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100K PROJECT MANAGERS MEETING MINUTES
March 22, 2012

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Meeting Minutes Transmittal/Approval
100K Project Managers Meeting
March 22, 2012

APPROVAL: _____ Date: 3-22-2012
Tom Teynor, 100K Project Manager, DOE RL

APPROVAL: _____ Date: 3-22-2012
Rod Lobos, 100K Project Manager, EPA

HFFACO Action Plan Section 4.1 states that agreements and commitments resulting from the Project Managers meetings will be prepared and signed by all parties. Approval of these minutes documents approval of agreements and commitments documented in Attachments 2 and 3 to these minutes. Approvals do not apply to any other attachments. Any other attachments are provided for information purposes.

Minutes of the 100K Project Managers meeting of March 22, 2012 are attached. Minutes are comprised of the following.

Attachment 1	Attendance Record
Attachment 2	Milestone Status Report with Agreements, Commitments and Actions Identified
Attachment 3	100K Area PMM Response Action Agreements
Attachment 4	100 K Removal Action Statuses
Attachment 5	100K Waste Sites Status
Attachment 6	Emerging Issues / Pending Actions List
Attachment 7	Justification to Backfill 183.4KE/KW Clearwells
Attachment 8	Updated Summary of 100K Area Waste Site Agreements between RL and EPA
Attachment 9	TPA Change Package M-93-12-01

100K Project Managers Meeting
March 22, 2012

Please print clearly and use black ink

Printed Name	Organization	Telephone
THOMAS K. TEYNOR	DOE-RL	376-6363
Rod Lobos	EPA	376-3749
Steve Barone	DOE-RL	376-0236
Ellen D. Dogan Ellen D. Dogan	DOE-RL	376-3811
Dottie Norman	CHPRC	373-0040
Kurt Kepler	CHPRC	376-0566
Nane Bichand	CHPRC	373-0771
Lorna Dittmer	CHPRC	376-7017
David Watson	CHPRC	373-3250

ATTACHMENT 2
100K AREA PROJECT MANAGERS MEETING MILESTONE STATUS

March 22, 2012

M-016-171 Complete K Basin sludge treatment and packaging technology evaluation report and submit a schedule including proposed new interim milestones for bench scale or identified testing in order to meet M-016-173
Due 03/31/2012, DOE Lead Roger Quintero

- The Technology Evaluation and Alternatives Analysis Report was completed. The warm water oxidation process was identified as the technical baseline for further testing and development, along with process enhancement options of a Fenton's Reagent and size reduction to potentially shorten the time necessary for sludge treatment.
- A preliminary technology maturation plan is being developed to support completion of M-016-171.
- The results of the Technology Evaluation and Alternatives Analysis Report and a summary testing schedule were presented to EPA on March 14, 2012.
- A change package to establish two interim milestones in FY13 and FY14 toward completion of interim milestone M-016-173 has been provided to EPA for review and comment.

Schedule Status: On schedule.
Agreements, Commitments and Actions:

RL to send completed change package to EPA for approval the week of March 26, 2012.

M-016-173 Select K Basin sludge treatment and packaging technology and propose new interim sludge treatment and packaging milestones.
Due 03/31/2015 DOE Lead Roger Quintero

- Pre-conceptual activities are being planned, including a facility siting study to evaluate existing new, and hybrid facility alternatives; and uranium metal size reduction technology testing.

Schedule Status: Pending completion of M-016-171.
Agreements, Commitments and Actions:

M-016-172 Complete KOP material removal from 105-KW Fuel Storage Basin.
Due 9/30/2012, DOE Lead Roger Quintero

- Installation and testing of Knockout Pot Processing (KPS) production hardware is in progress and expected to be complete in March 2012.
- Operational readiness activities are underway to verify systems, procedures, and personnel are ready for startup operations.
- Procurement of additional MCOs for load out of the KOP product material is complete and procurement of copper inserts that will hold the KOP product material is in progress.
- Nuclear safety basis documentation for KPS operations in KW Basin, and Canister Storage Building have been approved by RL. The nuclear safety basis documentation for Cold Vacuum Drying Facility is expected to be approved in March 2012.

Schedule Status: On schedule.
Agreements, Commitments and Actions:

M-016-174 Complete final design of sludge retrieval and transfer system.
Due 9/30/2013, DOE Lead Roger Quintero

- The KW Basin Annex and building systems final design (issued in construction drawings) is expected to be completed in April 2012.
- Engineered Container Retrieval and Transfer System optimization testing continues at MASF as well as final design of the system.
- A Technology Readiness Assessment (TRA) will be held in June 2012 to support completion of final design.

Schedule Status: On schedule.
Agreements, Commitments and Actions:

DOE commits to notifying EPA of Project delays due to funding short falls as soon as possible.

M-016-175 Begin sludge removal from 105-KW Fuel Storage Basin
Due 09/30/2014, DOE Lead Roger Quintero

- Procurement of a construction contractor for the KW Basin Annex is in progress. Proposals have been received and are being reviewed for selection. Contract award is expected in May 2012.
- DOE review of the request for early procurement and construction is in progress and expected to be completed in April 2012.

Schedule Status: Pending completion of M-016-174.
Agreements, Commitments and Actions:

M-016-176 Complete sludge removal from 105-KW Fuel Storage Basin
Due 12/31/2015, DOE Lead Roger Quintero

Schedule Status: Pending completion of M-016-175.
Agreements, Commitments and Actions:

M-016-53 Complete the interim response actions for the 100 K Area within the perimeter boundary and to the river for Phase 1 actions.
Due 12/31/2012, DOE Lead Steve Balone

Remedial Actions:

- The verification sample instructions for Area AA Zone 1 and 2 were submitted to EPA for review and comment on March 13, 2012. The sample instructions support confirmatory sampling of the following phase 1 waste sites: 100-K-102, 100-K-18, 100-K-19, 100-K-34, 120-KW-5, 120-KW-7 and 1607-K3.
- Interim re-vegetation was completed for the 100-K-63 waste site.
- The RSVP for the 100-K-63 is being drafted.
- The verification sample instruction for Area AG, Zone 2 was provided to EPA for review and comment.
- Initiated mobilization activities for the continued remediation of waste sites 100-K-3, 100-K-68, 100-K-69, 100-K-70, and 100-K-71.

Schedule Status: On schedule.
Agreements, Commitments and Actions:

DOE to schedule briefing with EPA prior to April PMM for path forward for UPR-100-K-1, 116-KE-1, and 116-KE-3 waste sites.

DOE and EPA will continue to meet to discuss facility demolition and waste site remediation scheduling per the integrated schedule revisions. To be scheduled on an ongoing basis.

M-016-143 Complete the interim response actions for the 100 K Area within the perimeter boundary and to the river for Phase 2 actions.
Due 12/31/2015, DOE Lead Steve Balone

- The verification sample instructions for Area AA Zone 1 and 2 were submitted to EPA for review and comment on March 13, 2012. The sample instructions support verification sampling of the following Phase 2 waste sites: 100-K-102 and 100-K-9. An MOA for remediation work on the 100-K Eastern floodplain at 100-K-80, 100-K-81, 100-K-83, and 100-K-96 waste sites is under review by DOE and the Tribes.
- Demolition of the 182-K substructure began and is approximately 5% complete.

Schedule Status: On schedule.
Agreements, Commitments and Actions:

M-016-178 Initiate deactivation of 105-KW Fuel Storage Basin
Due 12/31/2015, DOE Lead Roger Quintero

- Preparing equipment and personnel for found fuel MCO loading and shipment.

Schedule Status: On schedule.
Agreements, Commitments and Actions:

M-016-00C Complete All Response Actions in The 100 K Area
Due 12/31/2020, DOE Lead Tom Teynor

- Asbestos removal is approximately 45% complete at 165-KE and approximately 95% complete at the 105-KE water tunnel.
- Demolition of 183.2 KE was not worked, remains 35% complete. Sediment removal continues from the western bays of the sedimentation basin in preparation for sampling. The eastern bays of the sedimentation basin were walked down with EPA to finalize sampling locations. Sampling is pending resource availability.

Schedule Status: On schedule.
Agreements, Commitments and Actions:

MILESTONE	DESCRIPTION	DUE DATE	DOE LEAD	SCHEDULE STATUS
M-093-22	Complete 105-KE Reactor Interim Safe Storage in Accordance with the Removal Action Work Plan	7/31/2014	Ellen Dagan	On Schedule
M-093-26	Initiate 105-KW Reactor Interim Safe Storage	12/31/2015	Ellen Dagan	On Schedule
M-016-181	Complete Deactivation, Demolition, and Removal of 105-KW Fuel Storage Basin	9/30/2019	Roger Quintero	On Schedule
M-093-27	Complete 105-KW Reactor Interim Safe Storage	12/31/2019	Ellen Dagan	On Schedule
M-016-186	Initiate Soil Remediation Under 105KW Fuel Storage Basin	12/31/2019	Steve Balone	On Schedule

ATTACHMENT 3
100K AREA PROJECT MANAGERS MEETING RESPONSE ACTION AGREEMENTS

Backfill Approval

- The justification to backfill the 183.4 KE / KW Clearwells was approved by RL and EPA on March 13, 2012. (Reference Attachment 7)

Waste Site Agreements Update

- Attachment 8 provides an update to the waste site agreements resulting from a meeting between RL and EPA on September 7, 2011 and last updated on October 12, 2011.

TPA Change Package

- TPA Change Number M-93-12-01 was approved by EPA on March 23, 2012. This change package corrects the description of Interim Milestone M-093-22 to indicate that the 105-KE Reactor ISS will be conducted in accordance with DOE/RL-2005-26, *Removal Action Work Plan for 105-KE/105-KW Facilities and Ancillary Facilities*". (Reference Attachment 9)

100K Area Removal Action Status (March 22, 2012)

Phase 1 M-016-053: December 31, 2012	Phase 2 M-016-143: December 31, 2015	Phase 3 (M-016-00C: December 31, 2020)	
110KW Gas Storage Facility	118KW Horizontal Control Rod Storage Cave	105KE Water Tunnel	183.2KE Sedimentation Basin
110KE Gas Storage Facility	166AKE Oil Storage Facility	105KW Water Tunnel	183.3KE Filter Basin
115KE Gas Recirculation Building	166KE Oil Storage Vault	115KW Gas Recirculation Building	183.4KE Clearwell
116KE Reactor Exhaust Stack	1705KE Effluent Water Treatment Pilot Plant	116KW Reactor Exhaust Stack	183.1KE Headhouse
117KE Exhaust Air Filter Building	1713KER Shop Building	117KW Exhaust Air Filter Building	183.5KE Lime Feeder
118KE Horizontal Control Rod Storage Cave	1720K Administration Office Building	119KW Exhaust Air Sampling Building	183.6KE Lime Feeder
119KE Exhaust Air Sampling	1724KB Gas Bottle Storage Facility	142K CVDF	183.7KE Tunnel
1706KE Radiation Control Counting Lab	182K Emergency Water Reservoir Pump House	1506K1 Fiber Optics Hut	185K Potable Water Treatment Plant
1706KEL Developmental Lab	183.5KW Lime Feeder Building	165KE Power Control Bldg	1908K Outfall Structure
1706KER Water Studies Recirculation Bldg	183.6KW Lime Feeder Building	142KA CVDF Generator Bldg	1908KE Outfall Structure
1713KE Warehouse	MO101 Administration	165KW Power Control Bldg	190KE Main Pump House
1714KE Oil and Paint Storage Shed	MO102 Administration	166KW Oil Storage Vault	190KW Main Pump House
183.4KW Clearwell	MO214 Administration	167K Cross-tie Tunnel Bldg	MO054 Lunch Room
183.1KW Head House	MO382 Office	1713KW Warehouse	MO500 Administration
181KE River Pump House	MO401 Administration	1714KW Oil and Paint Storage Shed	MO236 KW Ops/HPT Change
183.2KW Sedimentation Basin	MO402 Administration	1717K Maintenance Shop	MO237 KW Construction Forces
183.3KW Filter Basin	MO442 Classroom/Office	1724K Maintenance Shop	MO323 CVD Change Trailer
MO048 Construction Lunch Trailer	MO506 CVDF Lunch Room	1724KA Storage Shed	MO955 Conference Room
MO060 Conference Trailer	MO507 CVDF Conference Room	181KW River Pump House	1605KW Guard Tower West
MO872 Leased trailer	MO907 Administration	183KE Chlorine Vault	
MO873 Leased trailer	MO917 CVDF Administration		
MO969 HPT Change Trailer	MO928 Administration		
1605KE Guard Tower East			

Field Work In Progress

Demolition Complete

Closure Actions and Documentation Complete

100K Area Waste Site Remediation Status

March 22, 2012

Phase 1 M-016-053: 12/31/2012		Phase 2 M-016-143: 12/31/2015		Phase 3 M-016-00C: 12/31/2020	M-016-57 (Initiate soil remediation at K East Basin)	Legend
100-K-3	100-K-71	100-K-4	126-KE-2	100-K-1	UPR-100-K-1	Excavation ongoing/ Additional remediation needed
100-K-6	100-K-77	100-K-5	130-K-2	100-K-35		Failed CSNA
100-K-18	116-KE-1	100-K-13	130-KE-2	100-K-43		Mixed Failed CSNA and RTD
100-K-19	116-KE-3	100-K-14	130-KW-2	100-K-47		Drafting VSI/Collecting Samples
100-K-34	116-KE-6A	100-K-25	1607-K1	100-K-54		Drafting RSVP
100-K-36	116-KE-6B	100-K-27	1607-K2	100-K-55		RSVP approved
100-K-37	116-KE-6C	100-K-48	1607-K4	100-K-56		Backfill complete
100-K-38	116-KE-6D	100-K-49	1607-K5	100-K-60		Revegetation complete
100-K-46	118-KE-2	100-K-56	1607-K6	100-K-61		
100-K-53	120-KW-1	100-K-57	100-K-94	100-K-72		
100-K-56	120-KW-2	100-K-64	100-K-96	100-K-73		
100-K-62	120-KW-3	100-K-66	100-K-97	100-K-74		
100-K-63	120-KW-4	100-K-67	100-K-98	100-K-75		
100-K-68	120-KW-5	100-K-80	100-K-99	100-K-79		
100-K-69	120-KW-7	100-K-81	116-K-3	100-K-82		
100-K-70	130-KE-1	100-K-83	100-K-100	116-KE-2		
	132-KE-1	118-KW-2	100-K-101	116-KW-1		Waste site listing is based on DOE/RL-96-17 TPA-CN-499
	1607-K3	120-KE-1	100-K-102	116-KW-2		
		120-KE-2	100-K-103	118-KW-1		
		120-KE-3	100-K-104	130-KW-1		
		120-KE-4	100-K-105	132-KW-1		
		120-KE-5	100-K-106			
		120-KE-6	100-K-107			
		120-KE-8	100-K-108			
		120-KE-9	100-K-109			
		120-KW-6	100-K-110			

100-K Waste Site Status as of 3/22/2012

Site Code	Site Names	TPA-CN-499	PMB Remedy	Document Authorizing RTD of a	Waste Site Status	Action	Actionee	VSI Status	RSVP	Area	Zone	Backfill Completed
100-K-18	183-KW Caustic Neutralization Pit	Phase 1	RTD	N/A	VSI is with EPA for review	Review	EPA	RA-00368 (Area AA Z2)		AA	Zone 2	
100-K-19	183-KW Caustic Soda Storage Tank Site	Phase 1	CSNA	RA-00134	VSI is with EPA for review	Review	EPA	RA-00368 (Area AA Z2)		AA	Zone 2	
100-K-3	1706-KE Fish Pond Heat Exchanger Pit and Pump Pit, Water Studies Semi-Works	Phase 1	RTD	N/A	Excavating contaminated soils	Excavate	Fox	Pipeline partial closure in: RA-00408 (Area AG Z1A) on hold, RA-00407 (Area AG Z2) being reviewed by DOE-RL and EPA		AG	Zone 1A & Zone 2	
100-K-34	183-KW Acid Neutralization Pit	Phase 1	RTD	N/A	VSI is with EPA for review	Review	EPA	RA-00368 (Area AA Z2)		AA	Zone 2	
100-K-36	1706-KE Chemical Storage Facility Dry Well	Phase 1	CSNA	RA-00122	VSI is with EPA for review	Review	EPA	RA-00407 (Area AG Z2), being reviewed by EPA		AG/AH	AG Zone 2	
100-K-37	1706-KE Sulfuric Acid Tank	Phase 1	CSNA	RA-00122	Closed			N/A	DOE/RL-2010-44	AH	N/A	N/A
100-K-38	100-K-38, 1706-KE Caustic Soda Tank	Phase 1	CSNA	RA-00122	Closed			N/A	DOE/RL-2010-44	AH	N/A	N/A
100-K-46	100-K-46, 119-KE French Drain, Drywell	Phase 1	CSNA	RA-00145	Plan to collect in-process samples	Need funding	Norman	On hold pending in-process sampling		AH	N/A	
100-K-53	100-K-53, 100-KE Glycol Heat Recovery Underground Pipelines	Phase 1	RTD	N/A	Plan to collect in-process samples	Need funding	Norman	On hold pending in-process sampling		AH	N/A	
100-K-56	100-K-56, 100-KE Reactor Cooling Water Effluent Underground Pipelines	Phase 1	RTD	N/A	Additional excavation needed	Need funding	Norman	Pipeline partial closure in: RA-00408 (Area AG Z1A) on hold, RA-00407 (Area AG Z2), being reviewed by DOE-RL and EPA		AG	Zone 1A & Zone 2	
100-K-6	Vacuum Pit, Cyclone Separator, 105-KE Vacuum Pit	Phase 1	CSNA	RA-00142	Plan to collect in-process samples	Need funding	Norman	On hold pending in-process sampling		AH	N/A	
100-K-62	100-K-62, 117-KE Filter Building	Phase 1	CSNA	RA-00136	Plan to collect in-process samples	Need funding	Norman	On hold pending in-process sampling		AH	N/A	
100-K-63	100-K-63, 100-KW Floodplain, 100-K Flood Plain Contamination Area	Phase 1	CSNA	RA-00086	Backfill/interim revegetation complete, RSVP to be drafted	Draft RSVP	Klages	RA-00401, Approved 9/28/2011		AJ	N/A	10/20/2011
100-K-68	100-K-68, 105-KE Pump Gallery and Catch Tank, D Sump	Phase 1	RTD	N/A	Excavating contaminated soils	Excavate	Fox			AG	N/A	
100-K-69	100-K-69, 105-KE Sump C	Phase 1	RTD	N/A	Excavating contaminated soils	Excavate	Fox			AG	N/A	
100-K-70	100-K-70, 105-KE Waste Storage Tank, Holding Tank	Phase 1	RTD	N/A	Excavating contaminated soils	Excavate	Fox			AG	N/A	
100-K-71	100-K-71, 105-KE Collection Box	Phase 1	RTD	N/A	Excavating contaminated soils	Excavate	Fox			AG	N/A	
100-K-77	100-K-77, Underground Railroad Ties Southeast of 1706KE	Phase 1	RTD	N/A	Closed			RA-00379, Approved 9/8/2011	DOE/RL-2011-105	AH	N/A	9/30/2011
116-KE-1	116-KE-1, 115-KE Condensate Crib	Phase 1	RTD	N/A	Modeling, C-14 issue	Modeling	Westcott			AH	N/A	
116-KE-3	116-KE-3, 105-KE Storage Basin French Drain, 105-KE Fuel Storage Basin Sub-Basin Drainage Disposal System Crib	Phase 1	RTD	N/A	Modeling	Modeling	Westcott			AG	N/A	
116-KE-6A	116-KE-6A, 1706-KE Condensate Collection Tank, 1706-KE Waste Treatment System	Phase 1	CSNA	RA-00121	Closed			N/A	DOE/RL-2010-42	AH	N/A	N/A
116-KE-6B	116-KE-6B, 1706-KE Evaporation Tank, 1706-KE Waste Treatment System	Phase 1	CSNA	RA-00121	Closed			N/A	DOE/RL-2010-42	AH	N/A	N/A
116-KE-6C	116-KE-6C, 1706-KE Waste Accumulation Tank, 1706-KE Waste Treatment System	Phase 1	CSNA	RA-00121	Closed			N/A	DOE/RL-2010-42	AH	N/A	N/A
116-KE-6D	116-KE-6D, 1706-KE Ion Exchange Column, 1706-KE Waste Treatment System	Phase 1	CSNA	RA-00121	Closed			N/A	DOE/RL-2010-42	AH	N/A	N/A
118-KE-2	118-KE-2, 105-KE Horizontal Control Rod Storage Cave	Phase 1	CSNA	RA-00119	Closed			N/A	DOE/RL-2010-50	AH	N/A	N/A
120-KW-1	120-KW-1, 183-KW Filter Water Facility Dry Well, 100-KW-1, 183-KW Acid Neutralization Pit, 100-K-17	Phase 1	RTD	N/A	Closed			RA-00358, Approved	DOE/RL-2011-113	AA	Zone 3	11/8/2011
120-KW-2	120-KW-2, 183-KW Filter Water Facility French Drain, 100-KW-2	Phase 1	RTD	N/A	Closed			RA-00358, Approved	DOE/RL-2011-113	AA	Zone 3	11/8/2011
120-KW-3	120-KW-3, 183-KW1 Sulfuric Acid Storage Tank	Phase 1	CSNA	RA-00134	Closed			RA-00358, Approved	DOE/RL-2011-113	AA	Zone 3	11/8/2011
120-KW-4	120-KW-4, 183-KW2 Sulfuric Acid Storage Tank	Phase 1	CSNA	RA-00134	Closed			RA-00358, Approved	DOE/RL-2011-113	AA	Zone 3	11/8/2011
120-KW-5	120-KW-5, 183-KW Sodium Dichromate Storage Tank	Phase 1	CSNA	RA-00134	VSI is with EPA for review	Review	EPA	RA-00368 (Area AA Z2)		AA	Zone 2	
120-KW-7	120-KW-7, 183-KW Brine Pit, 183-KW Salt Dissolving Pits and Brine Pump Pit	Phase 1	CSNA	RA-00134	VSI is with EPA for review	Review	EPA	RA-00368 (Area AA Z2)		AA	Zone 2	
130-KE-1	130-KE-1, 105-KE Emergency Diesel Oil Storage Tank, 105-KE Emergency Diesel Fuel Tank	Phase 1	CSNA	RA-00133	Closed			N/A	DOE/RL-2010-45	AH	N/A	N/A
132-KE-1	132-KE-1, 116-KE Reactor Exhaust Stack	Phase 1	CSNA	RA-00136	Plan to collect in-process samples	Need funding	Norman	On hold pending in-process sampling		AH	N/A	
1607-K3	1607-K3 Septic Tank and Associated Drain Field	Phase 1	RTD	N/A	VSI is with EPA for review	Review	EPA	RA-00371 (Area AA Z1) Drafting		AA	Zone 1	

100-K Waste Site Status as of 3/22/2012

Site Code	Site Names	TPA-CN-499	PMB Remedy	Document Authorizing RTD of a	Waste Site Status	Action	Actionee	VSI Status	RSVP	Area	Zone	Backfill Completed
100-K-100	100-K-100, Radioactive Material Area Remaining After 107-KW Basin Removal, 116-KW-3 Remaining Contaminated Soil and Items	Phase 2	RTD	N/A	Not Started					AF	N/A	
100-K-101	100-K-101, French Drains and Mercury Stained Soils near the 183KE Sedimentation Basin	Phase 2	RTD	N/A	Not Started					AB	N/A	
100-K-102	100-K-102, French Drains and Mercury Stained Soils near the 183KW Sedimentation Basin	Phase 2	RTD	N/A	VSI is with EPA for review	Review	EPA	RA-00371 (Area AA Z1) Drafting		AA	Zone 1	
100-K-103	100-K-103, 1704-K and 1717-K Septic Systems, 1607-K4	Phase 2	RTD	N/A	Not Started					AF	N/A	
100-K-104	100-K-104, 166-KE French Drain	Phase 2	RTD	N/A	Not Started					AD	N/A	
100-K-105	100-K-105, Pit at Southeast Corner of 100K	Phase 2	RTD	N/A	Not Started					AF	N/A	
100-K-106	100-K-106, 182-K Fuel Oil Crib	Phase 2	RTD	N/A	Not Started					AD	N/A	
100-K-107	100-K-107, 1706-KER Abandoned Drain Field	Phase 2	RTD	N/A	Not Started					AF	N/A	
100-K-108	100-K-108, 1706-KER Septic System	Phase 2	RTD	N/A	Not Started					AF	N/A	
~~100-K-109~~	~~100-K-109, Unplanned Chemical Release near 183.1KW Head House, Yellow Stained Soil adjacent to 183.1KW Head House~~	~~Phase 2~~	~~RTD~~	~~N/A~~	Closed			RA-00361, Approved	DOE/RL-2011-114	AA	Zone 4	11/22/2011
100-K-110	Soil beneath 183.2-KW Flocculation and Sedimentation Basins; the 183.3-KW Sand Filter Basins	Phase 2	N/A	N/A	VSI is with EPA for review	Review	EPA	RA-00371 (Area AA Z1) Drafting		AA	N/A	
100-K-13	100-K-13, French Drain West of the 166-KW Oil Storage Tank Facility	Phase 2	CSNA	RA-00144	Not Started					AC	N/A	
100-K-14	100-K-14, 183-KE Acid Neutralization Pit and Overflow French Drain	Phase 2	RTD	N/A	Not Started					AB	N/A	
100-K-25	100-K-25, 183-KE Caustic Neutralization Pit	Phase 2	CSNA	RA-00139	Not Started					AB	N/A	
100-K-27	100-K-27, 183-KE Caustic Soda Storage Tank Site	Phase 2	RTD	N/A	Not Started					AB	N/A	
~~100-K-4~~	~~100-K-4, 1706-KE Wet Fish Studies Ponds and Valve Pit~~	~~Phase 2~~	~~RTD~~	~~N/A~~	Closed			GC-SI-2010-0015, Approved	DOE/RL-2010-43	AG	N/A	Dec-11
100-K-48	100-K-48, 100-KE Oil Contamination Areas	Phase 2	CSNA	RA-00147	Not Started					AF	N/A	
100-K-56	100-K-56, 100-KE Reactor Cooling Water Effluent Underground Pipelines (See Subsites)	Phase 2	RTD	N/A	Not Started					AF	N/A	
100-K-57	100-K-57, 107-KE Drainage Ditch	Phase 2	RTD	N/A	Not Started		Norman			AM	N/A	
100-K-64	100-KE Floodplain, 100-KE Flood Plain Contamination Area	Phase 2	CSNA	RA-00086	Not Started		Norman			AM	N/A	
100-K-66	100-K-66, 165-KW Power Control Building	Phase 2	CSNA	RA-00136	Not Started					AC	N/A	
100-K-67	100-K-67, 165-KE Power Control Building	Phase 2	CSNA	RA-00136	Not Started					AD	N/A	
100-K-80	100-K-80, 100K River Effluent Pipeline, 100K River Line, 116-K-3 Outfall Structure, 1908 K Outfall	Phase 2	RTD	N/A	Drafting MOA for RTD	Need MOA	Norman/RL			AM	N/A	
100-K-81	100-K-81, Contamination Area West of 116-K-3	Phase 2	RTD	N/A	Drafting MOA for RTD	Need MOA	Norman/RL			AM	N/A	
100-K-83	100-K-83, 1904- K Spillway, 116-K-3, 1904-K Outfall Structure	Phase 2	CSNA	RA000149	Drafting MOA for RTD	Need MOA	Norman/RL			AM	N/A	
100-K-94	100-K-94, 1702-KE and 1702-KW Guard House Dry Wells	Phase 2	RTD	N/A	Not Started					AB	N/A	
100-K-96	100-K-96, 100KE River Effluent Pipeline, 100KE River Line, River Line (East) from 116-K-3 Outfall	Phase 2	RTD	N/A	Drafting MOA for RTD	Need MOA	Norman/RL			AM	N/A	

100-K Waste Site Status as of 3/22/2012

Site Code	Site Names	TPA-CN-499	PMB Remedy	Document Authorizing RTD of a	Waste Site Status	Action	Actionee	VSI Status	RSVP	Area	Zone	Backfill Completed
100-K-97	100-K-97, 183-KW French Drain and Rail Spur Unplanned Release	Phase 2	RTD	N/A	VSI is with EPA for review	Review	EPA	RA-00368 (Area AA Z2)		AA	N/A	
100-K-98	100-K-98, 183-KE French Drain and Rail Spur Unplanned Release	Phase 2	RTD	N/A	Not Started					AB	N/A	
100-K-99	100-K-99, Radioactive Material Area Remaining After 107-KE Basin Removal, 116-KE-4 Contaminated Soil and Items	Phase 2	RTD	N/A	Not Started					AF	N/A	
116-K-3	116-K-3, 1904-K Outfall Structure, 1908-K Outfall Structure	Phase 2	RTD	N/A	Drafting MOA for RTD	Need MOA	Norman/RL			AM	N/A	
118-KW-2	118-KW-2, 105-KW Horizontal Control Rod Storage Cave	Phase 2	RTD	N/A	Closed			N/A	DOE/RL-2011-35	AF	N/A	
120-KE-1	120-KE-1, 183-KE Filter Waste Facility Dry Well, 100-KE-1, 183-KE Filter Water Facility, 183-KE Acid Neutralization Pit, 100-K-26	Phase 2	RTD	N/A	Not Started					AB	N/A	
120-KE-2	120-KE-2, 183-KE Filter Waste Facility French Drain, 100-KE-2, 183 KE Filter Water Facility	Phase 2	RTD	N/A	Not Started					AB	N/A	
120-KE-3	120-KE-3, 100-KE-3, 183-KE Filter Water Facility Trench	Phase 2	CSNA	RA-00134	Not Started					AB	N/A	
120-KE-4	120-KE-4, 183-KE1 Sulfuric Acid Storage Tank	Phase 2	RTD	RA-00134	Not Started					AB	N/A	
120-KE-5	120-KE-5, 183-KE2 Sulfuric Acid Storage Tank	Phase 2	RTD	RA-00134	Not Started					AB	N/A	
120-KE-6	120-KE-6, 183-KE Sodium Dichromate Tank	Phase 2	CSNA	RA-00134	Not Started					AB	N/A	
120-KE-8	120-KE-8, 165-KE Brine Pit, 165-KE Brine Mixing Tank	Phase 2	CSNA	RA-00141	Not Started					AB	N/A	
120-KE-9	120-KE-9, 183-KE Brine Pit, 183-KE Salt Dissolving Pits and Brine Pump Pit	Phase 2	RTD	N/A	Not Started					AB	N/A	
120-KW-6	120-KW-6, 165-KW Brine Pit, 165-KW Brine Mixing Tank	Phase 2	CSNA	RA-00141	Not Started					AC	N/A	
126-KE-2	126-KE-2, 183-KE Liquid Alum Storage Tank #2	Phase 2	RTD	N/A	Not Started					AB	N/A	
130-K-2	130-K-2, 1717-K Waste Oil Storage Tank	Phase 2	CSNA	RA-00150	Not Started					AD	N/A	
130-KE-2	130-KE-2, 166-KE Oil Storage Tank	Phase 2	CSNA	RA-00136	Not Started					AD	N/A	
130-KW-2	130-KW-2, 166-KW Oil Storage Tank	Phase 2	CSNA	RA-00136	Not Started					AC	N/A	
1607-K1	1607-K1, 1607-K1 Septic Tank and Associated Drain Field, 124-K-1, 1607-K1 Sanitary Sewer System, 1607-K1 Septic Tank	Phase 2	RTD	RA-00135	Not Started					AA	N/A	
1607-K2	1607-K2, 1607-K2 Septic Tank and Associated Drain Field, 124-KE-1, 1607-K2 Sanitary Sewer System, 1607-K2 Septic Tank	Phase 2	RTD	RA-00135	Not Started					AB	N/A	
1607-K4	1607-K4, 1607-K4 Septic Tank and Associated Drain Field, 124-K-2, 1607-K4 Sanitary Sewer System, 1607-K4 Septic Tank	Phase 2	RTD	N/A	Closed					AF	N/A	
1607-K5	1607-K5, 1607-K5 Septic Tank and Associated Drain Field, 124-KE-2, 1607-K5 Sanitary Sewer System, 1607-K5 Septic Tank	Phase 2	RTD	RA-00135	Not Started					AH	N/A	
1607-K6	1607-K6, 1607-K6 Septic Tank and Associated Drain Field, 124-KW-1, 1607-K6 Sanitary Sewer System, 1607-K6 Septic Tank	Phase 2	RTD	RA-00135	Not Started					AF	N/A	
100-K-49	100-K-49, 100-KW Oil Contamination Area	Phase 2	CSNA	RA-00147	Not Started					AC	N/A	
100-K-5	100-K-5, 1705-KE French Drain	Phase 2	CSNA	RA-00146	Not Started					AD	N/A	

100-K Waste Site Status as of 3/22/2012

Site Code	Site Names	TPA-CN-499	PMB Remedy	Document Authorizing RTD of a	Waste Site Status	Action	Actionee	VSI Status	RSVP	Area	Zone	Backfill Completed
100-K-1	100-K-1, 119-KW French Drain, 119-KW Exhaust Air Sample Building French Drain, 100-K-45	Phase 3	RTD	N/A	Not Started					AF	N/A	
100-K-35	100-K-35, 183-KE Acid Neutralization Pit	Phase 3	CSNA	RA-00139	Not Started					AB	N/A	
100-K-43	100-K-43, KW Basin, 105-KW Fuel Storage Basin, K West Basin, Irradiated Fissile Material Storage	Phase 3	RTD	N/A	Not Started					AE	N/A	
100-K-47	100-K-47, 1904-K Process Sewer	Phase 3	RTD	N/A	Additional remediation required					AG/AF/AE	N/A	AG Zone 1A
100-K-54	100-K-54, 100-KW Glycol Heat Recovery Underground Pipelines	Phase 3	RTD	N/A	Not Started					AF	N/A	
100-K-55	100-K-55, 100-KW Reactor Cooling Water Effluent Underground Pipelines (See Subsites)	Phase 3	RTD	N/A	Not Started					AE	N/A	
100-K-56	100-K-56, 100-KE Reactor Cooling Water Effluent Underground Pipelines (See Subsites)	Phase 3	RTD	N/A	Not Started					AE	N/A	
100-K-60	100-K-60, 1904-K Process Sewer (165-KW)	Phase 3	CSNA	RA-00148	Not Started					AC	N/A	
100-K-61	100-K-61, 117-KW Filter Building	Phase 3	CSNA	RA-00136	Not Started					AF	N/A	
100-K-72	100-K-72, 105-KW Pump Gallery and Catch Tank, D Sump	Phase 3	RTD	N/A	Not Started					AE	N/A	
100-K-73	100-K-73, 105-KW Collection Box	Phase 3	RTD	N/A	Not Started					AE	N/A	
100-K-74	100-K-74, 105-KW Waste Storage Tank, Holding Tank	Phase 3	RTD	N/A	Not Started					AE	N/A	
100-K-75	100-K-75, 105-KW Sump C	Phase 3	RTD	N/A	Not Started					AE	N/A	
100-K-79	Sodium Dichromate and Sulfuric Acid Product Pipelines at 100-K	Phase 3	CSNA	RA-00134	Additional remediation required			Pipeline partial closure in: RA-00407 (Area AG Z2), being reviewed by EPA and RA-00368 (Area AA Z2) being reviewed by DOE-RL		AA/AB/AF/AG	AA Zone 2 AG Zone 2	
100-K-82	100-K-82, 105 -KW Fuel Storage Basin Leak	Phase 3	CSNA	RA-00143	Not Started					AE	N/A	
116-KE-2	116-KE-2, 1706-KER Waste Crib	Phase 3	RTD	N/A	Not Started					AF	N/A	
116-KW-1	116-KW-1, 115-KW Condensate Crib	Phase 3	RTD	N/A	Not Started					AF	N/A	
116-KW-2	116-KW-2, 105-KW Storage Basin French Drain, 105-KW Basin Reverse Well, 105-KW Fuel Storage Basin Sub-Basin Drainage Disposal System Crib	Phase 3	RTD	N/A	Not Started					AE	N/A	
118-KW-1	118-KW-1, 105-KW Reactor Building	Phase 3	CSNA	RA-00136	Not Started					AN	N/A	
130-KW-1	130-KW-1, 105-KW Emergency Diesel Oil Storage Tank, 130-KW-1A/130-KW-1B Tanks, 105-KW Emergency Diesel Fuel Tank	Phase 3	CSNA	RA-00137	Not Started					AC	N/A	
132-KW-1	132-KW-1, 116-KW Reactor Exhaust Stack	Phase 3	CSNA	RA-00136	Not Started					AF	N/A	

Emerging Concerns / Pending Actions – 100K PMM

1. Need to formalize/definitize closure of 100-K-42 and UPR-100-K-1. Propose 100-K-42 be closed with the completion of the basin demolition/excavation activities and assign remaining costs to UPR-100-K-1 or assign new waste site. Discuss with EPA the path forward for closing and backfilling 100-K-42.
    - **Action:** Rod Lobos to look at the flexibility in the ROD to move forward. 100-K-42 is specific to the 105-KE basin and substructure only; the substructure and debris have been removed.

2. RL and EPA to reach agreement on "backfill complete" for the interim actions.
    - **Action:** RL will work with Contractor to prepare a contour plan.

3. 100K waste management areas (e.g., staging areas, debris storage, solid waste storage, etc). Review map of locations and requirements from RAWPs for EPA approval. Propose revision to 100K waste management plans for consistency and clarification of dangerous waste staging piles requirements, solid waste storage piles requirements and EPA approvals. Discuss EPA's November email regarding issuance of a letter (pending or in agreement there are no compliance issues).
    - **Status:** Revisions to the waste management plans were provided to EPA on March 2, 2012 for review and comment.

4. Notice of Violation of the Removal Action Work Plan for 105-KE/105-KW Reactor Facilities and Ancillary Facilities, Revision 1 (DOE/RL-2005-26).
    - **Status:** Complete. RL sent response letter (12-EMD-0056) to EPA on March 23, 2012.

5. RL to schedule a meeting with EPA prior to the March PMM and reach agreement the 116-KE-1 waste site will be removed when the 105-KE reactor is removed. A TPA-CN will be prepared for approval once agreement is reached.
    - **Status:** Rod Lobos took action to discuss with Dennis Faulk EPA's decision to allow RTD of 116-KE-1 waste site when the 105-KE reactor is removed.

6. Emerging concerns expressed by Rod Lobos
    - Disposition of IDW waste from 105-KE Reactor core sampling.
        i. **Status**: Field activities have commenced to remove drums of water generated from reactor core drilling activities.
    - 181-KE/KW river sediment samples are not being picked up for evaluation in the RI/FS. Sediment evaluated in the RI/FS punted the decision to the Final ROD. If these sediment samples are not addressed in the Final ROD, completion of the Interim ROD Milestone could be in jeopardy.
        i. **Action:** Dottie Norman to provide recommended disposition for inclusion in the Removal Action Report.

Emerging Concerns / Pending Actions – 100K PMM

7. The description for the M-093-22 Milestone incorrectly identifies the 105-KE Reactor ISS will be complete in accordance with the Remedial Design/Remedial Action Work Plan.
    - **Status:** Complete. Change Package approved by RL and EPA on March 23, 2012.

8. Transmit volume 1 of the Technical Evaluation and Alternatives Analysis Report (M-016-171) to EPA with the Milestone completion letter. Volume 2 of the report is to be provided on a CD.
    - **Action:** Dave Watson to provide necessary electronic files and CDs to EPA.

9. Schedule a meeting with EPA for briefing on UPR-100-K-1, 116-KE-1, and 116-KE-3 modeling efforts (M-016-53). Meeting to be scheduled at the PACE center.
    - **Action:** Dottie Norman to schedule meeting.

10. RL asked if EPA has made a decision yet on whether or not to push the 116-KE-1 waste site out of Phase 1 (M-016-53 Milestone) and align with the removal of the 105-KE reactor.
    - **Action:** Rod Lobos to discuss with Dennis Faulk.

11. EPA requested the contaminants of concern identified for sampling the 183.2KE sedimentation basin be validated against the contaminants of concern identified in the Removal Action Work Plan. The contaminants should be aligned with the RAWP to limit scope creep on sampling.
    - **Action:** Dottie Norman to verify contaminants of concern for sampling.

Justification to Backfill 183.4KE/KW Clearwells

- The demolition activities for the 183.4-KE/KW Clearwells were completed in September 2011. These activities are described in depth in the *Removal Action Report for the 183.4-KW, 183.5-KW, and 183.6-KW Ancillary Facilities* (DOE/RL-2011-60) and *100-K Area Removal Action Report for 183.3-KE, 183.4-KE, 183.5-KE, and 183.6-KE Ancillary Facilities, 100-K Area* (DOE/RL-2011-60) for 183.4-KE. The floor was left in place at each facility, and potholed at several locations to allow residual water to drain and to prevent pooling of water after the structure is backfilled. The north, east, and west walls of the clearwells were left intact at grade level to protect against soil subsidence and provide structural support.

- In June of 2011, DOE/RL and EPA formalized an approach to determine whether the clearwells could be left in place (DD-49882, *In-Process Sampling Instructions for the Substructures of the 183-KE Water Treatment Plant).* DD-49882 used the sampling approach described in the *100 Area Remedial Action Sampling and Analysis Plan* (DOE/RL-96-22) to establish a statistical basis for 10 biased samples from the clearwells. The sampling instruction focused sample locations on areas with the greatest potential for introduction of contaminants (e.g., locations where chemical process lines were flushed, areas of stained concrete). In August 2011, 10 soil samples were collected from below the 183.4-KW and 183.4-KE Clearwells floor through the potholes used to drain the remaining water, and at additional locations near the 183.7 pipe tunnel. The soil samples were screened and analyzed for gross alpha and gross beta contamination. Samples were also analyzed for the following nonradionuclide constituents: antimony, arsenic, barium, beryllium, boron, cadmium, total chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, uranium (soluble salts), vanadium, zinc, PCBs, chloride, and sulfate. Attachments 1 and 3 provide the high sample results from the analysis of soil samples beneath the 183.4 KW and 183.4 KE Clearwells, respectively, along with a comparison to remedial action goals (RAGS) and the relevant K_d vales (see evaluation of protectiveness, below).

- In August 2011, post-D&D concrete sampling was conducted at the 183.4-KW and 183.4-KE Clearwells. The clearwell floor and wall surfaces were sampled for characterization to confirm whether these structures could remain in place. The concrete samples were screened and analyzed for gross alpha and gross beta contamination. Samples were also analyzed for the following nonradionuclide contaminants: antimony, arsenic, barium, beryllium, boron, cadmium, total chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, uranium (soluble salts), vanadium, zinc, chloride, and sulfate. Attachments 2 and 4 provide the high sample results from the analysis of concrete samples beneath the 183.4 KW and 183.4 KE Clearwells, respectively, along

with a comparison to remedial action goals (RAGS) and the relevant Kd vales (see evaluation of protectiveness, below).

- On September 8, 2011 EPA agreed the analytical data associated with the concrete floor and walls, as well as the underlying soil of the 183.4-KE/KW clearwells indicates that D&D activities are complete in accordance with the applicable RAWP, and no remedial action is required for the underlying soils. The clearwells will be backfilled with demolition rubble and contoured with a cover of minimally 1 meter of soils. The uppermost 1 meter of soils will have sufficient water holding capacity to support the establishment and maintenance of vegetation specified in the revegetation plan requirements for this location. This agreement is documented in the September 8, 2011 100K Project Managers Meeting minutes.

Evaluation of Protectiveness

Post-D4 soil sampling was conducted in accordance with *In-Process Sampling Instructions for the Substructures of the 183-KE Water Treatment Plant: 183.4-KE/KW Clearwells and 183.5/183.6-KE/KW Lime Feeder Buildings* (DD-49882) and in accordance with requirements of the *100 Area Remedial Action Sampling and Analysis Plan* (DOE/RL-96-22). The analytical data were used to evaluate protectiveness based on the applicable soil cleanup levels (remedial action goals) identified in 100 Area Remaining Sites ROD (EPA/ROD/R10-99/039) and the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE/RL-96-17).

Appendix C, *Methodology for Determining if Contaminants in Soil Reach Groundwater*, of the 100 Area RDR/RAWP (DOE/RL-96-17) (Calculation Brief) discusses the contaminant-specific concentrations in soil that achieve protection of groundwater and the Columbia River. The 100 Area contaminant Kds (soil partitioning coefficients) were evaluated for protectiveness as a function of the thickness of the vadose zone. The Calculation Brief used the RESidual RADioactivity (RESRAD) model, with input parameters from the 100 Area RDR/RAWP, to calculate the thickness of the vadose zone that would be required underneath residual contamination to ensure that a contaminant will not migrate to the groundwater for 1,000 years.

The RESRAD model predicts that a contaminant with a Kd of 30 mL/g or greater will not migrate more than 10 feet within 1,000 years. Using the approach provided in the Calculation Brief, because the vadose zone thickness under the 183.4 KE/KW Clearwells is approximately 70 feet (21 meters), the minimum acceptable Kd value for contaminants in the soil beneath these sites is 3.6 mL/g. Contaminants identified beneath these sites with a Kd of 3.6g mL/g or greater, therefore, do not pose a risk to groundwater or the Columbia River. The post-D&D soil sampling under the 183.4-KW/KE Clearwells indicated that the maximum gross alpha (1.5 pCi/g) and gross beta (3.4 pCi/g) levels detected did not result in the need for further radiological analyses (Attachments 1 and 3).

The maximum concentrations of nonradiological constituents were compared to RAGs as defined in DOE/RL-96-17 for direct exposure, groundwater protection, and river protection. The maximum soil concentrations beneath the 183.4KW/KE clearwells for all analytes were below the direct exposure RAGs (Attachments 1 and 3). The maximum soil concentration of five metals beneath 183.4-KW (antimony, lead, selenium, vanadium, and zinc) and two metals beneath 183.4-KE (vanadium and zinc) slightly exceeded the groundwater protection and/or river protection RAGs. Using the partitioning coefficient for these metals and the depth to groundwater (21 m) in the vicinity of the clearwells, none of the relevant contaminant soil Kd values were less than the Table C-2 protection of groundwater Kd value (3.6 mL/g). Therefore, it was determined that the soil can remain in place. On September 8, 2011, EPA provided approval for backfilling of the clearwells with demolition rubble, followed by a minimum of 3 ft of soil cover (CHPRC-0900289 R24, *Meeting Minutes Transmittal/ Approval 100K Project Managers Meeting September 8, 2011*).

The maximum concentrations of nonradiological constituents in concrete were compared to RAGs as defined in DOE/RL-96-17 for direct exposure, groundwater protection, and river protection. Contaminants that exceeded the RAGs were compared to the Kd value for concrete to determine whether they were bound in the matrix. For those metals exceeding the RAGs, Appendix C of DOE/RL-96-17 was used to further evaluate groundwater protection. Using the Kd for these metals and the depth to groundwater (21 m) in the vicinity of the clearwells, no further D&D action is required to ensure that the clearwells do not pose a risk to the environment. On September 8, 2011, EPA provided approval for backfilling of the clearwells with demolition rubble, with a minimum of 3 ft of soil cover on top of the demolition rubble (CHPRC-0900289 R24).

Evaluation of the analytical results for the remaining concrete against the RAGs indicates that it is acceptable to leave the concrete in place with no threat from direct exposure or to groundwater. Analysis of the concrete samples identified that the maximum gross alpha (2.8 pCi/g) and gross beta (3.7 pCi/g) levels were low, and that no further radiological analyses were required. Comparison of the results for the nonradiological analytes with the RAGs indicated no threat based on direct exposure or to groundwater quality over a 1,000 year time frame.

The removal actions for the two clearwell facilities mitigate the potential threat of release of contaminants to the environment, and are consistent with interim remedial actions for the 100-KR-2 OU. Protection of human health and the environment has been demonstrated by the safe physical removal and disposal of the 183.3-KE, 183.4-KE, 183.5-KE, and 183.6-KE Facilities into the ERDF, and the determination that no detectable radiological contamination or other potentially hazardous substances remain above unacceptable levels.

In the post-D4 configuration of the 183.4-KW/KE Clearwells, the contaminants in the remaining concrete and underlying soil will not leach to groundwater or the Columbia River within 1,000 years. The results of sampling of soils beneath the Clearwells indicate that the contaminant levels in sediments at these locations meet the criteria established for protection of groundwater and the Columbia River.

Recommendation

Sampling results for the concrete and the sediments beneath the 183.4 KE/KW Clearwells indicate that residual contamination levels do not pose a threat to groundwater or the Columbia River. Based on these results, backfilling of the excavations at these locations should proceed in order to stabilize the surrounding soils and facilitate the ongoing remediation of adjacent sites.

Approval to Proceed with Backfilling of 183.4-KE/KW Clearwells:

DOE-RL — Date: 3/13/2012

EPA — Date: 3/13/2012

Attachment 1

183.4-KW Clearwell Underlying Soil Contaminant Summary with Comparison to RAGs and K_d Values

183.4-KW Clearwell Underlying Soil Cleanup Level Summary: Contaminant-Specific Concentrations and Comparison to RAGs and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Back-ground (pCi/g)	RDL (pCi/g)	Soil Cleanup Levels (pCi/g)[b]			Highest Sample Result	Additional Analysis?
				Direct Exposure	Groundwater Protection	River Protection		
Radionuclides								
Gross Alpha	--		--	--	--	--	1.5	No
Gross Beta	--		--	--	--	--	3.4	No

Contaminant	Soil K_d Value (mL/g)[a]	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Soil K_d <3.6 mL/g?[c]
				Direct Exposure	Ground-water Protection	River Protection			
Metals									
Antimony	3.76	5	0.6	32	5[d]	5[d]	6.02	Yes	No
Arsenic	3	6.5	10	20[c]	20[d]	20[d]	10.2	No	
Barium	25	132	2	5,600	200	400	103	No	
Beryllium	790	1.51	0.5	10.4[e]	1.51[d]	1.51[d]	0.347	No	
Boron	3	--[f]	2	7,200	320	--	1.18	No	
Cadmium	30	0.81[g]	0.5	13.9[e]	0.81[d]	0.81[d]	0.11	No	
Chromium, Total	200	18.5	1	80,000	18.5[d]	18.5[d]	8.44	No	
Chromium VI	0	--[f]	0.5	2.1[c]	4.8	2	0.269	No	
Cobalt	50	15.7	2	24	15.7[d]	--	13.2	No	
Copper	22	22.0	1	2,960	59.2	22.0[d]	20.8	No	
Lead	30	10.2	5	353	10.2[d]	10.2[d]	19.4	Yes	No
Manganese	50	512	5	3,760	512[d]	512[d]	453	No	
Mercury	30	0.33	0.2	24	0.33[d]	0.33[d]	0.054	No	
Molybdenum	20	--[f]	2	400	8	--	0.612	No	

183.4-KW Clearwell Underlying Soil Cleanup Level Summary:
Contaminant-Specific Concentrations and Comparison to RAGs and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Soil K_d <3.6 mL/g?[c]
				Direct Exposure	Ground-water Protection	River Protection			
Nickel	65	19.1	4	1,600	19.1[d]	27.4	10.8	No	
Selenium	5	0.78[g]	1	400	5	1	1.82 B	Yes	No
Silver	90	0.73	0.2	400	8	0.73[d]	0.11	No	
Strontium	25	--[f]	1	48,000	960	--	36.6	No	
Tin	130	--[f]	10	48,000	960	--	1.24	No	
Uranium (soluble salts)	2	3.21	1	240	3.21[d]	3.21[d]	0.621	No	
Vanadium	1,000	85.1	2.5	560	85.1[d]	--	89.3	Yes	No
Zinc	30	67.8	1	24,000	480	67.8[d]	70.2	Yes	No
Inorganic Anions									
Chloride	0	100	2	--	25,000	--	3.3	No	
Sulfate	0	237	5	--	25,000	--	126	No	

183.4-KW Clearwell Underlying Soil Cleanup Level Summary: Contaminant-Specific Concentrations and Comparison to RAGs and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Soil K_d <3.6 mL/g?[c]
				Direct Exposure	Ground-water Protection	River Protection			

a. The K_d values for soil were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE/RL-96-17). The K_d values for concrete were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (DOE/RL-2005-93), as K_d values for concrete are not included in DOE/RL-96-17.

b. Soil cleanup levels in this table are obtained from Table B-4 and B-7 of Appendix B of DOE/RL-96-17. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 (ANL, 2007) assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater. Nonradionuclide soil concentrations protective of groundwater and the river are based upon application of the "100 times" rule.

c. The minimum contaminant K_d value that is protective of groundwater at 21 meters unsaturated/uncontaminated zone thickness is obtained from DOE/RL-96-17 Appendix C – *Methodology for Determining if Contaminants in Soil Reach Groundwater*, Table C-2.

d. Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d), (1996), "Model Toxics Control Act—Cleanup," "Overview of Cleanup Standards." The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of this document.

e. Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750(3), (1996), "Cleanup Standards to Protect Air Quality") using an airborne particulate mass-loading rate of 0.0001 g/m^3 (WDOH/320-015, *Hanford Guidance for Radiological Cleanup*).

f. No Hanford Site-specific or Washington State background value is available.

g. Hanford Site-specific background not available. Value is Washington State background from DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*.

--	=	not available
EPA	=	U.S. Environmental Protection Agency
K_d	=	Distribution coefficient discussed in Appendix E. K_d values also found in the Ecology CLARC Database at < http://www.ecy.wa.gov > or from the Risk Assessment Information System database maintained by the Oak Ridge National Laboratory at < http://risk.lsd.ornl.gov >.
PCB	=	polychlorinated biphenyl
RDL	=	required detection limit
RESRAD	=	RESidual RADioactivity
TPH	=	total petroleum hydrocarbon
WAC	=	*Washington Administrative Code*
B	=	analyte was detected in both the blank and the sample
N	=	spike recovery is outside the control limits
X	=	The laboratory control sample did not meet laboratory acceptance limits

Attachment 2

183.4-KW Clearwell Floor/Wall Concrete Contaminant Summary with Comparison to RAGs and K_d Values

183.4-KW Clearwell Floor/Wall Concrete Cleanup Level Summary: Contaminant-Specific Maximum Concentrations—Comparison to RAGs and K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Concrete K_d Value (mL/g)	Back-ground (pCi/g)	RDL (pCi/g)	Soil Cleanup Levels (pCi/g)[b]			Highest Sample Result	Additional Analysis?
					Direct Exposure	Groundwater Protection	River Protection		
Radionuclides									
Gross Alpha	--	--		--	--	--	--	2.8	No
Gross Beta	--	--		--	--	--	--	3.7	No

Contaminant	Soil K_d Value (mL/g)[a]	Concrete K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Concrete K_d <3.6 mL/g?	Soil K_d <3.6 mL/g?[c]
					Direct Exposure	Ground-water Protection	River Protection				
Metals											
Antimony	3.76	45	5	0.6	32	5[d]	5[d]	29.3	Yes	No	
Arsenic	3	100	6.5	10	20[d]	20[d]	20[d]	54.3	Yes	No	
Barium	25	25	132	2	5,600	200	400	174	No		
Beryllium	790	--	1.51	0.5	10.4[e]	1.51[d]	1.51[d]	0.5	No		
Boron	3	--	--[f]	2	7,200	320	--	22.5	No		
Cadmium	30	30	0.81[g]	0.5	13.9[e]	0.81[d]	0.81[d]	8.39	Yes	No	
Chromium, Total	200	200	18.5	1	80,000	18.5[d]	18.5[d]	19.7	Yes	No	
Chromium VI	0	870	--[f]	0.5	2.1[d]	4.8	2	2.45	Yes	No	
Cobalt	50	--	15.7	2	24	15.7[d]	--	12.9	No		
Copper	22	100	22.0	1	2,960	59.2	22.0[d]	77.5	Yes	No	
Lead	30	500	10.2	5	353	10.2[d]	10.2[d]	447	Yes	No	

183.4-KW Clearwell Floor/Wall Concrete Cleanup Level Summary:
Contaminant-Specific Maximum Concentrations—Comparison to RAGs and K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Concrete K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)			Highest Sample Result	Exceeds RAGs?	Concrete K_d <3.6 mL/g?	Soil K_d <3.6 mL/g?
					Direct Exposure	Ground-water Protection	River Protection				
Manganese	50	100	512	5	3,760	512[d]	512[d]	587	Yes	No	
Mercury	30	30	0.33	0.2	24	0.33[d]	0.33[d]	1.91	Yes	No	
Molybdenum	20	--	--[f]	2	400	8	--	3.41	No		
Nickel	65	100	19.1	4	1,600	19.1[d]	27.4	28.7	Yes	No	
Selenium	5	0.1	0.78[g]	1	400	5	1	1.43	Yes	Yes	No
Silver	90	1	0.73	0.2	400	8	0.73[d]	0.115	No		
Strontium	25	--	--[f]	1	48,000	960	--	81.2	No		
Tin	130	--	--[f]	10	48,000	960	--	19.7	No		
Uranium (soluble salts)	2	--	3.21	1	240	3.21[d]	3.21[d]	2.08	No		
Vanadium	1,000	100	85.1	2.5	560	85.1[d]	--	80.2	No		
Zinc	30	30	67.8	1	24,000	480	67.8[d]	1,000	Yes	No	
Inorganic Anions											
Chloride	0	--	100	2	--	25,000	--	10.1	No		
Sulfate	0	0	237	5	--	25,000	--	587	No		

183.4-KW Clearwell Floor/Wall Concrete Cleanup Level Summary: Contaminant-Specific Maximum Concentrations—Comparison to RAGs and K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Concrete K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Concrete K_d <3.6 mL/g?	Soil K_d <3.6 mL/g?[c]
					Direct Exposure	Ground-water Protection	River Protection				

a. The K_d values for soil were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE/RL-96-17). The K_d values for concrete were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (DOE/RL-2005-93), as K_d values for concrete are not included in DOE/RL-96-17.

b. Soil cleanup levels in this table are obtained from Table B-4 and B-7 of Appendix B of DOE/RL-96-17. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 (ANL, 2007) assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater. Nonradionuclide soil concentrations protective of groundwater and the river are based upon application of the "100 times" rule.

c. The minimum contaminant K_d value that is protective of groundwater at 21 meters unsaturated/uncontaminated zone thickness is obtained from DOE/RL-96-17Appendix C – *Methodology for Determining if Contaminants in Soil Reach Groundwater*, Table C-2.

d. Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d), (1996), "Model Toxics Control Act—Cleanup," "Overview of Cleanup Standards." The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of this document.

e. Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750(3) (1996), "Cleanup Standards to Protect Air Quality") using an airborne particulate mass-loading rate of 0.0001 g/m^3 (WDOH/320-015, *Hanford Guidance for Radiological Cleanup*).

f. No Hanford Site-specific or Washington State background value is available.

g. Hanford Site-specific background not available. Value is Washington State background from DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*.

--	=	not available
EPA	=	U.S. Environmental Protection Agency
K_d	=	Distribution coefficient discussed in Appendix E. K_d values also found in the Ecology CLARC Database at < http://www.ecy.wa.gov > or from the Risk Assessment Information System database maintained by the Oak Ridge National Laboratory at < http://risk.lsd.ornl.gov >.
PCB	=	polychlorinated biphenyl
RDL	=	required detection limit
RESRAD	=	RESidual RADioactivity
TPH	=	total petroleum hydrocarbon
WAC	=	*Washington Administrative Code*
B	=	analyte was detected in both the blank and the sample
N	=	spike recovery is outside the control limits
X	=	The laboratory control sample did not meet laboratory acceptance limits

Attachment 3

183.4-KE Clearwell Underlying Soil Contaminant Summary with Comparison to RAGs and K_d Values

183.4-KE Clearwell Underlying Soil Cleanup Level Summary:
Contaminant-Specific Concentrations and Comparison to RAGs and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Background (pCi/g)	RDL (pCi/g)	Soil Cleanup Levels (pCi/g)[b]			Highest Sample Result	Additional Analysis?
				Direct Exposure	Groundwater Protection	River Protection		
Radionuclides								
Gross Alpha	--		--	--	--	--	2.9	No
Gross Beta	--		--	--	--	--	4	No

Contaminant	Soil K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Soil K_d <3.6 mL/g?[c]
				Direct Exposure	Ground-water Protection	River Protection			
Metals									
Antimony	3.76	5	0.6	32	5[d]	5[d]	4.62	No	
Arsenic	3	6.5	10	20[c]	20[d]	20[d]	9.39	No	
Barium	25	132	2	5,600	200	400	96.1	No	
Beryllium	790	1.51	0.5	10.4[e]	1.51[d]	1.51[d]	0.323	No	
Boron	3	--[f]	2	7,200	320	--	3.75	No	
Cadmium	30	0.81[g]	0.5	13.9[e]	0.81[d]	0.81[d]	0.142	No	
Chromium, Total	200	18.5	1	80,000	18.5[d]	18.5[d]	14.4	No	
Chromium VI	0	--[f]	0.5	2.1[e]	4.8	2	0.216	No	
Cobalt	50	15.7	2	24	15.7[d]	--	12.3	No	
Copper	22	22.0	1	2,960	59.2	22.0[d]	21.8	No	
Lead	30	10.2	5	353	10.2[d]	10.2[d]	8.4	No	

183.4-KE Clearwell Underlying Soil Cleanup Level Summary:
Contaminant-Specific Concentrations and Comparison to RAGs and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)			Highest Sample Result	Exceeds RAGs?	Soil K_d <3.6 mL/g?[c]
				Direct Exposure	Ground-water Protection	River Protection			
Manganese	50	512	5	3,760	512[d]	512[d]	464	No	
Mercury	30	0.33	0.2	24	0.33[d]	0.33[d]	0.06	No	
Molybdenum	20	--[f]	2	400	8	--	1.03	No	
Nickel	65	19.1	4	1,600	19.1[d]	27.4	15.8	No	
Selenium	5	0.78[g]	1	400	5	1	0.97	No	
Silver	90	0.73	0.2	400	8	0.73[d]	0.12	No	
Strontium	25	--[f]	1	48,000	960	--	57.5	No	
Tin	130	--[f]	10	48,000	960	--	1.19	No	
Uranium (soluble salts)	2	3.21	1	240	3.21[d]	3.21[d]	0.925	No	
Vanadium	1,000	85.1	2.5	560	85.1[e]	--	86.6	Yes	No
Zinc	30	67.8	1	24,000	480	67.8[e]	72.7	Yes	No
Inorganic Anions									
Chloride	0	100	2	--	25,000	--	11.9	No	
Sulfate	0	237	5	--	25,000	--	176	No	

183.4-KE Clearwell Underlying Soil Cleanup Level Summary: Contaminant-Specific Concentrations and Comparison to RAGs and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)			Highest Sample Result	Exceeds RAGs?	Soil K_d <3.6 mL/g?[c]
				Direct Exposure	Ground-water Protection	River Protection			

a. The K_d values for soil were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE/RL-96-17). The K_d values for concrete were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (DOE/RL-2005-93), as K_d values for concrete are not included in DOE/RL-96-17.

b. Soil cleanup levels in this table are obtained from Table B-4 and B-7 of Appendix B of DOE/RL-96-17. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 (ANL, 2007) assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater. Nonradionuclide soil concentrations protective of groundwater and the river are based upon application of the "100 times" rule.

c. The minimum contaminant K_d value that is protective of groundwater at 21 meters unsaturated/uncontaminated zone thickness is obtained from DOE/RL-96-17, Appendix C – *Methodology for Determining if Contaminants in Soil Reach Groundwater*, Table C-2.

d. Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d), (1996), "Model Toxics Control Act—Cleanup," "Overview of Cleanup Standards." The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of this document.

e. Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750(3), (1996), "Cleanup Standards to Protect Air Quality") using an airborne particulate mass-loading rate of 0.0001 g/m^3 (WDOH/320-015, *Hanford Guidance for Radiological Cleanup*).

f. No Hanford Site-specific or Washington State background value is available.

g. Hanford Site-specific background not available. Value is Washington State background from DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*.

-- = not available

EPA = U.S. Environmental Protection Agency

K_d = Distribution coefficient discussed in Appendix E. K_d values also found in the Ecology CLARC Database at < http://www.ecy.wa.gov > or from the Risk Assessment Information System database maintained by the Oak Ridge National Laboratory at < http://risk.lsd.ornl.gov >.

PCB = polychlorinated biphenyl

RDL = required detection limit

RESRAD = RESidual RADioactivity

TPH = total petroleum hydrocarbon

WAC = *Washington Administrative Code*

B = analyte was detected in both the blank and the sample

N = spike recovery is outside the control limits

X = The laboratory control sample did not meet laboratory acceptance limits

Attachment 4

183.4-KE Clearwell Floor/Wall Concrete Contaminant Summary with Comparison to RAGs and K_d Values

183.4-KE Clearwell Floor/Wall Cleanup Level Summary: Contaminant-Specific Concentrations and Comparison to RAGs and Concrete and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)[a]	Concrete K_d Value (mL/g)	Back-ground (pCi/g)	Soil Cleanup Levels (pCi/g)[b]			River Protection	Highest Sample Result	Additional Analysis?
				RDL (pCi/g)	Direct Exposure	Ground-water Protection			
Radionuclides									
Gross Alpha	--	--		--	--	--	--	2.8	No
Gross Beta	--	--		--	--	--	--	3.7	No

Contaminant	Soil K_d Value (mL/g)[a]	Concrete K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Concrete K_d <3.6 mL/g?	Soil K_d <3.6 mL/g?[c]
					Direct Exposure	Ground-water Protection	River Protection				
Metals											
Antimony	3.76	45	5	0.6	32	5[cd]	5[d]	21.9	Yes	No	No
Arsenic	3	100	6.5	10	20[d]	20[d]	20[d]	60.8	Yes	No	No
Barium	25	25	132	2	5,600	200	400	174	No		
Beryllium	790	--	1.51	0.5	10.4[e]	1.51[d]	1.51[d]	0.523	No		
Boron	3	--	--[f]	2	7,200	320	--	6.79	No		
Cadmium	30	30	0.81[g]	0.5	13.9[e]	0.81[d]	0.81[d]	8.01	Yes	No	No
Chromium, Total	200	200	18.5	1	80,000	18.5[d]	18.5[d]	16.7	No		
Chromium VI	0	870	--[f]	0.5	2.1[d]	4.8	2	0.569	No		
Cobalt	50	--	15.7	2	24	15.7[d]	--	13.3	No		
Copper	22	100	22.0	1	2,960	59.2	22.0[d]	90.5	Yes	No	No
Lead	30	500	10.2	5	353	10.2[d]	10.2[d]	15.8	Yes	No	No

183.4-KE Clearwell Floor/Wall Cleanup Level Summary:
Contaminant-Specific Concentrations and Comparison to RAGs and Concrete and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)	Concrete K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Concrete K_d <3.6 mL/g?	Soil K_d <3.6 mL/g?[c]
					Direct Exposure	Ground-water Protection	River Protection				
Manganese	50	100	512	5	3,760	512[d]	512[d]	628	Yes	No	No
Mercury	30	30	0.33	0.2	24	0.33[d]	0.33[d]	1.21	Yes	No	No
Molybdenum	20	--	--[f]	2	400	8	--	13	Yes	--	--
Nickel	65	100	19.1	4	1,600	19.1[d]	27.4	22.7	Yes	No	No
Selenium	5	0.1	0.78[g]	1	400	5	1	1.34	Yes	Yes	No
Silver	90	1	0.73	0.2	400	8	0.73[d]	0.175	No		
Strontium	25	--	--[f]	1	48,000	960	--	73.5	No		
Tin	130	--	--[f]	10	48,000	960	--	18.9	No		
Uranium (soluble salts)	2	--	3.21	1	240	3.21[d]	3.21[d]	2.24	No		
Vanadium	1,000	100	85.1	2.5	560	85.1[d]	--	78.1	No		
Zinc	30	30	67.8	1	24,000	480	67.8[d]	940	Yes	No	No
Inorganic Anions											
Chloride	0	--	100	2	--	25,000	--	17.3	No		
Sulfate	0	0	237	5	--	25,000	--	592	No		

183.4-KE Clearwell Floor/Wall Cleanup Level Summary: Contaminant-Specific Concentrations and Comparison to RAGs and Concrete and Soil K_d Values

Contaminant	Soil K_d Value (mL/g)	Concrete K_d Value (mL/g)	Back-ground (mg/kg)	RDL (mg/kg)	Soil Cleanup Levels (mg/kg)[b]			Highest Sample Result	Exceeds RAGs?	Concrete K_d <3.6 mL/g?	Soil K_d <3.6 mL/g?[c]
					Direct Exposure	Ground-water Protection	River Protection				

a. The K_d values for soil were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE/RL-96-17). The K_d values for concrete were obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (DOE/RL-2005-93), as K_d values for concrete are not included in DOE/RL-96-17.

b. Soil cleanup levels in this table are obtained from Table B-4 and B-7 of Appendix B of DOE/RL-96-17. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 (ANL, 2007) assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater. Nonradionuclide soil concentrations protective of groundwater and the river are based upon application of the "100 times" rule.

c. The minimum contaminant K_d value that is protective of groundwater at 21 meters unsaturated/uncontaminated zone thickness is obtained from DOE/RL-96-17 Appendix C – *Methodology for Determining if Contaminants in Soil Reach Groundwater*, Table C-2.

d. Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d), (1996), "Model Toxics Control Act—Cleanup," "Overview of Cleanup Standards." The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of this document.

e. Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750(3), (1996), "Cleanup Standards to Protect Air Quality") using an airborne particulate mass-loading rate of 0.0001 g/m^3 (WDOH/320-015, *Hanford Guidance for Radiological Cleanup*).

f. No Hanford Site-specific or Washington State background value is available.

g. Hanford Site-specific background not available. Value is Washington State background from DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*.

--	=	not available
EPA	=	U.S. Environmental Protection Agency
K_d	=	Distribution coefficient discussed in Appendix E. K_d values also found in the Ecology CLARC Database at < http://www.ecy.wa.gov > or from the Risk Assessment Information System database maintained by the Oak Ridge National Laboratory at < http://risk.lsd.ornl.gov >.
PCB	=	polychlorinated biphenyl
RDL	=	required detection limit
RESRAD	=	RESidual RADioactivity
TPH	=	total petroleum hydrocarbon
WAC	=	*Washington Administrative Code*
B	=	analyte was detected in both the blank and the sample
N	=	spike recovery is outside the control limits
X	=	The laboratory control sample did not meet laboratory acceptance limits

Updated Summary of 100K Area Waste Site Agreements between RL & EPA

On September 7, 2011, RL & EPA discussed the following shifts in 100K Area waste sites based on FY12 funding priorities, layback safety requirements, and ongoing cultural review issues. Status in bold reflects decisions as of February 23, 2012.

1. The following waste sites planned for remediation in FY12 will be moved to Phase 2, if not already there, as a result of ongoing cultural review issues.
    - 100-K-80, 100K River Effluent Pipeline, 100K River Line, 1908K Outfall
    - 100-K-81, Contamination Area West of 116-K-3
    - 100-K-83, 1904K Spillway, 116-K3, 1904K Outfall Structure
    - 100-K-96, 100KE River Effluent Pipeline, River Line (East) from 116-K-3 Outfall
    - 116-K-3, 1904K Outfall Structure, 1908K Outfall Structure

    Status: TPA-CN-499 approved by RL & EPA on February 23, 2012.

2. The following waste site will be moved to Phase 3 as a result of layback safety requirements and removing sludge from the 105-KW Basin. The waste site will need to be accounted for in the pending RI/FS.
    - 100-K-55, 100-KW Reactor Cooling Water Effluent Underground Pipelines
    - 100-K-79, Sodium Dichromate and Sulfuric Acid Product Pipelines at 100K.

    Status: TPA-CN-412 approved by RL & EPA on November 8, 2011.

3. The following waste sites will move to Phase 2 as a result of ongoing cultural review issues:
    - 100-K-57, 107-KE Drainage Ditch
    - 100-K-64, 100KE Floodplain Contamination Area
    - 100-K-56, 100-KE Reactor Cooling Water Effluent Underground Pipelines

    Status: TPA-CN-499 approved by RL & EPA on February 23, 2012.

4. The following waste site will stay in Phase 1 as a placeholder to ensure all information needed for the Final ROD is accounted for in the pending RI/FS.
    - 116-KE-1, 115-KE Condensate Crib

    Status: EPA concurrence is pending a review of the 100K Area RI/FS.
    * Rod Lobos commented that if the RI/FS is inadequate, there will be no relief on the waste sites milestones. The RI/FS needs to account for all 100K needs.

5. RL discussed that some waste sites will have to be shifted to coordinate STP activities with 105-KW Basin deactivation activities. RL and EPA agreed to table those decisions but recognize options will be considered for baseline planning. RL will start preparing the proposed path forward but EPA will not entertain a final decision for a year or more.

    Status: TPA-CN-498 was approved by RL & EPA on February 23, 2012. The following waste sites were moved from Phase 2 to Phase 3 based on impacts from the Sludge Treatment Project:
    - 100-K-1, 100-K-54, 100-K-60, 100-K-61, 116-KW-1, 130-KW-1, 132-KW-1

Backfill agreements concurred by EPA on September 7, 2011:

- 100-K-63 – backfill can be initiated (pending final sampling results). Before final closure, the area will be contoured to the match the surrounding terrain
- Interim closure may be pursued for Phase 1 waste sites in areas with many contiguous waste sites (e.g., Area AA in the vicinity of the former KW Headhouse), and associate resolution of the residual concern (underlying hexavalent chromium source term) with the appropriate Phase 2 or Phase 3 waste sites that are located in the broad excavation footprint.
- RL will provide a backfill/re-vegetation proposal to EPA to define the strategy for backfill and re-vegetation, especially in large/deep excavations that encompass multiple facility and/or waste site footprints. EPA expects that areas will have undulations and not graded flat so the amount of fill will vary. Soil stabilizing agents with minimal vegetation cover in the interim may be considered in the proposal.

CHPRC-0900289 R 29
Attachment 9

Change Number M-93-12-01	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date 03/23/2012

Originator Thomas K. Teynor **Phone** (509) 376-6363

Class of Change

[ ] I - Signatories [X] II - Executive Manager [ ] III - Project Manager

Change Title

Correction of Description of *Hanford Federal Facility Agreement and Consent Order* (HFFACO) Interim Milestone M-093-22.

Description/Justification of Change

This change package corrects the description of Interim Milestone M-093-22. The milestone, which was modified by Change Request M-93-08-01, indicates that the 105-KE Reactor will undergo Interim Safe Storage (ISS) in accordance with the remedial design/remedial action work plan. This change package changes the description to indicate that the ISS of 105-KE Reactor will be conducted in accordance with DOE/RL-2005-26, *Removal Action Work Plan for 105-KE/105-KW Reactor Facilities and Ancillary Facilities*.

(continued on page 2)

Impact of Change

This change package associates the performance of the ISS of 105-KE Reactor with the correct project work plan.

Affected Documents

The *Hanford Federal Facility Agreement and Consent Order*, as amended, DOE/RL-2005-26, *Removal Action Work Plan for 105-KE/105-KW Reactor Facilities and Ancillary Facilities*, and Hanford Site internal planning, management, and budget documents (e.g., USDOE contractor Baseline Change Control documents).

Approvals

N/A Ecology	Date	____Approved	____Disapproved
DOE-RL	3.22.12 Date	X Approved	____Disapproved
for DAC EPA	3/23/12 Date	✓ Approved	____Disapproved

CHPRC-0900289 R29.
Attachment 9

Description/Justification, Continued from Page 1

The following milestone description is modified for milestone M-093-22 to reflect the appropriate project work plan for conducting ISS of 105-KE Reactor.

Modifications to existing Tri-Party Agreement milestones are denoted with ~~strikeout~~; new milestones/text are denoted with double underline.

M-093-22	Complete 105-KE Reactor Interim Safe Storage in accordance with the ~~remedial design/remedial~~ removal action work plan.	07/31/2014