

# **River Corridor Closure Contract**

---

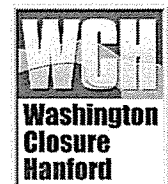
## **Identification of 300-Area Contaminants of Potential Concern for Soil**

**March 2010**

For Public Release

**Washington Closure Hanford**

Prepared for the U.S. Department of Energy, Richland Operations Office  
Office of Assistant Manager for River Corridor



**TRADEMARK DISCLAIMER** \_\_\_\_\_

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

---

This report has been reproduced from the best available copy.

Printed in the United States of America

**STANDARD APPROVAL PAGE**

**Title:** Identification of 300-Area Contaminants of Potential Concern for Soil

**Author Name:** R. W. Ovink, Integration Project Task Lead

**Approval:** J. A. Lerch, Mission Completion

Megan Proctor for Jeff Lerch  
Signature

3/31/10  
Date

*The approval signature on this page indicates that this document has been authorized for information release to the public through appropriate channels. No other forms or signatures are required to document this information release.*

**River Corridor  
Closure Contract** 

---

# Identification of 300-Area Contaminants of Potential Concern for Soil

March 2010

Author:

**R. W. Ovink**

For Public Release

**Washington Closure Hanford**

Prepared for the U.S. Department of Energy, Richland Operations Office  
Office of Assistant Manager for River Corridor



---

## TABLE OF CONTENTS

1.0	PURPOSE.....	1
2.0	APPROACH.....	1
2.1	STEP 1 – DECISION UNIT MASTER COPC IDENTIFICATION.....	1
2.2	STEP 2 – LOCATION-SPECIFIC COPC IDENTIFICATION.....	1
2.3	STEP 3 – DEVELOP LOCATION-SPECIFIC COPC LISTS.....	2
2.4	STEP 4 – AGENCY REVIEW OF LOCATIONS AND LOCATION-SPECIFIC COPCS.....	3
3.0	ASSUMPTIONS.....	3
4.0	SOFTWARE CONSIDERATIONS.....	3
5.0	SOIL COPC LIST IDENTIFICATION.....	4
5.1	STEP 1 – 300-AREA ANALYTE IDENTIFICATION.....	4
5.2	STEP 2 – MASTER 300-AREA COPC LIST.....	7
5.3	STEPS 3 AND 4 – LOCATION-SPECIFIC COPC IDENTIFICATION AND AGENCY INPUT.....	12
6.0	CONCLUSIONS.....	21
7.0	REFERENCES.....	21

## TABLES

1.	Documents Used to Develop the Initial 300-Area Analyte List.....	4
2.	Summary of Initial 300-Area Analytes and References.....	5
3.	300-Area Soil Analytes Excluded from Further Consideration.....	7
4.	Master 300-Area Contaminants of Potential Concern, Analytical Methods, and Laboratory Detection Limits.....	9
5.	Master 300-Area Contaminants of Potential Concern Excluded for All Characterization Locations.....	13
6.	300-DU-1, 300-DU-2, 300-DU-3, 300-DU-4, and 300-DU-5 (300-Area Perimeter) Contaminants of Potential Concern.....	14
7.	300-DU-8 and 300-DU-9 (North Process Pond, 316-2); 300-DU-10 (Process Trenches, 316-5); and 300-DU-11 (South Process Pond, 316-1); COPCs.....	15
8.	300-DU-6 and 300-DU-7 (Near the Columbia River) COPCs.....	17
9.	300-DU-VZ1 (618-10) and 300-VZ-3 (316-4) Contaminants of Potential Concern.....	18
10.	300-DU-VZ2 (618-11) Contaminants of Potential Concern.....	19

## 1.0 PURPOSE

This report documents the process used to identify source area contaminants of potential concern (COPCs) in support of the 300 Area remedial investigation/feasibility study (RI/FS) work plan. The COPCs identified for the 300 Area must support RI/FS nature and extent characterization and final remedial action decisions for source areas. This report also establishes the exclusion criteria applicable for 300 Area use and the analytical methods needed to analyze the COPCs.

## 2.0 APPROACH

The approach for identifying vadose zone soil COPCs was a multi-step process. In steps 1 and 2, initial and master COPC lists were developed. The third step developed location-specific COPC lists for locations where additional characterization is planned. Finally, the COPC lists received regulatory review and input, which resulted in final location-specific COPCs.

### 2.1 STEP 1 – DECISION UNIT MASTER COPC IDENTIFICATION

Remediation and characterization information (historic and current) were identified and reviewed to develop an initial list of analytes that represents COPCs in the vadose zone. The following types of reference documents and information sources were evaluated:

- Focused feasibility studies, limited field investigation (LFI) reports
- Interim action records of decision (IARODs)
- Cleanup verification documents (cleanup verification packages, remaining sites verification packages)
- Technical baseline reports
- Databases containing analytical data resulting from these activities (e.g., characterization, remediation, waste management information)
- Other pertinent documents.

### 2.2 STEP 2 – LOCATION-SPECIFIC COPC IDENTIFICATION

After the initial analyte list was compiled, the information underwent additional evaluation to refine the list to a master COPC list. The master COPC list is comprehensive and includes all analytes with credible potential to be present in the vadose zone above action thresholds. The following steps were taken to prepare the master COPC list.

- Exclude analytes from the initial set that met the any of the following characteristics:
  - Radionuclides with a half-life of 3 years or less (and no significant daughters)
  - Naturally occurring radionuclides that are not associated with past Hanford processes in the 100 Area (e.g., potassium-40)
  - Radionuclides potentially present only as trace impurities in solid irradiated materials
  - Essential nutrients for human nutrition (recommended daily allowances are developed for essential nutrients to estimate safe and adequate daily dietary intakes [NRC 1989])
  - Analytes that have no toxicity values (based on the hierarchy of toxicity values recommended by the U.S. Environmental Protection Agency (EPA) in OSWER 9285.7-53])
  - Common laboratory contaminants.
- Compare the resulting list for vadose zone soil with the COPC list developed for 300 Area groundwater. Further evaluate groundwater COPCs not found on the master soil COPC list to determine if there is a valid basis for their inclusion.
- Identify appropriate analytical methods and estimated quantitation limits for the resulting master COPC list.

### **2.3 STEP 3 – DEVELOP LOCATION-SPECIFIC COPC LISTS**

Location-specific COPCs were identified for each characterization location from the master COPC list using the following approach.

- Identify contaminants of concern (COCs) and COPCs for each location where characterization is proposed from the applicable IAROD (which reflects information from LFI and technical baseline reports). The default decision was to carry these analytes forward as COPCs for characterization unless a specific basis was available to eliminate them.
- Identify COCs and COPCs for each location where characterization is proposed from the site-specific interim cleanup verification documentation (typically developed based on the applicable IAROD). The default decision was to carry these analytes forward as COPCs for characterization unless a specific basis was available to eliminate them.
- As appropriate, retain 300 Area groundwater COPCs as soil COPCs.
- Consider the remaining analytes on the master COPC list individually on a location-specific basis. The default decision was to carry these analytes forward as COPCs for characterization unless a specific basis was available to eliminate them.

## 2.4 STEP 4 – AGENCY REVIEW OF LOCATIONS AND LOCATION-SPECIFIC COPCS

The lead regulatory agency for the 300 Area (EPA) was consulted during the process to determine if adjustments were required to address additional information needs for each characterization location. General process and location-specific input from EPA has been included in the final lists developed for each characterization location.

## 3.0 ASSUMPTIONS

- Older analytical data (e.g., pre-*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*) reflect laboratory state-of-the-art procedures. Analytical methods have improved, resulting in lower detection limits for many analytes and better data quality assurance/quality control.
- Characterization activities implemented since initiating remediation under the IARODs may provide additional contaminant information that should be considered during pending RI/FS field investigations.
- Post-remediation characterization and cleanup verification data reflect focused lists of analytes that are unique to each waste site and have been evaluated against IAROD cleanup requirements.
- Examining existing data and waste site process information will be useful in developing laboratory analytical needs for RI/FS characterization tasks.
- Accepted exclusion criteria may be applied to the initial analyte list to develop a master COPC list.
- Additional exclusion criteria (e.g., statistical Hanford Site background comparisons, infrequently detected analytes, and analytes not detected at concentrations/activities exceeding required cleanup levels) may be applied during the RI/FS process as more data become available.

## 4.0 SOFTWARE CONSIDERATIONS

No statistical or algebraic calculations were performed for this activity. The evaluations conducted included analyte comparisons/sorting using Microsoft® Excel®.

---

Microsoft® and Excel® are registered trademarks of Microsoft Corporation in the United States and/or other countries.



## 5.0 SOIL COPC LIST IDENTIFICATION

### 5.1 STEP 1 – 300-AREA ANALYTE IDENTIFICATION

The documents listed in Table 1 were used to develop the initial 300 Area analyte list.

**Table 1. Documents Used to Develop the Initial 300-Area Analyte List. (2 Pages)**

Reference	Document Number	Document Type
1. <i>Cleanup Verification Package for the 618-2 Burial Ground</i>	CVP-2006-00010	CVP
2. <i>Cleanup Verification Package for the 300 VTS Waste Site</i>	CVP-2005-00009	CVP
3. <i>Cleanup Verification Package for the 300-18 Waste Site</i>	CVP-2005-00004	CVP
4. <i>Cleanup Verification Package for the South Process Pond (WIDS Site 316-1), the Retired Filter Backwash Pond (WIDS Site 300 RFBP), 300-262 Contaminated Soil, and Unplanned Release Sites UPR-300-32, UPR-300-33, UPR-300-34, UPR-300-35, UPR-300-36, UPR-300-37, and UPR-300-FF-1</i>	CVP-2003-00002	CVP
5. <i>Cleanup Verification Package for the 618-3 Burial Ground</i>	CVP-2006-00005	CVP
6. <i>Cleanup Verification Package for the 300-8 Waste Site</i>	CVP-2005-00007	CVP
7. <i>Cleanup Verification Package for Landfill 1D (WIDS Site 628-4)</i>	CVP-2003-00001	CVP
8. <i>Cleanup Verification Package for the 600-259 Waste Site</i>	CVP-2005-00008	CVP
9. <i>Contaminants of Potential Concern in the 300-FF-5 Operable Unit: Expanded Annual Groundwater Report for Fiscal Year 2004</i>	PNNL-15127	PNNL Report
10. <i>Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington</i>	300-FF-1, 300-FF-5 ROD	ROD
11. <i>Explanation of Significant Differences for the 300-FF-2 Operable Unit Record of Decision</i>	300-FF-2 OU ESD	ESD
12. <i>Remedial Design Report/Remedial Action Work Plan for the 300 Area</i>	DOE/RL-2001-47, Rev.1	RDR/RAWP
13. <i>300 Area Remedial Action Sampling and Analysis Plan</i>	DOE/RL-2001-48, Rev.1	SAP
14. <i>Focused Feasibility Study for the 300-FF-2 Operable Unit</i>	DOE/RL-99-40	FFS
15. <i>Limited Field Investigation Report for the 300-FF-2 Operable Unit</i>	DOE/RL-96-42	Limited Field Investigation
16. <i>Engineering Evaluation of the 618-9 Burial Ground Expedited Response Action</i>	DOE/RL-91-38	Engineering Evaluation
17. <i>Sampling and Analysis Plan for 618-10 and 618-11 Nonintrusive Sampling</i>	DOE/RL-2008-27, Draft A	SAP
18. <i>Technical Information Document for the Fast Flux Test Facility Closure Project Environmental Impact Statement</i>	FFTF-18346, Rev. 1	Technical Information/EIS
19. <i>Fast Flux Test Facility Preliminary Screening In-Place Closure Assessment</i>	FFTF-13409, Rev. 0	Closure Assessment

**Table 1. Documents Used to Develop the Initial 300-Area Analyte List. (2 Pages)**

Reference	Document Number	Document Type
20. <i>Environmental Assessment, Shutdown of the Fast Flux Test Facility, Hanford Site, Richland, Washington</i>	DOE/EA-0993	Environmental Assessment

CVP = cleanup verification package                      PNNL = Pacific Northwest National Laboratory  
 EIS = environmental impact statement                  RDR/RAWP = remedial design report/remedial action work plan  
 ESD = explanation of significant differences          ROD = record of decision  
 FFS = focused feasibility study                            SAP = sampling and analysis plan  
 IAROD = Interim Action Record of Decision          WIDS = Waste Information Data System  
 OU = operable unit

The initial list of analytes presented in Table 2 was created from the review and evaluation of the Table 1 documents. Note that for simplicity, if analytes were identified in multiple documents, only one document reference is provided.

**Table 2. Summary of Initial 300-Area Analytes and References. (3 Pages)**

Analyte	Reference	Analyte	Reference
<b>Radionuclides</b>			
1. Americium-241	CVP-2006-00010	20. Nickel-63	CVP-2006-00010
2. Antimony-125	DOE/RL-96-42	21. Niobium-94	FFTF-18346, Rev. 1
3. Beryllium-7	DOE/RL-96-42	22. Plutonium-238	CVP-2005-00009
4. Carbon-14	DOE/RL-2008-27	23. Plutonium-239/240	CVP-2006-00010
5. Cerium-144	300-FF-2 OU ROD	24. Plutonium-241	CVP-2006-00010
6. Cesium-134	CVP-2005-00008	25. Potassium-40	DOE/RL-96-42
7. Cesium-137	CVP-2005-00009	26. Promethium-147	300-FF-2 OU ROD
8. Cobalt-60	CVP-2003-00002	27. Radium-226	DOE/RL-2001-48, Rev. 1
9. Europium-152	CVP-2006-00010	28. Ruthenium-106	CVP-2005-00009
10. Europium-154	CVP-2006-00010	29. Sodium-22	FFTF-18346, Rev. 1
11. Europium-155	CVP-2006-00010	30. Strontium-90	CVP-2005-00009
12. Iodine-129	DOE/RL-96-42	31. Technetium-99	CVP-2005-00008
13. Iodine-131	300-FF-2 OU ROD	32. Thorium-228	300-FF-1, 300-FF-5 ROD
14. Iodine-133	300-FF-2 OU ROD	33. Thorium-232	DOE-RL-2001-48
15. Iron-55	FFTF-18346, Rev. 1	34. Tritium	CVP-2005-00008
16. Lead-212	DOE/RL-96-42	35. Uranium-233/234	CVP-2006-00010
17. Manganese-54	CVP-2005-00008	36. Uranium-235	CVP-2003-00002
18. Molybdenum-93	FFTF-18346, Rev. 1	37. Uranium-238	CVP-2006-00005
19. Nickel-59	FFTF-18346, Rev. 1		

**Table 2. Summary of Initial 300-Area Analytes and References. (3 Pages)**

Analyte	Reference	Analyte	Reference
<b>Nonradionuclides</b>			
1. Acetone	300-FF-2 OU ROD	35. Lithium	DOE/RL-96-42
2. Aluminum	DOE/RL-2001-47	36. Manganese	300-FF-2 OU ROD
3. Ammonia	300-FF-1, 300-FF-5 ROD	37. Mercury	DOE/RL-96-42
4. Antimony	300-FF-2 OU ROD	38. Methanol	DOE/RL-96-42
5. Arsenic	CVP-2005-00004	39. Methyl ethyl ketone	DOE/RL-99-40
6. Asbestos	300-FF-2 OU ROD	40. Nickel	300-FF-1, 300-FF-5 ROD
7. Barium	CVP-2006-00010	41. Nitrate	300-FF-1, 300-FF-5 ROD
8. Benzene	DOE/RL-99-40	42. Nitrite	DOE/RL-96-42
9. Benzo(a)pyrene	CVP-2003-00001	43. Nitrobenzene	DOE/RL-99-40
10. Beryllium	CVP-2005-00004	44. PCBs (Aroclors)	CVP-2005-00009
11. Bis(2-ethylhexyl)phthalate	DOE/RL-91-38	45. Total petroleum hydrocarbons	300-FF-2 OU ROD
12. Bismuth	300-FF-2 OU ROD	46. Phenanthrene	DOE/RL-91-38
13. Butylbenzylphthalate	DOE/RL-91-38	47. Phosphate	DOE/RL-96-42
14. Cadmium	CVP-2006-00010	48. Potassium	FFTF-18346, Rev. 1
15. Carbon tetrachloride	300-FF-2 OU ROD	49. Selenium	CVP-2006-00010
16. Chloride	DOE-RL-2001-48	50. Silver	CVP-2006-00005
17. Chloroform	300-FF-2 OU ROD	51. Sodium (metal)	FFTF-18346, Rev. 1
18. Chromium (total)	CVP-2005-00004	52. Strontium	DOE/RL-99-40
19. Chromium (hexavalent)	DOE/RL-96-42	53. Sulfate	DOE-RL-2001-48
20. Chrysene	CVP-2003-00001	54. Sulfide	DOE/RL-99-40
21. Cobalt	DOE/RL-96-42	55. Tetrachloroethene	300-FF-1, 300-FF-5 ROD
22. Copper	300-FF-2 OU ROD	56. Thallium	CVP-2003-00001
23. Cyanide	DOE-RL-2001-48	57. Tin	CVP-2006-00010
24. 1,2-(total) Dichloroethene	300-FF-1, 300-FF-5 ROD	58. Toluene	DOE/RL-99-40
25. 1,2-cis-Dichloroethylene	HEIS/groundwater	59. 1,1,1-Trichloroethane	DOE/RL-96-42
26. Ethyl acetate	300-FF-2 OU ROD	60. Trichloroethene	300-FF-1, 300-FF-5 ROD
27. Ethylene glycol	300-FF-2 OU ROD	61. Tributyl phosphate	DOE/RL-91-38
28. Fluoride	DOE-RL-2001-48	62. Uranium (total)	DOE/RL-99-40
29. Graphite	300-FF-2 OU ROD	63. Vanadium	300-FF-2 OU ROD

**Table 2. Summary of Initial 300-Area Analytes and References. (3 Pages)**

Analyte	Reference	Analyte	Reference
30. Hexachlorobutadiene	DOE/RL-91-38	64. <i>Vinyl chloride</i>	<i>HEIS/Groundwater</i>
31. Hexachloroethane	DOE/RL-91-38	65. Xylene	DOE/RL-99-40
32. Normal paraffin hydrocarbon (kerosene)	DOE/RL-91-38	66. Zinc	300-FF-2 OU ROD
33. Methyl isobutyl ketone (hexone)	DOE/RL-96-42	67. Zirconium	300-FF-2 OU ROD
34. Lead	CVP-2003-00001		

NOTE: Italics denote groundwater COPCs.

CVP = cleanup verification package

PCB = polychlorinated biphenyl

HEIS = Hanford Environmental Information System

ROD = record of decision

OU = operable unit

## 5.2 STEP 2 – MASTER 300-AREA COPC LIST

Approved exclusion criteria were applied to the initial soil analyte list (Table 2) to identify the excluded analytes listed in Table 3. The list of groundwater COPCs was then reviewed to reconcile potential gaps. This resulted in the addition of 1,2-cis-Dichloroethylene and vinyl chloride. Exclusion of the analytes listed in Table 3 and inclusion of additional groundwater COPCs (in italics) resulted in the master COPC list presented in Table 4.

**Table 3. 300-Area Soil Analytes Excluded from Further Consideration. (2 Pages)**

Analyte	Exclusion Rationale	Daughters
<b><i>Radionuclides</i></b>		
Antimony-125	Half-life less than 3 years (2.76 years)	Te-125m (58d) Te-125 (stable)
Beryllium-7	Naturally-occurring background radiation/half-life less than 3 years (53.4 days)	Li-7 (stable)
Carbon-14a	Activation product contained in the FFTF structure	N-14 (stable)
Cerium-144	Half-life less than 3 years (284.6 days)	Pr-144m (1.2m), Pr-144 (17.28m), Nd-144 (stable)
Cesium-134	Half-life less than 3 years (2.065 years)	Ba-134 (stable)
Iron-55a	Activation product contained in the FFTF structure/half-life less than 3 years (2.73 years)	Mn-55 (stable)
Manganese-54	Half-life less than 3 years (612.2 days)	Fe-54 (stable)
Molybdenum-93a	Activation product contained in the FFTF structure	Nb-93 (stable)
Nickel-59a	Activation product contained in the FFTF structure	Co-59 (stable)
Nickel-63a	Activation product contained in the FFTF structure	Cu-63 (stable)
Niobium-94a	Activation product contained in the FFTF structure	Mo-94 (stable)

**Table 3. 300-Area Soil Analytes Excluded from Further Consideration. (2 Pages)**

Analyte	Exclusion Rationale	Daughters
Ruthenium-106	Half-life less than 3 years (1.020 years)	Rh-106 (29.9s) and Pd-106 (stable)
Sodium-22	Half-life less than 3 years (2.6 years)	Ne-22 (stable)
Promethium-147	Half-life less than 3 years (2.6 years)	Sm-147 ( $1.06 \times 10^{11}$ ) (natural occurring)
Zinc-65	Half-life less than 3 years (244 days)	Cm-65 (stable)
Iodine-131	Half-life less than 3 years (8.02 days)	Xe-131m (11.8d) Xe-131 (stable)
Iodine-133	Half-life less than 3 years (20.8 hours)	Xe-133m (2.19d) Xe-133 (5.25d) Cs-133 (stable)
Analyte	Exclusion Rationale	Half-Life
Potassium-40	Naturally occurring background radiation	Half-life 1.28 E9 years
Radium-226	Only potential source is natural background radiation (insufficient in-growth time for Hanford introduced U as decay daughter of U-234/Th-230)	Half-life 1.6 E3 years
Thorium-228	Daughter of Th-232/Ra-228; in equilibrium with parent.	Half-life 1.91 years
Thorium-232	Naturally occurring background radiation	1.4 E10 years
Lead-212	Daughter of Th-232/Ra-228; in equilibrium with parent	Half-life 10.6 hours
<b>Nonradionuclides</b>		
Acetone	Laboratory contaminant	None
Aluminum	Essential nutrient (minerals)	None
Cobalt	Essential nutrient (minerals)	None
Fluoride	Essential nutrient (minerals)	None
Phosphate	Essential nutrient (minerals)	None
Potassium	Essential nutrient	None
Ammonia	No soil toxicity information available	None
Chloride	No soil toxicity information available	None
Graphite	No soil toxicity information available	None
Nitrate	No soil toxicity information available	None
Nitrite	No soil toxicity information available	None
Sulfate	No soil toxicity information available	None
Sulfide	No soil toxicity information available	None
Zirconium	No soil toxicity information available	None
Methanol	Naturally occurring, readily biodegradable organic compound	None

FFTF = fast flux test facility

**Table 4. Master 300-Area Contaminants of Potential Concern, Analytical Methods, and Laboratory Detection Limits. (4 Pages)**

COPCs	Practical Quantitation Limits <sup>a</sup>	Preliminary Cleanup Goals <sup>a, b</sup>			Analytical Methods
		Direct Exposure (Industrial)	Groundwater Protection	River Protection	
<b>Radionuclides</b>					
1. Americium-241 <sup>c</sup>	1	32.1	NV	NV	1. GEA
2. Cesium-137	0.1	6.2	NV	NV	
3. Cobalt-60	0.05	1.4	NV	NV	
4. Europium-152	0.1	3.3	NV	NV	
5. Europium-154	0.1	3.0	NV	NV	
6. Europium-155	0.1	125	NV	NV	
7. Strontium-90	1	4.5	NV	NV	2. Gas flow proportional counting
8. Iodine-129	2	2 <sup>b</sup>	2 <sup>b</sup>	2 <sup>b</sup>	3. Low-energy GEA
9. Carbon-14	2	8.7	82	NV	4. Liquid scintillation counting
10. Nickel-63	30	4,026	NV	NV	
11. Technetium-99	0.25	34.7	0.46	0.46	
12. Tritium	10	711	15.8	15.8	
13. Plutonium-238	1	38.8	NV	NV	5. Isotopic plutonium AEA
14. Plutonium-239/240	1	35.1	NV	NV	
15. Plutonium-241	15	12,900	NV	NV	
16. Uranium-233/234	1	27.2	1.1 <sup>b</sup>	1.1 <sup>b</sup>	6. Isotopic uranium AEA
17. Uranium-235	1	2.7	0.185 <sup>d</sup>	0.185 <sup>d</sup>	
18. Uranium-238	1	26.2	1.1 <sup>b</sup>	1.1 <sup>b</sup>	
<b>Nonradionuclides</b>					
1. Benzene	0.005	2,390	0.004	0.014	7. EPA 8260 (VOA)
2. Carbon tetrachloride	0.005	1,010	0.031	0.0046 <sup>d</sup>	
3. Chloroform	0.005	21,500	0.038	0.0607	
4. Dichloroethene 1, 2- (total)	0.005	31,500	0.360	0.700	
5. <i>Dichloroethylene; 1,2-cis-</i>	0.001	35,000	0.350	NV	
6. Methyl isobutyl ketone (hexone)	0.010	280,000	2.71	NV	
7. Methyl ethyl ketone	0.010	2,100,000	19.6	NV	
8. Nitrobenzene	0.005	2,390	0.004	0.014	8. EPA 8260 (VOA)

**Table 4. Master 300-Area Contaminants of Potential Concern, Analytical Methods, and Laboratory Detection Limits. (4 Pages)**

COPCs	Practical Quantitation Limits <sup>a</sup>	Preliminary Cleanup Goals <sup>a, b</sup>			Analytical Methods	
		Direct Exposure (Industrial)	Groundwater Protection	River Protection		
9. Toluene	0.005	6,400	4.65	99.0	9. EPA 8270 (SVOA)	
10. Tetrachloroethene	0.005	35,000	0.008	0.008		
11. 1,1,1-Trichloroethane	0.005	7,000,000	1.58	3.17		
12. Trichloroethene	0.005	1,470	0.003	0.090		
13. Vinyl Chloride	0.001	87.5	0.00018 <sup>d</sup>	0.0252		
14. Xylene	0.01	700,000	14.6	183		
15. Bis(2-ethylhexyl)phthalate	0.33	9,380	13.9	8.01		
16. Butylbenzylphthalate	0.33	700,000	893	698		
17. Hexachlorobutadiene	0.33	1,680	0.605	0.950		
18. Tributyl phosphate	3.3	24,300	0.677	NV		
19. Hexachloroethane	0.3	9,380	0.125	0.152		
20. Aroclor-1016 (PCB)	0.017	65.6	0.094	0.000447 <sup>d</sup>		11. EPA 8082 (PCB by GC)
21. Aroclor-1221 (PCB)	0.017	65.6	0.00920 <sup>d</sup>	0.0000437 <sup>d</sup>		
22. Aroclor-1232 (PCB)	0.017	65.6	0.00920 <sup>d</sup>	0.0000437 <sup>d</sup>		
23. Aroclor-1242 (PCB)	0.017	65.6	0.0394	0.000187 <sup>d</sup>		
24. Aroclor-1248 (PCB)	0.017	65.6	0.0386	0.000183 <sup>d</sup>		
25. Aroclor-1254 (PCB)	0.017	65.6	0.0664	0.000315 <sup>d</sup>		
26. Aroclor-1260 (PCB)	0.017	65.6	0.721	0.00342 <sup>d</sup>		
27. Normal paraffin hydrocarbon (kerosene)	5	NV	200	400		12. NWTPH-Dx (kerosene range)
28. Total petroleum hydrocarbons	5	2,000	2,000	NV	13. NWTPH-Dx	
29. Chromium (hexavalent)	0.5	10,500	18.4	7.7	14. Cr-VI 7196	
30. Arsenic	10	20 <sup>b</sup>	20 <sup>b</sup>	20 <sup>b</sup>	15. EPA 6010 (ICP metals)	
31. Barium	2	700,000	1,650	3,300		
32. Beryllium	0.5	7,000	63.2	126		
33. Bismuth	10	NV	NV	NV		
34. Cadmium	0.5	3,500	0.69	0.25 <sup>d</sup>		
35. Antimony	6	1,400	5.4	25.3		
36. Chromium (total)	1	5,250,000	2,000	2,600		

**Table 4. Master 300-Area Contaminants of Potential Concern, Analytical Methods, and Laboratory Detection Limits. (4 Pages)**

COPCs	Practical Quantitation Limits <sup>a</sup>	Preliminary Cleanup Goals <sup>a, b</sup>			Analytical Methods
		Direct Exposure (Industrial)	Groundwater Protection	River Protection	
37. Copper	1	140,000	284	1,150	16. EPA 6010 (ICP metals)
38. Lead	5	353	3,000	840	
39. Lithium	2.5	7,000	192	NV	
40. Manganese	5	165,000	512 <sup>b</sup>	512 <sup>b</sup>	
41. Nickel	4	70,000	130	357	
42. Selenium	10	17,500	5.2 <sup>d</sup>	1.04 <sup>d</sup>	
43. Silver	1	17,500	13.6	0.884	
44. Sodium (metal)	50	NA	NA	NA	
45. Strontium	1	2,100,000	2,920	NA	
46. Thallium	5	245	1.59	4.46	
47. Tin	10	2,100,000	48,000	NV	
48. Vanadium	2.5	24,500	2,240	NV	
49. Zinc	1	1,050,000	5,970	226	
50. Chrysene	0.1	1,800	9.56	0.0446 <sup>d</sup>	
51. Benzo(a)pyrene	0.015	0.18	2.33	0.109	
52. Phenanthrene	0.05	1,050,000	1,140	9,100	
53. Ethyl acetate	5	3,150,000	29.8	NV	18. EPA 8015 (nonhalogenated VOA)
54. Ethylene glycol	5	7,000,000	64.3	NA	
55. Cyanide	0.5	70,000	0.800	1.60	19. EPA 9010
56. Mercury	0.2	1,050	2.09	0.33 <sup>b</sup>	20. EPA 7471 (Hg cold vapor)



**Table 4. Master 300-Area Contaminants of Potential Concern, Analytical Methods, and Laboratory Detection Limits. (4 Pages)**

COPCs	Practical Quantitation Limits <sup>a</sup>	Preliminary Cleanup Goals <sup>a, b</sup>			Analytical Methods
		Direct Exposure (Industrial)	Groundwater Protection	River Protection	
57. Uranium (total)	1	10,500	3.21 <sup>b</sup>	3.21 <sup>b</sup>	21. UKPA or via isotopic
58. Asbestos	1%	NA	NA	NA	22. Microscopy

NOTE: Italics denote groundwater COPCs.

<sup>a</sup> Units are mg/kg (nonradionuclides) and pCi/g (radionuclides) unless otherwise noted. Cleanup levels are established in the most current CLARC table (updated February 12, 2009) calculated per *Washington Administrative Code* 173-340 (Ecology 2007) using input parameters stated in the CLARC table.

<sup>b</sup> Where cleanup levels are less than background, cleanup levels default to background as discussed in Sec. 2.1.2.1 of the 100 Area RDR/RAWP (DOE-RL-96-17).

<sup>c</sup> If strong gamma emissions interfere with analysis of Am-241, Am-241 can be analyzed using Cm/Am alpha emission analysis method.

<sup>d</sup> Where cleanup levels are less than PQLs, cleanup levels default to PQLs as discussed in Sec. 2.1.2.1 of the 100 Area RDR/RAWP (DOE-RL-96-17).

AEA = alpha energy analysis

CLARC = Cleanup Levels and Risk Calculation database

COPC = contaminant of potential concern

EPA = U.S. Environmental Protection Agency

GC = gas chromatography

GEA = gamma energy analysis

ICP = inductively coupled plasma

NA = not applicable

NWTPH-Dx = Northwest total petroleum hydrocarbon-diesel range organics

NV = No value. The generic RESidual RADioactivity modeling reported in the 100 Area RDR/RAWP predicts the contaminant will not reach groundwater within 1,000 years.

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

PQL = practical quantitation limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

SVOA = semivolatile organic analysis

UKPA = uranium kinetic phosphorescence analysis

VOA = volatile organic analysis

### 5.3 STEPS 3 AND 4 – LOCATION-SPECIFIC COPC IDENTIFICATION AND AGENCY INPUT

1. The IAROD COCs and COPCs for each location where characterization is proposed were identified (which reflects information from LFI and technical baseline reports). The default decision was to carry these analytes forward as COPCs for site-specific characterization unless a specific basis was available to eliminate them.
2. The interim cleanup verification COCs and COPCs for each location where characterization is proposed were identified. The default decision was to carry these analytes forward as COPCs for location-specific characterization unless a specific basis was available to eliminate them.
3. The 300 Area groundwater COPCs were identified. As appropriate, these analytes were retained for location-specific characterization.

4. The remaining analytes from the 300 Area master list were considered individually on a location-specific basis. The default decision was to carry these analytes forward as COPCs for characterization unless a specific basis was available to eliminate them. Specific lead agency input was incorporated in these considerations.

For convenience, the 300 Area master COPCs that were not retained for site-specific characterization at any of the proposed characterization locations are listed in Table 5. The product of steps three and four is the identification of location-specific COPC lists for the remedial investigation. Tables 6 through 10 present the 300 Area COPCs that were retained and excluded on a location-specific basis.

**Table 5. Master 300-Area Contaminants of Potential Concern Excluded for All Characterization Locations.**

Analyte	Exclusion Basis
1. Americium-241	Components of spent nuclear fuel that do not measurably contribute to potential risk relative to their ratios to other 300 Area constituents of spent nuclear fuel.
2. Plutonium-241	
3. Plutonium-238	
4. Europium-152	
5. Europium-154	
6. Europium-155	
7. Strontium-90	
8. Dichloroethene 1, 2- (total)	No known discharges of these volatile/semivolatile organic compounds to 300 Area locations proposed for characterization.
9. Methyl isobutyl ketone (hexone)	
10. Methyl ethyl ketone	
11. Bis(2-ethylhexyl)phthalate	
12. Butylbenzylphthalate	
13. Hexachloroethane	
14. Phenanthrene	
15. Ethylene glycol	These organics are potentially present only in association with oils and solid bituminous materials used in construction. These compounds do not represent a significant potential contributor to cumulative risk in the quantities in which they would be present relative to other total petroleum hydrocarbons.
16. Normal paraffin hydrocarbon (kerosene)	
17. Total petroleum hydrocarbons	Not associated with 300 Area processes except as solid metals in equipment and in trace impurities.
18. Bismuth	
19. Lithium	
20. Sodium (metal)	
21. Thallium	
22. Cyanide	
23. Chromium (hexavalent)	
24. Asbestos	Potentially present in mastic coatings and facilities but would not have an impact to remaining soils.

**Table 6. 300-DU-1, 300-DU-2, 300-DU-3, 300-DU-4, and 300-DU-5 (300-Area Perimeter) Contaminants of Potential Concern. (2 Pages)**

<b>COPCs Included</b>	<b>Inclusion Rationale</b>
1. Uranium-233/234	CVP
2. Uranium-235	CVP
3. Uranium-238	CVP
4. Plutonium-239/240	CVP
5. Technetium-99	CVP
6. Tritium	CVP
7. Uranium (total)	DOE/RL-99-40, groundwater COPC
8. Arsenic	DOE/RL-99-40, groundwater COPC
9. Barium	CVP
10. Beryllium	CVP
11. Cadmium	CVP, groundwater COPC
12. Chromium (total)	CVP, groundwater COPC
13. Copper	IAROD, groundwater COPC
14. Lead	CVP, groundwater COPC
15. Manganese	IAROD, groundwater COPC
16. Nickel	IAROD, groundwater COPC
17. Selenium	CVP, groundwater COPC
18. Silver	CVP, groundwater COPC
19. Strontium (metal)	DOE/RL-99-40
20. Vanadium	IAROD
21. Zinc	IAROD, groundwater COPC
22. Ethyl acetate	IAROD
23. Carbon tetrachloride	IAROD, groundwater COPC
24. Chloroform	IAROD, groundwater COPC
25. 1,2-cis-Dichloroethylene	Groundwater COPC
26. Tetrachloroethene	IAROD, groundwater COPC
27. Toluene	IAROD
28. Trichlorethane; 1,1,1,-	IAROD
29. Trichloroethene	IAROD, groundwater COPC
30. Vinyl chloride	Groundwater COPC
<b>COPCs Excluded</b>	<b>Exclusion Rationale</b>
1. Cesium-137	Not present at activities significant for potential cumulative dose risk in 300 Area perimeter soils
2. Cobalt-60	
3. Iodine-129	
4. Carbon-14	
5. Nickel-63	
6. Plutonium-23	

**Table 6. 300-DU-1, 300-DU-2, 300-DU-3, 300-DU-4, and 300-DU-5 (300-Area Perimeter) Contaminants of Potential Concern. (2 Pages)**

COPCs Excluded	Exclusion Rationale
7. Benzene	No significant discharge of organic chemicals to 300 Area perimeter soils
8. Nitrobenzene	
9. Xylene	
10. Bis(2-ethylhexyl)phthalate	
11. Tributyl phosphate	
12. Chrysene	
13. Benzo(a) pyrene	
14. Arochlor-1016 (PCB)	No known or expected usage of PCBs associated with 300 Area perimeter soils
15. Arochlor-1221 (PCB)	
16. Arochlor-1232 (PCB)	
17. Arochlor-1242 (PCB)	
18. Arochlor-1248 (PCB)	
19. Arochlor-1254 (PCB)	
20. Arochlor-1260 (PCB)	
21. Antimony	Not associated with 300 Area perimeter soils
22. Tin	
23. Mercury	

COPC = contaminant of potential concern  
 CVP = cleanup verification package  
 IAROD = interim action record of decision  
 PCB = polychlorinated biphenyl

**Table 7. 300-DU-8 and 300-DU-9 (North Process Pond, 316-2); 300-DU-10 (Process Trenches, 316-5); and 300-DU-11 (South Process Pond, 316-1); COPCs. (2 Pages)**

COPCs Included	Inclusion Rationale
1. Cobalt-60	CVP
2. Cesium-137	CVP
3. Tritium	CVP
4. Uranium-233/234	CVP
5. Uranium-235	CVP
6. Uranium-238	CVP
7. Arochlor-1016 (PCB)	CVP
8. Arochlor-1221 (PCB)	CVP
9. Arochlor-1232 (PCB)	CVP
10. Arochlor-1242 (PCB)	CVP
11. Arochlor-1248 (PCB)	CVP
12. Arochlor-1254 (PCB)	CVP
13. Arochlor-1260 (PCB)	CVP
14. Uranium (total)	DOE/RL-99-40, groundwater COPC
15. Antimony	IAROD, groundwater COPC
16. Arsenic	CVP, groundwater COPC
17. Barium	CVP

**Table 7. 300-DU-8 and 300-DU-9 (North Process Pond, 316-2); 300-DU-10 (Process Trenches, 316-5); and 300-DU-11 (South Process Pond, 316-1); COPCs. (2 Pages)**

<b>COPCs Included</b>	<b>Inclusion Rationale</b>
18. Cadmium	CVP, groundwater COPC
19. Chromium (total)	CVP, groundwater COPC
20. Copper	IAROD, groundwater COPC
21. Lead	CVP, groundwater COPC
22. Manganese	IAROD, groundwater COPC
23. Mercury	IAROD, groundwater COPC
24. Nickel	IAROD, groundwater COPC
25. Selenium	CVP, groundwater COPC
26. Strontium (metal)	IAROD
27. Tin	CVP
28. Vanadium	IAROD
29. Zinc	IAROD, groundwater COPC
30. Benzene	IAROD
31. Bis(2-ethylhexyl) phthalate	DOE/RL-91-38
32. Carbon tetrachloride	IAROD, groundwater COPC
33. Chloroform	IAROD, groundwater COPC
34. 1,2-cis-Dichloroethylene	Groundwater COPC
35. Tetrachloroethene	IAROD, groundwater COPC
36. Toluene	IAROD
37. Trichloroethene	IAROD, groundwater COPC
38. Vinyl chloride	Groundwater COPC
39. Xylene	DOE/RL-99-40
<b>COPCs Excluded</b>	<b>Exclusion Rationale</b>
1. Iodine-129	Not present at activities significant for potential cumulative dose risk near the preliminary remediation goal relative to other isotopes in general 300 Area soils.
2. Carbon-14	
3. Nickel-63	
4. Technetium-99	
5. Plutonium-239/240	
6. Nitrobenzene	May have been present in coatings, sealants, and solvents. No significant discharge of organic chemicals to 300 Area soils.
7. 1,1,1-Trichloroethane	
8. Tributyl phosphate	
9. Chrysene	
10. Benzo(a) pyrene	
11. Ethyl acetate	Not associated with 300 Area vadose soils except as solid metals and trace impurities.
12. Beryllium	
13. Silver	

COPC = contaminant of potential concern  
CVP = cleanup verification package  
IAROD = interim action record of decision  
PCB = polychlorinated biphenyl

**Table 8. 300-DU-6 and 300-DU-7 (Near the Columbia River) COPCs. (2 Pages)**

<b>COPCs Included</b>	<b>Inclusion Rationale</b>
1. Cesium-137	CVP
2. Cobalt-60	CVP
3. Uranium-233/234	CVP
4. Uranium-235	CVP
5. Uranium-238	CVP
6. Technetium-99	CVP
7. Tritium	CVP
8. Benzene	IAROD
9. Chloroform	IAROD, groundwater COPC
10. 1,2-cis-Dichloroethylene	Groundwater COPC
11. Tetrachloroethene	IAROD, groundwater COPC
12. Trichloroethene	IAROD, groundwater COPC
13. Vinyl chloride	Groundwater COPC
14. Xylene	DOE/RL-99-40
15. Aroclor-1016 (PCB)	CVP
16. Aroclor-1221 (PCB)	CVP
17. Aroclor-1232 (PCB)	CVP
18. Aroclor-1242 (PCB)	CVP
19. Aroclor-1248 (PCB)	CVP
20. Aroclor-1254 (PCB)	CVP
21. Aroclor-1260 (PCB)	CVP
22. Antimony	IAROD, groundwater COPC
23. Barium	CVP
24. Cadmium	CVP, groundwater COPC
25. Chromium (total)	CVP, groundwater COPC
26. Copper	IAROD, groundwater COPC
27. Lead	CVP, groundwater COPC
28. Manganese	IAROD, groundwater COPC
29. Nickel	IAROD, groundwater COPC
30. Silver	CVP, groundwater COPC
31. Strontium (metal)	DOE/RL-99-40
32. Vanadium	IAROD
33. Zinc	IAROD, groundwater COPC
34. Benzo(a)pyrene	CVP
35. Chrysene	CVP
36. Uranium (total)	DOE/RL-99-40, groundwater COPC
<b>COPCs Excluded</b>	<b>Exclusion Rationale</b>
1. Iodine-129	Not present at activities significant for potential cumulative dose risk near the preliminary remediation goal relative to other isotopes in general 300 Area soils.
2. Carbon-14	
3. Nickel-63	
4. Plutonium-239/240	

**Table 8. 300-DU-6 and 300-DU-7 (Near the Columbia River) COPCs. (2 Pages)**

COPCs Excluded	Exclusion Rationale
5. Carbon tetrachloride	May have been present in coatings, sealants, and solvents. No significant discharge of organic chemicals to 300 Area soils.
6. Nitrobenzene	
7. Toluene	
8. 1,1,1-Trichloroethane	
9. Bis(2-ethylhexyl)phthalate	
10. Tributyl phosphate	
11. Ethyl acetate	Not associated with 300 Area vadose soils except as solid metals and trace impurities.
12. Arsenic	
13. Beryllium	
14. Selenium	
15. Tin	
16. Mercury	

COPC = contaminant of potential concern  
 CVP = cleanup verification package  
 IAROD = interim action record of decision  
 PCB = polychlorinated biphenyl

**Table 9. 300-DU-VZ1 (618-10) and 300-VZ-3 (316-4) Contaminants of Potential Concern. (2 Pages)**

COPCs Included	Inclusion Rationale
1. Carbon-14	DOE/RL-2008-27
2. Cesium-137	DOE/RL-2008-27
3. Cobalt-60	DOE/RL-2008-27
4. Iodine-129	DOE/RL-96-42
5. Nickel-63	DOE/RL-2008-27
6. Technetium-99	IAROD
7. Tritium	DOE/RL-2008-27
8. Antimony	IAROD, groundwater COPC
9. Arsenic	CVP, groundwater COPC
10. Barium	CVP
11. Beryllium	CVP
12. Chromium (total)	CVP, groundwater COPC
13. Copper	IAROD, groundwater COPC
14. Manganese	IAROD, groundwater COPC
15. Nickel	IAROD, groundwater COPC
16. Selenium	CVP, groundwater COPC
17. Silver	CVP, groundwater COPC
18. Strontium (metal)	DOE/RL-99-40
19. Vanadium	IAROD
20. Zinc	IAROD, groundwater COPC
21. Mercury	DOE/RL-96-42, groundwater COPC
22. Tributyl phosphate	DOE/RL-91-38
23. Benzene	DOE/RL-99-40

**Table 9. 300-DU-VZ1 (618-10) and 300-VZ-3 (316-4) Contaminants of Potential Concern. (2 Pages)**

COPCs Included	Inclusion Rationale
24. Nitrobenzene	Stewardship Information System COPC
25. Chloroform	IAROD, groundwater COPC
26. Trichloroethene	IAROD, groundwater COPC
27. Vinyl chloride	Groundwater COPC
28. Uranium (total)	DOE/RL-99-40, groundwater COPC
COPCs Excluded	Exclusion Rationale
1. Plutonium-239/240	Not present at activities significant for potential cumulative dose risk near the preliminary remediation goal relative to other isotopes in general 300 Area soils.
2. Uranium-233/234	
3. Uranium-235	
4. Uranium-238	
5. Carbon tetrachloride	May have been present in coatings, sealants, and solvents. No significant discharge of organic chemicals to 300 Area soils.
6. 1,2-cis-Dichloroethylene	
7. Toluene	
8. Tetrachloroethene	
9. 1,1,1-Trichloroethane	
10. Xylene	
11. Bis(2-ethylhexyl) phthalate	
12. Chrysene	
13. Benzo(a) pyrene	
14. Ethyl acetate	
15. Arochlor-1016 (PCB)	No known or expected usage of PCBs associated with these characterization locations.
16. Arochlor-1221 (PCB)	
17. Arochlor-1232 (PCB)	
18. Arochlor-1242 (PCB)	
19. Arochlor-1248 (PCB)	
20. Arochlor-1254 (PCB)	
21. Arochlor-1260 (PCB)	
22. Cadmium	Not associated with 300 Area vadose soils except as solid metals and trace impurities.
23. Lead	
24. Tin	

COPC = contaminant of potential concern  
 CVP = cleanup verification package  
 IAROD = interim action record of decision  
 PCB = polychlorinated biphenyl

**Table 10. 300-DU-VZ2 (618-11) Contaminants of Potential Concern. (3 Pages)**

COPCs Included	Inclusion Rationale
1. Carbon-14	DOE/RL-2008-27
2. Nickel-63	DOE/RL-2008-27
3. Technetium-99	IAROD
4. Tritium	DOE/RL-2008-27



**Table 10. 300-DU-VZ2 (618-11) Contaminants of Potential Concern. (3 Pages)**

<b>COPCs Included</b>	<b>Inclusion Rationale</b>
5. Arsenic	CVP, groundwater COPC
6. Barium	CVP
7. Chromium (total)	CVP, groundwater COPC
8. Copper	IAROD, groundwater COPC
9. Manganese	IAROD, groundwater COPC
10. Nickel	IAROD, groundwater COPC
11. Selenium	CVP, groundwater COPC
12. Silver	CVP, groundwater COPC
13. Strontium (metal)	DOE/RL-99-40
14. Vanadium	IAROD
15. Zinc	IAROD, groundwater COPC
16. Mercury	DOE/RL-96-42, groundwater COPC
17. Benzene	DOE/RL-99-40
18. Uranium (total)	DOE/RL-99-40, groundwater COPC
<b>COPCs Excluded</b>	<b>Exclusion Rationale</b>
1. Cesium-137	Not present at activities significant for potential cumulative dose risk near the preliminary remediation goal relative to other isotopes in general 300 Area soils.
2. Cobalt-60	
3. Iodine-129	
4. Plutonium-239/240	
5. Uranium-233/234	
6. Uranium-235	
7. Uranium-238	
8. Carbon tetrachloride	May have been present in coatings, sealants, and solvents. No significant discharge of organic chemicals to 300 Area soils.
9. Chloroform	
10. 1,2-cis-Dichloroethylene	
11. Nitrobenzene	
12. Toluene	
13. Tetrachloroethene	
14. 1,1,1-Trichloroethane	
15. Trichloroethene	
16. Vinyl chloride	
17. Xylene	
18. Bis(2-ethylhexyl)phthalate	
19. Chrysene	
20. Benzo(a) pyrene	
21. Ethyl acetate	
22. Tributyl phosphate	
23. Arochlor-1016 (PCB)	No known or expected usage of PCBs associated with this characterization location.
24. Arochlor-1221 (PCB)	
25. Arochlor-1232 (PCB)	
26. Arochlor-1242 (PCB)	
27. Arochlor-1248 (PCB)	
28. Arochlor-1254 (PCB)	

**Table 10. 300-DU-VZ2 (618-11) Contaminants of Potential Concern. (3 Pages)**

COPCs Excluded	Exclusion Rationale
29. Arochlor-1260 (PCB)	No known or expected usage of PCBs associated with this characterization location.
30. Beryllium	Not associated with 300 Area vadose soils except as solid metals and trace impurities.
31. Cadmium	
32. Antimony	
33. Lead	
34. Tin	

COPC = contaminant of potential concern  
 CVP = cleanup verification package  
 IAROD = interim action record of decision  
 PCB = polychlorinated biphenyl

## 6.0 CONCLUSIONS

This approach provides for a systematic identification of COPCs, considering available data and recognized potential deficiencies. The analytical methods identified in Table 4 should be verified and documented in the quality assurance project plan section of the sampling and analysis plan for the 300 Area remedial investigation. As additional soil and groundwater data become available, other suitable exclusion criteria should be considered and evaluated for use in the COPC identification process.

## 7.0 REFERENCES

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, 42 U.S.C. 9601, et seq.
- CVP-2003-00001, 2003, *Cleanup Verification Package for Landfill 1D (WIDS Site 628-4)*, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.
- CVP-2003-00002, 2003, *Cleanup Verification Package for the South Process Pond (WIDS Site 316-1), the Retired Filter Backwash Pond (WIDS Site 300 RFBP), 300-262 Contaminated Soil, and Unplanned Release Sites UPR-300-32, UPR-300-33, UPR-300-34, UPR-300-35, UPR-300-36, UPR-300-37, and UPR-300-FF-1*, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.
- CVP-2005-00004, 2005, *Cleanup Verification Package for the 300-18 Waste Site*, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.
- CVP-2005-00007, 2005, *Cleanup Verification Package for the 300-8 Waste Site*, Rev. 0, Washington Closure Hanford, Richland, Washington.

- CVP-2005-00008, 2006, *Cleanup Verification Package for the 600-259 Waste Site*, Rev. 0, Washington Closure Hanford, Richland, Washington.
- CVP-2005-00009, 2006, *Cleanup Verification Package for the 300 VTS Waste Site*, Rev. 0, Washington Closure Hanford, Richland, Washington.
- CVP-2006-00005, 2006, *Cleanup Verification Package for the 618-3 Burial Ground*, Rev. 0, Washington Closure Hanford, Richland, Washington.
- CVP-2006-00010, 2006, *Cleanup Verification Package for the 618-2 Burial Ground*, Rev. 0, Washington Closure Hanford, Richland, Washington.
- DOE/EA-0993, 1995, *Environmental Assessment, Shutdown of the Fast Flux Test Facility, Hanford Site, Richland, Washington*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-91-38, 1992, *Engineering Evaluation of the 618-9 Burial Ground Expedited Response Action*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-96-42, 1996, *Limited Field Investigation Report for the 300-FF-2 Operable Unit, Draft A*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-99-40, 2000, *Focused Feasibility Study for the 300-FF-2 Operable Unit*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-2001-47, 2004, *Remedial Design Report/Remedial Action Work Plan for the 300 Area*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-2001-48, 2004, *300 Area Remedial Action Sampling and Analysis Plan*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-2008-27, 2009, *Sampling and Analysis Plan for 618-10 and 618-11 Nonintrusive Sampling*, Rev. 0 for approval, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Ecology, 2007, *Model Toxics Control Act Statute and Regulation*, Publication No. 94-06, Washington State Department of Ecology, Olympia, Washington.
- Ecology, 2009, *Cleanup Levels and Risk Calculations (CLARC) Database*, Washington State Department of Ecology, Olympia, Washington, <<https://fortress.wa.gov/ecy/clarc.CLARCHome.aspx>>.
- EPA, 2009, *Explanation of Significant Differences for the 300-FF-2 Operable Unit Interim Action Record of Decision, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Washington, D.C.
- EPA/ROD/R10-96/143, 1996, *Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Washington, D.C.

EPA/ROD/R10-01/119, 2001, *Interim Action Record of Decision for the 300-FF-2 Operable Unit, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Washington, D.C.

FFTF-13409, 2003, *Fast Flux Test Facility Preliminary Screening In-Place Closure Assessment*, Rev. 0, Fluor Hanford, Inc., Richland, Washington.

FFTF-18346, 2005, *Technical Information Document for the Fast Flux Test Facility Closure Project Environmental Impact Statement*, Rev. 1A, Fluor Hanford, Inc., Richland, Washington.

NRC, 1989, *Recommended Daily Allowances*, 10<sup>th</sup> ed., Nuclear Regulatory Commission, Washington, D.C.

OSWER 9285.7-53, 2003, *Human Health Toxicity Values in Superfund Risk Assessments*, U.S. Environmental Protection Agency, Washington, D.C.

PNNL-15127, 2005, *Contaminants of Potential Concern in the 300-FF-5 Operable Unit: Expanded Annual Groundwater Report for Fiscal Year 2004*, Pacific Northwest National Laboratory, Richland, Washington.

## DISTRIBUTION

U.S. Department of Energy  
Richland Operations Office

M. Thompson	A6-38
R. F. Guercia	A3-04

Washington Closure Hanford

Z. P. Walton	H4-22
J. A. Lerch	H4-22
K. M. Singleton	H4-22

CH2M HILL Plateau Remediation Contractor

J. V. Borghese	H3-21
M. Faurote	H3-21
D. L. Morgans	H8-51

Document Control	H4-11
DOE-RL Public Reading Room	H2-53
Hanford Technical Library	P8-55