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Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Hanford Site Environmental Surveillance Master Sampling Schedule for Calendar Year 2011

LE Bisping

January 2011



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NATIONAL LABORATORY

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Pacific Northwest National Laboratory
Richland, Washington 99352

Summary

Environmental surveillance of the Hanford Site and surrounding areas is conducted by Pacific Northwest National Laboratory for the U.S. Department of Energy (DOE).¹ Sampling is conducted to evaluate levels of radioactive and nonradioactive pollutants in the Hanford Site environs, as required in DOE Order 450.1A, “Environmental Protection Program,” and DOE Order 5400.5, “Radiation Protection of the Public and the Environment.”^{2,3} The environmental surveillance sampling design is described in the Hanford Site *Environmental Monitoring Plan, United States Department of Energy, Richland Operations Office* (DOE/RL-91-50).⁴

This document contains the calendar year 2011 schedule for the routine collection of samples for the Surface Environmental Surveillance Project (SESP) and the Drinking Water Monitoring Project (DWMP). Each section includes sampling locations, sampling frequencies, sample types, and analyses to be performed. In some cases, samples are scheduled on a rotating basis. If a sample will not be collected in 2011, the anticipated year for collection is provided. Maps showing approximate sampling locations are included for media scheduled for collection in 2011.

Surface Environmental Surveillance Project Sampling

The SESP is a multimedia environmental surveillance effort to measure the concentrations of radionuclides and chemicals in environmental media to demonstrate compliance with applicable environmental quality standards and public exposure limits, and assess environmental impacts. Project personnel annually collect selected samples of ambient air, surface water, agricultural products, fish, wildlife, and sediments. Soil and vegetation samples are collected approximately every 5 years. Analytical capabilities include the measurement of radionuclides at environmental concentrations and in selected media; and nonradiological constituents including metals, anions, volatile organic compounds, and total organic carbon.

Drinking Water Monitoring Project Sampling

Mission Support Alliance, LLC is responsible for monitoring the quality of drinking water supplied by DOE to its onsite facilities in accordance with federal and state regulations. Pacific Northwest National Laboratory conducts radiological monitoring of onsite drinking water for Mission Support Alliance, LLC concurrent with SESP activities to promote sampling efficiency and consistency; use expertise developed over the years; and reduce costs associated with management, sample collection, procedure development, analytical contracting, data management, quality control, and reporting.

¹ Pacific Northwest National Laboratory is operated by Battelle for the U.S. Department of Energy.

² DOE Order 450.1A. 2008. “Environmental Protection Program.” U.S. Department of Energy, Washington, D.C.

³ DOE Order 5400.5, Chg 2. 1993. “Radiation Protection of the Public and the Environment.” U.S. Department of Energy, Washington, D.C.

⁴ DOE/RL-91-50, Rev. 4. 2008. *Environmental Monitoring Plan, United States Department of Energy, Richland Operations Office*. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Data Management

The Hanford Environmental Information System (HEIS) database is used as a repository for data gathered during environmental surveillance activities at the Hanford Site. For ease in retrieving SESP or drinking water data from the HEIS database, the majority of the location names in this document are the location names used in the database.⁵

Schedule Changes

This schedule is subject to modification during the year in response to changes in Hanford Site operations, program requirements, and the nature of the observed results. Operational limitations such as weather, mechanical failures, sample availability, and other factors may also impact scheduled sampling. Therefore, this document may not be an accurate record of samples collected during the year.

Multi-Agency Samples

By joint agreement, some samples are collected by SESP personnel and provided to the Washington State Department of Health. All planned cooperative sampling efforts are indicated in this schedule.

Additional Information

Questions relating to the content of this document can be directed to either

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or

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(509) 371-7121

⁵HEIS. 1989. *Hanford Environmental Information System*. Environmental Database Management, CH2M HILL Plateau Remediation Company, Richland, Washington.

Acronyms and Symbols

Acronyms

ALE	Fitzner/Eberhardt Arid Lands Ecology Reserve
DOE	U.S. Department of Energy
DOH	Washington State Department of Health
DR	downriver
DWMP	Drinking Water Monitoring Project
FFTF	Fast Flux Test Facility
HEIS	Hanford Environmental Information System
HRM	Hanford River Marker
ICP-MS	inductively coupled plasma mass spectrometry
NASQAN	National Stream Quality Accounting Network
PNNL	Pacific Northwest National Laboratory
PRD	Priest Rivers Dam
SESP	Surface Environmental Surveillance Project
UR	upriver
USGS	U.S. Geological Survey

Frequency Symbols Used

A	annually
BE	biennially (every 2 years)
BW	biweekly (every 2 weeks)
M	monthly
M Comp.	monthly composite
Q	quarterly
Q Comp.	quarterly composite
SA	semiannually (twice each year)
TE	triennially (every 3 years)

Analytical Symbols Used

Generally, standard element, chemical, and isotope designations are used to indicate the analyses performed. Other analytical designations used include the following:

Alpha	gross alpha activity of sample
Anions	major anions – generally chloride, fluoride, nitrate, nitrite, sulfate
Beta	gross beta activity of sample

Gamma Scan	analysis of photon energy spectrum for individual photon-emitting radionuclides
HTO	tritiated water ($^3\text{H}^1\text{H}^{16}\text{O}$)
Hg-CVAA	mercury by cold vapor atomic absorbance spectrometry
Hg-CVAF	total mercury in water by cold vapor atomic fluorescence
ICP-MS	major metals by inductively coupled plasma mass spectrometry – samples unfiltered unless otherwise noted
Lo ^3H	low-level method for the electrolytic enrichment of tritium
Pu	isotopic plutonium (^{238}Pu , $^{239/240}\text{Pu}$)
TOC	total organic carbon
U	isotopic uranium (^{234}U , ^{235}U , ^{238}U)
VOA	volatile organic compounds

Contents

Summary	iii
Acronyms and Symbols	v
1.0 Air Surveillance.....	1
1.1 Particulate Filter	1
1.2 Tritium.....	3
2.0 Surface Water Surveillance	5
2.1 Columbia River	5
2.2 River Shoreline Springs	8
2.3 Onsite Pond	9
2.4 Offsite Irrigation.....	9
3.0 Drinking Water Surveillance	11
3.1 Onsite Drinking.....	11
4.0 Biota	13
4.1 Food and Farm Products	13
4.1.1 Milk	13
4.1.2 Leafy Vegetables.....	13
4.1.3 Vegetables	13
4.1.4 Fruits	14
4.1.5 Wines.....	14
4.1.6 Alfalfa	14
4.2 Wildlife	16
4.2.1 Fish.....	16
4.2.2 Geese	17
4.2.3 Upland Game Birds.....	17
4.2.4 Rabbits.....	18
4.2.5 Deer/Elk	18
5.0 Soil and Vegetation	21
5.1 Soil	21
5.2 Vegetation	22
6.0 Sediment.....	23
6.1 Columbia River	23
6.2 River Shoreline Springs	23
6.3 Onsite Pond.....	23

Figures

1.1	2011 Air Sampling Locations	4
2.1	2011 Surface Water and Drinking Water Sampling Locations.....	10
4.1	2011 Food and Farm Products Sampling Locations	15
4.2	2011 Wildlife Sampling Locations	19
6.1	2011 Sediment Sampling Locations	24

1.0 Air Surveillance

1.1 Particulate Filter

Location	Individual Samples			Composited Samples		
	Location Number ^(a)	Frequency	Analyses	Composite Group	Frequency	Analyses
Onsite						
100 K Area	1	BW	Beta, Alpha	100 Areas	Q	⁹⁰ Sr, Pu, Gamma Scan
100 N-1325 Crib	2	BW	Beta, Alpha			
100 D Area	3	BW	Beta, Alpha			
100 F Met Tower	4	BW	Beta, Alpha	Hanford Townsite	Q	⁹⁰ Sr, Pu, Gamma Scan
Hanford Townsite	5	BW	Beta, Alpha			
Gable Mountain	6	BW	Beta, Alpha	Gable Mountain	Q	Pu, U, Gamma Scan
200 ESE	7	BW	Beta, Alpha	200 E Area	Q	⁹⁰ Sr, Pu, U, Gamma Scan
S of 200 E	8	BW	Beta, Alpha			
B Pond	9	BW	Beta, Alpha	B Pond	Q	Pu, U, Gamma Scan
Army Loop Camp	10	BW	Beta, Alpha	200 W South East	Q	⁹⁰ Sr, Pu, U, Gamma Scan
200 Tel. Exchange	11	BW	Beta, Alpha			
SW of B/C Cribs	12	BW	Beta, Alpha			
200 W SE	13	BW	Beta, Alpha	200 W Area	Q	Pu, U, Gamma Scan
300 Water Intake	14	BW	Beta, Alpha	300 Area	Q	⁹⁰ Sr, Pu, U, Gamma Scan
300 South Gate	15	BW	Beta, Alpha			
300 South West	16	BW	Beta, Alpha			
300 Trench	17	BW	Beta, Alpha	300 NE	Q	⁹⁰ Sr, Pu, U, Gamma Scan
300 NE	18	BW	Beta, Alpha			
400 E	19	BW	Beta, Alpha	400 Area	Q	⁹⁰ Sr, Pu, Gamma Scan
400 N	20	BW	Beta, Alpha			
Wye Barricade ^(b)	21	BW	Beta, Alpha	Wye Barricade	Q	Pu, U, Gamma Scan
Perimeter						
Ringold Met Tower	22	BW	Beta, Alpha	Ringold Met Tower	Q	Pu, Gamma Scan
W End of Fir Road ^(b)	23	BW	Beta, Alpha	W End of Fir Road	Q	⁹⁰ Sr, Pu, U, Gamma Scan
Dogwood Met Tower	24	BW	Beta, Alpha	Dogwood Met Tower	Q	⁹⁰ Sr, U, Gamma Scan
Byers Landing	25	BW	Beta, Alpha	Byers Landing	Q	⁹⁰ Sr, Pu, U, Gamma Scan
Battelle Complex ^(b)	26	BW	Beta, Alpha	Battelle Complex	Q	U, Gamma Scan
Horn Rapids Substa	27	BW	Beta, Alpha	Prosser Barricade	Q	⁹⁰ Sr, Pu, Gamma Scan
Prosser Barricade ^(b)	28	BW	Beta, Alpha			
Yakima Barricade ^(b)	29	BW	Beta, Alpha	Yakima Barricade	Q	⁹⁰ Sr, Pu, Gamma Scan
Rattlesnake Springs	30	BW	Beta, Alpha			
Wahluke Slope	31	BW	Beta, Alpha	Wahluke Slope	Q	⁹⁰ Sr, Pu, Gamma Scan
S End Vernita Bridge	32	BW	Beta, Alpha			

Particulate Filter (contd)

Location	Individual Samples			Composited Samples		
	Location Number ^(a)	Frequency	Analyses	Composite Group	Frequency	Analyses
Community						
Basin City School	33	BW	Beta, Alpha	Basin City School	Q	Pu, U, Gamma Scan
Leslie Groves-Rchlnd	34	BW	Beta, Alpha	Leslie Groves-Rchlnd	Q	⁹⁰ Sr, Pu, U, Gamma Scan
Pasco	35	BW	Beta	Tri Cities	Q	⁹⁰ Sr, Pu, U, Gamma Scan
Kennewick-Ely Street	36	BW	Beta, Alpha			
Benton City	37	BW	Beta	Benton City	Q	Gamma Scan
Mattawa	38	BW	Beta	Mattawa	Q	Gamma Scan
Othello	39	BW	Beta	Othello	Q	U, Gamma Scan
Distant						
Yakima	40	BW	Beta, Alpha	Yakima	Q	⁹⁰ Sr, Pu, U, Gamma Scan

(a) Refer to Figure 1.1, "2011 Air Sampling Locations."

(b) Washington State Department of Health (DOH) air sampler also at this location.

1.2 Tritium

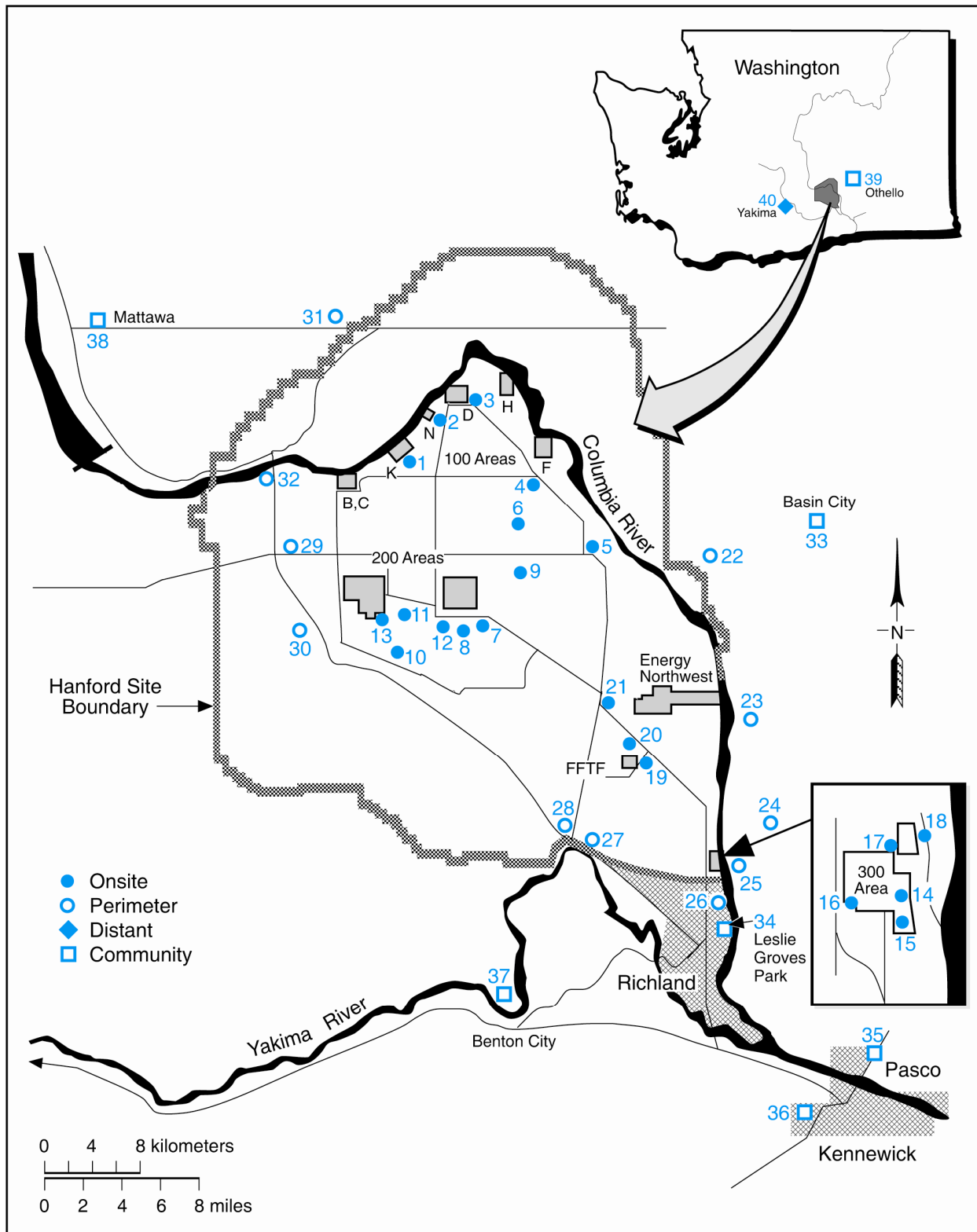
Location	Location Number ^(a)	Frequency	Analysis ^(b)
Onsite			
100 K Area	1	M	³ H
100 N-1325 Crib	2	M	³ H
200 ESE	7	M	³ H
200 Tel. Exchange	11	M	³ H
300 Water Intake ^(c)	14	M	³ H
300 South Gate ^(d)	15	M	³ H
300 South West	16	M	³ H
300 Trench	17	M	³ H
300 NE	18	M	³ H
400 E	19	M	³ H
Perimeter			
Ringold Met Tower	22	M	³ H
W End of Fir Road	23	M	³ H
Dogwood Met Tower	24	M	³ H
Byers Landing	25	M	³ H
Battelle Complex ^(c)	26	M	³ H
Prosser Barricade	28	M	³ H
Wahluke Slope	31	M	³ H
Community			
Basin City School	33	M	³ H
Leslie Groves-Rchlnd	34	M	³ H
Distant			
Yakima	40	M	³ H

(a) Refer to Figure 1.1, "2011 Air Sampling Locations."

(b) As tritiated water (HTO).

(c) DOH air sampler also at this location.

(d) Two tritium samples are collected from this location.



2010-12-0010-4

Figure 1.1. 2011 Air Sampling Locations

2.0 Surface Water Surveillance

2.1 Columbia River

Location ^(a)	Sample Type	Frequency	Analyses/Agency
Priest Rapids-River	Cumulative	M Comp. ^(b)	Alpha, Beta, Lo ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U/DOH ^(c)
	Particulate (filter)	M Comp. ^(d)	Gamma Scan
		Q Comp. ^(d)	Pu
	Soluble (resin)	M Comp. ^(d)	Gamma Scan
Q Comp. ^(d)		Pu	
Rich.Pmphs HRM 46.4	Cumulative	M Comp. ^(b)	Alpha, Beta, Lo ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U
	Particulate (filter)	M Comp. ^(d)	Gamma Scan
		Q Comp. ^(d)	Pu
		M Comp. ^(d)	Gamma Scan
	Soluble (resin)	M Comp. ^(d)	Gamma Scan
Q Comp. ^(d)		Pu	
Grab	3/Yr	USGS-NASQAN ^(e)	
Rich.Pmphs-1 HRM46.4 ^(f)	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-2 HRM46.4	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-3 HRM46.4	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-5 HRM46.4	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-7 HRM46.4	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs-10 HRM46.4	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Rich.Pmphs HRM 43.5	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Rich.Pmphs HRM 43.9	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Rich.Pmphs HRM 45.0	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Rich.Pmphs HRM 45.8	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	ICP-MS, Hg-CVAF, ICP-MS Filtered
Vernita	Grab	3/Yr	USGS-NASQAN ^(e)
Vernita-1 HRM 0.3	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	⁹⁹ Tc, ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Vernita-2 HRM 0.3	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	⁹⁹ Tc, ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Vernita-3 HRM 0.3	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	⁹⁹ Tc, ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA
Vernita-4 HRM 0.3	Transect ^(g)	Q	Lo ³ H, ⁹⁰ Sr, U, Anions
		A	⁹⁹ Tc, ICP-MS, Hg-CVAF, ICP-MS Filtered, VOA

Columbia River (contd)

Location ^(a)	Sample Type	Frequency	Analyses/Agency
100 N -1 HRM 9.5 ^(h)	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -2 HRM 9.5	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -3 HRM 9.5	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -5 HRM 9.5	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -7 HRM 9.5	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N -10 HRM 9.5	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
100 N Shore HRM 8.4	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
100 N Shore HRM 8.9	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
100 N Shore HRM 9.2	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
100 N Shore HRM 9.8	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
Hanfrd TS-1 HRM 28.7	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-2 HRM 28.7	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-3 HRM 28.7	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-5 HRM 28.7	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-7 HRM 28.7	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd TS-10 HRM 28.7	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
Hanfrd Twnsite HRM26	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
Hanfrd Twnsite HRM27	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
Hanfrd Twnsite HRM28	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
Hanfrd Twnsite HRM30	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
300 Area -1 HRM 43.1	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -2 HRM 43.1	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -3 HRM 43.1	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -5 HRM 43.1	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -7 HRM 43.1	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area -10 HRM 43.1	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions
300 Area Shr HRM41.5	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
300 Area Spring 42-2	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
300 Area Spr DR 42-2	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾
300 Area Shr HRM42.9	Transect ^(g)	A	Lo ³ H, ⁹⁰ Sr, U, ICP-MS, ICP-MS Filtered, Anions/DOH ⁽ⁱ⁾

Columbia River (contd)

Location ^(a)	Sample Type	Frequency	Analyses/Agency
300 Area Outfl13	Grab	Q A	Lo ³ H, ⁹⁰ Sr, U, Anions ICP-MS, ICP-MS Filtered
<p>(a) Refer to Figure 2.1, “2011 Surface Water and Drinking Water Sampling Locations.” Hanford River Markers (HRMs) are a series of signposts along the Hanford Site shoreline of the Columbia River that are roughly 1.6 km (1 mi) apart. The Vernita Bridge is HRM #0 and Ferry Street in Richland is HRM #46. Samples collected between HRMs are assigned a decimal.</p> <p>(b) Sample is collected weekly and composited monthly for analysis.</p> <p>(c) Additional sample provided to the DOH (January and June only).</p> <p>(d) Sample is collected biweekly and composited for analysis.</p> <p>(e) Analyses are performed by the U.S. Geological Survey (USGS) in conjunction with the National Stream Quality Accounting Network (NASQAN) Program, and include conductance, pH, temperature, turbidity, dissolved oxygen, hardness, Ca, Mg, alkalinity, carbonates, sulfate, Cl, F, solids, NH₄-N, NO₃+NO₂, N-Kjeldahl, P, Cr, Fe, and dissolved organic carbon.</p> <p>(f) Quality assurance sample submitted for analyses twice per year.</p> <p>(g) Samples collected from cross-river transects and near-shore locations.</p> <p>(h) Quality assurance sample submitted for analyses once per year.</p> <p>(i) Additional sample provided to the DOH.</p>			

2.2 River Shoreline Springs

Location ^(a)	HRM ^(b)	Sample Type	Frequency	Analyses/Agency
100-B Spring 38-3	3.8	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, ⁹⁹ Tc, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA
100-B Spring 39-2	3.9	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, ⁹⁹ Tc, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA
100-K Spring 63-1	6.3	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/DOH ^(c)
100-K Spring 77-1	7.6	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/DOH ^(c)
100-N Spring 8-13	9.3	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH ^(c)
100-D Spring 102-1	10.2	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH ^(c)
100-D Spring 110-1	11.0	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH ^(c)
100-H Spring 145-1	14.4	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions
100-H Spring 153-1	15.3	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, ⁹⁹ Tc, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions
100-F Spring 207-1	21.3	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA
Hanford Spr UR 28-2 ^(d)	27.8	Grab	A	Alpha, Beta, ³ H, ⁹⁹ Tc, U, ¹²⁹ I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH ^(c)
Hanford Spring 28-2	28.1	Grab	A	Alpha, Beta, ³ H, ⁹⁹ Tc, U, ¹²⁹ I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH ^(c)
Hanford Spr DR 28-2 ^(e)	28.3	Grab	A	Alpha, Beta, ³ H, ⁹⁹ Tc, U, ¹²⁹ I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions/DOH ^(c)
300 Area Spring 41-9	41.9	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions
300 Area Spring 42-2	42.1	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, U, ¹²⁹ I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/DOH ^(c)
300 Area Spr DR 42-2 ^(e)	42.4	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, U, ¹²⁹ I, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions, VOA/DOH ^(c)
300 Area Spring 42-7	42.7	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, U, Gamma Scan, Anions
Richland Spr(SRL 437-1)	43.7	Grab	A	Alpha, Beta, ³ H, ⁹⁰ Sr, U, Gamma Scan, ICP-MS, Hg-CVAF, ICP-MS Filtered, Anions

(a) Refer to Figure 2.1, “2011 Surface Water and Drinking Water Sampling Locations.”

(b) HRMs are a series of signposts along the Hanford Site shoreline of the Columbia River that are roughly 1.6 km (1 mi) apart. The Vernita Bridge is HRM #0 and Ferry Street in Richland is HRM #46. Samples collected between HRMs are assigned a decimal.

(c) Additional sample provided to the DOH.

(d) UR = Upriver from noted location.

(e) DR = Downriver from noted location.

2.3 Onsite Pond

Location ^(a)	Sample Type	Frequency	Analyses
West Lake	Grab	Q	³ H
FFTF Pond ^(b)	Grab	Q	Alpha, Beta, ³ H, Gamma Scan

(a) Refer to Figure 2.1, “2011 Surface Water and Drinking Water Sampling Locations.”

(b) Quality assurance sample submitted for analyses once per year. FFTF = Fast Flux Test Facility (400 Area).

2.4 Offsite Irrigation

Location ^(a)	Sample Type	Frequency	Analyses/Agency
Riverview Canal	Grab	3 (May-Sept)	Alpha, Beta, Lo ³ H, ⁹⁰ Sr, U, Gamma Scan/DOH ^(b)
Horn Rapids Area	Grab	3 (May-Sept)	Alpha, Beta, Lo ³ H, ⁹⁰ Sr, U, Gamma Scan/DOH ^(b)

(a) Refer to Figure 2.1, “2011 Surface Water and Drinking Water Sampling Locations.”

(b) Additional sample provided to the DOH.

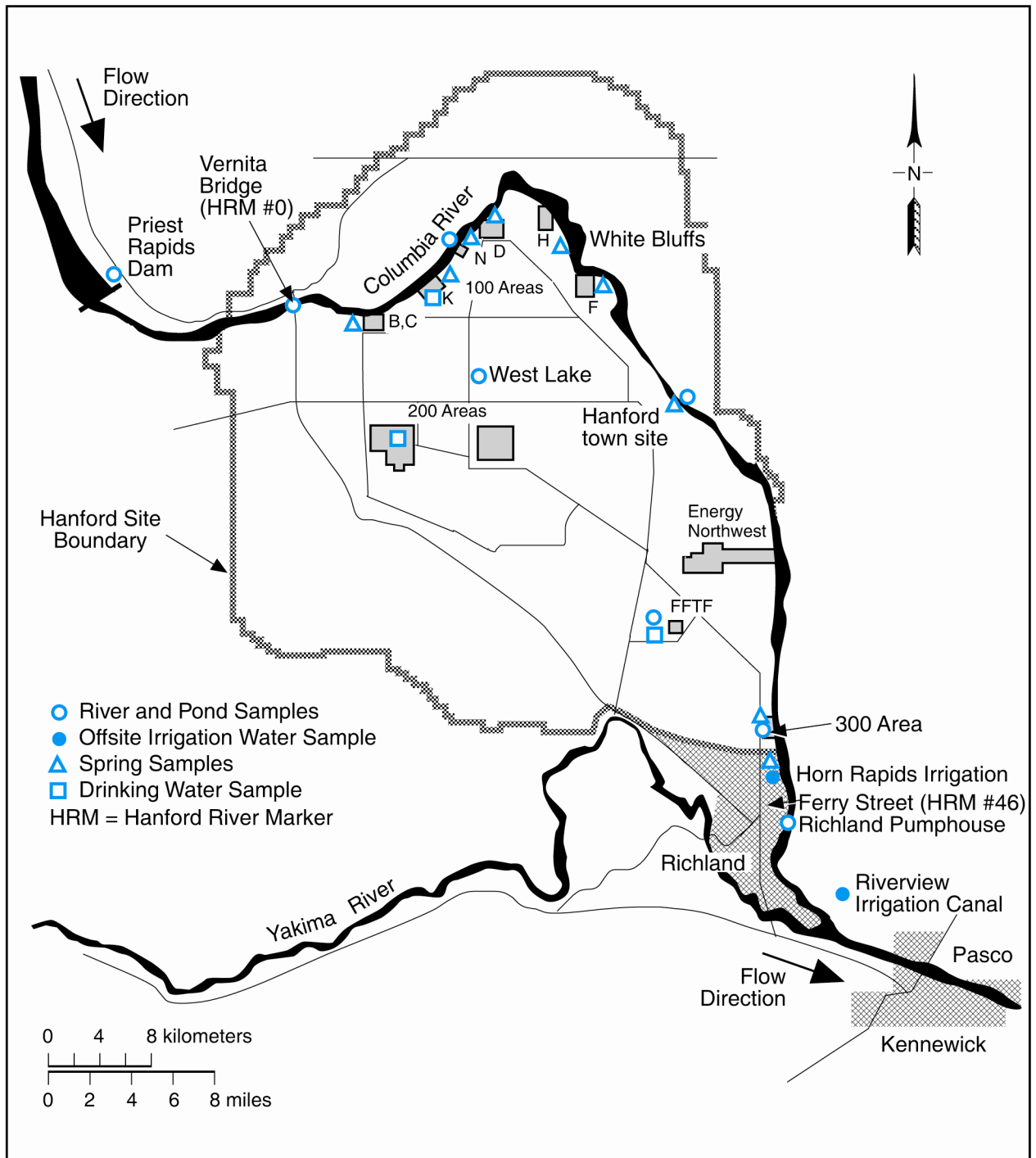


Figure 2.1. 2011 Surface Water and Drinking Water Sampling Locations

3.0 Drinking Water Surveillance

3.1 Onsite Drinking

Location ^(a)	Sample Type	Individual Samples		Composited Samples		
		Fre-quency	Analyses/Agency	Composite Group	Fre-quency	Analyses/Agency
200 W Area	Grab	M ^(b)		200 W Area	Q	Beta
100 K Area	Grab	M ^(b)		100 K Area	Q	Beta
400 Area Well P-14	Grab	M ^(b)		400 Area Well P-14	Q	Beta
400 Area	Grab	M ^(b)		400 Area	Q	Beta
200 W Area	Grab	Q ^(c)	Alpha }	200 W Area	A	⁹⁰ Sr, ³ H
100 K Area	Grab	Q ^(c)	Alpha }	100 K Area	A	⁹⁰ Sr, ³ H
400 Area Well P-14	Grab	Q ^(c)	Alpha }	400 Area Well P-14	A	⁹⁰ Sr, ³ H
400 Area	Grab	Q ^(c)	Alpha, ³ H/DOH ^(d) }	400 Area	A	⁹⁰ Sr/DOH ^(e)

(a) Refer to Figure 2.1, “2011 Surface Water and Drinking Water Sampling Locations.”

(b) Sample is collected monthly and composited for quarterly analysis.

(c) Sample is collected and analyzed quarterly and then composited for annual analysis.

(d) Additional sample provided to the DOH for ³H analysis (January only).

(e) Additional sample provided quarterly to the DOH for annual ⁹⁰Sr analysis.

4.0 Biota

4.1 Food and Farm Products

4.1.1 Milk

Location ^(a)	Frequency	Analyses
East Wahluke Area ^(b)	Q	Lo ³ H, ⁹⁰ Sr, Gamma Scan
Sagemoor Composite ^(b,c)	Q	Lo ³ H, ⁹⁰ Sr, Gamma Scan
Sunnyside Area	Q	Lo ³ H, ⁹⁰ Sr, Gamma Scan

(a) Refer to Figure 4.1, “2011 Food and Farm Products Sampling Locations.”

(b) Sample composited from multiple dairies in each area.

(c) Quality assurance sample submitted for analyses once per year.

4.1.2 Leafy Vegetables

Location ^(a,b)	Frequency ^(c)	Analyses/Agency
Riverview Area	A	⁹⁰ Sr, Gamma Scan/DOH ^(d)
Sunnyside Area	A	⁹⁰ Sr, Gamma Scan
Sagemoor Area	BE (2011)	⁹⁰ Sr, Gamma Scan/DOH ^(d)
East Wahluke Area	BE (2012)	⁹⁰ Sr, Gamma Scan/DOH ^(d)

(a) Refer to Figure 4.1, “2011 Food and Farm Products Sampling Locations” identifying those locations scheduled for collection in 2011.

(b) Two samples collected for Pacific Northwest National Laboratory (PNNL) within each area; one sample is analyzed and one is archived.

(c) Samples are collected in 2011 according to their specified frequency unless otherwise noted.

(d) Additional sample provided to the DOH.

4.1.3 Vegetables

Location ^(a,b)	Sample Type	Frequency ^(c)	Analyses/Agency
Riverview Area ^(d)	Potatoes	A	⁹⁰ Sr, Gamma Scan/DOH ^(e)
Sunnyside Area	Potatoes	A	⁹⁰ Sr, Gamma Scan
East Wahluke Area	Potatoes	A	⁹⁰ Sr, Gamma Scan/DOH ^(e)
Horn Rapids Area	Potatoes	BE (2011)	⁹⁰ Sr, Gamma Scan/DOH ^(e)
Sagemoor Area	Potatoes	TE (2012)	⁹⁰ Sr, Gamma Scan/DOH ^(e)

(a) Refer to Figure 4.1, “2011 Food and Farm Products Sampling Locations” identifying those locations scheduled for collection in 2011.

(b) Two samples collected for PNNL within each area; one sample is analyzed and one is archived.

(c) Samples are collected in 2011 according to their specified frequency unless otherwise noted.

(d) Other vegetables may be substituted if potatoes are not available.

(e) Additional sample provided to the DOH.

4.1.4 Fruits

Location ^(a,b)	Sample Type	Frequency ^(c)	Collection Period	Analyses/Agency
Sagemoor Area	Cherries	TE (2011)	June	⁹⁰ Sr, Gamma Scan/DOH ^(d)
	Apples	TE (2012)	September	⁹⁰ Sr, Gamma Scan/DOH ^(d)
	Grapes ^(e)	TE (2013)	September	⁹⁰ Sr, Gamma Scan/DOH ^(d)
Sunnyside Area	Tomatoes	A	July	⁹⁰ Sr, ³ H, Gamma Scan
	Cherries	TE (2011)	June	⁹⁰ Sr, Gamma Scan/DOH ^(d)
	Apples	TE (2012)	September	⁹⁰ Sr, Gamma Scan/DOH ^(d)
Riverview Area ^(f)	Grapes ^(e)	TE (2013)	September	⁹⁰ Sr, Gamma Scan
	Tomatoes	A	July	⁹⁰ Sr, ³ H, Gamma Scan
	Cherries	TE (2011)	June	⁹⁰ Sr, Gamma Scan
Ringold Area	Apples	TE (2012)	September	⁹⁰ Sr, Gamma Scan/DOH ^(d)
	Grapes ^(e)	TE (2013)	September	⁹⁰ Sr, Gamma Scan/DOH ^(d)
	Cherries	TE (2011)	June	⁹⁰ Sr, Gamma Scan/DOH ^(d)
East Wahuake Area	Cherries	TE (2011)	June	⁹⁰ Sr, Gamma Scan/DOH ^(d)
Mattawa Area	Apples	TE (2012)	September	⁹⁰ Sr, Gamma Scan/DOH ^(d)
Cold Creek Area	Grapes ^(e)	TE (2013)	September	⁹⁰ Sr, Gamma Scan

- (a) Refer to Figure 4.1, “2011 Food and Farm Products Sampling Locations” identifying those locations scheduled for collection in 2011.
- (b) Two samples collected for the PNNL within each area; one sample is analyzed and one is archived.
- (c) Samples are collected in 2011 according to their specified frequency unless otherwise noted.
- (d) Additional sample provided to the DOH.
- (e) Concord grapes preferred; table grapes acceptable if concord grapes are unavailable.
- (f) Other fruits may be substituted due to availability.

4.1.5 Wines

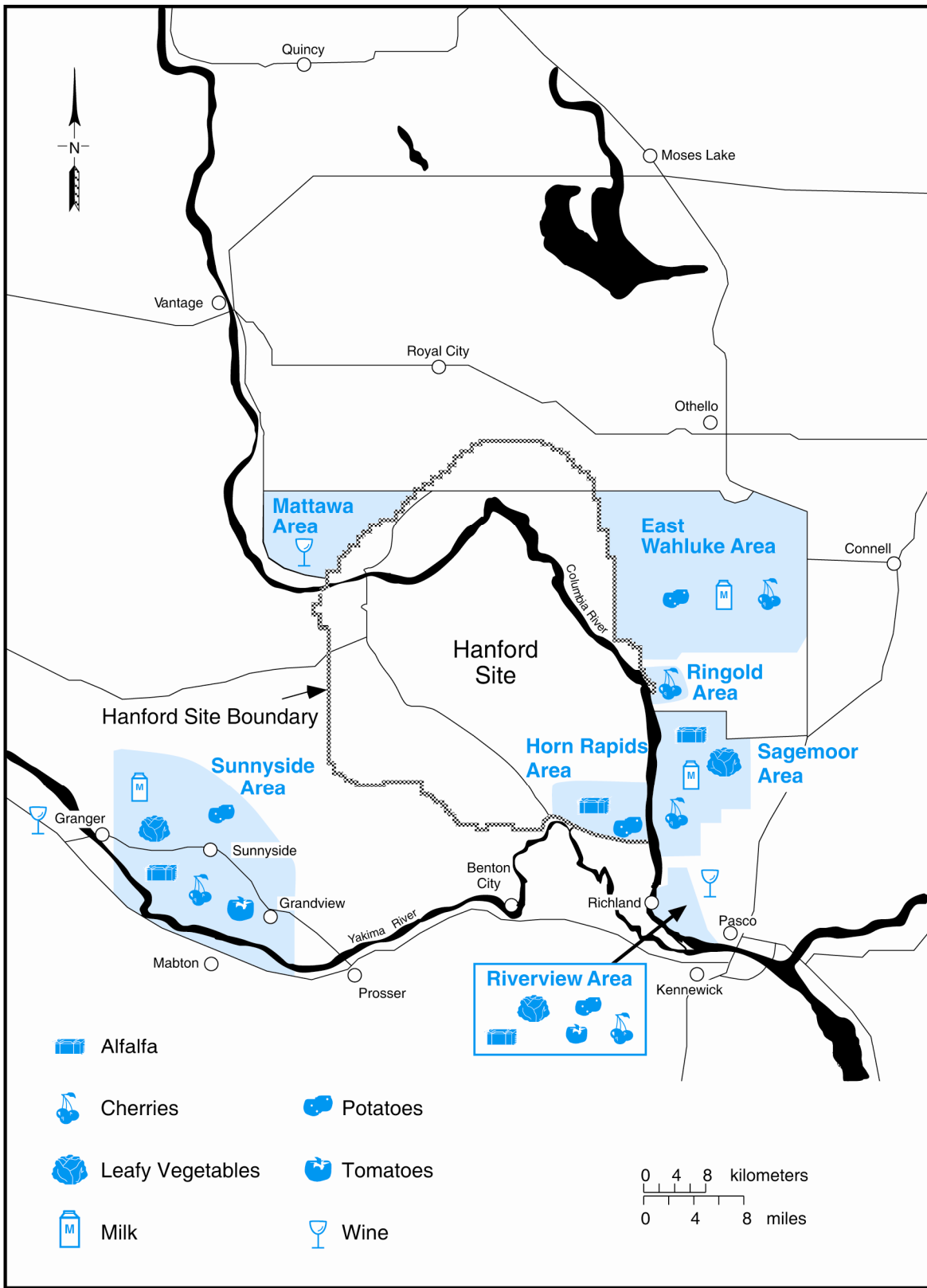
Location ^(a,b)	Sample Type	Frequency	Collection Period	Analyses/Agency
Columbia Basin ^(c)	White	BE (2011)	December	Lo ³ H, Gamma Scan/DOH ^(d)
	Red	BE (2011)	December	Lo ³ H, Gamma Scan/DOH ^(d)
Yakima Valley	White	BE (2011)	December	Lo ³ H, Gamma Scan/DOH ^(d)
	Red	BE (2011)	December	Lo ³ H, Gamma Scan/DOH ^(d)
Mattawa Area	White	BE (2011)	December	Lo ³ H, Gamma Scan/DOH ^(d)
	Red	BE (2011)	December	Lo ³ H, Gamma Scan/DOH ^(d)

- (a) Refer to Figure 4.1, “2011 Food and Farm Products Sampling Locations.”
- (b) Two samples of each type collected for PNNL within each area.
- (c) Location refers to Benton and Franklin Counties.
- (d) Additional sample provided to the DOH.

4.1.6 Alfalfa

Location ^(a,b)	Sample Type	Frequency	Collection Period	Analyses/Agency
Sagemoor Area	Alfalfa	BE (2011)	May	⁹⁰ Sr, Gamma Scan
Riverview Area	Alfalfa	BE (2011)	May	⁹⁰ Sr, Gamma Scan/DOH ^(c)
Sunnyside Area	Alfalfa	BE (2011)	May	⁹⁰ Sr, Gamma Scan
Horn Rapids Area	Alfalfa	BE (2011)	May	⁹⁰ Sr, Gamma Scan/DOH ^(c)

- (a) Refer to Figure 4.1, “2011 Food and Farm Products Sampling Locations.”
- (b) Two samples collected for PNNL within each area; one sample is analyzed and one is archived.
- (c) Additional sample provided to the DOH.



2010-12-0010-2

Figure 4.1. 2011 Food and Farm Products Sampling Locations

4.2 Wildlife

4.2.1 Fish

Location ^(a)	Species/ Sample	Number of Samples	Frequency ^(b)	Collection Period	Analyses/Agency
100 F Slough	Bass				
	Fillet	5	TE (2011)	April-June	Gamma Scan/DOH ^(c)
	Carcass	5	TE (2011)	April-June	⁹⁰ Sr/DOH ^(c)
Hanford Slough	Liver ^(d)	5	TE (2011)	April-June	ICP-MS, Hg-CVAA
	Bass				
	Fillet	5	TE (2011)	April-June	Gamma Scan/DOH ^(c)
300 Area	Carcass	5	TE (2011)	April-June	⁹⁰ Sr/DOH ^(c)
	Liver ^(d)	5	TE (2011)	April-June	ICP-MS, Hg-CVAA
	Bass				
Background - Desert Aire/Vantage	Fillet	5	TE (2011)	April-June	Gamma Scan, U
	Carcass	5	TE (2011)	April-June	⁹⁰ Sr
	Liver ^(d)	5	TE (2011)	April-June	ICP-MS, Hg-CVAA
Background – Priest Rapids/Wanapum Pools	Carp				
	Fillet	5	BE (2012)	April-July	Gamma Scan, U/DOH ^(c)
	Carcass	5	BE (2012)	April-July	⁹⁰ Sr/DOH ^(c)
100-N to 100-D	Liver ^(d)	5	BE (2012)	April-July	ICP-MS, Hg-CVAA
	Whitefish				
	Fillet	5	BE (2011)	November	Gamma Scan
100-N to 100-D	Carcass	5	BE (2011)	November	⁹⁰ Sr
	Liver ^(d)	5	BE (2011)	November	ICP-MS, Hg-CVAA
	Whitefish				
100-N to 100-D	Fillet	5	BE (2011)	Oct-Nov	Gamma Scan/DOH ^(c)
	Carcass	5	BE (2011)	Oct-Nov	⁹⁰ Sr/DOH ^(c)
	Liver ^(d)	5	BE (2011)	Oct-Nov	ICP-MS, Hg-CVAA
100-N to 100-D	Carp				
	Fillet	5	BE (2012)	April-July	Gamma Scan/DOH ^(c)
	Carcass	5	BE (2012)	April-July	⁹⁰ Sr/DOH ^(c)
100-N to 100-D	Liver ^(d)	5	BE (2012)	April-July	ICP-MS, Hg-CVAA

(a) Refer to Figure 4.2, “2011 Wildlife Sampling Locations” identifying those locations scheduled for collection in 2011.

(b) Samples are collected in 2011 according to their specified frequency unless otherwise noted.

(c) Additional whole fish sample provided to the DOH.

(d) Ecological assessment sample.

4.2.2 Geese

Location ^(a)	Species/ Sample	Number of Samples	Frequency	Collection Period	Analyses
100 Areas	Canada Goose				
	Muscle	5	BE (2011)	May-July	Gamma Scan
	Bone	5	BE (2011)	May-July	⁹⁰ Sr
	Liver ^(b)	5	BE (2011)	May-July	ICP-MS, Hg-CVAA
Hanf Townsite to 300 Area	Canada Goose				
	Muscle	5	BE (2011)	May-July	Gamma Scan
	Bone	5	BE (2011)	May-July	⁹⁰ Sr
	Liver ^(b)	5	BE (2011)	May-July	ICP-MS, Hg-CVAA
Background – Desert Aire/Vantage	Canada Goose				
	Muscle	5	BE (2011)	May-July	Gamma Scan
	Bone	5	BE (2011)	May-July	⁹⁰ Sr
	Liver ^(b)	5	BE (2011)	May-July	ICP-MS, Hg-CVAA

(a) Refer to Figure 4.2, “2011 Wildlife Sampling Locations.”

(b) Ecological assessment sample.

4.2.3 Upland Game Birds

Location	Species/ Sample ^(a)	Number of Samples	Frequency	Collection Period	Analyses/Agency
100-D to 100-H	Pheasant				
	Muscle	4	BE (2012)	September	Gamma Scan
	Bone	4	BE (2012)	September	⁹⁰ Sr
	Liver ^(b)	4	BE (2012)	September	ICP-MS
100-H to 100-F	Pheasant				
	Muscle	6	BE (2012)	September	Gamma Scan/DOH ^(c)
	Bone	6	BE (2012)	September	⁹⁰ Sr/DOH ^(c)
	Liver ^(b)	6	BE (2012)	September	ICP-MS
Background	Pheasant				
	Muscle	5	BE (2012)	September	Gamma Scan/DOH ^(c)
	Bone	5	BE (2012)	September	⁹⁰ Sr/DOH ^(c)
	Liver ^(b)	5	BE (2012)	September	ICP-MS

a) Pheasants preferred; chukars or quail acceptable if pheasants are unavailable.

b) Ecological assessment sample.

c) Additional whole bird sample provided to the DOH.

4.2.4 Rabbits

Location ^(a)	Species/ Sample	Number of Samples	Frequency	Collection Period	Analyses/Agency
100 N Area	Cottontail				
	Muscle	4	BE (2011)	Jan-Dec	Gamma Scan/DOH ^(b)
	Bone	4	BE (2011)	Jan-Dec	⁹⁰ Sr/DOH ^(b)
	Liver ^(c)	4	BE (2011)	Jan-Dec	ICP-MS, Hg-CVAA
200 E Area	Cottontail				
	Muscle	4	BE (2011)	Jan-Dec	Gamma Scan/DOH ^(b)
	Bone	4	BE (2011)	Jan-Dec	⁹⁰ Sr/DOH ^(b)
	Liver ^(c)	4	BE (2011)	Jan-Dec	Pu, ICP-MS
200 West	Cottontail				
	Muscle	4	BE (2011)	Jan-Dec	Gamma Scan/DOH ^(b)
	Bone	4	BE (2011)	Jan-Dec	⁹⁰ Sr/DOH ^(b)
	Liver ^(c)	4	BE (2011)	Jan-Dec	Pu, ICP-MS
Background	Cottontail				
	Muscle	5	BE (2011)	Jan-Dec	Gamma Scan
	Bone	5	BE (2011)	Jan-Dec	⁹⁰ Sr
	Liver ^(c)	5	BE (2011)	Jan-Dec	Pu, ICP-MS, Hg-CVAA

(a) Refer to Figure 4.2, “2011 Wildlife Sampling Locations.”

(b) Additional whole rabbit sample provided to the DOH.

(c) Ecological assessment sample.

4.2.5 Deer/Elk

Location	Species/ Sample	Number of Samples	Frequency	Collection Period	Analyses/Agency
100 N Area	Mule Deer				
	Muscle	2	BE (2010)	Nov-Dec	Gamma Scan/DOH ^(a)
	Bone	2	BE (2010)	Nov-Dec	⁹⁰ Sr/DOH ^(a)
	Liver ^(b)	2	BE (2010)	Nov-Dec	ICP-MS
200 Areas	Mule Deer				
	Muscle	2	BE (2010)	Nov-Dec	Gamma Scan/DOH ^(a)
	Bone	2	BE (2010)	Nov-Dec	⁹⁰ Sr/DOH ^(a)
	Liver ^(b)	2	BE (2010)	Nov-Dec	Pu, ICP-MS
Road Kill at Onsite Locations ^(c)	Mule Deer or Elk				
	Muscle	10	BE (2010)	As Available	Gamma Scan
	Bone	10	BE (2010)	As Available	⁹⁰ Sr
Background ^(d)	Mule Deer				
	Muscle	2	BE (2010)	October	Gamma Scan/DOH ^(a)
	Bone	2	BE (2010)	October	⁹⁰ Sr/DOH ^(a)
	Liver ^(b)	2	BE (2010)	October	Pu, ICP-MS

(a) Additional sample provided to the DOH.

(b) Ecological assessment sample.

(c) As available, according to location.

(d) One of the two background samples obtained from the DOH.

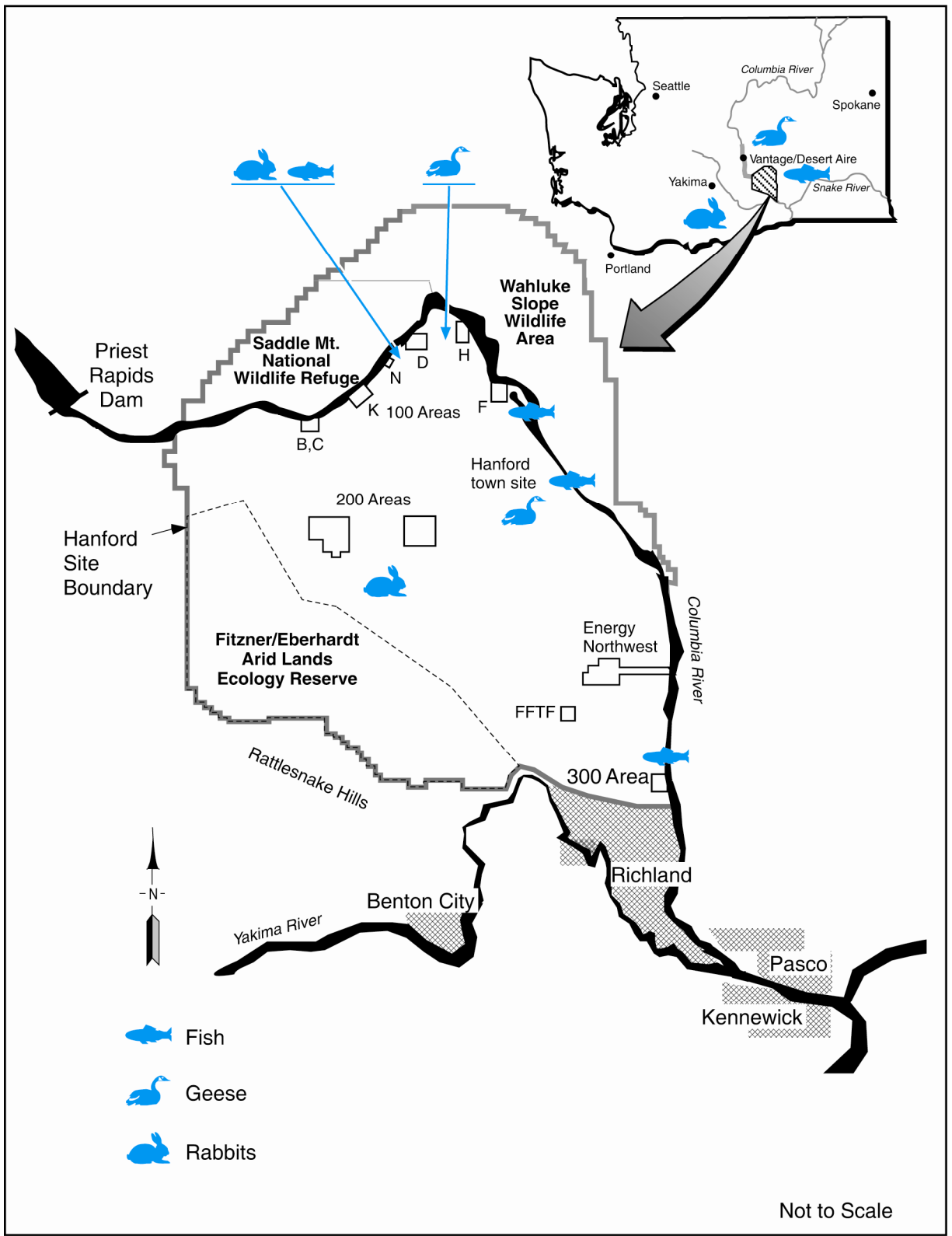


Figure 4.2. 2011 Wildlife Sampling Locations

5.0 Soil and Vegetation

5.1 Soil

Location	Frequency ^(a)	Collection Period	Analyses/Agency
100 K Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
NE of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
E of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
100N Shore Above HGP	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
100N Spring Shoreline	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Above 100D Pumphouse	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
100 Area Fire Stat	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
200 ENC	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
E of 200 E	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
200 ESE	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu, ²⁴¹ Am
S of 200 E	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
SW of B/C Cribs	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu, ²⁴¹ Am/DOH ^(b)
E of 200 W Gate	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu, ²⁴¹ Am/DOH ^(b)
S of 200 W	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Rattlesnake Springs	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Yakima Barricade	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
400 E	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
SE Side of FTF	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
North of 300 Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
South of 300 Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Hanford Townsite	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Wye Barricade ^(c)	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Prosser Barricade	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
ALE Field Lab ^(d)	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
N End Vernita Bridge	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Wahluke Slope	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Berg Ranch	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Ringold Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
W End of Fir Road	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Taylor Flats No. 2	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Sagemoor Farm ^(c)	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu, ²⁴¹ Am
Byers Landing	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Riverview-Harris	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Benton City	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Sunnyside	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu, ²⁴¹ Am
McNary Dam	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Walla Walla	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Washtucna	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Toppenish	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
George	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Othello	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Wanapum	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)

(a) Samples are collected once every 3 to 5 years and were collected in 2008. Next collection will occur in 2013.

(b) Additional sample provided to the DOH.

(c) Quality assurance samples submitted for analyses.

(d) Fitzner/Eberhardt Arid Lands Ecology Reserve.

5.2 Vegetation

Location	Frequency ^(a)	Collection Period	Analyses/Agency
100 K Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
NE of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
E of 100 N Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
100N Spring Shoreline	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
E of 200 W Gate	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
300 Area Shoreline	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Hanford Townsite	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Hanford Twnsite HRM28	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Ringold Area	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Sage Moor Farm	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Byers Landing	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Riverview-Harris	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Sunnyside	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
Toppenish	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu
George	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Othello	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)
Wanapum	3 to 5 yrs	June-Sept	Gamma Scan, ⁹⁰ Sr, U, Pu/DOH ^(b)

(a) Samples are collected once every 3 to 5 years and were collected in 2008. Next collection will occur in 2013.

(b) Additional sample provided to the DOH.

6.0 Sediment

6.1 Columbia River

Location ^(a)	Frequency	Analyses/Agency
McNary Dam		
McNary-OR. Side Near Dam	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH ^(b)
McNary-Wash. Side Near Dam	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH ^(b)
Priest Rapids Dam (PRD)		
PRD-Grant Side Near Dam	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH ^(b)
PRD-Yakima Side Near Dam	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH ^(b)
White Bluffs Slough	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC/DOH ^(b)
100 F Slough	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC
Hanford Slough	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC
Richland	A	Gamma Scan, ⁹⁰ Sr, U, Pu, ICP-MS, Hg-CVAA, TOC

(a) Refer to Figure 6.1, “2011 Sediment Sampling Locations.”

(b) Additional sample provided to the DOH.

6.2 River Shoreline Springs

Location ^(a)	HRM ^(b)	Frequency	Analyses/Agency
100-B Spring 38-3	3.8	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA
100-K Spring 63-1	6.3	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA/DOH ^(c)
100-H Spring 145-1	14.4	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA
100-F Spring 207-1	21.3	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA
Hanford Spr UR 28-2 ^(d)	27.8	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA/DOH ^(c)
Hanford Spr DR 28-2 ^(e)	28.3	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA/DOH ^(c)
300 Area Spring 41-9	41.9	A	Gamma Scan, U
300 Area Spring 42-2	42.1	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA/DOH ^(c)
300 Area Spr DR 42-2 ^(e)	42.4	A	Gamma Scan, ⁹⁰ Sr, U, ICP-MS, Hg-CVAA/DOH ^(c)
300 Area Spring 42-7	42.7	A	Gamma Scan, U
Richland Spr(SRL 437-1)	43.7	A	Gamma Scan, U

(a) Refer to Figure 6.1, “2011 Sediment Sampling Locations.”

(b) HRMs are a series of signposts along the Hanford Site shoreline of the Columbia River that are roughly 1.6 km (1 mi) apart. The Vernita Bridge is HRM #0 and Ferry Street in Richland is HRM #46. Samples collected between HRMs are assigned a decimal.

(c) Additional sample provided to the DOH.

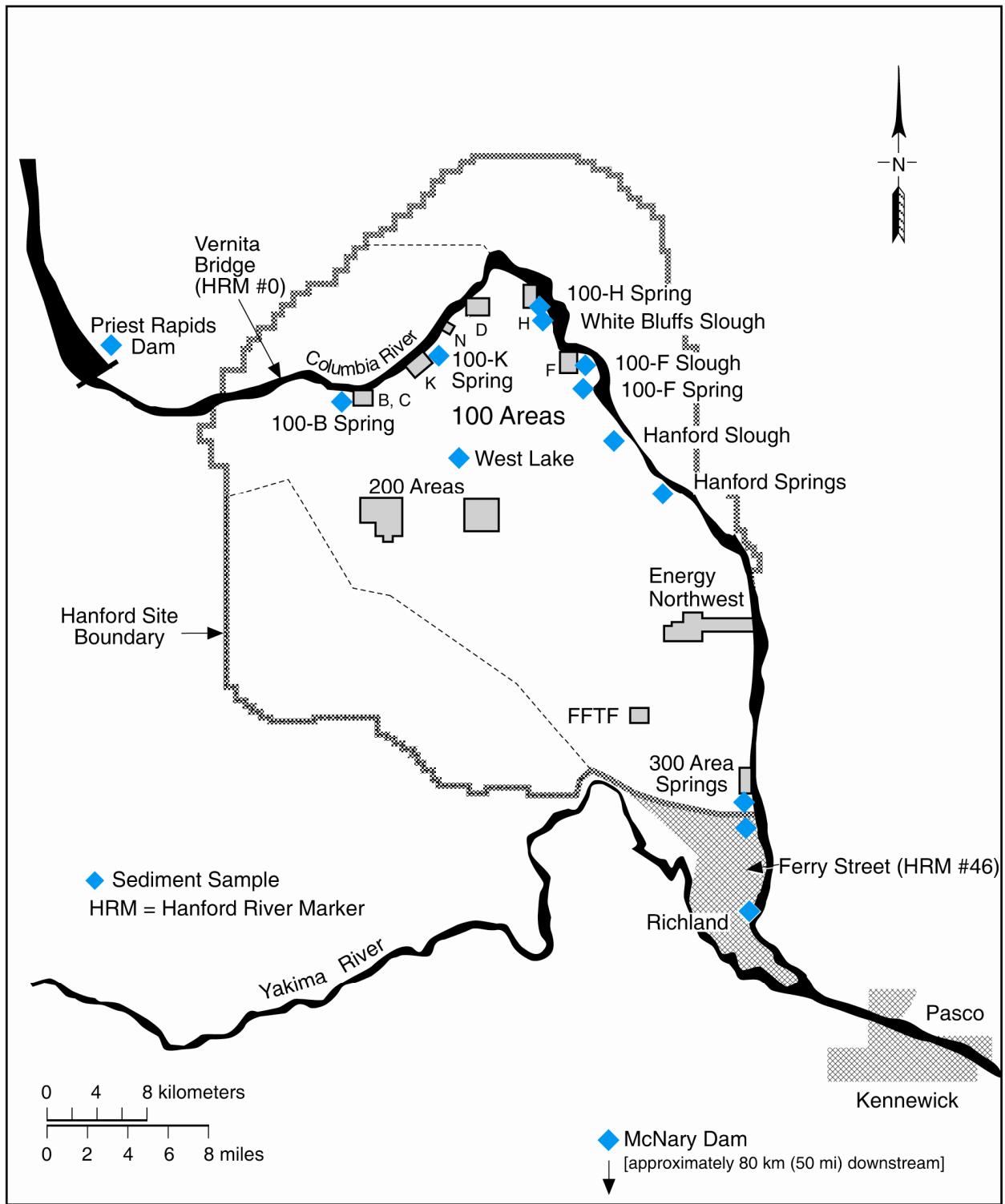
(d) UR = Upriver from noted location.

(e) DR = Downriver from noted location.

6.3 Onsite Pond

Location ^(a)	Frequency	Analyses/Agency
West Lake	SA (Feb & June)	Gamma Scan, ⁹⁰ Sr, U, ⁹⁹ Tc, Alpha, Beta

(a) Refer to Figure 6.1, “2011 Sediment Sampling Locations.”



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Figure 6.1. 2011 Sediment Sampling Locations

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