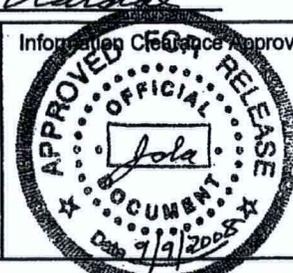


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SGW-38475  
Revision 0

# Cost Estimate for the 200-MG-2 Operable Unit Engineering Evaluation/ Cost Analysis Removal Actions

Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the  
U.S. Department of Energy under Contract DE-AC06-96RL13200

**FLUOR**<sup>®</sup>  
P.O. Box 1000  
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J. A. Hulstrom  
Fluor Hanford, Inc.

Date Published  
August 2008

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**TERMS**

CS/NA	confirmatory sampling/no action
ERDF	Environmental Restoration Disposal Facility
FH	Fluor Hanford, Inc.
FP	fixed price
IC	institutional control
MESC	maintain existing soil cover
MNA	monitored natural attenuation
OU	operable unit
QA	quality assurance
RCT	radiological control technician
RTD	removal, treatment, and disposal

## METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
<i>If you know</i>	<i>Multiply by</i>	<i>To get</i>	<i>If you know</i>	<i>Multiply by</i>	<i>To get</i>
<b>Length</b>			<b>Length</b>		
inches	25.40	millimeters	millimeters	0.0394	Inches
inches	2.54	centimeters	centimeters	0.394	Inches
feet	0.305	meters	meters	3.281	Feet
yards	0.914	meters	meters	1.094	yards
miles (statute)	1.609	kilometers	kilometers	0.621	miles (statute)
<b>Area</b>			<b>Area</b>		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.0929	sq. meters	sq. meters	10.764	sq. feet
sq. yards	0.836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.591	sq. kilometers	sq. kilometers	0.386	sq. miles
acres	0.405	hectares	hectares	2.471	acres
<b>Mass (weight)</b>			<b>Mass (weight)</b>		
ounces (avoir)	28.349	grams	grams	0.0353	ounces (avoir)
pounds	0.454	kilograms	kilograms	2.205	pounds (avoir)
tons (short)	0.907	ton (metric)	ton (metric)	1.102	tons (short)
<b>Volume</b>			<b>Volume</b>		
teaspoons	5	milliliters	milliliters	0.034	ounces (U.S., liquid)
tablespoons	15	milliliters	liters	2.113	pints
ounces (U.S., liquid)	29.573	milliliters	liters	1.057	quarts (U.S., liquid)
cups	0.24	liters	liters	0.264	gallons (U.S., liquid)
pints	0.473	liters	cubic meters	35.315	cubic feet
quarts (U.S., liquid)	0.946	liters	cubic meters	1.308	cubic yards
gallons (U.S., liquid)	3.785	liters			
cubic feet	0.0283	cubic meters			
cubic yards	0.764	cubic meters			
<b>Temperature</b>			<b>Temperature</b>		
Fahrenheit	$(^{\circ}\text{F}-32)*5/9$	Centigrade	Centigrade	$(^{\circ}\text{C}*9/5)+32$	Fahrenheit
<b>Radioactivity</b>			<b>Radioactivity</b>		
picocurie	37	millibecquerel	millibecquerel	0.027	picocurie

## 1.0 INTRODUCTION

### 1.1 PURPOSE

This document provides a backup of the cost estimates conducted to support the DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites*. DOE/RL-2008-45 evaluates the following four removal action alternatives:

- No Action Alternative
- Maintain Existing Soil Cover/Institutional Controls/Monitored Natural Attenuation (MESC/IC/MNA) Alternative
- Confirmatory Sampling/No Action (CS/NA) Alternative
- Removal, Treatment, and Disposal (RTD) Alternative.

DOE/RL-2008-45 provides descriptions of the alternatives. This cost estimate addresses the following:

- Site-specific conditions and assumptions that provide the bases for the estimate
- Description of estimating methods used
- Estimating assumptions
- Tabulation of the cost estimates for the alternatives.

### 1.2 OVERVIEW

Cost estimates for DOE/RL-2008-45 have a target accuracy of -30 percent to +50 percent, as specified in EPA/540/R-00/002, *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study*, OSWER 9355.0-75. The cost estimates provide a discriminator for deciding between similar protective and implemental alternatives for a specific waste site. Therefore, the costs are relational, not absolute, for alternatives evaluation.

Cost estimate methods were developed using the cost models developed by Fluor Hanford, Inc. (FH), Project Controls and Estimating Department. DOE/RL-2008-45 does not evaluate the economies attained by combining multiple sites in a single removal action or by including 200-MG-2 Operable Unit (OU) waste sites with common alternatives or aggregated remediation activities in other OUs.

Appendix A presents the cost comparison tables.

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## 2.0 ALTERNATIVE COST ESTIMATES

This chapter describes the cost estimates, summarizes the total present-worth costs, and provides summary and backup information. Present-net-worth costs were estimated using the real discount rate published in Appendix C of OMB Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, which is effective through January 2009.

Although present worth costs are used in DOE/RL-2008-45 for evaluation of alternatives, other estimates are provided as well. Nondiscounted costs were developed in response to recommendations in EPA/540/R-00/002, but serve only a comparison purpose in DOE/RL-2008-45. The utility of the nondiscounted constant dollar cost is to demonstrate the impact of a discount rate on the total present value cost. Constant dollar costs provide a comparison on the resources required for the alternatives. Site information for the MESC/IC/MNA, CS/NA, and RTD alternatives is provided in Tables A-1 and A-2.

### 2.1 NO ACTION ALTERNATIVE

In this alternative, legal restrictions, access controls, or active remedial measures are not applied. Taking no action implies walking away from the site and allowing the waste to remain in its current configuration, affected only by natural processes. No maintenance or other activities are included.

Because the No Action Alternative assumes that no further actions will be taken, costs are assumed to be zero.

### 2.2 MAINTAIN EXISTING SOIL COVER/ INSTITUTIONAL CONTROLS/MONITORED NATURAL ATTENUATION ALTERNATIVE

The primary annual/periodic costs associated with this alternative are surveillance, cover maintenance, and monitoring, along with a one-time soil sampling of the site. This alternative does not include long-term groundwater monitoring since the 200-MG-2 OU waste sites are generally shallow and do not pose a threat to groundwater. The costs for these annual/periodic activities are based on the area of the waste site. Tables A-2 and A-3 provide details of the capital and annual/periodic cost estimates, respectively.

The unit cost for surveillance and maintenance are assumed to be the same as the current unit cost for surveillance and maintenance activities conducted annually on the waste sites. The unit cost accounts for such activities as site radiation surveys, vegetation/pest control, fence/signing maintenance, and repair of the existing soil cover on the sites where it is present. Because the existing soil cover is maintained annually, costs for replacing all or large portions of the existing cover at specified intervals (i.e., every 20 years) are considered unnecessary.

The cost associated with MNA is for the radiological surveys of surface soils. The costs are assumed to be similar to those for current survey practices at the sites and are included in the surveillance and maintenance costs.

Vadose zone and groundwater monitoring costs are not included in this alternative. Sites covered by this OU do not have high concentrations of contaminants in the shallow zone and do not pose a threat to groundwater.

ICs, which can have one-time or recurring costs (e.g., capital, annual operations and maintenance, or periodic), are non-engineering or legal/administrative measures to reduce or minimize the potential for exposure to site contamination or hazards by limiting or restricting site access.

Examples include IC plans, restrictive covenants, property easements, zoning, deed notices, advisories, groundwater use restrictions, and site information databases. An IC plan describes the controls for a site and how they are to be implemented. A site information database would provide a system for managing data necessary to characterize the current nature and extent of contamination. ICs are project specific costs that can be an important component of a remedial alternative and, as such, should generally be estimated separately from other costs, usually as a sub-element. ICs may need to be updated or maintained either annually or periodically.

The IC cost model used for this alternative was developed by the FH Project Controls and Estimating Department. The duration for IC only considers the initial, year-one period. The annual/periodic activities are based on the 150-year length of time specified for DOE/RL-2008-45.

Sampling of the waste site will occur in the initial year, the same as the IC process. The sampling is to verify that no additional remediation work will be required at a waste site. The number of samples required is based on the size of the waste site area and the expected depth of the contamination. The type of sample analysis will be based on the type of contamination expected at the site.

The combined present-net-worth costs for surveillance and maintenance, MNA, and IC activities represent the present-worth cost for this alternative. The real discount rate of 2.8 percent is used for discounting real (constant-dollar) flows for the duration. The nondiscounted costs are presented for comparison purposes.

### **2.3 CONFIRMATORY SAMPLING/NO ACTION ALTERNATIVE**

The confirmatory sampling process will verify that removal actions are not required at certain waste sites. The number of samples is assumed to be linked to the size of the waste site area and the expected depth of the contamination. The analytical methods used are based on the type of contamination expected at the site. This process will be used at sites that are expected to have little if any detectable contamination. Tables A-4 and A-5 provide details of the capital and annual/periodic cost estimates.

The primary costs associated with this alternative are surveillance and cover maintenance. The annual/periodic activities are based on the 2-year review period for acceptance of the analytical data.

### **2.4 REMOVAL, TREATMENT, AND DISPOSAL ALTERNATIVE**

Tables A-6 and A-7 provide details of the capital and annual/periodic cost estimates for the RTD Alternative. Table A-1 lists the excavation depths and other site information for the RTD Alternative. The RTD Alternative considers removal and disposal of very small sites and sites that contain structure slabs/foundations, debris, or large volumes of contaminated soil.

There are no annual/periodic or IC costs associated with the RTD Alternative because contaminants are assumed to be removed, eliminating the need for long-term surveillance and maintenance. The removal and disposal work, along with the remedial engineering activities, make up the present-worth costs for this alternative.

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### 3.0 ESTIMATING METHOD ASSUMPTIONS

#### 3.1 GLOBAL ASSUMPTIONS

##### 3.1.1 Labor

Fixed-price (FP) construction craft labor rates are those listed in Appendix A of the *Site Stabilization Agreement for All Construction Work for the U.S. Department of Energy at the Hanford Site*. The rates include base wages, fringe benefits, and other compensation, as negotiated between FH and the National Building and Construction Trades Department American Federation of Labor-Congress of Industrial Organizations. Other factors to cover additional costs for Workman's Compensation, *Federal Insurance Contributions Act*, and state and Federal unemployment insurance to develop a fully burdened rate by craft have been incorporated. The labor rates used are for 2008.

FH labor rates for management, engineering, safety oversight, and technical support are based on the FH approved planning rates for fiscal year 2008.

##### 3.1.2 Markups

###### 3.1.2.1 Direct Cost Factors

- Sales tax has been applied to all materials and equipment purchases at 8.3 percent.
- Construction consumables are estimated at 3.5 percent of FP direct craft labor costs to allow for small items (e.g., small tools, tape, plastics, and gloves).
- A general supervisor factor of 3 percent has been applied to FP craft labor hours.

###### 3.1.2.2 Indirect Cost Factors

- FP contractor overhead, profit, bond, and insurance costs have been applied at 26.5 percent on FP labor, materials, and equipment.
- FH general and administrative overhead of 15 percent has been applied to all FH labor, material, and equipment. The general and administrative overhead also is applied to the FP contractor costs.

##### 3.1.3 General Assumptions

- FH cost estimating templates for site remediation were used as the basis for each waste site. Templates used include standard RTD and very small RTD.
- Construction labor, material, and equipment units have been estimated based on standard commercial estimating resources and databases: Means, 2007, *Facility Construction Cost Data*; *Rental Rate Blue Book for Construction Equipment* database; and Richardson's *Process Plant Construction Estimating Standards*. The units may have been factored or adjusted by the estimator, as appropriate, to reflect influences by contract, work site, or other identified project or special conditions.
- Quotes from local commercial sources have been used for materials that need to be acquired for the construction of barriers or temporary improvements.
- Equipment rates are based on 21 working days per month.

- Equipment operation is based on one shift of 8 hours per day.
- Work week equals 5 days per week.
- Work stoppages or shutdowns because of inclement weather are not factored into the estimates or planning schedules for this study.
- Work delays or stoppages caused by waiting for laboratory results or approval for backfilling waste site excavations are not factored into the estimates or planning schedules for this study.
- The cost estimates include costs for design, work plan preparation, or any other preparation costs normally associated with activities occurring before field mobilization.
- Remedial design capital costs are based on EPA/540/R-00/002, Exhibit 5-8. The following guide is used in this study.
  - For projects with construction costs less than \$100,000, remedial design is planned at 20 percent of construction costs.
  - For projects with construction costs from \$100,000 to \$500,000, remedial design is planned at 15 percent of construction costs.
  - For projects with construction costs from \$500,000 to \$2 million, remedial design is planned at 12 percent of construction costs.
  - For projects with construction costs from \$2 million to \$10 million, remedial design is planned at 8 percent of construction costs.
  - For projects with construction costs greater than \$10 million, remedial design is planned at 6 percent of construction costs.
- Escalation has not been included in the calculations. All costs are fiscal year 2008.
- Contingency rates are based on EPA/540/R-00/002, Section 5.4.

### **3.2 MAINTAIN EXISTING SOIL COVER/ INSTITUTIONAL CONTROLS/MONITORED NATURAL ATTENUATION ALTERNATIVE**

#### **3.2.1 General Assumptions**

This alternative includes the following assumptions.

- Costs were calculated based on the area of the site and the expected depth of the contamination. The minimum site area for this study is 0.5 a (21,780 ft<sup>2</sup>). Costs based on area became unrealistically low for sites smaller than 0.5 a (21,780 ft<sup>2</sup>).
- The annual/periodic activities are based on the 150-year length of time specified for DOE/RL-2008-45.
- Fencing and monuments/signs for ICs and fencing maintenance are considered institutional costs and are considered in this cost estimate.

- MESC/IC/MNA includes the following seven general activities.
  - Implementation of IC plan – Sets up the controls for a site by implementing restrictive covenants, property easements, zoning, deed notices, advisories, groundwater use restrictions, and a site information database. Activity occurs in the first year.
  - Site cover inspection – Two-person crew performs annual inspections of the waste site cover.
  - Radiation survey of surface soil – Two-person crew performs annual radiation surveys of the waste site.
  - Existing cover maintenance – Annual cover soil repair performed to fix holes, wind damage, etc.; work includes loading/hauling cover soil, spreading, dust control, and reseeding.
  - Weed/pest control – A radiological control technician (RCT) will perform annual control of weeds and burrowing animals or other pests.
  - Fence/sign maintenance – An RCT will perform annual maintenance of existing site fences and signs, includes removal of windblown vegetation and trash.
  - Site review reporting – The site condition report is prepared every five years.
- The pricing or production rates that make up the cost estimate were obtained from one of the following sources:
  - Means, 2001, *ECHOS Environmental Remediation Cost Data – Unit Price*
  - Means, 2007
  - *Rental Rate Blue Book for Construction Equipment* database
  - Experience on similar projects.

### 3.2.2 MESC/IC/MNA Sampling Process

For 200-MG-2 OU, the following MESC/IC/MNA sampling process is to be used to verify that no additional remediation work will be required at a waste site. This work occurs once in the first year.

1. MESC/IC/MNA Field Sampling
  - a. These samples verify additional remediation work is not required at the site.
  - b. This process begins after the research of the site waste stream/history has been completed.
  - c. The minimum number of sample holes/boreholes per site will be 4. If the site is less than 4 ft deep, then 4 samples will be required (one sample per sample hole). For sites deeper than 4 ft, 8 samples will be required (2 samples per borehole).
  - d. The planning cost is \$5,722/sample for on-site lab analysis and \$1,293/sample for off-site lab analysis and shipping; total cost is \$7,016/sample for the full suite of analysis. If the sample is to support the radiological analysis, then the cost is \$3,303/sample.

- e. Sites that have an expected depth of contamination of less than 4 ft:
  - i. Will be sampled by hand.
  - ii. The sampling crew will have one field sampler, one RCT, and one facility supervisor. Equipment will be hand tools and a pickup truck. Sample rate will be 2 hours per sample.
  - iii. The sample preparation prior to lab analysis and follow up report will require a sample technician for 4 hours and a supervisor for 0.5 hours for each group of 4 samples.
  - iv. One sample will be taken from each excavation hole. The depth of the sample will be determined by analysis of the waste site data and history.
- f. Sites that have an expected depth of contamination of 4 ft to 10 ft:
  - i. Will be sampled using a mini excavator.
  - ii. A sampling crew will have one operator, one teamster, one field sampler, one RCT, and one facility supervisor. Equipment will be mini excavator and a 1-ton pickup truck with trailer. Sample rate will be 1 hour per sample.
  - iii. The sample preparation prior to lab analysis and follow up report will require a sample technician for 4 hours and a supervisor for 0.5 hours for each group of 4 samples.
  - iv. Two samples will be taken from each excavation hole. The depth of the sample will be determined by analysis of the waste site data and history.
- g. Sites that have an expected depth of contamination of 10 ft or more:
  - i. Will be sampled using a truck-mounted auger drill rig.
  - ii. A sampling crew will have two operators, one teamster, one laborer, one field sampler, one RCT, and one facility supervisor. Equipment will be a truck-mounted auger drill rig and a 1-ton pickup truck with trailer. Sample rate will be 2 hours per sample.
  - iii. The sample preparation prior to lab analysis and follow up report will require a sample technician for 4 hours and a supervisor for 0.5 hours for each group of 4 samples.
  - iv. Two samples will be taken from each borehole. The depth of the sample will be determined by analysis of the waste site data and history.

2. Confirmatory Process Final Report

- a. After the completion of site sampling (including analysis report), a preliminary report will be produced to help determine future action at each waste site. The report will include the preliminary site information from the remedial engineering phase of the work.

- b. The following preparation time is planned for the confirmatory process final report: environmental engineer/scientist 80 hours, drafter/engineering technician 40 hours, and survey crew 9 hours.

### 3.3 CONFIRMATORY SAMPLING/NO ACTION ALTERNATIVE

#### 3.3.1 General Assumptions

For the 200-MG-2 OU, the following confirmatory sampling process will be used to verify that no additional remediation work will be required at a waste site. This sampling process is based on the current 100 Area Sampling Plan.

1. The Confirmatory Process Remedial Engineering
  - a. Based on the estimated cost of CS/NA remedial engineering for similar sized waste sites, the following costs will be used:
    - i. Sites <15,000 ft<sup>2</sup> – \$18,000
    - ii. Sites 15,000 to 25,000 ft<sup>2</sup> – \$45,000
    - iii. Sites 25,000 to 45,000 ft<sup>2</sup> – \$80,000
    - iv. Sites 45,000 to 100,000 ft<sup>2</sup> – \$120,000
    - v. Sites >100,000 ft<sup>2</sup> – \$150,000.
2. Confirmatory Process Field Sampling
  - a. These samples are to show that no additional remediation work is required at the site.
  - b. This process begins after the remedial engineering and other research of the site waste stream/history have been completed.
  - c. The minimum number of sample holes/boreholes per site will be based on the size of the waste site:
    - i. Sites <15,000 ft<sup>2</sup> – 4 samples holes/boreholes
    - ii. Sites 15,000 to 25,000 ft<sup>2</sup> – 8 samples holes/boreholes
    - iii. Sites 25,000 to 35,000 ft<sup>2</sup> – 12 samples holes/boreholes
    - iv. Sites 35,000 to 45,000 ft<sup>2</sup> – 16 samples holes/boreholes
    - v. Sites 45,000 to 100,000 ft<sup>2</sup> – 20 samples holes/boreholes
    - vi. Sites 100,000 to 200,000 ft<sup>2</sup> – 24 samples holes/boreholes
    - vii. Sites >200,000 ft<sup>2</sup> – 28 samples holes/boreholes.
  - d. Quality Assurance (QA) samples required will be a minimum of either 2 samples or 5 percent of the total number of samples, whichever is greater.
  - e. The planning cost is \$5,722/sample for on-site lab analysis and \$1,293/sample for off-site lab analysis and shipping; total cost is \$7,016/sample for the full suite of

analysis. If the sample is to support the radiological analysis, then the cost is \$3,303/sample.

- f. Appendix A shows the official Waste Sampling and Characterization Facility and off-site commercial lab analysis tests with costs that will make up the main categories of sampling at the waste sites.
- g. Sites that have an expected depth of contamination of less than 4 ft:
  - i. Will be sampled by hand.
  - ii. The sampling crew will have one field sampler, one RCT, and one facility supervisor. Equipment will be hand tools and a pickup truck. Sample rate will be 2 hours per sample.
  - iii. The sample preparation prior to lab analysis and follow up report will require a sample technician for 4 hours and a supervisor for 0.5 hours for each group of 4 samples.
  - iv. One sample will be taken from each excavation hole. The depth of the sample will be determined by analysis of the waste site data and history.
- h. Sites that have an expected depth of contamination of 4 ft to 10 ft:
  - i. Will be sampled using a mini excavator.
  - ii. A sampling crew will have one operator, one teamster, one field sampler, one RCT, and one facility supervisor. Equipment will be a mini excavator and a 1-ton pickup truck with trailer. Sample rate will be 1 hour per sample.
  - iii. The sample preparation prior to lab analysis and follow up report will require a sample technician for 4 hours and a supervisor for 0.5 hours for each group of 4 samples.
  - iv. Two samples will be taken from each excavation hole. The depth of the sample will be determined by analysis of the waste site data and history.
- i. Sites that have an expected depth of contamination of 10 ft or more:
  - i. Will be sampled using a truck-mounted auger drill rig.
  - ii. A sampling crew will have two operators, one teamster, one laborer, one field sampler, one RCT, and one facility supervisor. Equipment will be a truck-mounted auger drill rig and a 1-ton pickup truck with trailer. Sample rate will be 2 hours per sample.
  - iii. The sample preparation prior to lab analysis and follow up report will require a sample technician for 4 hours and a supervisor for 0.5 hours for each group of 4 samples.
  - iv. Two samples will be taken from each borehole. The depth of the sample will be determined by analysis of the waste site data and history.

### 3. Confirmatory Process Radiological Grid Surveys

- a. Before the start of the field sampling process, each site will have a Radiological Grid Survey of the site surface. The surveys will determine the areas of concern that could require sampling.
  - b. Completion of surveys for sites that are less than 1 a (43,560 ft<sup>2</sup>) will require 2 hours of survey crew and equipment (pickup truck with trailer and radiation survey equipment) time.
  - c. Completion of surveys for sites that are greater than 1 a (43,560 ft<sup>2</sup>) will take 2 hours of survey crew and equipment time for each additional acre of surface.
  - d. The surveys will cover 50 percent of the surface area.
  - e. Each site will require a report on the radiological survey performed at the completion of the fieldwork. Each report will require 8 hours of RCT support, 8 hours of health physicists, 1 hour of QA, and 1 hour of supervisor time.
4. Confirmatory Process Final Report
- a. After the completion of site sampling (including analysis report) and the radiological site report, a preliminary report will be produced to help determine future action at each waste site. The report will include the preliminary site information from the remedial engineering phase.
  - b. The following preparation time is planned for the confirmatory process final report: environmental engineer/scientist 80 hours, drafter/engineering technician 40 hours, and survey crew 9 hours.

### **3.4 REMOVAL, TREATMENT, AND DISPOSAL ALTERNATIVE**

Ditches, retention basins, underground structures, unplanned releases, and building foundations requiring removal are excavated to the required depth and contaminated material is removed to the Environmental Restoration Disposal Facility (ERDF) for disposal. The sites are then backfilled and remediated. Excavation depth and width are different for each type of site.

#### **3.4.1 General Assumptions**

This alternative includes the following general assumptions.

- The RTD work scope will not affect any operating facility or structure.
- All waste sites either are shut down or are not currently in use.
- All pipelines or other utilities have been previously isolated from the wastes sites.
- All contaminated liquids, sludge, or other loose debris have been removed from the retention basins, cribs, trenches, ditches, French drains, and injection wells.
- There are 2 types of RTD cost models based on certain types of expected remediation work for this OU. The 2 types are standard RTD, and very small sites.
  - The standard RTD cost model covers sites that have a maximum excavation depth of 35 ft , surface or subsurface concrete/steel demolition, pipeline removal, or any

- combination of the three. Typical sites covered by this model are trenches, ditches, retention basins, cribs, french drains, and large unplanned releases.
- The very small site cost model is for sites that have a contaminated waste removal of less than 100 yd<sup>3</sup> and a maximum depth of 10 ft. These sites should have a short duration time for the work (2 weeks or less). Typical sites covered by this model are small, unplanned releases, drains, and injection/reverse wells.

Both cost models can be for a stand-alone site or a group of sites.

### **3.4.2 General Assumptions for Standard Removal, Treatment, and Disposal Process**

Standard RTD process includes the following assumptions.

1. Fieldwork (e.g., mobilization/demobilization, excavation, backfill, revegetation, and some of the post construction work) will be performed by an FP contractor. The project management, RCT support, sampling, and safety oversight will be performed by FH. The waste disposal work involved with hauling from the site to the ERDF and ERDF dumping cost/fees will be performed by the environmental restoration contractor responsible for the ERDF.
2. Mobilization and startup include site training; mobilization of equipment and personnel; installation of temporary construction fences; construction of staging/container storage areas and access roads; and setting up office, change, and storage trailers with utilities, temporary survey buildings, and decontamination areas. The assumption for the 200-MG-2 OU is that 10 wastes sites will be remediated per FP contract. The mobilization costs will be prorated over the 10 sites.
3. The excavation sites will have contaminated waste removed. The sides of the excavation will be sloped at 1.5:1 to the bottom of the excavation, except for those sites that do not require the excavation to go below 5 ft. During the removal process, heavy equipment will be kept out of the excavation site.
4. For excavation sites, overburden will be removed with a 2- to 3-yd<sup>3</sup> excavator and two haul trucks. The soil will be stockpiled near the waste site. A highway truck with a water tank trailer is used to control dust during this activity. The production rate for one crew is 146 yd<sup>3</sup>/hr. A FH RCT supports the work at 1.5 hours per excavation crew hour.
5. Contaminated waste will be excavated using a 2- to 3-yd<sup>3</sup> hydraulic crawler excavator. The contaminated soil will be directly placed into lined ERDF containers and hauled from the excavation site. A highway truck with a water tank trailer is used to control dust during this activity. Crew labor consists of one operator, one laborer, and one truck driver. The production rate for one crew is 52 yd<sup>3</sup>/hr. An FH RCT supports the work at 1.5 hours per excavation crew hour.
6. An industrial safety technician will be onsite at all times during the excavation process to monitor for unplanned hazardous gases.
7. Soil samples will be taken from the overburden, from ERDF containers, and for verification at the completion of the excavation. For 200-MG-2 OU, the following sampling process (based on the Multi Increment Sampling process) is to be used.

- Sampling Required for ERDF Waste
  - The planning cost is \$1,434/sample.
- Noncontaminated Soil Sampling
  - The soil being sampled is the overburden that is uncontaminated and will not be removed from the site.
  - For planning purposes, there will be one overburden stockpile for every 5000 yd<sup>3</sup> of overburden soil.
  - There will be one sample per stockpile.
  - Additional focused sampling will be required at a minimum of 1 sample or 15 percent of the total number of noncontaminated soil samples, whichever is greater.
  - The planning cost is \$7,016/sample for the full suite of analysis and \$3,303/sample for the radiological suite of analysis.
- Radiological Grid Surveys
  - This process will occur once at the completion of the excavation process and before the pre-verification process sampling starts.
  - Sites that are less than 1 a (43,560 ft<sup>2</sup>) it will take 2 hours of survey crew and equipment time to complete a survey.
  - Sites that are greater than 1 a (43,560 ft<sup>2</sup>) it will take 2 hours of survey crew and equipment time for each additional acre of surface to complete a survey.
  - Sites will be surveyed at 50 percent of the surface area.
- Pre-Verification Process Sampling
  - These samples are the preliminary samples to determine if all of waste has been excavated from a site.
  - This process will happen once during the excavation process.
  - If the samples show that the site has met the requirement then the verification process will start.
  - The minimum number of samples per site will be based on size of the waste site:
    - i. Sites <15,000 ft<sup>2</sup> – 1 samples
    - ii. Sites 15,000 to 25,000 ft<sup>2</sup> – 2 samples
    - iii. Sites 25,000 to 35,000 ft<sup>2</sup> – 3 samples
    - iv. Sites 35,000 to 45,000 ft<sup>2</sup> – 4 samples
    - v. Sites 45,000 to 100,000 ft<sup>2</sup> – 5 samples
    - vi. Sites 100,000 to 150,000 ft<sup>2</sup> – 6 samples
    - vii. Sites 150,000 to 200,000 ft<sup>2</sup> – 7 samples
    - viii. Sites >200,000 ft<sup>2</sup> – 8 samples.
  - The planning cost is \$1,046/sample.
- Verification Process Sampling
  - These samples are the final samples to show that all waste has been removed from the site.
  - This process happens once after the completion of the excavation process and the pre-verification process/analysis confirms removal of all the waste.
  - The minimum number of samples per site will based on size of the waste site:

- ix. Sites <15,000 ft<sup>2</sup> – 1 sample
  - x. Sites 15,000 to 25,000 ft<sup>2</sup> – 2 samples
  - xi. Sites 25,000 to 35,000 ft<sup>2</sup> – 3 samples
  - xii. Sites 35,000 to 45,000 ft<sup>2</sup> – 4 samples
  - xiii. Sites 45,000 to 100,000 ft<sup>2</sup> – 5 samples
  - xiv. Sites 100,000 to 200,000 ft<sup>2</sup> – 6 samples
  - xv. Sites >200,000 – 7 samples.
- Additional focused sampling will be required. It will be a minimum of 1 sample or 15 percent of the total number of verification soil samples, whichever is greater.
  - QA samples required will be a minimum of 2 samples or 5 percent of the total number of verification process samples, whichever is greater.
  - The planning cost is \$5,722/sample for onsite lab analysis and \$1,293/sample for offsite lab analysis and shipping; total cost is \$7,016/sample for the full suite of analysis. If the sampling is to support the radiological analysis, then the cost is \$3,303/sample.
- Air Monitoring & Sampling – Environmental
    - The environmental air monitoring will involve a round of samples from both air monitors at the start of the project, at the completion of work, and quarterly during the project.
    - For waste site with an area less than 15,000 ft<sup>2</sup> and with less than 150 yd<sup>3</sup> of contaminated waste, the environmental air-monitoring requirement will not apply.
    - The cost is \$384/sample.
8. The ERDF container handling and loading process starts with a site haul truck picking up an empty container at the staging area. The container is moved to a preparation area where laborers install a bed liner and a half-time RCT inspects the container. The haul truck and container proceed to the loading area. After loading, the liner is sealed and the container is secured by laborers. The container is moved to the survey building where 3 RCT's inspect and survey the container and truck for contamination. From there, the haul truck and container are weighed on a platform scale and then driven to the storage area. The container is unloaded from the truck at the storage area. Three trucks are required to support each contaminated excavation crew.
  9. ERDF disposal fee, transportation, and handling costs are estimated at \$869 per container. An environmental restoration contractor driver and truck/trailer will move a loaded container to the ERDF and place an empty container in the staging area. The estimated costs include the rental of the containers used. For planning purposes, the capacity of an ERDF container is 13 yd<sup>3</sup> of contaminated waste.
  10. Backfilling is performed by three different operations:
    - The moving of the stockpiled overburden back to the excavation site will require one crew. The equipment used by a crew is one 4- to 5-yd<sup>3</sup> loader and two haul trucks. Labor is one operator and two truck drivers. The production rate for one crew is 275 yd<sup>3</sup>/hr.
    - The moving of borrow material to the excavation site typically is performed by one crew hauling from an on-site pit source. The equipment used by a crew is one

- 5-yd<sup>3</sup> loader, five 32-yd<sup>3</sup> highway dump trucks with trailers, and one water truck. Labor is one operator and seven truck drivers. The production rate for one crew is 185 yd<sup>3</sup>/hr.
- Spreading and compaction of the backfill at the site is performed by one crew. The equipment used per crew is one 300-hp dozer and one 4,000-gal water truck/trailer. Labor consists of one operator, one truck driver, and one laborer. The production rate for one crew is 275 yd<sup>3</sup>/hr.
11. Revegetation of the waste sites within the 200-MG-2 OU is not needed. All waste sites are within the Core Area designated by DOE/RL-2008-45.
  12. The FH project management team consists of a part-time project manager, with a full-time field supervisor and part-time engineering support. Part-time QA radiological control and safety personnel provide oversight; other personnel provide part-time support for contract management and project controls. Total hours for this staff are planned at 22.5 hours per day. The duration of this work is based on total project duration.
  13. The FP contractor field supervisory team consists of a full-time construction manager and field supervisor, along with part-time QA, construction safety, and clerical support. Two pickup trucks are included in the cost. Total hours for this staff are planned at 21 hours per day. The duration of this work is based on total project duration.
  14. Demobilization includes demobilization of equipment and personnel, removing temporary construction fences, construction of staging/container storage areas, access roads, office/change/storage trailers, temporary survey buildings, and decontamination areas. The demobilization costs will be prorated over the 10 sites using the same assumptions as mobilization.
  15. Contaminated retention basins, belowground concrete structures, and building foundations will require demolition as part of the removal work. All basins, French drains, and belowground structures are empty of any sludge or debris before demolition.
    - Overburden is removed the same as for other contaminated waste site removals.
    - Building foundations will be excavated to a minimum of 1 ft outside each foundation wall and 1 ft below the lowest point of the structure. All soil excavated within this boundary will be considered contaminated waste.
    - Concrete structures and slabs will be reduced to rubble with an impact hammer, pulverizer, or crusher mounted on a hydraulic excavator. After that, the debris will be loaded into an ERDF container. Concrete retention basins or other structures that have been backfilled with low strength, controlled-density fill will have the controlled-density fill removed by excavation. The controlled-density fill will be handled the same as contaminated soil.
    - Steel structures or tanks are to be cut up using a shear mounted on a hydraulic excavator. After that, the debris will be loaded into an ERDF container.
    - The ERDF containers have a 6-in. sand bed on the bottom of the liners and bedding sand placed with the demolition debris to ensure the liners are not damaged.
    - The excavation of the overburden soil, the processing of ERDF containers, sampling, backfilling, and revegetation of the excavation will be the same as described in Section 3.4.1 for excavation of RTD sites.

### 3.4.3 General Assumptions for Very Small Site Removal Treatment and Disposal Process

The very small RTD process includes the following assumptions.

1. Fieldwork (e.g., mobilization/demobilization, excavation, backfill, revegetation, and some of the post construction work) will be performed by an FP contractor. The project management, RCT support, sampling, and safety oversight will be performed by FH. The waste disposal work involved with hauling from the site to the ERDF and ERDF dumping cost/fees will be performed by the environmental restoration contractor responsible for the ERDF.
2. Mobilization and startup is the same as described in Section 3.4.2, Number 2. The assumption for 200-MG-2 is that 20 very small wastes sites will be remediated per FP contract. The mobilization costs will be prorated over the 20 sites.
3. The excavation sites will have contaminated waste removed. The sides of the excavation will be sloped at 1.5:1 to the bottom of the excavation, except for those sites that do not require the excavation to go below 5 ft. During the removal process, heavy equipment will be kept out of the excavation site.
4. For excavation sites, overburden will be removed with a 1.25-yd<sup>3</sup> loader backhoe. The soil will be stockpiled near the waste site. A highway truck with a 3,000-gal water tank is used to control dust during this activity. The production rate for one crew is 25 yd<sup>3</sup>/hr. For most sites that require the full suite of sample analysis and where there is less than 100 yd<sup>3</sup> planned overburden removal, the soil is considered to be contaminated.
5. Contaminated waste will be excavated using a 1.25-yd<sup>3</sup> loader backhoe. The contaminated soil will be directly placed into lined ERDF containers and hauled from the excavation site. A highway truck with a 3,000-gal water tank is used to control dust during this activity. Crew labor consists of one operator, one laborer, and one truck driver. The production rate for one crew is 12 yd<sup>3</sup>/hr. An FH RCT supports the work at 1.5 hours per excavation crew hour.
6. The sampling process is the same as described in Section 3.4.2, Number 7.
7. The ERDF disposal costs for the very small sites are based on the cost per ton of waste and the cost to transport a container to the ERDF. The disposal fee at the ERDF is \$23.94 per ton for waste generated at 200 West or 200 East Areas. The ERDF disposal fee shown in the estimate is based on the tons of waste. The second part includes the driver labor, transportation charge, and Environmental Remediation Contract direct labor charges. Transportation and handling costs are based on the Washington Closure Letter, "FY 2008 ERDF Rates for Other Hanford Contractors," September 25, 2007. The average transportation and handling cost is \$391.47 per container for waste generated at the 200 West or 200 East Areas. The costs shown in the estimate are based on the number of containers. For planning purposes, the capacity of an ERDF container is 13 yd<sup>3</sup> of contaminated waste.
8. After completion of the excavation and sampling processes, the site will be backfilled or regraded, depending on the depth of the excavation. For sites that are excavated less than 4 ft deep, the site will be regraded. Sites excavated deeper than 4 ft will be backfilled. In either case, any stockpiled overburden will be returned to the excavated area. The

- moving of the stockpiled overburden back to the excavation site will require a crew using 1.25-yd<sup>3</sup> loader backhoe. The production rate for one crew is 100 yd<sup>3</sup>/hr.
9. Regrading a waste site involves the spreading of overburden material and re-contouring of the site after the excavation and sampling work has been completed. The area to be regraded will have 25-ft added to each side to help blend the disturbed area with the existing ground. One 1.25-yd<sup>3</sup> loader backhoe will be the only piece of equipment used for this work. A highway truck with a 3,000-gal water tank is used to control dust during this activity. The production rate for one crew is 200 yd<sup>2</sup>/hr.
  10. Backfilling is performed by two different operations. The moving of the stockpiled overburden back to the excavation site will be conducted as described in Number 8. The moving of borrow material to the excavation site typically is performed by one crew hauling from an on-site pit source. The equipment used by a crew is one 4-yd<sup>3</sup> loader, four 16-yd<sup>3</sup> highway dump trucks, and one water truck. The production rate for one crew is 120 yd<sup>3</sup>/hr. Spreading and compaction of the backfill at the site is performed by one crew. The equipment used per crew is one dozer and one 3,000-gal water truck. The production costs for one crew is based on the time required to move stockpiled and borrow material to the site.
  11. Revegetation of the waste sites within the 200-MG-2 OU is not needed. All waste sites are within the Core Area designated by DOE/RL-2008-45.
  12. The FH project management team is the same as described in Section 3.4.2, Number 12.
  13. The FP contractor field supervisory team is the same as described in Section 3.4.2, Number 13.
  14. Demobilization is the same as described in Section 3.4.2, Number 14. The demobilization costs will be prorated over the twenty sites using the same assumptions as mobilization.
  15. Minor belowground concrete structures, french drains, etc., will require demolition work as part of the removal work. All these structures are empty of any sludge or debris before demolition.
    - Overburden is removed the same as for other contaminated waste site removals.
    - Concrete structures and French drains will be reduced to rubble with a small impact hammer mounted on a loader backhoe. After that, the debris will be loaded into an ERDF container.
    - The volume of demolition debris is expected to be less than 2 yd<sup>3</sup> for these sites. The debris will be mixed with other contaminated soil going to the ERDF so that the containers will not require bedding sand or other special handling.
    - The excavation of the overburden soil, the processing of ERDF containers, sampling, backfilling, and revegetation of the excavation will be the same as previously described in this section.
  16. Assumptions used for small injection/reverse wells that are less than 3 by 3 by 4 ft with a vertical gravel filled 3 ft diameter concrete pipe are as follows.
    - There will be 1 yd<sup>3</sup> of contaminated soil and 1 yd<sup>3</sup> of contaminated concrete at each site.

- The concrete pipe will be broken up before removal.
- There is no clean overburden soil/material at the site.

### **3.4.4 Site Specific Assumptions – Removal, Treatment and Disposal**

#### **3.4.4.1 207-A North Retention Basin**

This facility consist of two retention basins and a pump station. This remediation action will remove only the north basin. The pump station and south basin are currently in use. It is assumed that the piping to the north basin has been isolated from the basin so that any removal work will not affect the pump station or the south basin. The site excavation of the north basin will not affect either the pump station or south basin and will not require any shoring or additional work. The design of the north basin has an overall dimension of 96 by 55 ft with a two divider/weirs that splits the basin into three equal parts. The basins are concrete lined with sloping walls 4 in. thick. The excavation limit of contaminated soil removal is 1 ft outside the concrete structure. The basin has not been backfill and is currently empty. The empty volume has been calculated at 1,650 yd<sup>3</sup>. The volume of concrete walls, floors, and weirs has been calculated based on design drawings. At completion, the excavated site will be backfilled to current site ground level.

#### **3.4.4.2 207-S Retention Basin**

This site is an opened top retention basin that is 130 by 130 ft. The waste site was widened to 135 by 135 ft to include four catch basins that are on the outside perimeter of the retention basin. The excavation limit of contaminated soil removal is 1 ft below the structure. The basin has not been backfill and is currently empty. The empty volume has been calculated at 4,540 yd<sup>3</sup>. The volume of concrete walls, floors, and weirs has been calculated based on site drawings. At completion, the excavated site will be backfilled to current site ground level.

#### **3.4.4.3 207-T and 207-U Retention Basins**

The two retention basins were built using the same design drawings and are therefore assumed to be identical. The design of the basins has an overall dimension of 249 by 125 ft with a center divider/weir that splits the basin into two equal parts. The basins are concrete lined with sloping walls 1 ft thick. The excavation limit of contaminated soil removal is 1 ft outside the concrete structure. The basin has not been backfilled and is currently empty. The empty volume has been calculated at 5,730 yd<sup>3</sup>. The volume of concrete walls, floors, and weirs has been calculated based on design drawings. At completion, the excavated site will be backfilled to current site ground level.

#### **3.4.4.4 207-Z Retention Basins**

This site is an opened top retention basin that is 50 by 44 ft with a 20 by 12 ft pump room attached. The design of the basin has a center divider that splits the basin into two equal parts. The basin is concrete below ground structure with 1.25 ft thick walls and floors. The excavation limit of contaminated soil removal is 1 ft outside the concrete structure. The basin has been backfilled with control density fill and is has a new 4 in. fiber reinforced concrete cover. It is expected that the controlled-density fill can be dug out using an excavator; an impact hammer will not be required. The volume of concrete walls and floors has been calculated based on design drawings. At completion, the excavated site will be backfilled to current site ground level.

### **3.5 COST REPORTING**

A summary of the present-worth costs for all alternatives (Table A-8) are included in DOE/RL-2008-45, Chapter 5.

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- Washington Closure Hanford, "FY 2008 ERDF Rates for Other Hanford Contractors," (generic letter from Washington Closure Hanford), Washington Closure Hanford, Richland Washington, September 25, 2007.
- Waste Information Data System Report*, Hanford Site database.

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**APPENDIX A**

**COST ESTIMATE TABLES**

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**APPENDIX A**  
**COST ESTIMATE TABLES**

**INTRODUCTION**

This appendix presents the cost estimates tables for the 200-MG-2 Operable Unit engineering evaluation/cost analysis removal action.

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Table A-1. 200-MG-2 Operable Unit Alternatives –  
Site Information. (3 Pages)

Waste Site	Site Description	MESC/IC/MNA and CS/NA						RTD												
		Site Dimensions (ft)						Template	Sampling	Excavation Dimensions (ft)				Contaminated Soil Volume (yd <sup>3</sup> )	Contaminated Debris (yd <sup>3</sup> )	Excavation Volume (yd <sup>3</sup> )	Void Volume (yd <sup>3</sup> )	Overburden Soil Volume (yd <sup>3</sup> )	Backfill (yd <sup>3</sup> )	Duration (days)
		Length (Bottom) (ft)	Width (Bottom) (ft)	Clean Soil Depth (ft bgs)	Side Slope (assumed)	End Slope (assumed)	Surface Area (a)			Length (Top) (ft)	Width (Top) (ft)	Excavation Depth (ft)	Clean Overburden Depth (ft)							
200-E-4	French Drain	4	4	0	1.5	1.5	0.01	RTD	All	49	49	15	0	9	0	671	0	663	9	8
200-E-25	French Drain	2	2	1	1.5	1.5	0.01	RTD	All	47	47	15	1	2	1	615	0	612	3	9
200-E-55	French Drain	6	6	3	1.5	1.5	0.01	RTD	All	60	60	18	3	19	1	1212	0	1192	20	10
200-E-65	Injection/Reverse Well	4	4	4	1.5	1.5	0.01	Very Small RTD	All	22	22	6	0	55	1	56	0	0	56	5
200-E-67	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-E-68	Injection/Reverse Well	4	4	4	1.5	1.5	0.01	Very Small RTD	All	22	22	6	0	55	1	56	0	0	56	5
200-E-70	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-E-71	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-E-73	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-E-74	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-E-77	Injection/Reverse Well	4	4	5	1.5	1.5	0.01	Very Small RTD	All	22	22	6	5	55	1	56	0	0	56	5
200-E-79	Injection/Reverse Well	3	3	6	1.5	1.5	0.01	Very Small RTD	All	24	24	7	0	75	1	76	0	0	76	5
200-E-84	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-W-107	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-W-108	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	5	4	1	1	2	0	0	2	5
200-W-109	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-W-111	Injection/Reverse Well	3	3	3	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
200-W-118	Injection/Reverse Well	3	3	0	0.0	0.0	0.01	Very Small RTD	All	3	3	4	0	1	1	2	0	0	2	4
207-A North	Retention Basin	96	59	7	2.0	2.0	0.14	RTD	All	156	119	15	7	4879	204	6730	1647	0	6730	30
207-S	Retention Basin	135	135	0	1.5	1.5	0.42	RTD	All	168	168	11	0	1943	436	9462	4538	2037	7425	28
207-T	Retention Basin	249	125	0	1.5	1.5	0.72	RTD	All	276	152	9	0	3484	1161	12180	5730	1805	10375	43
207-U	Retention Basin	249	125	0	1.5	1.5	0.72	RTD	All	276	152	9	0	3484	1161	12180	5730	1805	10375	43
207-Z	Retention Basin	50	40	0	1.5	1.5	0.05	RTD	All	95	85	15	0	416	1101	2968	0	1481	1487	18
209-E-WS-2	French Drain	4	4	0	1.5	1.5	0.01	Very Small RTD	All	31	31	9	0	161	2	163	0	0	163	6
216-A-11	French Drain - RCP	9	9	17	1.5	1.5	0.01	RTD	All	129	129	40	17	67	2	12387	0	12318	69	29
216-A-12	French Drain - RCP	10	10	20	1.5	1.5	0.01	RTD	All	100	100	30	20	35	2	5611	0	5574	37	18
216-A-13	French Drain - RCP	4	4	0	1.5	1.5	0.01	RTD	All	94	94	30	0	16	2	4918	0	4900	18	17
216-A-14	French Drain - RCP	9	9	17	1.5	1.5	0.01	RTD	All	129	129	40	17	67	2	12387	0	12318	69	29

Table A-1. 200-MG-2 Operable Unit Alternatives – Site Information. (3 Pages)

Waste Site	Site Description	MESC/IC/MNA and CS/NA						RTD												
		Site Dimensions (ft)						Template	Sampling	Excavation Dimensions (ft)				Contaminated Soil Volume (yd <sup>3</sup> )	Contaminated Debris (yd <sup>3</sup> )	Excavation Volume (yd <sup>3</sup> )	Void Volume (yd <sup>3</sup> )	Overburden Soil Volume (yd <sup>3</sup> )	Backfill (yd <sup>3</sup> )	Duration (days)
		Length (Bottom) (ft)	Width (Bottom) (ft)	Clean Soil Depth (ft bgs)	Side Slope (assumed)	End Slope (assumed)	Surface Area (a)			Length (Top) (ft)	Width (Top) (ft)	Excavation Depth (ft)	Clean Overburden Depth (ft)							
216-A-22	Crib/French Drain	12	12	7	1.5	1.5	0.01	RTD	All	93	93	27	7	107	0	4397	0	4290	107	14
216-A-26	French Drain - VCP	4	4	1	1.5	1.5	0.01	RTD	All	64	64	20	1	11	0	1523	0	1512	11	10
216-A-26A	French Drain - VCP	4	4	1	1.5	1.5	0.01	RTD	All	64	64	20	1	11	0	1523	0	1512	11	10
216-A-32	Crib	85	23	10	1.5	1.5	0.05	RTD	All	151	89	22	10	869	0	6272	0	5403	869	20
216-A-33	French Drain	6	6	5	1.5	1.5	0.01	RTD	All	51	51	15	5	12	1	733	0	719	13	9
216-A-35	French Drain - RCP	8	8	0	1.5	1.5	0.01	RTD	All	68	68	20	0	38	9	1736	0	1689	47	11
216-A-38-1	Crib	20	520	28	1.5	1.5	0.24	RTD	All	134	634	38	28	3852	0	67102	0	63251	3852	133
216-A-41	Crib	15	15	5	1.5	1.5	0.01	RTD	All	66	66	17	5	100	0	1442	0	1342	100	9
216-B-13	French Drain - RCP	6	6	0	1.5	1.5	0.01	RTD	All	81	81	25	0	30	3	3054	0	3021	33	13
216-B-51	French Drain	10	10	2	1.5	1.5	0.01	RTD	All	76	76	22	2	74	0	2394	0	2320	74	11
216-C-4	Crib w/Pipe <sup>a</sup>	32	22	12	1.5	1.5	0.02	RTD	All	98	88	22	12	261	0	3800	0	3540	261	15
216-S-12	Trench	90	20	10	1.5	1.5	0.05	RTD	All	135	65	15	10	333	0	2938	0	2604	333	12
216-S-16D	Ditch	1700	4	5	1.5	1.5	0.16	RTD	All	1724	28	8	5	756	0	8159	0	7403	756	24
216-S-18	Trench	125	15	2	1.5	1.5	0.05	RTD	All	176	66	17	2	1042	0	4247	0	3206	1042	16
216-S-25	Crib	583	18	6	1.5	1.5	0.25	RTD	All	643	78	20	6	5441	0	22462	0	17021	5441	59
216-SX-2	Crib	62	17	5	1.5	1.5	0.03	RTD	All	107	62	15	5	390	0	2136	0	1745	390	11
216-T-1	Ditch w/Pipe <sup>b</sup>	1467	3	10	1.5	1.5	0.11	RTD	All	1512	48	15	10	815	0	21383	0	20568	815	49
216-T-4-1D	Ditch	850	8	8	1.5	1.5	0.16	RTD	All	901	59	17	6	2770	0	18876	0	16106	2770	46
216-T-4-2	Ditch	1750	8	8	1.5	1.5	0.33	RTD	All	1801	59	17	6	5704	0	37859	0	32156	5704	88
216-T-9	Trench	50	10	6	1.5	1.5	0.02	RTD	All	80	40	10	6	74	0	685	0	611	74	8
216-T-10	Trench	50	10	6	1.5	1.5	0.02	RTD	All	80	40	10	6	74	0	685	0	611	74	8
216-T-11	Trench	50	10	6	1.5	1.5	0.02	RTD	All	80	40	10	6	74	0	685	0	611	74	8
216-T-12	Trench	15	10	0	1.5	1.5	0.01	RTD	All	60	55	15	0	83	0	958	0	875	83	8
216-T-13	Trench	20	20	10	1.5	1.5	0.01	RTD	All	53	53	11	10	15	0	654	0	639	15	8
216-T-29	French Drain	110	48	0	1.5	1.5	0.13	RTD	All	128	66	6	0	1173	0	1525	0	352	1173	12
216-T-31	French Drain	7	7	27	1.5	1.5	0.01	RTD	All	91	91	28	27	2	0	4326	0	4324	2	14
216-T-33	Crib	43	18	7	1.5	1.5	0.02	RTD	All	88	63	15	7	229	0	1755	0	1526	229	10
216-U-3	French Drain	5	5	0	1.5	1.5	0.01	RTD	All	50	50	15	0	14	0	701	0	688	14	8

Table A-1. 200-MG-2 Operable Unit Alternatives – Site Information. (3 Pages)

Waste Site	Site Description	MESC/IC/MNA and CS/NA						RTD												
		Site Dimensions (ft)						Template	Sampling	Excavation Dimensions (ft)				Contaminated Soil Volume (yd <sup>3</sup> )	Contaminated Debris (yd <sup>3</sup> )	Excavation Volume (yd <sup>3</sup> )	Void Volume (yd <sup>3</sup> )	Overburden Soil Volume (yd <sup>3</sup> )	Backfill (yd <sup>3</sup> )	Duration (days)
		Length (Bottom) (ft)	Width (Bottom) (ft)	Clean Soil Depth (ft bgs)	Side Slope (assumed)	End Slope (assumed)	Surface Area (a)			Length (Top) (ft)	Width (Top) (ft)	Excavation Depth (ft)	Clean Overburden Depth (ft)							
216-U-7	French Drain	5	5	2	1.5	1.5	0.01	RTD	All	86	86	27	2	20	3	3711	0	3687	23	15
216-U-13	Trench	200	70	18	1.5	1.5	0.33	RTD	All	257	127	19	18	519	0	16410	0	15892	519	36
216-U-14	Ditch	5680	8	12	1.5	1.5	1.05	RTD	All	5731	59	17	12	8415	0	120753	0	112338	8415	240
216-W-LWC	Crib	553	171	12	1.5	1.5	2.18	RTD	All	643	261	30	12	63042	0	145770	0	82728	63042	228
216-Z-13	French Drain	3	3	9	1.5	1.5	0.01	RTD	All	54	54	17	9	2	1	921	0	918	3	10
216-Z-14	French Drain	3	3	9	1.5	1.5	0.01	RTD	All	54	54	17	9	2	1	921	0	918	3	10
216-Z-15	French Drain – VCP	5	5	16	1.5	1.5	0.01	RTD	All	80	80	25	16	8	0	2975	0	2966	8	12
2704-C-WS-1	French Drain	6	6	0	1.5	1.5	0.01	RTD	All	51	51	15	0	19	1	733	0	713	20	9
UPR-200-E-17	Unplanned Release	9	9	2	1.5	1.5	0.01	Very Small RTD	All	33	33	8	2	18	0	173	0	155	18	7
UPR-200-E-9	Unplanned Release	9	9	10	1.5	1.5	0.01	RTD	All	54	54	15	10	15	0	833	0	818	15	8
UPR-200-W-103	Unplanned Release	25	6	7	1.5	1.5	0.01	RTD	All	70	51	15	7	44	0	1033	0	989	44	9
UPR-200-W-111	Unplanned Release	40	15	2	1.5	1.5	0.02	RTD	All	91	66	17	2	333	0	2080	0	1746	333	11
UPR-200-W-112	Unplanned Release	40	15	2	1.5	1.5	0.02	RTD	All	91	66	17	2	333	0	2080	0	1746	333	11
UPR-200-W-138	Unplanned Release	10	10	0	1.5	1.5	0.01	Very Small RTD	All	28	28	6	0	98	0	98	0	0	98	6

<sup>a</sup> Add 115 ft 12" pipe.

<sup>b</sup> Add 76 ft <12" pipe.

bgs = below ground surface.  
 CS/NA = confirmatory sampling/no action.

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.  
 RCP = reinforced concrete pipe.

RTD = removal, treatment, and disposal.  
 VCP = vitrified clay pipe.

Table A-2. MESC/IC/MNA - Alternative -  
Capital Cost Summary. (3 Pages)

Waste Site	Site Description	Template	Sampling	Institutional Controls	Sampling	Sub Contract Staff	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
200-E-4	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
200-E-25	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
200-E-55	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
200-E-65	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
200-E-67	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-E-68	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
200-E-70	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-E-71	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-E-73	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-E-74	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-E-77	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
200-E-79	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
200-E-84	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-W-107	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-W-108	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
200-W-109	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-W-111	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
200-W-118	Injection/Reverse Well	Very Small RTD	All	\$20,000	\$38,479	\$1,200	\$15,392	\$75,071	\$18,768	\$5,900	\$99,739
207-A North	Retention Basin	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
207-S	Retention Basin	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
207-T	Retention Basin	RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
207-U	Missing Info	RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
207-Z	Retention Basin	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
209-E-WS-2	French Drain	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
216-A-11	French Drain - RCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-12	French Drain - RCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-13	French Drain - RCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-14	French Drain - RCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-22	Crib/French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-26	French Drain - VCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-26A	French Drain - VCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-32	Crib	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-33	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875

Table A-2. MESC/IC/MNA - Alternative - Capital Cost Summary. (3 Pages)

Waste Site	Site Description	Template	Sampling	Institutional Controls	Sampling	Sub Contract Staff	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
216-A-35	French Drain - RCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-38-1	Crib	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-A-41	Crib	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-B-13	French Drain - RCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-B-51	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-C-4	Crib w/Pipe	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-S-12	Trench	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-S-16D	Ditch	RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
216-S-18	Trench	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-S-25	Crib	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-SX-2	Crib	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-T-1	Ditch w/Pipe	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-T-4-1D	Ditch	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-T-4-2	Ditch	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-T-9	Trench	RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
216-T-10	Trench	RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
216-T-11	Trench	RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
216-T-12	Trench	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-T-13	Trench	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-T-29	French Drain	RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
216-T-31	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-T-33	Crib	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-U-3	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-U-7	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-U-13	Trench	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-U-14	Ditch	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-W-LWC	Crib	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-Z-13	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-Z-14	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
216-Z-15	French Drain - VCP	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
2704-C-WS-1	French Drain	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
UPR-200-E-17	Unplanned Release	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240
UPR-200-E-9	Unplanned Release	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875

Table A-2. MESC/IC/MNA - Alternative -  
Capital Cost Summary. (3 Pages)

Waste Site	Site Description	Template	Sampling	Institutional Controls	Sampling	Sub Contract Staff	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
UPR-200-W-103	Unplanned Release	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
UPR-200-W-111	Unplanned Release	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
UPR-200-W-112	Unplanned Release	RTD	All	\$20,000	\$77,788	\$1,200	\$15,392	\$114,380	\$28,595	\$5,900	\$148,875
UPR-200-W-138	Unplanned Release	Very Small RTD	All	\$20,000	\$74,080	\$1,200	\$15,392	\$110,672	\$27,668	\$5,900	\$144,240

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.

RCP = reinforced concrete pipe.

RTD = removal, treatment, and disposal.

VCP = vitrified clay pipe.

Table A-3. Maintain Existing Soil Cover/Institutional Controls/Monitored Natural Attenuation Alternative – Cost Summary.  
(3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
200-E-4	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
200-E-25	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
200-E-55	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
200-E-65	Injection/Reverse Well	\$144,240	\$1,478,152	\$1,622,392	\$489,056
200-E-67	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-E-68	Injection/Reverse Well	\$144,240	\$1,478,152	\$1,622,392	\$489,056
200-E-70	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-E-71	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-E-73	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-E-74	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-E-77	Injection/Reverse Well	\$144,240	\$1,478,152	\$1,622,392	\$489,056
200-E-79	Injection/Reverse Well	\$144,240	\$1,478,152	\$1,622,392	\$489,056
200-E-84	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-W-107	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-W-108	Injection/Reverse Well	\$144,240	\$1,478,152	\$1,622,392	\$489,056
200-W-109	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-W-111	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
200-W-118	Injection/Reverse Well	\$99,739	\$1,478,152	\$1,577,890	\$444,555
207-A North	Retention Basin	\$148,875	\$1,478,152	\$1,627,027	\$493,691
207-S	Retention Basin	\$148,875	\$1,478,152	\$1,627,027	\$493,691
207-T	Retention Basin	\$144,240	\$1,944,716	\$2,088,956	\$598,377
207-U	Retention Basin	\$144,240	\$1,944,716	\$2,088,956	\$598,377
207-Z	Retention Basin	\$148,875	\$1,478,152	\$1,627,027	\$493,691
209-E-WS-2	French Drain	\$144,240	\$1,478,152	\$1,622,392	\$489,056
216-A-11	French Drain - RCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-12	French Drain - RCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691

Table A-3. Maintain Existing Soil Cover/Institutional Controls/Monitored Natural Attenuation Alternative – Cost Summary.  
(3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
216-A-13	French Drain - RCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-14	French Drain - RCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-22	Crib/French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-26	French Drain - VCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-26A	French Drain - VCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-32	Crib	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-33	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-35	French Drain - RCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-38-1	Crib	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-A-41	Crib	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-B-13	French Drain - RCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-B-51	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-C-4	Crib w/Pipe	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-S-12	Trench	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-S-16D	Ditch	\$144,240	\$1,478,152	\$1,622,392	\$489,056
216-S-18	Trench	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-S-25	Crib	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-SX-2	Crib	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-T-1	Ditch w/Pipe	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-T-4-1D	Ditch	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-T-4-2	Ditch	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-T-9	Trench	\$144,240	\$1,478,152	\$1,622,392	\$489,056
216-T-10	Trench	\$144,240	\$1,478,152	\$1,622,392	\$489,056
216-T-11	Trench	\$144,240	\$1,478,152	\$1,622,392	\$489,056
216-T-12	Trench	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-T-13	Trench	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-T-29	French Drain	\$144,240	\$1,478,152	\$1,622,392	\$489,056

Table A-3. Maintain Existing Soil Cover/Institutional Controls/Monitored Natural Attenuation Alternative – Cost Summary.  
(3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
216-T-31	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-T-33	Crib	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-U-3	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-U-7	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-U-13	Trench	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-U-14	Ditch	\$148,875	\$2,748,223	\$2,897,098	\$791,283
216-W-LWC	Crib	\$148,875	\$5,231,066	\$5,379,941	\$1,373,041
216-Z-13	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-Z-14	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
216-Z-15	French Drain - VCP	\$148,875	\$1,478,152	\$1,627,027	\$493,691
2704-C-WS-1	French Drain	\$148,875	\$1,478,152	\$1,627,027	\$493,691
UPR-200-E-17	Unplanned Release	\$144,240	\$1,478,152	\$1,622,392	\$489,056
UPR-200-E-9	Unplanned Release	\$148,875	\$1,478,152	\$1,627,027	\$493,691
UPR-200-W-103	Unplanned Release	\$148,875	\$1,478,152	\$1,627,027	\$493,691
UPR-200-W-111	Unplanned Release	\$148,875	\$1,478,152	\$1,627,027	\$493,691
UPR-200-W-112	Unplanned Release	\$148,875	\$1,478,152	\$1,627,027	\$493,691
UPR-200-W-138	Unplanned Release	\$144,240	\$1,478,152	\$1,622,392	\$489,056

RCP = reinforced concrete pipe.

VCP = vitrified clay pipe.

Table A-4. Confirmatory Sampling/No Action Alternative – Capital Cost Summary. (3 Pages)

Waste Site	Site Description	Template	Sampling	Sampling	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
200-E-4	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
200-E-25	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
200-E-55	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
200-E-65	Injection/Reverse Well	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
200-E-67	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-E-68	Injection/Reverse Well	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
200-E-70	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-E-71	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-E-73	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-E-74	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-E-77	Injection/Reverse Well	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
200-E-79	Injection/Reverse Well	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
200-E-84	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-W-107	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-W-108	Injection/Reverse Well	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
200-W-109	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-W-111	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
200-W-118	Injection/Reverse Well	Very Small RTD	All	\$57,595	\$14,532	\$72,127	\$18,032	\$18,000	\$108,159
207-A North	Retention Basin	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
207-S	Retention Basin	RTD	All	\$186,267	\$16,513	\$202,780	\$50,695	\$45,000	\$298,475
207-T	Retention Basin	RTD	All	\$244,417	\$14,532	\$258,949	\$64,737	\$80,000	\$403,686
207-U	Missing Info	RTD	All	\$244,417	\$14,532	\$258,949	\$64,737	\$80,000	\$403,686
207-Z	Retention Basin	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
209-E-WS-2	French Drain	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
216-A-11	French Drain - RCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-12	French Drain - RCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-13	French Drain - RCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184

Table A-4. Confirmatory Sampling/No Action Alternative – Capital Cost Summary. (3 Pages)

Waste Site	Site Description	Template	Sampling	Sampling	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
216-A-14	French Drain - RCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-22	Crib/French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-26	French Drain - VCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-26A	French Drain - VCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-32	Crib	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-33	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-35	French Drain - RCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-38-1	Crib	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-A-41	Crib	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-B-13	French Drain - RCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-B-51	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-C-4	Crib w/Pipe	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-S-12	Trench	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-S-16D	Ditch	RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
216-S-18	Trench	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-S-25	Crib	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-SX-2	Crib	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-T-1	Ditch w/Pipe	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-T-4-1D	Ditch	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-T-4-2	Ditch	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-T-9	Trench	RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
216-T-10	Trench	RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
216-T-11	Trench	RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
216-T-12	Trench	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-T-13	Trench	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-T-29	French Drain	RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
216-T-31	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-T-33	Crib	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184

Table A-4. Confirmatory Sampling/No Action Alternative – Capital Cost Summary. (3 Pages)

Waste Site	Site Description	Template	Sampling	Sampling	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
216-U-3	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-U-7	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-U-13	Trench	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-U-14	Ditch	RTD	All	\$434,091	\$16,954	\$451,045	\$112,761	\$120,000	\$683,806
216-W-LWC	Crib	RTD	All	\$435,160	\$17,396	\$452,556	\$113,139	\$120,000	\$685,695
216-Z-13	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-Z-14	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
216-Z-15	French Drain - VCP	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
2704-C-WS-1	French Drain	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
UPR-200-E-17	Unplanned Release	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596
UPR-200-E-9	Unplanned Release	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
UPR-200-W-103	Unplanned Release	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
UPR-200-W-111	Unplanned Release	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
UPR-200-W-112	Unplanned Release	RTD	All	\$104,015	\$14,532	\$118,547	\$29,637	\$18,000	\$166,184
UPR-200-W-138	Unplanned Release	Very Small RTD	All	\$94,745	\$14,532	\$109,277	\$27,319	\$18,000	\$154,596

RCP = reinforced concrete pipe.  
 RTD = removal, treatment, and disposal.  
 VCP = vitrified clay pipe.

Table A-5. Confirmatory Sampling/No Action Alternative – Cost Summary. (3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
200-E-4	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
200-E-25	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
200-E-55	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
200-E-65	Injection/Reverse Well	\$154,596	\$13,934	\$168,530	\$167,966
200-E-67	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-E-68	Injection/Reverse Well	\$154,596	\$13,934	\$168,530	\$167,966
200-E-70	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-E-71	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-E-73	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-E-74	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-E-77	Injection/Reverse Well	\$154,596	\$13,934	\$168,530	\$167,966
200-E-79	Injection/Reverse Well	\$154,596	\$13,934	\$168,530	\$167,966
200-E-84	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-W-107	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-W-108	Injection/Reverse Well	\$154,596	\$13,934	\$168,530	\$167,966
200-W-109	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-W-111	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
200-W-118	Injection/Reverse Well	\$108,159	\$13,934	\$122,093	\$121,529
207-A North	Retention Basin	\$166,184	\$13,934	\$180,118	\$179,554
207-S	Retention Basin	\$298,475	\$20,402	\$318,877	\$318,051
207-T	Retention Basin	\$403,686	\$26,586	\$430,272	\$429,196
207-U	Retention Basin	\$403,686	\$26,586	\$430,272	\$429,196
207-Z	Retention Basin	\$166,184	\$13,934	\$180,118	\$179,554
209-E-WS-2	French Drain	\$154,596	\$13,934	\$168,530	\$167,966
216-A-11	French Drain - RCP	\$166,184	\$13,934	\$180,118	\$179,554
216-A-12	French Drain - RCP	\$166,184	\$13,934	\$180,118	\$179,554
216-A-13	French Drain - RCP	\$166,184	\$13,934	\$180,118	\$179,554

Table A-5. Confirmatory Sampling/No Action Alternative – Cost Summary. (3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
216-A-14	French Drain - RCP	\$166,184	\$13,934	\$180,118	\$179,554
216-A-22	Crib/French Drain	\$166,184	\$13,934	\$180,118	\$179,554
216-A-26	French Drain - VCP	\$166,184	\$13,934	\$180,118	\$179,554
216-A-26A	French Drain - VCP	\$166,184	\$13,934	\$180,118	\$179,554
216-A-32	Crib	\$166,184	\$13,934	\$180,118	\$179,554
216-A-33	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
216-A-35	French Drain - RCP	\$166,184	\$13,934	\$180,118	\$179,554
216-A-38-1	Crib	\$166,184	\$13,934	\$180,118	\$179,554
216-A-41	Crib	\$166,184	\$13,934	\$180,118	\$179,554
216-B-13	French Drain - RCP	\$166,184	\$13,934	\$180,118	\$179,554
216-B-51	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
216-C-4	Crib w/Pipe	\$166,184	\$13,934	\$180,118	\$179,554
216-S-12	Trench	\$166,184	\$13,934	\$180,118	\$179,554
216-S-16D	Ditch	\$154,596	\$13,934	\$168,530	\$167,966
216-S-18	Trench	\$166,184	\$13,934	\$180,118	\$179,554
216-S-25	Crib	\$166,184	\$13,934	\$180,118	\$179,554
216-SX-2	Crib	\$166,184	\$13,934	\$180,118	\$179,554
216-T-1	Ditch w/Pipe	\$166,184	\$13,934	\$180,118	\$179,554
216-T-4-1D	Ditch	\$166,184	\$13,934	\$180,118	\$179,554
216-T-4-2	Ditch	\$166,184	\$13,934	\$180,118	\$179,554
216-T-9	Trench	\$154,596	\$13,934	\$168,530	\$167,966
216-T-10	Trench	\$154,596	\$13,934	\$168,530	\$167,966
216-T-11	Trench	\$154,596	\$13,934	\$168,530	\$167,966
216-T-12	Trench	\$166,184	\$13,934	\$180,118	\$179,554
216-T-13	Trench	\$166,184	\$13,934	\$180,118	\$179,554
216-T-29	French Drain	\$154,596	\$13,934	\$168,530	\$167,966
216-T-31	French Drain	\$166,184	\$13,934	\$180,118	\$179,554

Table A-5. Confirmatory Sampling/No Action Alternative – Cost Summary. (3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
216-T-33	Crib	\$166,184	\$13,934	\$180,118	\$179,554
216-U-3	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
216-U-7	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
216-U-13	Trench	\$166,184	\$13,934	\$180,118	\$179,554
216-U-14	Ditch	\$683,806	\$35,043	\$718,849	\$717,432
216-W-LWC	Crib	\$685,695	\$67,890	\$753,585	\$750,839
216-Z-13	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
216-Z-14	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
216-Z-15	French Drain - VCP	\$166,184	\$13,934	\$180,118	\$179,554
2704-C-WS-1	French Drain	\$166,184	\$13,934	\$180,118	\$179,554
UPR-200-E-17	Unplanned Release	\$154,596	\$13,934	\$168,530	\$167,966
UPR-200-E-9	Unplanned Release	\$166,184	\$13,934	\$180,118	\$179,554
UPR-200-W-103	Unplanned Release	\$166,184	\$13,934	\$180,118	\$179,554
UPR-200-W-111	Unplanned Release	\$166,184	\$13,934	\$180,118	\$179,554
UPR-200-W-112	Unplanned Release	\$166,184	\$13,934	\$180,118	\$179,554
UPR-200-W-138	Unplanned Release	\$154,596	\$13,934	\$168,530	\$167,966

RCP = reinforced concrete pipe.

VCP = vitrified clay pipe.

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Table A-6. RTD Alternative – Capital Cost Summary. (2 Pages)

Waste Site	Site Description	Template	Sampling	Mobilization/ Demobilization	Monitoring & Sampling	Site Work	Soil Excavation	Construction Staff	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
200-E-4	French Drain	RTD	All	\$57,683	\$98,552	\$41,584	\$17,889	\$39,100	\$18,793	\$273,601	\$68,400	\$51,300	\$393,301
200-E-25	French Drain	RTD	All	\$57,780	\$98,552	\$38,701	\$20,672	\$42,652	\$20,774	\$279,131	\$69,783	\$52,337	\$401,251
200-E-55	French Drain	RTD	All	\$60,381	\$98,552	\$41,358	\$25,567	\$46,203	\$22,755	\$294,816	\$73,704	\$55,278	\$423,798
200-E-65	Injection/Reverse Well	Very Small RTD	All	\$12,837	\$44,442	\$4,287	\$13,387	\$18,826	\$11,848	\$105,627	\$26,407	\$19,805	\$151,839
200-E-67	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-E-68	Injection/Reverse Well	Very Small RTD	All	\$12,837	\$44,442	\$4,287	\$13,387	\$18,826	\$11,848	\$105,627	\$26,407	\$19,805	\$151,839
200-E-70	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-E-71	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-E-73	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-E-74	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-E-77	Injection/Reverse Well	Very Small RTD	All	\$12,837	\$44,442	\$4,287	\$13,387	\$18,826	\$11,848	\$105,627	\$26,407	\$19,805	\$151,839
200-E-79	Injection/Reverse Well	Very Small RTD	All	\$12,863	\$44,442	\$4,525	\$16,531	\$18,826	\$11,848	\$109,035	\$27,259	\$20,444	\$156,738
200-E-84	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-W-107	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-W-108	Injection/Reverse Well	Very Small RTD	All	\$12,784	\$44,442	\$3,959	\$10,702	\$18,826	\$11,848	\$102,561	\$25,640	\$19,230	\$147,431
200-W-109	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-W-111	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
200-W-118	Injection/Reverse Well	Very Small RTD	All	\$12,587	\$44,442	\$3,452	\$7,800	\$15,274	\$9,867	\$93,422	\$23,356	\$17,517	\$134,294
207-A North	Retention Basin	RTD	All	\$65,809	\$88,773	\$82,497	\$804,902	\$117,230	\$62,817	\$1,222,028	\$305,507	\$183,304	\$1,710,839
207-S	Retention Basin	RTD	All	\$65,610	\$126,275	\$80,757	\$434,925	\$110,127	\$58,855	\$876,549	\$219,137	\$131,482	\$1,227,169
207-T	Retention Basin	RTD	All	\$72,074	\$143,422	\$171,133	\$1,230,019	\$163,398	\$89,012	\$1,869,058	\$467,265	\$280,359	\$2,616,681
207-U	Missing Info	RTD	All	\$72,074	\$143,422	\$171,133	\$1,230,019	\$163,398	\$89,012	\$1,869,058	\$467,265	\$280,359	\$2,616,681
207-Z	Retention Basin	RTD	All	\$58,437	\$100,491	\$57,428	\$282,517	\$74,614	\$38,603	\$612,090	\$153,023	\$91,814	\$856,926
209-E-WS-2	French Drain	Very Small RTD	All	\$12,955	\$44,442	\$9,014	\$26,495	\$22,377	\$13,829	\$129,112	\$32,278	\$24,209	\$185,599
216-A-11	French Drain - RCP	RTD	All	\$64,957	\$109,253	\$133,911	\$90,446	\$113,679	\$60,836	\$573,082	\$143,271	\$85,962	\$802,315
216-A-12	French Drain - RCP	RTD	All	\$58,293	\$98,552	\$74,536	\$52,491	\$74,614	\$38,603	\$397,089	\$99,272	\$74,454	\$570,815
216-A-13	French Drain - RCP	RTD	All	\$58,438	\$98,552	\$82,193	\$45,461	\$71,062	\$36,622	\$392,328	\$98,082	\$73,562	\$563,972
216-A-14	French Drain - RCP	RTD	All	\$64,957	\$109,253	\$133,911	\$90,446	\$113,679	\$60,836	\$573,082	\$143,271	\$85,962	\$802,315
216-A-22	Crib/French Drain	RTD	All	\$58,426	\$98,552	\$78,871	\$51,390	\$60,408	\$30,679	\$378,326	\$94,582	\$70,936	\$543,844
216-A-26	French Drain - VCP	RTD	All	\$58,079	\$98,552	\$49,160	\$23,951	\$46,203	\$22,755	\$298,700	\$74,675	\$56,006	\$429,381
216-A-26A	French Drain - VCP	RTD	All	\$58,079	\$98,552	\$49,160	\$23,951	\$46,203	\$22,755	\$298,700	\$74,675	\$56,006	\$429,381
216-A-32	Crib	RTD	All	\$59,633	\$109,253	\$95,651	\$174,257	\$81,717	\$43,007	\$563,518	\$140,880	\$84,528	\$788,925
216-A-33	French Drain	RTD	All	\$57,834	\$98,552	\$39,223	\$22,560	\$42,652	\$20,774	\$281,595	\$70,399	\$52,799	\$404,793
216-A-35	French Drain - RCP	RTD	All	\$58,127	\$98,552	\$50,694	\$33,069	\$49,754	\$24,736	\$314,932	\$78,733	\$59,050	\$452,715
216-A-38-1	Crib	RTD	All	\$95,642	\$159,131	\$394,126	\$930,854	\$483,020	\$266,420	\$2,329,193	\$582,298	\$232,919	\$3,144,411
216-A-41	Crib	RTD	All	\$57,886	\$98,552	\$45,169	\$33,951	\$42,652	\$20,774	\$298,984	\$74,746	\$56,060	\$429,790
216-B-13	French Drain - RCP	RTD	All	\$58,282	\$98,552	\$59,695	\$37,445	\$56,857	\$28,698	\$339,529	\$84,882	\$63,662	\$488,073
216-B-51	French Drain	RTD	All	\$58,222	\$98,552	\$58,627	\$36,533	\$49,754	\$24,736	\$326,424	\$81,606	\$61,205	\$469,235
216-C-4	Crib w/Pipe <sup>a</sup>	RTD	All	\$58,426	\$98,552	\$75,557	\$77,972	\$63,960	\$32,660	\$407,127	\$101,782	\$76,336	\$585,245
216-S-12	Trench	RTD	All	\$58,293	\$98,552	\$61,990	\$77,450	\$53,306	\$26,772	\$376,363	\$94,091	\$56,454	\$526,908
216-S-16D	Ditch	RTD	All	\$77,214	\$115,347	\$125,174	\$166,017	\$95,922	\$52,697	\$632,371	\$158,093	\$94,856	\$885,319

Table A-6. RTD Alternative – Capital Cost Summary. (2 Pages)

Waste Site	Site Description	Template	Sampling	Mobilization/ Demobilization	Monitoring & Sampling	Site Work	Soil Excavation	Construction Staff	Project Management	Sub Total	Contingency (25%)	Remedial Design	Total Project
216-S-18	Trench	RTD	All	\$59,428	\$102,523	\$6,841	\$188,380	\$67,511	\$35,083	\$459,766	\$114,942	\$68,965	\$643,672
216-S-25	Crib	RTD	All	\$74,711	\$151,681	\$249,786	\$1,321,884	\$220,219	\$121,149	\$2,139,430	\$534,858	\$213,943	\$2,888,231
216-SX-2	Crib	RTD	All	\$58,108	\$98,552	\$48,670	\$80,839	\$49,754	\$25,178	\$361,101	\$90,275	\$67,706	\$519,083
216-T-1	Ditch w/Pipe	RTD	All	\$83,036	\$141,984	\$182,413	\$252,998	\$184,706	\$102,222	\$947,359	\$236,840	\$142,104	\$1,326,303
216-T-4-1D	Ditch	RTD	All	\$77,013	\$145,863	\$149,088	\$506,231	\$174,052	\$95,396	\$1,147,643	\$286,911	\$172,146	\$1,606,700
216-T-4-2	Ditch	RTD	All	\$96,480	\$164,949	\$271,668	\$1,026,076	\$323,209	\$179,923	\$2,062,305	\$515,576	\$206,231	\$2,784,112
216-T-9	Trench	RTD	All	\$57,815	\$98,552	\$41,662	\$27,232	\$39,100	\$19,235	\$283,596	\$70,899	\$53,174	\$407,669
216-T-10	Trench <sup>b</sup>	RTD	All	\$57,815	\$98,552	\$41,662	\$27,232	\$39,100	\$19,235	\$283,596	\$70,899	\$53,174	\$407,669
216-T-11	Trench	RTD	All	\$57,815	\$98,552	\$41,662	\$27,232	\$39,100	\$19,235	\$283,596	\$70,899	\$53,174	\$407,669
216-T-12	Trench	RTD	All	\$57,785	\$98,552	\$42,928	\$29,723	\$39,100	\$19,235	\$287,323	\$71,831	\$53,873	\$413,027
216-T-13	Trench	RTD	All	\$57,862	\$98,552	\$38,992	\$19,343	\$39,100	\$18,793	\$272,642	\$68,161	\$51,120	\$391,923
216-T-29	French Drain	RTD	All	\$58,464	\$98,552	\$51,612	\$189,800	\$53,306	\$26,717	\$478,451	\$119,613	\$71,768	\$669,831
216-T-31	French Drain	RTD	All	\$58,186	\$98,552	\$68,315	\$36,837	\$60,408	\$30,679	\$352,977	\$88,244	\$66,183	\$507,404
216-T-33	Crib	RTD	All	\$58,000	\$98,552	\$46,640	\$54,216	\$46,203	\$23,197	\$326,808	\$81,702	\$61,277	\$469,787
216-U-3	French Drain	RTD	All	\$57,695	\$98,552	\$41,726	\$19,508	\$39,100	\$18,793	\$275,374	\$68,844	\$51,633	\$395,850
216-U-7	French Drain	RTD	All	\$58,342	\$98,552	\$64,129	\$39,730	\$63,960	\$32,660	\$357,373	\$89,343	\$67,007	\$513,724
216-U-13	Trench	RTD	All	\$65,711	\$130,655	\$173,681	\$174,239	\$138,538	\$74,703	\$757,527	\$189,382	\$113,629	\$1,060,538
216-U-14	Ditch	RTD	All	\$167,678	\$238,683	\$811,761	\$1,880,556	\$863,015	\$487,657	\$4,449,350	\$1,112,338	\$444,935	\$6,006,623
216-W-LWC <sup>c</sup>	Crib	RTD	All	\$822,014	\$391,363	\$1,414,374	\$10,203,784	\$1,588,970	\$825,001	\$15,245,506	\$3,811,377	\$1,143,413	\$20,200,295
216-Z-13	French Drain	RTD	All	\$57,876	\$98,552	\$40,065	\$23,013	\$46,203	\$22,755	\$288,464	\$72,116	\$54,087	\$414,667
216-Z-14	French Drain	RTD	All	\$57,876	\$98,552	\$40,065	\$23,013	\$46,203	\$22,755	\$288,464	\$72,116	\$54,087	\$414,667
216-Z-15	French Drain - VCP	RTD	All	\$58,270	\$98,552	\$59,060	\$30,641	\$53,306	\$26,717	\$326,546	\$81,637	\$61,227	\$469,410
2704-C-WS-1	French Drain	RTD	All	\$57,839	\$98,552	\$39,226	\$22,598	\$42,652	\$20,774	\$281,641	\$70,410	\$52,808	\$404,859
UPR-200-E-17	Unplanned Release	Very Small RTD	All	\$12,981	\$44,442	\$9,121	\$25,037	\$25,928	\$15,810	\$133,319	\$33,330	\$24,997	\$191,646
UPR-200-E-9	Unplanned Release	RTD	All	\$57,876	\$98,552	\$39,821	\$19,971	\$39,100	\$18,793	\$274,113	\$68,528	\$51,396	\$394,037
UPR-200-W-103	Unplanned Release	RTD	All	\$57,965	\$98,552	\$40,756	\$25,371	\$42,652	\$20,774	\$286,070	\$71,518	\$53,638	\$411,226
UPR-200-W-111	Unplanned Release	RTD	All	\$58,211	\$98,552	\$45,488	\$71,578	\$49,754	\$24,736	\$348,319	\$87,080	\$65,310	\$500,709
UPR-200-W-112	Unplanned Release	RTD	All	\$58,211	\$98,552	\$45,488	\$71,578	\$49,754	\$24,736	\$348,319	\$87,080	\$65,310	\$500,709
UPR-200-W-138	Unplanned Release	Very Small RTD	All	\$12,915	\$44,442	\$4,839	\$15,304	\$22,377	\$13,829	\$113,706	\$28,427	\$21,320	\$163,452

<sup>a</sup> Add 115 ft 12" pipe.

<sup>b</sup> Add 76 ft <12" pipe.

<sup>c</sup> Values given reflect the work being done in 1 year.

RCP = reinforced concrete pipe.

RTD = removal, treatment, and disposal.

VCP = vitrified clay pipe.

Table A-7. RTD Alternative – Cost Summary. (3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
200-E-4	French Drain	\$393,301	\$0	\$393,301	\$393,301
200-E-25	French Drain	\$401,251	\$0	\$401,251	\$401,251
200-E-55	French Drain	\$423,798	\$0	\$423,798	\$423,798
200-E-65	Injection/Reverse Well	\$151,839	\$0	\$151,839	\$151,839
200-E-67	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-E-68	Injection/Reverse Well	\$151,839	\$0	\$151,839	\$151,839
200-E-70	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-E-71	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-E-73	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-E-74	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-E-77	Injection/Reverse Well	\$151,839	\$0	\$151,839	\$151,839
200-E-79	Injection/Reverse Well	\$156,738	\$0	\$156,738	\$156,738
200-E-84	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-W-107	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-W-108	Injection/Reverse Well	\$147,431	\$0	\$147,431	\$147,431
200-W-109	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-W-111	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
200-W-118	Injection/Reverse Well	\$134,294	\$0	\$134,294	\$134,294
207-A North	Retention Basin	\$1,710,839	\$0	\$1,710,839	\$1,710,839
207-S	Retention Basin	\$1,227,169	\$0	\$1,227,169	\$1,227,169
207-T	Retention Basin	\$2,616,681	\$0	\$2,616,681	\$2,616,681
207-U	Retention Basin	\$2,616,681	\$0	\$2,616,681	\$2,616,681
207-Z	Retention Basin	\$856,926	\$0	\$856,926	\$856,926
209-E-WS-2	French Drain	\$185,599	\$0	\$185,599	\$185,599
216-A-11	French Drain - RCP	\$802,315	\$0	\$802,315	\$802,315
216-A-12	French Drain - RCP	\$570,815	\$0	\$570,815	\$570,815
216-A-13	French Drain - RCP	\$563,972	\$0	\$563,972	\$563,972

Table A-7. RTD Alternative – Cost Summary. (3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
216-A-14	French Drain - RCP	\$802,315	\$0	\$802,315	\$802,315
216-A-22	Crib/French Drain	\$543,844	\$0	\$543,844	\$543,844
216-A-26	French Drain - VCP	\$429,381	\$0	\$429,381	\$429,381
216-A-26A	French Drain - VCP	\$429,381	\$0	\$429,381	\$429,381
216-A-32	Crib	\$788,925	\$0	\$788,925	\$788,925
216-A-33	French Drain	\$404,793	\$0	\$404,793	\$404,793
216-A-35	French Drain - RCP	\$452,715	\$0	\$452,715	\$452,715
216-A-38-1	Crib	\$3,144,411	\$0	\$3,144,411	\$3,144,411
216-A-41	Crib	\$429,790	\$0	\$429,790	\$429,790
216-B-13	French Drain - RCP	\$488,073	\$0	\$488,073	\$488,073
216-B-51	French Drain	\$469,235	\$0	\$469,235	\$469,235
216-C-4	Crib w/Pipe	\$585,245	\$0	\$585,245	\$585,245
216-S-12	Trench	\$526,908	\$0	\$526,908	\$526,908
216-S-16D	Ditch	\$885,319	\$0	\$885,319	\$885,319
216-S-18	Trench	\$643,672	\$0	\$643,672	\$643,672
216-S-25	Crib	\$2,888,231	\$0	\$2,888,231	\$2,888,231
216-SX-2	Crib	\$519,083	\$0	\$519,083	\$519,083
216-T-1	Ditch w/Pipe	\$1,326,303	\$0	\$1,326,303	\$1,326,303
216-T-4-1D	Ditch	\$1,606,700	\$0	\$1,606,700	\$1,606,700
216-T-4-2	Ditch	\$2,784,112	\$0	\$2,784,112	\$2,784,112
216-T-9	Trench	\$407,669	\$0	\$407,669	\$407,669
216-T-10	Trench	\$407,669	\$0	\$407,669	\$407,669
216-T-11	Trench	\$407,669	\$0	\$407,669	\$407,669
216-T-12	Trench	\$413,027	\$0	\$413,027	\$413,027
216-T-13	Trench	\$391,923	\$0	\$391,923	\$391,923
216-T-29	French Drain	\$669,831	\$0	\$669,831	\$669,831
216-T-31	French Drain	\$507,404	\$0	\$507,404	\$507,404

Table A-7. RTD Alternative – Cost Summary. (3 Pages)

Site	Site Description	Total Capital Cost	Non-Discounted Annual & Periodic Cost	Non-Discounted Cost	Total Present Worth Cost
216-T-33	Crib	\$469,787	\$0	\$469,787	\$469,787
216-U-3	French Drain	\$395,850	\$0	\$395,850	\$395,850
216-U-7	French Drain	\$513,724	\$0	\$513,724	\$513,724
216-U-13	Trench	\$1,060,538	\$0	\$1,060,538	\$1,060,538
216-U-14	Ditch	\$6,006,623	\$0	\$6,006,623	\$6,006,623
216-W-LWC*	Crib	\$20,200,295	\$0	\$20,200,295	\$20,200,295
216-Z-13	French Drain	\$414,667	\$0	\$414,667	\$414,667
216-Z-14	French Drain	\$414,667	\$0	\$414,667	\$414,667
216-Z-15	French Drain - VCP	\$469,410	\$0	\$469,410	\$469,410
2704-C-WS-1	French Drain	\$404,859	\$0	\$404,859	\$404,859
UPR-200-E-17	Unplanned Release	\$191,646	\$0	\$191,646	\$191,646
UPR-200-E-9	Unplanned Release	\$394,037	\$0	\$394,037	\$394,037
UPR-200-W-103	Unplanned Release	\$411,226	\$0	\$411,226	\$411,226
UPR-200-W-111	Unplanned Release	\$500,709	\$0	\$500,709	\$500,709
UPR-200-W-112	Unplanned Release	\$500,709	\$0	\$500,709	\$500,709
UPR-200-W-138	Unplanned Release	\$163,452	\$0	\$163,452	\$163,452

\* Values given reflect the work being done in 1 year.

RCP = reinforced concrete pipe.

RTD = removal, treatment, and disposal.

VCP = vitrified clay pipe.

Table A-8. Present Worth Cost Summary. (3 Pages)

Waste Site/Group	Site Description	No Action	MES/C/MNA with Sampling		CS/NA		RTD	
			Non-Discounted Cost	Total Present Worth Cost	Non-Discounted Cost	Total Present Worth Cost	Non-Discounted Cost	Total Present Worth Cost
200-E-4	French Drain	\$0	\$1,627,027	\$493,691	\$393,301	\$393,301	\$180,118	\$179,554
200-E-25	French Drain	\$0	\$1,627,027	\$493,691	\$401,251	\$401,251	\$180,118	\$179,554
200-E-55	French Drain	\$0	\$1,627,027	\$493,691	\$423,798	\$423,798	\$180,118	\$179,554
200-E-65	Injection/Reverse Well	\$0	\$1,622,392	\$489,056	\$151,839	\$151,839	\$168,530	\$167,966
200-E-67	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-E-68	Injection/Reverse Well	\$0	\$1,622,392	\$489,056	\$151,839	\$151,839	\$168,530	\$167,966
200-E-70	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-E-71	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-E-73	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-E-74	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-E-77	Injection/Reverse Well	\$0	\$1,622,392	\$489,056	\$151,839	\$151,839	\$168,530	\$167,966
200-E-79	Injection/Reverse Well	\$0	\$1,622,392	\$489,056	\$156,738	\$156,738	\$168,530	\$167,966
200-E-84	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-W-107	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-W-108	Injection/Reverse Well	\$0	\$1,622,392	\$489,056	\$147,431	\$147,431	\$168,530	\$167,966
200-W-109	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-W-111	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
200-W-118	Injection/Reverse Well	\$0	\$1,577,890	\$444,555	\$134,294	\$134,294	\$122,093	\$121,529
207-A North	Retention Basin	\$0	\$1,627,027	\$493,691	\$1,710,839	\$1,710,839	\$180,118	\$179,554
207-S	Retention Basin	\$0	\$1,627,027	\$493,691	\$1,227,169	\$1,227,169	\$318,877	\$318,051
207-T	Retention Basin	\$0	\$2,088,956	\$598,377	\$2,616,681	\$2,616,681	\$430,272	\$429,196
207-U	Retention Basin	\$0	\$2,088,956	\$598,377	\$2,616,681	\$2,616,681	\$430,272	\$429,196
207-Z	Retention Basin	\$0	\$1,627,027	\$493,691	\$856,926	\$856,926	\$180,118	\$179,554
209-E-WS-2	French Drain	\$0	\$1,622,392	\$489,056	\$185,599	\$185,599	\$168,530	\$167,966
216-A-11	French Drain - RCP	\$0	\$1,627,027	\$493,691	\$802,315	\$802,315	\$180,118	\$179,554

Table A-8. Present Worth Cost Summary. (3 Pages)

Waste Site/Group	Site Description	No Action	MES/IC/MNA with Sampling		CS/NA		RTD	
			Non-Discounted Cost	Total Present Worth Cost	Non-Discounted Cost	Total Present Worth Cost	Non-Discounted Cost	Total Present Worth Cost
216-A-12	French Drain - RCP	\$0	\$1,627,027	\$493,691	\$570,815	\$570,815	\$180,118	\$179,554
216-A-13	French Drain - RCP	\$0	\$1,627,027	\$493,691	\$563,972	\$563,972	\$180,118	\$179,554
216-A-14	French Drain - RCP	\$0	\$1,627,027	\$493,691	\$802,315	\$802,315	\$180,118	\$179,554
216-A-22	Crib/French Drain	\$0	\$1,627,027	\$493,691	\$543,844	\$543,844	\$180,118	\$179,554
216-A-26	French Drain - VCP	\$0	\$1,627,027	\$493,691	\$429,381	\$429,381	\$180,118	\$179,554
216-A-26A	French Drain - VCP	\$0	\$1,627,027	\$493,691	\$429,381	\$429,381	\$180,118	\$179,554
216-A-32	Crib	\$0	\$1,627,027	\$493,691	\$788,925	\$788,925	\$180,118	\$179,554
216-A-33	French Drain	\$0	\$1,627,027	\$493,691	\$404,793	\$404,793	\$180,118	\$179,554
216-A-35	French Drain - RCP	\$0	\$1,627,027	\$493,691	\$452,715	\$452,715	\$180,118	\$179,554
216-A-38-1	Crib	\$0	\$1,627,027	\$493,691	\$3,144,411	\$3,144,411	\$180,118	\$179,554
216-A-41	Crib	\$0	\$1,627,027	\$493,691	\$429,790	\$429,790	\$180,118	\$179,554
216-B-13	French Drain - RCP	\$0	\$1,627,027	\$493,691	\$488,073	\$488,073	\$180,118	\$179,554
216-B-51	French Drain	\$0	\$1,627,027	\$493,691	\$469,235	\$469,235	\$180,118	\$179,554
216-C-4	Crib w/Pipe	\$0	\$1,627,027	\$493,691	\$585,245	\$585,245	\$180,118	\$179,554
216-S-12	Trench	\$0	\$1,627,027	\$493,691	\$526,908	\$526,908	\$180,118	\$179,554
216-S-16D	Ditch	\$0	\$1,622,392	\$489,056	\$885,319	\$885,319	\$168,530	\$167,966
216-S-18	Trench	\$0	\$1,627,027	\$493,691	\$643,672	\$643,672	\$180,118	\$179,554
216-S-25	Crib	\$0	\$1,627,027	\$493,691	\$2,888,231	\$2,888,231	\$180,118	\$179,554
216-SX-2	Crib	\$0	\$1,627,027	\$493,691	\$519,083	\$519,083	\$180,118	\$179,554
216-T-1	Ditch w/Pipe	\$0	\$1,627,027	\$493,691	\$1,326,303	\$1,326,303	\$180,118	\$179,554
216-T-4-1D	Ditch	\$0	\$1,627,027	\$493,691	\$1,606,700	\$1,606,700	\$180,118	\$179,554
216-T-4-2	Ditch	\$0	\$1,627,027	\$493,691	\$2,784,112	\$2,784,112	\$180,118	\$179,554
216-T-9	Trench	\$0	\$1,622,392	\$489,056	\$407,669	\$407,669	\$168,530	\$167,966
216-T-10	Trench	\$0	\$1,622,392	\$489,056	\$407,669	\$407,669	\$168,530	\$167,966
216-T-11	Trench	\$0	\$1,622,392	\$489,056	\$407,669	\$407,669	\$168,530	\$167,966

Table A-8. Present Worth Cost Summary. (3 Pages)

Waste Site/Group	Site Description	No Action	MESC/IC/MNA with Sampling		CS/NA		RTD	
			Non-Discounted Cost	Total Present Worth Cost	Non-Discounted Cost	Total Present Worth Cost	Non-Discounted Cost	Total Present Worth Cost
216-T-12	Trench	\$0	\$1,627,027	\$493,691	\$413,027	\$413,027	\$180,118	\$179,554
216-T-13	Trench	\$0	\$1,627,027	\$493,691	\$391,923	\$391,923	\$180,118	\$179,554
216-T-29	French Drain	\$0	\$1,622,392	\$489,056	\$669,831	\$669,831	\$168,530	\$167,966
216-T-31	French Drain	\$0	\$1,627,027	\$493,691	\$507,404	\$507,404	\$180,118	\$179,554
216-T-33	Crib	\$0	\$1,627,027	\$493,691	\$469,787	\$469,787	\$180,118	\$179,554
216-U-3	French Drain	\$0	\$1,627,027	\$493,691	\$395,850	\$395,850	\$180,118	\$179,554
216-U-7	French Drain	\$0	\$1,627,027	\$493,691	\$513,724	\$513,724	\$180,118	\$179,554
216-U-13	Trench	\$0	\$1,627,027	\$493,691	\$1,060,538	\$1,060,538	\$180,118	\$179,554
216-U-14	Ditch	\$0	\$2,897,098	\$791,283	\$6,006,623	\$6,006,623	\$718,849	\$717,432
216-W-LWC	Crib	\$0	\$5,379,941	\$1,373,041	\$20,200,295*	\$20,200,295*	\$753,585	\$750,839
216-Z-13	French Drain	\$0	\$1,627,027	\$493,691	\$414,667	\$414,667	\$180,118	\$179,554
216-Z-14	French Drain	\$0	\$1,627,027	\$493,691	\$414,667	\$414,667	\$180,118	\$179,554
216-Z-15	French Drain - VCP	\$0	\$1,627,027	\$493,691	\$469,410	\$469,410	\$180,118	\$179,554
2704-C-WS-1	French Drain	\$0	\$1,627,027	\$493,691	\$404,859	\$404,859	\$180,118	\$179,554
UPR-200-E-17	Unplanned Release	\$0	\$1,622,392	\$489,056	\$191,646	\$191,646	\$168,530	\$167,966
UPR-200-E-9	Unplanned Release	\$0	\$1,627,027	\$493,691	\$394,037	\$394,037	\$180,118	\$179,554
UPR-200-W-103	Unplanned Release	\$0	\$1,627,027	\$493,691	\$411,226	\$411,226	\$180,118	\$179,554
UPR-200-W-111	Unplanned Release	\$0	\$1,627,027	\$493,691	\$500,709	\$500,709	\$180,118	\$179,554
UPR-200-W-112	Unplanned Release	\$0	\$1,627,027	\$493,691	\$500,709	\$500,709	\$180,118	\$179,554
UPR-200-W-138	Unplanned Release	\$0	\$1,622,392	\$489,056	\$163,452	\$163,452	\$168,530	\$167,966

\* Values given reflect the work being done in 1 year.

- CS/NA = confirmatory sampling/no action.
- MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.
- RCP = reinforced concrete pipe.
- RTD = removal, treatment, and disposal.
- VCP = vitrified clay pipe.

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