DOE/RL-2008-53
Revision 0

Hanford Facility Dangerous Waste Closure/Postclosure Plan for the 216-A-29 Ditch

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

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

DOE/RL-2008-53
Revision 0

Hanford Facility Dangerous Waste Closure/Postclosure Plan for the 216-A-29 Ditch

Date Published
September 2008

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

United States Department of Energy
P.O. Box 550
Richland, Washington 99352

A. D. Aardal 09/26/2008
Release Approval Date

Approved for Public Release
Further Dissemination Unlimited

CONTENTS

FIGURES

TABLES

TERMS

200-CS-1	200-CS-1 Chemical Sewer Group
CFR	*Code of Federal Regulations*
DOE	U.S. Department of Energy
DQO	data quality objectives
Ecology	Washington State Department of Ecology
GW	groundwater
HEIS	*Hanford Environmental Information System* database
MCL	maximum contaminant level
N/A	not applicable
ND	not detected
OU	operable unit
PUREX	Plutonium-Uranium Extraction Plant
RCRA	*Resource Conservation and Recovery Act of 1976*
RI	remedial investigation
SMCL	secondary maximum contaminant level
Tri-Party Agreement	Ecology et al., 1989a, *Hanford Federal Facility Agreement and Consent Order*
Tri-Party Agreement Action Plan	Ecology et al., 1989b, *Hanford Federal Facility Agreement and Consent Order Action Plan*
TSD	treatment, storage, and/or disposal
WAC	*Washington Administrative Code*

METRIC CONVERSION CHART

Into Metric Units			**Out of Metric Units**		
If You Know	*Multiply By*	*To Get*	*If You Know*	*Multiply By*	*To Get*
Length			**Length**		
inches	25.4	Millimeters	millimeters	0.039	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	1.609	Kilometers	kilometers	0.621	miles
Area			**Area**		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.0836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	Hectares	hectares	2.47	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	Grams	grams	0.035	ounces
pounds	0.454	Kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
Volume			**Volume**		
teaspoons	5	Milliliters	milliliters	0.033	fluid ounces
tablespoons	15	Milliliters	liters	2.1	pints
fluid ounces	30	Milliliters	liters	1.057	quarts
cups	0.24	Liters	liters	0.264	gallons
pints	0.47	Liters	cubic meters	35.315	cubic feet
quarts	0.95	Liters	cubic meters	1.308	cubic yards
gallons	3.8	Liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			**Temperature**		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			**Radioactivity**		
picocuries	37	Millibecquerel	millibecquerel	0.027	picocuries

1.0 INTRODUCTION

The original closure plan for the 216-A-29 Ditch (DOE/RL-93-74, *200-BP-11 Operable Unit RFI/CMS and 216-B-3 Main Pond, 216-B-63 Trench, and 216-A-29 Ditch Work/Closure Plan*) was submitted to the Washington State Department of Ecology (Ecology) pursuant to Ecology et al., 1989a, *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) Milestone M-20-36 in April 1995. An updated version of the 216-A-29 Ditch closure plan was submitted to Ecology in March 2006 (Draft A of DOE/RL-2005-63, *Feasibility Study for the 200-CS-1 Chemical Sewer Group Operable Unit*, Appendix E) to supersede the April 1995 closure plan. This closure plan has been rewritten to update and finalize the March 2006 closure plan.

The 216-A-29 Ditch treatment, storage, and/or disposal (TSD) unit will be incorporated into a future revision of the WA789000896, *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste,*). When the TSD unit is incorporated, the provisions of Permit Condition II.Y.2.c will apply. Permit Condition II.Y.2.c establishes the corrective-action status of the waste site following certification of closure.

Because this closure plan is being coordinated with the activities associated with the 200-CS-1 Chemical Sewer Group (200-CS-1) Operable Unit (OU), the closure plan is written to address only the constituents of concern relating to *Resource Conservation and Recovery Act of 1976* (RCRA) TSD unit operations. Any other constituents of concern described in DOE/RL-2005-63, *Feasibility Study for the 200-CS-1 Chemical Sewer Group Operable Unit* (pending), are related to past-practice activities at this waste site and will be addressed under past-practice authority, in accordance with Permit Condition II.Y.2. Deferral of pre-existing contamination to other authorities that occurred prior to dangerous waste management activities is described in Ecology Publication 94-111, *Guidance for Clean Closure of Dangerous Waste Units and Facilities*, Section 2.8. Any physical activities necessary to complete remediation of non-TSD unit constituents is outside the scope of this closure plan and will be performed in conjunction with Tri-Party Agreement past-practice activities for the 200-CS-1 OU and the 200-PO-1 Groundwater OU.

The development of this closure plan has been coordinated with the 200-CS-1 OU remediation activities. This coordinated approach was established in June 2002 following the completion of negotiations between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency, and Ecology on the modifications to 200 Areas waste site cleanup milestones through Tri-Party Agreement change requests M-13-02-01, M-15-02-01, M-16-02-01, and M-20-02-01. As a result, much of the text contained in this closure plan has been obtained from existing 200-CS-1 OU *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* documentation.

The proposed closure strategy for the 216-A-29 Ditch soils is clean closure following remediation of the soils; the groundwater strategy is clean closure following certification of closure. The soil strategy is based on analytical data provided in DOE/RL-2005-63, Appendices A and B and verification sampling activities, which will be completed following 200-CS-1 OU soil remediation activities. Groundwater data from the *Hanford Environmental*

Information System (HEIS) database were used to show that the TSD unit has not impacted groundwater. Analytical data from vadose zone characterization activities (DOE/RL-2005-63, Appendices A and B) were used to show that the TSD unit will not impact groundwater in the future. Sampling of the soils will be performed to verify that contaminant removal is complete, as well as to confirm waste site remedy selection was implemented to achieve clean closure.

2.0 UNIT DESCRIPTION

This chapter provides a physical description of the 216-A-29 Ditch and describes security related to the ditch.

2.1 PHYSICAL DESCRIPTION AND OPERATIONS

The 216-A-29 Ditch is located to the east of the 200 East Area of the Hanford Facility (Figure 2-1). The 216-A-29 Ditch received discharge from the Plutonium-Uranium Extraction (PUREX) Plant (A Plant) Chemical Sewer. The ditch was uncovered and unlined and followed the natural topography. The ditch originated from the southeastern side of the A Tank Farm (east of the AP Tank Farm) outside the 200 East Area perimeter fence. The ditch was estimated to be 1,220 m (4,000 ft) long, 1.8 m (6 ft) wide, and from 0.6 to 4.6 m (2 to 15 ft) deep. The head end of the ditch was modified in 1983 to allow for the construction of the AP Tank Farm. The end of the ditch connects to the 216-B-3-3 Ditch and finally to the 216-B-3 Pond.

The PUREX Plant Chemical Sewer operated between November 1955 and July 1991. At the beginning of its operation, the 216-A-29 Ditch received discharge from the PUREX Plant cooling water and discharge from the Chemical Sewer. In early 1980, because of effluent monitoring requirements, the chemical sewer lines feeding the 216-A-29 Ditch required upgrades to allow for monitoring and diversion capabilities. The basin received contaminated diversions from the PUREX Plant Chemical Sewer line, cooling water line, and steam condensate discharge. During 1990, plans were developed and approved to discontinue discharges to and close the 216-A-29 Ditch, and in 1991, all discharges were discontinued. Stabilization of the 216-A-29 Ditch was performed in three phases from July to October 1991.

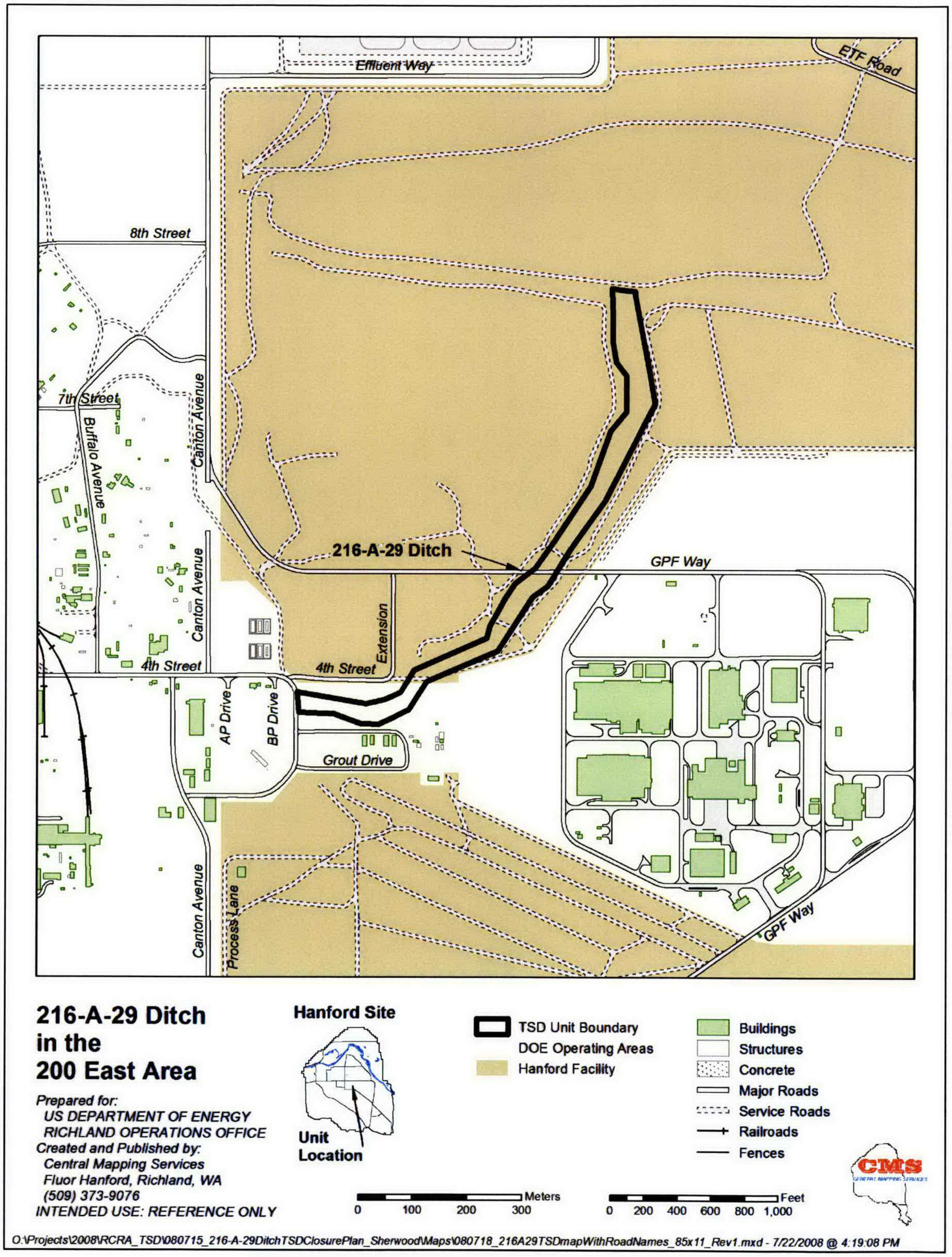
During construction for the Waste Treatment Plant, activities to place needed infrastructure were undertaken in the area around the 216-A-29 Ditch, near the grout disposal site, the 4th Street Extension, and access road (GPF Way), which crossed the ditch to the north of the grout disposal site. Above ground-bermed raw and sanitary water, pipelines and liquid effluent pipelines for service to the Waste Treatment Plant also cross over the 216-A-29 Ditch in various places. Liquid effluent pipelines that cross the ditch are routed along the south side of the GPF Way and the 4th Street Extension, while the water lines cross the ditch on the north side of GPF Way. Utilities lines also are present at the 216-A-29 Ditch.

2.2 SECURITY

Security information for the Hanford Facility is discussed in Permit Condition II.M and Attachment 33 to the Permit (WA789000896). Because the 216-A-29 Ditch is located near the 200 East Area, the security information pertaining to the 200 Areas applies to this TSD unit.

Changes to security are expected to occur during the course of 200 East Area deactivation and decommissioning activities. Security measures will remain in place that limit entry to authorized personnel and that preclude unknowing access by unauthorized individuals. Following clean-closure certification of this TSD unit (Section 7.8), security provisions no longer will apply.

Figure 2-1. 216-A-29 Ditch Location and Site Plan.



3.0 PROCESS INFORMATION

A variety of waste streams contributed to the 216-A-29 Ditch and are summarized in the stream-specific report, WHC-EP-0342, Addendum 2, *PUREX Plant Chemical Sewer Stream-Specific Report*.

Section 7.1 provides additional information on physical isolation of the TSD unit.

This page intentionally left blank.

4.0 WASTE CHARACTERISTICS

This chapter identifies the estimate of maximum inventory and the characteristics of the waste disposed at the 216-A-29 Ditch.

4.1 ESTIMATE OF MAXIMUM INVENTORY OF WASTE

During operations, approximately 22,700,000 L/d (6,000,000 gal/d) of liquid wastewater reached the 216-A-29 Ditch. The ditch was equipped with a meter for measuring flow rate. Flow rates varied from approximately 378 to 5,290 L/min (100 to 1,400 gal/min), depending on the operating conditions of the PUREX Plant. The average flow was about 3,760 L/min (970 gal/min).

4.2 WASTE CHARACTERISTICS

Chemical discharges to the 216-A-29 Ditch after the effective date of regulation (non-radioactive hazardous waste: November 19, 1980) that designate as a dangerous waste constitute the waste codes appearing on the Hanford Facility Dangerous Waste Part A Permit Application form for the 216-A-29 Ditch (02-RCA-0385, "Transfer of Hanford Facility Dangerous Waste Part A Permit Application, Form 3s for Certification in Support of Contract Transition for Central Plateau") The waste codes on the form are based on known documented discharges to the TSD unit. These discharges are identified in WHC-EP-0342, Addendum 2; DOE/RL-89-28, *216-B-3 Expansion Pond Closure Plan* (Attachment 23 to Revision 6 of the Permit [WA7890008967]); and DOE/RL-2004-17, *Remedial Investigation Report for the 200-CS-1 Chemical Sewer Group Operable Unit*, Table B-2.

The dangerous waste received at the 216-A-29 Ditch included nitric acid, sulfuric acid, sodium hydroxide, potassium hydroxide, hydrazine, hydroxylamine nitrate, cadmium nitrate, ammonium fluoride, and ammonium nitrate. Some of these chemicals are regulated under WAC 173-303, "Dangerous Waste Regulations," as dangerous wastes because they displayed the characteristic of corrosivity (D002) (closure parameter is pH). Cadmium nitrate is regulated because of the cadmium (D006) (closure parameter is cadmium). Hydrazine is regulated because it is in the listed waste code (U133) (closure parameter is hydrazine). In addition, other constituents are regulated because the state-only WT02 waste code was mentioned at a basis. There are no closure parameters from waste codes D002 and WT02, because disassociated anions/cations of acids, bases, and salts, do not result in a dangerous waste designation. They are not subject to the numerical closure performance standard comparison in WAC 173-303-610(2)(b)(i), "Closure Performance Standard," because none of them constitute a "dangerous waste, dangerous waste constituent, or residue."

Based on the dangerous waste received at the 216-A-29 Ditch, the TSD unit constituents of concern for RCRA closure are pH, cadmium, and hydrazine. These constituents constitute the scope of the TSD unit RCRA closure activities (Table 4-1). The pH range for the ditch soils is from 9.3 to 9.5 and is well within the noncorrosive range from WAC 173-303-090(6), "Characteristic of Corrosivity."

Table 4-1. Comparison of 216-A-29 Ditch Remedial Investigation Data to Residential [a] Clean-Closure Levels.

TSD Unit Constituent Related to Part A Waste Code D002	Maximum Concentration Shallow-Zone Soil (mg/kg) [b]	Maximum Concentration Deep Zone Soil (mg/kg) [b]	90th Percentile Lognormal Hanford Site Background (mg/kg) [c]	Soil Concentration Protective of Groundwater [d] (mg/kg)	Human Health Protection Soil Direct Contact [e] (mg/kg)		Screening Levels for Ecological Protection (mg/kg) [f]	Clean Closure Driver [g]	Meet Clean Closure Standard?
					Carcinogen	Non-carcinogen			
pH	9.3	9.5	N/A	N/A	N/A	N/A	N/A	Non corrosive (>2.0 and <12.5)	Yes
Cadmium	**28**	0.32	1.0	4.7 [h]	N/A	80	14	Soil Concentration Protective of Groundwater	No
Hydrazine	ND	ND	ND	Practical quantitation limit [i]	0.333	N/A	N/A	Practical quantitation limit	Yes [j]

Shaded cells indicate the constituent is above clean closure standards.

[a] Clean closure evaluations for TSD units are required to use residential levels in WAC 173-340-740(3), "Method B Soil Cleanup Levels for Unrestricted Land Use," based on WAC 173-303-610(2)(b)(i), "Closure Performance Standard."

[b] DOE/RL-2005-63, *Feasibility Study for the 200-CS-1 Chemical Sewer Group Operable Unit,* Appendices A and B. Shallow zone is surface to 15 feet.

[c] DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes,* Vol. I.

[d] WAC 173-340-740(3)(b)(iii)(A), "Ground Water Protection." Point of compliance is soils throughout the site (WAC 173-340-740(6), "Point of Compliance").

[e] WAC 173-340-740(3)(b)(iii)(B)(I), ""Noncarcinogens," and (II), "Carcinogens." Equations are found in (I) and (II) for human health direct contact. Point of compliance is surface to 15 ft (WAC 173-340-740(6)).

[f] WAC 173-340-740(3)(b)(ii), "Environmental Protection," however only wildlife for industrial values from Table 749-3 are used [WAC 173-340-7493(2)(a)(i), "The Chemicals of Ecological Concern."]. Point of compliance is surface to 15 ft (WAC 173-340-7490(4)(b), "Standard Point of Compliance").

[g] Represents the most restrictive level after ensuring the most restrictive level is not less than natural background and for analytical considerations, as indicated in WAC 173-340-700(6)(d), "Natural Background and Analytical Considerations."

[h] 4.7 mg/kg is proposed as the clean closure standard based on site specific calculations, which changed infiltration, groundwater flow rate, and the thickness of the mixing zone parameters in equations 747-A, 747-3, 747-4, and 747-5. Otherwise, 0.69 mg/kg would be the cleanup standard, which is below background.

[i] The practical quantitation limit for hydrazine exceeds the soil concentration protective of groundwater standard of 0.0000625. Therefore, the practical quantitation limit is used for clean-closure determinations.

[j] Hydrazine was not identified as a constituent of concern during the 200-CS-1 Operable Unit data quality objectives process. Contained-in determinations for listed waste code U133 for hydrazine in soils have been approved by the Washington State Department of Ecology. Clean closure is based on the data quality objectives process and the contained-in determination.

Part A = Hanford Facility Dangerous Waste Part A Permit Application form for the 216-A-29 Trench (02-RCA-0385, "Transfer of Hanford Facility Dangerous Waste Part A Permit Application, Forms 3s for Certification in Support of Contract Transition for the Central Plateau").

N/A = not applicable.
ND = not detected.
TSD = treatment, storage, and/or disposal.
WAC = *Washington Administrative Code.*

5.0 GROUNDWATER MONITORING

The 216-A-29 Ditch groundwater closure approach is clean closure, in accordance with the Ecology et al., 1989b, *Hanford Federal Facility Agreement and Consent Order Action Plan* (Tri-Party Agreement Action Plan), Section 6.3.1, where any TSD unit is eligible for clean closure at the Hanford Site. The clean closure approach is based on the data gathered to date from the monitoring network (PNNL-13047, *Groundwater Monitoring Plan for the 216-A-29 Ditch*), data contained in the HEIS database, vadose zone characterization data, and DOE/RL-2008-01, *Hanford Site Groundwater Monitoring for Fiscal Year 2007*, Section 2.11.3.4 for the 216-A-29 Ditch. Following clean closure of the groundwater, OU groundwater monitoring will continue, as appropriate, in the 200-PO-1 Groundwater OU for constituents under past-practice processes of the Tri-Party Agreement. Table 5-1 shows a comparison of the TSD unit constituent levels in groundwater to clean-closure levels. The clean-closure levels for groundwater are the maximum contaminant levels (when available), or the most restrictive level of the WAC 173-340-740(3)(b)(iii)(B)(I), "Noncarcinogens," and (II), "Carcinogens," value for groundwater (unless this value is lower than analytical considerations as indicated in WAC 173-340-700(6)(d), "Natural Background and Analytical Considerations"). For pH, the clean closure level is non-corrosive (pH range > 2.0 and <12.5). Following closure certification of the 216-A-29 Ditch (Section 7.8), the TSD unit groundwater monitoring program for the 216-A-29 Ditch will be discontinued.

The current interim-status groundwater monitoring plan (as required by WAC 173-303-400 "Interim Status Facility Standards," and 40 CFR 265, Subpart F, "Ground-Water Monitoring") is contained in a separate document, DOE/RL-2008-58, *Interim Status Groundwater Monitoring Plan for the 216-A-29 Ditch* (pending). This document contains further details regarding the geology, hydrology, and current groundwater monitoring programs for the TSD unit.

Excerpts from DOE/RL-2008-01 provide more recent monitoring network and groundwater conditions.

> The groundwater beneath the 216-A-29 ditch is monitored for evidence (detection) of hazardous waste migration as required by interim status RCRA regulations (40 CFR 265.93(b) as referenced by WAC 173-303-400). The nine wells of the groundwater monitoring network are sampled semiannually for contamination indicator parameters and annually for groundwater quality parameters and site-specific constituents. The well network is adequate for the current groundwater flow directions. Groundwater samples were collected and analyzed as scheduled at all nine wells monitoring the 216-A-29 ditch in FY 2007.
>
> Specific conductance continues to remain above the critical mean in downgradient wells 299-E25-35, 299-E25-48, and 299-E26-13 during both semiannual sampling events. Sulfate, nitrate, chloride, and the major cations are also rising in these wells. Wells 299-E25-28 (deep completion) and 299-E25-34 appear to be least affected by these trends. The cause of this rise is unknown, but appears to coincide with a general, multi-year increase in ionic strength throughout much of the 200 East Area and adjacent areas, and as such cannot be uniquely attributed to the 216-A-29 ditch. None of these constituents exceed drinking water standards. The remaining three contamination-indicator parameters (pH, total organic carbon, and total organic halides) were below critical means for all wells in the 216-A-29 network during FY 2007.

Based on general interpretations of the water table map in the 200 East Area the direction of groundwater flow near the 216-A-29 ditch is generally to the south or southwest. The water-table gradient in the immediate vicinity of the 216-A-29 ditch is too low to provide confidence in estimates of flow direction or rate.

5.1 HISTORY OF RCRA GROUNDWATER MONITORING

The RCRA groundwater monitoring of the 216-A-29 Ditch began in November 1988 with an interim-status indicator parameter evaluation (detection-level) program (DOE/RL-92-03, *Annual Report for RCRA Groundwater Monitoring Projects at Hanford Site Facilities for 1991*). The wells were sampled quarterly for one year to establish background levels. Background sampling was completed in August 1989. The program was elevated to an assessment-level program in 1990 because of elevated specific conductance beyond the critical mean in one downgradient well. The results of the groundwater quality assessment, which concluded in 1995, are reported in WHC-SD-EN-EV-032, *Results of the Groundwater Quality Assessment Program at the 216-A-29 Ditch*. The program then reverted to indicator evaluation monitoring in October 1996.

5.2 AQUIFER IDENTIFICATION

The uppermost or unconfined aquifer beneath the 216-A-29 Ditch is approximately 2 to 24 m (7 to 79 ft) thick and is contained within sediments of the Hanford formation and the Ringold Formation. The aquifer extends from the water table to the top of the basalt or, in some areas, the lower mud unit of the Ringold Formation. The direction of groundwater flow near the 216-A-29 Ditch is generally to the south or southwest. The water-table gradient in the immediate vicinity of the 216-A-29 Ditch is too low to provide confidence in estimates of flow direction or rate (DOE/RL-2008-01). The water table beneath the ditch has declined significantly since the discharges to the 216-B-3 Pond system ceased.

5.3 WELL LOCATION AND DESIGN

At the end of the assessment monitoring program, the monitoring well network reverted to a smaller group of ten wells. There were two upgradient wells (699-43-43 and 699-43-45) and eight downgradient wells. Well 699-43-43 no longer produces representative groundwater samples and was removed from the sampling schedule in 2001. The downgradient wells (prefixed by 299-) are E25-26, E25-28, E25-32P, E25-34, E25-35, E25-48, E26-12, and E26-13 (Figure 5-1). All of the wells are sampled semiannually with dedicated sampling pumps. Under the revised monitoring plan (DOE/RL-2008-58), wells 299-E25-32P and 699-43-43 were removed from the monitoring network.

Construction of the wells followed the RCRA standard well-construction specifications. The standards in WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," were used to set the basic design requirements. The revised interim-status groundwater monitoring network for the 216-A-29 Ditch includes eight wells constructed from 1985 through 1992. Seven of the wells are constructed with screens at the water table, and the remaining well is screened above the top of the basalt. Construction summaries and details of drilling and design specifications for all wells in the interim-status groundwater monitoring system are contained in several reports and are available upon request.

Table 5-1. Comparison of 216-A-29 Ditch Groundwater Data to Clean-Closure Levels.

TSD Unit Constituent Related to Part A Waste Codes D002, D006, U133	Maximum Concentration in Groundwater from HEIS (µg/L) [a]	Groundwater Clean Closure Cleanup Level (µg/L) [b]	Clean Closure Driver [b]	Meet Clean Closure standard?
pH	7.79 - 8.77 pH units	Non corrosive	WAC 173-303-090(6)	Yes
Cadmium	ND (.058-4)	5	MCL	Yes
Hydrazine	No Data	Practical quantitation limit [c]	Practical quantitation limit	Yes

[a] HEIS queries date range back through 2002.

[b] Except for pH, listed values represent in the following order of priority: (1) the MCL (when available), (2) the most restrictive level of the Method B carcinogen or non-carcinogen value for groundwater unless this value is lower than analytical considerations as indicated in WAC 173-340-700(6)(d), "Natural Background and Analytical Considerations."

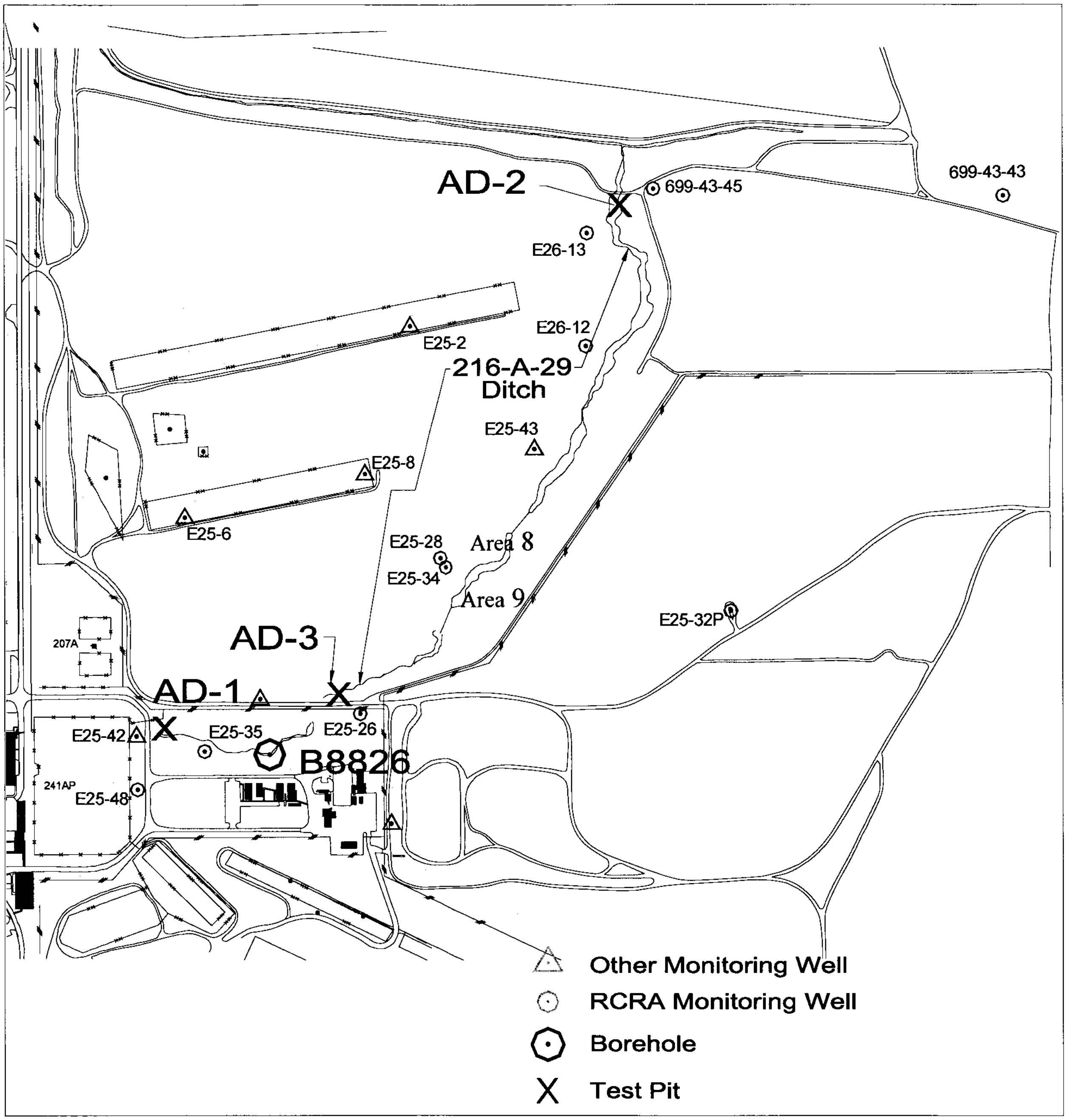
[c] The cleanup level of 0.0146 µg/l (Method B carcinogen) is below the practical quantitation limit. Clean closure is based on the practical quantitation limit.

Part A = Hanford Facility Dangerous Waste Part A Permit Application form for the 216-A-29 Trench (02-RCA-0385, "Transfer of Hanford Facility Dangerous Waste Part A Permit Application, Forms 3s for Certification in Support of Contract Transition for the Central Plateau").

WAC 173-303-090(6), "Characteristic of Corrosivity."

HEIS = *Hanford Environmental Information System.*
MCL = maximum contaminant level.
ND = not detected.
TSD = treatment, storage, and/or disposal.
WAC = Washington Administrative Code.

Figure 5-1. Borehole and Test Pit Location Map for the 216-A-29 Ditch.



G:\Maps\042999M.DWG

5.4 RESULTS OF RCRA INTERIM-STATUS GROUNDWATER MONITORING DATA

The RCRA indicator parameters are specific conductance, pH, total organic carbon, and total organic halides. Site-specific parameters include inductively coupled plasma metals, anions, alkalinity, and turbidity. Except turbidity, these constituents are analyzed annually, although the wells are sampled semiannually. Groundwater quality parameters are chloride, iron (filtered), manganese (filtered), phenols, sodium (filtered), and sulfate. From 1990, when the 216-A-29 Ditch was placed into an assessment-level groundwater monitoring program, to 1995, comprehensive sampling and analysis were performed to determine the cause of the specific conductance exceedance. The assessment report (WHC-SD-EN-EV-032) concluded that elevated specific conductance was caused by high concentrations of sulfate, sodium, and calcium in the groundwater beneath the 216-A-29 Ditch. None of these contaminants could be conclusively linked to discharges to the 216-A-29 Ditch and are not considered dangerous wastes. The TSD unit reverted to an indicator parameter evaluation program.

Unfiltered chromium and iron historically have exceeded drinking water standards in several wells, but filtered results have not exceeded the drinking water standard. These concentrations have been attributed to well construction and oxidizing conditions in the aquifer.

This page intentionally left blank.

6.0 CLOSURE STRATEGY AND PERFORMANCE STANDARDS

This chapter identifies the 216-A-29 Ditch closure strategy and closure performance standards for soils. Groundwater is discussed in Section 5.0.

6.1 CLOSURE STRATEGY

The standards for closure of Hanford Site TSD units are in WAC 173-303-610, "Closure and Post-Closure." The option to clean close a surface impoundment or pursue landfill closure of a surface impoundment is identified in WAC 173-303-650(6), "Closure and Post-Closure Care.". The possibility for clean closure for all TSD units at the Hanford Site is described in the Tri-Party Agreement Action Plan, Section 6.3.1.

The 216-A-29 Ditch is expected to meet clean-closure standards for soils following removal of soil and verification sampling.

6.2 CLOSURE PERFORMANCE STANDARDS

This section identifies general clean-closure performance standards and the specific closure standards for the soils.

6.2.1 Treatment, Storage, and/or Disposal Unit Closure Performance Standards

The closure performance standards of WAC 173-303-610(2)(a)(i - iii), "Closure Performance Standard," require the owner or operator of a TSD unit to close the unit in a manner that ensures the following:

1. "Minimizes the need for further maintenance"
2. "Controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, postclosure escape of dangerous waste, dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere"
3. "Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity."

These standards can be met by one of the following methods:

1. Clean-closure according to the removal or decontamination standard of WAC 173-303-610(2)(b) based on WAC 173-303-650(6)(a)(i)
2. By landfill closure according to WAC 173-303-650(6)(a)(ii)
3. By implementing the alternative closure requirements of WAC 173-303-610(1)(e), "Applicability."

Potential contaminant exposures and health impacts to humans are largely dependent on land use. The land use for the 200 Areas selected by the DOE through 64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)," is industrial-exclusive. Industrial cleanup standards are identified in WAC 173-340-745(5), "Method C Industrial Soil Cleanup Levels.". Before WAC 173-340-745(5) standards are applied, however, the owner/operator can choose to pursue a clean-closure evaluation based on the traditional application of residential standards under WAC 173-340-740(3), "Method B Soil Cleanup Levels for Unrestricted Land Use," as described in WAC 173-303-610(2)(b)(i). If necessary, and if Ecology agrees, the standards in WAC 173-340-745(5) can be imposed through the alternative closure requirements of WAC 173-303-610(1)(e).

The first approach to examine for TSD unit closure is clean closure. Clean closure will eliminate the need for future inspections and maintenance necessitated by TSD unit constituent contamination. Clean closure also will eliminate the need for future postclosure monitoring and maintenance of the soils. Clean closure using the WAC 173-340-740(3) residential values were examined first because if the DOE/RL-2005-63, Appendices A and B data showed that the soils met WAC 173-340-740(3) residential values without further remediation, then TSD unit clean closure can occur independent of the OU remediation activities.

If the TSD unit constituents cannot meet the WAC 173-340-740(3) residential values as is, then before choosing a postclosure pathway, the OU remediation activities are examined to see if removal of soils is needed for past practice contaminants. If removal of soils will be pursued for the OU remediation activities, then clean closure using WAC 173-340-740(3) residential values for TSD unit constituents through verification sampling and analysis can still be used. Clean closure can then be pursued for the soils, and the closure approach for groundwater must be considered (Section 5.0).

If neither of the clean closure approaches can achieve the outcome, then the TSD unit will need to pursue some form of postclosure. The classical landfill closure option described in WAC 173-303-650(6)(a)(ii) would result in the construction of a barrier and long term postclosure care. Before pursuing a landfill closure option with a barrier, however, other options can be explored, with Ecology's approval through use of the alternative closure requirement in WAC 173-303-610(1)(e), provided the conditions are met. Since the alternative requirements allow Ecology to replace all of the closure requirements except the general closure performance standards of WAC 173-303-610(2)(a), closure approaches other than landfill closure could be pursued.

6.2.2 Soil Closure Standards

The clean-closure requirements are established in WAC 173-303-610(2)(b) and the surface impoundment standards are established in WAC 173-303-650(6)(a) to remove or decontaminate unit soils contaminated above clean-closure standards. These soil clean-closure cleanup levels are the numeric levels identified in WAC 173-340-740(3) that are either levels calculated using the most restrictive WAC 173-340-740(3) formulas for unrestricted use, or background levels (DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*) when the most restrictive WAC 173-340-740(3) formulas are more stringent than Hanford Site background concentrations. WAC 173-340-740(3) formulas for unrestricted use can include site specific parameters.

WAC 173-340-740(3) contains the following potential clean-closure standards: environmental protection related to ecological receptors, soil concentrations protective of groundwater, soil direct-contact carcinogens, soil direct-contact noncarcinogens, soil direct-contact petroleum vapors, and soil vapors. The environmental protection related to ecological receptors, soil concentration protective of groundwater, soil direct-contact carcinogens, and soil direct-contact noncarcinogens are applicable and are identified in Table 4-1. The soil direct-contact petroleum vapors and soil vapors standards do not apply, because there are no petroleum compounds and no volatile organic compounds related to TSD unit closure, respectively.

Historical listed waste (U133) hydrazine discharges will not prevent clean closure of the 216-A-29 Ditch. Hydrazine was ruled out as a potential contaminant of concern during the data quality objectives (DQO) process for the 200-CS-1 OU. The DQO report (BHI-01276, *200-CS-1 Operable Unit DQO Summary Report*) states: "Hydrazine is a listed waste that was potentially discharged with the cooling waters. However, because hydrazine is extremely reactive and volatile, it no longer is present in any media associated with the 200-CS-1 OU." The practical quantitation limit for hydrazine exceeds the soil concentration protective of groundwater standard of 0.0146 μg/L; therefore, the practical quantitation limit is used for clean-closure determinations. Furthermore, 216-A-29 Ditch hydrazine was subject to a contained-in determination by Ecology (00-GWVZ-050, 2000, "200 Area Hydrazine Contained-In Determination Request;" 02-RCA-0261, 2002, "216-A-29 Ditch Hydrazine Contained – In Determination (CID) Request"). This contained-in determination addressed the 216-A-29 Ditch soils. Clean closure can be pursued for hydrazine at the 216-A-29 Ditch, and the U133 waste code no longer applies to 216-A-29 Ditch soils. Clean closure for hydrazine is based on the DQO process and the contained-in determinations.

This page intentionally left blank.

7.0 CLOSURE ACTIVITIES

This chapter summarizes clean-closure activities for the 216-A-29 Ditch performed in coordination with the 200-CS-1 OU remediation process. Physical closure activities included TSD unit physical isolation, borehole and test pit drilling, soil sampling and analysis, removal of 216-A-29 Ditch contaminated soils (i.e., soil with concentrations above standards protective of human health and the environment), and verification sampling following contaminated soil removal.

The unit soils are planned to be clean closed based on the results of DOE/RL-2005-63, Appendices A and B, remediation of the 216-A-29 Ditch contaminated soils, and sampling of the soils to verify that contaminant removal is complete, as well as to confirm waste site remedy selection was implemented to achieve clean closure. Contaminated soil will be removed, require subsequent designation according to WAC 173-303-070(3), "Designation Procedures," and (5), "Additional Designation Required," and managed as part of closure. Because soils are not expected to be designated as dangerous waste, treatment of the soils is not expected before they are disposed of at the Environmental Restoration Disposal Facility.

7.1 TREATMENT, STORAGE, AND/OR DISPOSAL UNIT PHYSICAL ISOLATION

To preclude any further discharges to the unit and in support of TSD unit closure, the 216-A-29 Ditch was physically isolated from receipt of the PUREX Plant Chemical Sewer effluent. Stabilization of the 216-A-29 Ditch was performed in three phases from July to October 1991. The trench no longer can accept dangerous waste.

7.2 TREATMENT, STORAGE, AND/OR DISPOSAL UNIT SAMPLING AND ANALYSIS

The following sections describe sampling and analyses activities that have been completed for the 216-A-29 Ditch. Additional sampling of the soils will be performed to verify that contaminant removal is complete, as well as to confirm waste site remedy selection was implemented to achieve clean closure.

7.2.1 Completed Soil Sampling and Analysis

As part of the 200-CS-1 OU remedial investigation, data were collected to characterize the nature and vertical extent of contamination and the physical conditions in the vadose zone underlying the 216-A-29 Ditch. Drilling, test pit excavation, surface and borehole geophysical surveys, and soil sampling and analysis were conducted during the field activities. Figure 5-1 shows borehole and test pit locations.

Borehole B8826 was drilled and sampled in the 216-A-29 Ditch east of the AP Tank Farm in the 200 East Area. Test Pits AD-1 through AD-3 were excavated and sampled at the

216-A-29 Ditch in fiscal year 2002, and details are summarized in DOE/RL-2004-17. Data collected from Test Pit AD-3 was additional to the data required by DOE/RL-99-44, *200-CS-1 Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, and was used to support the decision-making process for locating a proposed waste transfer line to the Waste Vitrification Plant.

Borehole B8826 was drilled and sampled during fiscal year 2003. The borehole was drilled through the 216 A-29 Ditch, from the ground surface to a depth of 83.2 m (273 ft). The borehole was logged using a high-resolution spectral gamma-ray logging system and a neutron-moisture logging system. The borehole was drilled to better define stratigraphy and to assess the nature and vertical extent of contamination, as well as to determine the physical properties of the soil beneath the TSD unit.

The test pit locations were prepared by removing 0.3 to 0.6 m (1 to 2 ft) of topsoil from the site. The test pits were excavated to a maximum depth of 7 m (25 ft) below ground surface using a trackhoe. Samples were obtained directly from the trackhoe bucket at intervals of approximately 0.7 m (2.5 ft). Before being placed in a sample jar, soil samples were screened in the field to assist in selecting sample points, to support worker health and safety, and to provide shipping information. Samples were analyzed for chemical and physical properties. The test pits were backfilled in the reverse order from which they were excavated, using the trackhoe.

Soils from the boreholes and test pits were screened in the field both for indications of contamination and for assisting in determining the discrete sample locations or depths before the samples were collected. Soil samples were collected for analysis and determination of physical properties. The sampling approach generally required a greater sample frequency near the bottom of the TSD unit, which is the area of highest suspected contamination. Sample collection always was attempted at depths of 4.6 and 7.6 m (15 and 25 ft) below ground surface to define contamination profiles. Sample frequency generally was reduced to 6.1 to 15.2 m (20 to 50 ft) intervals below a depth of 7.6 m (25 ft) in the boreholes.

Soil samples were analyzed for the constituents of concern from DOE/RL-2004-17. Samples were analyzed selectively for field bulk density and moisture content. In addition, ditch bottom samples from each of the test pits were analyzed for an expanded list of compounds, to satisfy waste-designation requirements. Soil descriptions were recorded to better define stratigraphic relationships in the OU. The results obtained from previous characterization activities also were evaluated as part of this remedial investigation.

7.2.2 Soil Sample Results and Verification Sampling

Analytical results obtained from the remedial investigation were intended for refining and/or validating the site conceptual contaminant distribution model and are defensible for use in this closure plan for determining constituents of concern (DOE/RL-99-44, Appendix B). Table 4-1 identifies the maximum concentration of TSD unit constituents in shallow soils and deep-zone soils from DOE/RL-2005-63, Appendices A and B. The maximum values are compared to the clean-closure levels described in Section 6.2.2.

After comparing the TSD unit constituent concentrations found in DOE/RL-2005-63, Appendices A and B to the WAC 173-340-740(3) residential values, the TSD unit was not eligible for clean closure without remediation. The TSD unit constituent concentrations were then compared to the WAC 173-340-745(5) industrial values with the same result. Not all constituents met the WAC 173-340-745(5) standard without remediation because the soil concentration protective of groundwater cleanup level was the same. Remediation of the 216-A-29 Ditch soils will prevent the need for barrier construction.

Table 4-1 shows that two of the three TSD unit constituents (pH and hydrazine) meet the clean-closure standard, or, in the case of hydrazine, other provisions are used to demonstrate clean closure. Cadmium is the TSD unit constituent that does not meet the clean-closure standard. To meet WAC 173-340-740(3) residential cleanup levels, 216-A-29 Ditch contaminated soils will require removal. As the 200-CS-1 OU is removing the 216-A-29 Ditch contaminated soils, the TSD unit clean-closure approach for the soils also will be to remove the 216-A-29 Ditch contaminated soils and conduct verification sampling. The sampling and analysis plan for verifying that contaminant removal is complete is contained in DOE/RL-2005-63, Appendix K.

7.2.3 Confirm Waste Site Remedy Selection was Implemented to Achieve Clean Closure

Additional sampling and analysis of the soil is planned to confirm waste site remedy selection was implemented to achieve clean closure. The sampling will be documented and developed, as described in DOE/RL-2005-63, Appendix K.

7.3 OTHER ACTIVITIES REQUIRED FOR CLOSURE

The 200-CS-1 OU activities planned to support clean closure of the TSD unit include the removal of the 216-A-29 Ditch contaminated soils. This activity is expected to achieve clean closure for the TSD unit soils. In addition, a DQO process with follow-on sampling will be performed to determine if the clean-closure levels have been met, in coordination with the 200-CS-1 OU activities (DOE/RL-2005-63, Appendix K). After closure, appearance of the land will be consistent with land-use determinations of the Hanford Site.

7.4 INSPECTIONS

The TSD unit has been inspected to meet interim-status requirements. Annual inspections are performed based on Ecology approval in 2003. Following closure certification as described in Section 7.8, inspections for the 216-A-29 Ditch will be discontinued.

7.5 TRAINING

A dangerous waste training plan has been maintained for the TSD unit to meet interim-status requirements. The duties associated with dangerous waste management activities include performing inspections, notifying Ecology of any potential threats to human health and the environment, and performing groundwater monitoring. Following closure certification as described in Section 7.8, the dangerous waste training plan addressing the 216-A-29 Ditch waste management duties will be discontinued.

7.6 SCHEDULE FOR CLOSURE

The remaining closure activities for this TSD unit include: (1) removal of the 216-A-29 Ditch contaminated soils, (2) completion of a DQO process for verification sampling, and (3) verification sampling of the soils. These activities will be conducted as part of the 200-CS-1 OU activities. Following submittal of this closure plan to Ecology, Ecology's 90-day review period begins in accordance with the Tri-Party Agreement Action Plan, Figure 9-2.

7.7 AMENDMENT OF CLOSURE PLAN

As required by WAC 173-303-610(3)(b), "Closure Plan; Amendment of Plan," the closure plan will be amended if changes to closure activities require a modification of the approved closure plan. Modifications to this plan could occur as a result of the activities identified in Section 7.6.

7.8 CERTIFICATION OF CLOSURE

Upon removal of the 216-A-29 Ditch contaminated soils, sampling will be performed to verify that contaminant removal is complete, as well as to confirm waste site remedy selection was implemented to achieve clean closure. When sampling results have been evaluated, closure activities under this closure plan are planned to have been completed.

In accordance with WAC 173-303-610(6), "Certification of Closure," within 60 days of completion of TSD unit closure, the DOE will submit to Ecology a certification of closure. Both DOE and the Co-Operator identified on the current Part A Permit Application for the TSD unit will sign the certification of closure, and an independent Registered Professional Engineer will state that the unit has been closed in accordance with the approved closure plan. The certification will be submitted by registered mail or an equivalent delivery service. Documentation supporting the independent Registered Professional Engineer's certification will be placed in the Administrative Record.

8.0 POSTCLOSURE PLAN

The closure strategy for the 216-A-29 Ditch is clean closure with regard to TSD unit constituents for soils and groundwater; therefore, no postclosure plan is anticipated. If the verification sampling following removal of the 216-A-29 Ditch contaminated soils does not demonstrate clean closure, then a postclosure plan will be prepared for the 216-A-29 Ditch. The postclosure plan will be submitted to Ecology within 180 days following certification of closure, or as otherwise agreed to by Ecology, based on 200-CS-1 OU schedules.

This page intentionally left blank.

9.0 REFERENCES

02-RCA-0261, 2002, "216-A-29 Ditch Hydrazine Contained – In Determination (CID) Request," (Letter to J. Price, 200 Area Section Manager Nuclear Waste Program, Department of Ecology, Kennewick, Washington, from J. Hebdon), U.S. Department of Energy, Richland Operations Office, Richland, Washington, April 4.

02-RCA-0385, 2002, "Transfer of Hanford Facility Dangerous Waste Part A Permit Application, Form 3s for Certification in Support of Contract Transition for Central Plateau," (letter to M. A. Wilson, Washington State Department of Ecology, from J. Hebdon), U.S. Department of Energy, Richland Operations Office, Richland, Washington, July 1.

40 CFR 265, Subpart F, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart F, "Ground-Water Monitoring," Title 40, *Code of Federal Regulations*, Part 265, as amended.

40 CFR 265.93(b), "Interim Status for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," "Preparation, Evaluation, and Response," Title 40, *Code of Federal Regulations*, Part 265.93(b), as amended.

64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)," *Federal Register*, Vol. 64, No. 218, pp. 61615-61625, November 12, 1999.

00-GWVZ-050, 2000, "200 Area Hydrazine Contained-In Determination Request," (letter to E. R. Skinnarland, Washington State Department of Ecology, from K. M. Thompson), U.S. Department of Energy, Richland Operations Office, Richland, Washington, June 12.

BHI-01276, 1999, *200-CS-1 Operable Unit DQO Summary Report*, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601 et seq.

DOE/RL-89-28, 1994, *216-B-3 Expansion Ponds Closure Plan*, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-92-03, 1992, *Annual Report for RCRA Groundwater Monitoring Projects at Hanford Site Facilities for 1991*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-92-24, 1997, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 3, 2 vols., U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-93-74, 1995, *200-BP-11 Operable Unit RFI/CMS and 216-B-3 Main Pond, 216-B-63 Trench, and 216-A-29 Ditch Work/Closure Plan*, Rev. 0, Draft B, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-99-44, 2000, *200-CS-1 Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2004-17, *Remedial Investigation Report for the 200-CS-1 Chemical Sewer Group Operable Unit*, Rev. 0, U. S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2005-63, 2006, *Feasibility Study for the 200-CS-1 Chemical Sewer Group Operable Unit*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2005-63, pending, *Feasibility Study for the 200-CS-1 Chemical Sewer Group Operable Unit*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2008-01, 2008, *Hanford Site Groundwater Monitoring for Fiscal Year 2007,* Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2008-58, pending, *Interim Status Groundwater Monitoring Plan for the 216-A-29 Ditch*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, EPA, and DOE, 1989a, *Hanford Federal Facility Agreement and Consent Order*, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, as amended.

Ecology, EPA, and DOE, 1989b, *Hanford Federal Facility Agreement and Consent Order Action Plan*, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Ecology Publication 94-111, 2005, *Guidance for Clean Closure of Dangerous Waste Units and Facilities*, as amended, Washington State Department of Ecology, Olympia, Washington.

Hanford Environmental Information System, Hanford Site database.

PNNL-13047, 1999, *Groundwater Monitoring Plan for the 216-A-29 Ditch*, Pacific Northwest National Laboratory, Richland, Washington.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq.

WA7890008967, 2007, *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste,* Washington State Department of Ecology, Richland, Washington.

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

- 173-303-070(3), "Designation Procedures."
- 173-303-070(5), "Additional Designation Required."
- 173-303-090(6), "Characteristic of Corrosivity."
- 173-303-400, "Interim Status Facility Standards."
- 173-303-610, "Closure and Post-Closure."
- 173-303-610(1), "Applicability."
- 173-303-610(2), "Closure Performance Standard."
- 173-303-610(3), "Closure Plan; Amendment of Plan."
- 173-303-610(6), "Certification of Closure."
- 173-303-650(6), "Closure and Post-Closure Care."

WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

- 173-340-700(6)(d), "Natural Background and Analytical Considerations."
- 173-340-740(3), "Method B Soil Cleanup Levels for Unrestricted Land Use."
- 173-340-740(3)(b)(ii), "Environmental Protection."
- 173-340-740(3)(b)(iii)(A), "Ground Water Protection."
- 173-340-740(3)(b)(iii)(B)(I) and (II), "Noncarcinogens" and "Carcinogens."
- 173-340-740(6), "Point of Compliance."
- 173-340-745(5), "Method C Industrial Soil Cleanup Levels."
- 173-340-7490(4)(b), "Standard Point of Compliance."
- 173-340-7493, "The Chemicals of Ecological Concern."

WHC-EP-0342, 1990, Addendum 2, *PUREX Plant Chemical Sewer Stream-Specific Report,* Westinghouse Hanford Company, Richland, Washington.

WHC-SD-EN-EV-032, 1995, *Results of the Groundwater Quality Assessment Program at the 216-A-29 Ditch*, Rev. 0, Westinghouse Hanford Company, Richland Washington.

This page intentionally left blank.

DISTRIBUTION

Onsite

21	U.S. Department of Energy Richland Operations Office	
	G. L Sinton (20)	A6-38
	DOE Public Reading Room	H2-53
10	Fluor Hanford, Inc.	
	B. A. Austin	E6-44
	R. C. Brunke	E6-44
	B. H. Ford	E6-44
	G.J. LeBaron	S2-42
	A. G. Miskho	H8-12
	R.W. Oldham	E6-35
	S. L. Pedersen (3)	E6-44
	F. A. Ruck	H8-40
1	Pacific Northwest National Laboratory	
	Hanford Technical Library	P8-55
2	Lockheed Martin Information Technology	
	Document Clearance	H6-08
	Administrative Record	H6-08

This page intentionally left blank.