheep. During the spring months, grizzlies also feed on the calves of these animals (McNamee 1984).

Most grizzly bears are active during the morning and early evening hours. During the daytime they rest in day beds, often constructed in dense cover to escape the heat. During the late summer and fall months, when they are fattening up for the long months of hibernation, grizzly bears may be active throughout the day. As food items become scarce, the grizzly bear's territory increases.

Determination of Effect:
The Corps believes this project will have *no effect* on the grizzly bear. This determination is based on minimal impacts associated with the project. Also, the relatively high human population in the project area would likely deter a high degree of grizzly activity in the area.

Gray Wolf
The gray wolf was classified as an endangered species under provisions of the Endangered Species Act on June 4, 1973. Once exterminated from the lower 48 states, the gray wolf is making a comeback in Montana. Gray wolf populations have persisted and expanded in the northern Rocky Mountains since 1986, while reintroduction efforts in Idaho and Yellowstone have further bolstered the population. Wolves have occupied areas that have a higher degree of forest cover, low human population density, high elk density, and low sheep density. USFWS analysis indicated that relatively large tracts of suitable habitat remain unoccupied; suggesting that wolf populations likely will continue to increase in the region. On April 1 2003, the U.S. Fish and Wildlife Service (FWS) changed the classification of the gray wolf from endangered to threatened.

The gray wolf is the largest member of the dog family (*Canidae*). Adult males average 31.8-45.4 kg (70-100 lbs.) and females weigh in at around 24.9-38.6 kg (55-85 lbs.). Gray wolves measure 1.5-1.8 m (5-6 ft.) from nose to tail, and stand 66-81 cm (26-32 in.) at the shoulder. The pelt may be any color from black to white, or a mix. They have long legs and the chest is deep and narrow. These aspects of the wolf's anatomy are especially well suited for fast, far ranging travels, such as frequent hunting expeditions. Wolves' sense of smell is very keen, and they are reported to be able to hear other wolves howling at up to 9.7 km (6mi.) away. There are as many as 24 sub-species in North America.

The gray wolf reaches sexual maturity in approximately 2 years. About six pups are born in April in a den dug by the female. The pack (2-8 wolves) shares in the responsibility of raising the pups. Gray wolves are carnivorous, feeding on most game animals from large ungulates such as

elk to small rodents like deer mice. Their diet is very seasonal and is based on food availability. Gray wolves will travel as far as 30 miles per day in search of food.

Determination of Effect:
The Corps believes this project will have *no effect* on the gray wolf. This determination is based on minimal impacts associated with the project. Also, the relatively high human population in the project area would likely deter a high degree of gray wolf activity in the area.

Canada Lynx
The Canada Lynx was classified as a threatened species under provisions of the Endangered Species Act on July 3, 2003. Canada lynx are medium-sized cats that are on average 75-90 cm long (30-35 inches) and 8-10.5 kg (18-23 pounds). They have large feet adapted to walking on snow, long legs, tufts on the ears, and black-tipped tails. They occur in mesic coniferous forests that have cold, snowy winters. In the western U.S., most lynx occurrences (83%) are associated with Rocky Mountain Conifer Forest, and most (77%) occur within the 1,500-2,000 m (4,920-6,560 ft) elevation zone (McKelvey et al. 2000*b*). Primary vegetation that contributes to lynx habitat is lodgepole pine, subalpine fir, and Engelmann spruce (Aubry et al. 2000). In extreme northern Idaho, northeastern Washington, and northwestern Montana, cedar-hemlock habitat types may also be considered primary vegetation. Secondary vegetation when interspersed within subalpine forests, may also contribute to lynx habitat. This includes cool, moist Douglas-fir, grand fir, western larch, and aspen forests. Dry forest types (e.g., ponderosa pine, climax lodgepole pine) do not provide lynx habitat.

The home ranges of lynx are variable, ranging anywhere from 7 to 147 square miles. Generally, home range sizes at the southern extent of lynx range in boreal and montane forests are larger than those reported from the taiga. The range of lynx in the southern portion of their distributions is, on average, twice as large as of those in the northern portion (Ruediger et al. 2000).

Lynx feed primarily on snowshoe hares (*Lepus americanus),* which comprise 35-97% of the diet throughout the range of the lynx (Koehler and Aubry 1994, *in* Ruediger et al. 2000), and the distribution of lynx and snowshoe hare in North America appears to be tightly coupled (Ruediger et al. 2000). However, lynx are known to feed on other prey species, including small mammals such as red squirrel (*Tamiasciurus hudsonicus*), grouse (*Bonasa umbellus*, *Dendragopus* spp., *Lagopus* spp., *Centrocercus urophasianus, Tympanichus phasianellus*), flying squirrel (*Glaucomys sabrinus*), ground squirrel (*Spermophilus parryii, S. richardsonii*), porcupine (*Erethrizon dorsatum*), beaver (*Castor canadensis*), white-tailed jackrabbit (*Lepus townsendii*), black-tailed jackrabbit (*Lepus californicus*), mice (*Peromyscus* spp.), voles (*Microtus* spp.), and shrews (*Sorex* spp.).

Determination of Effect:
The Corps believes this project will have *no effect* on Canada lynx. Typical lynx habitat occurs much higher in the elevation and the nearest observations are likely from the North Cascades. This determination is based on minimal impacts associated with the project. Also, the relatively

high human population in the project area would likely deter a high degree of lynx activity in the area.

Bald Eagle

The Washington State bald eagle population was listed as threatened under the Endangered Species Act of 1973, as amended, in February 1978. Since DDT was banned in 1972, bald eagle populations have rebounded. The bald eagle was proposed for de-listing in July 1999.

The bald eagle wintering season extends from October 31 through March 31. Food is recognized as the essential habitat requirement affecting winter numbers and distribution of bald eagles. Other wintering habitat considerations are communal night roosts and perches. Generally large, tall, and decadent stands of trees on slopes with northerly exposures are used for roosting; eagles tend to roost in older trees with broken crowns and open branching (Watson and Pierce 1998). Bald eagles select perches on the basis of exposure, and proximity to food sources. Trees are preferred over other types of perches, which may include pilings, fence posts, power line poles, the ground, rock outcrops, and logs (Steenhof 1978).

Bald eagles nest between early January and mid-August. The characteristic features of bald eagle breeding habitat are nest sites, perch trees, and available prey. Bald eagles primarily nest in uneven-aged, multi-storied stands with old-growth components. Factors such as tree height, diameter, tree species, position on the surrounding topography, distance from water, and distance from disturbance also influence nest selection. Snags, trees with exposed lateral branches, or trees with dead tops are often present in nesting territories and are critical to eagle perching, movement to and from the nest, and as points of defense of their territory.

Determination of Effect:

The Corps believes the project will have *no effect* on bald eagles, as no nests or roosts are located within six miles of the project.

Water Howellia

On July 14, 1994, the water howellia was designated as threatened in the entire range this species is known to occur in California, Idaho, Montana, Oregon, and Washington. Historically, this species occurred over a large area of the Pacific Northwest, but extant populations are mostly clustered in 2 main population centers, one in eastern Washington and one in northwestern Montana in the drainage of the Swan River in northwestern Montana (Lake and Missoula Counties). Water howellia is found in shallow, low-elevation glacial pothole ponds and former river oxbows with margins of deciduous trees and shrubs. These habitats are inundated by spring rains and snowmelt runoff and typically dry out by the end of the growing season. The plants tend to root in the shallow water at the edges of deeper ponds that are (at lower elevations) surrounded by deciduous trees.

Populations vary widely in size from year to year and very wet or very dry seasons can have a detrimental effect on abundance. The large fluctuations in annual numbers and low genetic

variability indicate that isolated populations may be vulnerable to extirpation. Populations near the larger "population centers" may be inherently more resilient.

Water howellia is an aquatic annual that grows submerged, rooted in bottom sediments of ponds and sloughs. Leaves are very narrow and about 1-5 cm long. Two types of flowers are produced - small, inconspicuous flowers beneath the water's surface and larger, white, emergent flowers that appear in July.

Determination of Effect:
The Corps has determined that the proposed project will have *no effect* on water howellia. This determination is based on the fact there is no suitable habitat at the proposed project site.

Ute Ladies Tresses
Ute Ladies'-tresses was federally listed as threatened in 1992 when it was only known from Colorado, Utah, and Nevada. Since that time, it has been found in Wyoming, Montana, Nebraska, and Idaho. Currently, the largest documented population - with about 5500 plants - is in Colorado. The riparian habitat on which this species depends has been drastically modified by urbanization and stream channelization for agriculture and development. Most surviving populations are small and appear to be relict in nature. Plants are usually in moist to very wet meadows along streams or in abandoned stream meanders that still retain ample ground water. It also occurs near springs, seeps, and lakeshores between 1,500 and 7,000 feet in elevation. Ute ladies'-tresses is a perennial, terrestrial orchid with stems 20 to 50 centimeters (cm) (8 to 20 in) tall, arising from tuberously thickened roots. Its narrow leaves are about 28 cm (11in) long at the base of the stem, and become reduced in size going up the stem. The flowers consist of 7 to 32 small (7.5 to 15mm) (3/8 to 5/8 in) white or ivory flowers clustered into a spike arrangement at the top of the stem. The species is characterized by whitish, stout, ringent (gaping at the mouth) flowers. The sepals and petals, except for the lip, are rather straight, although the lateral sepals are variably oriented, with these often spreading abruptly from the base of the flower. Sepals are sometime free to the base.

Ute ladies'-tresses generally blooms from late July through September, depending on location and climatic conditions. In some areas, this species may bloom in early July or as late as early October. Bumblebees are apparently required for pollination of this species. Ute ladies'-stresses is usually found in mesic or wet meadows along permanent streams.

Determination of Effect:
The Corps has determined that the proposed project will have *no effect* on Ute ladies'-tresses as none are known to be at the site nor is there currently suitable habitat available.

4. Interrelated and Interdependent Effects
There are no known interrelated and interdependent effects from this action.

5. Cumulative Effects
There are no known cumulative effects from this action.

6. References

McNamee, T. 1984. The Grizzly Bear. New York. 308 pp.
Rieman, B.E. and J.D. McIntyre. 1995. Occurrence of bull trout in naturally fragmented habitat patches of varied size. Transactions of the American Fisheries Society. Vol. 124 (3): 285-296.

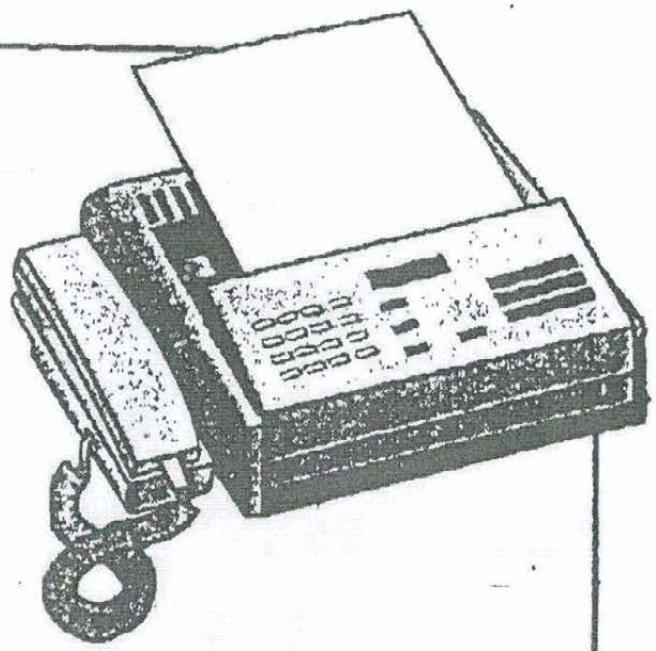
Ruediger, Bill, Jim Claar, Steve Gniadek, Bryon Holt, Lyle Lewis, Steve Mighton, Bob Naney, Gary Patton, Tony Rinaldi, Joel Trick, Anne Vandehey, Fred Wahl, Nancy Warren, Dick Wenger, and Al Williamson. 2000. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Missoula, MT.

Steenhof, K. 1978. *Management of Wintering Bald Eagles*. U.S. Fish and Wildlife Service Biological Report (FWS/OBS-78-79).

USEPA, 2002. Record of Decision, The Bunker Hill Mining and Metallurgical Complex, Operable Unit 3. USEPA Region 10, Seattle, WA. September 2002.

APPENDIX 5: CLEAN WATER ACT COMPLIANCE

USEPA-10 Environmental Cleanup Office



(206) 553-1090
(206) 553-0124 Fax
(206) 553-0957 Fax

U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101-1128

Facsimile Cover Sheet

To: Harry Ahlers

From: Randi Sanger

Date: 8/30/05

# of Pages (including cover sheet):

Comments: 401 Cert. for Rec. Areas

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

August 29, 2005

Reply To Attn Of: EPA-083

Water Quality Certification

CERCLA
Starr Road Remediation
Bunker Hill Mining and Metallurgical Complex OU 3
Spokane River, Washington

Introduction. This Water Quality Certification (WQC) has been completed in support of to a fund-lead Remedial Action (in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended [CERCLA]) to remediate metals contaminated soils and sediments in a Washington State recreational site located last of Spokane, Washington. The work is being conducted by the U.S. Environmental Protection Agency, Region 10 (EPA), with assistance from the Seattle District, U.S. Army Corps of Engineers (USACE), and in coordination with the Washington State Department of Ecology (Ecology). The Starr Road site is a state park owned and operated by the Washington State Department of Parks and Recreation Commission, with river frontage on the Spokane River. The Site is located approximately 2.5 miles west of the Washington and Idaho state line. The Starr Road site is one of the ten shoreline sites on the Spokane River identified for cleanup in the Record of Decision (ROD) for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (USEPA, 2002). The metals contamination present in the Site is associated with historic mining operations in the Coeur d'Alene Basin. The metals of principal concern for protection of human health are lead and arsenic. The project goal is to reduce the risk of human exposure to identified contaminants of concern, specifically lead and arsenic, in accordance with the Bunker Hill OU3 ROD. A copy of this WQC will be included in EPA's site file as part of the record for this action.

The Environmental Protection Agency (EPA) is responsible for review of this project to insure compliance with the substantive requirements of the Clean Water Act Section 401. The State of Washington water quality standards (Chapter 173-201 WAC) are drawn on heavily for EPA's evaluation, these standards being normally applicable and used by the State of Washington for Section 401 certification in the absence of a CERCLA action. The antidegradation policy of the State of Washington, in addition to preservation of beneficial uses, is a major factor in our analysis.

Action proposed. The proposed action will clean up contaminated soils and sediments using a combination of excavation/removal and capping to meet the ROD requirements. EPA

proposes to remediate approximately 3.5 acres of land at the approximately 85 acre Starr Road site, including approximately 2.5 acres located along the north side of the Spokane River, where historic deposition and accumulation of metals-contaminated soil and sediment pose a human health risk to recreational users of the property. Approximately 1.95 acres of the work is located below the ordinary high water elevation of the Spokane River. The project will result in no net loss of "waters of the United States." Excavation and fill placement on the Starr Road site requires work adjacent to and below the seasonal ordinary high water level of the Spokane River and shall occur during a seasonal low period of the river. The following work will occur above and below the ordinary high water elevation in the Spokane River:

- Excavate 1,600 cubic yards of metals-contaminated soil and sediment from approximately 1.0 acre of a gravel bar (seasonally exposed during the summer's dam-controlled low water event) and replacing it with an equivalent quantity of clean gravels in the Spokane River. The fill consists of two gravel gradations suitable for restoration of rainbow trout spawning habitat disturbed by the excavation work. The contaminated soil excavated from the bar will be disposed of at an offsite commercial landfill.

- Place 3,000 cubic yards of fill over a 1.77 acre area to create a barrier-type soil cap over contaminated sediment and soils that are not spawning habitat. Approximately 0.95 acres of the cap is located below the ordinary high water (OHW) elevation; 0.82 acres of the cap is above the OHW. The fill includes approximately 2,550 cubic yards of clean capping material and 450 cubic yards of topsoil for revegetation of cap areas located above the ordinary high water elevation.

Ancillary activities occurring above the ordinary high water elevation, in upland portions of the Site, include the construction of a new access point for the Starr Road site, consisting of a paved pullout along River Road (0.06 acres), a permanent pathway leading (0.09 acres) leading from the pullout to the capped areas located along the Spokane River, and the use of various landscaping techniques to revegetate unwanted paths (0.43 acres) and modify foot traffic routes, including plantings of "hostile vegetation" (0.16 acres of thorny, dense-growing plants) in a steeper, limited access area of the site in lieu of capping.

Certification. EPA certifies that the work proposed complies with applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, as amended. This certification is subject to the following conditions:

1. Work in waters pursuant to this action shall be completed prior to February 14, 2007; thereafter this WQC will expire unless amended or extended.

2. Copies of this certification shall be kept on the job site and readily available for reference by EPA, the contractor, and other appropriate federal, state and local government inspectors. EPA retains the jurisdiction to make further modifications to this certification through written amendment if it appears necessary to protect the public interest.

3. Water quality standards of the State of Washington pertaining to this reach of the Spokane River shall apply to this project except in the authorized dilution zone. For this project, the entire water area within 300 feet measured from the approximate center of the construction operation is authorized as the dilution zone, except that not more than one-quarter of the river width may be affected. Water quality monitoring shall occur during excavation and fill placement to ensure that applicable standards for turbidity as established in the Surface Water Quality Standards, WAC 173-201A (1997), are not exceeded. If water quality standards are exceeded, work may be changed or may cease until conditions return to acceptable levels. Observation reports and any water quality data collected within and at the edge of the mixing zone for any reason shall be provided to EPA in a timely manner. At no time within any point of the dilution zone shall dissolved oxygen levels be caused to drop below 4.0 mg/l. Should this occur, all in-water activities should cease immediately and EPA notified. Work shall not recommence until dissolved oxygen levels have returned to ambient levels and approval given by EPA.

4. Care shall be taken to prevent any petroleum products or other deleterious or toxic materials from entering the water as a result of any activity. Appropriate cleanup materials such as sorbent pads and booms must be available on-site for deployment in the event of incidental or accidental discharges. If significant oil sheen is observed in the vicinity of the operation, immediate action must be taken to identify the source and to modify the activity and prevent further degradation, or the activity shall cease. EPA will be notified of the condition immediately.

5. If distressed or dying fish are observed in the vicinity of the operation, immediate action must be taken to modify the activity and prevent further degradation, or the activity shall cease. EPA will be notified of the condition.

6. Floatable debris introduced into the river by the construction activities will be collected and suitably disposed at an upland location.

Monitoring Activities and Requirements. The overall objective of monitoring water quality is to assess compliance with WQS during construction and placement of grading material operations. The specific objectives are to ensure dissolved oxygen concentrations do not fall below prescribed minimums and turbidities do not exceed prescribed maximums so that construction activities are accomplished in a manner ensuring protection of the environment.

1. Turbidity shall be monitored at three locations at least two times per day during active site work; 1) upgradient of active work areas; 2) adjacent to active work areas; and 3) downgradient of active work areas. Turbidity shall be determined using a turbidity meter or other approved field screening method. Variance of turbidity between sample locations shall not be greater than 10 nephelometric turbidity units (NTUs). Turbidity shall not exceed background turbidity by more than 50 NTUs at any instantaneous sampling event or more than 25 NTUs for more than 10 consecutive days.

2. Dissolved Oxygen shall be monitored concurrent with turbidity whenever turbidities exceed background by more than 50 NTUs at any instantaneous sampling event or more than 25 NTUs for more than 10 consecutive days.

Additional water quality measurements may be taken at the discretion of the Quality Assurrance Official on-site or at the direction of EPA to define any area of impact and to assess the situation to allow informed decisions. EPA expects that the cause of any water quality problem will be assessed and appropriate measures (e.g., change production rates, modify construction techniques, etc.) will be taken to correct an identified problem.

Notification. EPA shall be notified 3 days prior to initiation of construction and immediately upon exceedence or failure to comply with conditions of this WQC. Copies of any monitoring results will be provided to EPA in a timely fashion. Contact: John Malek, Sediment Management Program, at (206) 553-1286), Fax: (206) 553-1775; Address: 1200 Sixth Ave., ECO-083, Seattle, Washington, 98101; Email: malek.john@epa.gov.

PREPARED AND APPROVED BY:

John Malek — 29 Aug 2005
John Malek
Sediment Management Program
Office of Ecosystems, Tribal and Public Affairs
Date

cc: EPA (Ravi Sanga)
COE (Nicolle Rutherford)
Ecology (Brendan McFarland)

DECISION DOCUMENT
NATIONWIDE PERMIT # 38

Reference: Starr Road

Name: EPA Region 10, Office of Environmental Cleanup

Project Description: The Environmental Protection Agency (EPA), with assistance from the Seattle District, U.S. Army Corps of Engineers (USACE), and in coordination with the Washington State Department of Ecology (Ecology), proposes the remediation of metals contaminated soil and sediment in a Washington State recreational site located east of Spokane, Washington. The Starr Road site (the Site) is a state park owned and operated by the Washington State Department of Parks and Recreation Commission, with river frontage on the Spokane River. The Site is located approximately 2.5 miles west of the Washington and Idaho state line. The Starr Road site is one of the ten shoreline sites on the Spokane River identified for cleanup in the Record of Decision (ROD) for the Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 (USEPA, 2002). The metals contamination present in the Site is associated with historic mining operations in the Coeur d'Alene Basin.

Project activities are the result of Superfund actions in accordance with the Bunker Hill OU3 ROD. The metals of principal concern for protection of human health are lead and arsenic. The project goal is to reduce the risk of human exposure to identified contaminants of concern, specifically lead and arsenic, in accordance with the Bunker Hill OU3 ROD. The purpose is to clean up contaminated soils and sediments using a combination of excavation/removal and capping to meet the ROD requirements.

EPA proposes to remediate approximately 3.5 acres of land at the approximately 85 acre Starr Road site, including approximately 2.5 acres located along the north side of the Spokane River, where historic deposition and accumulation of metals-contaminated soil and sediment pose a human health risk to recreational users of the property. Approximately 1.95 acres of the work is located below the ordinary high water elevation of the Spokane River. The project will result in no loss of waters. The following work will occur above and below the ordinary high water elevation in the Spokane River:

- Excavate 1,600 cubic yards of metals-contaminated soil and sediment from approximately 1.0 acre of a gravel bar (seasonally exposed during the summer's dam-controlled low water event) and replacing it with an equivalent quantity of clean gravels in the Spokane River. The fill consists of two gravel gradations suitable for restoration of rainbow trout spawning habitat disturbed by the excavation work. The contaminated soil excavated from the bar will be disposed of at an offsite commercial landfill.
- Place 3,000 cubic yards of fill over a 1.77 acre area to create a barrier-type soil cap over contaminated sediment and soils that are not spawning habitat. Approximately 0.95 acres of the cap is located below the ordinary high water (OHW) elevation; 0.82 acres of the cap is above the OHW. The fill includes approximately 2,550 cubic yards of clean capping material and 450 cubic yards of topsoil for revegetation of cap areas located above the ordinary high water elevation.

Ancillary activities occurring above the ordinary high water elevation, in upland portions of the Site, include the construction of a new access point for the Starr Road site, consisting of a paved pullout along River Road (0.06 acres), a permanent pathway leading (0.09 acres) from the

pullout to the capped areas located along the Spokane River, and the use of various landscaping techniques to revegetáte unwanted paths (0.43 acres) and modify foot traffic routes, including plantings of "hostile vegetation" (0.16 acres of thorny, dense-growing plants) in a steeper, limited access area of the site in lieu of capping.

1. **Location**: The site is located in Township 25 North, Range 45 East, Section 1 and 2. The upland areas of the Starr Road site are located on property owned and operated by the Washington State Parks and Recreation Commission (Spokane County Parcel No.'s 55024.0701 and 55012.0122). The seasonally submerged areas of the Spokane River adjacent to the Starr Road site are controlled by the Washington State Department of Natural Resources.

2. **Agency Coordination**: The project has been coordinated with the Washington State Department of Ecology (Ecology), Washington Department of Fish and Wildlife (WDFW), and the Environmental Protection Agency (EPA). The EPA will be issuing the 401 Water Quality Certification for the project.

3. **Endangered Species**: Listed below are the species, listed under the Endangered Species Act (ESA) of 1973, as amended, that occur in the project area and the Corps' determination of effect.
   - Grizzly Bear (*Ursus arctos horribillis*) – Threatened, no effect.
   - Gray Wolf *(Canus lupus)* – Endangered, no effect.
   - Canada lynx (*Lynx Canadensis*) – Threatened, no effect.
   - Bald Eagle *(Haliaeetus leucocephalus)* – Threatened, no effect.
   - Water Howellia (*Howellia aquatilis*) – Threatened, no effect.
   - Ute ladies'-tresses *(Spiranthes diluvialis)* – Threatened, no effect.

   The biological evaluation (BE), dated August 2005, prepared by the Corps' Environmental Resources Section, provides supporting documentation to this determination. In short, none of the listed species occur or are likely to occur within the project area. Because the Corps has determined that the project will have no effect on listed species, it is not necessary to initiate ESA consultation with the U.S. Fish and Wildlife Service.

4. **Essential Fish Habitat**: No Essential Fish Habitat has been designated in the area. No further EFH consultation is necessary.

5. **Historic and/or Cultural Resources**: As the Federal agency responsible for Section 106 of the NHPA, EPA has determined that the project will result in No Historic Properties Affected. EPA received concurrence with this determination from the Washington State Historic Preservation Officer (SHPO), Department of Archaeology and Historic Preservation on 29 August 2005 (Log No: 062705-14-EPA). The Spokane Tribe and the Coeur d'Alene Tribe's traditional cultural knowledge and concerns about the Area of Potential Effects (APE) have been acknowledged by EPA by supporting the presence of a cultural resources staff member representing the tribes during earth disturbing activities. Special Condition "a." through "d." listed in the last section of this document will become a condition of the permit.

6. **Mitigation**: The proposed cleanup action is a self-mitigating action because it will result in the removal and containment of heavy metal contaminants in the aquatic and terrestrial environment. The cleanup of hazardous and toxic waste will generally improve the natural

resource characteristics of the project area and areas in the vicinity of the work. No additional mitigation is necessary.

7. **Jurisdictional Determination**: The project is within Corps jurisdiction because it involves work below the ordinary high water mark in the Spokane River, a portion of which is a navigable water of the United States.

8. **Rationale for Use of the Nationwide Permit #38**: NWP 38 authorizes "Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. . ." The proposed work is being undertaken as part of an EPA Superfund action. The applicant provided proper pre-construction notification. Project will not result in new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste. The proposed work meets the conditions of NWP 38.

9. **Corps Decision**:
   1. Minimal Impact: Yes.
   2. Discretionary authority to require an individual permit: No.
   3. Special Conditions: Per rationale provided in this document, the following conditions will be made special conditions of the permit:

      a. A cultural resources staff member representing both the Spokane Tribe and Coeur d'Alene Tribe must be on-site during ground disturbing construction within the Starr Road work site.

      b. A summary report of the findings of the monitoring must be submitted to the Corps within 13 months of permit issuance.

      c. If human remains or archaeological resources are encountered during construction, all ground disturbing activities shall cease in the immediate area and the permittee shall immediately (within one business day of discovery) notify the Corps, the Washington State Office of Archeological and Historic Preservation, and the cultural resource offices of the Spokane Tribe and the Coeur d'Alene Tribe. The permittee shall perform any work required by the Corps in accordance with Section 106 of the National Historic Preservation Act and Corps regulations.

      d. The permittee shall notify the Corps, the Washington State Office of Archeological and Historic Preservation, and the cultural resource offices of the Spokane Tribe and the Coeur d'Alene Tribe at least three days prior to beginning ground disturbing activities.

Nicolle Rutherford

31 Aug 2005

Nicolle Rutherford, Biologist
Environmental Resources Section
Seattle District, Corps of Engineers

Date

DECISION DOCUMENT
NATIONWIDE PERMIT 38

This document discusses the factors considered by the Corps of Engineers (Corps) during the issuance process for this Nationwide Permit (NWP). This document contains: (1) the public interest review required by Corps regulations at 33 CFR 320.4(a)(1) and (2); (2) a discussion of the environmental considerations necessary to comply with the National Environmental Policy Act; and (3) the impact analysis specified in Subparts C through F of the 404(b)(1) Guidelines (40 CFR Part 230). This evaluation of the NWP includes a discussion of compliance with applicable laws, consideration of public comments, an alternatives analysis, and a general assessment of individual and cumulative impacts, including the general potential effects on each of the public interest factors specified at 33 CFR 320.4(a).

1. CLEANUP OF HAZARDOUS AND TOXIC WASTE. Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority provided the permittee notifies the District Engineer in accordance with the "*Notification*" General Condition. For discharges in special aquatic sites, including wetlands, the *notification* must also include a delineation of affected special aquatic sites, including wetlands. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste. Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the CWA or Section 10 of the Rivers and Harbors Act. (Sections 10 and 404)

General conditions of the NWPs are in the Federal Register notice announcing the reissuance of this NWP. Notification requirements, additional conditions, limitations, and restrictions are in 33 CFR Part 330.

2. STATUTORY AUTHORITY:

(a) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)

(b) Section 404 of the Clean Water Act (33 U.S.C. 1344)

3. COMPLIANCE WITH RELATED LAWS (33 CFR 320.3):

(a) General:

NWPs are a type of general permit designed to authorize certain activities that have minimal adverse effects on the aquatic environment and generally comply with the related laws cited in 33 CFR 320.3. Activities that result in more than minimal adverse effects on the aquatic environment, individually or cumulatively, cannot be authorized by NWPs. Individual review of each activity authorized by an NWP will not normally be performed, except when preconstruction notification to the Corps is required or when an applicant requests verification that an activity complies with an NWP. Potential adverse impacts and compliance with the laws cited in 33 CFR 320.3 are controlled by the terms and conditions of each NWP, regional and case-specific conditions, and the review process that is undertaken prior to the issuance of NWPs.

The evaluation of this NWP, and related documentation, considers compliance with each of the following laws, where applicable: Sections 401, 402, and 404 of the Clean Water Act; Section 307(c) of the Coastal Zone Management Act of 1972, as amended; Section 302 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended; the National Environmental Policy Act of 1969; the Fish and Wildlife Act of 1956; the Migratory Marine Game-Fish Act; the Fish and Wildlife Coordination Act, the Federal Power Act of 1920, as amended; the National Historic Preservation Act of 1966; the Interstate Land Sales Full Disclosure Act; the Endangered Species Act; the Deepwater Port Act of 1974; the Marine Mammal Protection Act of 1972; Section 7(a) of the Wild and Scenic Rivers Act; the Ocean Thermal Energy Act of 1980; the National Fishing Enhancement Act of 1984; and the Magnuson-Stevens Fishery and Conservation and Management Act. In addition, compliance of the NWP with other Federal requirements, such as Executive Orders and Federal regulations addressing issues such as floodplains, essential fish habitat, and critical resource waters is considered.

(b) Terms and Conditions:

Many NWPs have notification requirements that trigger case-by-case review of certain activities. Two NWP general conditions require case-by-case review of all activities that may adversely affect Federally-listed endangered or threatened species or historic properties (i.e., General Conditions 11 and 12). General Condition 7 restricts the use of NWPs for activities that are located in Federally-designated wild and scenic rivers. None of the NWPs authorize artificial reefs. General Condition 15 prohibits the use of an NWP with other NWPs, except when the acreage loss of waters of the United States does not exceed the highest specified acreage limit of the NWPs used to authorize the single and complete project.

In some cases, activities authorized by an NWP may require other Federal, state, or local authorizations. Examples of such cases include, but are not limited to: activities that are in marine sanctuaries or affect marine sanctuaries or marine mammals; the ownership, construction, location, and operation of ocean thermal conversion facilities or deep water ports beyond the territorial seas; activities that result in discharges of dredged or fill material into waters of the

United States and require Section 401 water quality certification; or activities in a state operating under a coastal zone management program approved by the Secretary of Commerce under the Coastal Zone Management Act. In such cases, a provision of the NWPs states that an NWP does not obviate the need to obtain other authorizations required by law. [33 CFR 330.4(b)(2)]

Additional safeguards include provisions that allow the Chief of Engineers, division engineers, and/or district engineers to: assert discretionary authority and require an individual permit for a specific activity; modify NWPs for specific activities by adding special conditions on a case-by-case basis; add conditions on a regional or nationwide basis to certain NWPs; or take action to suspend or revoke an NWP or NWP authorization for activities within a region or state. Regional conditions are imposed to protect important regional concerns and resources. [33 CFR 330.4(e) and 330.5]

(c) Review Process:

The analyses in this document and the coordination that was undertaken prior to the issuance of the NWP fulfill the requirements of the National Environmental Policy Act (NEPA), the Fish and Wildlife Coordination Act, and other acts promulgated to protect the quality of the environment.

All NWPs that authorize activities which may result in discharges into waters of the United States require Section 401 water quality certification. NWPs that authorize activities within, or affecting land or water uses within a state that has a Federally-approved coastal zone management program, must also be certified as consistent with the state's program. The procedures to ensure that the NWPs comply with these laws are described in 33 CFR 330.4(c) and (d), respectively.

(d) Public Comment and Response:

For a summary of the public comments received in response to the August 9, 2001, Federal Register notice, refer to the preamble in the Federal Register notice announcing the reissuance of this NWP. The substantive comments received in response to the August 9, 2001, Federal Register notice were used to improve the NWP by changing NWP terms and limits, notification requirements, and/or NWP general conditions, as necessary.

4. INDIVIDUAL AND CUMULATIVE IMPACTS:

(a) General Evaluation Criteria:

This document contains a general assessment of the foreseeable effects of the individual

activities authorized by this NWP, the anticipated cumulative effects of those activities, and the potential future losses of waters of the United States that are estimated to occur until the expiration date of the NWP. In the assessment of these individual and cumulative effects, the terms and limits of the NWP, notification requirements, and the standard NWP general conditions are considered. The supplementary documentation provided by division engineers will address how regional conditions affect the individual and cumulative effects of the NWP.

The following evaluation comprises the NEPA analysis, the public interest review specified in 33 CFR 320.4(a)(1) and (2), and the impact analysis specified in Subparts C through F of the 404(b)(1) Guidelines (40 CFR Part 230).

The issuance of an NWP is based on a general assessment of the effects on public interest and environmental factors that are likely to occur as a result of using this NWP to authorize activities in waters of the United States. As such, this assessment must be speculative or predictive in general terms. Since NWPs authorize activities across the nation, projects eligible for NWP authorization may be constructed in a wide variety of environmental settings. Therefore, it is difficult to predict all of the indirect impacts that may be associated with each activity authorized by an NWP. For example, the NWP that authorizes 25 cubic yard discharges of dredged or fill material into waters of the United States may be used to fulfill a variety of project purposes. Indication that a factor is not relevant to a particular NWP does not necessarily mean that the NWP would never have an effect on that factor, but that it is a factor not readily identified with the authorized activity. Factors may be relevant, but the adverse effects on the aquatic environment are negligible, such as the impacts of a boat ramp on water level fluctuations or flood hazards. Only the reasonably foreseeable direct or indirect effects are included in the environmental assessment of this NWP. Division and district engineers will impose, as necessary, additional conditions on the NWP authorization or exercise discretionary authority to address locally important factors or to ensure that the authorized activity results in no more than minimal individual and cumulative adverse effects on the aquatic environment. In any case, adverse effects will be controlled by the terms, conditions, and additional provisions of the NWP. For example, Section 7 consultation will be required for activities that may affect endangered species.

(b) NEPA Alternatives:

This evaluation includes an analysis of alternatives based on the requirements of NEPA, which requires a more expansive review than the Clean Water Act Section 404(b)(1) Guidelines. The alternatives discussed below are based on an analysis of the potential environmental impacts and impacts to the Corps, Federal and state resource agencies, general public, and prospective permittees. Since the consideration of off-site alternatives under Section 404(b)(1) does not apply to specific projects authorized by general permits, the alternatives analysis discussed below consists of a general NEPA alternatives analysis for the NWP.

(i) No Action Alternative (no Nationwide Permit):

The no action alternative would not achieve one of the goals of the Corps Nationwide Permit program, which is to reduce the regulatory burden on applicants for activities that result in minimal adverse effects on the aquatic environment, individually or cumulatively. The no action alternative would also reduce the Corps ability to pursue the current level of review for other activities that have greater adverse effects on the aquatic environment, including activities that require individual permits as a result of the Corps exercising its discretionary authority under the NWP program. The no action alternative would also reduce the Corps ability to conduct compliance actions.

If this NWP is not available, substantial additional resources would be required for the Corps to evaluate these minor activities through the individual permit process, and for the public and Federal and state resource agencies to review and comment on the large number of public notices for these activities. In a considerable majority of cases, when the Corps publishes public notices for proposed activities that result in minimal adverse effects on the aquatic environment, the Corps typically does not receive responses to these public notices from either the public or Federal and state resource agencies. Another important benefit of the NWP program that would not be achieved through the no action alternative is the incentive for project proponents to design their projects so that those activities meet the terms and conditions of an NWP. The Corps believes the NWPs have significantly reduced adverse effects to the aquatic environment because most applicants modify their projects to comply with the NWPs and avoid the delays and costs typically associated with the individual permit process.

In the absence of this NWP, Department of the Army (DA) authorization in the form of another general permit (i.e., regional or programmatic general permits, where available) or individual permits would be required. Corps district offices may develop regional general permits if an NWP is not available, but this is an impractical and inefficient method for activities with minimal individual or cumulative adverse effects on the aquatic environment that are conducted across the Nation. Not all districts would develop these regional general permits for a variety of reasons. The regulated public, especially those companies that conduct work in more than one Corps district, would be adversely affected by the widespread use of regional general permits because of the greater potential for lack of consistency and predictability in the authorization of similar activities with minimal adverse effects on the aquatic environment. These companies would incur greater costs in their efforts to comply with different regional general permit requirements between Corps districts. Nevertheless, in some states Corps districts have issued programmatic general permits to take the place of this and other NWPs. However, this approach only works in states with regulatory programs comparable to the Corps Regulatory Program.

(ii) National Modification Alternatives:

Since the Corps Nationwide Permit program began in 1977, the Corps has continuously strived to develop NWPs that authorize activities that result only in minimal adverse effects on the aquatic environment, individually or cumulatively. Every five years the Corps reevaluates the NWPs during the reissuance process, and may modify an NWP to address concerns for the aquatic environment. Utilizing collected data and institutional knowledge concerning activities authorized by the Corps regulatory program, the Corps constantly reevaluates the potential impacts of activities authorized by NWPs. The Corps also uses substantive public comments on proposed NWPs to assess the expected impacts. This NWP was developed to authorize work in waters of the United States, including discharges of dredged or fill material, to effect the containment, stabilization, or removal of hazardous or toxic waste materials. The Corps has considered modifying or adding NWP general conditions, as discussed in the preamble of the Federal Register notice announcing the reissuance of this NWP.

(iii) Regional Modification Alternatives:

An important aspect for the NWPs is the increased emphasis on regional conditions to address differences in aquatic resource functions and values across the nation. District engineers can add regional conditions to the NWPs to enhance protection of the aquatic environment and address local concerns. Division engineers can also revoke an NWP if the use of that NWP results in more than minimal adverse effects on the aquatic environment, especially in high value or unique wetlands and other waters.

Corps divisions and districts also monitor and analyze the cumulative adverse effects of the NWPs on a watershed basis, and if warranted, further restrict or prohibit the use of the NWPs to ensure that the NWPs do not authorize activities that result in more than minimal adverse effects on the aquatic environment. To the maximum extent practicable, division and district engineers will use regulatory databases and institutional knowledge about the typical adverse effects of activities authorized by NWPs, as well as substantive public comments, to assess the individual and cumulative adverse effects on the aquatic environment resulting from regulated activities. When conducting this assessment, division and district engineers can only consider those activities regulated by the Corps under Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972. Adverse impacts resulting from activities outside of the Corps scope of analysis, such as the construction or expansion of upland developments, cannot be considered in the Corps analysis of cumulative adverse effects on the aquatic environment.

(iv) Case-specific On-site Alternatives:

Although the terms and conditions for this NWP have been established at the national level to

authorize most activities that have minimal adverse effects on the aquatic environment, division and district engineers have the authority to impose case-specific special conditions on an NWP authorization to ensure that the authorized work will result in minimal adverse effects.

General Condition 19 requires the permittee to minimize and avoid impacts to waters of the United States on-site to the maximum extent practicable. Off-site alternatives cannot be considered for activities authorized by NWPs. During the evaluation of a preconstruction notification, the District Engineer may determine that additional avoidance and minimization is practicable. The District Engineer may also condition the NWP authorization to require compensatory mitigation to offset losses of waters of the United States and ensure that the net adverse effects on the aquatic environment are minimal. As another example, the NWP authorization can be conditioned to prohibit the permittee from conducting the work during specific times of the year to protect spawning fish and shellfish. If the proposed work will result in more than minimal adverse effects on the aquatic environment, then the District Engineer will exercise discretionary authority and require an individual permit. Discretionary authority can be asserted where there are concerns for the aquatic environment, including high value aquatic habitats. The individual permit review process requires a project-specific alternatives analysis, including the consideration of off-site alternatives, and a public interest review.

(c) Impact Analysis

(i) General:

This NWP authorizes activities in waters of the United States, including discharges of dredged or fill material, for cleanups of hazardous and toxic wastes that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. There is no acreage limit for this NWP.

Notification is required for all activities authorized by this NWP. The notification requirement allows district engineers to review proposed activities on a case-by-case basis to ensure that the adverse effects of those activities on the aquatic environment are minimal. If the District Engineer determines that the adverse effects of a particular project are more than minimal after considering mitigation, then discretionary authority will be asserted and the applicant will be notified that another form of DA authorization, such as a regional general permit or individual permit, is required (see 33 CFR 330.4(e) and 330.5).

Additional conditions can be placed on proposed activities on a regional or case-by-case basis to ensure that the work has minimal adverse effects on the aquatic environment. Regional conditioning of this NWP will be used to account for differences in aquatic resource functions and values across the country, ensure that the NWP authorizes only those activities with minimal individual or cumulative adverse effects on the aquatic environment, and allow each Corps

district to prioritize its workload based on where its efforts will best serve to protect the aquatic environment. Regional conditions can prohibit the use of an NWP in certain waters (e.g., high value waters or specific types of wetlands or waters). Specific NWPs can also be revoked on a geographic or watershed
basis where the adverse effects resulting from the use of those NWPs are more than minimal.

In high value waters, division and district engineers can: 1) prohibit the use of the NWP in those waters and require an individual permit or regional general permit; 2) impose an acreage limit on the NWP; 3) add regional conditions to the NWP to ensure that the adverse environmental effects are minimal; or 4) for those activities that require notification, add special conditions to NWP authorizations, such as compensatory mitigation requirements, to ensure that the adverse effects on the aquatic environment are minimal. NWPs can authorize activities in high value waters as long as the individual and cumulative adverse effects on the aquatic environment are minimal.

The construction and use of fills for temporary access for construction may be authorized by NWP 33 or regional general permits issued by division or district engineers. The related work must meet the terms and conditions of the specified permit(s). If the activity is dependent on portions of a larger project that require an individual permit, this NWP will not apply. [See 33 CFR 330.6(c) and (d)]

(ii) Public interest review factors (33 CFR 320.4(a)(1)):

For each of the 20 public interest review factors, the extent of the Corps consideration of expected impacts resulting from the use of this NWP is discussed, as well as the reasonably foreseeable cumulative adverse effects that are expected to occur. The Corps decision process involves consideration of the benefits and detriments that may result from the activities authorized by this NWP.

(a) Conservation: The activities authorized by this NWP may modify the natural resource characteristics of the project area. Compensatory mitigation, if required for activities authorized by this NWP, will result in the restoration, enhancement, creation, or preservation of aquatic habitats that will offset losses of conservation values. The adverse effects of activities authorized by this NWP on conservation will be minor, since the NWP authorizes only those activities with minimal adverse effects on the aquatic environment and the Corps scope of analysis is usually limited to impacts to aquatic resources. The cleanup of hazardous and toxic waste will generally improve the natural resource characteristics of the project area and areas in the vicinity of the work.

(b) Economics: The cleanup of hazardous and toxic waste will have positive impacts on local economies. During construction, these activities will generate jobs and revenue for local

contractors as well as revenue to building supply companies that sell construction materials. The activities authorized by this NWP will improve environmental conditions by removing or containing hazardous and toxic wastes, thereby making areas in the vicinity of the cleanup project safer for living and working. Improving environmental conditions will enhance the local economic base, which is affected by employment, tax revenues, community services, and property values.

(c) Aesthetics: Hazardous and toxic waste cleanup activities will alter the visual character of some waters of the United States. The extent and perception of these changes will vary, depending on the size and configuration of the cleanup activity, the nature of the surrounding area, and the public uses of the area. Activities authorized by this NWP can also modify other aesthetic characteristics, such as air quality and the amount of noise. The increased human use of the project area and surrounding land will also alter local aesthetic values. Hazardous and toxic waste cleanup activities will generally improve the aesthetic characteristics of the project area and surrounding land, especially after construction.

(d) General environmental concerns: Activities authorized by this NWP will affect general environmental concerns, such as water, air, noise, and land pollution. The authorized work will also affect the physical, chemical, and biological characteristics of the environment. The adverse effects of the activities authorized by this NWP on general environmental concerns will be minor, since the NWP authorizes only those activities with minimal adverse effects on the aquatic environment. Adverse effects to the chemical composition of the aquatic environment will be controlled by General Condition 18, which states that the material used for construction must be free from toxic pollutants in toxic amounts. General Condition 19 requires mitigation to minimize adverse effects to the aquatic environment through on-site avoidance and minimization. Compensatory mitigation may be required by district engineers to ensure that the net adverse effects on the aquatic environment are minimal. It is important to note that the Corps scope of analysis is usually limited to impacts to aquatic resources. Specific environmental concerns are addressed in other sections of this document.

(e) Wetlands: Work in waters of the United States for hazardous and toxic waste cleanup activities may result in the destruction of wetlands. In some cases, the affected wetlands will be permanently filled, especially where berms and other permanent fills are located, resulting in the permanent loss of aquatic resource functions and values. In other cases, some wetlands may be temporarily filled or excavated during construction, and restored after the cleanup activity has been completed. Wetlands may also be converted to other uses and habitat types. Some wetlands may be temporarily impacted by the work through the use of temporary staging areas and access roads. These wetlands will be restored, unless the District Engineer authorizes another use for the area, but the plant community may be different, especially if the site was originally forested. Compensatory mitigation may be required by district engineers to offset the loss of wetlands and ensure that the adverse effects to the aquatic environment are minimal.

Wetlands provide habitat, including foraging, nesting, spawning, rearing, and resting sites for aquatic and terrestrial species. The destruction of wetlands may alter natural drainage patterns. Wetlands reduce erosion by stabilizing the substrate. Wetlands also act as storage areas for stormwater and flood waters. Wetlands may act as groundwater discharge or recharge areas. The loss of wetland vegetation will adversely affect water quality because these plants trap sediments, pollutants, and nutrients and transform chemical compounds. Wetland vegetation also provides habitat for microorganisms that remove nutrients and pollutants from water. Wetlands, through the accumulation of organic matter, act as sinks for some nutrients and other chemical compounds, reducing the amounts of these substances in the water.

General Condition 19 requires on-site avoidance and minimization of impacts to waters of the United States, including wetlands. Compensatory mitigation may be required by district engineers to ensure that the net adverse effects on the aquatic environment are minimal. General Condition 25 requires notification to the District Engineer for activities in critical resource waters and adjacent wetlands, which may include high value wetlands. Division engineers can regionally condition this NWP to restrict or prohibit the use of this NWP in high value wetlands. District engineers will also exercise discretionary authority to require an individual permit if the wetlands to be filled are high value and the work will result in more than minimal adverse effects on the aquatic environment. District engineers can also add case-specific special conditions to the NWP authorization to provide protection to wetlands or require compensatory mitigation to offset losses of wetlands.

(f) Historic properties: General Condition 12 states that the NWPs cannot authorize activities that affect historic properties listed, or eligible for listing in, the National Register of Historic Places, until the District Engineer has complied with 33 CFR Part 325, Appendix C. The provisions of Appendix C ensure that activities authorized by NWPs comply with the National Historic Preservation Act.

(g) Fish and wildlife values: This NWP authorizes activities in waters of the United States, including open waters and wetlands, which provide habitat to many species of fish and wildlife. Activities authorized by this NWP may alter the habitat characteristics of open waters and wetlands, decreasing the quantity and quality of fish and wildlife habitat. Wetland and riparian vegetation provides food and habitat for many species, including foraging areas, resting areas, corridors for wildlife movement, and nesting and breeding grounds. Open waters provide habitat for fish and other aquatic organisms. Woody riparian vegetation shades streams, which reduces water temperature fluctuations and provides habitat for fish and other aquatic animals. Riparian vegetation provides organic matter that is consumed by fish and aquatic invertebrates. Woody riparian vegetation creates habitat diversity in streams when trees and large shrubs fall into the channel, forming snags that provide habitat and shade for fish. The morphology of a stream channel may be altered by activities authorized by this NWP, which can affect fish

populations. Notification is required for all activities authorized by this NWP, which provides the District Engineer with an opportunity to review the proposed work and assess potential impacts on fish and wildlife values and ensure that the authorized activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation may be required by district engineers to restore, enhance, create, and/or preserve wetlands and other aquatic habitats to offset losses of waters of the United States. Vegetated buffers next to open and flowing waters may also be required as compensatory mitigation. These methods of compensatory mitigation will provide fish and wildlife habitat values.

General Condition 4 will reduce the adverse effects to fish and other aquatic species by prohibiting activities that substantially disrupt the necessary life cycle movements of indigenous aquatic species, unless the primary purpose of the activity is to impound water. Compliance with General Conditions 17 and 20 will ensure that the authorized work has minimal adverse effects on shellfish beds and spawning areas, respectively. The authorized work cannot have more than minimal adverse effects on breeding areas for migratory waterfowl, due to the requirements of General Condition 23.

Pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery and Conservation Management Act, the Corps entered into programmatic Essential Fish Habitat consultation with the NMFS. As discussed elsewhere in this document (i.e., Section 4(c)(ii)(g), Section 4(c)(iii)(h), and Section 4(c)(iii)(l)), the NWPs contain provisions that will ensure that impacts to Essential Fish Habitat are minimal, individually or cumulatively. Division and district engineers can impose regional and special conditions to ensure that activities authorized by this NWP will result in minimal adverse effects on Essential Fish Habitat.

(h) Flood hazards: The activities authorized by this NWP may affect the flood-holding capacity of 100-year floodplains, including surface water flow velocities. Changes in the flood-holding capacity of 100-year floodplains may impact human health, safety, and welfare. Compliance with General Condition 21 will reduce flood hazards. This general condition requires the permittee to maintain preconstruction surface flow rates from the site and avoid relocating or redirecting water to the maximum extent practicable. It is important to note that much of the land area within 100-year floodplains is upland, and outside of the Corps scope of review.

(i) Floodplain values: Activities authorized by this NWP may affect the flood-holding capacity of floodplains, as well as other floodplain values. The fish and wildlife habitat values of floodplains will be adversely affected by activities authorized by this NWP, by modifying or eliminating areas used for nesting, foraging, resting, and reproduction. The water quality functions of floodplains may also be adversely affected by these activities. Modification of the floodplain may also adversely affect other hydrological processes, such as groundwater recharge. District engineers will review each pre-construction notification to ensure that those activities result in minimal adverse effects on the aquatic environment.

In many cases, compensatory mitigation will be required for activities authorized by this NWP, which will offset losses of waters of the United States and provide water quality functions and wildlife habitat. General Condition 19 requires on-site avoidance and minimization of impacts to waters of the United States to the maximum extent practicable, which will reduce losses of floodplain values. The mitigation requirements of General Condition 19 will help ensure that the adverse effects of these activities on floodplain values are minimal. Compliance with General Condition 21 will ensure that activities in 100-year floodplains will not cause more than minimal adverse effects on flood storage and conveyance.

(j) Land use: Activities authorized by this NWP may result in changes in land use. After the hazardous and toxic waste cleanup activity, the land may be used for different purposes, or restored to provide fish and wildlife habitat. The general public will benefit from the cleanup activities authorized by this permit. Changes in land use after the hazardous and toxic waste cleanup activity will, in many cases, provide economic benefits for the surrounding community. Since the primary responsibility for land use decisions is held by state, local, and Tribal governments, the Corps scope of analysis is limited to significant issues of overriding national importance, such as navigation and water quality (see 33 CFR 320.4(j)(2)).

(k) Navigation: Activities authorized by this NWP must comply with General Condition 1, which states that no activity may cause more than minimal adverse effects on navigation. This NWP requires notification for all activities, which will allow district engineers to review the proposed work and determine if there will be any adverse effects on navigation.

(l) Shore erosion and accretion: The activities authorized by this NWP will have minor adverse effects on shore erosion and accretion processes. Activities authorized by this NWP may occur in coastal areas. All activities authorized by this NWP require notification to the District Engineer, to allow case-by-case review and ensure that the work results in minimal adverse effects on the aquatic environment, including shore erosion and accretion processes.

(m) Recreation: Activities authorized by this NWP may change the recreational uses of the area. Certain recreational activities, such as bird watching, hunting, and fishing may become available in the area after the hazardous and toxic wastes are removed. Other recreational facilities, such as playgrounds, playing fields, and golf courses, may be constructed in the project area after the cleanup activity has occurred, thereby providing new recreational activities in the area. Some hazardous and toxic waste cleanup activities may eliminate current recreational uses of the area.

(n) Water supply and conservation: Activities authorized by this NWP may affect both surface water and groundwater supplies. During construction, there may be adverse effects to water supplies, but after the hazardous and toxic waste cleanup activity is completed, there are likely

to be net improvements to surface and groundwater supplies. Activities authorized by this NWP can also affect the quality of water supplies by adding pollutants and toxic chemicals to surface waters and groundwater, but many causes of water pollution, such as discharges regulated under Section 402 of the Clean Water Act, are outside the Corps scope of analysis. The quantity and quality of local water supplies may be enhanced through the construction of water treatment facilities associated with hazardous and toxic waste cleanup activities. Division and district engineers can prohibit the use of this NWP in watersheds for public water supplies, if it is in the public interest to do so. General Condition 16 prohibits discharges in the vicinity of public water supply intakes. Compensatory mitigation may be required for activities authorized by this NWP, which will help improve the quality of surface waters.

(o) Water quality: Hazardous and toxic waste cleanup activities in wetlands and open waters may have adverse effects on water quality. These activities can result in increases in nutrients, sediments, and pollutants in the water during construction, but water quality should be improved after the cleanup activity has been completed. The loss of wetland and riparian vegetation will adversely affect water quality because these plants trap sediments, pollutants, and nutrients and transform chemical compounds. Wetland and riparian vegetation also provides habitat for microorganisms that remove nutrients and pollutants from water. Wetlands, through the accumulation of organic matter, act as sinks for some nutrients and other chemical compounds, reducing the amounts of these substances in the water column. Wetlands and riparian areas also decrease the velocity of flood waters, removing suspended sediments from the water column and reducing turbidity. Riparian vegetation also serves an important role in the water quality of streams by shading the water from the intense heat of the sun. Compensatory mitigation may be required for activities authorized by this NWP, to ensure that the work does not have more than minimal adverse effects on the aquatic environment, including water quality. Wetlands and riparian areas restored, created, enhanced, or preserved as compensatory mitigation may provide local water quality benefits.

During hazardous and toxic waste cleanup activities, small amounts of oil and grease from construction equipment may be discharged into the waterway. Because most construction will occur during a relatively short period of time, the frequency and concentration of these discharges are not expected to have more than minimal adverse effects on overall water quality.

This NWP requires a Section 401 water quality certification, since it authorizes discharges of dredged or fill material into waters of the United States. Most water quality concerns are addressed by the state or Tribal Section 401 agency.

(p) Energy needs: The activities authorized by this NWP may increase energy consumption in the area, such as electricity, natural gas, and petroleum products, especially during construction. Increases in energy needs in the vicinity of the proposed work will be temporary and negligible.

(q) Safety: The activities authorized by this NWP will be subject to Federal, state, and local safety laws and regulations. Therefore, this NWP will not adversely affect the safety of the project area.

(r) Food and fiber production: Activities authorized by this NWP may affect food and fiber production, especially where hazardous and toxic waste cleanup activities are conducted near farmland. The removal of hazardous and toxic wastes near sites of food and fiber production will help ensure safe food products. The activities authorized by this NWP may bring new areas into production. In addition, food processing plants may be constructed on the project site, after the hazardous and toxic waste cleanup activity has been completed.

(s) Mineral needs: Activities authorized by this NWP may increase demand for aggregates and stone, which may be used during hazardous and toxic waste cleanup activities. Activities authorized by this NWP may increase the demand for other building materials, such as steel, aluminum, and copper, which are made from mineral ores.

(t) Considerations of property ownership: The NWP complies with 33 CFR 320.4(g), which states that an inherent aspect of property ownership is a right to reasonable private use. The NWP provides expedited DA authorization for work in waters of the United States, including discharges of dredged or fill material, for hazardous and toxic waste cleanup activities, provided the work complies with the terms and conditions of the NWP and results in minimal adverse effects on the aquatic environment.

(iii) 404(b)(1) Guidelines Impact Analysis (Subparts C through F):

(a) Substrate: Discharges of dredged or fill material into waters of the United States will alter the substrate of those waters, usually replacing the aquatic area with dry land, and changing the physical, chemical, and biological characteristics of the substrate. The original substrate will be removed or covered by other material, such as concrete, soil, gravel, etc. Temporary fills may be placed upon the substrate, but must be removed upon completion of the work (see General Condition 24). Higher rates of erosion may result during construction, but General Condition 3 requires the use of appropriate measures to control soil erosion and sediment.

(b) Suspended particulates/turbidity: Depending on the method of construction, soil erosion and sediment control measures, equipment, composition of the bottom substrate, and wind and current conditions during construction, fill material placed in open waters will temporarily increase water turbidity. Notification is required for all activities authorized by this NWP, which will allow the District Engineer to review each activity to ensure that adverse effects on the aquatic environment are minimal. Particulates will be resuspended in the water column during removal of temporary fills. The turbidity plume will normally be limited to the immediate vicinity of the disturbance and should dissipate shortly after each phase of the construction activity.

General Condition 3 requires the permittee to stabilize exposed soils and other fills, which will reduce turbidity. In many localities, project proponents are required to develop and implement sediment and erosion control plans to minimize the entry of soil into the aquatic environment. NWP activities
cannot create turbidity plumes that smother important spawning areas downstream (see General Condition 20).

(c) Water: Hazardous and toxic waste cleanup activities can affect some characteristics of water, such as water clarity, chemical content, dissolved gas concentrations, pH, and temperature. The activities authorized by this NWP can change the chemical and physical characteristics of the waterbody by introducing suspended or dissolved chemical compounds or sediments into the water. Changes in water quality can affect the species and quantities of organisms inhabiting the aquatic area. Water quality certification is required for activities authorized by this NWP, which will ensure that the work does not violate applicable water quality standards. After construction, these activities will result in net improvement of the aquatic environment, by removing or containing hazardous and toxic wastes.

(d) Current patterns and water circulation: Activities authorized by this NWP may adversely affect the movement of water in the aquatic environment. All activities authorized by this NWP require notification to the District Engineer, to ensure that adverse effects to current patterns and water circulation are minimal. Temporary construction, dewatering, and access activities may alter water flow patterns and circulation, but the affected areas will usually be restored after the hazardous and toxic waste cleanup activity is completed. General Condition 21 requires the authorized activity to be designed to withstand expected high flows and maintain preconstruction surface flow rates from the site to the maximum extent practicable.

(e) Normal water level fluctuations: The activities authorized by this NWP will have minor adverse effects on normal patterns of water level fluctuations due to tides and flooding. General Condition 21 requires the permittee to maintain preconstruction surface flow rates from the site to the maximum extent practicable.

(f) Salinity gradients: The activities authorized by this NWP will have minor adverse effects on salinity gradients. Salinity gradients may be temporarily affected during construction, but there will be negligible permanent changes to salinity gradients after the cleanup activity has been completed.

(g) Threatened and endangered species: The Corps believes that the procedures currently in place result in proper coordination under Section 7 of the Endangered Species Act (ESA) and ensure that activities authorized by this NWP will not jeopardize the continued existence or any listed threatened and endangered species or result in the destruction or adverse modification of critical habitat. The Corps also believes that current local procedures in Corps districts are

effective in ensuring compliance with ESA.

Each activity authorized by an NWP is subject to General Condition 11, which states that "no activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to modify the critical habitat of such species." In addition, General Condition 11 explicitly states that the NWP does not authorize the taking of threatened or endangered species, which will ensure that permittees do not mistake the NWP authorization as a Federal authorization to take threatened or endangered species. General Condition 11 also requires the applicant to notify the District Engineer if there are endangered or threatened species in the vicinity of the project.

Under the current Corps regulations (33 CFR 325.2(b)(5)), the District Engineer must review all permit applications for potential impacts on threatened and endangered species or critical habitat. For the NWP program, this review occurs when the District Engineer evaluates the preconstruction notification or request for verification. Based on the evaluation of all available information, the District Engineer will initiate consultation with the U.S. Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS), as appropriate, if he or she determines that the regulated activity may affect any threatened and endangered species or critical habitat. Consultation may occur during the NWP authorization process or the district engineer may exercise discretionary authority to require an individual permit for the proposed activity and initiate consultation through the individual permit process. If ESA consultation is conducted during the NWP authorization process without the District Engineer exercising discretionary authority, then the applicant will be notified that he or she cannot proceed with the proposed activity until ESA consultation is complete. If the District Engineer determines that the activity will have no effect on any threatened and endangered species or critical habitat, then the District Engineer will notify the applicant that he or she may proceed under the NWP authorization.

Corps districts have, in most cases, established informal or formal procedures with local offices of the FWS and NMFS, through which the agencies share information regarding threatened and endangered species and their critical habitat. This information helps district engineers determine if a proposed activity will affect endangered species or their critical habitat and, if necessary, initiate consultation. Corps districts may utilize maps or databases that identify locations of populations of threatened and endangered species and their critical habitat. Regional conditions are added to NWPs, where necessary, to require notification for activities that occur in known locations of threatened and endangered species or critical habitat. For activities that require agency coordination during the notification process, the FWS and NMFS will review the proposed work for potential impacts to threatened and endangered species and their critical habitat. Any information provided by local maps and databases and any comments received during the notification process will be used by the district engineer to make a "may affect" or "not likely to adversely affect" decision.

Based on the safeguards discussed above, especially General Condition 11, the Corps has determined that the activities authorized by this NWP will not jeopardize the continued existence of any listed threatened or endangered species or result in the destruction or adverse modification of designated critical habitat. Although the Corps continues to believe that these procedures ensure compliance with ESA, the Corps has taken some steps to provide further assurance. Corps district offices have met with local representatives of the FWS and NMFS to establish or modify existing procedures, where necessary, to ensure that the Corps has the latest information regarding the existence and location of any threatened or endangered species or their critical habitat. Corps districts can also establish, through local procedures or other means, additional safeguards that ensure compliance with ESA. Through formal consultation under Section 7 of the Endangered Species Act, or through other coordination with the FWS and/or the NMFS, as appropriate, the Corps will establish procedures to ensure that the NWP will not jeopardize any threatened and endangered species or result in the destruction or adverse modification of designated critical habitat. Such procedures will be included as regional conditions to the NWPs or as special conditions of an NWP authorization, if necessary.

(h) Fish, crustaceans, molluscs, and other aquatic organisms in the food web:

All activities authorized by this NWP require notification to the District Engineer, which will allow review of each activity to ensure that adverse effects to fish and other aquatic organisms in the food web are minimal. Fish and other motile animals will avoid the project site during construction. Sessile or slow-moving animals in the path of discharges, equipment, and building materials will be destroyed. Some aquatic animals may be smothered by the placement of fill material. Motile animals will return to those areas that are temporarily impacted by the work and restored or allowed to revert back to preconstruction conditions. Aquatic animals will not return to sites of permanent fills. Benthic and sessile animals are expected to recolonize sites temporarily impacted by the work, after those areas are restored. Activities that alter the riparian zone, especially floodplains, may adversely affect populations of fish and other aquatic animals, by altering stream flow, flooding patterns, and surface and groundwater hydrology. Some species of fish spawn on floodplains, which could be prevented if the activity involves clearing or filling the floodplain. Hazardous and toxic waste cleanup activities in the vicinity of streams may alter habitat features by increasing surface water flow velocities, which can increase erosion and reduce the amount of habitat for aquatic organisms and destroy spawning areas. Cleanup activities in the vicinity of streams can also cause more unstable flow regimes, such as higher peak flows, more frequent dry periods, and more frequent flooding, which may decrease the amount of habitat for aquatic animals. Hazardous and toxic waste cleanup activities will usually improve habitat for fish, shellfish, and other aquatic organisms by removing poisonous and toxic chemicals.

Division and district engineers can place conditions on this NWP to prohibit discharges during

important stages of the life cycles of certain aquatic organisms. Such time of year restrictions can prevent adverse effects to these aquatic organisms during reproduction and development periods. General Conditions 17 and 20 address protection of shellfish beds and spawning areas, respectively. General Condition 17 prohibits activities in areas of concentrated shellfish populations. General Condition 20 states that activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. In addition, General Condition 20 also prohibits activities that result in the physical destruction of important spawning areas. General Condition 21 requires the maintenance of preconstruction downstream flow conditions to the maximum extent practicable, which will help minimize adverse impacts to fish, shellfish, and other aquatic organisms in the food web.

(i) Other wildlife: Activities authorized by this NWP will result in adverse effects on other wildlife associated with aquatic ecosystems, such as resident and transient mammals, birds, reptiles, and amphibians, through the destruction of aquatic habitat, including breeding and nesting areas, escape cover, travel corridors, and preferred food sources. This NWP does not authorize activities that jeopardize the continued existence of Federally-listed endangered and threatened species or result in the destruction or adverse modification of critical habitat. Compensatory mitigation, including the establishment and maintenance of vegetated buffers next to open waters, may be required for activities authorized by this NWP, which will help offset losses of aquatic habitat for wildlife. General Condition 23 states that activities in breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

(j) Special aquatic sites: The potential impacts to specific special aquatic sites are discussed below:

(1) Sanctuaries and refuges: The activities authorized by this NWP will have minimal adverse effects on waters of the United States within sanctuaries or refuges designated by Federal or state laws or local ordinances. Division engineers can regionally condition the NWP to restrict or prohibit its use in sanctuaries and refuges. District engineers will also exercise discretionary authority and require individual permits for specific projects in waters of the United States in sanctuaries and refuges if those activities will result in more than minimal adverse effects on the aquatic environment.

(2) Wetlands: The activities authorized by this NWP will have minimal adverse effects on wetlands. District engineers will review preconstruction notifications to ensure that the adverse effects on the aquatic environment are minimal. Division engineers can regionally condition this NWP to restrict or prohibit its use in certain high value wetlands. See paragraph (e) in Section 4(c)(ii), above, for a more detailed discussion of impacts to wetlands.

(3) Mud flats: The activities authorized by this NWP will have minimal adverse effects

on mud flats. Division engineers can regionally condition the NWP to restrict or prohibit its use in mud flats. District engineers will review pre-construction notifications and may add special conditions to the NWP to ensure that the adverse effects on the aquatic environment are minimal.

(4) Vegetated shallows: The activities authorized by this NWP will have minimal adverse effects on vegetated shallows. Division engineers can regionally condition the NWP to restrict or prohibit its use in vegetated shallows. District engineers will review pre-construction notifications and may add special conditions to the NWP to ensure that the adverse effects on the aquatic environment are minimal. If the vegetated shallows are high value and the proposed work will result in more than minimal adverse effects on the aquatic environment, the District Engineer will exercise discretionary authority to require the project proponent to obtain an individual permit.

(5) Coral reefs: The activities authorized by this NWP will have minimal adverse effects on coral reefs. Division engineers can regionally condition the NWP to restrict or prohibit its use in coral reefs. District engineers will review pre-construction notifications and may add special conditions to the NWP to ensure that the adverse effects on the aquatic environment are minimal.

(6) Riffle and pool complexes: Activities in riffle and pool complexes may be authorized by this NWP, but district engineers will review all proposed activities to determine if those activities will result in minimal adverse effects on the aquatic environment. If the riffle and pool complexes are high value and the proposed work will result in more than minimal adverse effects on the aquatic environment, the District Engineer will exercise discretionary authority to require the project proponent to obtain an individual permit.

(k) Municipal and private water supplies: See paragraph (n) in Section 4(c)(ii), above, for a discussion of potential impacts to water supplies.

(l) Recreational and commercial fisheries, including Essential Fish Habitat: The activities authorized by this NWP may adversely affect waters of the United States that act as habitat for populations of economically important fish and shellfish species. Division and district engineers can condition this NWP to prohibit discharges during important life cycle stages, such as spawning or development periods, of economically valuable fish and shellfish. All activities authorized by this NWP require notification to the District Engineer, which will allow review of each activity to ensure that adverse effects to economically important fish and shellfish are minimal. Compliance with General Conditions 17 and 20 will ensure that the authorized work does not adversely affect concentrated shellfish populations or important spawning areas.

Pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery and Conservation

Management Act, the Corps entered into programmatic Essential Fish Habitat consultation with the NMFS. As discussed elsewhere in this document (i.e., Section 4(c)(ii)(g), Section 4(c)(iii)(h), and Section 4(c)(iii)(l)), the NWPs contain provisions that will ensure that impacts to Essential Fish Habitat are minimal, individually or cumulatively. Division and district engineers can impose regional and special conditions to ensure that activities authorized by this NWP will result in minimal adverse effects on Essential Fish Habitat.

(m) Water-related recreation: See paragraph (m) in Section 4(c)(ii) above.

(n) Aesthetics: See paragraph (c) in Section 4(c)(ii), above.

(o) Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar areas: General Condition 25 requires notification to the District Engineer for proposed activities in designated critical resource waters and adjacent wetlands, which may be located in parks, national and historical monuments, national seashores, wilderness areas, and research sites. This NWP can be used to authorize activities in parks, national and historical monuments, national seashores, wilderness areas, and research sites if the manager or caretaker wants to conduct work in waters of the United States and those activities result in minimal adverse effects on the aquatic environment. Division engineers can regionally condition the NWP to prohibit its use in designated areas, such as national wildlife refuges or wilderness areas.

(iv) Cumulative Impacts:

The cumulative impacts of an NWP generally do not depend on the number of times the permit is used on a national basis but on the number of times the NWP and other DA permits are used within a specific geographic area, particularly a watershed. In a specific watershed, division or district engineers may determine that the cumulative adverse effects of activities authorized by NWPs are more than minimal. Division and district engineers will monitor and review geographic areas that may be subject to more than minimal cumulative adverse effects. Division and district engineers have the authority to require individual permits where the cumulative adverse effects are more than minimal, or add conditions to the NWP either on a case-by-case or regional basis to ensure that the cumulative adverse effects are minimal. When division or district engineers determine that a geographic area is subject to more than minimal cumulative adverse effects due to the use of the NWPs, they will use the revocation and modification procedure at 33 CFR 330.5. In reaching the final decision, they will compile information on the cumulative adverse effects and supplement this document.

Based on the reported use of this NWP in calendar year 2000, the Corps estimates that this NWP will be used approximately 70 times per year, resulting in impacts to approximately 55 acres of waters of the United States, with approximately 40 acres of compensatory mitigation

required to offset those impacts. The demand for these types of activities could increase or decrease over the five-year duration of this NWP. Using the current trend, approximately 350 activities could be authorized over a five year period until this NWP expires, resulting in impacts to approximately 275 acres of waters of the United States. Approximately 200 acres of compensatory mitigation would be required to offset those impacts to waters of the United States. The Corps expects that the convenience and time savings associated with the use of this NWP will encourage applicants to design their projects within the scope of the NWP rather than request individual permits for projects which could result in greater adverse impacts to the aquatic environment.

(d) Additional Public Interest Review Factors (33 CFR 320.4(a)(2)):

(i) Relative extent of the public and private need for the proposed structure or work:

This NWP authorizes work in waters of the United States, including discharges of dredged or fill material, for hazardous and toxic waste cleanup activities that have minimal adverse effects on the aquatic environment, individually and cumulatively. These activities satisfy public and private needs by removing and containing hazardous and toxic wastes. The need for this NWP is based upon the large number of these activities that occur annually with minimal adverse effects on the aquatic environment.

(ii) Where there are unresolved conflicts as to resource use, the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work:

Most situations in which there are unresolved conflicts concerning resource use arise when environmentally sensitive areas are involved (e.g., special aquatic sites, including wetlands) or where there are competing uses of a resource. The nature and scope of the activity, when planned and constructed in accordance with the terms and conditions of this NWP, reduce the likelihood of such conflict. In the event that there is a conflict, the NWP contains provisions that are capable of resolving the matter (see Sections 1 and 3 of this document).

General Condition 19 requires permittees to avoid and minimize impacts to waters of the United States to the maximum extent practicable on the project site. Consideration of off-site alternative locations is not required for activities that are authorized by general permits. General permits authorize activities that have minimal individual and cumulative adverse effects on the aquatic environment and overall public interest. District engineers will exercise discretionary authority and require an individual permit if the proposed work will result in more than minimal adverse environmental effects on the project site. The consideration of off-site alternatives can be required during the individual permit process.

(iii) The extent and permanence of the beneficial and/or detrimental effects which the proposed structure or work is likely to have on the public and private uses to which the area is suited:

The nature and scope of the work authorized by the NWP will most likely restrict the extent of the beneficial and detrimental effects to the area immediately surrounding the hazardous and toxic waste cleanup activities. Activities authorized by this NWP will have minimal adverse effects on the aquatic environment. A provision of the NWPs requires that the activity, including all attendant features, both temporary and permanent, is part of a single and complete project.

As previously stated, the terms, conditions, and provisions of the NWP were developed to ensure that individual and cumulative adverse environmental effects are minimal. Specifically, NWPs do not obviate the need for the permittee to obtain other Federal, state, or local authorizations required by law. The NWPs do not grant any property rights or exclusive privileges (see 33 CFR 330.4(b) for further information). Additional conditions, limitations, restrictions, and provisions for discretionary authority, as well as the ability to add activity-specific or regional conditions to this NWP, will provide further safeguards to the aquatic environment and the overall public interest. There are also provisions to allow suspension, modification, or revocation of the NWP. Refer to Sections 1 and 3 of this document for further information and procedures.

5. EVALUATION OF COMPLIANCE WITH THE GUIDELINES PROMULGATED UNDER SECTION 404(b)(1) OF THE CLEAN WATER ACT (40 CFR Part 230):

The 404(b)(1) compliance criteria for general permits are contained in 40 CFR 230.7.

(a) Evaluation Process (40 CFR 230.7(b)(1)):

(i) Alternatives (40 CFR 230.10(a)):

General Condition 19 requires permittees to avoid and minimize discharges of dredged or fill material into waters of the United States to the maximum extent practicable on the project site. The consideration of off-site alternatives is not directly applicable to general permits.

(ii) Prohibitions (40 CFR 230.10(b)):

This NWP authorizes discharges of dredged or fill material into waters of the United States, which require Section 401 water quality certification. Water quality certification requirements will be met in accordance with the procedures in 33 CFR 330.4(c).

No toxic discharges will be authorized by this NWP. General Condition 18 specifically states that the material must be free from toxic pollutants in toxic amounts.

This NWP does not authorize activities that jeopardize the continued existence of any listed threatened or endangered species or result in the destruction or adverse modification of critical habitat. Reviews of preconstruction notifications, regional conditions, and local operating procedures for endangered species will ensure compliance with the Endangered Species Act. Refer to General Condition 11 and to 33 CFR 330.4(f) for information and procedures.

This NWP will not authorize the violation of any requirement to protect any marine sanctuary. Refer to Section 3 of this document for further information.

(iii) Findings of Significant Degradation (40 CFR 230.10(c)):

Potential impact analysis (Subparts C through F):

The potential impact analysis specified in Subparts C through F is discussed in Section 4 of this document. Mitigation required by the District Engineer will ensure that the adverse effects on the aquatic environment are minimal.

Evaluation and testing (Subpart G):

Because the terms and conditions of the NWP specify the types of discharges that are authorized, as well as those that are prohibited, individual evaluation and testing for the presence of contaminants will normally not be required. If a situation warrants, provisions of the NWP allow division or district engineers to further specify authorized or prohibited discharges and/or require testing.

Based upon Subparts B and G, after consideration of Subparts C through F, the discharges authorized by this NWP will not cause or contribute to significant degradation of waters of the United States.

(iv) Factual determinations (40 CFR 230.11):

The factual determinations required in 40 CFR 230.11 are discussed in Section 4 of this document.

(v) Appropriate and practicable steps to minimize potential adverse impacts (40 CFR 230.10(d)):

As demonstrated by the information in this document, as well as the terms, conditions, and provisions of this NWP, actions to minimize adverse effects (Subpart H) have been thoroughly considered and incorporated into the NWP. General Condition 19 requires permittees to avoid

and minimize discharges of dredged or fill material into waters of the United States to the maximum extent practicable on the project site. Compensatory mitigation required by the District Engineer will ensure that the net adverse effects on the aquatic environment are minimal.

(b) Evaluation Process (40 CFR 230.7(b)(2)):

(i) Description of permitted activities:

As indicated by the text of this NWP in Section 1 of this document and the discussion of potential impacts in Section 4, the activities authorized by this NWP are sufficiently similar in nature and environmental impact to warrant authorization under a single general permit. Specifically, the purpose of the NWP is to authorize discharges of dredged or fill material for hazardous and toxic waste cleanup activities. The nature and scope of the impacts are controlled by the terms and conditions of the NWP.

If a situation arises in which the activity requires further review, or is more appropriately reviewed under the individual permit process, provisions of the NWPs allow division and/or district engineers to take such action.

(c) Cumulative effects (40 CFR 230.7(b)(3)):

The cumulative effects, including the number of activities likely to be authorized under this NWP, are discussed in Section 4 of this document. If a situation arises in which the proposed activity requires further review, or is more appropriately reviewed under the individual permit process, provisions of the NWPs allow division and/or district engineers to take such action.

6. Final Determinations:

(a) Finding of No Significant Impact:

Based on the information in this document, the Corps has determined that the issuance of this NWP will not have a significant impact on the quality of the human environment. Therefore, the preparation of an Environmental Impact Statement is not required.

(b) 404(b)(1) Compliance:

This NWP has been evaluated for compliance with the Section 404(b)(1) Guidelines, including Subparts C through G. Based on the information in this document, the Corps has determined that the discharges authorized by this NWP comply with the 404(b)(1) Guidelines, with the

inclusion of appropriate and practicable conditions, including mitigation, necessary to minimize adverse effects on affected aquatic ecosystems. The activities authorized by this NWP will not result in significant degradation of the aquatic environment.

(c) Public Interest Determination:

In accordance with the requirements of 33 CFR 320.4, the Corps has determined, based on the information in this document, that the issuance of this NWP is not contrary to the public interest.

(d) Section 176(c) of the Clean Air Act General Conformity Rule Review:

This NWP has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities authorized by this permit will not exceed de minimis levels of direct emissions of a criteria pollutant or its precursors and are exempted by 40 CFR 93.153. Any later indirect emissions are generally not within the Corps continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons, a conformity determination is not required for this NWP.

(e) Public Hearing: A public hearing was held on September 26, 2001, in Washington, D.C. to solicit comments on the proposed reissuance of this NWP.

FOR THE COMMANDER

Date: 04 JAN 2002 /s/

ROBERT H. GRIFFIN
Brigadier General, U.S. Army
Director of Civil Works

APPENDIX 6: STATE AND LOCAL SUBSTANTIVE REQUIREMENTS

Ehlers, Harald R NWS

From: Ehlers, Harald R NWS

Sent: Tuesday, August 16, 2005 5:03 PM

To: 'Harper, Pat'; 'Greene, Barry'

Cc: 'Sanga.Ravi@epamail.epa.gov'; JROL461@ECY.WA.GOV; Desjardin, Catherine A NWS; Kaiser, Monte E NWS; 'Graham, Ken (PARKS)'

Subject: Substantive compliance with Spokane County requirements

Attachments: WA Rec Engineering Judgment for Stormwater.doc; stormwaterguidance1.jpg; stormwaterguidance1.jpg

Pat and Barry,

I wanted to pass on my thanks for your assistance in the last few weeks as the Starr Road remedy has taken shape around the agreements between EPA, Ecology, and Washington State Parks and Recreation Commission. The Corps is completing the drawings revisions for the Starr Road site, and our designers wanted to be sure that you were of the actions taken regarding your prior comments about the site. The latest drawings are posted on the Corps ftp site at ftp://ftp.usace.army.mil/pub/nws/WA%20Rec%20Sites,%20Starr%20Road%20drawings%208-12-05/

The following is for your information and intended to show our substantive compliance efforts with Spokane County under the Superfund program:

(1) Stormwater management: Cathy Desjardin prepared the attached evaluation of stormwater criteria and engineering reflected in the design drawings (see the 3 attached files). As you will note in the drawings provided to you last week, the pullout on River Road is managing stormwater by sheet flow to the adjoining Parks & Recreation property.

(2) Guardrails: The Corps drawings show that the limits of the pullout on River Road are adjacent to the existing guardrail at the intersection of Starr Road and River Road. Removal or disturbance of the existing guardrail is not required to build the pullout. Recognizing the intent of discussions between the county, Ecology, and Parks & Rec, the current EPA-funded actions do not include the installation of new guardrail in this area or along River Road. As part of its contribution to the Starr Road cleanup, Ecology is separately working you to address the guardrail issues. The Corps drawings do include a 2-foot wide shoulder area along the paved pullout's margin that can be used by Ecology for a separately bid and constructed guardrail system.

(3) Sight distance: The current drawings include a detail on Plate C-3 (sheet 6 of 13) that shows sight distance and stopping sight distance on River Road, referenced to the centerline of the pullout and the intersection of River Road with Starr Road. We believe the information is appropriate for the substantive purposes of the county approach permit.

If you have any questions about this information, please contact Cathy Desjardin and me via e-mail.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Desjardin, Catherine A NWS

Sent: Tuesday, August 16, 2005 1:34 PM
To: Ehlers, Harald R NWS
Subject: FW:

From: Harper, Pat [mailto:PHarper@spokanecounty.org]
Sent: Thursday, July 14, 2005 10:14 AM
To: Desjardin, Catherine A NWS
Cc: Greene, Barry
Subject: RE:

Cathie, I just met with Barry Greene our Traffic Engineer. Based on his review he wanted to emphasize that if you effect the existing guardrail in anyway you will need to replace the entire length with current guardrail improvements. Secondly, your contractor will need to obtain an approach permit, Barry could not ascertain from the plans you sent what the sight distance would be from your proposed entrance. If you have a better set of plans could you send them to BGreene@spokanecounty.org.

From: Desjardin, Catherine A NWS [mailto:Catherine.A.Desjardin@nws02.usace.army.mil]
Sent: Tuesday, July 12, 2005 4:34 PM
To: Harper, Pat
Cc: Ehlers, Harald R NWS
Subject:
Importance: High

Pat, have you had a chance to look at the drawings yet? We look forward to your input.

We are planning to submit the final plans to our customer sometime this week.

Let me know if you have any questions.

Thank you,
Cathie DesJardin
206-764-3452 desk
206-909-7937 cell

Engineering Judgment for Stormwater, Washington Rec Site Project.

These stormwater judgments are based on the "Stormwater Management Manual for Eastern Washington". The following stormwater treatment will be implemented:

- New impervious surface area is approximately
  15 * (70 + 2*1/2(45))= 1725 sq. ft. = 1725/27 = 192 sq. yds.
  Approximately 200 sq. yds.

- Per chapter 2.2.5
  New surface is used by motor vehicles (parking turnout) is classified as a pollution generating impervious surface (PGIS) but is less than 5,000 sq. ft. and therefore doesn't require treatment.

- Per chapter 5.3.1
  Summary of areas needing treatment, the new grassy areas is not adding addition runoff to existing street drainage and is not required to be estimated.

- Runoff from the new PGIS will infiltrate the grass and riprap slope. The riprap slope is designed to deter pedestrian access (1.5 H:1V) and disturbance to the material below. Runoff is expected to infiltrate the riprap slope.

other infiltration facility.

Basic Treatment Requirements

Runoff treatment is required for all projects creating 5,000 square feet or more of pollutant-generating impervious surfaces (PGIS) unless the discharge is to (1) a qualified UIC facility (see section above) or (2) satisfies the requirements for full dispersion (see Chapter 6, BMP F6.42) and is not a high-use site. Treatment is required for discharges to all surface waters of the state, including perennial and seasonal streams, lakes and wetlands where the PGIS threshold is met. Certain exemptions may exist for Category 4 wetlands (see later section on "Use of Existing Wetlands to Provide Runoff Treatment"). Runoff treatment is also required for discharges of stormwater to groundwater via UIC facilities where the vadose zone does not provide adequate treatment capacity (see Chapter 5.6). Project designers should also consider the possible impact of additional TSS loading from pervious areas at the project site on the long-term function of the treatment facility.

Metals Treatment Requirements

Metals treatment is required for moderate- and high-use sites (see Definitions section above) and sites that meet any of the following definitions and discharge to a non-exempt surface water:

- Industrial sites as defined by EPA (40 CFR 122.26(b)(14)) with benchmark monitoring requirements for metals; or industrial sites subject to handling, storage, production, or disposal of metallic products or other materials, particularly those containing arsenic, cadmium, chromium, copper, lead, mercury, nickel or zinc; or
- An urban road with expected ADT greater than 7,500; or a rural road or freeway with expected ADT greater than 15,000; or
- A commercial or industrial site with an expected trip end count equal to or greater than 40 vehicles per 1,000 square feet of gross building area; or a customer or visitor parking lot with equal to or greater than 100 trip ends; or on-street parking areas of municipal streets in commercial and industrial areas; or highway rest areas; or
- Runoff from metal roofs not coated with an inert, non-leachable material.

Oil Control Requirements

Oil control is required for all high-use sites (see definition above) and high ADT traffic areas. Some sites will require a spill control type of oil control facility (see Chapter 8) for source control separate from or in addition to this treatment requirement. High ADT traffic areas generate sufficient quantities of oil to threaten water quality, but the quantities of oil generated may be insufficient for many oil control BMPs to be effective; therefore these sites may employ different BMPs than are recommended for high-use sites (see Chapter 5). Projects proposing a high-use site must provide oil controls in addition to any other water quality treatment required per this Core Element.

structures for these facilities should be designed to dampen velocities; the pond dimensions will further dissipate the energy. In these facilities, larger storms will be retained for a shorter detention time than the shorter storms for which the ponds are designed.

Summary of Areas Needing Treatment

All runoff from pollution-generating impervious surfaces meeting permitted thresholds is to be treated through the water quality facilities as required by Core Element #5.

- Lawns and landscaped areas specified are pervious but may also generate run-off into street drainage systems. In those cases the runoff from the pervious areas must be estimated and added to the runoff from impervious areas to size treatment facilities.
- Drainage from impervious surfaces that are not pollution-generating need not be treated and may bypass runoff treatment, if it is not mingled with runoff from pollution-generating surfaces.
- Runoff from metal roofs must be treated unless the roofs are coated with an inert non-leachable material.
- Drainage from areas in native vegetation should not be mixed with untreated runoff from streets and driveways, if possible. It is best to infiltrate or disperse this relatively clean runoff to maximize recharge to shallow ground water, wetlands, and streams.
- If runoff from non-pollution generating surfaces reaches a runoff treatment BMP, flows from those areas must be included in the sizing calculations for the facility. Once runoff from non-pollution generating areas is mixed with runoff from pollution-generating areas, it cannot be separated before treatment.

5.3.2 Sequence of Facilities

In general, all treatment facilities may be installed upstream of detention facilities. However, not all treatment facilities can function effectively if located downstream of detention facilities. Those facilities that treat unconcentrated flows, such as filter strips, are usually not practical downstream of detention facilities. Other types of treatment facilities present special problems that must be considered before placement downstream of detention. These would include biofiltration swales or sand filters which are sensitive to saturation and continuous flow.

Oil control facilities may be located upstream or downstream of treatment facilities and as close to the source of oil-generating activity as possible. They should also be located upstream of detention facilities, if possible.

Ehlers, Harald R NWS

From: Ehlers, Harald R NWS
Sent: Monday, August 08, 2005 5:37 PM
To: 'Karin Divens'
Cc: 'heinebah@dfw.wa.gov'; 'Sanga.Ravi@epamail.epa.gov'; 'Roland, John L.'; Kaiser, Monte E NWS; Desjardin, Catherine A NWS
Subject: Washington Recreation Sites - Starr Road

Attachments: WDFW HPA compliance.pdf

TO: Karin Divens, Washington Department of Fish and Wildlife
FROM: Harry Ehlers, USACE-Seattle District

Karin,

I am contacting you to follow up regarding your July 21, 2005 letter to me regarding substantive requirements for the Washington State Parks and Recreation's Starr Road site located in Otis Orchards, near the intersection of Starr Road and River Road. This project is proceeding under an accelerated schedule to allow construction in September, and I wanted to be sure that you were provided with substantive information about your original concerns about the Starr Road work.

(1) I am providing you a link to a ftp site with our latest design drawings, which show excavation/replacement and capping activities in the floodplain:

ftp://ftp.usace.army.mil/pub/nws/ , then open the file titled ""WA Rec Sites, Starr Road drawings 8-8-05"

Please note that the drawings are correctly referencing the site survey and floodplain datums, show ordinary high water mark, and 100-year floodplain elevation.

2) We have reached agreement about the nature of the replacement gravels for the bar, and you will find the gradation information on the drawings. Please be aware that I've identified the area of larger rock as best as I can from the description provided by you and Bruce; we can adjust actual in the field. The drawings contain detailed cross-sections to address your concerns about matching topography and delineating where different fill types are used.

(3) Again, thanks for putting together your July 21 letter of substantive compliance measures for a Hydraulic Project Approval (HPA), which I've attached as a .pdf for others receiving this e-mail. Please note that your letter's requirements for a post-project survey are not necessary given the level of grade control that we'll need to provide in the field for the removal/replacement work. I would prefer to demonstrate to you that our grade control is effective by inspection of grade staking for such a limited work area, and not spend EPA's money on another survey beyond that done on site by the Contractor to control the work. I hope that will be workable for you. I will provide a copy of your letter to Ravi and our contractor prior to starting work.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

WDFW HPA
mpliance.pdf (982 K

Washington Department of FISH AND WILDLIFE

2315 North Discovery Place, Spokane Valley, WA 99216-1566
509-892-1001 509-921-2440 Fax

July 21
~~June 22~~, 2005

US Army Corp of Engineers, Seattle District
Harry Ehlers, PE, Project Manager
PO Box 3755 CENWS-PM-EM
Seattle, WA 98124-3755

Dear Mr. Ehlers:

SUBJECT: Substantive requirement for the EPA Starr Road Cleanup Project Proposal

The Washington Department of Fish and Wildlife (WDFW) would like to provide the following provisions as substantive requirements for the Starr Road Gravel Bar Removal Project.

1. Gravel removal from the river shall be limited to removal from the exposed bar and shall not result in a lowering, over time, of the average channel cross-section profile through the project area or downstream.

2. Post-project channel cross-sectional surveys are required and are the permittee's responsibility. The cross sections shall be referenced vertically to a permanent bench mark and horizontally to a permanent base line. They shall be taken perpendicularly to the high-flow channel every 100 feet throughout the project area and at cross sections through the upstream and downstream riffles immediately adjacent to the project area. Surveys shall be taken near the upstream control point (i.e. break in grade) and at the mid-point of each riffle. The post-project survey shall be submitted to the Washington Department of Fish and Wildlife within 90 days of completion of removal of gravel. (The pre-project survey information per WAC 220-110-140(8) was submitted to the Washington Department of Fish and Wildlife May 2005.

3. As per agreement, all contaminated gravels removed from the exposed bar and backwater area shall be replaced with material of the same gradation and composition as removed materials. Elevations must also be matched.

4. Stockpiling of material waterward of the ordinary high water line is not approved

5. The Area Habitat Biologist listed below shall be notified at least five working days before the start of actual gravel removal and upon project completion to allow for compliance inspection.

6. Gravel shall not be pushed across the channel.

7. Equipment used for this project shall operate stationed on exposed portions of the gravel bar.

8. Equipment used for this project may operate below the ordinary high water line, provided the drive mechanisms (wheels, tracks, tires, etc.) shall not enter or operate within the wetted width of the river.

9. Equipment used for this project shall be free of external petroleum-based products while working around the stream. Accumulation of soils or debris shall be removed from the drive mechanisms (wheels, tires, tracks, etc.) and undercarriage of equipment prior to its working below the ordinary high water line. Equipment shall be checked daily for leaks and any necessary repairs shall be completed prior to commencing work activities along the stream.

10. Equipment crossings of the stream are not authorized by this HPA.

11. If at any time, as a result of project activities, fish are observed in distress, a fish kill occurs, or water quality problems develop (including equipment leaks or spills), operations shall cease and the Washington Department of Fish and Wildlife at ? and Washington Department of Ecology at ? shall be contacted immediately. Work shall not resume until further approval is given by the Washington Department of Fish and Wildlife.

12. Every effort shall be taken during all phases of this project to ensure that sediment-laden water is not allowed to enter the river. This may be accomplished by isolating the work in the backwater channel area from the main channel by using an Aquabarrier or similar such method at the downstream end. Accumulated sediments shall be removed during the project and prior to removing

the check dam(s) after completion of work.

13. Wastewater from project activities and water removed from within the work area shall be routed to an area landward of the ordinary high water line to allow removal of fine sediment and other contaminants prior to being discharged to the stream.

14. All waste material such as construction debris, silt, excess dirt or overburden resulting from this project shall be deposited above the limits of flood water in an approved upland disposal site.

15. If high flow conditions that may cause siltation are encountered during this project, work shall stop until the flow subsides.

16. Extreme care shall be taken to ensure that no petroleum products, hydraulic fluid, fresh cement, sediments, sediment-laden water, chemicals, or any other toxic or deleterious materials are allowed to enter or leach into the stream.

17. The permittee shall capture and safely move food fish, game fish, and other fish life from the job site. The permittee shall have fish capture and transportation equipment ready and on the job site. Captured fish shall be immediately and safely transferred to free-flowing water downstream of the project site. The permittee may request the Washington Department of Fish and Wildlife assist in capturing and safely moving fish life from the job site to free-flowing water, and assistance may be granted if personnel are available.

18. Any device used for diverting water from a fish-bearing stream shall be equipped with a fish guard to prevent passage of fish into the diversion device pursuant to RCW 77.55.040 and 77.16.220. The pump intake shall be screened with 3/32-inch mesh to prevent fish from entering the system. The screened intake shall consist of a facility with enough surface area to ensure that the velocity through the screen is less than 0.4 feet per second. Screen maintenance shall be adequate to prevent injury or entrapment to juvenile fish and the screen shall remain in place whenever water is withdrawn from the stream through the pump intake.

STATE OF WASHINGTON

Department of Archaeology and Historic Preservation

1063 S. Capitol Way, Suite 106 • PO Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
Fax Number (360) 586-3067 • http://www.dahp.wa.gov

August 29, 2005

Mr. L. Michael Bogert
EPA Region X
1200 Sixth Avenue
Seattle, Washington 98101

Log No.: 062705-14-EPA
Re: WRAR Project: Starr Road BHMMC, OU#3

Dear Mr. Bogert;

Thank you for contacting our department. We have reviewed the professional cultural resources report by Jones and Stokes, Inc. for the proposed Washington Recreation Area Remediation Project, Starr Road Site, Bunker Hill Mining and Metallurgical Complex, Operable Unit 3 in Spokane County, Washington.

We concur with their professional conclusions and recommendations and your finding of No Historic Properties Effected. We concur with the proposed monitoring and would appreciate receiving a copy of the monitoring report when available.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in compliance with the Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800.4. Should additional information become available, our assessment may be revised, including information regarding historic properties that have not yet been identified.

Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 586-3080
email: rob.whitlam@dahhp.wa.gov

cc: R Abrahamson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

AUG 26 2005

Reply to
Attn Of: ECL-111

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology and Historic Preservation
Post Office Box 48343
Olympia, WA 98504-8343

Re: Request for Concurrence with a Determination of No Historic Properties Affected for the Washington Recreation Areas Remediation Project, Starr Road Site, Bunker Hill Mining and Metallurgical Complex, Operable Unit 3, Spokane County, Washington (DAHP File Number 062705-14-EPA)

Dear Dr. Brooks:

The U.S. Environmental Protection Agency Region 10 (EPA) has decided, with assistance from the U.S. Army Corps of Engineers, Seattle District (Corps), to take remedial action at the Starr Road Recreation Area on the north bank of the Spokane River approximately one and one quarter miles west of the Washington/Idaho border (see Figure 1 of enclosed report). The remedial action will entail:

- Removing approximately 1,600 cubic yards of sediments and soils contaminated with lead and arsenic from the top one foot of approximately one acre of an annually flooded bank below the ordinary higher high water line,
- Disposing of these contaminated sediments in the state certified Graham Road Waste Management Landfill near Medical Lake, Washington,
- Replacing in-kind the removed sediments and soils with clean materials,
- Capping approximately one and three quarter acres of upland to prevent contact with contaminated sediments and soils,
- Closing off and replanting trails and roads that have formed across the site from recreational uses,
- Creating, using clean fill, a designated parking area pullout near the intersection of Starr and River Roads,
- Constructing a new permanent access pathway leading from the pullout area to the floodplain.

Enclosure 1 discusses the creation of an on-site repository for the excavated material. Recent negotiations with the State of Washington have resulted in the decision to dispose of the material

in the certified Graham Road Waste Management Landfill, rather than creating the onsite repository.

EPA determined that the proposed undertaking had the potential to cause effects on historic properties under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) and initiated consultation with the affected Tribes and your office in February and June 2005, respectively (see correspondence letters in Appendix C of Enclosure 1). Although the Graham Road Landfill is a discontiguous portion of the project area, EPA has defined the area of potential effects (APE) as the Starr Road remediation site that includes areas slated for earth disturbance and staging of equipment, access routes for vehicles and machinery, the pullout, and trails to be re-planted with vegetation. No cultural surveys are proposed by EPA for the landfill.

In support of EPA's compliance responsibilities under NHPA, an intensive cultural resources assessment survey was completed by Jones and Stokes (under contract to the Corps) with assistance from a professional archaeologist in the employ of the Spokane Tribe to identify historic properties in the project area, to determine the potential for undiscovered historic properties, and to provide EPA with recommendations for any additional measures needed to ensure the identification of historic properties. The cultural resource consultant determined that there are no recorded historic properties within the project area. Please refer to the enclosed reports titled, "Cultural Resources Assessment of the Washington Recreation Areas Remediation Project, Starr Road Site, Bunker Hill Mining and Metallurgical Complex, Operable Unit 3, Spokane County, Washington," by Jason Cooper of Jones and Stokes, and, "Traditional Cultural Property Inquiry of the Proposed Washington Recreation Areas Remediation Project, Starr Road Site -- Bunker Hill Mining and Metallurgical Complex OU 3, Spokane River, Washington," by Jill Wagner, Ph.D., Archaeologist and Anthropologist with the Coeur d'Alene Tribe (Enclosure 1, Appendix B).

The cultural resources assessment located and recorded two historic-period archaeological sites. Jones and Stokes recommended that these sites (45SP487 and 45SP488) are not eligible for listing in the National Register of Historic Places (NRHP) because they lack depositional context and do not retain integrity from their period of significance. Furthermore, Jones and Stokes determined through archival research of the history of the landform, pedestrian survey, and subsurface investigations that the project area demonstrates a low probability for the existence of NHPA-eligible properties and that the permanent visual impacts of the proposed undertaking would be negligible and discountable. EPA concurs with these findings.

There are, however, four cultural resource sites within one half mile of the project area. Of these, 45SP57 is the location where Colonel George Wright's men were ordered to kill approximately 700 captured horses during the Spokan War (a.k.a., Steptoe-Wright War) in 1858. The Horse Slaughter Site is located on the Department of Archaeology and Historic Preservation (DAHP) database as directly opposite the project site on the south side of the Spokane River. A historic monument commemorating the infamous events that took place at this site, however, is located approximately one half mile southwest of the project area. Although additional work will be needed to determine the boundaries of the Horse Slaughter Site with certainty, this site, and the other three sites (45SP224, 45SP226, and 45SP228) are on the south side of the river.

Both the Spokane and Coeur d'Alene Tribes were consulted regarding historic properties within the project area. The enclosed report (Enclosure 1, Appendix B) submitted by the Coeur d'Alene Tribe with the support of the Spokane Tribe concludes the following:

> "Monitoring by cultural resources staff member from the Spokane and/or Coeur d'Alene Tribe during all earth moving activity is recommended.
>
> The site has significant prehistoric, protohistoric, and historic elements which may not be evident in a phase-1 archaeological investigation. The use of the area as a travel corridor, proximity to the 1858 Horse Slaughter location and known home-sites of leaders during the protohistoric and historic periods, as well as the on-going significance of the river to both the Spokane and Coeur d'Alene Tribes are factors in this significance. While surface evidence of artifacts may be sparse after years of non-Indian occupation and development, evidence below the surface may still be in place and artifacts may be entering the site through erosion, hydrological processes, and other means (Wagner 2005)".

While EPA would certainly not dispute the importance of the river corridor and the greater project area to the history and living culture of both Tribes, based on the findings of the cultural resources assessment by Jones and Stokes we do not concur with the conclusion that sites eligible for listing in the NRHP are likely to exist in the APE. Accordingly, as the Federal agency responsible for Section 106 of the NHPA, EPA has determined that the project will result in No Historic Properties Affected. EPA requests your concurrence with this determination.

In light of both Tribes' traditional cultural knowledge and concerns about the APE, however, EPA will support the presence of a cultural resources staff member from the Spokane and/or Coeur d'Alene Tribe on site during earth disturbing activities. Earth disturbing activities are not anticipated to exceed two weeks. EPA expects that monetary support can be provided to one Tribal monitor representative on behalf of both Tribes. Additionally, the Tribal representatives are invited and encouraged to attend the pre-construction meeting where the Tribal involvement with the clean up will be discussed. An EPA representative or its designee will call each Tribe to identify the date of this meeting.

If you have any questions, please feel free to call me. My number is (206) 553-1234. I have designated Dan Opalski, the Director of our Environmental Cleanup Office, to consult with your regarding this project. Mr. Opalski can be reached at (206) 553-1855. Your staff may also wish to consult Ravi Sanga, Remedial Project Manager for this project, at (206) 553-4092. Mr. Sanga can also be e-mailed at sanga.ravi@epamail.epa.gov.

Sincerely,

L. Michael Bogert
Regional Administrator

Enclosures (2)

cc: Dr. Robert Whitlam, Washington State Archaeologist w/enclosure
Quanah Matheson/Dr. Jill Wagner, Coeur d'Alene Tribe w/enclosure
Randy Abrahamson, THPO, Spokane Tribe w/enclosure
Dan Meatte, Washington Parks and Recreation Archaeologist w/enclosure
Cami Grandinetti, EPA
Angela Chung, EPA
Dan Opalski, EPA
Ravi Sanga, EPA
Piper Peterson Lee, EPA
Harald Ehlers, USACE
Dave Grant, USACE
John Roland, Ecology

Ehlers, Harald R NWS

From: Ehlers, Harald R NWS
Sent: Monday, June 27, 2005 11:04 AM
To: 'JROL461@ECY.WA.GOV'; 'BGreene@spokanecounty.org'; 'heinebah@dfw.wa.gov'
Cc: 'Sanga.Ravi@epamail.epa.gov'
Subject: FW: Tiff files for Washington Recreation Site, Starr Road

Gentlemen,

EPA and the Washington State Parks and Recreation Commission are continuing their discussions about the Starr Road remediation project. I would appreciate your input about the latest concepts for the Washington Recreation Sites - Starr Road, as shown in the drawings located at our ftp site:

ftp://ftp.usace.army.mil/pub/nws/tiffs/

I would appreciate any comments and suggestions that would help EPA and USACE to proceed to a final design. Please note that the pull-off configuration is based on our verbal discussions on June 8. The Corps drawings show the entry to Parks & Rec's property starting on the east end of the pull-off, reflecting Ecology's input that they would be separately proceeding with design/funding of a guardrail system along River Road. The guardrail would prevent foot and vehicle traffic onto the repository surface; therefore, the USACE drawings do not show any additional features for this purpose. I would especially appreciate identification of specific information needed by Spokane County to get design concurrence with the pull-off and any additional supporting data needed. As the design elements are set, I will also need assistance from Spokane County to proceed with the easement for construction in the County's right-of-way.

The replacement gravel gradations shown in the drawings are based on discussions with Bruce Heiner, WA Dept. of Fish and Wildlife. Additional bulk samples collected on June 23 are being analyzed and I should have the test results by the end of this week. I hope to have this fill issue resolved with Fish & Wildlife as soon as possible. The current drawings are based on a new survey of the site, with greater topographic accuracy in the bar area. We are also evaluating the hydraulic effect of the fill placement in the uplands and documenting its limited and localized affect on the 100-year floodplain.

Your input is greatly appreciated and important to EPA and the Corps. Thanks for your help to date.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

-----Original Message-----
From: Ehlers, Harald R NWS
Sent: Monday, June 27, 2005 10:24 AM
To: 'ken.graham@parks.wa.gov'; 'bill.fraser@parks.wa.gov'
Cc: 'Sanga.Ravi@epamail.epa.gov'
Subject: FW: Tiff files for Washington Recreation Site, Starr Road

Ken & Bill,

I am enclosing updated drawings of the Starr Road site that show the features discussed to date by EPA and Ecology with Parks and Rec (revisions based on our conversation of June 8). The repository/parking area is the pull-off concept requested by Parks & Rec. The bar excavation and the upland cap configurations shown in the enclosed drawings were developed on April 27 during a meeting between Ecology and EPA. This is what we think meets the intent of the discussions; the amount of contaminated soil removed from the bar is approximately 1,500 CY. This latest concept has not been fully discussed by Ecology, EPA, or Parks & Rec, so I expect that Ravi Sanga and I will follow up with you to

discuss this further. The enclosed files are too large to e-mail, so I have placed them on our ftp site, which you can get to by copying the link below to Internet Explorer and printing the individual drawing files contained in the project folder:

ftp://ftp.usace.army.mil/pub/nws/tiffs/

If you have any problems with viewing the drawings, please call me. Please note that the permanent trail from the repository/parking is supposed to continue down to the cap area. It got left off as we made revisions to the base map (notice that the topography is now based on new field survey data).

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

Ehlers, Harald R NWS

From: Roland, John L. [JROL461@ECY.WA.GOV]
Sent: Tuesday, April 19, 2005 7:54 AM
To: 'Ravi Sanga'; 'Grandinetti.Cami@epamail.epa.gov'
Cc: Ehlers, Harald R NWS; Goldstein, Flora J. (ECY)
Subject: FW: Spokane River heavy metals sequestration

Ravi and Cami - Please note the attached correspondence concerning statutory factors associated with our State Shoreline Management Act and the Spokane River. This relates in particular at Starr Road where the best and wisest placement of the parking containment area is of importance. John

-----Original Message-----
From: Pineo, Douglass A.
Sent: Monday, February 28, 2005 2:28 PM
To: Roland, John L.; Merker, Christopher R.; Farmer, Brian G.; Holliday, Keith; Maher, Michael W.
Subject: RE:

John,

Thanks for circulating this focus sheet before the brief meeting we just conducted. I also appreciate your lengthy history of consultation with the SEA Program on the looming issues surrounding the contaminated sediments (PCP and heavy metals) issues in the Spokane River.

There are a number of simple ideas which form part of the context of these "cleanup" efforts, and which must be addressed. Since you're already aware of them, I only itemize them here so we all have seen them in one place at least once.

- In stream environments, these contaminants are bound with sediments settling out in the river's lowest energy environments, which directly correlate with and support the most established, undisturbed, and complex riparian plant communities.

- The areas in question are designated as Pastoral or Conservancy shoreline environments in the Spokane County Shoreline Master Program (SMP), developed and administered pursuant to the Shoreline Management Act (SMA) of 1971.

- The Spokane County SMP also applies in the new City of Spokane Valley.

- These Pastoral and Conservancy environment designations are designed to protect the existing character of the shorelines, especially the riparian and associated upland plant commuities.

- The native plant communities are many decades old.

- The native plant communities are very expensive and problematic to redevelop.

- A 70-90 year old pine tree takes 70-90 years to become 70-90 years old.

- The Spokane River is a shoreline of statewide significance as defined in the SMA. As such, it is to be managed to carry out the legislative intent as expressed in RCW 90.58.020. Below is a quote from this section of the law (emphasis added):

This policy contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life, while protecting generally public rights of navigation and corollary rights incidental thereto.

The legislature declares that the interest of all of the people shall be paramount in the management of shorelines of statewide significance. The department, in adopting guidelines for shorelines of statewide significance, and local government, in developing master programs for shorelines of statewide significance, ***shall give preference to uses in the following order of preference which:***

(1) Recognize and protect the statewide interest over local interest;

(2) Preserve the natural character of the shoreline;

(3) Result in long term over short term benefit;

(4) Protect the resources and ecology of the shoreline;

(5) Increase public access to publicly owned areas of the shorelines;

(6) Increase recreational opportunities for the public in the shoreline;

(7) Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.

In the implementation of this policy ***the public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally.*** To this end ***uses shall be preferred which are consistent with control of pollution and prevention of damage to the natural environment,*** or are unique to or dependent upon use of the state's shoreline.

- The law thus addresses both contaminated sediments, and the approach to be taken in their remediation.

- The contaminated sediments in the Spokane River are deposited by more than a century of ongoing fluvial processes, and solutions to their sequestration must be based in, and accomodate these fluvial processes, if they are to be consistent with the law.

- The subject shoreline areas are publicly owned, and managed on behalf of, the citizens of the State of Washington.

- The subject shoreline areas are not owned by the federal Environmental Protection Agency or the US Army Corps of Engineers.

See you Wednesday morning.

Doug

-----Original Message-----
From: Roland, John L.
Sent: Monday, February 28, 2005 12:31 PM
To: Pineo, Douglass A.; Merker, Christopher R.; Farmer, Brian G.; Holliday, Keith; Maher, Michael W.
Subject: FW:

Doug suggested I forward the attached fact sheet to help with our discussions. This is only a part of

the actions being planned.

John

APPENDIX 7: DRAWINGS

US Army Corps
of Engineers
Seattle District

WASHINGTON RECREATION SITES, STARR ROAD

SPOKANE COUNTY, WASHINGTON

VICINITY MAP
NOT TO SCALE

DRAWING INDEX		
SHEET NO.	PLATE NO.	TITLE
		GENERAL
1 OF 13	G-1	TITLE SHEET, DRAWING INDEX, VICINITY/LOCATION MAP
2 OF 13	G-2	KEY MAP, LEGEND AND CONSTRUCTION REQUIREMENTS
3 OF 13	G-3	SURVEY
		STARR ROAD
4 OF 13	C-1	STARR ROAD SITE PLAN
5 OF 13	C-2	STARR ROAD TURNOUT AREA
		SECTIONS AND DETAILS
6 OF 13	C-3	STARR ROAD TURNOUT AREA DETAILS
7 OF 13	C-4	STARR ROAD PATHWAY, EXCAVATION AND CAP AREA DETAILS
8 OF 13	C-5	STARR ROAD EXCAVATION AND CAP AREAS
9 OF 13	C-6	STARR ROAD EXCAVATION AND CAP AREA SECTIONS
10 OF 13	C-7	STARR ROAD EXCAVATION AND CAP AREA SECTIONS
11 OF 13	C-8	STARR ROAD EXCAVATION AND CAP AREA SECTIONS
12 OF 13	C-9	STARR ROAD EXCAVATION AND CAP AREA SECTIONS
13 OF 13	C-10	STARR ROAD EXCAVATION & CAP AREA SECTIONS AND HOSTILE VEGETATION LAYOUT

SAFETY PAYS

This project was designed by the Seattle District U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear within the specifications or on these project documents within the scope of their employment as required by ER 1110-1-8152, Professional Registration.

DATE AND TIME PLOTTED: 09-JAN-2006 08:45
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE\CIV\WAREF08A.DGN

Computer Aided Design & Drafting

PREPARED:
DENNIS A. FISCHER, PE
CHIEF, CIVIL/GEOTECH SECTION

SUBMITTED:
HARALD R. EHLERS, PE
PROJECT MANAGER

SUBMITTED:
DEAN M. SCHMIDT
CHIEF, TECHNICAL ENGINEERING & REVIEW SECTION

RECOMMENDED:
OLTON SWANSON, PE
CHIEF, DESIGN BRANCH

APPROVED:
MARK A. OHLSTROM, PE
CHIEF, ENGINEERING & CONSTRUCTION DIVISION

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

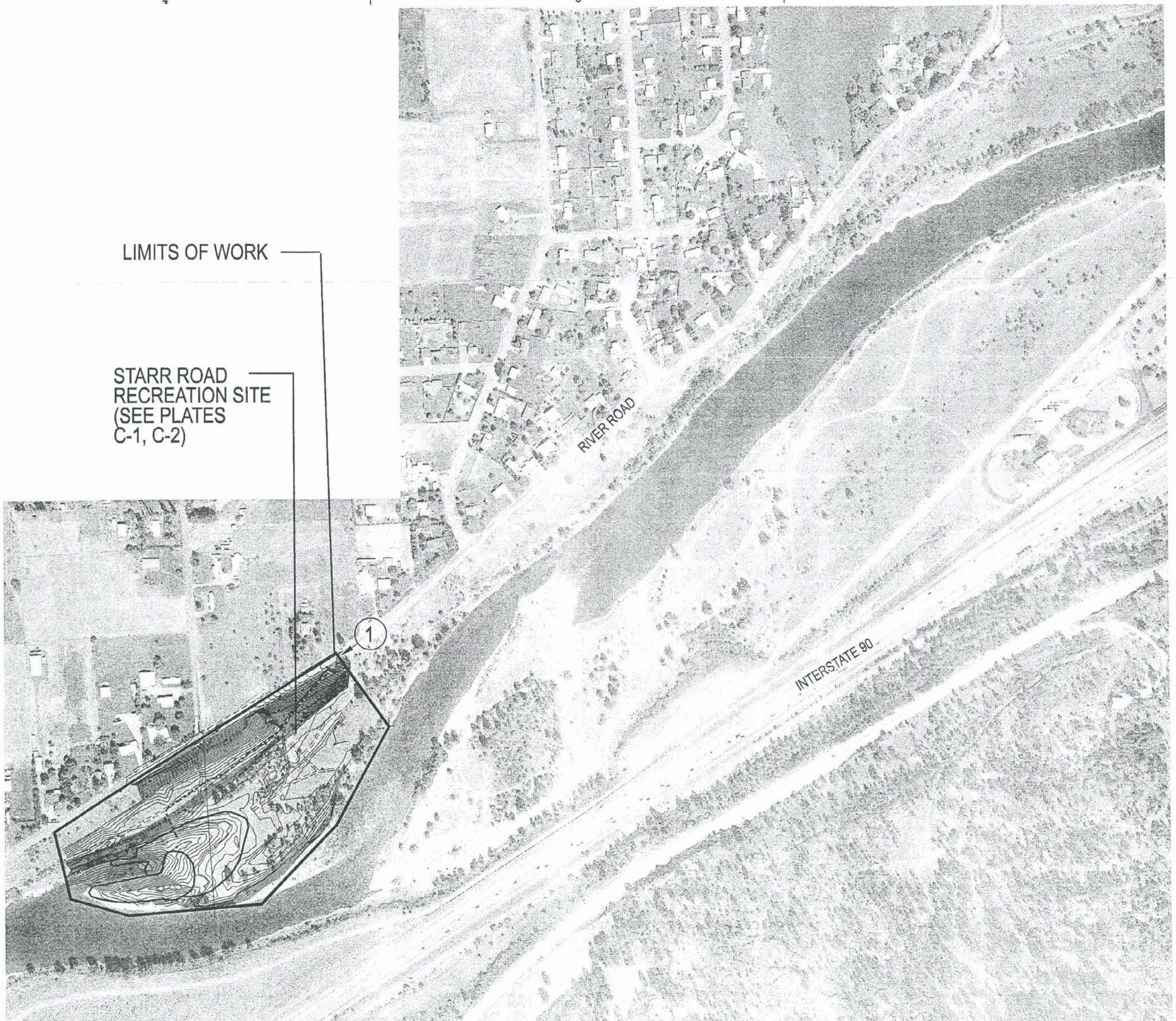
WASHINGTON RECREATION SITES
STARR ROAD

TITLE SHEET, DRAWING INDEX,
VICINITY/LOCATION MAP

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO.	FILE NO.	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	G-1

DSGN: DESJARDIN CHK: KAISER SHEET 1 OF 13



REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

LEGEND

- CONTRACTOR ACCESS ROUTE FOR SITE
- (1) CONTRACTOR ACCESS VIA RIVER ROAD AND UNIMPROVED SERVICE ROAD
- ROAD BLOCKED OFF
- LIMITS OF WORK

CONSTRUCTION REQUIREMENTS

CONTRACTOR REQUIRED TO CONTACT:
UTILITY LOCATE - 1-800-424-5555
CALL TWO WORKING DAYS BEFORE DIGGING.
REFERENCE NO. 5228760

1" = 200' 200' 100' 0 200' 400'

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DATE AND TIME PLOTTED: 09-JAN-2006 10:28
DESIGN FILE: I:\GROUPS\EN-DB-CO\WA REC SITE 1\CIV\WAREFG0B.DGN

COMPUTER AIDED DESIGN & DRAFTING

PREPARED: DENNIS A. FISCHER, PE
CHIEF CIVIL-SOILS SECTION

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

KEY MAP, LEGEND AND
CONSTRUCTION REQUIREMENTS

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO.	FILE NO.	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	G-2
DSGN. DESJARDIN		CHK. KAISER	SHEET 2	

TOPOGRAPHIC SURVEY OF STARR ROAD COMPLEX
FOR THE DEPARTMENT OF THE ARMY

SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755 SEATTLE, WASHINGTON 98124-3755

A PORTION OF SECTIONS 1 AND 2, T.25N., R.45 E.W.M.,
SPOKANE COUNTY, WASHINGTON, MAY, 2005

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS MAP IS GRID BEARING BASED ON NAD 1983/91 WASHINGTON STATE PLANE COORDINATE SYSTEM NORTH ZONE. TO OBTAIN A GEODETIC AZIMUTH APPLY A CONVERGENCE ANGLE OF 02°48'14" AT CONTROL #8.

NOTES

1. FIELD SURVEY COMPLETED DURING THE WEEKS OF MAY 16TH AND MAY 23RD, 2005.
2. CONTROL COORDINATES SHOWN ON THIS SURVEY ARE GRID COORDINATES BASED ON WASHINGTON STATE DEPARTMENT OF TRANSPORTATION PRIMARY CONTROL GPS MONUMENTS GP32090-52 AND GP32090-53. THE COORDINATES ARE NAD 83/91 IN FEET AND THE ELEVATIONS ARE NAVD 88 IN FEET. TO OBTAIN GROUND COORDINATES A PROJECT SCALE FACTOR OF 1.00009653 WAS USED FOR THIS SURVEY.

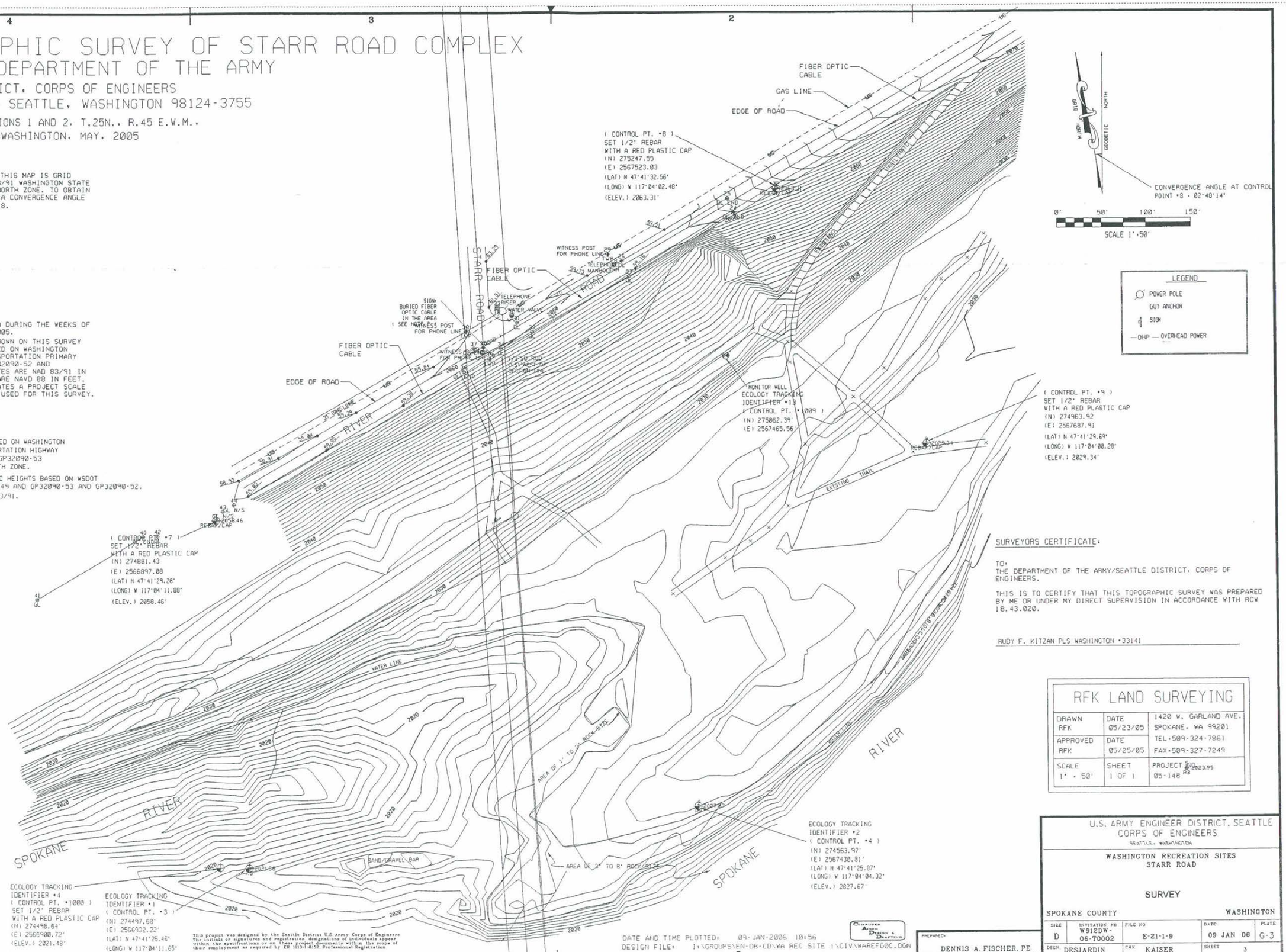
DATUM

STATE PLANE COORDINATES BASED ON WASHINGTON STATE DEPARTMENT OF TRANSPORTATION HIGHWAY MONUMENTS GP32090-52 AND GP32090-53 NAD 1983/91 WASHINGTON NORTH ZONE.

VERTICAL NAVD 88 ORTHOMETRIC HEIGHTS BASED ON WSDOT HIGHWAY MONUMENTS GP32090-49 AND GP32090-53 AND GP32090-52.
LONGITUDE AND LATITUDE NAD 83/91.

GP32090-52 NAD 83
N 83215.131 METERS
E 782068.959 METERS
ELEVATION 623.048 METERS
NAVD 88
LAT. N 47°41'11.369128"
LONG. W 117°04'28.681542"

GP32090-53 NAD 83
N 84338.718 METERS
E 78773.737 METERS
ELEVATION 627.089 METERS
NAVD 88
LAT. N 47°41'45.003474"
LONG. W 117°03'04.384845"



SURVEYORS CERTIFICATE:

TO:
THE DEPARTMENT OF THE ARMY/SEATTLE DISTRICT, CORPS OF ENGINEERS.

THIS IS TO CERTIFY THAT THIS TOPOGRAPHIC SURVEY WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH RCW 18.43.020.

RUDY F. KITZAN PLS WASHINGTON #33141

RFK LAND SURVEYING		
DRAWN RFK	DATE 05/23/05	1420 W. GARLAND AVE. SPOKANE, WA 99201
APPROVED RFK	DATE 05/25/05	TEL.509-324-7861 FAX.509-327-7249
SCALE 1" = 50'	SHEET 1 OF 1	PROJECT NO. 05-148

This project was designed by the Seattle District U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear within the specifications or on these project documents within the scope of their employment as required by ER 1110-1-8152, Professional Registration.

DATE AND TIME PLOTTED: 09-JAN-2006 10:56
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE 1\CIV\WAREFGOC.DGN

PREPARED: DENNIS A. FISCHER, PE
CHIEF, CIVIL DESIGN SECTION

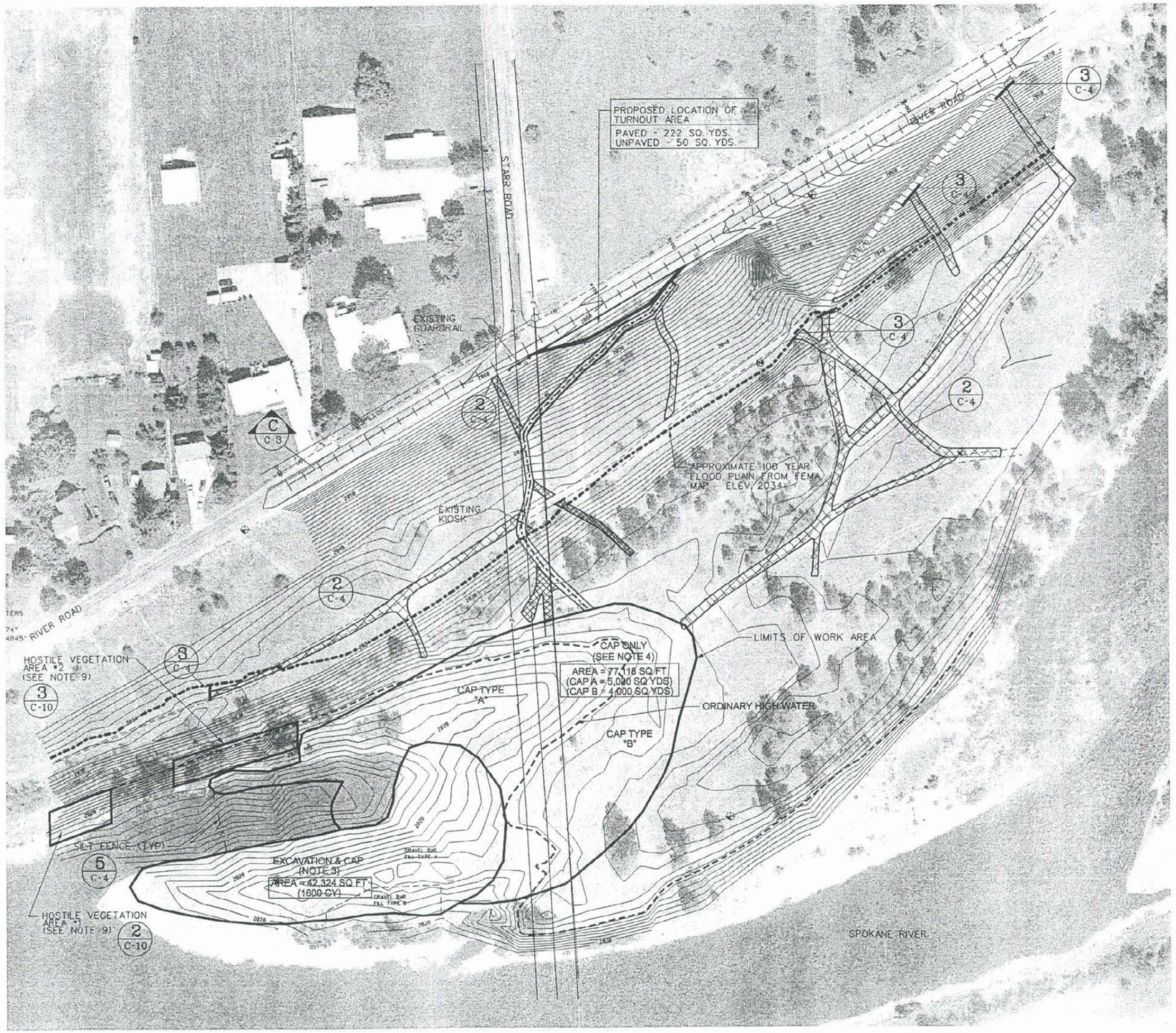
U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

SURVEY

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO.	FILE NO.	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	G-3
DSGN. DESJARDIN	CHK KAISER		SHEET 3	



REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

LEGEND

- ROAD BLOCKED OFF (NOTE 8)
- PATH TO BE REVEGETATED (NOTE 1)
- DESIGNATED PATH CAPPED WITH CLEAN MATERIAL (NOTE 2)
- E — OVERHEAD UTILITY WIRES
- APPROXIMATE 100 YEAR FLOOD PLAIN FROM FEMA MAP ADJUSTED TO CONFORM TO NAVD 88 DATUM. (SEE NOTE 7)
- U/G GAS — UNDERGROUND GAS LINE
- ORDINARY HIGH WATER LINE

NOTES:

1. PATHS TO BE REVEGETATED: SCARIFIED TO 6-INCH DEPTH, CAPPED WITH 6-INCH LIFT OF TOPSOIL, AND HYDROSEEDED WITH NATIVE BLEND OF GRASSES.

2. DESIGNATED PATHS: COVERED WITH FILTER FABRIC (MIRAFI 700X OR EQUIVALENT) AND CAPPED WITH 6-INCH LIFT OF 3/8-INCH MINUS CRUSHED ROCK FOR 7.5 FOOT WIDTH.

3. EXCAVATION AREA: REMOVE SOILS AND SEDIMENT TO 1-FOOT BELOW EXISTING GROUND SURFACE. BACKFILL WITH GRAVEL BAR GRADATION FILLS TO ORIGINAL ELEVATION. SEE TABLES ON PLATE C-2 FOR GRADATION, PLATE C-5 FOR LOCATIONS.

4. CAP AREA: SEE TABLES ON PLATE C-2 FOR GRADATION, PLATE C-5 FOR LOCATIONS.

5. HORIZONTAL AND VERTICAL CONTROL ARE BASED ON RFK LAND SURVEYING, PLATE G-3.

6. AERIAL PHOTOGRAPH IS REFERENCE ONLY.

7. FEMA 100 YEAR FLOOD PLAN ELEVATION VARIES FROM 2,027 TO 2,029 FEET NGVD '29 DATUM (NATIONAL FLOOD INSURANCE PROGRAM - FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 530174-0310-C, PANEL 310 OF 625, SEPT. 30, 1992); CORRECTION TO NAD 1988-2,034

8. BLOCK UNAUTHORIZED ROADS BY MECHANICALLY PLACING ON SITE BOULDERS AT LOCATIONS AS SHOWN; SEE PLATE C-4.

9. HOSTILE VEGETATION PLANTING AREA #1 (2500 SQ. FT) AND AREA #2 (4500 SQ. FT); SEE PLATE C-10, DETAIL 1.

1" = 60' 60' 30' 0 60' 120'

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD SITE PLAN

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO	FILE NO	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	C-1
DSGN: DESJARDIN	CHK: KAISER		SHEET 4	

PREPARED: DENNIS A. FISCHER, PE
CHIEF, CIVIL SOILS SECTION

DATE AND TIME PLOTTED: 04-JAN-2006 10:32
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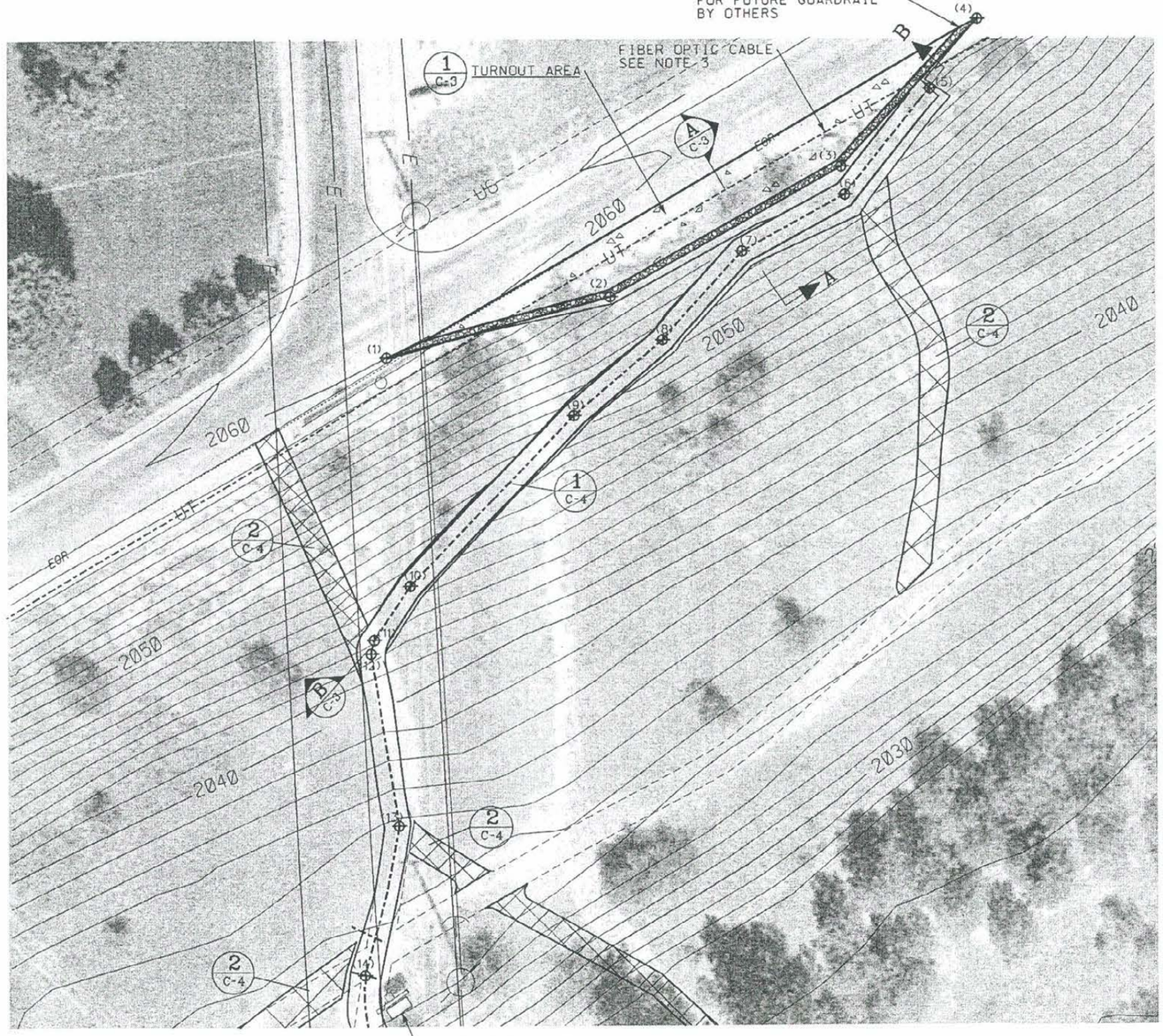

SURVEY POINTS

POINT	NORTHING	EASTING	ELEV.
1	275070	2567207	2059.5
2	275088	2567274	2059.3
3	275127	2567343	2059.3
4	275170	2567384	2059.5
5	275150	2567369	2059.2
6	275118	2567344	2057.8
7	275102	2567313	2055.3
8	275075	2567289	2052.8
9	275053	2567263	2050.3
10	275002	2567214	2045.3
11	274986	2567204	2043.7
12	274982	2567203	2049.0
13	274931	2567211	2036.2
14	274887	2567200	2034.5

CONSTRUCTION NOTES

1. PROTECT EXISTING GUARDRAIL AND SIGNAGE.

2. REMOVE BOULDERS FROM RIGHT OF WAY IMPROVEMENT AREA, REUSE FOR BLOCKING UNIMPROVED ROADS IN SITE (5 LOCATIONS, PLATE C-1.)

3. CAUTION!! U/G FIBER OPTIC COMM LINE IN RIGHT OF WAY IMPROVEMENT. LOCATE AND PROTECT.

4. FIBER OPTIC CABLE BURIED APPROX 4' DEEP. AT&T SHALL BE ONSITE TO OBSERVE CONTRACTOR WHEN DOING THE EXCAVATION IN THIS AREA. CONTRACTOR SHOULD CONTACT AT&T PRIOR TO WORK IN THIS AREA: TOM DEWEY - (509) 994-1255

5. HORIZONTAL AND VERTICAL CONTROL ARE BASED ON RFK LAND SURVEYING SURVEY, PLATE G-3

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

LEGEND

- ROAD BLOCKED OFF
- 2' SPACE FOR FUTURE GUARDRAIL NOT PATH
- PATH TO BE REVEGETATED
- DESIGNATED PATH CAPPED WITH CLEAN MATERIAL
- E — OVERHEAD UTILITY WIRES
- ASPHALT
- EOR — EDGE OF ROAD (EX.)
- SURVEY POINT ON PATH
- SURVEY POINT
- UT — TELECOMMUNICATIONS (FIBER OPTICS)

CLASS II RIPRAP

100% SMALLER THAN	500#
50% SIZE	200#
90% LARGER THAN	100#
10%	25-100#
TOLERANCE	+6"

N

1" = 20' 20' 10' 0 20' 40'

UPLANDS FILL (CAP A & CAP B) (GRADATION BASED ON LABORATORY GRADATIONS FROM CONTAMINATION TESTING)

U.S. SIEVE	% PASSING by WEIGHT
3"	100-60
2"	80-45
1"	65-30
1/2"	50-25
No. 4	35-15
No. 10	25-10
No. 40	10-0
No. 200	5-0

GRAVEL BAR FILL TYPE A (GRADATION BASED ON SOIL GRADATION TESTING AND CONSULTATION WITH WDFW HABITAT PROGRAM)

U.S. SIEVE	% PASSING by WEIGHT
3"	100
2"	100-85
1"	95-60
1/2"	85-50
No. 4	60-30
No. 10	45-20
No. 40	15-5
No. 200	5-0

GRAVEL BAR FILL TYPE B (GRADATION BASED ON SOIL GRADATION TESTING AND CONSULTATION WITH WDFW HABITAT PROGRAM)

U.S. SIEVE	% PASSING by WEIGHT
6"	100
3"	90-70
2"	75-50
1"	60-40
1/2"	50-25
NO. 4	35-15
No. 200	5-0

DATE AND TIME PLOTTED: 09-JAN-2006 10:34
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE I\CIV\WAREFD0B.DGN

Computer Aided Design & Drafting

PREPARED: DENNIS A. FISCHER, PE
CHIEF, CIVIL SOILS SECTION

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD TURNOUT AREA

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO	FILE NO	DATE	PLATE
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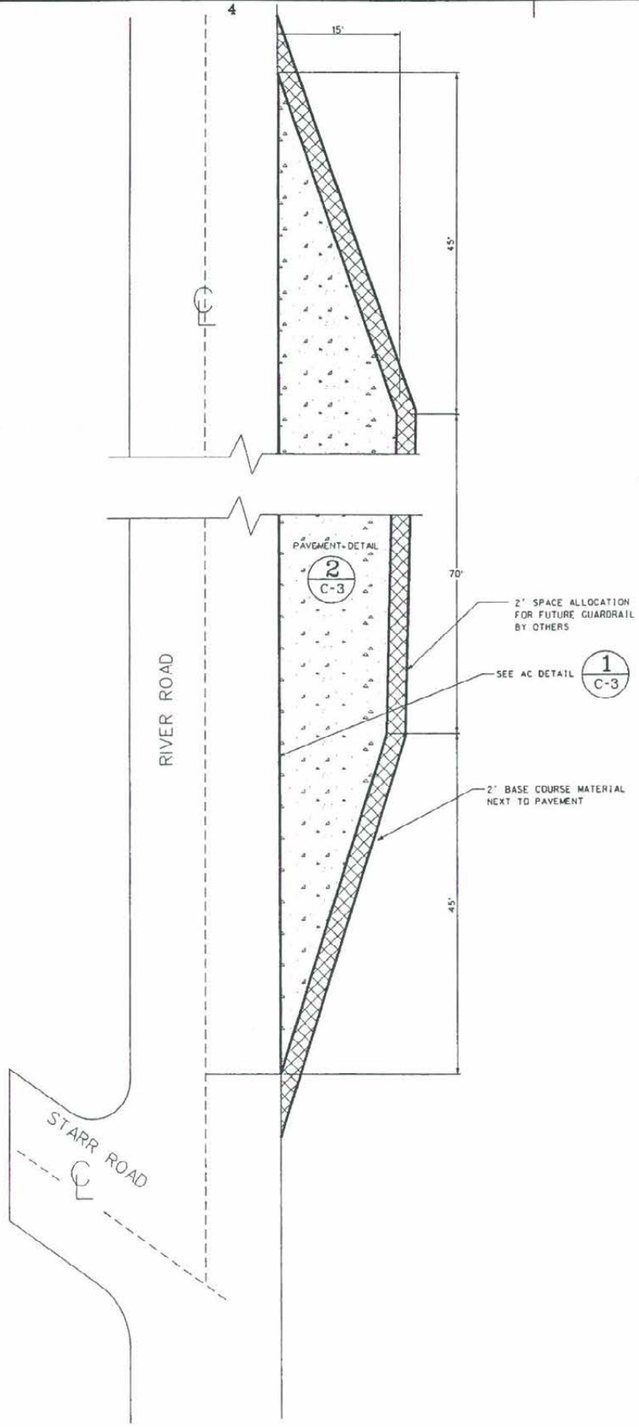
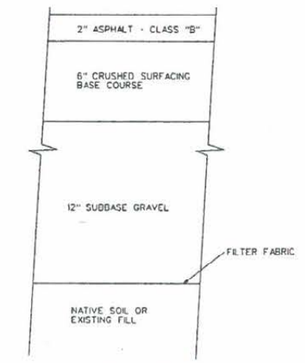
DESIGN: DESJARDIN	CHK: KAISER		SHEET: 5	



TURNOUT AREA

NO SCALE

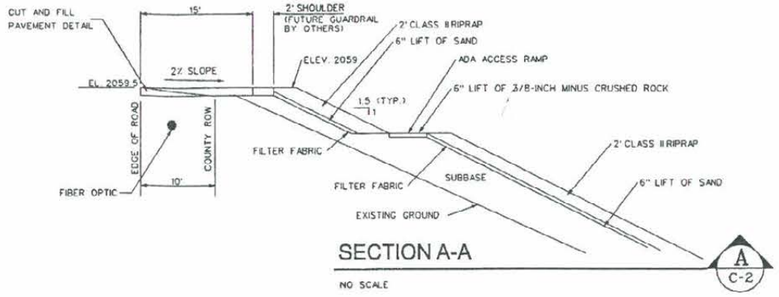
1 C-2



PAVEMENT DETAIL

NO SCALE

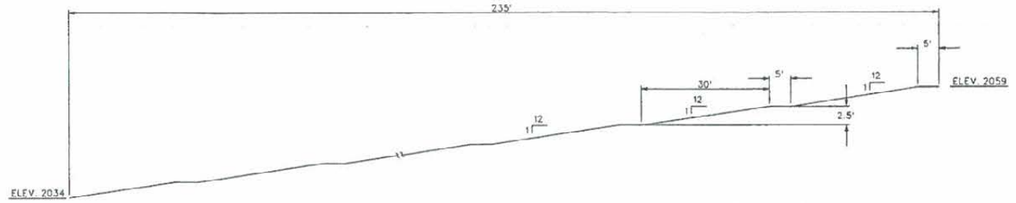
2 C-3



SECTION A-A

NO SCALE

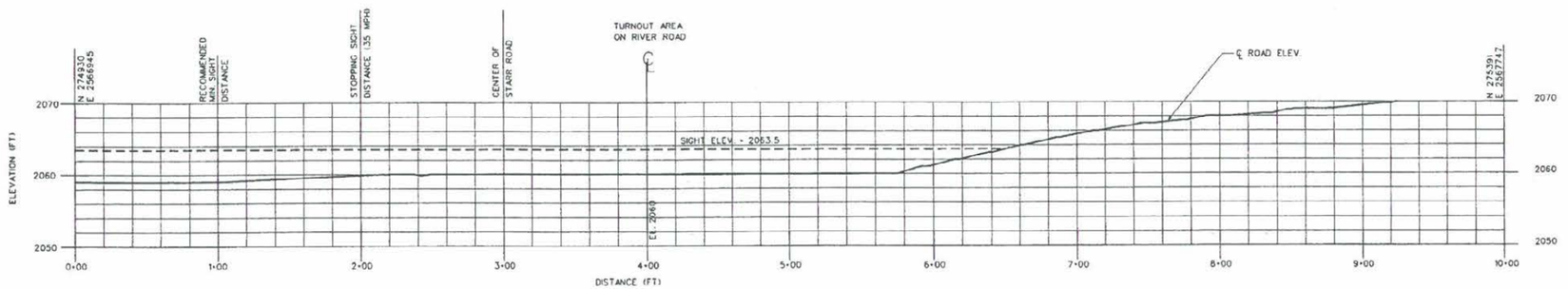
A C-2



SECTION B-B

NO SCALE

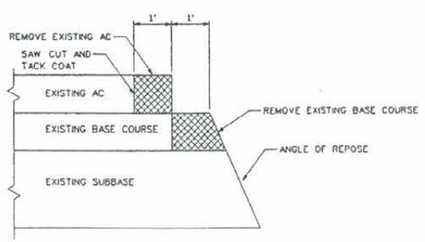
B C-2



SITE DISTANCE & STOPPING ON RIVER ROAD

NTS

C C-1



AC DETAIL

NO SCALE

1 C-3

DATE AND TIME PLOTTED: 09-JAN-2006 10:35
DESIGN FILE: I:\GROUPS\EN-DB-CO\WA REC SITE I\CIV\WAREFD0C.DGN

Computer Aided Design & Drafting

PREPARED: DENNIS A. FISCHER, PE
CHIEF — CIVIL SOILS — SECTION:

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD TURNOUT AREA DETAILS

SPOKANE COUNTY — WASHINGTON

SIZE	INVITATION NO.	FILE NO.	DATE	PLATE
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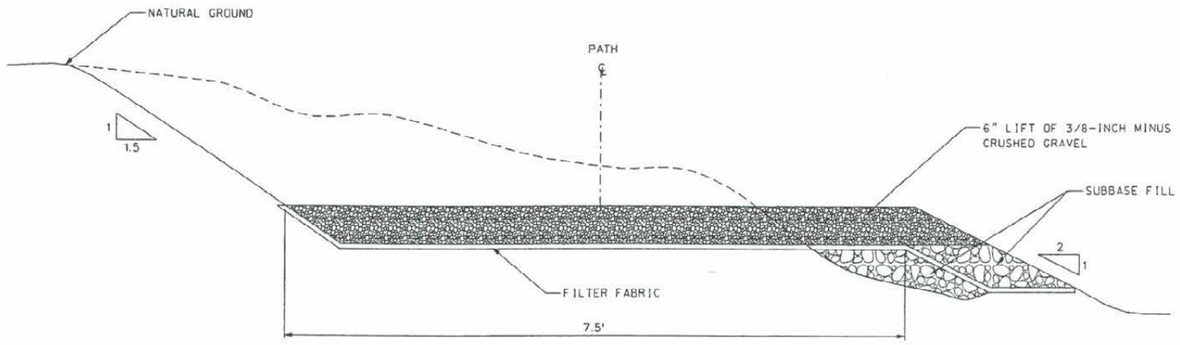
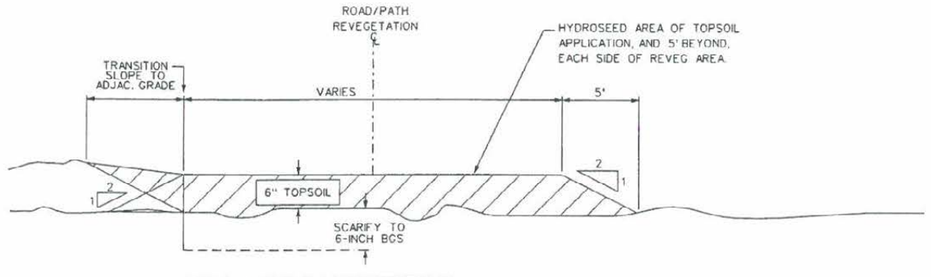
DSGN: DESJARDIN	CHK: KAISER	SHEET 6		



PERMANENT ACCESS PATHWAY

NTS

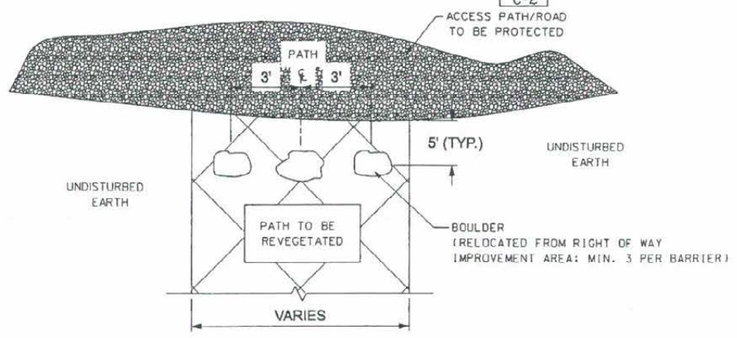
1 C-2



PATHWAY REVEGETATION

NTS

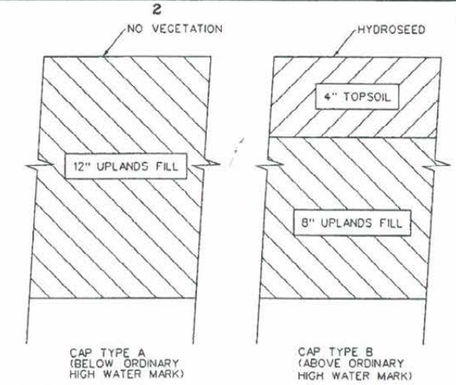
2 C-1 C-2



ROAD/PATH BARRIER

NTS

3 C-1

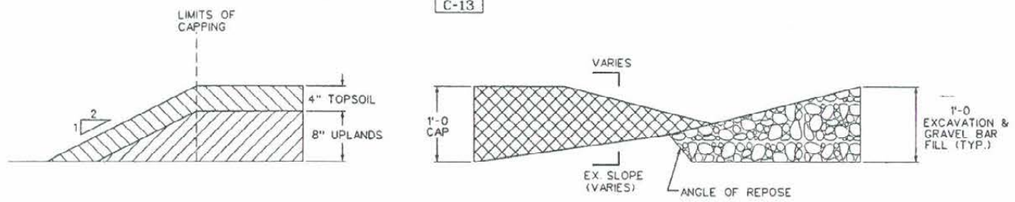


CAP DETAILS

NTS

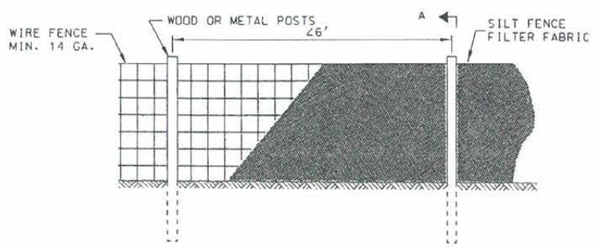
4 C-6 THRU C-13

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY



EXCAVATION & CAP TRANSITIONS (TYP.)

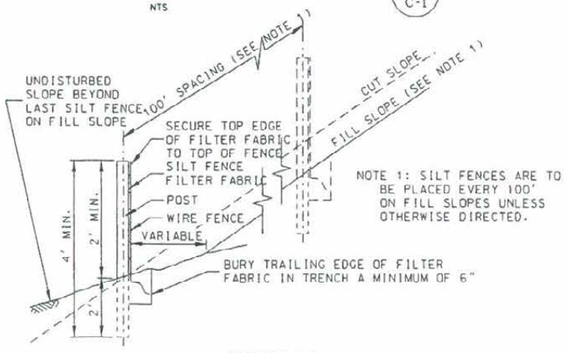
NTS



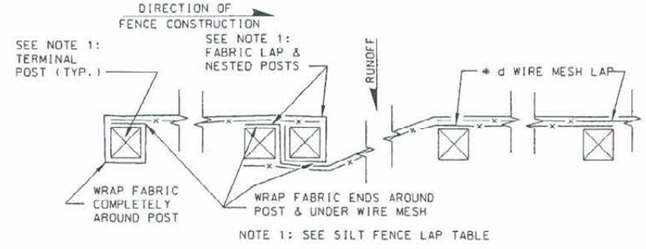
SILT FENCE

NTS

5 C-1



SECTION A-A



NOTE 1: SEE SILT FENCE LAP TABLE

SILT FENCE LAP DETAIL

NTS

SILT FENCE LAP TABLE
WIRE MESH LAP - FASTEN A DOUBLE LAP OF WIRE MESH OVER A MINIMUM OF (2) LINE POSTS.
FABRIC LAP - WRAP THE (2) FABRIC ENDS AROUND A MINIMUM OF (3) SIDES OF THE APPROPRIATE POST & BETWEEN (1) SIDE OF THE ADJACENT NESTED POST. THEN FASTEN THE (2) WIRE MESH ENDS & FABRIC OVER THE FABRIC ENDS & BOTH NESTED POSTS AS SHOWN ON THE DETAIL (WIRE MESH MUST BE SEVERED).
TERMINAL POST - WRAP THE FABRIC END COMPLETELY AROUND THE POST. THEN FASTEN THE FABRIC WIRE MESH END OVER THE FABRIC END & POST.
MODIFICATIONS - EXTEND & JOIN SILT FENCES WITH NESTED TERMINAL POSTS SIMILAR TO THE FABRIC LAP.

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DATE AND TIME PLOTTED: 09-JAN-2006 10:35
DESIGN FILE: I:\GROUPS\EN-DB-CO\WA REC SITE I\CIV\WAREFD00.DGN

COMPUTER AIDED DESIGN & DRAFTING

PREPARED: DENNIS A. FISCHER, PE
CHIEF, CIVIL SECTION

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

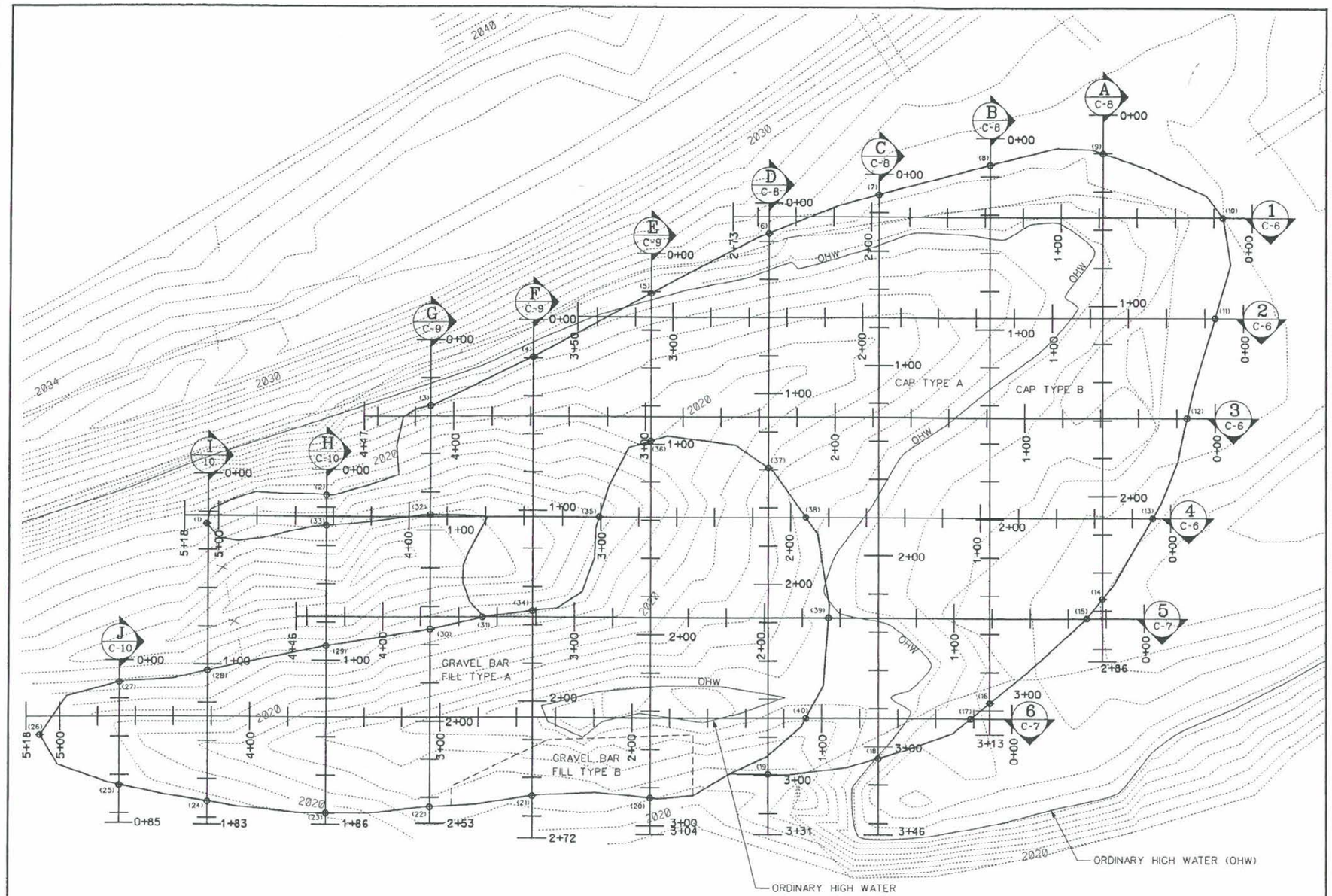
WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD PATHWAY, EXCAVATION AND CAP AREA DETAILS

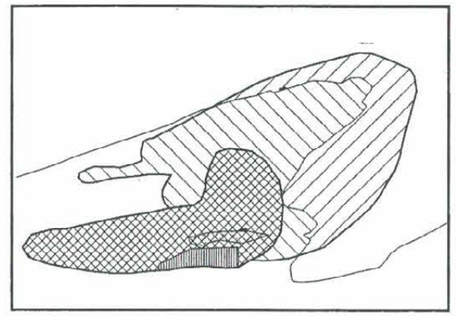
SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO.	FILE NO.	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	C-4
DSGN. DESJARDIN	CHK. KAISER	SHEET 7		

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY



KEY MAP



CAP TYPE A
CAP TYPE B
GRAVEL BAR FILL TYPE A
GRAVEL BAR FILL TYPE B

N

1" - 30' 30' 15' 0 30' 60'

SURVEY POINTS

POINT	NORTHING	EASTING	ELEV.
1	274600	2566856	2019
2	274615	2566919	2019
3	274662	2566974	2021.5
4	274688	2567027	2022
5	274721	2567089	2023
6	274753	2567151	2024.5
7	274773	2567209	2024.5
8	274789	2567267	2024.5
9	274795	2567327	2024
10	274761	2567390	2025

POINT	NORTHING	EASTING	ELEV.
11	274709	2567386	2024.5
12	274656	2567371	2024.5
13	274604	2567353	2026
14	274561	2567327	2026
15	274551	2567349	2026
16	274507	2567269	2024
17	274499	2567257	2024
18	274478	2567209	2023
19	274469	2567151	2021
20	274457	2567089	2020.5

POINT	NORTHING	EASTING	ELEV.
21	274458	2567027	2020.5
22	274452	2566974	2021
23	274449	2566919	2019.5
24	274454	2566857	2019.5
25	274443	2566810	2019
26	274489	2566768	2019
27	274517	2566810	2017.5
28	274523	2566857	2017.5
29	274536	2566919	2018
30	274545	2566974	2018.5

POINT	NORTHING	EASTING	ELEV.
31	274551	2567001	2017.5
32	274605	2566974	2016.5
33	274599	2566919	2018
34	274554	2567027	2018.5
35	274604	2567062	2018
36	274644	2567088	2020
37	274630	2567151	2020
38	274604	2567170	2021
39	274551	2567182	2022.5
40	274499	2567171	2022

DATE AND TIME PLOTTED: 09-JAN-2006 10:45
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE INCIV\WAREFD0E.DGN

Computer Aided Design & Drafting

PREPARED: DENNIS A. FISCHER, PE
DATE CIVIL SOILS SECTION

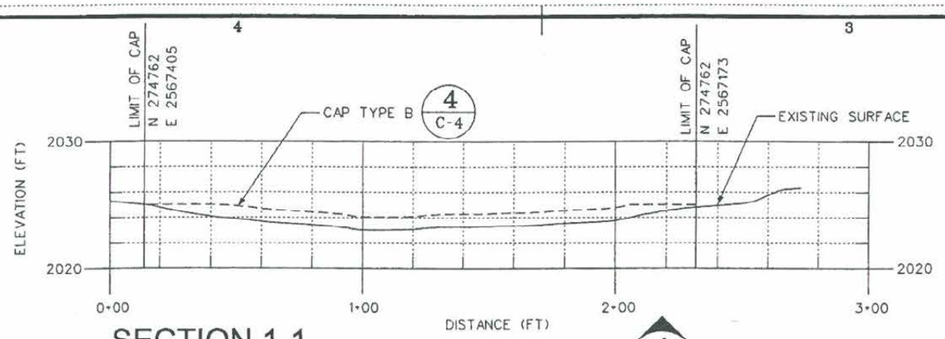
U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD EXCAVATION & CAP AREAS

SPOKANE COUNTY WASHINGTON

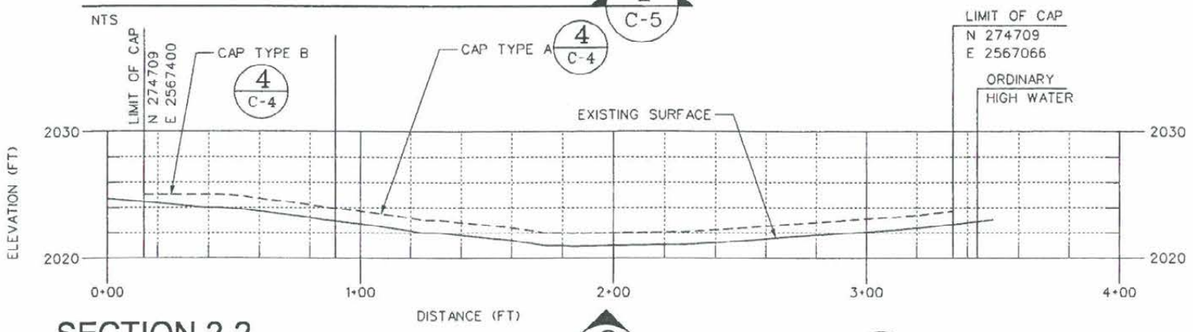
SIZE	INVITATION NO.	FILE NO	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	C-5
DSGN DESJARDIN	CHK KAISER	SHEET 8		



SECTION 1-1

1
C-5

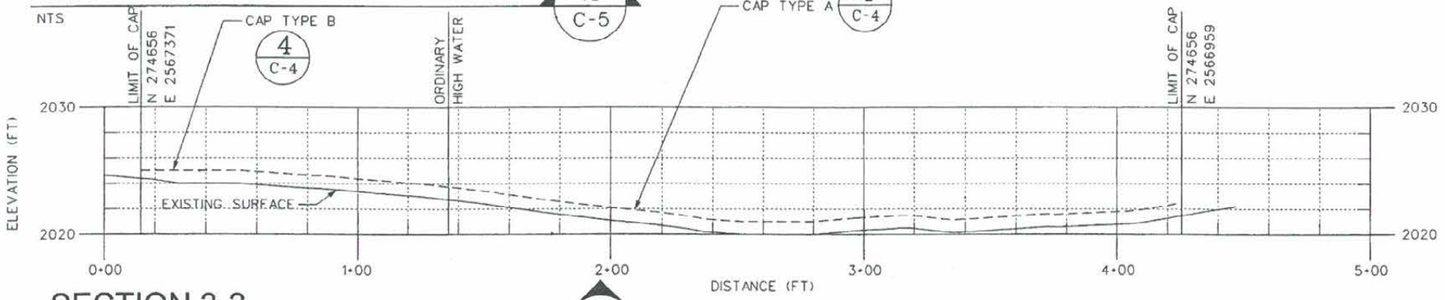
NTS



SECTION 2-2

2
C-5

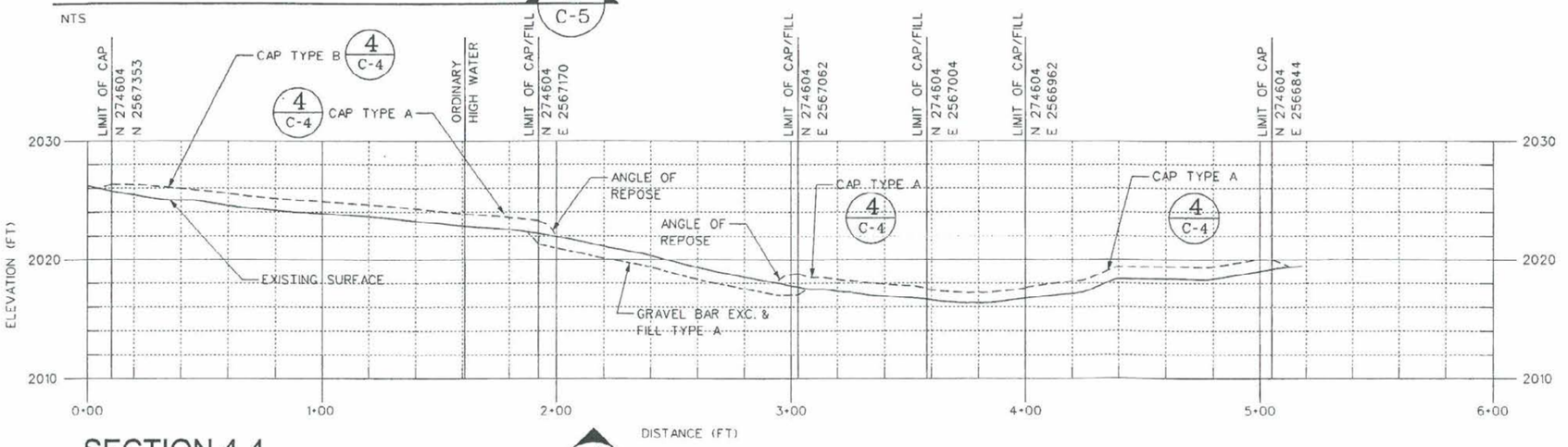
NTS



SECTION 3-3

3
C-5

NTS



SECTION 4-4

4
C-5

NTS

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

NOTE:

1. SEE PLATE C-4 FOR EXCAVATION & CAP TRANSITIONS

LINE	SURFACE
———	EXISTING SURFACE
- - - - -	EXCAV & FILL
— — —	CAP

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DATE AND TIME PLOTTED: 09-JAN-2006 10:47
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE 1\CIV\WAREF00F.DGN

COMPUTER AIDED DESIGN & DRAFTING

PREPARED: DENNIS A. FISCHER, PE
CHIEF, CIVIL DESIGN SECTION

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

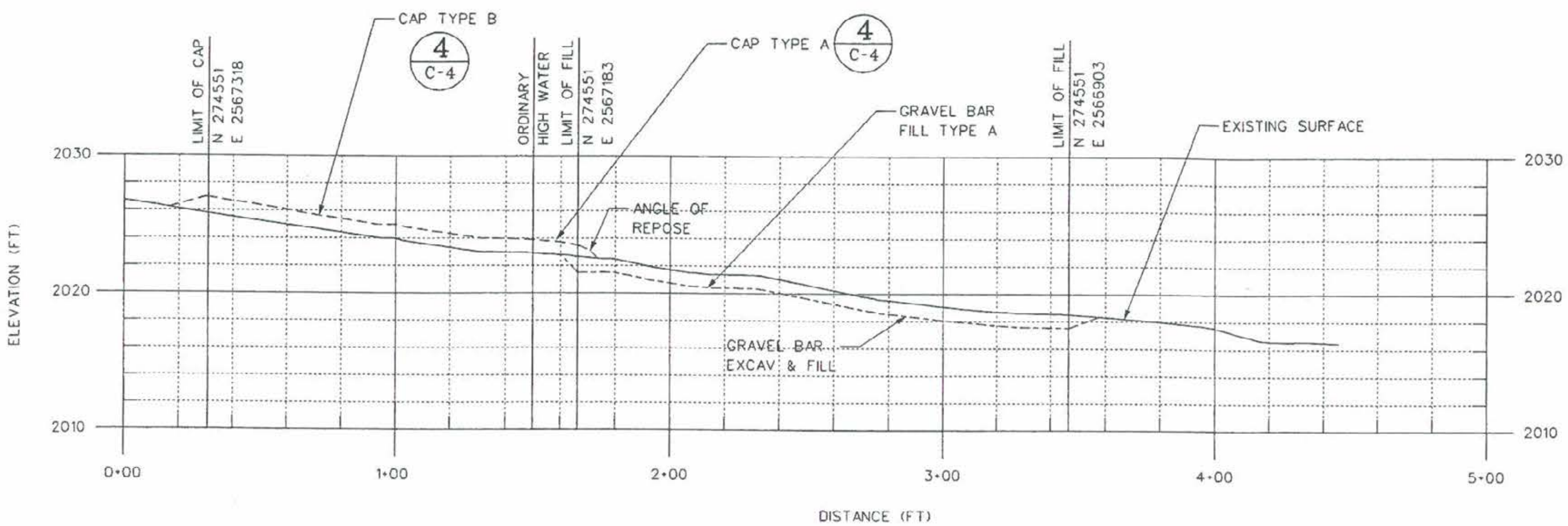
WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD EXCAVATION & CAP
AREA SECTIONS

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO	FILE NO.	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	C-6
DSGN: DESJARDIN	CHK: KAISER	SHEET 9		

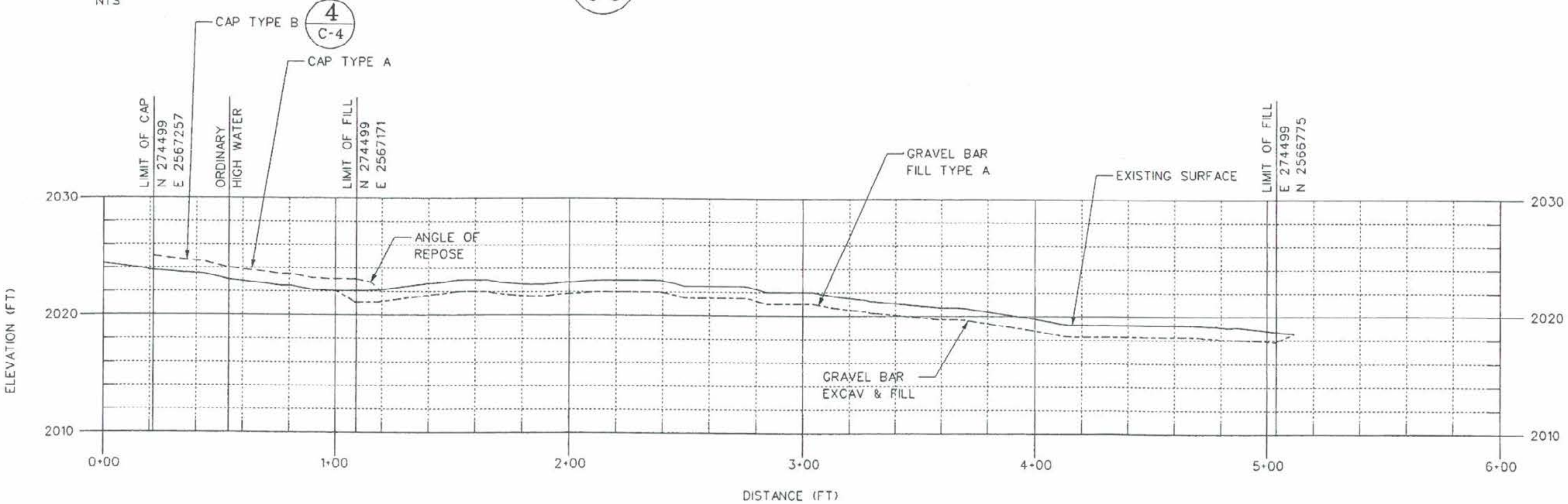
REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY



SECTION 5-5

NTS

5 / C-5



SECTION 6-6

NTS

6 / C-5

NOTE:

1. SEE PLATE C-4 FOR EXCAVATION & CAP TRANSITIONS

LINE	SURFACE
———	EXISTING SURFACE
-------	EXCAV & FILL
– – – –	CAP

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DATE AND TIME PLOTTED: 09-JAN-2006 10:48
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE I\CIV\WAREFD0G.DGN

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

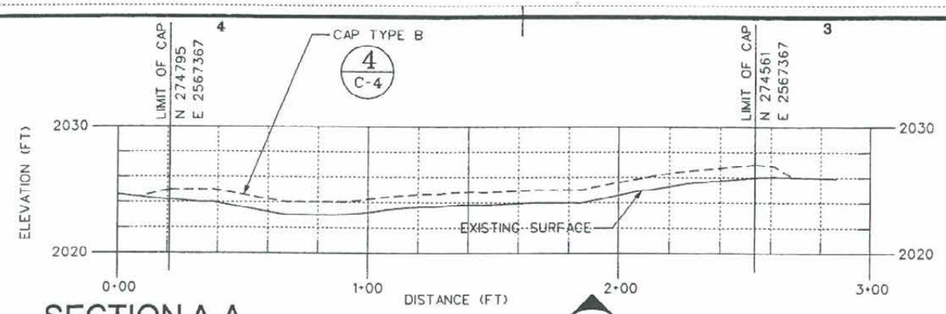
WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD EXCAVATION & CAP
AREA SECTIONS

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO	FILE NO.	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	C-7

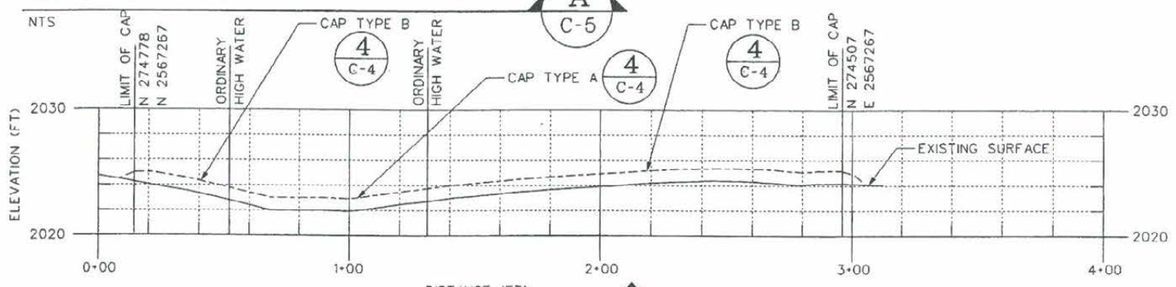
PREPARED: DENNIS A. FISCHER, PE
DSGN DESJARDIN CHK KAISER SHEET 10



SECTION A-A

NTS

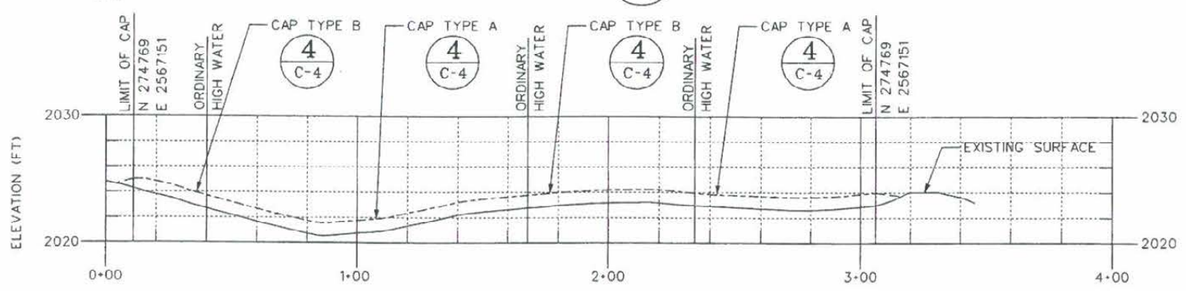
A
C-5



SECTION B-B

NTS

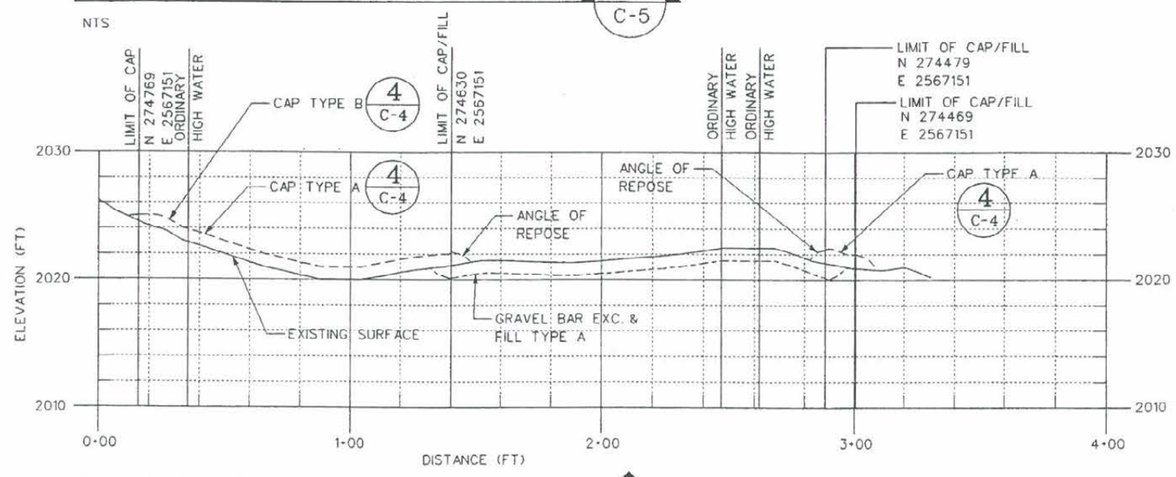
B
C-5



SECTION C-C

NTS

C
C-5



SECTION D-D

NTS

D
C-5

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

NOTE:

1. SEE PLATE C-4 FOR EXCAVATION & CAP TRANSITIONS

LINE	SURFACE
———	EXISTING SURFACE
– – – –	EXCAV & FILL
– – – –	CAP

DATE AND TIME PLOTTED: 09-JAN-2006 10:49
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE INCIV\WAREFD0H.DGN

Computer Aided Design & Drafting

PREPARED: DENNIS A. FISCHER, PE
CHIEF ____ CIVIL BASICS ____ SECTION

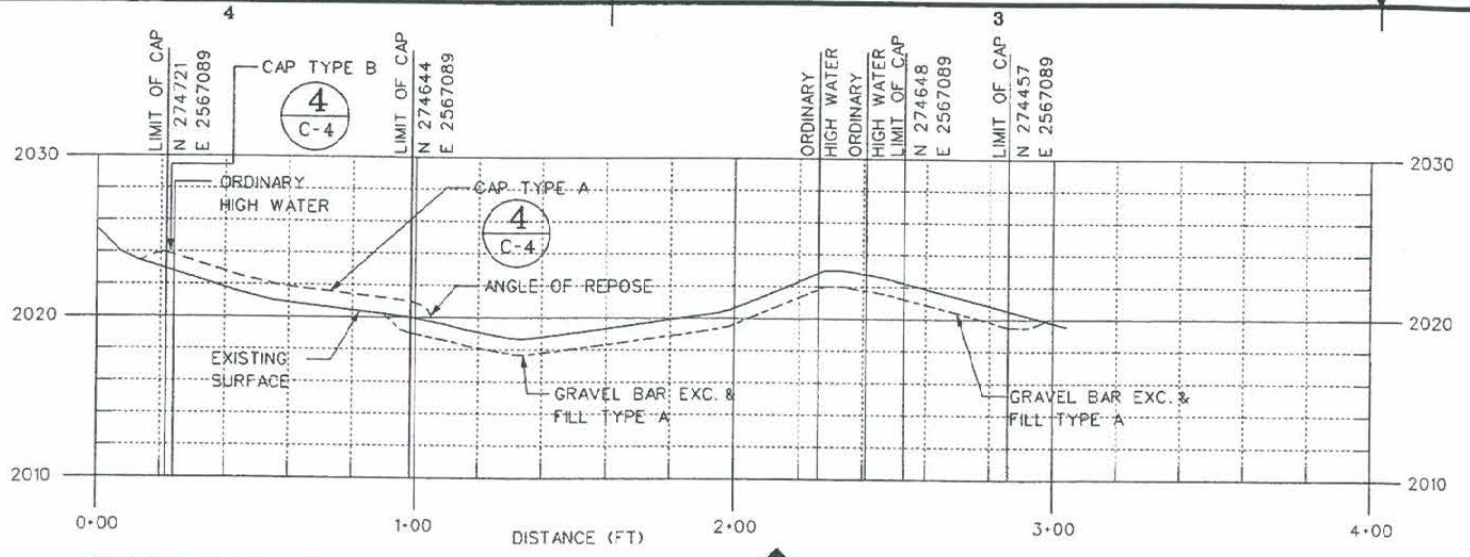
U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD EXCAVATION & CAP AREA SECTIONS

SPOKANE COUNTY WASHINGTON

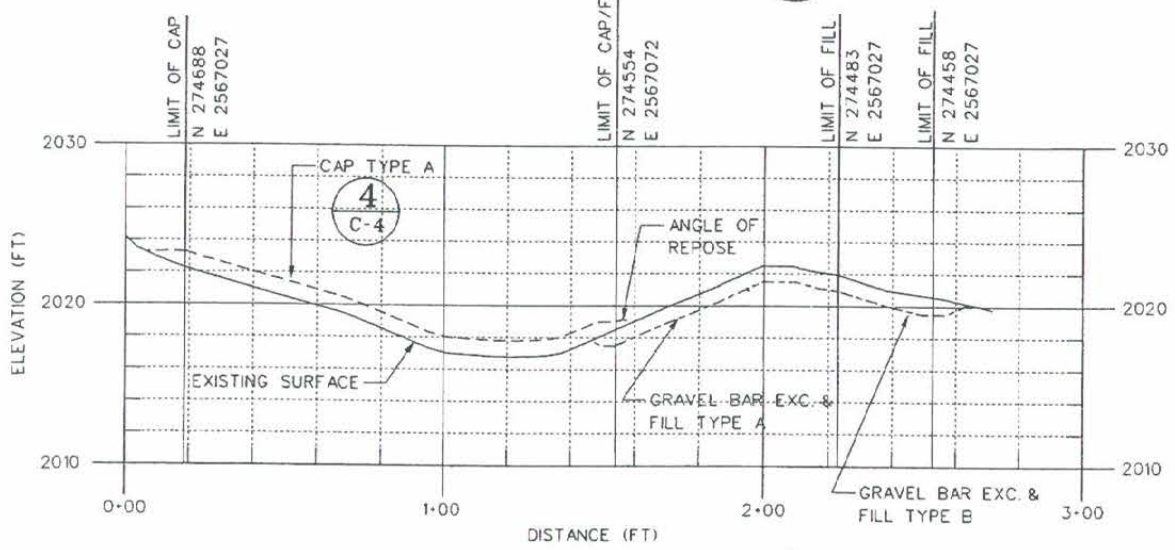
SIZE	INVITATION NO	FILE NO	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	C-8
DSGN DESJARDIN	CHK KAISER	SHEET 11		



SECTION E-E

NTS

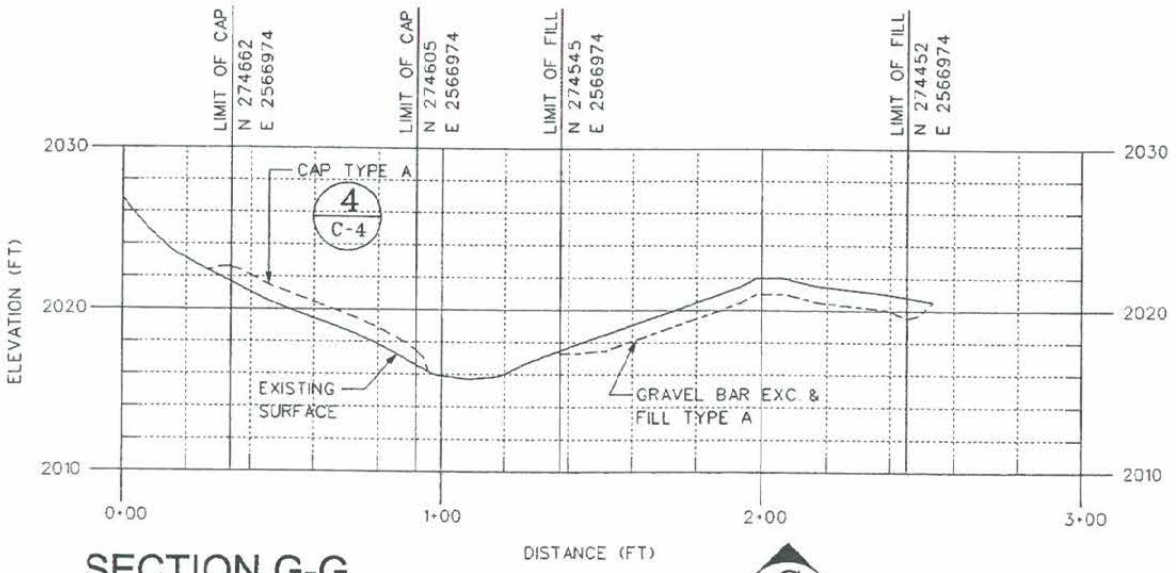
E
C-5



SECTION F-F

NTS

F
C-5



SECTION G-G

NTS

G
C-5

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

NOTE:

1. SEE PLATE C-4 FOR EXCAVATION & CAP TRANSITIONS

LINE	SURFACE
———	EXISTING SURFACE
– – – –	EXCAV & FILL
– – – –	CAP

DATE AND TIME PLOTTED: 09-JAN-2006 10:50
DESIGN FILE: I:\GROUPS\EN-DE-CD\WA REC SITE INCIV\WAREFD01.DGN

Computer Aided Design & Drafting

PREPARED:
DENNIS A. FISCHER, PE
CHIEF CIVIL DESIGN SECTION

U.S. ARMY ENGINEER DISTRICT, SEATTLE
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SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD EXCAVATION & CAP AREA SECTIONS

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO	FILE NO	DATE	PLATE
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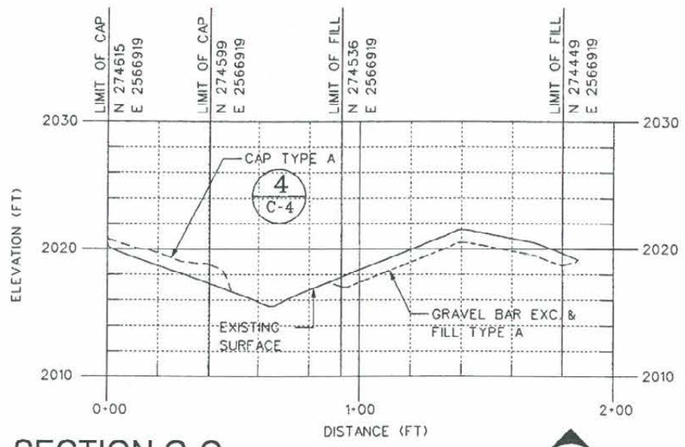
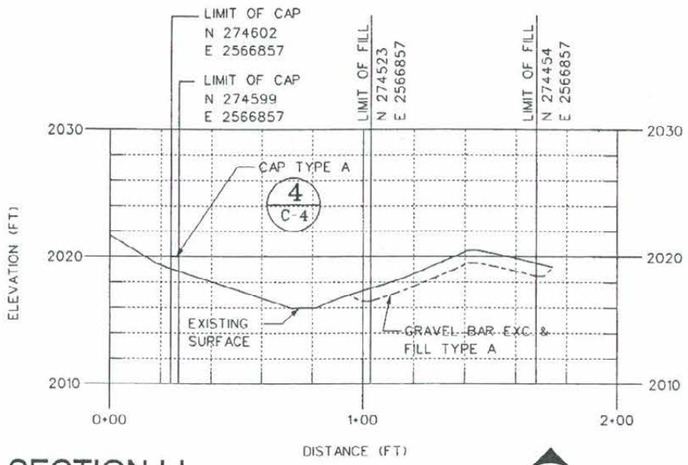
DSGN: DESJARDIN	CHK: KAISER		SHEET 12	



SECTION G-G

NTS

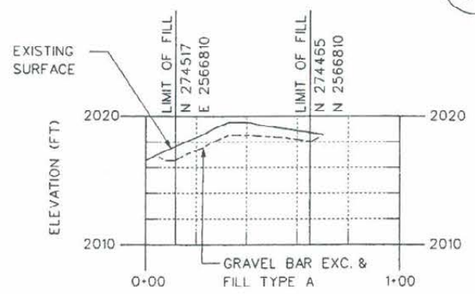
H C-5



SECTION I-I

NTS

I C-5



SECTION J-J

NTS

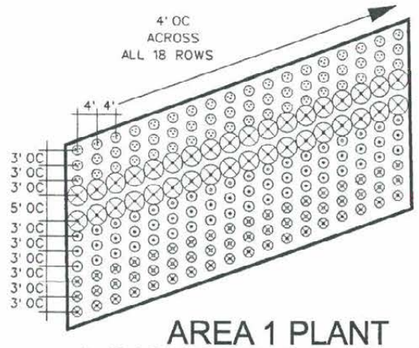
J C-5

SYM.	COMMON NAME	SPECIES NAME	PLANT SIZE	AREA #1 PLANT TOTALS	AREA #2 PLANT TOTALS
	WILD ROSE	ROSA WOODSII	1 G	54	108
	SNOWBERRY	SYMPHORICARPOS ALBUS	1 G	54	72
	GOLDEN CURRANT	RIBES AUREUM	1 G	54	72
	BLACK HAWTHORN	CRATAEGUS DOUGLASII	1 G	36	72

HOSTILE VEGETATION SCHEDULE

NTS

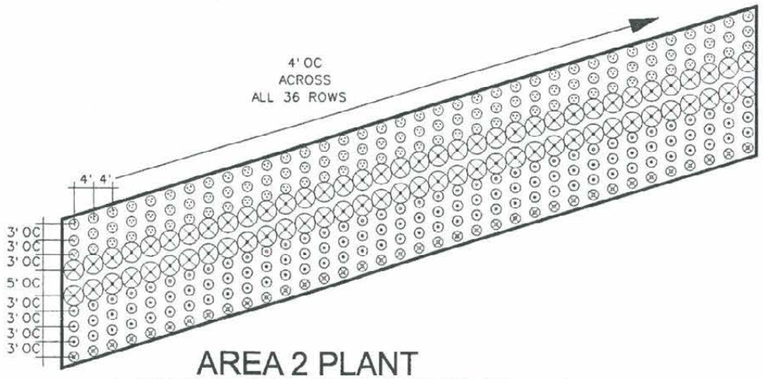
1 C-10



AREA 1 PLANT LAYOUT ON-CENTER (OC)

NTS

2 C-10



AREA 2 PLANT LAYOUT ON-CENTER (OC)

NTS

3 C-10

REVISIONS				
SYMBOL	ZONE	DESCRIPTION	DATE	BY

NOTE:

1. SEE PLATE C-4 FOR EXCAVATION & CAP TRANSITIONS

LINE	SURFACE
———	EXISTING SURFACE
- - - - -	EXCAV & FILL
– – – –	CAP
Scaled 5.0000 Times Ver.	
Scaled 1.0000 Times Hor.	

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD EXCAVATION & CAP AREA
SECTIONS AND HOSTILE VEGETATION LAYOUT

SPOKANE COUNTY — WASHINGTON

SIZE	INVITATION NO	FILE NO	DATE	PLATE
D	W912DW-06-T0002	E-21-1-9	09 JAN 06	C-10
DSGN: DESJARDIN	CHK: KAISER	SHEET 13 OF 13		

PREPARED: DENNIS A. FISCHER, PE
CHIEF — CIVIL BRICS — SECTION

DATE AND TIME PLOTTED: 09-JAN-2006 10:52
DESIGN FILE: I:\GROUPS\EN-DB-CD\WA REC SITE I\CIV\WAREF00J.DGN

Computer Aided Design & Drafting

APPENDIX 8: ENGINEERING ANALYSES

Ehlers, Harald R NWS

From: Ehlers, Harald R NWS
Sent: Tuesday, August 16, 2005 4:21 PM
To: 'Graham, Ken (PARKS)'
Cc: 'Sanga.Ravi@epamail.epa.gov'; JROL461@ECY.WA.GOV
Subject: Seed mix for Starr Road revegetation of paths and roads

Ken,

We're nearing completion on technical specifications, wanted to pass on to you the proposed seed mix for revegetation of the uplands. The seed is as follows:

30% Bluebunch Wheatgrass

20% Idaho Fescue

20% Sandberg Bluegrass

20% Slender Wheatgrass

10% Praire Junegrass

The seed will be applied at a rate of 40 pounds per acre.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
1735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

Ehlers, Harald R NWS

rom: Ehlers, Harald R NWS
ent: Friday, August 12, 2005 3:42 PM
To: 'Graham, Ken (PARKS)'; 'Sanga.Ravi@epamail.epa.gov'; 'bill.fraser@parks.wa.gov'
Cc: Cass, Lisa NWS
Subject: FW: WA Rec Site: Hostile Plant Information

Attachments: Hostile Plants.xls

Gentlemen,

We did some additional research into the "hostile vegetation" originally proposed for Starr Road and found that several weren't as appropriate as we thought. Lisa Cass has a landscaping background, researched and verified the characteristics of the plants that we are now recommending. These plants are better suited to the site conditions and will provide the deterent factor that we want along the backwater beach. Please refer to Plate C-1 of the last drawing set for the two planting locations. The drawings are posted on our ftp site: ftp://ftp.usace.army.mil/pub/nws/WA%20Rec%20Sites,%20Starr%20Road%20drawings%208-8-05/

If you have any questions, please call me.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Cass, Lisa NWS
Sent: Friday, August 12, 2005 3:20 PM
To: Ehlers, Harald R NWS
Subject: WA Rec Site: Hostile Plant Information

Hostile Plants.xls
(27 KB)

Lisa Cass
U.S. Army Corps of Engineers, Seattle District
(O) 206.764.3674 (F) 206.764.3706
Lisa.Cass@nws02.usace.army.mil

Ehlers, Harald R NWS

rom: Ehlers, Harald R NWS
ent: Monday, August 08, 2005 5:10 PM
To: 'mvance@spokanecounty.org'
Cc: 'Sanga.Ravi@epamail.epa.gov'; Desjardin, Catherine A NWS; Kaiser, Monte E NWS; Knapp, Douglas D NWS; 'Roland, John L.'; 'BGreene@spokanecounty.org'; 'PHarper@spokanecounty.org'; Katz, Daniel M NWS
Subject: FW: Spokane River Project

Attachments: SpokaneRiver.pdf

TO: Melanie Vance, Environmental Programs Coordinator, Spokane County
FROM: Harry Ehlers, USACE-Seattle District

Melanie,

I am contacting you to follow up regarding your April 14, 2005 letter to Ravi Sanga, EPA Region 10, regarding Washington State Parks and Recreation's Starr Road site located in Otis Orchards, near the intersection of Starr Road and River Road. This project has undergone some rapid changes in scope and is proceeding under an accelerated schedule toward construction. Given the coordination that is being done with the County at this time, I wanted to be sure that you were provided with substantive information about your original concerns about the Starr Road work.

(1) We are aware of your Floodplain Development Permit and Approach Permit requirements, which EPA and USACE believe are being substantively met by our design work. As a Superfund site, permits are not actually applicable but it is recognized that coordination is necessary to meet each parties needs. I'm including information that I believe answers your concerns about the floodplain and we are working with Barry Green and Pat Harper, Spokane County, regarding the approach for the current parking configuration (a pull-out on River Road).

(2) I am providing you a link to a ftp site with our latest design drawings, which show excavation/replacement and capping activities in the floodplain:

ftp://ftp.usace.army.mil/pub/nws/ , then open the folder titled "WA Rec Sites, Starr Road drawings 8-8-05"

Please note that the drawings are correctly referencing the site survey and floodplain datums, show ordinary high water mark, and 100-year floodplain elevation.

(3) A floodplain evaluation done by Doug Knapp, a USACE engineer working under the supervision of Dan Katz, PE, is enclosed below. Note that our analysis shows that capping done as part of the remediation raises the floodplain elevation by 0.15 feet for approximately 0.1 mile (530 feet) at river miles 94.9 to 95 of the Spokane River. The evaluation shows that the 500 feet of the upstream and downstream reaches affected by the capping activities are entirely within the park's properties, which have no development within or close to the 100-year floodplain. The capping activities are for human protection during the frequent low water periods on the river, so while exceeding the criteria of 0.1 feet, we do not think the capping will cause any other problems within the floodplain. We would be happy to talk with you further about this.

(4) The revised drawings show a pullout on River Road; we are discussing the approach requirements with Barry Green's staff. We are also discussing stormwater management with them. USACE believes that the small size of the pull-out will allow us to manage runoff by sheet flow to the Park's property and across its vegetated hillside that slopes south toward the river.

Please note that the Island Complex site is being withdrawn from 2005 work and will be a separate project for 2006.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Knapp, Douglas D NWS
Sent: Friday, July 15, 2005 8:22 AM
To: Katz, Daniel M NWS; Ehlers, Harald R NWS
Cc: Eriksen, Karl W NWS; Perkins, Ted E NWS
Subject: RE: Spokane River Project

Dan and Harald,

The hydraulic analysis for the Starr Road Recreation Site is complete. The maximum increase in water surface elevation was 0.15 feet, exceeding the 0.10-foot permit guideline. A brief memo has been attached to explain the procedure used for the analysis. Please let me know if you have any questions, and how you would like to proceed. Thanks,

Doug

SpokaneRiver.pdf
(179 KB)

Douglas D. Knapp, EIT
Seattle District Army Corps of Engineers
PO Box 3755, Seattle, WA 98124
4735 E Marginal Way S, Seattle, WA 98134
Tel: (206)764-3542 Fax: (206)764-6678
douglas.d.knapp@usace.army.mil

MEMORANDOM FOR FILE: 14 July 2005

PROJECT: Washington State Recreation Site, Starr Road
SUBJECT: Preliminary Hydraulic Analysis
PREPAIRED BY: Douglas D. Knapp, CENWS-EC-TB-HE, 206-764-3542

1. General. The plan for the Starr Road Recreation Site is to cap a 77,000 sq. ft. area of contaminated sediment with one foot of rock fill. The area is 250 feet wide at its widest point and extends 450 feet along the right bank of the Spokane River. The permit guidelines indicate that the 100-yr floodplain elevation should not be increased more than 0.1 feet.

2. Existing Data. A hard copy of the original FIS study output data was provided by FEMA's contractor, Baker Engineering, in HEC-2 format. The HEC-2 model covers approximately 15 miles (RM 81.0 to 96.3) of the Spokane River from the Washington-Idaho border through the City of Spokane. The Starr Road Recreation Site fill area is located between RM 94.8 and RM 94.9.

3. Procedure. A 3-mile section (RM 92.8 to RM 95.9) of the HEC-2 model was input into HEC-RAS. Using the original hydrology, the model was calibrated to match the 100-yr water surface elevation of the FIS study (see Figure 1). The geometry of the calibrated model was adjusted to reflect the conditions of one foot of fill over the Starr Road site. Figure 2 shows the increase in bed elevation at four cross sections.

Figure 1: Model Calibration.

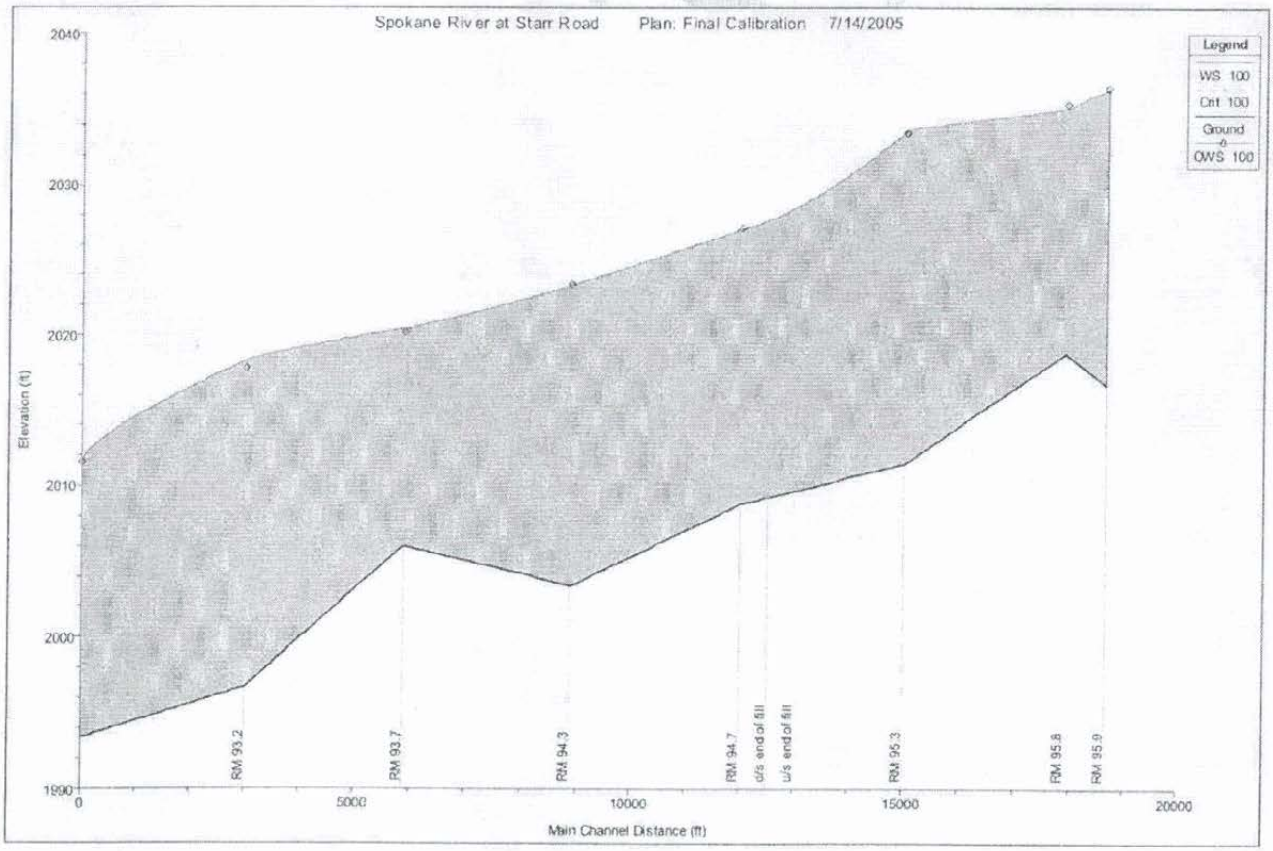
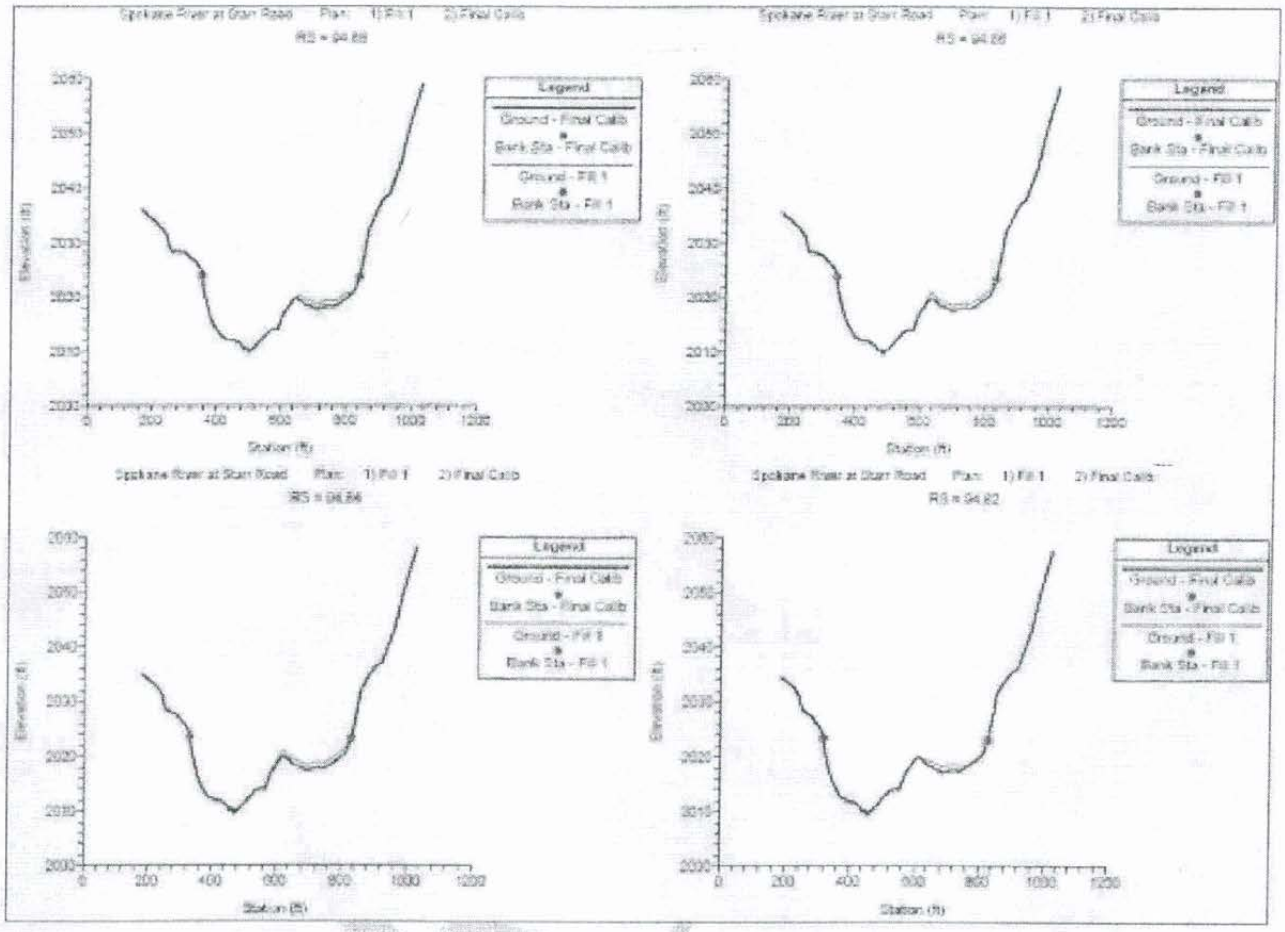
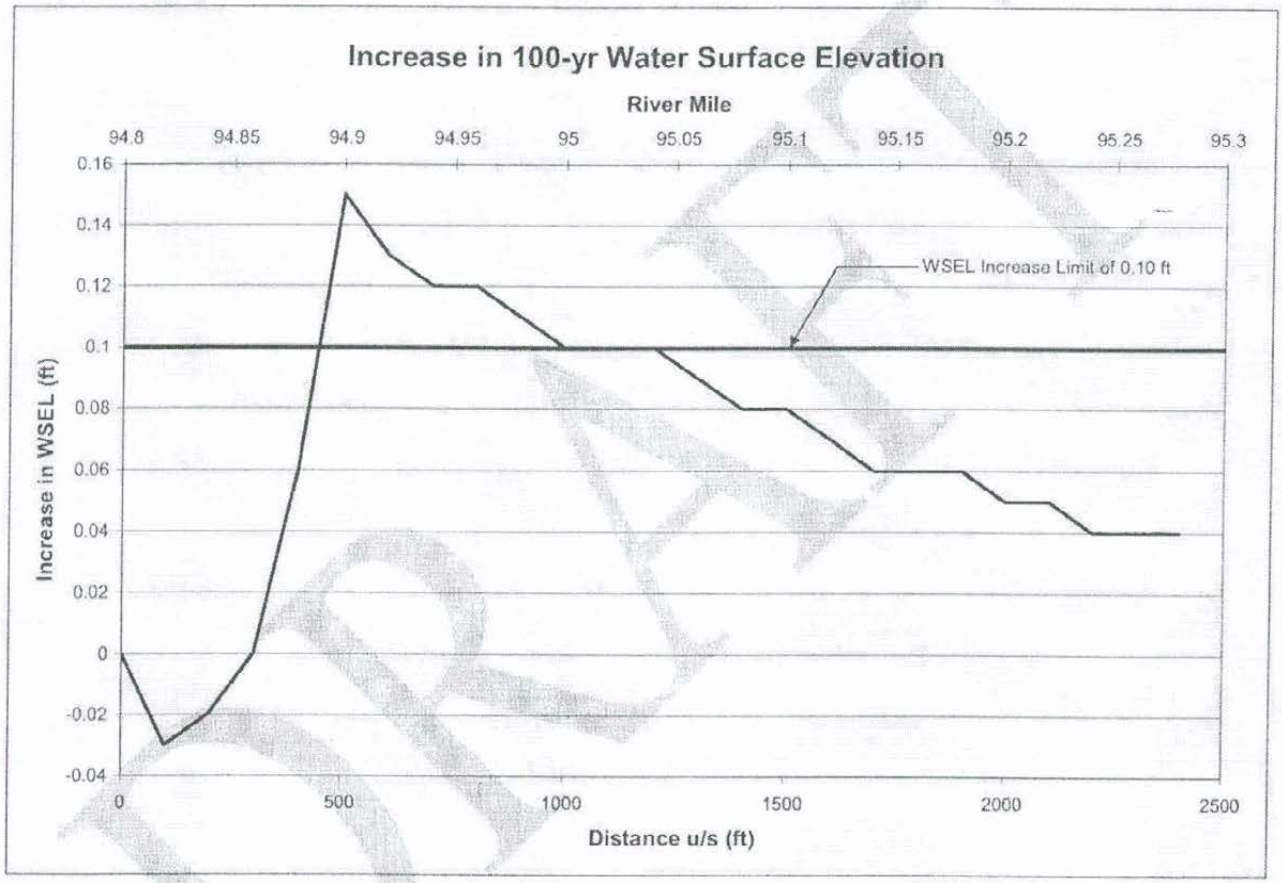


Figure 2: One Foot Increase in Bed Elevation for Cap at Starr Road Recreation Site.



4. Results. The maximum increase in the 100-yr water surface elevation was 0.15 feet, which occurred at RM 94.9. The increase in the 100-yr water surface elevation exceeded 0.10 feet from RM 94.9 to RM 95.0. Figure 3 shows the increase in the 100-yr water surface elevation from the downstream end of the project (RM 94.8) to 2500 feet upstream (RM 95.26).

Figure 3: Increase in WSEL Extending 2500 feet from Downstream end of Site.



5. Conclusion. Options to reduce the increase in the 100-yr water surface elevation include: 1) reduce cap height, 2) decrease cap area, or 3) excavate and cap.

Douglas D. Knapp, EIT
CENWS-EC-TB-HE

Ehlers, Harald R NWS

From: Ehlers, Harald R NWS
Sent: Tuesday, July 26, 2005 8:51 AM
To: Fink, Richard E NWS; Desjardin, Catherine A NWS; 'twdewey@ems.att.com'
Cc: Brandt, Bradley R NWS
Subject: RE: Fiber optic Cable at Starr Road - Wa Rec Sites

Attachments: Picture (Metafile); Picture (Metafile); Picture (Metafile); Picture (Metafile); Picture (Metafile)

Rich,

Thanks for checking the site and taking photos.

Cathy,

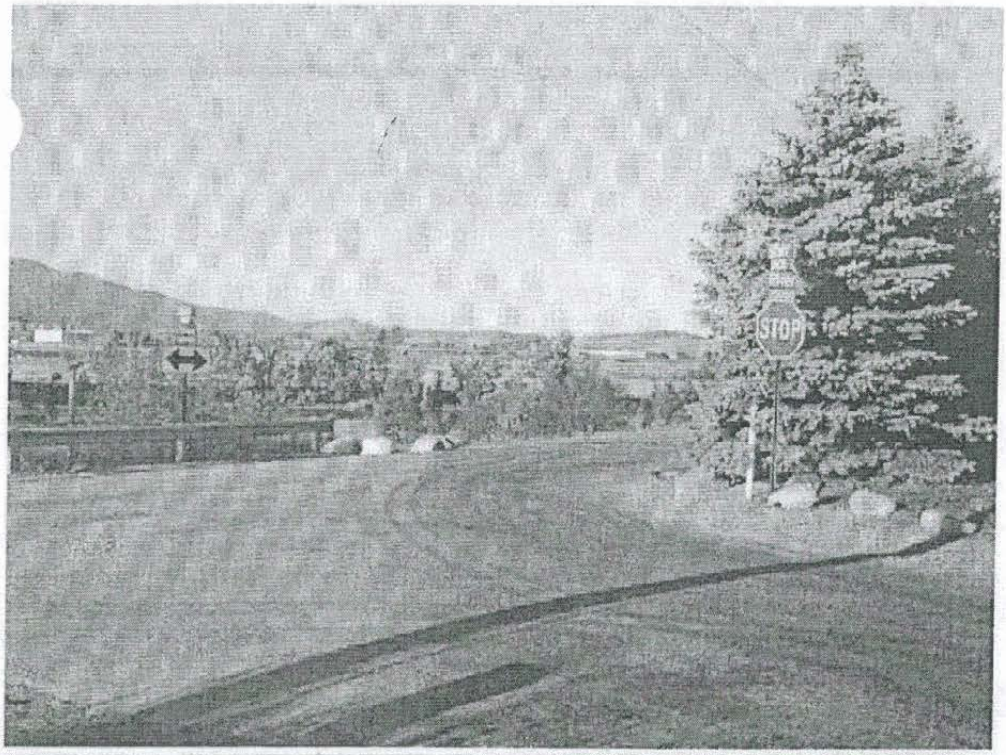
I called Tom Dewey at AT&T (509/994-1255) to confirm what we're seeing in the photos. Tom confirmed there are 2 fiber optic cables - one on the south side of the road (the wood post just behind the guard rail in Rich's first photo) that runs parallel to River Road and a second cable on the north side of the road (the newer white plastic markers in the remainder of Rich's photos) that also runs parallel to the road. **The cable on the south side does not run south toward the river, so no conflict with the excavation/capping on the river shoreline.**

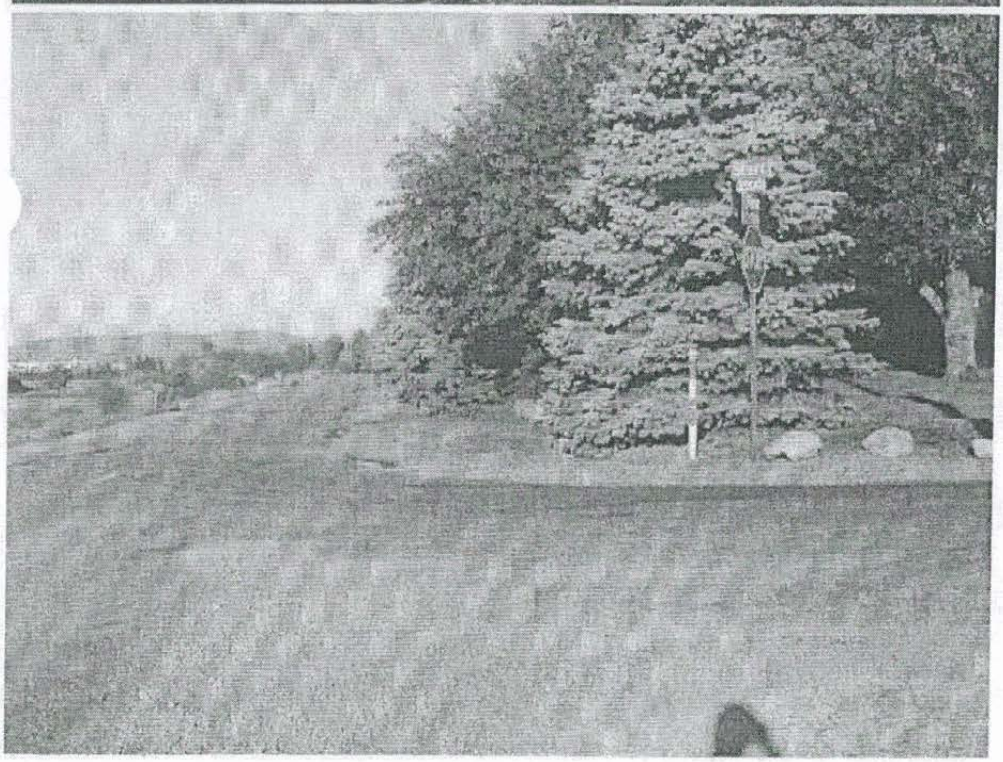
Our construction of the paved pull-out on River Road will be over the top of the cable. I asked Tom Dewey approximate depth - says it's about 4 feet bgs; cautioned me that AT&T will need someone onsite to observe our contractor when do the excavation in this area. Please note this in the drawing notes.

Tom, thanks for your help. If there is anything else we should be aware, appreciate your input.

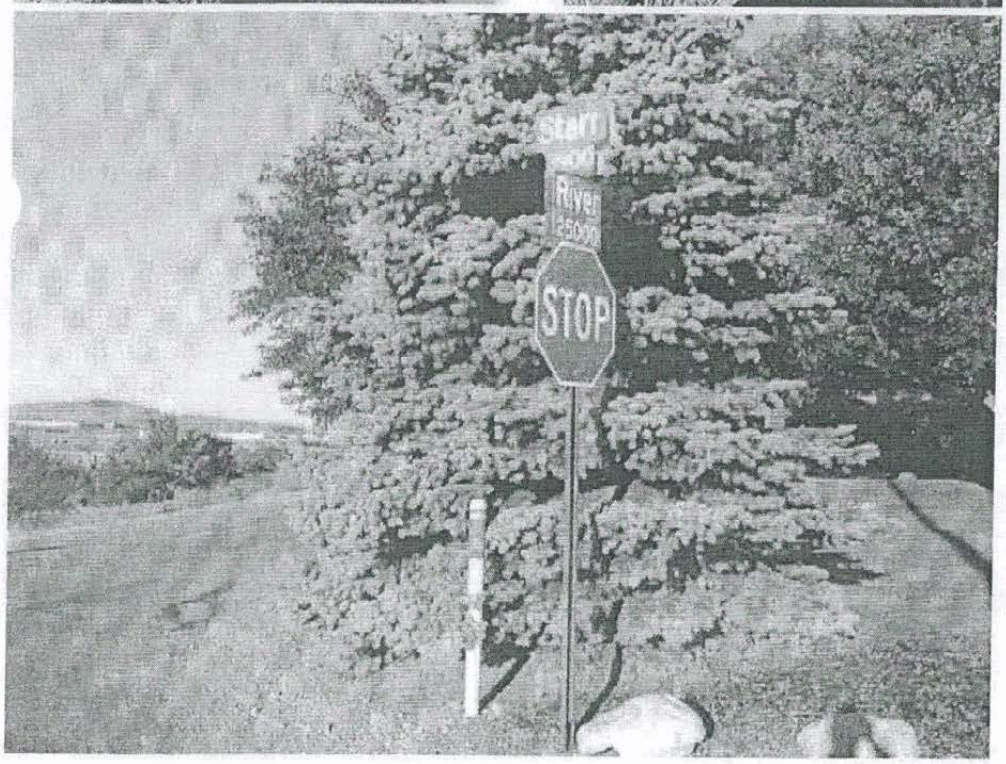
Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Fink, Richard E NWS
Sent: Tuesday, July 26, 2005 7:43 AM
To: Ehlers, Harald R NWS
Cc: Desjardin, Catherine A NWS; Bradley Brandt (Bradley.R.Brandt@nws02.usace.army.mil)
Subject: RE: Fiber optic Cable at Starr Road - Wa Rec Sites


STOP




WARNING
AT&T
CALL


STOP

Richard Fink, P.E.

Resident Engineer
Eastern Environmental Res. Ofc.
(208)762-5915 ext. 222
(208)762-5905 fax

From: Ehlers, Harald R NWS
Sent: Monday, July 25, 2005 1:43 PM
To: Fink, Richard E NWS
Cc: Desjardin, Catherine A NWS
Subject: FW: Fiber optic Cable at Starr Road - Wa Rec Sites
Importance: High

Rich,

Thanks for agreeing to check on the cable and take a couple digital photos on Tuesday morning.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Desjardin, Catherine A NWS
Sent: Monday, July 25, 2005 10:41 AM
To: Ehlers, Harald R NWS
ubject: Fiber optic Cable
nportance: High

Harry, AT & T owns the cable. Tom Dewey (sp) has located and marked the cable on the shoreward side of River Road.

Tom's number is 509-994-1255 if Brad needs to contact him.

Cathie

Ehlers, Harald R NWS

From: Desjardin, Catherine A NWS
Sent: Friday, July 15, 2005 8:03 AM
To: Ehlers, Harald R NWS
Cc: Kaiser, Monte E NWS
Subject: FW:
Attachments: wa rec site 3.JPG

Harry, Monte has pictures that show there in no guardrail where we are working. The only existing guardrail is at the end of Starr Road.

I'll get back to Pat and Barry with this information. Do you have anything to add about the guardrail other than it will be done by Ecology?

Cathie

From: Harper, Pat [mailto:PHarper@spokanecounty.org]
Sent: Thursday, July 14, 2005 10:14 AM
To: Desjardin, Catherine A NWS
Cc: Greene, Barry
Subject: RE:

Cathie, I just met with Barry Greene our Traffic Engineer. Based on his review he wanted to emphasize that if you effect the existing guardrail in anyway you will need to replace the entire length with current guardrail improvements. Secondly, your contractor will need to obtain an approach permit, Barry could not ascertain from the plans you sent what the sight distance would be from your proposed entrance. If you have a better set of plans could you send them to BGreene@spokanecounty.org.

From: Desjardin, Catherine A NWS [mailto:Catherine.A.Desjardin@nws02.usace.army.mil]
Sent: Tuesday, July 12, 2005 4:34 PM
To: Harper, Pat
Cc: Ehlers, Harald R NWS
Subject:
Importance: High

Pat, have you had a chance to look at the drawings yet? We look forward to your input.

We are planning to submit the final plans to our customer sometime this week.

Let me know if you have any questions.

Thank you,

Cathie DesJardin
206-764-3452 desk
206-909-7937 cell

Ehlers, Harald R NWS

From: Ehlers, Harald R NWS
Sent: Wednesday, July 06, 2005 11:47 AM
To: 'divenkad@dfw.wa.gov'
Subject: FW: Wash Rec Site - Starr Road: geotechnical samples from Gravel Bar

Attachments: June 16, 2005 sampling locations.pdf; June 16, 2005 geotech sample results .pdf; Revised gradations for replacement.pdf

Karin,

I sent the following information to Bruce Heiner. Hope to resolve the replacement material specifications soon. Note that I have a detailed survey of the bar area now, and can address the concerns of matching existing topography in the bar when we replace the material.

Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Ehlers, Harald R NWS
Sent: Wednesday, July 06, 2005 11:44 AM
To: 'heinebah@dfw.wa.gov'
Cc: Kaiser, Monte E NWS; 'Sanga.Ravi@epamail.epa.gov'; 'JROL461@ECY.WA.GOV'
Subject: FW: Wash rec site

Bruce,

I have lab results from the June 16 geotechnical sampling on Starr Road's bar area. I'm forwarding the following to you and will be calling to discuss with you shortly:

- The sample locations are shown on this drawing.

June 16, 2005 sampling locatio...

- The laboratory reports are in this file.

June 16, 2005 geotech sample r...

- Monte Kaiser has update the gradation specifications previously discussed with you for the bar.

Revised gradations
for replace...

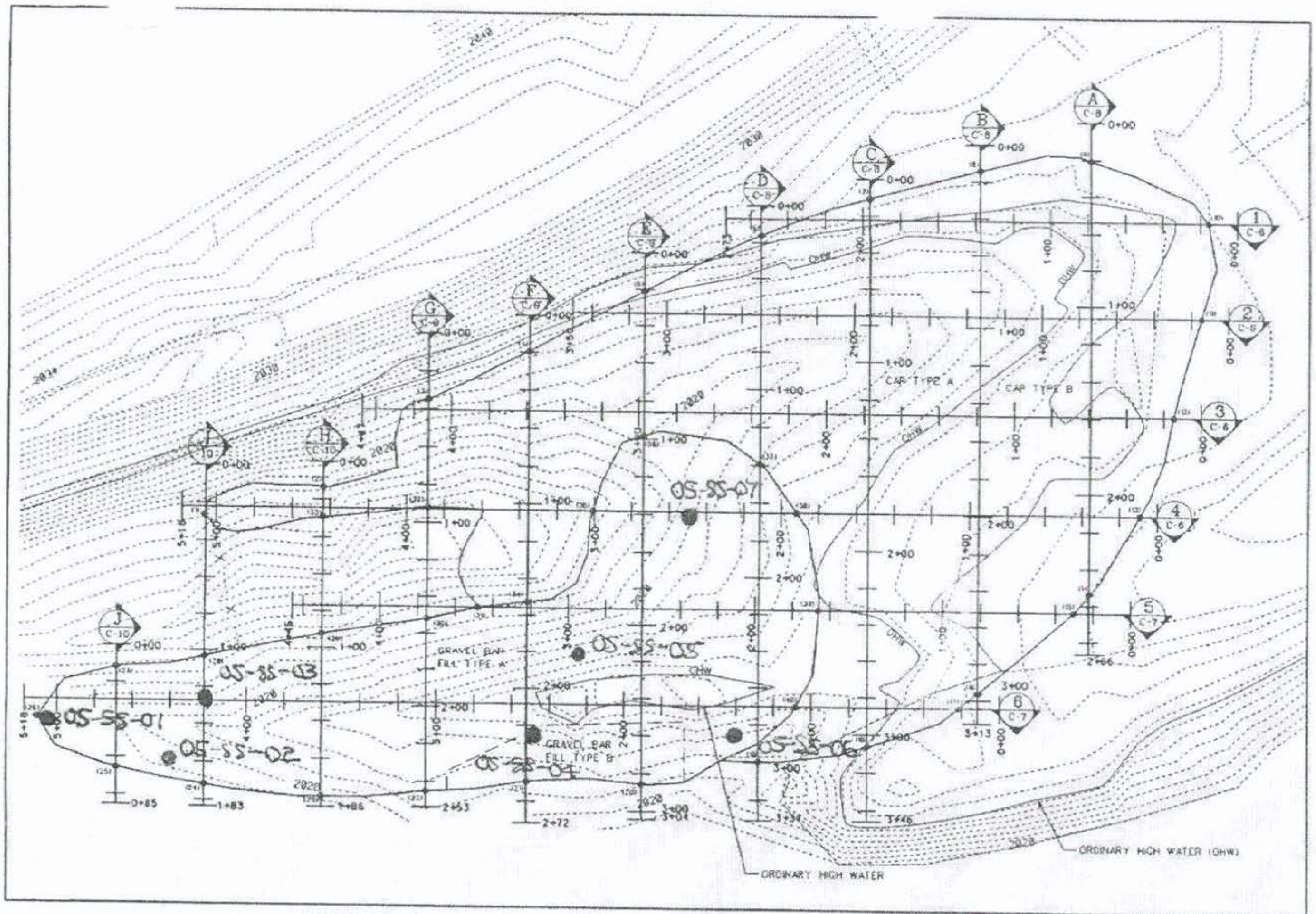
Bruce, based on this information, we think that a single gradation range would be appropriate for the entire removal area (about 1 acre, 1,500 cubic yards) in the gravel bar. The uplands gradation information is also provided, too. Please take a look and let us know what you think about the approach.

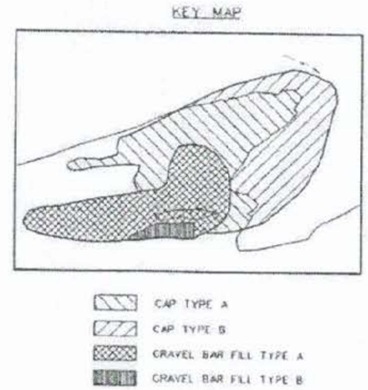
Harry Ehlers, PE, Project Manager
US Army Corps of Engineers, Seattle District
P.O. Box 3755, CENWS-PM-EM
4735 E Marginal Way S, Seattle, Washington 98124-3755
206/764-6712 (dir.), 206/764-3706 (fax)
harald.r.ehlers@usace.army.mil

From: Kaiser, Monte E NWS
Sent: Wednesday, July 06, 2005 10:49 AM
To: Ehlers, Harald R NWS
Subject: Wash rec site

Harry, with the exception of sample #6 all the gradations fall very close to the band of gradations we used for the gravel bar site. I can expand the gradation slightly to include almost all points but would recommend excluding the very coarse grading of sample #6.

Monte





N

1" = 30' 30' 15' 0 30' 60'

SURVEY POINTS

POINT	NORTHING	EASTING	ELEV.
1	274566	2566074	2019
2	274615	2566890	2019
3	274682	2566974	2021.5
4	274688	2567027	2022
5	274721	2567086	2023
6	274760	2567161	2024.3
7	274775	2567289	2024.1
8	274786	2567287	2024.5
9	274795	2567377	2024
10	274781	2567390	2023

POINT	NORTHING	EASTING	ELEV.
11	274709	2567398	2024.5
12	274616	2567371	2024.5
13	274664	2567353	2026
14	274561	2567327	2026
15	274503	2567348	2026
16	274507	2567268	2024
17	274498	2567227	2024
18	274476	2567209	2023
19	274469	2567161	2021
20	274457	2567089	2020.5

POINT	NORTHING	EASTING	ELEV.
21	274458	2567027	2020.5
22	274452	2566971	2021
23	274448	2566819	2018.5
24	274454	2566857	2018.5
25	274443	2566810	2019
26	274489	2566764	2018
27	274507	2566810	2017.5
28	274523	2566857	2017.5
29	274534	2566919	2018
30	274545	2566971	2018.5

POINT	NORTHING	EASTING	ELEV.
31	274551	2567001	2017.5
32	274605	2566974	2016.5
33	274598	2566919	2016
34	274554	2567027	2016.5
35	274681	2567062	2018
36	274844	2567068	2020
37	274839	2567151	2020
38	274684	2567170	2021
39	274551	2567182	2022.5
40	274495	2567771	2022

● SOIL GRADATION SAMPLES COLLECTED
JUNE 16, 2005

REVISIONS

SYMBOL	ZONE	DESCRIPTION	DATE	BY

REDUCED TO 60% OF FULL SIZE

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS

WASHINGTON RECREATION SITES
STARR ROAD

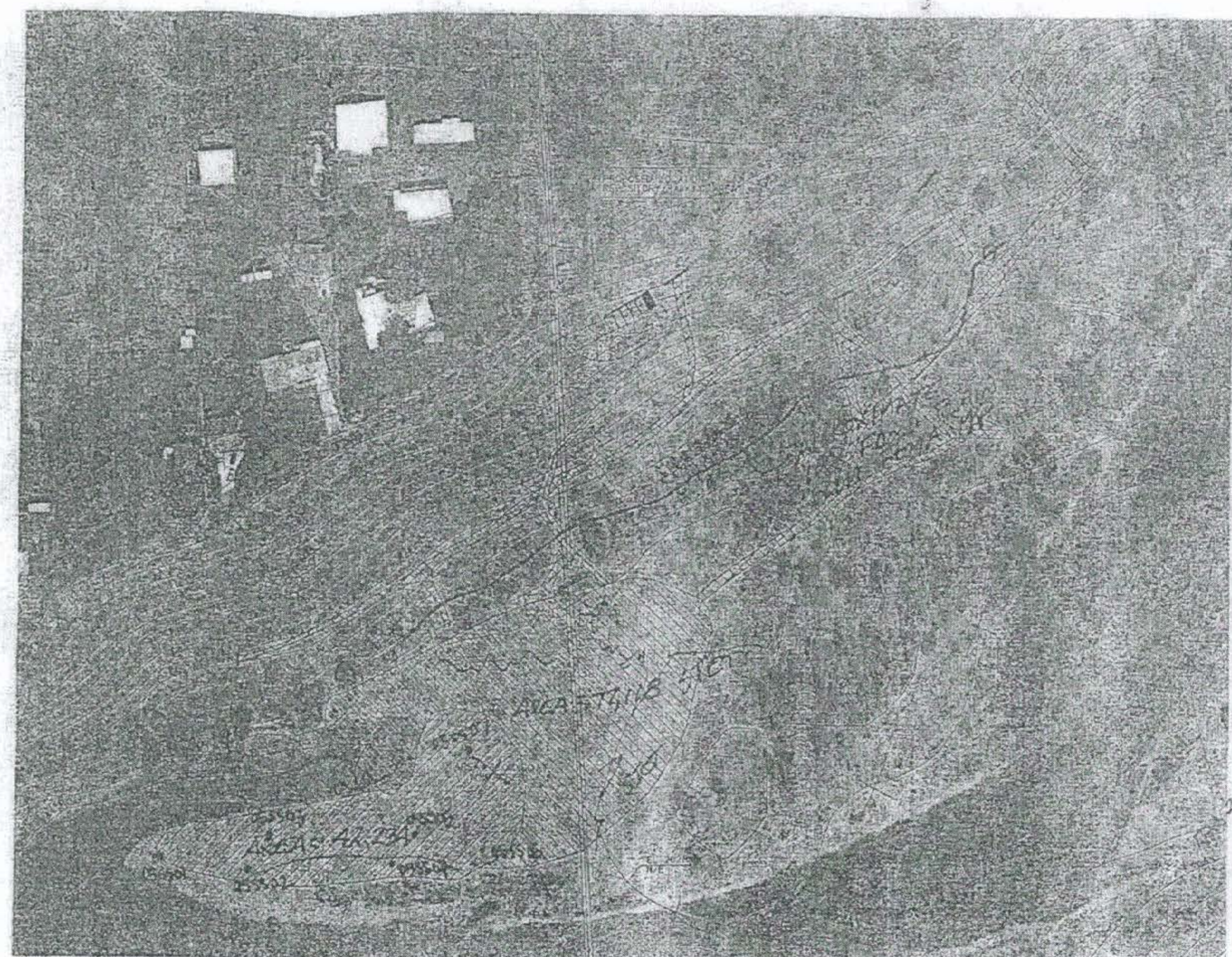
STARR ROAD EXCAVATION & CAP AREAS

SPOKANE COUNTY WASHINGTON

SIZE	INVITATION NO.	FILE NO.	DATE	PLATE
D	W912DR-05-T0004	E-21-1-9	17 AUG 00	C-5
DESJARDIN	KAISER			

DENNIS A. FISCHER, P.E.

DATE AND TIME PLOTTED: 30-AUG-2005 15:30
DESIGN FILE: J:\GROUPS\EN-DB-CD\WA REC SITES\CIV\WAREFDOE.DGN



REVISIONS

SYMBOL	ZONE	DESCRIPTION	DATE	BY

N

LEGEND

- BOULDERS AROUND PARKING LOT
- ROAD BLOCKED OFF
- PATH TO BE REVEGETATED
- DESIGNATED PATH CAPPED WITH CLEAN MATERIAL
- E — OVERHEAD UTILITY WIRES
- EXCAVATION & CAP
- CAP ONLY

1. PATHS TO BE REVEGETATED: SCARIFIED TO 4-INCH DEPTH, CAPPED WITH 8-INCH LIFT OF TOPSOIL AND HYDROSEEDED WITH NATIVE BLEND OF GRASSES.

2. DESIGNATED PATHS: COVERED WITH FILTER FABRIC (MIRAFI 700X OR EQUIVALENT) AND CAPPED WITH 8-INCH LIFT OF 2-INCH MINUS CRUSHED ROCK FOR 7.5' FOOT WIDTH.

~~3. REMOVE MATERIAL FROM TOP OF EXCAVATION SITE AND~~ TRANSPORT TO REPOSITORY/PARKING AREA.

3 ~~4.~~ EXCAVATION & CAP AREA: REMOVE SOILS AND SEDIMENT TO 1-FOOT BELOW EXISTING GROUND SURFACE. BACKFILL WITH ~~IMPORTED CLEAN FILL~~ TO ORIGINAL ELEVATION. UPLANDS GRADATION & GRAVEL BAR GRADATION

4 ~~5.~~ BACKFILL W/ TOP ~~CLEAN~~ FILL IN CAP AREA ONLY.

5 ~~6.~~ NO FORMAL PROPERTY BOUNDARY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT. TOPOGRAPHY IS BASED ON ORTHORECTIFIED AERIAL PHOTOGRAPH IMAGES OF SPOKANE, WASHINGTON, TAKEN BETWEEN JUNE 4, 2003, AND SEPTEMBER 13, 2003. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83). VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). AVAILABLE SURVEY INFORMATION IS FURNISHED AS REFERENCE DRAWINGS R1 THROUGH R__. SEE TABLES ON C2 FOR GRADATION

6 ~~7.~~ FEMA 100 YEAR FLOOD PLAN ELEVATION VARIES FROM 2,027 TO ~~2029~~ 2024 FEET. (NATIONAL FLOOD INSURANCE PROGRAM - FLOOD INSURANCE RATE MAP COMMUNITY PANEL NO. 530174-0310 E, PANEL 310 OF 625, SEPT. 30, 1992) NGVD '29 DATUM

1" = 80' 60' 30' 0 80' 120'

REDUCED TO 50% OF FULL SIZE

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD SITE PLAN

SPOKANE | WASHINGTON

SIZE			DATE	PLATE
D			4 MAR 05	C-1
				3 OF 5

DATE AND TIME PLOTTED: 10-MAY-2005 10:34

GeoEngineers

523 E. Second Avenue, Spokane, WA 99202, Telephone: (509) 363-3125, Fax: (509) 363-3126 www.geoengineers.com

Fax Transmittal

To: US Army Corps of Engineers, Seattle District

Date: July 5, 2005

File: 8000-001-50

Fax Number: 206/764-3706

Attention: Harry Ehlers, PE,

Regarding: Preliminary lab results for recent samples

Pages	Date	Description
1	7/5/05	Fax Transmittal
9	7/5/05	Preliminary lab results

Total Pages: 10

Comments:

Harry,

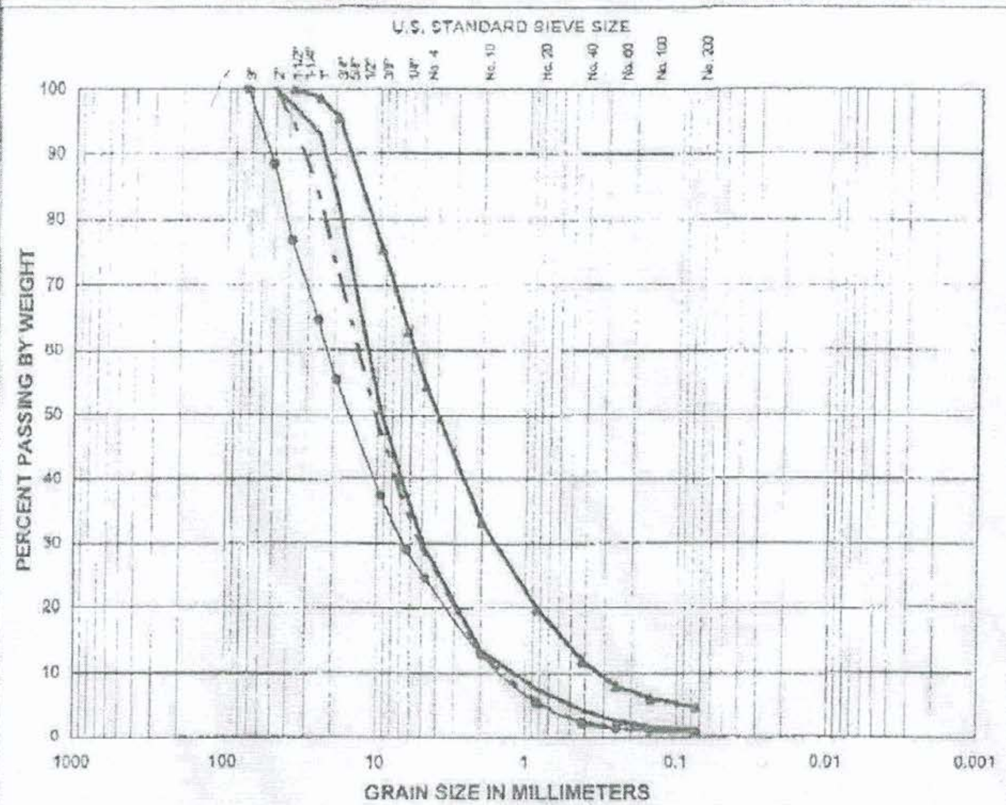
Please review the attached preliminary results from the samples you submitted to us a couple weeks ago. We have included the mechanical as well as the hydrometer gradation analyses.

Please call if you have questions, thanks,

Matt

Signed: _____

Matt Blankenship
mblankenship@geoengineers.com



COBBLES	GRAVEL		SAND			FINES - SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample No.	As Rec'd Water Content, %	C_u	C_c	Description/Classification
———	05-SS-01	7	8.67	1.28	Fine-coarse GRAVEL with sand (GW)
– – –	05-SS-02	3	8.82	1.02	Fine-coarse GRAVEL with sand (GW)
▲	05-SS-03	5	16.86	1.57	Medium-coarse SAND with gravel and trace silt (SW / GW)
●	05-SS-04	2	7.50	2.41	Fine-coarse GRAVEL with sand (GW)

Sample No.	Soil composition in percent			
	Gravel	Sand	Fines	Total
05-SS-01	71	28	1	100
05-SS-02	72	28	1	100
05-SS-03	46	50	5	100
05-SS-04	75	24	1	100

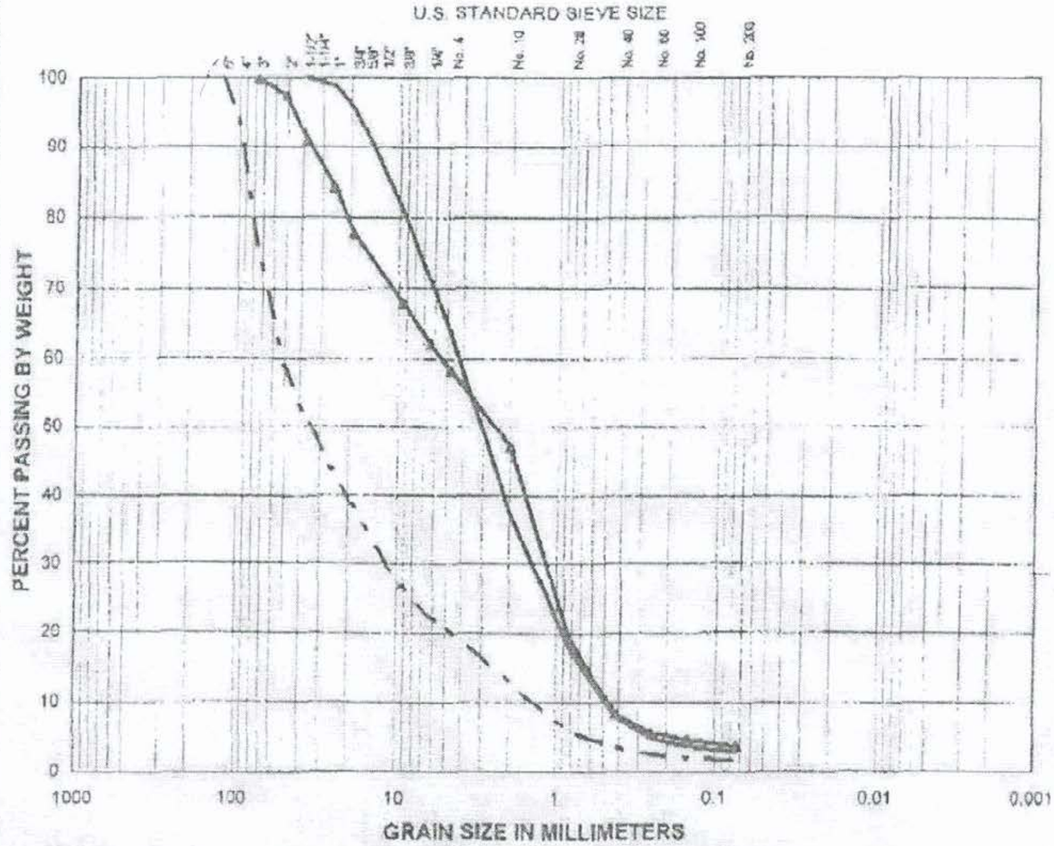
Test Method: ASTM C 136			
Project	U.S. Army Corps of Engineers	Date Tested	6-20-05
File No.	0000-001-30	Tested By	GT
Lab ID No.	NA	Checked By	

NOTE: Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes. This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc.

GEOENGINEERS
523 East Second Avenue, Spokane, WA 99202

GRAIN SIZE ANALYSIS

05-SS-01,05-SS-02,05-SS-03, & 05-SS-04



COBBLES	GRAVEL		SAND			FINES - SILT and CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample No.	As Rec'd Water Content %	C_u	C_c	Description/Classification
———	05-SS-05	4	8.60	1.19	Medium-coarse SAND with gravel and trace silt (SW)
– – –	05-SS-06	5	34.67	1.85	Fine-coarse GRAVEL with sand and trace silt (GW)
▲	05-SS-07	5	11.00	0.61	Medium SAND with gravel and trace silt (SP)

Sample No.	Soil composition in percent			
	Gravel	Sand	Fines	Total
05-SS-05	37	61	3	100
05-SS-06	79	19	2	100
05-SS-07	42	55	4	100

Test Method: ASTM C 136			
Project	U.S. Army Corps of Engineers	Date Tested	5-20-05
File No.	8000-001-50	Tested By	GT
Lab ID No.	NA	Checked By	

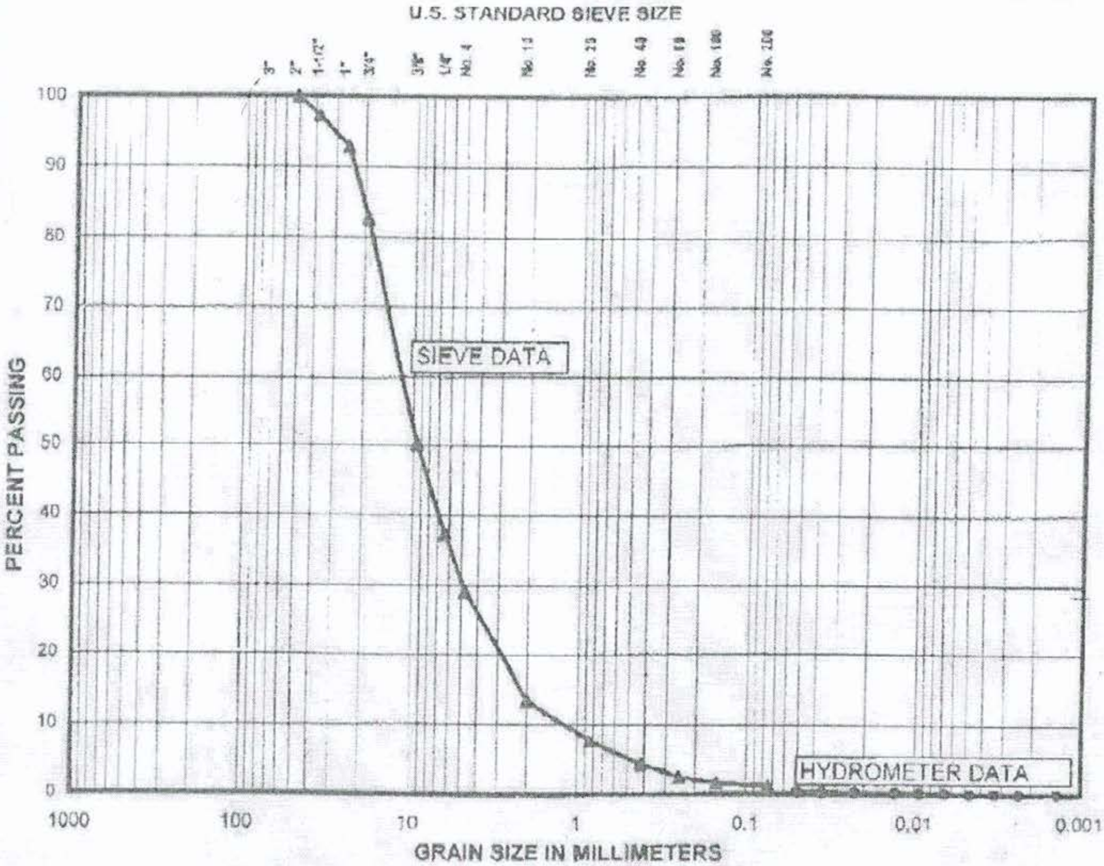
NOTE: Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes.

P:\8\8000001\50\US Army Corps of Engineers\C-136 (7 tests).xls

GEOENGINEERS
523 East Second Avenue, Spokane, WA 99202

GRAIN SIZE ANALYSIS

05-SS-05, 05-SS-06, & 05-SS-07



COBBLES	GRAVEL		SAND			FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

Client Sample Number	As Received Water Content, %	C_u	C_c	USC	Description based on D422
05-SS-01	7	8.67	1.28	GW	Fine-coarse GRAVEl with sand

Summary of Percentages Passing			
3"	100.0	No. 4	29.1
2"	100.0	No. 10	13.3
1 1/2"	97.3	No. 20	7.8
1"	92.8	No. 40	4.3
3/4"	82.7	No. 60	2.5
3/8"	50.2	No. 100	1.7
1/4"	37.3	No. 200	1.1

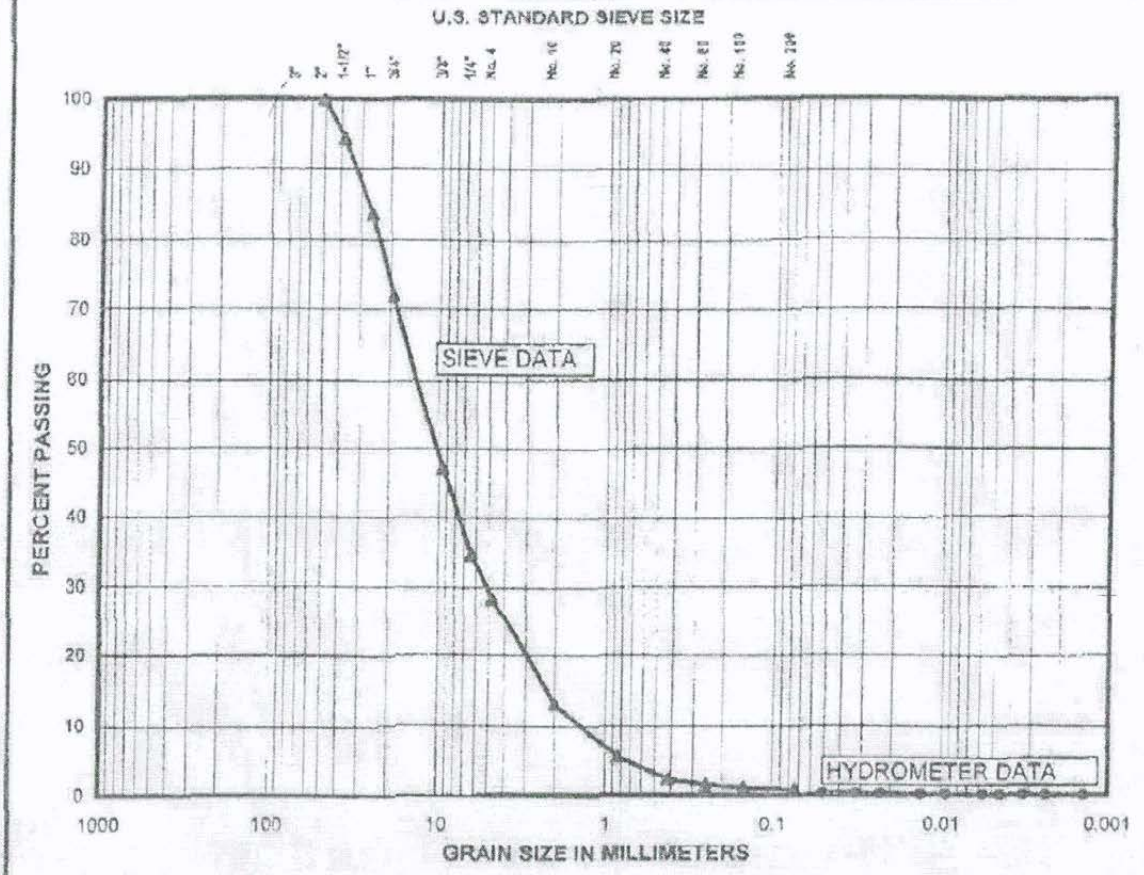
Sieve sets:	1, 2, 3
Hydrometer:	SL1387
Hydro jar:	SL 1064

Test Method: ASTM D422			
Project	U.S. Army Corps of Engineers	Date Tested	6/20/2005
File No.	8000-001-50	Tested By	C.Teffert
Sample No.	05-SS-01	Checked By	

GEOENGINEERS
523 East Second Avenue, Spokane, WA 99202

ASTM D422 GRAIN SIZE ANALYSIS

U.S. Army Corps of Engineers ; 05-SS-01



COBBLES	GRAVEL		SAND			FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

Client Sample Number	As Received Water Content, %	C_u	C_c	USC	Description based on D422
05-SS-02	3	8.82	1.02	GW	Fine-coarse GRAVEL with sand

Summary of Percentages Passing			
3"	100.0	No. 4	28.4
2"	100.0	No. 10	13.0
1 1/2"	94.4	No. 20	5.6
1"	83.6	No. 40	2.3
3/4"	72.0	No. 60	1.5
3/8"	47.1	No. 100	1.1
1/4"	34.8	No. 200	0.7

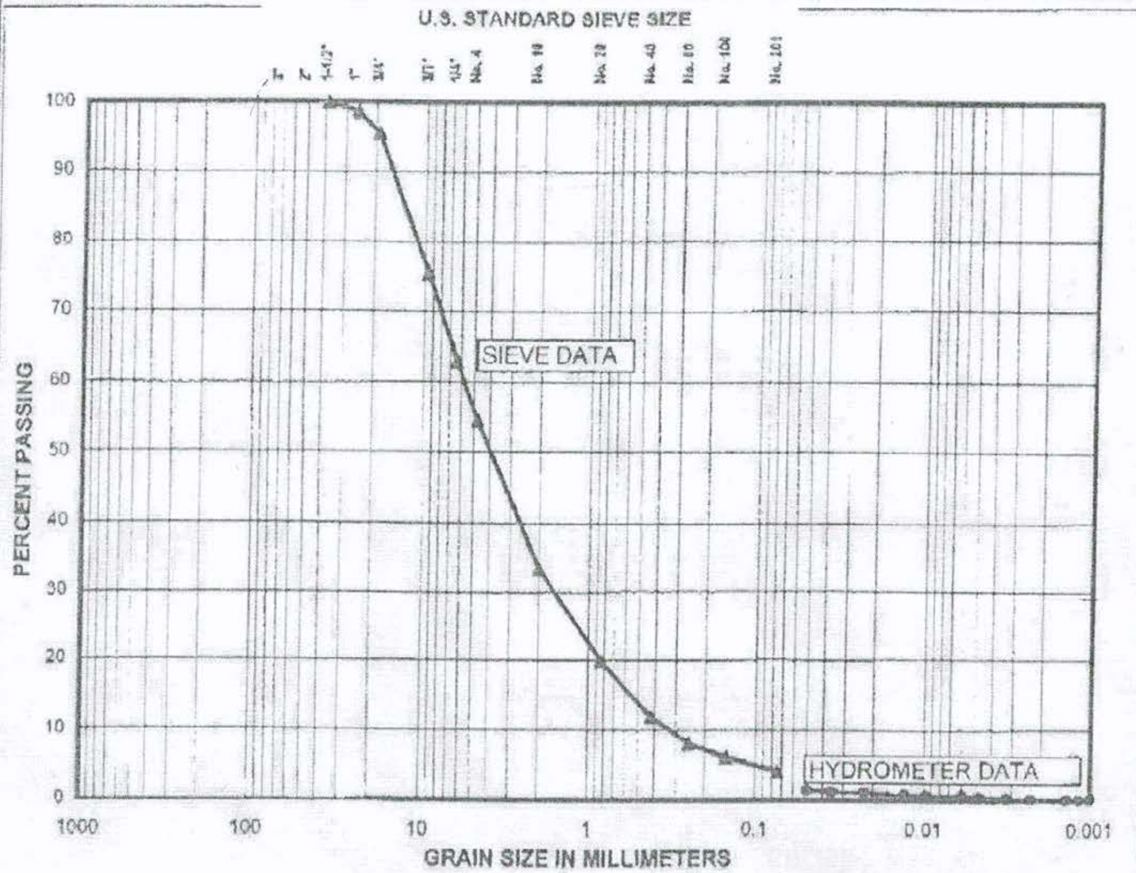
Sieve sets:	1, 2, 3
Hydrometer:	SL1387
Hydro jar:	SL1082

Test Method: ASTM D422			
Project	U.S. Army Corps of Engineers	Date Tested	6/20/2005
File No.	8000-001-50	Tested By	G.Tefferi
Sample No.	05-SS-02	Checked By	

GeoEngineers
523 East Second Avenue, Spokane, WA 99202

ASTM D422 GRAIN SIZE ANALYSIS

U.S. Army Corps of Engineers ; 05-SS-02



COBBLES	GRAVEL		SAND			FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

Client Sample Number	As Received Water Content, %	C_u	C_c	USC	Description based on D422
05-SS-03	5	15.88	1.57	SW / GW	Medium-coarse SAND with gravel and trace silt

Summary of Percentages Passing			
3"	100.0	No. 4	54.5
2"	100.0	No. 10	33.3
1 1/2"	100.0	No. 20	19.8
1"	98.6	No. 40	11.8
3/4"	95.5	No. 60	8.0
3/8"	75.3	No. 100	6.1
1/4"	62.9	No. 200	4.0

Sieve sets:	1, 2, 3
Hydrometer:	SL1387
Hydro jar:	SL 1064

Test Method: ASTM D422			
Project	U.S. Army Corps of Engineers	Date Tested	6/20/2005
File No.	8000-001-50	Tested By	G.Tefferi
Sample No.	05-SS-03	Checked By	

NOTE: Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes. This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc.

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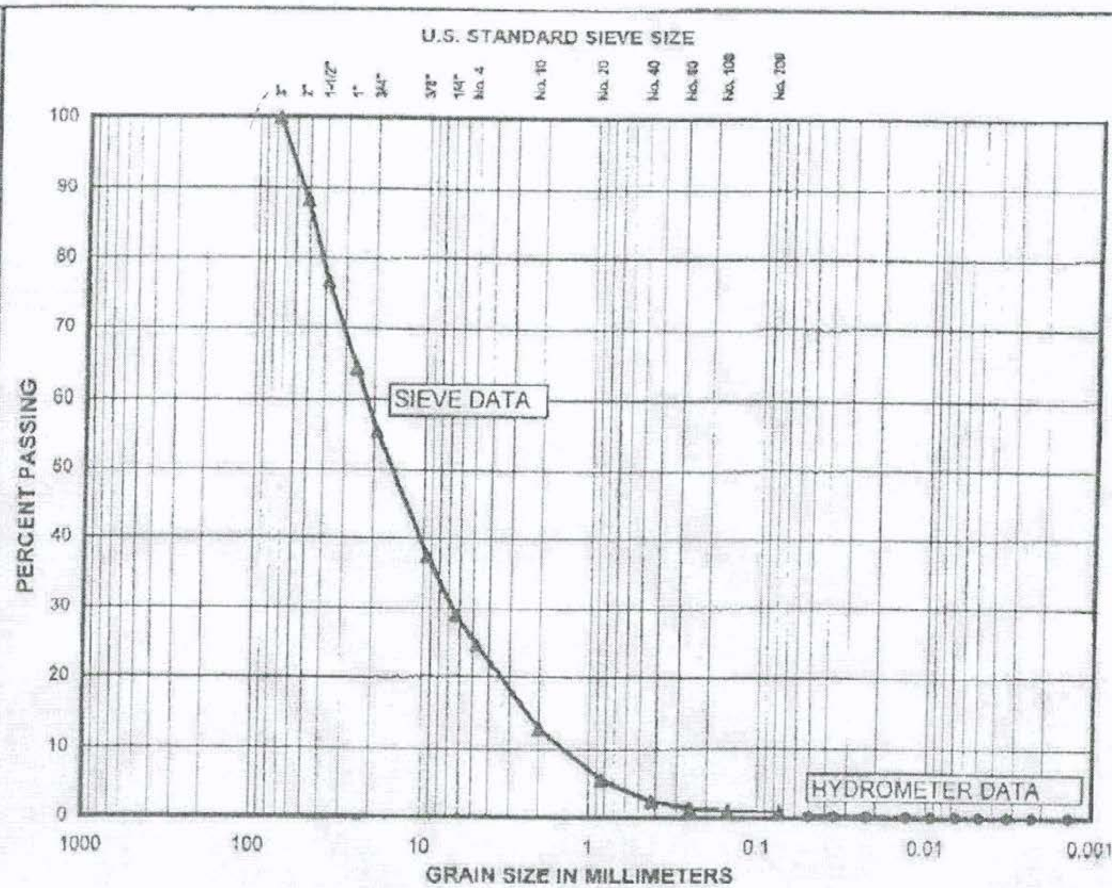
ASTM D422 GRAIN SIZE ANALYSIS

U.S. Army Corps of Engineers ; 05-SS-03



COBBLES	GRAVEL		SAND			FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

Client Sample Number	As Received Water Content, %	C_u	C_c	USC	Description based on D422
05-SS-04	2	7.50	2.41	GW	Fine-coarse GRAVEL with sand

Summary of Percentages Passing			
3"	100.0	No. 4	24.6
2"	88.2	No. 10	12.8
1 1/2"	76.5	No. 20	5.5
1"	64.3	No. 40	2.3
3/4"	55.4	No. 60	1.4
3/8"	37.5	No. 100	1.0
1/4"	29.0	No. 200	0.8

Sieve sets:	1, 2, 3
Hydrometer:	SL1387
Hydro jar:	SL 1063

Test Method: ASTM D422			
Project	U.S. Army Corps of Engineers	Date Tested	6/20/2005
File No.	8000-001-50	Tested By	G.Tefferi
Sample No.	05-SS-04	Checked By	

NOTE: Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes. This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc.

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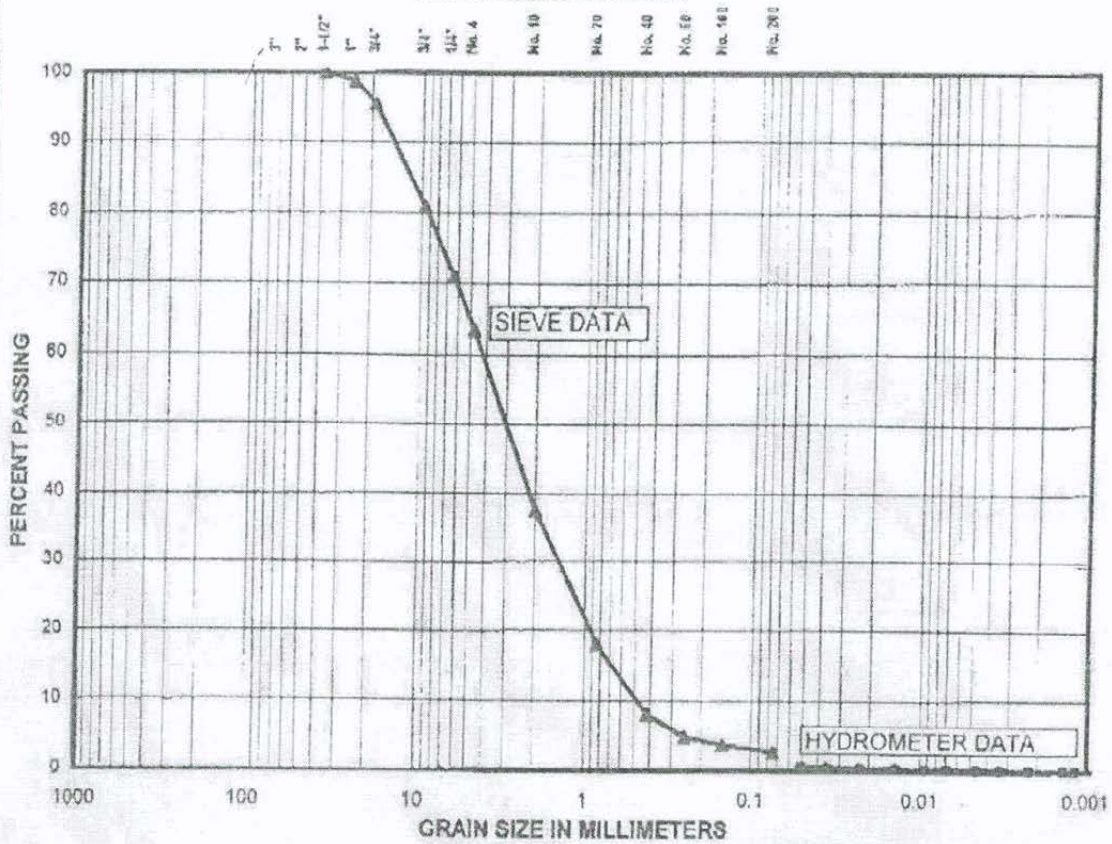
ASTM D422 GRAIN SIZE ANALYSIS

U.S. Army Corps of Engineers ; 05-SS-04



COBBLES	GRAVEL		SAND			FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

Client Sample Number	As Received Water Content, %	C_u	C_c	USC	Description based on D422
05-SS-05	4	8.60	1.19	SW	Medium-coarse SAND with gravel and trace silt

Summary of Percentages Passing			
3"	100.0	No. 4	53.4
2"	100.0	No. 10	37.5
1 1/2"	100.0	No. 20	17.9
1"	98.9	No. 40	8.0
3/4"	95.5	No. 60	4.6
3/8"	80.8	No. 100	3.8
1/4"	70.9	No. 200	2.6

Sieve sets:	1, 2, 3
Hydrometer:	SL1387
Hydro jar:	SL 1062

Test Method: ASTM D422			
Project	U.S. Army Corps of Engineers	Date Tested	6/20/2005
File No.	8000-001-50	Tested By	G.Tefferi
Sample No.	05-SS-05	Checked By	

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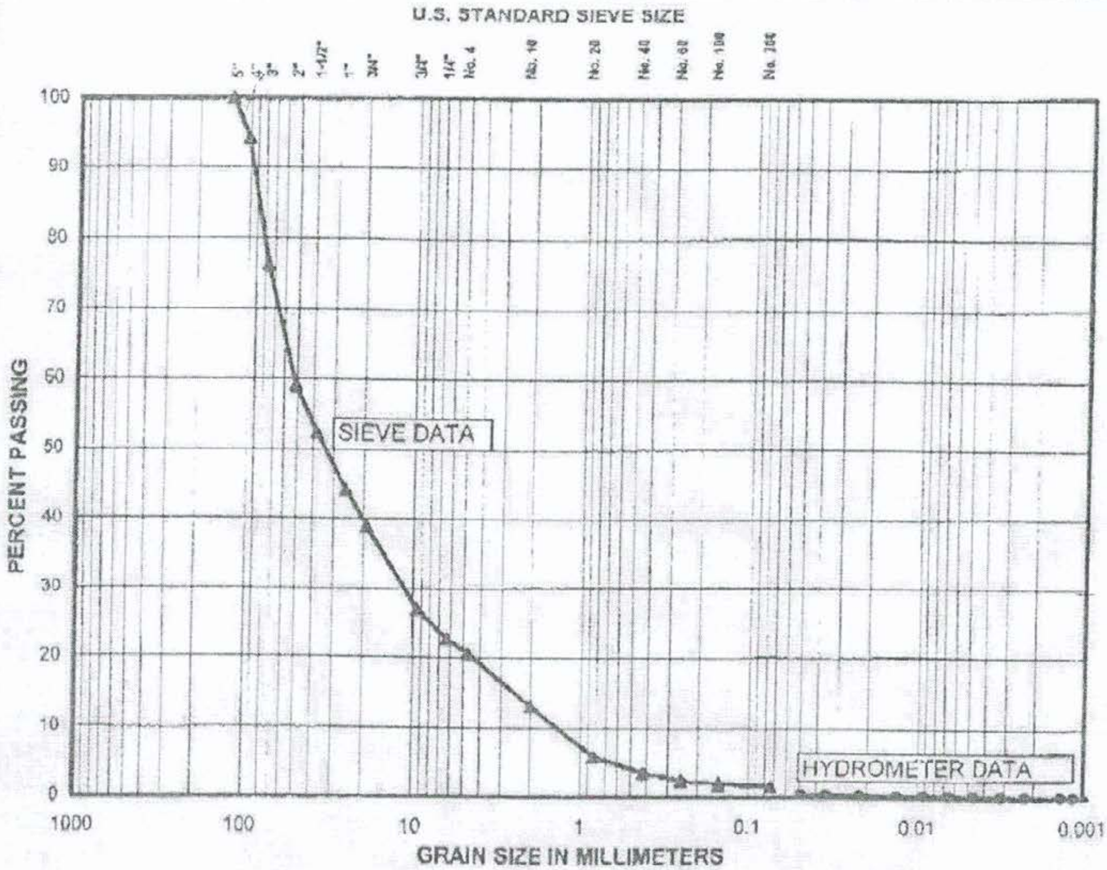
ASTM D422 GRAIN SIZE ANALYSIS

U.S. Army Corps of Engineers ; 05-SS-05



COBBLES	GRAVEL		SAND			FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

Client Sample Number	As Received Water Content, %	C_u	C_c	USC	Description based on D422
05-SS-06	5	34.67	1.85	GW	Fine-coarse GRAVEL with sand and trace silt

Summary of Percentages Passing			
5"	100.0	1/4"	22.0
4"	94.2	No. 4	20.6
3"	76.3	No. 10	13.1
2"	59.0	No. 20	5.9
1 1/2"	52.5	No. 40	3.8
1"	44.0	No. 60	2.4
3/4"	38.9	No. 100	2.0
3/8"	26.8	No. 200	1.8

Sieve sets:	1, 2, 3
Hydrometer:	SL1387
Hydro jar:	SL 1095

Test Method: ASTM D422			
Project	U.S. Army Corps of Engineers	Date Tested	6/20/2005
File No.	8000-001-50	Tested By	G.Tefferi
Sample No.	05-SS-06	Checked By	

NOTE: Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes. This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc.

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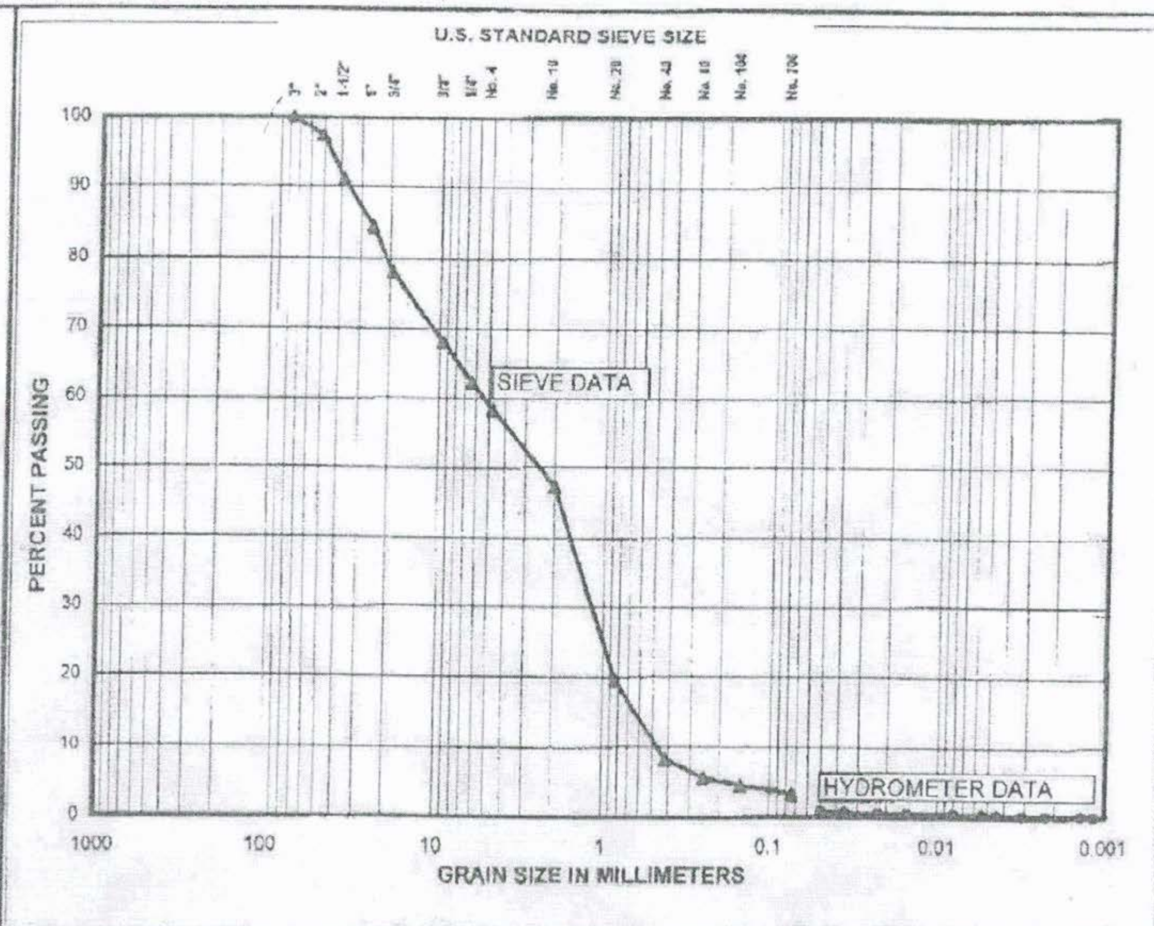
ASTM D422 GRAIN SIZE ANALYSIS

U.S. Army Corps of Engineers ; 05-SS-06



COBBLES	GRAVEL		SAND			FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

Client Sample Number	As Received Water Content, %	C_u	C_c	USC	Description based on D422
05-SS-07	5	11.00	0.61	SP	Medium SAND with gravel and trace silt

Summary of Percentages Passing			
3"	100.0	No. 4	58.3
2"	97.4	No. 10	47.2
1 1/2"	91.1	No. 20	19.4
1"	84.3	No. 40	8.3
3/4"	77.9	No. 60	5.8
3/8"	67.9	No. 100	4.5
1/4"	62.1	No. 200	3.3

Sieve sets:	1, 2, 3
Hydrometer:	SL1397
Hydro jar:	SL 1063

Test Method: ASTM D422			
Project	U.S. Army Corps of Engineers	Date Tested	6/20/2005
File No.	8000-001-50	Tested By	G. Tefferi
Sample No.	05-SS-07	Checked By	

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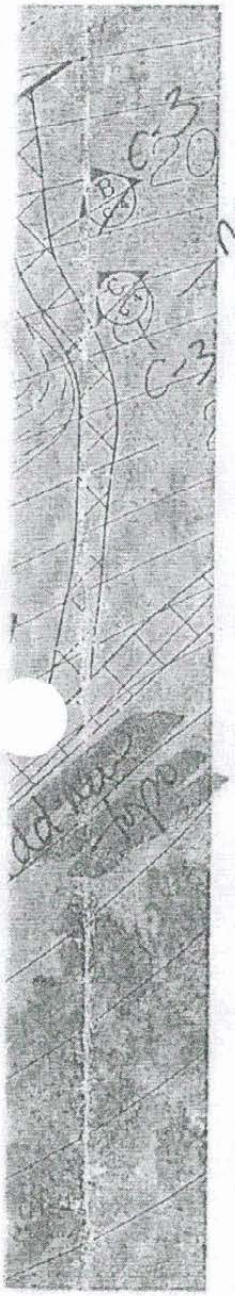
ASTM D422 GRAIN SIZE ANALYSIS

U.S. Army Corps of Engineers ; 05-SS-07

REVISIONS			
SYMBOL	ZONE	DESCRIPTION	DATE



UPLANDS GRADATION BASED ON LABORATORY GRADATIONS FROM CONTAMINATION TESTING

U.S. SIEVE	% PASSING by WEIGHT
3"	100-60
2"	80-45
1"	65-30
1/2"	50-25
No. 4	35-15
No. 10	25-10
No. 40	10-0
No. 200	5-0

New design side slope & toe is off this sheet (photo)

GRAVEL BAR GRADATION AS DISCUSSED WITH BRUCE HEINEK (WDFW HABITAT PROGRAM)

U.S. SIEVE	% PASSING by WEIGHT
3"	100
2"	100 95-85 85
1"	95 80-60
1/2"	85 70-45 50
No. 4	60-30
No. 10	45-20
No. 40	15-5
No. 200	5-0

CLASS II RIPRAP

100% SMALLER THAN	~~600#~~ 500
50% SIZE	~~300#~~ 300
90% LARGER THAN	~~150#~~ 100
10%	~~25-150#~~ 25-100
TOLERANCE	~~10"~~ +6"

LEGEND

- BOULDERS AROUND PARKING LOT
- ROAD BLOCKED OFF
- PATH TO BE REVEGETATED
- DESIGNATED PATH CAPPED WITH CLEAN MATERIAL
- OVERHEAD UTILITY WIRES
- ASPHALT
- ----- EOR ----- EDGE OF ROAD (EX.)

Update planting patterns for new work

CONSTRUCTION REQUIREMENTS

N

1" = 20' 20' 10' 0 20' 40'

REDUCED TO 50% OF FULL SIZE

U.S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

WASHINGTON RECREATION SITES
STARR ROAD

STARR ROAD REPOSITORY/PARKING AREA

SPOKANE WASHINGT

SIZE	INVITATION NO.	FILE NO.	DATE
D			4 MAR 05

DESIGN: DESJARDIN CHK: KAGER SHEET 4 OF 6

Corrected As Built Drawing

DATE AND TIME PLOTTED: 07-JUN-2005 13:49
DESIGN FILE: h:\groups\en-db-ed\WA REC SITE\en-\warefd2b.dgn