Terrestrial Ecological Evaluation Program

Northwest Pipeline GP
I-5 Corridor Compressor Station Facilities

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1.0 INTRODUCTION

This document presents the *Terrestrial Ecological Evaluation Program* and provides the rationale, methodology, and procedures proposed for Terrestrial Ecological Evaluations (TEEs) for the six Northwest Pipeline General Partnership (NWPL GP) compressor station facilities in Washington State along the north-south Interstate 5 (I-5) corridor between Oregon and the Canadian border. The performance of a TEE at these facilities is required by the Model Toxics Control Act (RCW 70.105D) and its implementing regulations (WAC 173-340), which are collectively referred to herein as "MTCA".

NWPL GP has several different types of facilities throughout Washington, including two basic categories of facilities with the potential for environmental impacts:

1. Meter stations (M/S) that are typically much smaller-scale facilities with relatively simple conceptual models and limited contaminants of potential concern (COPCs), primarily mercury, and

2. Compressor stations (C/S) that are larger in scale with more complex site histories and conceptual models, and varied and numerous Areas of Potential Concern (AOPCs) and COPCs.

Note: Previously, NWPL GP defined seven "Special Case" facilities, which included the six C/S along the I-5 corridor and one large meter station facility (Jackson Prairie Storage Facility M/S). However, since Jackson Prairie Storage Facility M/S and the Chehalis C/S facility share a single address, Ecology has consolidated these facilities into one voluntary cleanup program (VCP) account. Therefore, Jackson Prairie Storage Facility M/S and Chehalis C/S are considered one facility; thus, only six C/S facilities will be referenced herein.

NWPL GP previously submitted a *Terrestrial Ecological Evaluation Program* for its meter station facilities. That document was reviewed and has been finalized by Mr. Steve Teel of the Washington Department of Ecology (Ecology). The program presented herein includes procedures and practices similar to those for the M/S facilities, but they have been modified slightly and expanded to the specific conditions at C/S facilities. The C/S facilities along the I-5 corridor include:

- Sumas C/S;
- Mt. Vernon C/S;
- Snohomish C/S;
- Sumner C/S;
- Chehalis C/S (which includes Jackson Prairie Storage Facility M/S); and
- Washougal C/S.

NWPL GP originally submitted a draft *Terrestrial Ecological Evaluation Program – Northwest Pipeline GP I-5 Corridor Compressor Station Facilities* document to Mr. Steve Teel and Mr. Dale Myers at Ecology on May 23, 2011. Consolidated comments were returned to NWPL GP in an Ecology transmittal letter Re: Transmittal of Ecology Comments dated July 27, 2011.

This revised document incorporates each of the comments and concerns raised by Ecology in the July 27, 2011 transmittal letter.

NWPL GP is currently evaluating the environmental conditions at these facilities and has collected a significant amount of soil analytical data, which has been used to develop the program documented herein. Upon acceptance of this TEE program and after TEE sample collection, analysis, and interpretation, NWPL GP will complete C/S facility-specific *Remedial Investigation and Cleanup Action Plans* for the C/S facilities. These plans will summarize all of the investigative data collected up to that time and will propose facility-specific methodologies for addressing known impacts that exceed applicable cleanup levels, including those that have a potential effect on terrestrial receptors. The program presented herein will be used to assess potential terrestrial receptors and applicable cleanup levels to be used during the subsequent remedial actions at the facilities.

1.1 Facility Description

Compressor station facilities are large (multi-acre) and have varied histories and multiple potential contaminants of concern in a number of areas of potential concern. The surfaces of the facilities are typically mostly gravel-covered with asphalt surfaces ranging from about 10 to 15 percent. Compressor station facilities have multiple buildings including compressor buildings, support buildings (*i.e.*, auxiliary buildings), office buildings, and storage sheds. They are fenced with controlled access and general maintenance activities include active housekeeping, weed suppression, and maintenance of the integrity of the fencing, gates, and interior buildings/structures.

Based on work conducted since 2005 and prior knowledge of site conditions, a thorough understanding of typical site conditions such as vertical and horizontal migration of impacts, hot spots, and contaminant distribution has been formed.

1.2 Conceptual Site Model

There are multiple Areas of Potential Concern (AOPC) types associated with C/S facilities that have been previously shown through sampling and analysis to have confirmed soil impacts. These AOPC types include:

- Former earthen pits;
- Compressor station buildings;
- Fuel gas meter station buildings;
- Former underground storage tanks (USTs);
- Fin fan coolers;
- Pig receivers;
- Scrubbers;
- Aboveground storage tanks (ASTs);
- Septic tanks and leach fields; and
- Startup air tanks.

The principal contaminants of concern (COCs) associated with these AOPCs include:

- Gasoline and related compounds;
- Higher-range petroleum hydrocarbons (HRPH);
- Naphthalenes

- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs)
- Polychlorinated Biphenyls (PCBs);
- Arsenic;
- Cadmium;
- Lead; and
- Mercury

With a few exceptions (*e.g.*, underground storage tanks, former earthen pits, etc.), the majority of releases observed at C/S facilities appear to be related to operational activities of above ground equipment and piping. The data collected to date indicates that the primary mode of release is surficial spillage, which has resulted in the highest concentrations of COPCs being observed in surface or near-surface soils, with declining concentrations at depth. Generally, impacts that exceed potentially applicable regulatory limits are limited to within 3 feet of the surface.

Impacts associated with former USTs and former earthen pits are below grade. Remediation in these AOPC types is expected to be at a depth that will limit exposure to terrestrial plants and animals (*i.e.*, greater than 6 feet below grade, see Section 2.2.3).

2.0 PROBLEM FORMULATION

MTCA requires the completion of a TEE in accordance with WAC 173-340-7490.

2.1 Primary TEE Exclusions

The C/S facilities typically do not qualify for the primary exclusions from the TEE as documented in WAC 173-340-7491(1). The exclusions typically do not apply because of the often rural locations of the facilities, uncapped surfaces (*i.e.*, typically the facilities are mostly gravel-covered), and the near-surface contamination (*i.e.*, typically 3 feet or less). In the absence of a TEE exclusion, the MTCA regulations require further site-specific evaluation to ensure protection of potential terrestrial and ecological receptors.

2.2 Model TEE based upon Site-Specific TEE

NWPL GP proposes using the procedures detailed in 173-340-7493 for a Site-Specific TEE to establish contaminant concentrations that are protective of terrestrial and ecological exposures. As described in Section 3 below, because of the similarities between the operations at the various C/S facilities and the fact that they are located within similar regional climates and geography, NWPL GP proposes using the data collected to date at these facilities as regional data that is representative of multiple facilities. By developing "model" site-specific TEEs for specified regions, it will be possible to present a comprehensive conservative approach to address these six facilities. As noted above, NWPL GPs' proposed model approach was reviewed and is being finalized by Steve Teele at Ecology for use at multiple M/S facilities within designated geographic regions of Washington.

Developing the model site-specific TEE requires identifying the following:

- Chemicals of Potential Ecological Concern
- Potential Receptors of Concern, and
- Potential Exposure Pathways.

Once those factors have been identified, it is possible to perform toxicological assessments and to identify final chemicals of ecological concern for the six facilities. The following sections discuss this process in additional detail.

2.2.1 Chemicals of Potential Ecological Concern

The concentrations of compounds measured at concentrations above practical quantitation limits (PQLs) at the C/S facilities were compared against the Ecological Indicator Soil Concentrations for Protection of Terrestrial Plants and Animals (Table 749-3). If the detected compounds at a particular facility exceeded values in Table 749-3, or, if indicator soil concentrations have not been established for particular compounds, then the compounds are considered chemicals of potential ecological concern (COPEC).

The COPECs at the C/S facilities are facility-specific as summarized below:

Sumas C/S:

- Gasoline-range Petroleum hydrocarbons (GRPH)
- Benzene;
- Toluene;
- Ethylbenzene;
- Total Xylenes;
- Polychlorinated Biphenyls (PCBs);
- Arsenic;
- Cadmium;
- Chromium;
- Lead; and
- Mercury

Mt. Vernon C/S:

- PCBs;
- Arsenic;
- Cadmium;
- Chromium;
- Lead; and
- Mercury

Snohomish C/S:

- Higher-range petroleum hydrocarbons (HRPH);
- Arsenic;
- Cadmium;
- Chromium
- Lead; and
- Mercury

Sumner C/S:

- GRPH;
- HRPH;
- Total naphthalenes;
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs);
- Arsenic;
- Cadmium;
- Chromium; and
- Mercury

Chehalis C/S and Jackson Prairie Storage Facility M/S:

- HRPH;
- cPAHs;
- Arsenic;
- Cadmium;
- Chromium;
- Lead; and
- Mercury

Washougal C/S:

- DRPH;
- HRPH;
- Arsenic;
- Cadmium;
- Chromium;
- Lead; and
- Mercury

2.2.1 Receptors of Concern

The potential receptors of concern at C/S facilities may include vascular vegetation, soil biota, ground-feeding birds, ground-feeding small mammal predators, and herbivorous small mammals.

2.2.2 Exposure Pathways

The primary exposure pathway for potential receptors of concern at the NWPL GP C/S facilities is direct contact with contaminated soil. Secondary exposure pathways can occur when potential receptors of concern feed on affected media, resulting in bioaccumulation of contaminants through the food chain. Plants exposed to contaminants may directly uptake the contamination from the soil in their roots. Animals may be exposed from direct contact with contaminated soil or by consuming affected plants and/or soil biota.

2.2.3 Toxicological Assessment

An initial toxicological literature study was performed to determine if any of the COPECs could be ruled out for any of the potential receptors of concern. Based on the toxicological information obtained, it is unlikely that any COPECs can be ruled out of TEE consideration. The sampling proposed herein will provide empirical site- and compound-specific toxicological data to determine protective concentrations of COPECs. This data will be more beneficial than performing an overly exhaustive literature study for each of the COPECs present.

2.2.4 Final Chemicals of Ecological Concern

In accordance with WAC 173-340-7493(2)(a)(i), hazardous substances may be eliminated from further TEE evaluations when the maximum, or the upper ninety-five percent confidence limit, soil concentrations found at given sites do not exceed ecological indicator concentrations provided in Table 749-3. Comparisons of the maximum or upper ninety-five percent confidence limit soil concentrations found at the NWPL GP C/S facilities to the ecological indicator concentrations were used as the basis for eliminating potential receptors for individual COPECs from further TEE. The maximum and upper ninety-five percent confidence limit soil concentrations found at the NWPL GP C/Ss are summarized on Table 1.

In addition to the criteria referenced in WAC 173-340-7493(2)(a)(i), in the comment transmittal letter dated July 27, 2011, Ecology requested that two following additional criteria be met to eliminate hazardous substances from further TEE evaluations:

- No single sample concentration shall be greater than two times the ecological indicator concentrations; and

- Less than ten percent of the sample concentrations exceed the ecological indicator.

[Note: For compounds where the upper ninety-five percent confidence limit is below the ecological indicator concentration but these two additional criteria are not met, the mechanism for meeting these additional criteria will be 'hot spot' removal. Such hot spots will be defined as those areas where the additional criteria referenced above do not meet the ecological indicator concentrations. After 'hot spot' removal, the remainder of the site will necessarily meet these additional criteria and the particular pathway of concern will be eliminated from TEE consideration. Table 1 has been revised to indicate where 'hot spot' removal will occur so that the site complies with these additional criteria for that particular pathway of concern. Such pathways eliminations are denoted with an "HS".]

Furthermore, in accordance with 173-340-7490(4)(a), conditional points of compliance may be established at the biologically active zones, which are typically 6 feet below grade, with the use of institutional controls. For purposes of TEE, it is assumed that if remediations are planned for a depth greater than 6 feet below grade, then those particular compounds are eliminated from further TEE and appropriate institutional controls will be implemented during site closures.

Table 1 summarizes the COPECs for the C/S facilities, the maximum measured concentrations, the upper ninety five percent confidence limit soil concentrations calculated for each COEPC, and the Ecological Indicator Concentrations from Table 749-3. Table 1 also indicates which potential receptor of concern has been eliminated for each COEPC and the basis for elimination. Cells that are highlighted in *green* indicate where site-specific toxicological data will be necessary in order to determine a concentration that will be protective of a particular receptor of concern.

Ecological indicator concentrations for wildlife receptors provided in Table 1 are based upon Ecology's Wildlife Exposure Model for Site-Specific Evaluations (WEM; Table 749-4). Using the default information in the WEM, indicator concentrations were calculated for all three potential wildlife receptors (*i.e.*, ground-feeding birds, ground-feeding small mammal predators, and herbivorous small mammals)

using a specific species, as specified by MTCA, as a type-species for that receptor. The calculations are included in Attachment A. The type-species for the three potential wildlife receptors are as follows:

- Ground-feeding birds – American Robin (*Turdus migratorius*)
- Ground-feeding small mammal predator – Shrew (*Sorex*)
- Herbivorous small mammals – Vole (*Microtus*)

For each COPEC, surrogate species receptors are selected based upon the lowest values calculated for the three wildlife receptors. The surrogate species receptors for the wildlife indicator concentrations are also indicated in Table 1.

Based on the above criteria as summarized in Table 1, the final chemicals of ecological concern (COECs) and their potential receptors are as follows [note: the surrogate species for Wildlife receptors, if applicable, are indicated in parentheses]:

Sumas C/S:

- PCBs – Soil biota and Wildlife (Shrew);
- Arsenic – Vascular Plants, Soil Biota, and Wildlife (Shrew); and
- Mercury – Vascular Plants, Soil Biota, and Wildlife (Robin).

Mt. Vernon C/S:

- PCBs – Soil biota and Wildlife (Shrew);
- Arsenic – Vascular Plants, Soil Biota, and Wildlife (Shrew); and
- Lead – Vascular Plants, Soil Biota, and Wildlife (Robin).
- Mercury – Soil Biota

Snohomish C/S:

- HRPH – Vascular Plants and Soil Biota;
- Arsenic – Vascular Plants and Wildlife (Shrew);
- Lead – Vascular Plants; and
- Mercury – Vascular Plants and Soil Biota.

Sumner C/S:

- GRPH – Vascular Plants;
- Total naphthalenes – Vascular Plants, Soil Biota, and Wildlife (All);
- cPAHs – Vascular Plants and Soil Biota; and
- Mercury – Soil Biota.

Chehalis C/S:

- HRPH – Vascular Plants and Soil Biota;
- cPAHs – Vascular Plants and Soil Biota; and
- Mercury – Soil Biota.

Washougal C/S:

- Arsenic – Vascular Plants and Wildlife (Shrew); and
- Mercury – Vascular Plants, Soil Biota, and Wildlife (Robin).

3.0 METHODOLOGY

The proposed model Site-Specific TEE identifies and addresses the issue of potential soil toxicity at the NWPL GP C/Ss and its potential effects on terrestrial and ecological receptors.

The approach proposed herein is to divide western Washington State into representative areas based on regional climate and geography and to collect empirical data at a representative facility within each area. The other C/S facilities assessed and remediated within a given representative area will utilize the data collected at the area's representative facility for determining compliance with TEE.

The proposed division of western Washington State includes two ecological regions, focusing mainly on geographic location and its associated climate systems. The proposed representative areas are:

a. Northwest Washington: located in the Puget Sound trough with a maritime climate, forested foothills, and abundant riparian habitat. This area experiences high volumes of rainfall, averaging 40-80-inches annually. Significant development has occurred along the Interstate-5 corridor, which the NWPL GP pipeline parallels.

b. Southwest Washington/Columbia River Basin: located to the west of the Cascade Mountain Range. This area's climate is similar to Northwest Washington; however, rainfall is slightly greater, receiving an annual precipitation of 55 to 140 inches.

Figure 1 presents the line of demarcation for the proposed NWPL GP pipeline facility representative areas, as they relate to the NWPL GP pipeline..

The premise of the representative areas is that the data collected at one facility within a particular area should be applicable to all other facilities within the representative area. Representative ecological assessment samples will be collected from impacted soils within C/S facilities in the representative areas depending upon the overall data needs of the area represented. Those data will then be deemed representative of the other facilities within that geographic region.

3.1 Soil Bioassay

In order to address whether chemical impacts to representative soils are protective of vascular plants and soil biota, soil samples will be subjected to bioassay screening as specified in WAC 173-340-7493(3)(b)(i). The samples for bioassay screening analyses will be collected from areas where the highest concentrations of impacts were found during assessment. The previously collected assessment data will be used to determine the sampling location. No soil dilution will be performed prior to analysis.

In order to confirm the contaminant concentration prior to bioassay analysis, a sample will be submitted from the bioassay sample collected and analyzed for appropriate COECs.

If the bioassay screening analysis determines that the high concentration soils are not protective of plants and/or soil biota for a particular region, then serial dilutions of samples will be performed to

determine concentrations that are protective. Prior to performing bioassay analysis, a sample will be collected from the diluted soils and analyzed for appropriate COECs to confirm the concentration of the diluted soil.

The methodology for the soil bioassay for plants will be in accordance with the Ecology Publication No. 96-324, *Early Seedling Growth Protocol for Soil Toxicity Screening.* The methodology for soil bioassay for soil biota will be in accordance with the Ecology Publication No. 96-327, *Earthworm Bioassay Protocol for Soil Toxicity Screening.* The soil bioassay analysis will be performed by Nautilus Environmental, a Department of Ecology accredited laboratory located in Tacoma, Washington.

3.2 Bioaccumulation Factor Calculation

For wildlife receptors, the surrogate species are the American Robin and the Shrew; both are ground-feeding carnivorous species. Therefore, in accordance with the WEM, the potential exposure pathway for these receptors is through consumption of worms living in contaminated soil. The driving factor in calculating a site-specific indicator concentration using the WEM is the bioaccumulation factor (BAF) for worms living in the contaminated media. In order to calculate site-specific indicator concentrations for wildlife receptors, site-specific BAFs for each relevant COEC will be assessed as allowed by WAC 173-340-7493(3)(c)(i).

The BAFs for biota will be measured by collecting and analyzing worm samples living in representative contaminated soils. If worms are not available in the representative soils, other biota (*e.g.*, spiders, potato bug, etc.) will be collected and analyzed in lieu of worms.

If no biotas are present in the representative soils, worms will be grown in contaminated media and then analyzed for COEC concentrations. Using previously collected assessment data to determine the sampling location, contaminated media will be collected for purposes of growing worms. In order to confirm the contaminant concentration prior to growing worms, a sample will be submitted from the contaminated media collected and analyzed for appropriate COECs.

Methodology for growing worms in contaminated media will be in accordance with the *Standard Guide for Conducting Laboratory Soil Toxicity or Bioaccumulation Tests with the Lumbricid Earthworm Eisenia Fetida* (ASTM E1676-04, 2007).

After growing the worms in the contaminated media using the above method, the worm tissue will be analyzed for appropriate COECs.

The BAFs are determined by dividing the concentrations of compounds within the biota samples by the concentrations within the soil in which the biota were collected or grown. The resulting BAFs will then be used in the WEM equations to calculate site-specific concentrations that are protective of wildlife receptors.

4.0 SITE GROUPINGS AND REPRESENTATIVE SITES

The following summarizes NWPL GP's proposed representative areas, the associated NWPL GP C/S facilities, and the proposed representative facility for each area; see **Figure 1**.

4.1 Sumas Compressor Station

Although the Sumas C/S facility is located within the Northwest Washington Representative Area, due to the highly impacted soil conditions at the Sumas facility compared with the remainder of the I-5 corridor C/S facilities, NWPL GP proposes to perform site-specific bioassay screenings and BAF measurements for the Sumas C/S facility only, rather than group this facility with others for reciprocity of data.

Therefore, the following analyses for soil samples collected at the indicated locations are proposed for Sumas C/S COECs:

Table 2
Proposed TEE Sampling Locations and Analysis
Sumas Compressor Station

Chemical of Ecological Concern	Sampling Location	Soil Bioassay for Soil Biota[1]	Soil Bioassay for Plants[2]	BAF Measurement[3]
PCBs	SM11-BO53:3 (25 mg/kg)	X		X
Arsenic	SMSBT4-3685:3 (8,100 mg/kg)	X	X	X
Mercury	SMSB2-0814:12 (180 mg/kg)	X	X	X

Notes:

1 Methods described in Ecology Publication No. 96-327, *Earthworm Bioassay Protocol for Soil Toxicity Screening*

2 Methods described in Ecology Publication No. 96-324, Early Seedling Growth Protocol for Soil Toxicity Screening.

3 Methods described in Section 3.0 herein

4.2 Northwest Washington Representative Area

The Mt. Vernon, Snohomish, Sumner, and Chehalis (including Jackson Prairie Storage Facility Meter Station M/S as discussed previously; one facility) facilities are all located within the proposed Northwest Washington Representative Area. Data collected at these facilities is proposed to have reciprocity from facility to facility within the Northwest Washington Representative Area.

The following analyses for soil samples collected at the indicated facilities and sample locations are proposed for COECs within the Northwest Washington Representative Area:

Table 3
Proposed TEE Sampling Locations and Analysis
Northwest Washington Representative Area

Chemical of Ecological Concern	Facility	Sampling Location	Soil Bioassay for Soil Biota[1]	Soil Bioassay for Plants[2]	BAF Measurement[3]
GRPH	Sumner	SNSB8-2:36 (240 mg/kg)	X		
HRPH	Snohomish	SHSB2-1:3 (3,300 mg/kg)	X	X	
Total Naphthalenes	Sumner	SNSB3-2:2 (37 mg/kg)	X	X	X
cPAHs	Sumner	SN13-BX13:3.5 (20 mg/kg)	X	X	
PCBs	Mt. Vernon	MV2-R15:3 (206 mg/kg)		X	X
Arsenic	Mt. Vernon	MVSB9-1:3 (1,700 mg/kg)	X	X	X
Lead	Mt. Vernon	MVSB9-1:3 (1,300 mg/kg)	X		X
Mercury	Snohomish	SHSB2-3:18 (12 mg/kg)	X	X	X

Notes:
1 Methods described in Ecology Publication No. 96-327, *Earthworm Bioassay Protocol for Soil Toxicity Screening*
2 Methods described in Ecology Publication No. 96-324, Early Seedling Growth Protocol for Soil Toxicity Screening.
3 Methods described in Section 3.0 herein

4.3 Southwest Washington/Columbia River Basin Representative Area

The Washougal C/S facility is the only facility located within the proposed Southwest Washington/Columbia River Basin Representative Area. Data collected at these facilities is proposed to have reciprocity from facility to facility within the Southwest Washington/Columbia River Basin Representative Area.

The following analyses for a single soil sample collected at the indicated location is proposed for Washougal C/S's sole COEC:

Table 4
Proposed TEE Sampling Locations and Analysis
Southwest Washington/Columbia River Basin Representative Area

Chemical of Ecological Concern	Facility	Sampling Location	Soil Bioassay for Soil Biota[1]	Soil Bioassay for Plants[2]	BAF Measurement[3]
Arsenic	Washougal	WS11-AM24 (26 mg/kg)		X	X
Mercury	Washougal	WSSB6-1010:12 (70 mg/kg)	X	X	X

Notes:

1 Methods described in Ecology Publication No. 96-327, *Earthworm Bioassay Protocol for Soil Toxicity Screening*

2 Methods described in Ecology Publication No. 96-324, Early Seedling Growth Protocol for Soil Toxicity Screening.

3 Methods described in Section 3.0 herein

Table 1
Summary of Chemicals of Potential Ecological Concern
Northwest Pipeline GP
I-5 Corridor Compressor Stations

Compressor Station	Chemicals of Potential Ecological Concern	Maximum Measured Concentration (mg/kg)	Current UCL[a]	Vasular Plants		Soil Biota		Wildlife Receptors		
				Indicator Concentration[b]	Receptor Eliminated[c]	Indicator Concentration[b]	Receptor Eliminated[c]	Indicator Concentration[d]	Surrogate Receptor [e]	Receptor Eliminated[c]
Sumas	GRPH	4,700	N/A[i]	NVE	R	100	R	5,000	Not Specified	M
	Benzene	3	N/A[i]	NVE	R	NVE	R	NVE	Not Specified	R
	Ethylbenzene	55	N/A[i]	NVE	R	NVE	R	NVE	Not Specified	R
	Total Xylenes	96	N/A[i]	NVE	R	NVE	R	NVE	Not Specified	R
	PCBs	25	3.62	40	HH	NVE		0.65	MP (shrew)	
	Arsenic	8,100	>100	10		60		7	MP (shrew)	
	Cadmium	8.1	3.96	4	HS	20	M	14	MP (shrew)	M
	Chromium	98	38.56	42	HS	42	HS	67	AP (robin)	U
	Lead	940	40	50	HS	500	U	118	AP (robin)	HS
	Mercury	180	40.39	0.3		0.1		5.5	AP (robin)	
Mt. Vernon	PCBs	206	7.4	40	HH	NVE		0.65	MP (shrew)	
	Arsenic	1,700	97	10		60		7	MP (shrew)	
	Cadmium	2.6	N/A[h]	4	M	20	M	14	MP (shrew)	M
	Chromium	140	60.35	42	HS	42	HS	67	AP (robin)	HS
	Lead	1,300	110	50		500		118	AP (robin)	
	Mercury	0.77	0.15	0.3	HS	0.1		5.5	AP (robin)	U
Snohomish	HRPH	3,300	264	NVE		200		6,000	Not Specified	M
	Arsenic	420	51.7	10		60	HS	7	MP (shrew)	
	Cadmium	9.5	1.29	4	HS	20	M	14	MP (shrew)	M
	Chromium	60	23.65	42	U	42	U	67	AP (robin)	M
	Lead	380	70.26	50		500	M	118	AP (robin)	HS
	Mercury	12	0.471	0.3		0.1		5.5	AP (robin)	U
Sumner	GRPH	240	11.26	NVE		100	HH	5,000	Not Specified	M
	HRPH	10,000	416	NVE	R	200	R	6,000	Not Specified	R
	Total Naphthalenes	37	N/A[g]	NVE		NVE		NVE	N/A	
	cPAHs	20.28	0.551	NVE		NVE		12	MP (shrew)	U
	Arsenic	12	1.99	10	M	60	M	7	MP (shrew)	U
	Cadmium	3.6	N/A[h]	4	M	20	M	14	MP (shrew)	M
	Chromium	46	22.04	42	U	42	U	67	AP (robin)	M
	Mercury	0.16	0.089	0.3	M	0.1		5.5	AP (robin)	M
Chehalis-JP	HRPH	2,500	221	NVE[f]		200		6,000	Not Specified	M
	cPAHs	1.7	0.069	NVE		NVE		12	MP (shrew)	M
	Arsenic	25	2.583	10	R	60	M	7	MP (shrew)	R
	Cadmium	5.4	0.925	4	U	20	M	14	MP (shrew)	M
	Chromium	71	18.4	42	U	42	U	67	AP (robin)	U
	Lead	230	11.4	50	HS	500	M	118	AP (robin)	U
	Mercury	0.6	0.144	0.3	U	0.1		5.5	AP (robin)	M
Washougal	DRPH	160	19.11	NVE	HS	200	M	6000	Not Specified	M
	HRPH	1,300	100.53	NVE	HS	200	HS	6,000	Not Specified	M
	Arsenic	26	4.125	10		60	U	7	MP (shrew)	
	Cadmium	15	1.643	4	HS	20	M	14	MP (shrew)	U
	Chromium	190	27.05	42	HS	42	HS	67	AP (robin)	HS
	Lead	340	21.189	50	HS	500	M	118	AP (robin)	HS
	Mercury	70	2.302	0.3		0.1		5.5	AP (robin)	

Notes:

a 95 percent upper confidence level (UCL) calculated using MTCA-Stat 97

b Ecological Indicator Soil Concentrations (EIC) for Protection of Terrestrial Pland and Animals (Table 749-3) - mg/kg

c Receptors eliminated from further TEE according to the following basis:
- M - The maximum concentration observed at the facility is less than the EIC for that particular receptor
- U - The upper 95% confidence level soil concentration is less than the EIC for that particular receptor, no sample exceeds twice the EIC, less than 10% of the samples exceed the EIC.
- R - Remediation will occur to a depth below the conditional point of compliance (*i.e.*, 6 feet below grade)
- HS - 'Hot spot' planned for remediation. After 'hot spot' remediation, remaining site-wide data will comply with the statisical criteria listed in footnote c-U.
- HH - Remediation will occur to a remediation level protective of human health, which is below that particular EIC

d EIC calculated using the Wildlife Exposure Model (WEM) for Site-Specific Evaluations (Table 749-4)

e Surrogate Receptor for the WEM
- AP - Avian Predator (American Robin)
- MP - Mamallian Predator (Shrew)
- MH - Mamallian herbivore (Vole)

f NVE - No value established

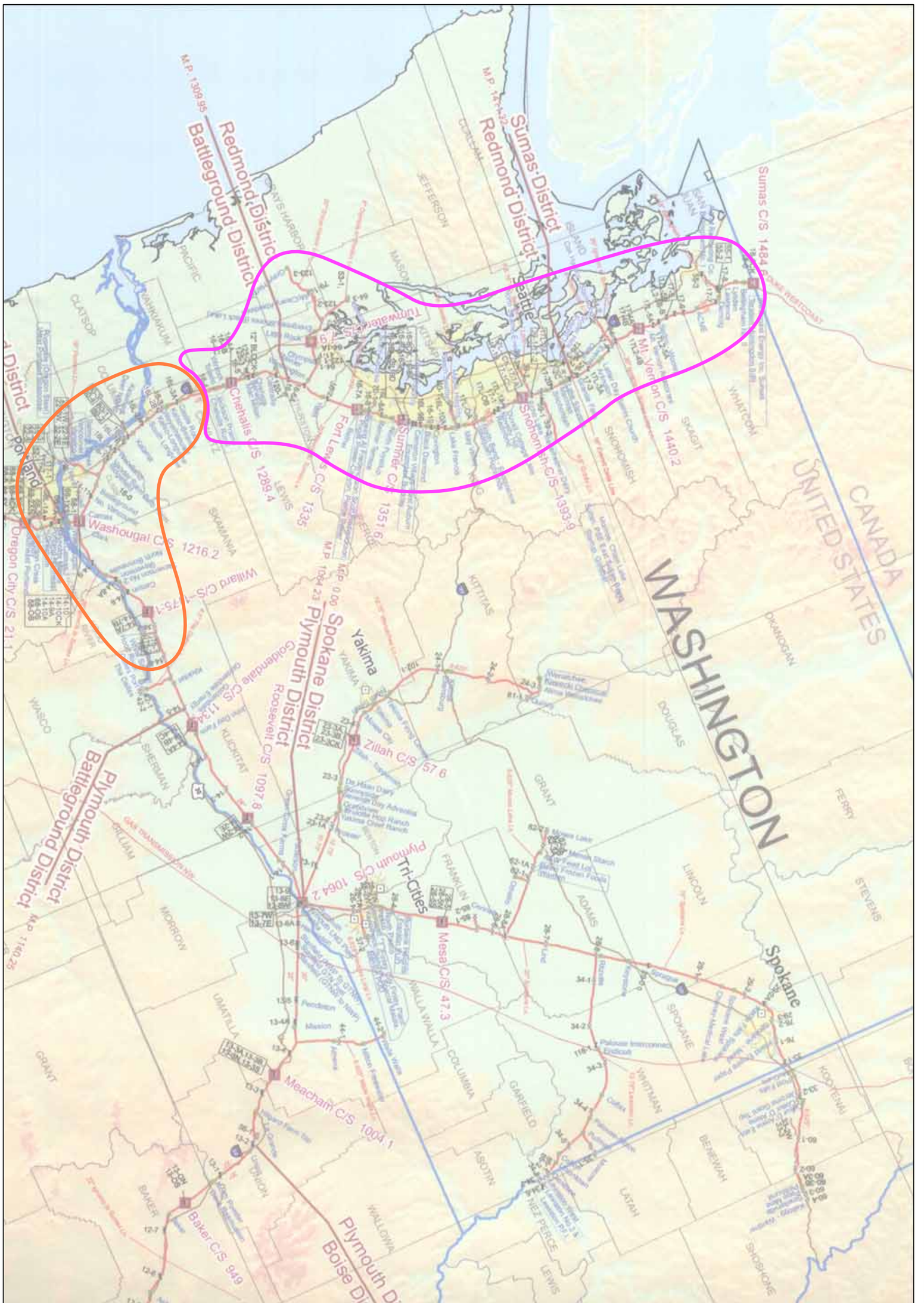
g No UCL calculated on the basis that there are no EICs established for that particular contaminant of concern

h No UCL calculated on the basis that the maximum concentration observed at the facility is less than the EICs

i No UCL calculated on the basis that remediation will occure at a depth greater than the conditional point of compliance (*i.e.*, 6 feet below grade)

N/A Not applicable

Site-specific toxicological data required in order to determine a concentration that is protective



KEY:

NORTHWEST WASHINGTON

SOUTHWEST WASHINGTON/COLUMBIA BASIN

NOT TO SCALE

ENVIRONMENTAL PARTNERS INC
295 NE Gilman Boulevard, Suite 201
Issaquah, Washington 98027

TEE SITE
"REPRESENTATIVE AREAS"

PROJECT	47308.33		
PREPARED FOR	NWPL GP/WILLIAMS		
LOCATION	WASHINGTON		
SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	ARM	EMK	01/13/11

Attachment A

Cleanup Levels for Potential TEE Receptors
ARSENIC

Cleanup Level for Avian Predator (Robin)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T robin}}{\text{(FIR robin X Psb robin X BAF worm) + (SIR robin X RGAF robin)}}$$

CUL	Units
150	**mg/kg**

Variable	Unit	Value
Psb robin	Unitless	0.52
FIR robin	kg dry food / kg body weight - day	0.207
SIR robin	kg dry soil / kg body weight - day	0.0215
RGAF robin	Unitless (Table 749-5)	1
T robin	mg/kg - day (Table 749-5)	22
Home Range	Acres	0.6
BAF worm	mg/kg worm / mg/kg soil (Table 749-5)	1.16

Notes:

Psb	Proportion of contaminated food in diet
FIR	Food ingestion rate
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor
T	Toxicity Reference Value
BAF	Bioaccumulation factor

Cleanup Level for Mammalian Predator (Shrew)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T shrew}}{\text{(FIR shrew X Psb shrew X BAF worm) + (SIR shrew X RGAF shrew)}}$$

CUL	Units
7	**mg/kg**

Variable	Unit	Value
T shrew	mg/kg - day	1.89
FIR shrew	kg dry food / kg body weight - day	0.45
Psb shrew	unitless	0.5
BAF worm	mg/kg worm / mg/kg soil	1.16
SIR shrew	kg dry soil / kg body weight - day	0.0045
RGAF shrew	Unitless (chemical specific-As)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
BAF	Bioaccumulation factor
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

Cleanup Level for Mammalian Herbivore (Vole)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T vole}}{\text{(FIR vole X P plant, vole X K plant) + (SIR vole X RGAF vole)}}$$

CUL	Units
43	**mg/kg**

Variable	Unit	Value
T vole	mg/kg - day	1.15
FIR vole	kg dry food / kg body weight - day	0.315
P plant, vole	unitless	1
K plant	mg/kg worm / mg/kg soil	0.06
SIR vole	kg dry soil / kg body weight - day	0.0079
RGAF vole	Unitless (chemical specific-As)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
K	Plant uptake coefficient
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

TEE Book Value CUL Protective of Plants
Table 749-3

CUL	Units
10	**mg/kg**

TEE Book Value CUL Protective of Soil Biota
Table 749-3

CUL	Units
60	**mg/kg**

Cleanup Levels for Potential TEE Receptors
CADMIUM

Cleanup Level for Avian Predator (Robin)
Equation in Table 749-4

Soil CUL = $\dfrac{\text{T robin}}{\text{(FIR robin X Psb robin X BAF worm) + (SIR robin X RGAF robin)}}$

CUL	Units
39	**mg/kg**

Variable	Unit	Value
Psb robin	Unitless	0.52
FIR robin	kg dry food / kg body weight - day	0.207
SIR robin	kg dry soil / kg body weight - day	0.0215
RGAF robin	Unitless (Table 749-5)	1
T robin	mg/kg - day (Table 749-5)	20
Home Range	Acres	0.6
BAF worm	mg/kg worm / mg/kg soil (Table 749-5)	4.6

Notes:

Psb	Proportion of contaminated food in diet
FIR	Food ingestion rate
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor
T	Toxicity Reference Value
BAF	Bioaccumulation factor

Cleanup Level for Mammalian Predator (Shrew)
Equation in Table 749-4

Soil CUL = $\dfrac{\text{T shrew}}{\text{(FIR shrew X Psb shrew X BAF worm) + (SIR shrew X RGAF shrew)}}$

CUL	Units
14	**mg/kg**

Variable	Unit	Value
T shrew	mg/kg - day	15
FIR shrew	kg dry food / kg body weight - day	0.45
Psb shrew	unitless	0.5
BAF worm	mg/kg worm / mg/kg soil	4.6
SIR shrew	kg dry soil / kg body weight - day	0.0045
RGAF shrew	Unitless (chemical specific-Cd)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
BAF	Bioaccumulation factor
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

Cleanup Level for Mammalian Herbivore (Vole)
Equation in Table 749-4

Soil CUL = $\dfrac{\text{T vole}}{\text{(FIR vole X P plant, vole X K plant) + (SIR vole X RGAF vole)}}$

CUL	Units
288	**mg/kg**

Variable	Unit	Value
T vole	mg/kg - day	15
FIR vole	kg dry food / kg body weight - day	0.315
P plant, vole	unitless	1
K plant	mg/kg worm / mg/kg soil	0.14
SIR vole	kg dry soil / kg body weight - day	0.0079
RGAF vole	Unitless (chemical specific-Cd)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
K	Plant uptake coefficient
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

TEE Book Value CUL Protective of Plants
Table 749-3

CUL	Units
4	**mg/kg**

TEE Book Value CUL Protective of Soil Biota
Table 749-3

CUL	Units
20	**mg/kg**

Cleanup Levels for Potential TEE Receptors
TOTAL CHROMIUM

Cleanup Level for Avian Predator (Robin)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T robin}}{\text{(FIR robin X Psb robin X BAF worm) + (SIR robin X RGAF robin)}}$$

CUL	Units
67	**mg/kg**

Variable	Unit	Value
Psb robin	Unitless	0.52
FIR robin	kg dry food / kg body weight - day	0.207
SIR robin	kg dry soil / kg body weight - day	0.0215
RGAF robin	Unitless (Table 749-5)	1
T robin	mg/kg - day (Table 749-5)	5
Home Range	Acres	0.6
BAF worm	mg/kg worm / mg/kg soil (Table 749-5)	0.49

Notes:

Psb	Proportion of contaminated food in diet
FIR	Food ingestion rate
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor
T	Toxicity Reference Value
BAF	Bioaccumulation factor

Cleanup Level for Mammalian Predator (Shrew)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T shrew}}{\text{(FIR shrew X Psb shrew X BAF worm) + (SIR shrew X RGAF shrew)}}$$

CUL	Units
307	**mg/kg**

Variable	Unit	Value
T shrew	mg/kg - day	35.2
FIR shrew	kg dry food / kg body weight - day	0.45
Psb shrew	unitless	0.5
BAF worm	mg/kg worm / mg/kg soil	0.49
SIR shrew	kg dry soil / kg body weight - day	0.0045
RGAF shrew	Unitless (chemical specific-Ch)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
BAF	Bioaccumulation factor
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

Cleanup Level for Mammalian Herbivore (Vole)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T vole}}{\text{(FIR vole X P plant, vole X K plant) + (SIR vole X RGAF vole)}}$$

CUL	Units
91	**mg/kg**

Variable	Unit	Value
T vole	mg/kg - day	29.6
FIR vole	kg dry food / kg body weight - day	0.315
P plant, vole	unitless	1
K plant	mg/kg worm / mg/kg soil	1.01
SIR vole	kg dry soil / kg body weight - day	0.0079
RGAF vole	Unitless (chemical specific-Ch)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
K	Plant uptake coefficient
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

TEE Book Value CUL Protective of Plants
Table 749-3

CUL	Units
42	**mg/kg**

TEE Book Value CUL Protective of Soil Biota
Table 749-3

CUL	Units
42	**mg/kg**

Cleanup Levels for Potential TEE Receptors
TOTAL LEAD

Cleanup Level for Avian Predator (Robin)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T robin}}{\text{(FIR robin X Psb robin X BAF worm) + (SIR robin X RGAF robin)}}$$

CUL	Units
118	**mg/kg**

Variable	Unit	Value
Psb robin	Unitless	0.52
FIR robin	kg dry food / kg body weight - day	0.207
SIR robin	kg dry soil / kg body weight - day	0.0215
RGAF robin	Unitless (Table 749-5)	1
T robin	mg/kg - day (Table 749-5)	11.3
Home Range	Acres	0.6
BAF worm	mg/kg worm / mg/kg soil (Table 749-5)	0.69

Notes:

Psb	Proportion of contaminated food in diet
FIR	Food ingestion rate
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor
T	Toxicity Reference Value
BAF	Bioaccumulation factor

Cleanup Level for Mammalian Predator (Shrew)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T shrew}}{\text{(FIR shrew X Psb shrew X BAF worm) + (SIR shrew X RGAF shrew)}}$$

CUL	Units
125	**mg/kg**

Variable	Unit	Value
T shrew	mg/kg - day	20
FIR shrew	kg dry food / kg body weight - day	0.45
Psb shrew	unitless	0.5
BAF worm	mg/kg worm / mg/kg soil	0.69
SIR shrew	kg dry soil / kg body weight - day	0.0045
RGAF shrew	Unitless (chemical specific-Pb)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
BAF	Bioaccumulation factor
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

Cleanup Level for Mammalian Herbivore (Vole)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T vole}}{\text{(FIR vole X P plant, vole X K plant) + (SIR vole X RGAF vole)}}$$

CUL	Units
2132	**mg/kg**

Variable	Unit	Value
T vole	mg/kg - day	20
FIR vole	kg dry food / kg body weight - day	0.315
P plant, vole	unitless	1
K plant	mg/kg worm / mg/kg soil	0.0047
SIR vole	kg dry soil / kg body weight - day	0.0079
RGAF vole	Unitless (chemical specific-Pb)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
K	Plant uptake coefficient
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

TEE Book Value CUL Protective of Plants
Table 749-3

CUL	Units
50	**mg/kg**

TEE Book Value CUL Protective of Soil Biota
Table 749-3

CUL	Units
500	**mg/kg**

Cleanup Levels for Potential TEE Receptors
MERCURY

Cleanup Level for Avian Predator (Robin)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T robin}}{\text{(FIR robin X Psb robin X BAF worm) + (SIR robin X RGAF robin)}}$$

CUL	Units
5.5	**mg/kg**

Variable	Unit	Value
Psb robin	Unitless	0.52
FIR robin	kg dry food / kg body weight - day	0.207
SIR robin	kg dry soil / kg body weight - day	0.0215
RGAF robin	Unitless (Table 749-5)	1
T robin	mg/kg - day (Table 749-5)	0.9
Home Range	Acres	0.6
BAF worm	mg/kg worm / mg/kg soil (Table 749-5)	1.32

Notes:

Psb	Proportion of contaminated food in diet
FIR	Food ingestion rate
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor
T	Toxicity Reference Value
BAF	Bioaccumulation factor

Cleanup Level for Mammalian Predator (Shrew)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T shrew}}{\text{(FIR shrew X Psb shrew X BAF worm) + (SIR shrew X RGAF shrew)}}$$

CUL	Units
9	**mg/kg**

Variable	Unit	Value
T shrew	mg/kg - day	2.86
FIR shrew	kg dry food / kg body weight - day	0.45
Psb shrew	unitless	0.5
BAF worm	mg/kg worm / mg/kg soil	1.32
SIR shrew	kg dry soil / kg body weight - day	0.0045
RGAF shrew	Unitless (chemical specific-Hg)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
BAF	Bioaccumulation factor
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

Cleanup Level for Mammalian Herbivore (Vole)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T vole}}{\text{(FIR vole X P plant, vole X K plant) + (SIR vole X RGAF vole)}}$$

CUL	Units
82	**mg/kg**

Variable	Unit	Value
T vole	mg/kg - day	2.86
FIR vole	kg dry food / kg body weight - day	0.315
P plant, vole	unitless	1
K plant	mg/kg worm / mg/kg soil	0.0854
SIR vole	kg dry soil / kg body weight - day	0.0079
RGAF vole	Unitless (chemical specific-Hg)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
K	Plant uptake coefficient
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

TEE Book Value CUL Protective of Plants
Table 749-3

CUL	Units
0.3	**mg/kg**

TEE Book Value CUL Protective of Soil Biota
Table 749-3

CUL	Units
0.1	**mg/kg**

Cleanup Levels for Potential TEE Receptors
PCBs

Cleanup Level for Avian Predator (Robin)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T robin}}{\text{(FIR robin X Psb robin X BAF worm) + (SIR robin X RGAF robin)}}$$

CUL	Units
3.5	**mg/kg**

Variable	Unit	Value
Psb robin	Unitless	0.52
FIR robin	kg dry food / kg body weight - day	0.207
SIR robin	kg dry soil / kg body weight - day	0.0215
RGAF robin	Unitless (Table 749-5)	1
T robin	mg/kg - day (Table 749-5)	1.8
Home Range	Acres	0.6
BAF worm	mg/kg worm / mg/kg soil (Table 749-5)	4.58

Notes:

Psb	Proportion of contaminated food in diet
FIR	Food ingestion rate
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor
T	Toxicity Reference Value
BAF	Bioaccumulation factor

Cleanup Level for Mammalian Predator (Shrew)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T shrew}}{\text{(FIR shrew X Psb shrew X BAF worm) + (SIR shrew X RGAF shrew)}}$$

CUL	Units
0.65	**mg/kg**

Variable	Unit	Value
T shrew	mg/kg - day	0.668
FIR shrew	kg dry food / kg body weight - day	0.45
Psb shrew	unitless	0.5
BAF worm	mg/kg worm / mg/kg soil	4.58
SIR shrew	kg dry soil / kg body weight - day	0.0045
RGAF shrew	Unitless (chemical specific-PCBs)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
BAF	Bioaccumulation factor
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

Cleanup Level for Mammalian Herbivore (Vole)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T vole}}{\text{(FIR vole X P plant, vole X K plant) + (SIR vole X RGAF vole)}}$$

CUL	Units
14	**mg/kg**

Variable	Unit	Value
T vole	mg/kg - day	0.51
FIR vole	kg dry food / kg body weight - day	0.315
P plant, vole	unitless	1
K plant	mg/kg worm / mg/kg soil	0.087
SIR vole	kg dry soil / kg body weight - day	0.0079
RGAF vole	Unitless (chemical specific-PCBs)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
K	Plant uptake coefficient
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

TEE Book Value CUL Protective of Plants
Table 749-3

CUL	Units
40	**mg/kg**

TEE Book Value CUL Protective of Soil Biota
Table 749-3

CUL	Units
NVE	**mg/kg**

Cleanup Levels for Potential TEE Receptors
cPAHs

Cleanup Level for Avian Predator (Robin)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T robin}}{\text{(FIR robin X Psb robin X BAF worm) + (SIR robin X RGAF robin)}}$$

CUL	Units
Not Calculable	--

Variable	Unit	Value
Psb robin	Unitless	0.52
FIR robin	kg dry food / kg body weight - day	0.207
SIR robin	kg dry soil / kg body weight - day	0.0215
RGAF robin	Unitless (Table 749-5)	1
T robin	mg/kg - day (Table 749-5)	NVE
Home Range	Acres	0.6
BAF worm	mg/kg worm / mg/kg soil (Table 749-5)	0.43

Notes:

Psb	Proportion of contaminated food in diet
FIR	Food ingestion rate
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor
T	Toxicity Reference Value
BAF	Bioaccumulation factor

Cleanup Level for Mammalian Predator (Shrew)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T shrew}}{\text{(FIR shrew X Psb shrew X BAF worm) + (SIR shrew X RGAF shrew)}}$$

CUL	Units
12	**mg/kg**

Variable	Unit	Value
T shrew	mg/kg - day	1.19
FIR shrew	kg dry food / kg body weight - day	0.45
Psb shrew	unitless	0.5
BAF worm	mg/kg worm / mg/kg soil	0.43
SIR shrew	kg dry soil / kg body weight - day	0.0045
RGAF shrew	Unitless (chemical specific-benzo(a)pyrene)	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
BAF	Bioaccumulation factor
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

Cleanup Level for Mammalian Herbivore (Vole)
Equation in Table 749-4

$$\text{Soil CUL} = \frac{\text{T vole}}{\text{(FIR vole X P plant, vole X K plant) + (SIR vole X RGAF vole)}}$$

CUL	Units
80	**mg/kg**

Variable	Unit	Value
T vole	mg/kg - day	0.91
FIR vole	kg dry food / kg body weight - day	0.315
P plant, vole	unitless	1
K plant	mg/kg worm / mg/kg soil	0.011
SIR vole	kg dry soil / kg body weight - day	0.0079
RGAF vole	Unitless (chemical specific-benzo(a)pyrene	1

Notes:

T	Toxicity Reference Value
FIR	Food ingestion rate
P	Proportion of contaminated food in diet
K	Plant uptake coefficient
SIR	Soil ingestion rate
RGAF	Gut Absorbsion Factor

TEE Book Value CUL Protective of Plants
Table 749-3

CUL	Units
NVE	**mg/kg**

TEE Book Value CUL Protective of Soil Biota
Table 749-3

CUL	Units
NVE	**mg/kg**