US Army Corps of Engineers®
Portland District

SEDIMENT QUALITY REPORT

JOHN DAY DAM, LAKE UMATILLA
COLUMBIA RIVER BASIN
COLUMBIA RIVER, OREGON AND WASHINGTON

John Day Dam, Lake Umatilla

Sediment Quality Report
September 2020

EXECUTIVE SUMMARY

This report provides a detailed analysis of the existing conditions for the John Day Lock and Dam (John Day Dam) reach of the lower Columbia River. This reach encompasses the lower Columbia River, immediately downstream of John Day Dam, upstream to McNary Lock and Dam. The analysis of the existing conditions is limited to sediment. Both physical and chemical parameters associated with sediment quality are presented. In cases where biological data associated with sediment is available, a discussion of physical and chemical impacts to biological receptors is discussed.

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ACRONYMS

Acronym	Description
µg/kg	Micrograms Per Kilogram
BD	Below Detection
Corps	U.S. Army Corps of Engineers
DDT	Dichlorodiphenyltrichloroethane
DOH	Washington State Department of Health
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
LOD	Limit of Detection
mg/kg	Milligrams Per Kilogram
NAVD88	North American Vertical Datum of 1988
NC	Not Calculated
ng/kg	Nanograms Per Kilogram
NMFS	National Marine Fisheries Service
ODEQ	Oregon Department of Environmental Quality
PBDE	Polybrominated Diphenyl Ether
PCB	Polychlorinated Biphenyl
REMAP	Regional Environmental Monitoring and Assessment Program
RM	River Mile
SEF	Sediment Evaluation Framework
TEQ	Toxic Equivalency
TMDL	Total Maximum Daily Load
USGS	U.S. Geological Survey

SECTION 1 - INTRODUCTION

1.1 STUDY AREA

This report provides a detailed analysis of the existing conditions for the John Day Lock and Dam (John Day Dam) reach of the lower Columbia River. This reach encompasses the lower Columbia River, immediately downstream of John Day Dam, upstream to McNary Lock and Dam. The analysis of the existing conditions is limited to sediment. Both physical and chemical parameters associated with sediment quality are presented. In cases where biological data associated with sediment is available, a discussion of physical and chemical impacts to biological receptors is discussed.

1.2 RIVER SEGMENT DESCRIPTION

The scope of this evaluation includes the John Day Dam, as well as the area immediately downstream, located at River Mile (RM) 216 on the Columbia River, and upstream to McNary Lock and Dam at RM 292.

Figure 1-1. John Day Reach of the Columbia River (RM 216 to RM 292)

1.3 SEF GUIDANCE

The Sediment Evaluation Framework (SEF) for the Pacific Northwest (Northwest Regional Sediment Evaluation Team Agencies 2016) is a regional guidance manual produced by Federal and state agencies. It provides a framework for the consistent characterization and assessment of sediment. Specifically, the framework can be used

to determine the suitability of the materials for unconfined aquatic placement and to predict water quality impacts during dredging operations. The framework is intended for use in the states of Washington, Oregon, and Idaho. It serves as an implementation manual for the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.—Testing Manual* (Inland Testing Manual) (1998) produced by U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (Corps) for satisfying Clean Water Act testing requirements.

Although the SEF was produced specifically for the evaluation of dredged materials for unconfined aquatic placement, the framework is also used for evaluating non-navigational projects and for anti-degradation evaluations. Because the purpose of the Columbia River System Operations Environmental Impact Statement is similar to an anti-degradation evaluation, the SEF provides a suitable approach for this report.

The SEF provides a “tiered” approach to make risk-based sediment assessments. Level 1 includes an evaluation of historically available data and the development of a conceptual site model. Level 2 includes the physical, chemical, and biological evaluation of the sediment and is conducted if the information collected for Level 1 is insufficient to make a risk-based determination. This report focuses on a Level 1 evaluation; no additional sediment data will be collected at this time. This report does discuss data gaps and data needs for potential future project implementation and provides recommendations on future data collection.

SECTION 2 - SEDIMENT QUALITY

2.1 GENERAL DESCRIPTION

The John Day reach is defined as the stretch of the Columbia River beginning immediately downstream of the John Day Dam at RM 216 upstream to McNary Lock and Dam at RM 292. John Day Lock and Dam consists of a navigation lock, spillway, powerhouse, and fish passage facilities. Construction of John Day Lock and Dam was completed in 1971, which resulted in the creation of Lake Umatilla (i.e. the reservoir impounded by John Day Dam). The authorized primary project purposes are navigation and power generation (Corps 2019a).

McNary Lock and Dam comprises the upstream boundary of the reach. Construction at McNary began in May 1947 and the lock and dam became fully operational in February 1957. McNary Lock and Dam consists of a powerhouse, navigation lock, two fish ladders, and a system of levees and pumping plants. The McNary Lock and Dam provides for navigation, hydroelectric power generation, recreation, wildlife habitat, and incidental irrigation (Corps 2019b)

The John Day reach is located in the Columbia Plateau ecoregion (EPA 2016). Mountainous ecoregions surround the Columbia Plateau on all sides; to the west is the Cascade Range, to the southeast are the Blue Mountains, to the north are the Okanogan Highlands, to the east are the loess hills of the Palouse region, and further to the east, the Rocky Mountains (Clarke and Bryce 1997, Thorson et al. 2003). Temperature and precipitation vary greatly within the Columbia Plateau, with lower temperatures and increased rainfall occurring at higher elevation areas around the boundaries with mountainous areas, and higher temperatures and less rainfall occurring in the central, lower elevation portions of the ecoregion.

The most notable tributaries of the John Day reach is the Umatilla River (Oregon) and the John Day River (Oregon) (Table 2-1). There are other smaller tributaries that flow into this reach from both the Oregon and Washington borders. In the John Day reach, the Columbia River sits at an approximate elevation of 267 feet (NAVD88) (U.S. Geological Survey [USGS] 2018). The geological formations through which the Columbia River passes in western portion of the John Day reach are primarily igneous, basalt formations that were deposited at various times during the middle Miocene (13.6 to 16 million years ago) (Huntting et al. 1961; Walker and MacLeod 1991). Toward the middle of the reach and eastward to McNary Dam, the river is flanked by unconsolidated sedimentary formations that were laid down during the Pleistocene (between 11.7 thousand years ago and 2.5 million years ago) or more recently. These formations are wind-deposited loess, river-deposited alluvium, and lacustrine sediments deposited during glacial flooding episodes on the Columbia River during the late Pleistocene.

Table 2-1. John Day Reach Tributaries

Tributary	Length (miles)	Drainage Area (miles^2)	Average Discharge (cubic feet per second)	Columbia River Confluence
Umatilla River	89	2,450	494	RM 289
John Day River	284	8,000	2,075	RM 218

This portion of the lower Columbia River is notable for its commercial navigation and recreational activities, including fishing. Interstate 84 in Oregon and Highway 14 in Washington parallel the Columbia River throughout this segment of river.

Sediments in the Columbia River appear to be derived from two distinct sources (Whetten, Kelley, and Hanson 1969). Sediment from the Snake River and upstream tributaries is fine grained and derived from metamorphic, plutonic, and sedimentary rocks and is primarily transported in suspension. Sediment from downstream tributaries is coarser grained and derived from erosion of volcanic rock. This coarser sediment generally forms the bedload. Historically, little sediment accumulated on the bed of the Columbia River above the location of Bonneville Dam (Whetten, Kelley, and Hanson 1969). However, the construction of dams has increased the retention of coarse sediment at the head of reservoirs, as well as the retention of fine sediment behind the dams (Randle and Bountry 2017). Additionally, the presence of dams has generally slowed the flow of the river, increasing the level of sediment deposition in delta formations at tributary confluences (Randle and Bountry 2017).

2.2 PAST STUDIES

2.2.1 Past Dredging

There has been no notable navigation dredging in this portion of the Columbia River.

2.2.2 Previous Studies

There is a limited number of previous studies conducted in the John Day reach. The majority of the available data is greater than 10 years old. However, given the limited data available, data older than 10 years is included is this synopsis of previous studies.

The Corps conducted an evaluation of effects of a reservoir drawdown on sediment in the John Day pool, specifically looking at the potential for contaminant release. This evaluation only looked at previously collected data and did not include new data collection. Sediment samples collected in 1994 and 1995 from the John Day Reservoir were analyzed only for grain size. Due to the limited data available for analysis, no conclusions were drawn to summarize the potential effects of contaminant release in the event of a drawdown (Corps 2000).

The Corps documented the findings of a suitability analysis for dredged materials associated with the Cavender Habitat Restoration Project along the North Fork John Day River (not within the mainstem of the Columbia River). Chemical concentrations were below thresholds defined in the SEF, and all sediment was deemed suitable for unconfined open water disposal (Corps 2015).

A multi-agency study was conducted in 2003 to characterize sediment impacts from the Hanford Nuclear Site. While radionuclides are not considered contaminants of interest under SEF guidance, given the potential influence of the Hanford Nuclear Site on downstream sediment in the Columbia River, data from this study was reviewed as part of the analysis for existing conditions. The study found low concentrations of radionuclides throughout the lower Columbia River. These sediment concentrations were found to be similar to background values measured upstream from the Hanford Site (DOH 2005).

2.2.3 Existing 303(d) and Total Maximum Daily Load

There is an established total maximum daily load (TMDL) for total dissolved gas for the lower Columbia River. EPA approved this TMDL on November 18, 2002 (Oregon Department of Environmental Quality [ODEQ] and Washington State Department of Ecology [Ecology] 2002). There is also a TMDL for dioxin discharges. EPA approved this TMDL on February 25, 1991 (EPA 1991).

The most recent state water quality classifications for Washington are shown in Table 2-2 (Ecology 2017). The most recent state water quality classifications for Oregon are shown in Table 2-3 and Table 2-4, respectively (ODEQ 2017). Category 5 listings are those that are on the Clean Water Act 303(d) list; Category 4A listings are those that have an approved total maximum daily load that is actively being implemented.

Table 2-2. Washington State Water Quality Classifications and 303(d) Listings

Assessment Unit ID	Listing ID	Category	Medium	Parameter	Initial Listing	Listing Sample Description
170701010602_01_01	8798	4A	Biological tissue	Dioxin	2004, Category 4A	See Note 1.
170701011403_01_01	34873	4A	Biological tissue	Dioxin	2004, Category 4A	See Note 2.
170701011403_01_01	18514	2	Biological tissue	4,4'-DDE	2004, Category 2	See Note 2.
170701011403_01_01	18623	2	Biological tissue	Chlordane	2004, Category 2	See Note 2.
170701011403_01_01	18735	2	Biological tissue	Hexachlorobenzene	2004, Category 2	See Note 3.
170701011403_01_01	15225	1	Biological tissue	1,3-Dichlorobenzene	2004, Category 1	See Note 4.
170701011403_01_01	16484	1	Biological tissue	Pyrene	2004, Category 1	See Note 4.
170701011403_01_01	17699	1	Biological tissue	Antimony	2004, Category 1	See Note 4.
170701011403_01_01	17702	1	Biological tissue	Mercury	2004, Category 1	See Note 4.
170701011403_01_01	17705	1	Biological tissue	Nickel	2004, Category 1	See Note 4.
170701011403_01_01	17708	1	Biological tissue	Thallium	2004, Category 1	See Note 4.
170701011403_01_01	18390	1	Biological tissue	1,2-Dichlorobenzene	2004, Category 1	See Note 4.
170701011403_01_01	18409	1	Biological tissue	1,2-Diphenylhydrazine	2004, Category 1	See Note 4.
170701011403_01_01	18428	1	Biological tissue	1,4-Dichlorobenzene	2004, Category 1	See Note 4.
170701011403_01_01	18447	1	Biological tissue	2,4,6-Trichlorophenol	2004, Category 1	See Note 4.
170701011403_01_01	18466	1	Biological tissue	2,4-Dichlorophenol	2004, Category 1	See Note 4.
170701011403_01_01	18485	1	Biological tissue	2,4-Dinitrotoluene	2004, Category 1	See Note 4.
170701011403_01_01	18565	1	Biological tissue	Anthracene	2004, Category 1	See Note 4.
170701011403_01_01	18584	1	Biological tissue	Beta-BHC (Beta-hexachlorocyclohexane)	2004, Category 1	See Note 4.
170701011403_01_01	18613	1	Biological tissue	Bis(2-chloroisopropyl)ether	2004, Category 1	See Note 4.
170701011403_01_01	18651	1	Biological tissue	Endosulfan sulfate	2004, Category 1	See Note 4.
170701011403_01_01	18670	1	Biological tissue	Fluoranthene	2004, Category 1	See Note 4.
170701011403_01_01	18689	1	Biological tissue	Fluorene	2004, Category 1	See Note 4.
170701011403_01_01	18708	1	Biological tissue	Hexachlorocyclohexane (Lindane)	2004, Category 1	See Note 4.
170701011403_01_01	18727	1	Biological tissue	Heptachlor	2004, Category 1	See Note 4.
170701011403_01_01	18755	1	Biological tissue	Hexachlorobutadiene	2004, Category 1	See Note 4.
170701011403_01_01	18774	1	Biological tissue	Hexachloroethane	2004, Category 1	See Note 4.
170701011403_01_01	18793	1	Biological tissue	Nitrobenzene	2004, Category 1	See Note 4.
170701011403_01_01	18954	1	Biological tissue	Phenol	2004, Category 1	See Note 4.
170701011407_01_01	18512	5	Biological tissue	4,4'-DDE	2004, Category 5	See Note 5 and Note 6.
170701011407_01_01	18621	5	Biological tissue	Chlordane	2004, Category 5	See Note 5 and Note 6.
170701011407_01_01	18801	5	Biological tissue	PCBs	2004, Category 5	See Note 5 and Note 6.
170701011407_01_01	34866	4A	Biological tissue	Dioxin	2004, Category 4A	See Note 5 and Note 6.
170701011407_01_01	15233	1	Biological tissue	1,4-Dichlorobenzene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	16473	1	Biological tissue	Pyrene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	17667	1	Biological tissue	Antimony	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	17668	1	Biological tissue	Mercury	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	17669	1	Biological tissue	Nickel	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	17670	1	Biological tissue	Thallium	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18379	1	Biological tissue	1,2-Dichlorobenzene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18398	1	Biological tissue	1,2-Diphenylhydrazine	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18417	1	Biological tissue	1,3-Dichlorobenzene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18436	1	Biological tissue	2,4,6-Trichlorophenol	2004, Category 1	See Note 7 and Note 8.

Assessment Unit ID	Listing ID	Category	Medium	Parameter	Initial Listing	Listing Sample Description
170701011407_01_01	18455	1	Biological tissue	2,4-Dichlorophenol	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18474	1	Biological tissue	2,4-Dinitrotoluene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18493	1	Biological tissue	4,4'-DDD	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18531	1	Biological tissue	4,4'-DDT	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18554	1	Biological tissue	Anthracene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18573	1	Biological tissue	Beta-BHC (Beta-hexachlorocyclohexane)	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18586	1	Biological tissue	Hexachlorobenzene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18602	1	Biological tissue	Bis(2-chloroisopropyl)ether	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18640	1	Biological tissue	Endosulfan sulfate	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18659	1	Biological tissue	Fluoranthene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18678	1	Biological tissue	Fluorene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18697	1	Biological tissue	Hexachlorocyclohexane (Lindane)	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18716	1	Biological tissue	Heptachlor	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18744	1	Biological tissue	Hexachlorobutadiene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18763	1	Biological tissue	Hexachloroethane	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18782	1	Biological tissue	Nitrobenzene	2004, Category 1	See Note 7 and Note 8.
170701011407_01_01	18820	1	Biological tissue	Phenol	2004, Category 1	See Note 7 and Note 8.
45120H6C8_NE	501947	2	Sediment	Sediment bioassay	1996 303(d) list	See Note 9.

Notes: 1/ Beak Consultants, Inc. (1989) found excursions beyond the tissue criterion in white sturgeon (Acipenser transmontanus), largescale sucker (Catostomus macrocheilus); and carp (Cyprinus carpio) at Study Site 4 (between RM 280 and 298). 2/ EVS Environmental Consultants (2000) show excursions beyond the National Toxic Rule criterion from white sturgeon composite of fillets without skin collected in 1997 at station 8-F (RM 241), samples #97080818, #97080819, and #97080820. 3/ EVS Environmental Consultants (2000) show an excursion beyond the National Toxic Rule criterion from white sturgeon composite of fillets with skin collected in 1997 at station 8-F (RM 241), samples #97080819 and #97080820. 4/ EVS Environmental Consultants (2000) show no excursions beyond the National Toxic Rule criterion from white sturgeon composite of fillets with skin collected in 1997 at station 8-F (RM 241), samples #97080818, #97080819, and #97080820. 5/ EVS Environmental Consultants (2000) show an excursion beyond the National Toxic Rule criterion from channel catfish (Ictalurus punctatus) composite of 8 fillets with skin collected in 1997 at station 8-C (RM 233.2), sample #97500957. 6/ EVS Environmental Consultants (2000) show an excursion beyond the National Toxic Rule criterion from channel catfish composite of 9 fillet with skin collected in 1997 at station 8-B (RM 228.5), sample #97500956. 7/ EVS Environmental Consultants (2000) show no excursions beyond the National Toxic Rule criterion from channel catfish composite of 8 fillet with skin collected in 1997 at station 8-C (RM 233.2), sample #97500957. 8/ EVS Environmental Consultants (2000) show no excursions beyond the National Toxic Rule criterion from channel catfish composite of 9 fillet with skin collected in 1997 at station 8-B (RM 228.5), sample #97500956. 9/ Sediment bioassay samples at 3 Washington State Department of Ecology SEDQUAL information system stations collected on or before November 4, 1993 exceed the Sediment Management Standards bioassay criterion.
Source: Ecology 2017.

Table 2-3. Oregon 303(d) Listings

USGS HUC	Record ID	River Miles	Category	Medium	Parameter	Initial Listing	Listing Sample Description
17070101; 17070105	26018	142 to 287.1	5	Biological tissue	Mercury	2012, Category 5	See Note 1.
17070101; 17070105	9284	142 to 287.1	5	Biological tissue	Polychlorinated biphenyls (PCBs)	2012, Category 5	See Note 2.

Notes: 1/ September 23, 2013: Fish consumption advisories issued jointly by the Oregon Health Authority and Washington State Department of Health due to PCBs and mercury in resident fish. Oregon fish advisory: Limit consumption of all resident fish (including sturgeon) taken from Bonneville Dam to McNary Dam to one meal per week. 2/ September 23, 2013: Fish consumption advisories issued jointly by the Oregon Health Authority and Washington State Department of Health due to PCBs and mercury in resident fish. Oregon fish advisory: Limit consumption of all resident fish (including sturgeon) taken at Bonneville Dam at Bradford Island extending 1 mile upstream to Ruckel Creek to 0 meals per month.
Source: ODEQ 2017 and ODEQ 2019.

Table 2-4. Oregon State Water Quality Classifications

Record ID	Section of the Columbia River to which classification listing applies (River Miles)	Parameter	Criteria	Beneficial Uses	Status
25983	142 to 303.9	Arsenic	Table 40 Human Health Criteria for Toxic Pollutants	Human health; Aquatic life	Cat 3: Insufficient data
25986	142 to 303.9	Cadmium	Table 20 Toxic Substances	Aquatic life	Cat 3: Insufficient data
20020	142 to 303.9	Iron	Table 20 Toxic Substances	Aquatic life; Human health	Cat 3: Insufficient data
25985	142 to 303.9	Lead	Table 20 Toxic Substances	Aquatic life	Cat 3: Insufficient data
25984	142 to 303.9	Silver	Table 20 Toxic Substances	Aquatic life	Cat 3: Insufficient data
20024	137.1 to 303.9	Manganese	Table 20 Toxic Substances	Human health	Cat 2: Attaining some criteria/uses
19999	0 to 303.9	Ammonia	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses
20002	0 to 303.9	Barium	Table 20 Toxic Substances	Human health	Cat 3: Insufficient data
20006	0 to 303.9	Chloride	Table 20 Toxic Substances	Aquatic life	Cat 3: Insufficient data
25982	0 to 303.9	Chromium	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses
20010	0 to 303.9	Copper	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses
20025	0 to 303.9	Nickel	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses
20026	0 to 303.9	Nitrates	Table 20 Toxic Substances	Human health	Cat 3: Insufficient data
20032	0 to 303.9	Selenium	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses
20035	0 to 303.9	Thallium	Table 20 Toxic Substances	Human health	Cat 3: Insufficient data
20036	0 to 303.9	Zinc	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses
44	213.7 to 287.1	Dioxin (2,3,7,8-TCDD)	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 4A: Water quality limited, TMDL approved
43	213.7 to 287.1	Dioxin (2,3,7,8-TCDD)	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 4A: Water quality limited, TMDL approved

Source: ODEQ 2017.

2.3 CONCEPTUAL SITE MODEL

There is a limited understanding of the conceptual site model for the John Day reach as a whole due to the lack of sitewide data.

Any potentially contaminated sediment could be distributed throughout the John Day reach through erosion and deposition processes. These mechanics are not well documented for the reach as a whole, but it could be assumed that there are sediments depositing in the John Day reach from tributaries, with exact quantities unknown. Sediment from upstream of the John Day reach could be assumed to be limited (though not absent), given the number of dams upstream of this reach that likely entrain sediment and limit transport.

Water soluble contaminants are present within the John Day reach, as indicated by the TMDL and state water quality classifications (see Section 2.2.3). Bioaccumulative contaminants in tissue are also present in aquatic receptors throughout the John Day reach.

2.3.1 Secondary Media and Release Mechanisms

Both surface water and sediment can serve as secondary media. Tissues of aquatic receptors also serve as a secondary media source for bioaccumulative contaminants. Release mechanisms include hydraulically induced erosion and other physical disturbances from anthropogenic activity, such as navigation and recreational activities.

2.3.2 Exposure Routes

Primary exposure routes to human and biological receptors are through direct contact and ingestion of sediment and/or surface water, depending on the contaminant. Exposure routes to human receptors also includes fish consumption.

2.3.3 Pathway Completeness

Based on the TMDLs and Washington State water quality classifications (see Section 2.2.3), complete pathways are present for bioaccumulative contaminants in aquatic receptors based on the listings for fish tissue. Whether surface water or sediment serves as the primary or secondary source for these pathways is uncertain. However, for more hydrophobic contaminants, it can be assumed that those chemicals identified in the state water quality classifications are present to some degree in sediment.

2.4 MANAGEMENT AREAS

Due to the lack of sitewide data, it is difficult to identify subareas with distinct sediment characteristics within the John Day reach.

2.5 CHEMICALS OF CONCERN

There is limited information on chemicals of concern for the John Day reach. Given this, no assumptions can be made regarding the presence of contaminants and which may pose a risk to human health or the environment.

2.5.1 Sources of Chemicals of Concern

Many of the contaminants of concern in the Columbia River system are widely distributed and derive from a variety of point and non-point sources.

Mercury contamination is released to the environment through erosion of natural deposits; mining and smelting activities; agricultural activities; wastewater and stormwater discharges; and recirculation and redistribution of sediments (EPA 2009). Atmospheric deposition from sources within and outside of the Columbia River drainage is thought to be a major pathway for mercury (EPA 2009).

Dichlorodiphenyltrichloroethane (DDT) is an organochlorine pesticide that was banned in the United States in 1972. DDT and its breakdown products are legacy contaminants that are bound to soil particles in agricultural areas (EPA 2009). The main pathway to the Columbia River system is through erosion and runoff from agricultural areas that transport DDT-contaminated soil and sediment to the aquatic environment (EPA 2009).

PCBs are a class of chlorine-containing organic chemicals that were widely used in industrial processes and electrical equipment until they were banned in the United States in 1976. Historical spills and improper disposal are important point sources of PCBs. PCBs can be generated and spread by the incineration of trash and atmospherically deposited from distant sources (EPA 2009). PCBs (both point and non-point sources) are transported into the aquatic environment via erosion and stormwater runoff (EPA 2009).

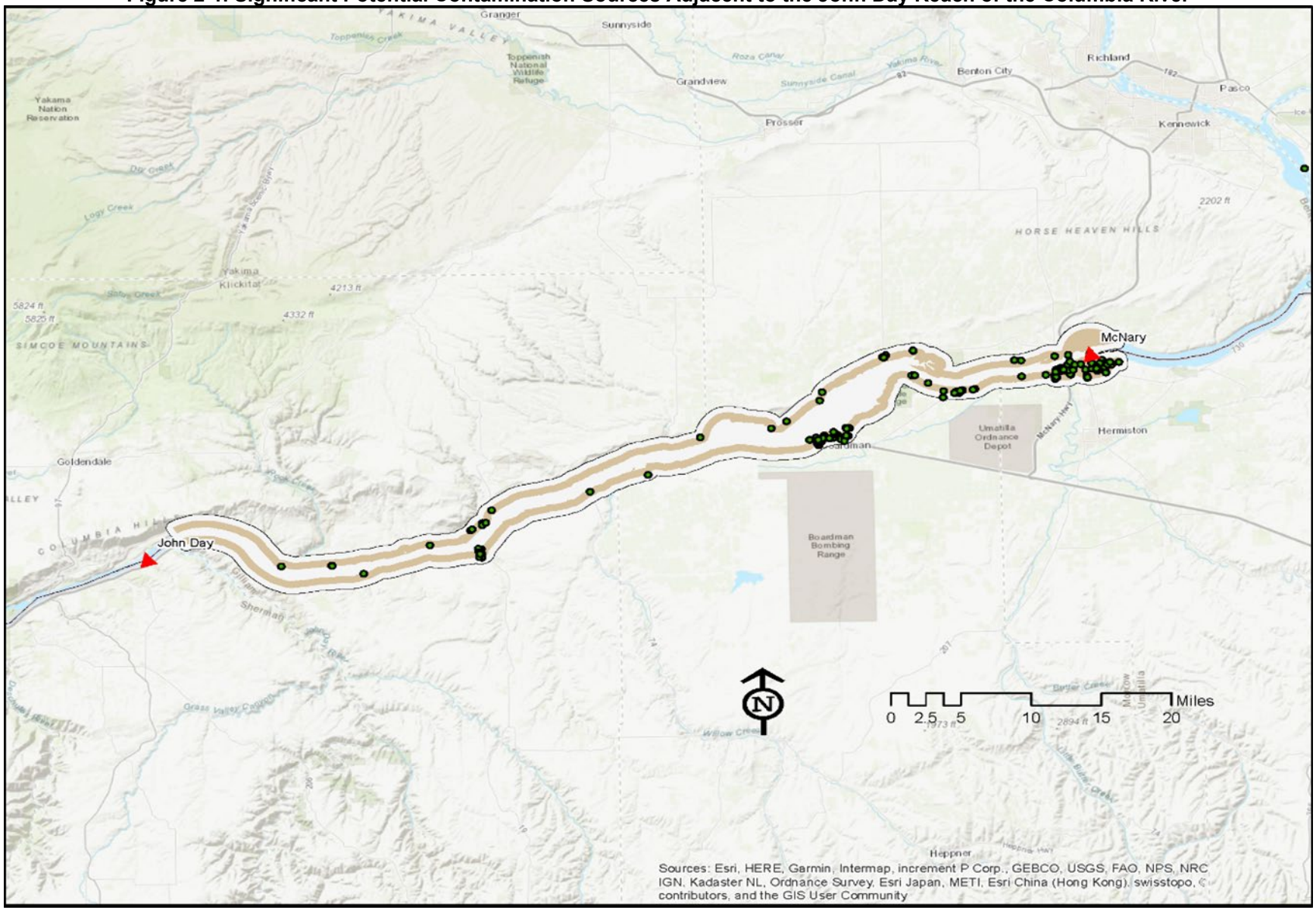
Polybrominated diphenyl ethers (PBDEs) are a class of bromine-containing organic chemicals used as flame retardants in a variety of materials and consumer products, including electronics, plastics, foam padding, and fabrics (EPA 2009). Fate and transport of PBDEs in the environment is not fully understood, but possible pathways include atmospheric deposition and wastewater and stormwater discharges (EPA 2009). Manufacturers voluntarily phased out the use of Penta-BDE and Octa-BDE by the end of 2004 (Van Bergen et al. 2015). Washington State has enacted restrictions on certain uses of Deca-BDE, and the three major producers of Deca-BDE reached an agreement with EPA halting the production, importation, and sale by the end of 2012 (Van Bergen et al. 2015). Despite the recent phaseout of these forms of PBDEs, releases to the environment are likely to continue as there is a reservoir of these chemicals in materials and consumer goods currently used in homes and businesses.

Metals enter the Columbia River via stormwater runoff from developed areas. Additionally, metals enter the reach by air and wastewater discharges from mines and smelters upstream in Washington, British Columbia, and Idaho (EPA 2009).

Dioxins and dioxin-like compounds are byproducts of combustion and manufacturing processes, including bleaching of wood pulp with chlorine during paper production. Incomplete combustion of materials containing chlorine can under certain conditions generate dioxin and dioxin-like compounds (EPA 2006). Following formation during combustion, dioxins adsorbed to particulates deposit on waters and soil from the atmosphere. Dioxins do not appreciably volatilize; once they have deposited in soil, they are primarily transported by action of wind or erosion of soil particles (EPA 2006). The aquatic environment receives some dioxins by direct atmospheric deposition, but a more significant portion is received through transport of dioxin-contaminated soil particles by runoff and stormwater (EPA 2006). On the Columbia River, in addition to non-point atmospheric and stormwater deposition, dioxins enter the system from the industrial wastewater discharge from pulp and paper mills. Releases of dioxin were reduced in the early 1990s when the TMDL for dioxin on the Columbia River was enacted and the mills changed their bleaching chemistry to reduce the generation of dioxin (EPA 2009).

A commercial database search was used to identify potential sources or other areas of contamination along the shore of Lake Umatilla. The extent of the search included a half-mile extent either side of the high pool elevation line for Lake Umatilla, from McNary Dam to John Day Dam. A separate 1-mile search radius was used at both dam locations. Figure 2-1 shows a summary of the locations the 337 sites of “significant” sites found (see Chapter 5 – Supplemental Table for a full list of sites). In this study, “significance” is a matter of professional judgment and includes broad categories of sites that might be expected to have an environmental impact on sediment quality (such as National Pollution Discharge Elimination System point discharges, Resource Conservation and Recovery Act listed sites or Comprehensive Environmental Response, Compensation, and Liability Act listed sites, non-compliant facilities regulated under state or Federal laws, landfills including historic landfills, and other large and discrete sites or potential contamination sources). Sites that generally are expected to have little or no impact or only transient impacts were not plotted (including minor spill reports, clandestine drug labs, schools and day-care facilities, and conditionally exempt small-quantity generators.) The database search results are being used for screening purposes only to identify appropriate chemical parameters or pollutants reflective of these potential sources that may affect sediment quality. The identification of the potential for sediment contamination from these sources does not imply that these are current sources or that regulatory action is recommended or required. Any specific proposed project would require a site-specific Phase I environmental assessment to adequately characterize existing site conditions.

Figure 2-1. Significant Potential Contamination Sources Adjacent to the John Day Reach of the Columbia River



2.6 SUMMARY OF EXISTING DATA

2.6.1 Physical Data

In 1994 and 1995, the National Marine Fisheries Service (NMFS) collected at total of 93 sediment samples at 6 different stations in and around the John Day Reservoir for physical analyses. The sediment results were reported in a Corps' memorandum (Corps, 2000). Each of the 6 stations was sampled at three depths: 1, 3, and 5 meters. With few exceptions, the samples were graded "poorly graded sand with silt" or "silty sand." The average of the samples was 72.2 percent sand, 20.8 percent silt/clay, and 1.4 percent volatile solids with a median grain size of 0.14 millimeters (Corps, 2000).

2.6.2 Chemical Data

There is no recent chemical data available for the John Day reach of the lower Columbia River.

2.6.3 Biological Data

Nilsen et al. (2015) collected sediment and Pacific lamprey (*Entosphenus tridentatus*) tissue samples from several locations along major tributaries of the Columbia River. Results for larval lamprey tissue and sediment can be found in Table 2-4 and Table 2-5, respectively. Samples most relevant to the John Day reach were collected from the mouth of the Umatilla River (i.e. the Lower Umatilla samples in Table 2-4 and Table 2-5). Nilsen et al. (2015) also compared their larval lamprey tissue results to three adult lamprey tissue samples collected at John Dam Day, as reported in a technical report from the Oregon Health Authority (OHA) (2012). In larval lamprey at Umatilla, total DDTs was the contaminant with the highest concentration; in adult lamprey at John Dam Day, total DDTs was the second highest (mercury was the contaminant with the highest concentration in adult lamprey tissue). In sediments in John Day reach, total DDTs were detect, but at much lower levels than in tissue samples. These results suggest that DDTs and mercury are present in John Day reach and biomagnify in the foodweb. Nilsen et al. (2015) also calculated human health risk screening levels based on fish consumption levels of subsistence fishers/consumers and compared these screening levels to adult lamprey tissue concentrations reported by OHA (2012) (see Table 2-6). Adult lamprey tissue collected at John Dam Day exceed these screening levels for chlordane, total DDTs, hexachlorobenzene, and PCB 118. Additionally, the adult lamprey tissue concentrations exceed the ODEQ Human Health Water Quality Criteria for methylmercury in fish tissue (ODEQ 2014). These contaminants are known persistent and toxic compounds that are apparently biomagnified by the foodweb in John Day reach.

Table 2-5. Contaminant Data for Larval Lamprey Collected from 2011 to 2012

Sample Location	Hood River 1	Hood River 2	Hood River 3	Mill Creek	Fifteenmile 1	Deschutes River Mouth	Lower Umatilla
Reach	Bonneville	Bonneville	Bonneville	Bonneville	Bonneville	Dalles	John Day
Chlorpyrifos	2.4	BD	2.2	30	1.5	BD	BD
Cyhalothrin	1.7	BD	BD	BD	BD	BD	BD
Oxyfluorfen	BD	BD	BD	BD	120	BD	BD
PBDEs (sum of 10 congeners)	1.8	2.1	BD	20.7	8.9	1.7	37.74
Total chlordane (cis-chlordane, trans-chlordane, cis-nonachlor, trans-nonachlor)	BD	BD	BD	66.5	3.72	BD	2.91
Total DDTs (sum of DDD, DDE, DDT)	126	180	140	77	13	BD	81
Dieldrin	4.4	BD	BD	3.7	BD	BD	BD
Total endosulfans (I, II, and sulfate)	17.6	8.4	10.9	11.9	1.8	BD	BD
Hexachlorobenzene (HCB)	1.2	BD	BD	4.3	1.8	BD	BD
Pentachloroanisole	1.9	BD	BD	4.6	3.1	BD	BD
PCBs (sum of 15 congeners)	BD	BD	BD	BD	BD	BD	BD

Note: all figures reported in micrograms per kilogram (µg/kg); BD = below detection.
Source: Nilsen et al. 2015.

Table 2-6. Contaminant Data for Surficial Sediments Collected from 2011 to 2012

Sample Location	Hood River 1	Hood River 2	Hood River 3	Mill Creek	Fifteenmile 1	Deschutes River Mouth	Lower Umatilla	SL1[1/]
Reach	Bonneville	Bonneville	Bonneville	Bonneville	Bonneville	Dalles	John Day	
Chlorpyrifos	BD	BD	BD	1.2	0.34	BD	BD	NS
Para-cresol	19	BD	22	114	27	91	49	NS
Phenol	BD	BD	BD	**427**	BD	BD	BD	120
Triclosan	7.6	BD	BD	BD	BD	BD	BD	NS
PAHs	50.8	BD	2.8	4931	14.3	27.2	56.4	17,000
oxyfluorfen	BD	BD	BD	BD	BD	BD	BD	NS
PBDEs (sum of 10 congeners)	BD	BD	BD	4.84	0.38	BD	BD	
Total chlordane (cis-chlordane, trans-chlordane, cis-nonachlor, trans-nonachlor)	BD	BD	BD	4.34	BD	BD	BD	NS
Total DDTs (sum of DDD, DDE, DDT)	1.1	1.98	0.92	4	BD	BD	0.4	431
Dieldrin	BD	BD	BD	0.11	BD	BD	BD	4.9
Total endosulfans (I, II, and sulfate)	0.23	0.21	0.5	1.32	0.28	BD	BD	NS
Hexachlorobenzene (HCB)	BD	BD	BD	1.2	BD	BD	0.17	NS
PCBs (sum of 18 congeners)	BD	BD	BD	0.3	BD	BD	BD	NS[2/]

Note: all figures reported in micrograms per kilogram (µg/kg); BD = below detection. 1/ Freshwater benthic SL1 used in SEF (RSET 2016); this screening level corresponds to a concentration below which adverse effects to benthic communities would not be expected. Values exceeding SL1 are highlighted bold. 2/ While the SEF (RSET 2016) has a SL1 for PCB total aroclors (110 µg/kg), it does not specify a SL1 for the sum of these 18 PCB congeners.
Source: Adapted from Nilsen et al. 2015.

Table 2-7. Detected Concentrations of Select Contaminants in Adult Lamprey Tissue

Site	Chlordane[1/] (µg/kg)	Total DDTs[2/] (µg/kg)	Dieldrin (µg/kg)	Hexachloro-benzene (µg/kg)	PCB 118 (µg/kg)	Mercury (total) (µg/kg)
Columbia River at John Day Dam	10.7	33.3	2.9	6.82	2.45	450
Columbia River at John Day Dam	11	25.5	3	7.08	2.43	130
Columbia River at John Day Dam	11.2	30.3	2.99	6.92	2.59	160
Human health screening level[3/], carcinogen (µg/kg, wet weight)	3.3	3.4	0.072	0.72	0.25	40[4/]

Note: µg/kg = micrograms per kilogram. 1/ Chlordane includes cis-chlordane, cis- and trans-nonachlor, and oxychlordane; no data for trans-chlordane. 2/ Total DDTs includes p-p'-DDT; p-p'-DDE; and p-p'-DDD. 3/ Human health screening levels for subsistence fishers/consumers as calculated by Nilsen et al. 2015. 4/ 40 µg/kg is the ODEQ Human Health Water Quality Criteria for methylmercury; this criteria is the concentration of methylmercury (not total mercury) in fish tissue (ODEQ 2014).
Source: Data for John Day Dam adult lamprey tissue samples is from OHA 2012, and is cited by Nilsen et al. 2015; Table adapted from: Nilsen et al. 2015

Under a grant from EPA to establish a baseline study for the Regional Environmental Monitoring and Assessment Program (REMAP) characterizing the lower mid-Columbia river, ODEQ developed a probabilistic sampling design to characterize fish tissues collected from Bonneville Dam to McNary Dam (ODEQ, 2012). Twenty-three probabilistic sites along the river mainstem were selected randomly, with approximately half being sampled from the Oregon shoreline and the other half being sampled from the Washington shoreline. A summary of tissue data from the probabilistic sites is presented in Table 2-8. Eight targeted sites were sampled including the mouths of major tributaries (the Hood, Big White Salmon, Klickitat, John Day, Deschutes, and Umatilla Rivers) and near potential sources of pollution (downstream of the PGE-Boardman coal-fired power plant, a potential mercury source; and downstream of The Dalles, a potential urban contaminant source). Data from the targeted locations within the John Day reach are presented in Table 2-9. Overall, 81 percent of tissue samples were smallmouth bass (*Micropterus dolomieu*) and 19 percent largescale sucker; the species distribution was similar among probabilistic and targeted site samples. For fish tissue samples collected from John Day reach and the lower mid-Columbia generally, mercury, total DDTs, and total PCBs were detected above ODEQ screening values. These results suggest that mercury, DDTs, and PCBs are present in the reach and it is likely that these contaminants are subject to biomagnification through the foodweb at John Day reach.

Table 2-8. Fish Fillet Data, Columbia Mainstem Probabilistic Sites

Analyte	Minimum	Maximum	Median	Mean	Standard Deviation	Percent Detects	Screening Values
Total mercury (mg/kg)	**0.11**	**0.5**	**0.19**	**0.22**	0.11	100%	0.04[1/]
Total 2,3,7,8 substituted dioxin-furans (ng/kg)	<LOD	**1.8**	NC	**0.23**	0.5	22%	0.0026[2/]
Total DDTs (ng/kg)	**3,338**	**134,312**	**12,309**	**33,086**	**41,501**	100%	1,200[3/]
Total chlordane[4/] (ng/kg)	62	**2,677**	242	655	794	100%	1,143
Dieldrin (ng/kg)	13	**714**	**53**	**134**	182	100%	25
Total PCBs (ng/kg)	**1,430**	**38,969**	**5,768**	**9,466**	10,531	100%	200[5/]
Total PBDEs (ng/kg)	800	15,746	3,226	4,600	4,416	100%	–

Notes: ng/kg = nanograms per kilogram; mg/kg = milligrams per kilogram; NC = not calculated; LOD = limit of detection. Bold values exceed the screening value. 1/ ODEQ's human health fish consumption criterion for total methylmercury (ODEQ 2014), is presented here as a screening value for total fillet mercury (i.e., assumes 100 percent of the fillet mercury is methylated). 2/ ODEQ human health screening value based on 175 grams per day fish consumption rate. 3/ Draft Washington Department of Health screening values based on the Oregon fish consumption rate. 4/ Total chlordane is the sum of cis-Nonachlor, trans-Nonachlor, cis-Chlordane, trans-Chlordane, and Oxychlordane. 5/ ODEQ's total PCB water quality criterion for human health protection was converted to the equivalent tissue residue concentration by removing the bioaccumulation factor from the denominator
Source: ODEQ (2009)

Table 2-9. Fish Fillet Data, Targeted Sites in John Day Reach

Analyte	John Day River	Columbia River Downstream of Portland General Electric – Boardman, OR	Umatilla River	Screening Values
Total mercury (mg/kg)	**0.41**	**0.14**	**0.31**	0.04[1/]
Total 2,3,7,8 substituted dioxin-furans (ng/kg)	**0.14[2/]**	<LOD	<LOD	0.0026[3/]
Total DDTs (ng/kg)	**5,323**	**3,201**	**11,244**	1,200[4/]
Total chlordane[5/] (ng/kg)	141	57	303	1,143
Dieldrin (ng/kg)	20	15	**42**	25
Total PCBs (ng/kg)	**2,175**	**866**	**6,716**	200[6/]
Total PBDEs (ng/kg)	1,014	884	4,167	–

Notes: Bold values exceed the screening value. 1/ODEQ's human health fish consumption criterion for total methylmercury (ODEQ 2014) is presented here as a screening value for total fillet mercury (i.e., assumes 100 percent of the fillet mercury is methylated). 2/ Analyte detected, but failed ion ratio criteria. The reported value is the estimated maximum possible concentration. 3/ ODEQ human health screening value based on 175 grams per day fish consumption rate. 4/ Draft Washington Department of Health screening values based on the Oregon fish consumption rate. 5/ Total chlordane is the sum of cis-Nonachlor, trans-Nonachlor, cis-Chlordane, trans-Chlordane, and Oxychlordane. 6/ ODEQ's total PCB water quality criterion for human health protection was converted to the equivalent tissue residue concentration by removing the bioaccumulation factor from the denominator
Source: ODEQ (2009)

White sturgeon are long lived, anadromous fish native to larger rivers of the west coast of North America including the Columbia River. White sturgeon live in estuaries and travel upstream to freshwater to spawn. In the Columbia River, dams present barriers to white sturgeon migration. Feist et al. (2005) collected liver and gonad tissue samples from 174 white sturgeon individuals from the Columbia River estuary, as well as the reservoir pools behind Bonneville, The Dalles, and John Day dams. Tissue samples were collected from February through April in 2000 and 2001. Samples represent harvestable fish under fishing regulations (110 to 137 fork length) for a total of 42 to 45 individuals (19 to 24 males and 21 to 23 females) collected at each location. Tissue samples were analyzed for chlorinated pesticides and PCBs (Table 2-10 and Table 2-11). White sturgeon from the Bonneville reach had significantly higher levels of total DDT, total pesticides, and PCBs than fish from the Columbia River estuary or The Dalles and John Day Reservoirs (Figure 2-2).

Table 2-10. Concentration (mean ± SE) of Chlorinated Pesticides in Livers and Gonads of White Sturgeon from the Columbia River

Pesticide	Number of Detections	Liver Lipid (µg/g)	Number of Detections	Gonad Lipid (µg/g)
Aldrin	2	0.002 ± 0.002	5	0.011 ± 0.006
Alpha-hexachlorocyclohexane (a-BHC)	19	0.039 ± 0.009	26	0.023 ± 0.005
Beta-hexachlorocyclohexane (b-BHC)	14	0.115 ± 0.046	11	0.023 ± 0.005
Lindane (Gamma-hexachlorocyclohexane or g-BHC)	8	0.024 ± 0.011	21	0.047 ± 0.014
Delta-hexachlorocyclohexane (d-BHC)	9	0.019 ± 0.007	15	0.154 ± 0.127
p,p´-DDD	86	1.863 ± 0.544	93	1.619 ± 0.400
p,p´-DDE	97	18.40 ± 7.313	98	10.60 ± 2.086
p,p´-DDT	28	0.274 ± 0.103	41	0.259 ± 0.073
Dieldrin	16	0.134 ± 0.045	15	0.031 ± 0.009
Endrin	10	0.114 ± 0.060	11	0.022 ± 0.007
Endrin aldehyde	16	0.108 ± 0.062	13	0.064 ± 0.032
Endrine ketone	8	0.038 ± 0.165	2	0.010 ± 0.007
Endosulfan I	34	0.161 ± 0.044	45	0.133 ± 0.025
Endosulfan II	9	0.108 ± 0.051	14	0.087 ± 0.047
Endosulfan sulfate	3	0.005 ± 0.003	8	0.008 ± 0.003
Heptachlor	8	0.018 ± 0.008	13	0.037 ± 0.019
Heptachlor epoxide	15	0.081 ± 0.031	25	0.074 ± 0.024
p,p´-Methoxychlor	14	0.112 ± 0.044	5	0.027 ± 0.017

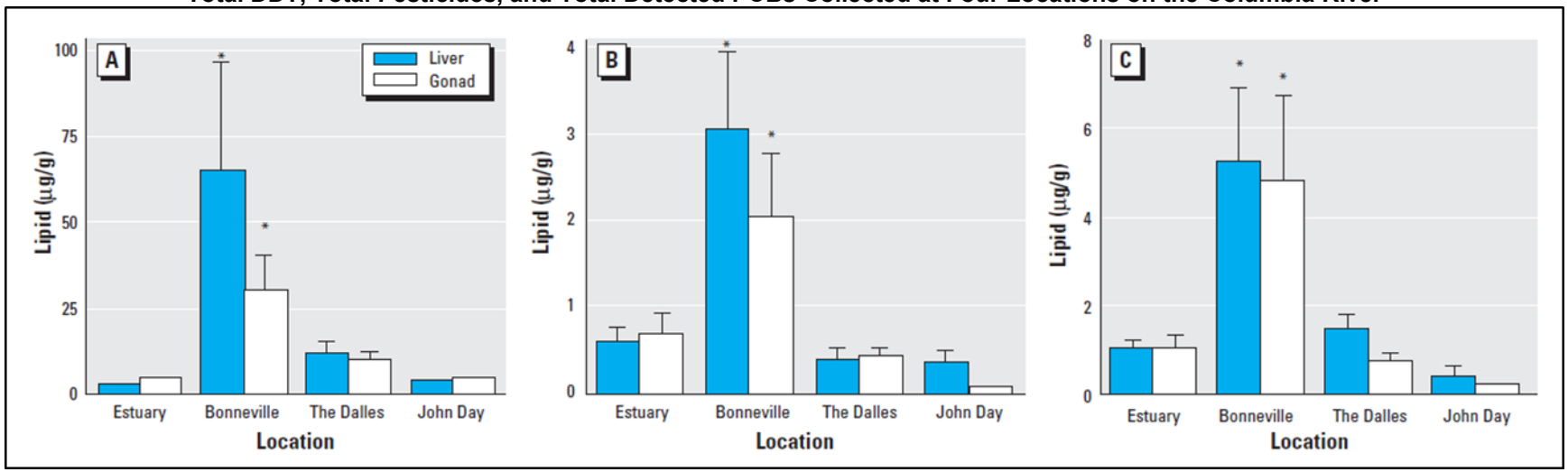
Note: Liver sample size = 97; gonad sample size = 98.
Source: Feist et al. (2005)

Table 2-11. Concentration (mean ± SE) of PCBs in Livers and Gonads of White Sturgeon from the Columbia River

PCB Congener	Number of Detections	Liver Lipid (µg/g)	Number of Detections	Gonad Lipid (µg/g)
28	3	0.020 ± 0.011	0	–
44	6	0.055 ± 0.042	4	0.004 ± 0.002
52	3	0.038 ± 0.024	3	0.024 ± 0.105
60	19	0.125 ± 0.033	11	0.163 ± 0.129
66	8	0.131 ± 0.066	2	0.025 ± 0.020
74	2	0.008 ± 0.006	4	0.037 ± 0.022
87	1	0.006 ± 0.006	2	0.008 ± 0.006
99	12	0.101 ± 0.036	12	0.077 ± 0.041
101	28	0.238 ± 0.088	24	0.217 ± 0.131
105	14	0.135 ± 0.051	9	0.033 ± 0.016
110/77	12	0.060 ± 0.019	17	0.128 ± 0.050
118	9	0.054 ± 0.020	10	0.152 ± 0.085
126	6	0.035 ± 0.016	5	0.024 ± 0.018
128	1	0.007 ± 0.007	6	0.043 ± 0.031
138	28	0.258 ± 0.071	28	0.233 ± 0.072
151	4	0.025 ± 0.015	7	0.032 ± 0.014
153	18	0.264 ± 0.101	20	0.157 ± 0.062
156	6	0.035 ± 0.018	7	0.013 ± 0.006
169	2	0.007 ± 0.005	0	–
170	3	0.006 ± 0.003	3	0.003 ± 0.001
180	3	0.030 ± 0.026	3	0.001 ± 0.001
183	9	0.042 ± 0.015	13	0.029 ± 0.010
187	20	0.163 ± 0.047	21	0.113 ± 0.032
194	4	0.018 ± 0.009	1	0.001 ± 0.001
199	10	0.022 ± 0.007	10	0.065 ± 0.030
203/170	10	0.043 ± 0.017	10	0.016 ± 0.008

Note: Liver n = 97; gonad n = 98.
Source: Feist et al. (2005)

Figure 2-2. White Sturgeon Liver and Gonad Tissue Concentrations (mean +/- SE) of Total DDT, Total Pesticides, and Total Detected PCBs Collected at Four Locations on the Columbia River



Notes: A = total DDT (DDD + DDE + DDT); B = total pesticides (all detected pesticides – total DDT); C = total detected PCBs. Each bar represents a sample size of 22–28. *Statistically different (Analysis of Variance [ANOVA] $p < 0.05$).
Source: Feist et al. (2005)

The osprey (*Pandion haliaetus*) is a fish-eating raptor that forages and nests throughout the Columbia River and its tributaries. Exposure to p,p'-DDE (one of the degradation products of the pesticide DDT) can cause eggshell thinning and subsequent reproductive failure in osprey. Henny et al. (2008) collected osprey eggs along the lower Columbia River (RM 29 to RM 286) in 1997, 1998, and 2004 and analyzed them for a suite of environmental contaminants including p,p'-DDE. Table 2-12 summarizes the data representing nine egg samples collected in 2004 along the Bonneville, Dalles, and John Day reaches (from RM 146 to RM 286). Table 2-13 compares the data from 1997 to 1998 and 2004 representing egg samples collected along the lower Columbia River (RM 29 to RM 286). DDT, DDD, and DDE levels in osprey eggs declined significantly over this time period. Most of the other environmental contaminants measured declined or declined significantly, with the exception of mercury, which increased significantly over this time period. Henny et al. (2008) notes that osprey reproductive success is negatively affected at DDE concentrations above 4,200 µg/kg or mercury concentrations above 0.50 µg/g. Henny et al. (2008) also reports that Columbia River osprey nesting success increased over this time period and concluded that contamination in the Columbia River had declined to levels that no longer adversely affect osprey reproduction.

Table 2-12. Summary of 2004 Data for Nine Osprey Egg Samples Collected on the Columbia River (RM 146 – RM 286)

Contaminant	Geometric Mean	Unit of Measure
Mercury	0.35	µg/g, dw
DDE	1705	µg/kg, ww
DDD	91.6	µg/kg, ww
DDT	7.56	µg/kg, ww
HCB	1.62	µg/kg, ww
Beta-hexachlorocyclohexane	0.25	µg/kg, ww
Total chlordanes[1/]	15.9	µg/kg, ww
Heptachlor epoxide	2.48	µg/kg, ww
Dieldrin	0.69	µg/kg, ww
Sum of 39 PCB congeners	492	µg/kg, ww
PCB TEQs[2/]	33.4	ng/kg ww
PCDD TEQs	6.07	ng/kg ww
PCDF TEQs	2.95	ng/kg ww
Combined TEQs[3/]	47.4	ng/kg ww

Notes: dw = dry weight; ww = wet weight; TEQ = toxic equivalent; µg/g = microgram per gram; µg/kg = microgram per kilogram; ng/kg = nanogram per kilogram. 1/ Total chordanes = sum of: trans-nonachlor, cis-nonachlor, oxychlordane, trans-chlordane, and cis-chlordane. 2/ Calculated by the method of Van den Berg et al. (1998). 3/ Includes PCB, PCDD, and PCDF TEQs. No-observed-adverse-effects level for ospreys, 136 ng/kg (ww) (Woodford et al. 1998).
Source: Henny et al. (2008)

Table 2-13. Comparison of 1997–1998 and 2004 Data for Osprey Egg Samples Collected on the Columbia River (RM 29 - RM 286)

Contaminant	Geometric Mean (1997–1998)	Unit	Geometric Mean (2004)	Unit	*P*
Mercury	**0.29**	**µg/g, dw**	**0.45**	**µg/g, dw**	**0.0028**
DDE	**4872**	**µg/kg, ww**	**1521**	**µg/kg, ww**	**<0.0001**
DDD	**199**	**µg/kg, ww**	**69.7**	**µg/kg, ww**	**<0.0001**
DDT	**19.8**	**µg/kg, ww**	**4.92**	**µg/kg, ww**	**0.0006**
HCB	**3.66**	**µg/kg, ww**	**1.73**	**µg/kg, ww**	**0.0002**
Beta-hexachlorocyclohexane	0.43	µg/kg, ww	0.28	µg/kg, ww	0.1685
Total chlordanes[1/]	**26.8**	**µg/kg, ww**	**14.7**	**µg/kg, ww**	**0.0004**
Heptachlor epoxide	**7.21**	**µg/kg, ww**	**2.72**	**µg/kg, ww**	**<0.0001**
Dieldrin	**6.47**	**µg/kg, ww**	**1.44**	**µg/kg, ww**	**<0.0001**
Sum of 39 PCB congeners	**1435**	**µg/kg, ww**	**783**	**µg/kg, ww**	**0.0013**
PCB TEQs[2/]	50	ng/kg ww	36.7	ng/kg ww	0.0959
PCDD TEQs	**12.4**	**ng/kg ww**	**3.8**	**ng/kg ww**	**<0.0001**
PCDF TEQs	1.48	ng/kg ww	1.74	ng/kg ww	0.6838
Combined TEQs[3/]	**62.5**	**ng/kg ww**	**43.8**	**ng/kg ww**	**0.0385**

Notes: 29 egg samples were collected from 1997 to 1998; 40 egg samples were collected in 2004. Bolded values indicate significant differences between years (P<0.05). dw = dry weight; ww = wet weight; TEQ = toxic equivalent; µg/g = microgram per gram; µg/kg = microgram per kilogram; ng/kg = nanogram per kilogram. 1/ Total chordanes = sum of: trans-nonachlor, cis-nonachlor, oxychlordane, trans-chlordane, and cis-chlordane. 2/ Calculated by the method of Van den Berg et al. (1998). 3/ Includes PCB, PCDD, and PCDF TEQs. No-observed-adverse-effects level for ospreys, 136 ng/kg (ww) (Woodford et al. 1998).
Source: Henny et al. (2008)

2.6.4 Elutriate Data

There is no existing elutriate data available for the John Day reach of the lower Columbia River.

2.7 RIVER SEGMENT DEVELOPMENT AND TRENDS

There are no other known land-use initiatives or activities identified for the John Day reach.

SECTION 3 - RECOMMENDATIONS AND CONCLUSIONS

Sediment data for the John Day reach is limited, and sediment quality can only be characterized for isolated portions of the reach and for a limited suite of chemicals and parameters. This data may or may not be able to be extrapolated to the rest of the John Day reach.

3.1 RECOMMENDATIONS

Sediment data for the John Day reach is limited and does not provide an adequate sitewide characterization of sediment quality as a whole. To provide a full characterization of sediment quality in the John Day reach, further empirical data is needed for a full suite of chemicals, as well as physical parameters, including but not limited to grain size and organic carbon. Sediment data is needed in both biased sampling locations and throughout the reach to provide a sense of contaminant sources and sitewide characteristics. Sediment data is needed for both surface and subsurface. A characterization of erosional and depositional areas would also provide valuable information on the sediment dynamics for the reach.

3.1.1 Conceptual Site Model

The conceptual site model for the John Day reach is based on general assumptions related to river mechanics and limited existing data available for sediment. As such, no formal conclusions can be developed based on the summary of the conceptual site model for this reach.

3.1.2 Chemicals of Concern

Due to the limited availability of chemical data for sediment in the John Day reach, no formal conclusions can be developed based on the summary of sediment data for this reach.

3.2 CONCLUSIONS

As stated throughout the document, there is limited data for this reach of the lower Columbia River, and additional information is needed to provide an accurate characterization of the existing conditions within the John Day reach.

SECTION 4 - REFERENCES

Beak Consultants, Inc. 1989. Columbia River Fish Study: Fish Collection, Fish Tissue Sampling, and Age of Fish Sampled. Prepared for Northwest Pulp and Paper Association.

Clarke, S. E., and S. A. Bryce, eds. 1997. Hierarchical Subdivisions of the Columbia Plateau and Blue Mountains Ecoregions, Oregon and Washington. General Technical Report PNW-GTR-395. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Portland, OR.

Corps (U.S. Army Corps of Engineers). 2019a. "Building Strong® at John Day Lock and Dam." Accessed August 5, 2019, https://www.nwp.usace.army.mil/John-Day/.

_____. 2019b. "McNary Lock and Dam." Accessed July 26, 2019, https://www.nww.usace.army.mil/Locations/District-Locks-and-Dams/McNary-Lock-and-Dam/.

_____. 2015. Memorandum: "Portland Sediment Evaluation Team (PSET) Level 2A dredged material suitability determination for the Monument Soil and Water Conservation District's (SWCD's) Cavender Habitat Enhancement project, located on the North Fork, John Day River (NFJDR), Monument, Grant County, Oregon (NWP-2015-258). Portland, OR.

_____. 2000. John Day Drawdown Phase I Study - Tier I Sediment Evaluation.

DOH (Washington State Department of Health). 2005. Survey of Potential Hanford Site Contaminants in the Upper Sediment for the Reservoirs at McNary, John Day, The Dalles, and Bonneville Dams, 2003. Olympia, WA.

Ecology (Washington State Department of Ecology). 2017. "Water Quality Atlas." Accessed December 18, 2017, https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx.

EPA (U.S. Environmental Protection Agency). 2006. An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000.

———. 2009. Columbia River Basin: State of the River Report for Toxics. January 2009.

_____. 1991. Total Maximum Daily Loading (TMDL) to Limit Discharges of 2,3,7,8-TCDD (Dioxin) to the Columbia River.

———. 2016. Ecoregions of the Pacific Northwest (Idaho, Oregon, Washington). Map scale 1:1,500,000. U.S. EPA, National Health and Ecological Effects Research Laboratory, Western Ecology Division. Available at https://www.epa.gov/ecoresearch/ecoregion-download-files-region#pane-10. Corvallis, OR.

EPA (U.S. Environmental Protection Agency) and Corps (U.S. Army Corps of Engineers). 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (Inland Testing Manual). Washington, D.C.

EVS Environmental Consultants, Inc., 2000. Columbia River Basin Fish Contaminant Survey: Volume 2 – Data Appendices. Prepared for the U.S. Environmental Protection Agency Region 10. Seattle, WA.

Fiest, G. W., M. A. H. Webb, D. T. Gundersen, E. P. Foster, C. B. Schreck, A. G. Maule, and M. S. Fitzpatrick. 2005. "Evidence of Detrimental Effects of Environmental Contaminants on Growth and Reproductive Physiology of White Sturgeon in Impounded Areas of the Columbia River." Environmental Health Perspectives 113(12):1675–1682.

Henny, C. J., R. A. Grove, and J. L. Kaiser. 2008. "Osprey Distribution, Abundance, Reproductive Success and Contaminant Burdens Along Lower Columbia River, 1997/1998 Versus 2004." Archives of Environmental Contamination and Toxicology 54:525–534.

Huntting, M. T., W. A. G. Bennett, V. E. Livingston, Jr., and W. S. Moen. 1961. Geologic Map of Washington: Washington Division of Mines and Geology, scale 1:500,000. GIS data available at https://mrdata.usgs.gov/geology/state/state.php?state=WA.

Nilsen, E. B., W. B. Hapke, B. McIlraith, and D. Markovchick. 2015. "Reconnaissance of Contaminants in Larval Pacific Lamprey (Entosphenus tridentatus) Tissues and Habitats in the Columbia River Basin, Oregon and Washington, USA." Environmental Pollution 201:121–130.

Northwest Regional Sediment Evaluation Team Agencies. 2016. Sediment Evaluation Framework for the Pacific Northwest. July 2016.

ODEQ (Oregon Department of Environmental Quality). 2012. Regional Environmental Monitoring and Assessment Program: 2009 Lower mid-Columbia River Ecological Assessment Final Report.

_____. 2014. "Table 40: Human Health Water Quality Criteria for Toxic Pollutants" Accessed August 20th, 2019, https://www.oregon.gov/deq/Rulemaking%20Docs/tables303140.pdf.

_____. 2017. "Water Quality Assessment - Oregon's 2012 Integrated Report Assessment Database and 303(d) List" Accessed December 13th, 2017, https://www.deq.state.or.us/wq/assessment/rpt2012/search.asp#db.

_____. 2019. "Middle Columbia Fish Advisory" Accessed August 5th, 2019, https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/RECREATION/FISHCONSUMPTION/Pages/Mid-Columbia.aspx.

ODEQ (Oregon Department of Environmental Quality) and Ecology (Washington Department of Ecology). 2002. Total Maximum Daily Load (TMDL) for Lower Columbia River Total Dissolved Gas.

Oregon Health Authority (OHA). 2012. Technical Report: 2009 CRITFC Pacific Lamprey Study.

Randle, T. J., and J. Bountry. 2017. Dam Removal Analysis Guidelines for Sediment. Prepared for U.S. Bureau of Reclamation, Technical Service Center. Denver, CO.

Thorson, T. D., S. A. Bryce, D. A. Lammers, A. J. Woods, J. M. Omernik, J. Kagan, D. E. Pater, and J. A. Comstock. 2003. Ecoregions of Oregon (color poster with map, descriptive text, summary tables, and photographs), map scale 1:1,500,000. U.S. Geological Survey. Reston, VA.

USGS (U.S. Geological Survey). The National Geologic Map Database TopoView. Accessed January 11, 2018, https://ngmdb.usgs.gov/topoview/viewer.

Van Bergen, S., H. Davies, J. Grice, C. Mathieu, and A. Stone. 2015. Flame Retardants: A Report to the Legislature. Publication no. 14-04-047. Washington State Department of Ecology. Olympia, WA.

Van den Berg, M., L. Birnbaum, A. T. C. Bosveld, B. Brunström, P. Cook, M. Feeley, J. P. Giesy, A. Hanberg, R. Hasegawa, S. W. Kennedy, T. Kubiak, J. C. Larsen, F. X. R. van Leeuwen, A. K. D. Liem, C. Nolt, R. E. Peterson, L. Poellinger, S. Safe, D. Schrenk, D. Tillitt, M. Tysklind, M. Younes, F. Wærn, and T. Zacharewski. 1998. “Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife.” Environmental Health Perspectives 106(12):775-792.

Walker, G. W. and N. S. MacLeod. 1991. Geologic map of Oregon: scale 1:500,000. U.S. Geological Survey. GIS data available at: https://mrdata.usgs.gov/geology/state/state.php?state=OR.

Whetten, J. T., J. C. Kelley, and L. G. Hanson. 1969. “Characteristics of Columbia River Sediment and Sediment Transport.” Journal of Sedimentary Petrology 39(3):1149–1166.

Woodford, J. E., W. H. Karasov, M. W. Meyer, and L. Chambers. 1998. “Impact of 2,3,7,8-TCDD Exposure on Survival, Growth, and Behavior of Ospreys Breeding in Wisconsin, USA.” Environmental Toxicology and Chemistry 17(7):1323-1331.

SECTION 5 - SUPPLEMENTAL TABLE

Table 5-1. Significant Potential Contamination Sources Adjacent to the John Day Reach of the Columbia River

Database in which site is listed	Site Name	Address	City	State	ZIP	County
,HE,I,	WEST EXTENSION IRRIGATION	840 E. HWY 730	IRRIGON	OR	97844	MORROW
,AF,FC,	CHEM WASTE MGMT OF THE NW INC	CEDAR SPGS RD STAR RT BOX 9	ARLINGTON	WA	97812	
,I,BO,	WATTS BROS FROZEN FOODS	23526 W SR 14	PATERSON	WA	99345	BENTON
,I,BO,U,	LES BARBEE UST 9154	HWY 221 & SR 14	PATERSON	WA	99345	BENTON
,I,BO,	SPRINT COMMUNICATIONS CO PATERSON	189902 S SR 221 HWY SW	PATERSON	WA	99345	BENTON
,I,BO,	SPRINT COMMUNICATIONS CO ROOSEVELT	224 FRONTAGE RD	ROOSEVELT	WA	99356-9743	KLICKITAT
,I,BO,	CHATEAU STE MICHELLE RIVER RIDGE WINERY	HWY 14 10 MI W OF	PATERSON	WA	99345	BENTON
,CC,	USDOI FWS UMATILLA NWR: WHITCOMB ISLAND UNIT WHITCOMB ISL	OFF HWY 14, 2 MI E OF WHITCOMB,	PATERSON	WA	99345	BENTON
,AF,FC,	SIMPLOT GROWER SOLUTIONS	1013 UMATILLA RD	UMATILLA	OR	97882	
,AF,FC,	CHEM WASTE MGMT OF THE NW	STAR ROUTE 9	ARLINGTON	OR	97812	
,AF,FC,	UMATILLA SD 6	1460 7TH ST	UMATILLA	OR	97882	
,AF,FC,	WESTERN FARM SVC UMATILLA	321 5TH ST	UMATILLA	OR	97882	
,FC,	CENEX LAND O LAKES AGRONOMY CNTR	621 5TH ST	UMATILLA	OR	97882	
,B,	MAINTENANCE OFFICE	631 H STREET	UMATILLA	OR	97882	
,B,	DISTRICT OFFICE	1001 6TH STREET	UMATILLA	OR	97882-6201	
,B,	UMATILLA HIGH (INDUSTRIAL ARTS BLDG)	1400 7TH ST	UMATILLA	OR	97882-9745	
,B,	MCNARY HEIGHTS ELEMENTARY	120 COLUMBIA AVE	UMATILLA	OR	97822-0131	
,B,	OLD DISTRICT OFFICE	1460 7TH STREET	UMATILLA	OR	97882-9745	
,I,BO,	ROOSEVELT LAGOON	27 ROOSEVELT FERRY RD	ROOSEVELT	WA	99356	KLICKITAT
,AF,FC,	PUREGRO CO INC	321 5TH ST	UMATILLA	OR	97882	
,AF,FC,	UMATILLA SD 6	1460 7TH ST PO BOX 430	UMATILLA	OR	97882	
,AF,	CENEX LAND O LAKES AGRONOMY CNTR	621 5TH ST	UMATILLA	OR	97882	
,ZM,	PUD NO.1 OF KLICKITAT CO	502 ROOSEVELT GRADE ROAD	ROOSEVELT	WA	99356	KLICKITAT
,HE,I,	PACIFIC ETHANOL COLUMBIA LLC	71335 RAIL LOOP DR	BOARDMAN	OR	97818	MORROW
,DZ,I,	MORROW COLD STORAGE	730 COLUMBIA AVE NE	BOARDMAN	OR	97818	MORROW
,HE,I,	STE MICHELLE WINE ESTATES CANOE RIDGE	133322 WEST SR 14	PATERSON	WA	99345	BENTON
,I,HE,	ROOSEVELT REGIONAL LANDFILL INTER	28 RAILROAD AVE	ROOSEVELT	WA	99356	KLICKITAT
,BS,	CONAGRA FOODS PACKAGED FOODS, INC. BOARDMAN LINE 5	750 COLUMBIA DRIVE	BOARDMAN	OR	97818	
,BS,	LAMB-WESTON, INC., BOARDMAN OREGON PLANT	COLUMBIA AVENUE AND OLSON ROAD	BOARDMAN	OR	97818	
,BS,	MORROW COLD STORAGE	730 COLUMBIA AVE. NE	BOARDMAN	OR	97818	
,BS,	PACIFIC ETHANOL COLUMBIA, LLC	71335 RAIL LOOP DRIVE	BOARDMAN	OR	97818	
,BS,	UMATILLA SIMPLOT GROWER SOLUTIONS	1013 OLD RIVER ROAD	UMATILLA	OR	97882	
,BS,	UMATILLA, OR 181	321 5TH STREET	UMATILLA	OR	97882	
,BS,	WESTERN FARM SERVICE, UMATILLA	321 5TH STREET	UMATILLA	OR	97882	
,I,HE,	LAMB WESTON, INC. - PATERSON PLANT	187107 S WATTS RD	PATERSON	WA	99345	BENTON
,OO,	J.R. SIMPLOT CO	1013 OLD RIVER RD	UMATILLA	OR	97882	
,HE,I,	OREGON CORRECTIONS ENTERPRISES TWO RIVERS CORRTNL	82911 BEACH ACCESS RD	UMATILLA	OR	97882	UMATILLA
,HE,I,FM,	TWO RIVERS CORRECTIONAL INST.	82911 BEACH ACCESS RD.	UMATILLA	OR	97882	UMATILLA
,OO,	WESTERN FARM SVC 181	321 5TH ST	UMATILLA	OR	97882	
,S,	PACIFIC ETHANOL COLUMBIA LLC	71335 RAIL LOOP DR	BOARDMAN	OR	97818	MORROW
,I,HE,	ARLINGTON STP	LOCUST & FIRST STREET	ARLINGTON	OR	97812	GILLIAM
,I,HE,	ODEQ 7TH & N MAIN DRUG LAB IRRIGON	7TH & N MAIN	IRRIGON	OR	97844	MORROW
,I,HE,	STELLAR J CORP	502 ROOSEVELT GRADE RD	ROOSEVELT	WA	99356	KLICKITAT
,HE,I,	CROP PRODUCTION SERVICES 181	321 5TH ST	UMATILLA	OR	97882	UMATILLA
,BS,ZM,HE,I,	CONAGRA FOODS LAMB WESTON BOARDMAN EAST	750 COLUMBIA AVE NE	BOARDMAN	OR	97818	MORROW
,IA,	PACIFIC ETHANOL COLUMBIA LLC #70060	71335 RAIL LOOP DRIVE	BOARDMAN	OR	97818	
,IA,	TIDEWATER TERMINAL - UMATILLA	535 PORT AVE	UMATILLA	OR	97882	
,ZM,	PRICE-LESS GAS	711 6TH STREET	UMATILLA	OR	97882	UMATILLA

Database in which site is listed	Site Name	Address	City	State	ZIP	County
,BS,	PACIFIC ETHANOL COLUMBIA, LLC	71335 RAIL LOOP DRIVE	BOARDMAN	OR	97818	
,I,HE,	ASHWORTH TRANSPORT CO	I 82 PLYMOUTH WEIGH STA	PLYMOUTH	WA	99346	BENTON
,I,HE,	USWCOM ROOSEVELT TD2 RADIO	S12 T3N R29EWM NE1/4	ROOSEVELT	WA	99356	KLICKITAT
,HH,	BURLINGTON NORTHERN INC			WA		BENTON
,I,HE,	IRRIGON STP	E OREGON LN	IRRIGON	OR	97844	MORROW
,HE,I,	COYOTE SPRINGS POWER GENERATING FACILITY	200 ULLMAN BLVD	BOARDMAN	OR	97818	MORROW
,HE,I,	TIDEWATER BARGE LINES UMATILLA TERMINAL	31031 LAUNCH LN	UMATILLA	OR	97882	UMATILLA
,HE,I,	OREGON POTATO CO	650 COLUMBIA AVE NE	BOARDMAN	OR	97818	MORROW
,HE,I,	USDOE BPA MCNARY MAINTENANCE HEADQUARTERS	1910 3RD ST	UMATILLA	OR	97882	UMATILLA
,I,HE,	LAMB WESTON - BOARDMAN	600 NE COLUMBIA AVE	BOARDMAN	OR	97818	MORROW
,I,HE,	ODFW - IRRIGON HATCHERY	74135 RIVERVIEW LANE	IRRIGON	OR	97844	MORROW
,I,HE,	ODFW - UMATILLA FISH HATCHERY	73959 RIVERVIEW LANE	IRRIGON	OR	97844	MORROW
,HE,I,FL,DA, H,AX,DI,	GREENWOOD MOTORLINES DBA R&L CARRIERS	711 RIVER RD	UMATILLA	OR	97882	UMATILLA
,FM,BO,	ASHWORTH TRANSPORT CO	I 82 PLYMOUTH WEIGH STA	PLYMOUTH	WA	99346	BENTON
,FM,CC,H,BP,U,	PUREGRO COMPANY	321 5TH ST	UMATILLA	OR	97882	UMATILLA
,FM,I,HE,	COUNTRYWIDE TRUCK SERVICE INC	295 NE 7TH	IRRIGON	OR	97844	MORROW
,FL,DA,H,BP, M,EC,AX,BB,	J R SIMPLOT DBA SIMPLOT GROWER SOLUTIONS	1013 OLD RIVER RD	UMATILLA	OR	97882	UMATILLA
,G,DY,BP,BQ,BO,	COLUMBIA CREST WINERY	HWY 221	PATERSON	WA	99345	BENTON
,U,	ARLINGTON PUBLIC SCHOOLS	1200 MAIN ST	ARLINGTON	OR	97812	
,U,	CENEX SOIL SERVICE CENTER	621 5TH ST	UMATILLA	OR	97882	
,FM,BO,	USWCOM ROOSEVELT TD2 RADIO	S12 T3N R29EWM NE1/4	ROOSEVELT	WA	99356	KLICKITAT
,I,HE,	UMATILLA STP	300 SIXTH STREET	UMATILLA	OR	97882	UMATILLA
,OO,	J.R. SIMPLOT	1013 OLD RIVER RD	UMATILLA	OR	97882	
,OO,	WESTERN FARM SVC	321 5TH ST	UMATILLA	OR	97882	
,I,BO,U,	VACANT KEYLOCK PATERSON	HWY 14 & HWY 122	PATERSON	WA	99345-9999	BENTON
,AF,FC,	WILBUR ELLIS CO UMATILLA	711 RIVER RD	UMATILLA	OR	97882	
,B,	CLARA BROWNELL MIDDLE SCHOOL	1300 7TH STREET	UMATILLA	OR	97882-9745	
,AF,FC,	CHEM WASTE MGMT OF THE NW	STAR ROUTE 9	ARLINGTON	OR	97812	
,BS,	COYOTE SPRINGS PLANT	200 ULLMAN BLVD.	BOARDMAN	OR	97818	
,BS,	TIDEWATER UMATILLA TERMINAL	31031 LAUNCH LANE	UMATILLA	OR	97882	
,OO,	CROP PRODUCTION SERVICES 181	321 5TH ST	UMATILLA	OR	97882	
,OO,	J.R. SIMPLOT CO	1013 OLD RIV RD	UMATILLA	OR	97882	
,OO,	J.R. SIMPLOT CO.	1013 OLD RIV RD	UMATILLA	OR	97882	
,HE,I,	JM MANUFACTURING, INC.	31240 ROXBURY RD	UMATILLA	OR	97882	UMATILLA
,I,HE,	BNSF RAILWAY BATES	SR 14 MP 123	BATES	WA	98620	KLICKITAT
,IA,	VITOL/TIDEWATER UMATILLA, OR	535 PORT AVENUE	UMATILLA	OR	97882	
,HE,I,	USWCOM UMATILLA CO 546	7TH & J ST	UMATILLA	OR	97882	UMATILLA
,HH,	JONES-SCOTT COMPANY			OR		UMATILLA
,X,	PACIFIC ETHANOL COLUMBIA LLC	71335 RAIL LOOP DRIVE	BOARDMAN	OR	97818	MORROW
,DZ,	UMATILLA STP	300 6TH ST	UMATILLA	OR	978826174	UMATILLA
,HE,I,	MCNARY DAM USACE	82925 DEVORE RD	UMATILLA	OR	97882	UMATILLA
,DS,	WEST DEWEY JR	101 COLUMBIA ST	BOARDMAN	OR	97818	MORROW
,DS,	G & S CHEVRON	1010 6TH ST	UMATILLA	OR	97882	UMATILLA
,DS,	GUNSOLLEY CHEVRON STATION	6TH & J	UMATILLA	OR	97882	UMATILLA
,DS,	CROSSROADS TRUCK STOP INC	2020 HWY 730	UMATILLA	OR	97882	UMATILLA
,DS,	A M P M ARCO	1800 6TH	UMATILLA	OR	97882	UMATILLA
,DS,	GONSOLLEY TEXACO	6 MARTIN DR	UMATILLA	OR	97882	UMATILLA
,HH,	CADMAN MATERIALS INC			OR		MORROW
,CF,	WARM SPRINGS RESERVATION			OR		
,BG,	LAKE WALLULA			OR		LAKE WALLULA
,K,	CENEX (SOIL SERVICE CENTER)	651 FIFTH STREET	UMATILLA	OR	97882	
,K,	CROSSROADS TRUCK STOP, INC.	HWY. 730 & BRIDGE JUNCTION	UMATILLA	OR	97882	

Database in which site is listed	Site Name	Address	City	State	ZIP	County
,K,	CROSSROADS TRUCK STOP INC	HWY 730 & BRIDGE JCT	UMATILLA	OR	97882	
,EC,	UMATILLA CITY OF	700 6TH ST	UMATILLA	OR	97882	UMATILLA
,BQ,	NW PIPELINE CORP PLYMOUTH	3 MI W CHRISTY RD	PLYMOUTH	WA	99346	BENTON
,EC,BB,	N MORROW VECTOR CONTROL DIST	3 MARINE DR	BOARDMAN	OR	97818	MORROW
,EC,	UMATILLA CITY OF	5 BUD DRAPER DR	UMATILLA	OR	97882	UMATILLA
,EC,BB,	UMATILLA CITY OF	SWITZER & 3RD ST	UMATILLA	OR	97882	UMATILLA
,K,	HEATING OIL TANK	123 COLUMBIA NW	BOARDMAN	OR	97818	
,AM,BO,CT,AX,	PRIOR FARMS	OFF HWY 14	PATERSON	WA	99345-9999	
,H,BQ,M,EC,BB,	PGE	200 ULLMAN BLVD	BOARDMAN	OR	97818	MORROW
,H,	READY MIX ASPHALT BATCH PLANT RESIDUES	COLUMBIA AVE.	PORT OF MORROW	OR		
,H,	TIDEWATER TERMINAL	31031 LAUNCH LN	MCNARY	OR		
,H,	ARLINGTON DRY CLEANERS (FORMER)	3N/21E/S28B	ARLINGTON	OR	97812	
,DY,AT,BP,BO,L,	LAB WASHINGTON	500 ROOSEVELT GRADE RD	ROOSEVELT	WA	99356	
,EC,	VERIZON WIRELESS	13 GRANT ST	UMATILLA	OR	97882	UMATILLA
,DI,	USACOE - MCNARY LOCK & DAM	BELOW MC NARY DAM	UMATILLA	OR	97882	UMATILLA
,H,	LAKESIDE CLEANERS (FORMER)	HERMISTON-MCNARY HWY		OR		
,DI,	UMATILLA STP	1205 THIRD ST.	UMATILLA	OR	97882-6174	UMATILLA
,BO,DI,	CONAGRA FOODS LAMB WESTON PATERSON	187107 S WATTS RD	PATERSON	WA	99345	
,DA,	PORT OF ARLINGTON MARINA	100 ISLAND PARK	ARLINGTON	OR		GILLIAM
,DA,	SHADY REST MOBILE COURT	28716 HWY 730	UMATILLA	OR		UMATILLA
,DA,	MCNARY HEIGHTS ELEMENTARY SCHOOL	120 COLUMBIA BLVD	UMATILLA	OR		UMATILLA
,EC,BB,	CENTURYLINK	1190 W 1ST ST	ARLINGTON	OR	97812	GILLIAM
,DA,	A.C. HOUGHTEN ELEMENTARY SCHOOL	1105 N. MAIN	IRRIGON	OR		MORROW
,BP,M,DI,	ANDRITZ HYDRO MCNARY LOCK AND DAM	82790 DEVORE RD	UMATILLA	OR	97882	
,IM,	BUCK'S CORNER	HWY 395 & HWY 730	UMATILLA	OR		
,IM,	IRRIGON POST OFFICE	300 N MAIN AVE	IRRIGON	OR		
,IM,	UMATILLA MARINE	1271 6TH ST	UMATILLA	OR		
,IM,	WESTERN FARM SERVICE FERTILIZER RELEASE	321 5TH ST	UMATILLA	OR		
,IN,	ROOSEVELT REGIONAL LANDFILL MSW	500 ROOSEVELT GRADE RD	ROOSEVELT	WA		
,IN,	ROOSEVELT REGIONAL LANDFILL	PO BOX 204	ROOSEVELT	WA		
,IL,	ANGELA ANDERSON ROSSIEL	375 W HEMLOCK ST	ARLINGTON	OR		
,IL,	CENEX (SOIL SERVICE CENTER)	651 FIFTH STREET	UMATILLA	OR		
,IL,	GRONQUIST TEXACO	LOCUST ST & BEECH ST	ARLINGTON	OR		
,IL,	HEATING OIL TANK	401 DESCHUTS	MCNARY	OR		
,IL,	STANLEY, MICHAEL	401 DESCHUTS	MCNARY	OR		
,DI,	CITY OF UMATILLA	300 6TH ST	UMATILLA	OR	97882	UMATILLA
,L,	WASTE MANAGEMENT BARGE UNLOADING FACILITY	79827 ULLMAN DRIVE	BOARDMAN	OR	97818	MORROW
,DA,	MCNARY LOCK AND DAM, US DOD, CORPS OF ENGINEERS	MCNARY LOCK AND DAM	UMATILLA	OR		UMATILLA
,H,BO,AX,	HATTENHAUER ROOSEVELT TANKER SPILL	SR 14 MP 133.5	ROOSEVELT	WA	99356	
,K,U,	DEVIN OIL CO., INC.	401 LOCUST	ARLINGTON	OR	97812	
,U,	BOARDMAN PARK & RECREATION DISTRICT	100 W MARINE DR, BOX 8	BOARDMAN	OR	97818	
,U,	PIK A POP #10	1010 6TH ST	UMATILLA	OR	97882	
,U,	ARS FRESNO, LLC	1800 6TH ST	UMATILLA	OR	97882	
,DA,H,K,AX,U,	UMATILLA TEXACO	1100 6TH ST	UMATILLA	OR	97882	
,U,	PRIOR FARMS	PRSE 176905 S SR 14	PLYMOUTH	WA	99345	BENTON
,K,U,	JOHN R. DUNN	730 6TH	UMATILLA	OR	97882	
,U,	IRRIGON, CITY OF	520 SE SOUTHMAIN AVE	IRRIGON	OR	97844	
,U,	UMATILLA MARINA	1710 QUINCY ST	UMATILLA	OR	97882	
,I,HE,	USACE PORTLAND 3 MILE CANYON SITE	INTERSTATE 84	ARLINGTON	OR	97812	GILLIAM
,FM,BO,	MCNARY DAM	MP 131 OFF I82	PLYMOUTH	WA	99346	BENTON
,HE,FM,I,	TEXACO SVC STA REM PROJ UMATILLA	1106 6TH ST	UMATILLA	OR	97882	UMATILLA
,ZM,DZ,FL,BP,	PORTLAND GENERAL ELECTRIC COMPANY	200 ULLMAN BLVD	BOARDMAN	OR	97818	MORROW

Database in which site is listed	Site Name	Address	City	State	ZIP	County
,FL,BP,M,EC,BB,	TIDEWATER TERMINAL COMPANY	31031 LAUNCH LANE	UMATILLA	OR	97882	UMATILLA
,DZ,ZM,FM,BP, BQ,BO,DI,L,	ROOSEVELT REGIONAL LANDFILL	500 ROOSEVELT GRADE RD	ROOSEVELT	WA	99356	KLICKITAT
,AF,FC,	PENDLETON GRAIN GROWERS	MCNARY ELEVATOR	MCNARY	OR	97882	
,FL,BP,	USDOE BPA MCNARY MAINT HEADQUARTERS	1910 3RD RD	UMATILLA	OR	97802	UMATILLA
,AF,FC,	UMATILLA SD 6R	1460 7TH ST	UMATILLA	OR	97882	
,HE,I,FL,BP,	BOISE WHITE PAPER, LLC	31221 ROXBURY RD	UMATILLA	OR	97882	UMATILLA
,FL,HE,I,BP,	MORROW PORT OF LAB	701 EAST COLUMBIA AVE	BOARDMAN	OR	97818	MORROW
,FM,I,HE,	JORGENSEN TRUCKING INC	81460 W FOURTH RD	IRRIGON	OR	97844	MORROW
,OO,	PUREGRO CO	321 5TH ST	UMATILLA	OR	97882	
,OO,	WILBUR-ELLIS CO	711 RIVER RD	UMATILLA	OR	97882	
,OO,	WILBUR-ELLIS CO	711 RIVER ROAD	UMATILLA	OR	97882	
,OO,	WILBUR-ELLIS COMPANY	711 RIVER ROAD	UMATILLA	OR	97882	
,I,HE,	PRICE-LESS GAS	711 6TH ST	UMATILLA	OR	97882	UMATILLA
,I,H,O,AX,BF,	UNOCAL SERVICE STATION #3316 (FORMER)	1301 6TH ST	UMATILLA	OR	97882	UMATILLA
,I,DA,H,	IRRIGON POST OFFICE	300 N MAIN AVE	IRRIGON	OR	97844-6937	MORROW
,DS,	BROWNS AUTO & TRUCK STOP	300 SE HWY 730	IRRIGON	OR	97844	MORROW
,DS,	ARTS UNION SERVICE	SIXTH & SWITZER	UMATILLA	OR	97882	UMATILLA
,DS,	BUSLER GEORGE	6TH & H STS	UMATILLA	OR	97882	UMATILLA
,DS,	MAIN STREET TEXACO INC	100 N MAIN	BOARDMAN	OR	97818	MORROW
,DS,	GARYS TEXACO	6TH & K STREETS	UMATILLA	OR	97882	UMATILLA
,DS,	COLUMBIA WOOD PRODUCTS	105 WILLAMETTE	UMATILLA	OR	97882	UMATILLA
,DS,	DEWEYS CHEVRON STATION	101 N MAIN ST	BOARDMAN	OR	97818	MORROW
,DS,	LEATHERS ENTERPRISES INC	700 G ST	UMATILLA	OR	97882	UMATILLA
,DS,	PRICE LESS GAS INC	1272 6TH AVE	UMATILLA	OR	97882	UMATILLA
,DS,	CLOUGH ARTHUR H	BEACH & LOCUST STS	ARLINGTON	OR	97812	GILLIAM
,DS,	UMATILLA MOBIL	1251 6TH	UMATILLA	OR	97882	UMATILLA
,DS,	PRICE LESS GAS INC	711 6TH ST	UMATILLA	OR	97882	UMATILLA
,DS,	MC NARY GROCERY	205 WILLAMETTE ST	UMATILLA	OR	97882	UMATILLA
,DS,	UMATILLA TEXACO	1100 6TH	UMATILLA	OR	97882	UMATILLA
,HE,I,	J.R. SIMPLOT CO.	1013 OLD RIVER RD	UMATILLA	OR	97882	UMATILLA
,HE,	MCNARY DAM TURBINE STORAGE BUILDING	82790 DEVORE RD.	UMATILLA	OR	97882	
,HH,	W.I. CONSTRUCTION INC.			OR		GILLIAM
,HE,	IRRIGON WATER FACILITY	7TH ST NE AND NE MAIN AVE	IRRIGON	OR	97844	MORROW
,S,	LAMB WESTON INC	750 NE COLUMBIA AVE	BOARDMAN	OR	97818	MORROW
,S,	LAMB WESTON INC - PATERSON PLANT	187107 S WATTS RD	PATERSON	WA	99345	BENTON
,EC,DI,BB,	PORT OF MORROW	2 MARINE DR	BOARDMAN	OR	97818	MORROW
,H,BO,SS,	USFW WHITCOMB ISLAND FARM	14 MILES SW OF PATERSON ON HWY 14	PATERSON	WA	99345	
,EC,BB,	OREGON POTATO CO	650 E COLUMBIA AVE	BOARDMAN	OR	97818	MORROW
,K,EC,BB,	DEWEY'S CHEVRON	101 N MAIN	BOARDMAN	OR	97818	
,K,	HEATING OIL TANK	401 DESCHUTS	MCNARY	OR	97882	
,BQ,	PUD NO. 1 OF KLICKITAT COUNTY	500 ROOSEVELT GRADE RD	GOLDENDALE	WA	99356	KLICKITAT
,H,	BPA - MCNARY DAM SUBSTATION	5N/28E/S9	UMATILLA	OR	97882	
,H,EC,	RUSSELL OIL CO.	101 FRONT ST SW	BOARDMAN	OR	97818	
,EC,BB,	HAGERMAN INC	82891 BUD DRAPER DR	UMATILLA	OR	97882	UMATILLA
,EC,	WEST EXTENSION IRRIGATION	840 E HWY 730	IRRIGON	OR	97844	MORROW
,BQ,	PUD NO. 1 OF KLICKITAT COUNTY	502 ROOSEVELT GRADE RD	GOLDENDALE	WA	99356	KLICKITAT
,H,AX,	BUCK'S CORNER (FORMER)	HWY 395 & HWY 730	UMATILLA	OR	97882	
,H,AX,	MORROW COUNTY - ROADSIDE GASOLINE RELEASE	COLUMBIA AVE. & PORT OF MORROW EXIT	PORT OF MORROW	OR		
,H,	US ARMY COE - THREE MILE CANYON	I-84 (8 MILES EAST OF ARLINGTON NEAR I-84)	THREE MILE CANYON	OR		
,3,BP,M,EC,DI,BB,	OR CORRCTIONS ENTERPS TWO RVRS CRRTNL IN	82911 BEACH ACCESS RD	UMATILLA	OR	97882-9419	UMATILLA
,M,EC,BB,	BOARDMAN FOODS INC	71320 COLUMBIA LN	BOARDMAN	OR	97818	MORROW
,M,EC,BB,	USACE	82925 DEVORE RD	UMATILLA	OR	978821230	UMATILLA

Database in which site is listed	Site Name	Address	City	State	ZIP	County
,H,	SHELL OIL BULK PLANT (FORMER) - ARLINGTON	3N/21E/S21C	ARLINGTON	OR	97812	
,H,	WASATCH OIL BULK PLANT - UMATILLA	3RD ST.	UMATILLA	OR	97882	
,H,	FLETCHER OIL BULK PLANT (FORMER) - UMATILLA	6TH ST. & I-82 (SW OF)	UMATILLA	OR	97882	
,H,	DESERT FARM SUPPLY	HWY 730 & 4TH ST (NW CORNER OF)	IRRIGON	OR	97844	
,DA,M,EC,	LAMB WESTON INC	730 COLUMBIA AVE NE	BOARDMAN	OR	97818	MORROW
,DA,	COLUMBIA VIEW ESTATES	165 TRUMAN DRIVE	UMATILLA	OR		UMATILLA
,H,	UMATILLA MARINE	1271 6TH ST.	UMATILLA	OR	97882	
,H,	PORT OF MORROW EXIT AST	PORT OF MORROW EXIT	PORT OF MORROW	OR		
,M,EC,	CONAGRA FOODS - BOARDMAN EAST	750 NE COLUMBIA AVE	BOARDMAN	OR	97818	MORROW
,EC,	VERIZON WIRELESS	100 BUD DRAPER RD	UMATILLA	OR	97882	UMATILLA
,BQ,	ROOSEVELT LANDFILL BIOGAS PROJECT NO. 1	502 ROOSEVELT GRADE RD	ROOSEVELT	WA	99356	
,H,BO,	GOODNOE HILLS TREATY FISHING ACCESS SITE	HWY 14 MP 119.1	GOODNOE HILLS	WA	98620	
,H,	MCNARY INDUSTRIAL PARK - TAX LOT 300	BUD DRAPER DR.	MCNARY	OR	97882	
,H,	MCNARY INDUSTRIAL PARK - TAX LOTS 800 & 100	BEACH ACCESS RD.	MCNARY	OR	97882	
,EC,DI,BB,	ODFW	74135 RIVERVIEW LN	IRRIGON	OR	97844	MORROW
,EC,DI,BB,	ODFW - UMATILLA FISH HATCHERY	73959 RIVERVIEW LANE	IRRIGON	OR	97844	MORROW
,DI,	SHADY REST MOBILE COURT	ROUTE 1, BOX 240	UMATILLA	OR	97882	UMATILLA
,H,AX,	MCNARY INDUSTRIAL PARK - OREGON RUSTICS PARCEL	31310 ROXBURY RD	MCNARY	OR	97882	
,EC,DI,BB,	KODIAK CARBONIC LLC	71335 RAIL LOOP DR	BOARDMAN	OR	97818	MORROW
,EC,	TWO RIVERS TERMINAL	621 5TH ST	UMATILLA	OR	97882	UMATILLA
,H,	BOARDMAN CHIP CO.	10 BEACH DR.	BOARDMAN	OR	97818	
,BP,	ARLINGTON HARDWARE LLC	200 ON THE MALL	ARLINGTON	OR	97812	GILLIAM
,L,	COLUMBIA CREST WINERY	178810 HWY 221	PATTERSON	WA	99345	BENTON
,K,	HEATING OIL TANK	375 W HEMLOCK ST	ARLINGTON	OR	97812	
,DA,EC,BB,	ARLINGTON SCHOOL DISTRICT 3	1200 MAIN ST	ARLINGTON	OR	97812	GILLIAM
,H,	UMATILLA OIL TERMINAL (FORMER)	CLINE AVE. & BROWNELL BLVD.	UMATILLA	OR	97882	
,DI,	IRRIGON STP	76029 E. OREGON LANE	IRRIGON	OR	97844	MORROW
,BO,	PATERSON PIER		PATERSON	WA		
,BO,	BIOGAS PROJECT 1 ROOSEVELT LANDFILL	500 ROOSEVELT GRADE RD BIOGAS PROJECT 1	ROOSEVELT	WA	99356	
,H,BP,BQ,EI,BO,DI,AX,	NORTHWEST PIPELINE GP PLYMOUTH PLANT	42612 E CHRISTY RD	PLYMOUTH	WA	99346	
,DA,	CITY OF UMATILLA	300 6TH ST.	UMATILLA	OR		UMATILLA
,DA,	UMATILLA SCHOOL DISTRICT ADMINISTRATIVE OFFICE	1001 6TH STREET	UMATILLA	OR		UMATILLA
,BP,BQ,BO,	HW HILL LANDFILL GAS GENERATING EXP	502 ROOSEVELT GRADE RD	ROOSEVELT	WA	99356	
,BO,DI,	ROOSEVELT REGIONAL LANDFILL INTER	28 RAILROAD AVE	ROOSEVELT	WA	99356	KLICKITAT
,BO,DI,	GRANITE NORTHWEST INC 10X PORTABLE	10X PORTABLE ASPHALT	YAKIMA	WA	98909-1268	
,H,	TEXACO BULK PLANT (FORMER) - ARLINGTON	OLD WASHINGTON ST & C ST (NW CORNER OF)	ARLINGTON	OR	97812	
,BP,BO,	EXPRESS TRANSPORT CORP SPILL	SR 221 & SR14	PATERSON	WA	99345	
,3,EC,DI,BB,	BOARDMAN CELLULOSIC ETHANOL DEMONSTRATION PLANT	71099 RAIL LOOP DR.	BOARDMAN	OR	97818	MORROW
,L,	ROOSEVELT WWTP	27 ROOSEVELT FERRY ROAD	ROOSEVELT	WA	99356	KLICKITAT
,BO,DI,	AMERICAN ROCK PRODUCTS WHITCOMB QUARRY	98315 SR14	PATERSON	WA	99345	BENTON
,DI,	UMATILLA NATIONAL WILDLIFE REFUGE	72650 RIVERVIEW LANE	IRRIGON	OR		MORROW
,H,	ARLINGTON MARINA	ARLINGTON PORT RD.	ARLINGTON	OR	97812	
,H,	UMATILLA ROUNDHOUSE (FORMER)		UMATILLA	OR	97882	
,H,	J-M MANUFACTURING	31240 ROXBURY RD.	MCNARY	OR	97882	
,H,	BLAYLOCK SERVICE STATION (FORMER)	I-84 BLAYLOCK EXIT		OR		
,DA,	CITY OF IRRIGON	76029 EAST OREGON LANE	IRRIGON	OR		MORROW
,DA,	CLARA BROWN MIDDLE SCHOOL/UMATILLA HIGH SCHOOL	1400 7TH ST	UMATILLA	OR		UMATILLA
,DA,	MCNARY SUBSTATION & OIL HOUSE - BPA	1910 THIRD STREET	UMATILLA	OR		UMATILLA
,DA,	U.S. POSTAL SERVICE, UMATILLA	1900 6TH ST	UMATILLA	OR		UMATILLA
,EC,	AGSOURCE LABORATORIES	323 6TH ST	UMATILLA	OR	978821350	UMATILLA
,EC,BB,	BOARDMAN CITY OF	1A E MARINE DR	BOARDMAN	OR	97818	MORROW
,EC,BB,	MORROW COUNTY GRAIN GROWERS INC	71010 RAIL LOOP DR	BOARDMAN	OR	97818	MORROW

Database in which site is listed	Site Name	Address	City	State	ZIP	County
,EC,	COMMERCIAL TIRE INC	81991 N HWY 395	HERMISTON	OR	97838	UMATILLA
,EC,BB,	JM EAGLE	31240 ROXBURY RD	UMATILLA	OR	97882	UMATILLA
,H,EC,AX,	MORROW COUNTY GRAIN GROWERS	901 6TH ST	UMATILLA	OR	97882	UMATILLA
,EC,	MORROW SCHOOL DISTRICT 1	210 NE BOARDMAN AVE	BOARDMAN	OR	97818	MORROW
,EC,	CENTURYLINK	921 SW 7TH ST	UMATILLA	OR	97882	UMATILLA
,EC,BB,	VERIZON WIRELESS	206 N MAIN ST	BOARDMAN	OR	97818	MORROW
,EC,BB,	HELLER & SONS DIST INC	430 3RD & KIK ST	HERMISTON	OR	978380066	UMATILLA
,BO,	RDC TRUCKING	13349 HWY 14	ROOSEVELT	WA	99356	
,BP,BO,	BNSF RAILWAY BATES	SR 14 MP 123	BATES	WA	98620	KLICKITAT
,H,BO,	HATTENHAUER SPILL	HWY 14 MP 123	ROOSEVELT	WA	99356	
,EC,DI,BB,	AMERICAN ROCK PRODUCTS	71427 E. COLUMBIA AVE.	BOARDMAN	OR	97818	MORROW
,EC,BB,	UPPER COLUMBIA MILL	71410 E COLUMBIA AVE	BOARDMAN	OR	97818	MORROW
,EC,BB,	PICK A POP - 10	1010 6TH ST	UMATILLA	OR	97882	UMATILLA
,BO,	TIDEWATER UMATILLA TERMINAL	500 WILLAMETTE ST	UMATILLA	WA	97882	
,IM,	BONOCO GAS STATION - UMATILLA	1251 6TH ST	UMATILLA	OR		
,IM,	CROP PRODUCTION SERVICES - UMATILLA	321 5TH ST	UMATILLA	OR		
,IM,	CROP PRODUCTION SERVICES	321 5TH ST	UMATILLA	OR		
,IM,	IRRIGON POST OFFICE	300 NE MAIN AVE	IRRIGON	OR		
,IM,	J-M MANUFACTURING	31240 ROXBURY RD.	MCNARY	OR		
,IM,	J-M MANUFACTURING	31240 ROXBURY RD	MCNARY	OR		
,IM,	MCNARY INDUSTRIAL PARK - OREGON RUSTICS PARCEL	31310 ROXBURY RD	MCNARY	OR		
,IM,	UMATILLA TEXACO STATION	1100 6TH ST	UMATILLA	OR		
,IM,	UNOCAL SERVICE STATION #3316 (FORMER)	1301 6TH ST	UMATILLA	OR		
,IM,	WILBUR-ELLIS CO. - UMATILLA	7 E WASHINGTON AVE	UMATILLA	OR		
,IM,	ROOSEVELT REGIONAL LANDFILL	500 ROOSEVELT GRADE RD	ROOSEVELT	WA		
,IN,	ROOSEVELT DROP BOX	500 ROOSEVELT GRADE ROAD	ROOSEVELT	WA		
,IN,	ROOSEVELT REGIONAL LANDFILL ASH MONOFILL	500 ROOSEVELT GRADE RD.	ROOSEVELT	WA		
,IN,	ROOSEVELT REGIONAL LANDFILL-ASH MONOFIL	PO BOX 338	ROOSEVELT	WA		
,IN,	ROOSEVELT REGIONAL LANDFILL-MSW	500 ROOSEVELT GRADE ROAD	ROOSEVELT	WA		
,IN,	ROOSEVELT REGIONAL LANDFILL-MSW	PO BOX 338	ROOSEVELT	WA		
,IN,	ROOSEVELT REGIONAL LANDFILL	PO BOX 264	ROOSEVELT	WA		
,IN,	ROOSEVELT WWTP	27 ROOSEVELT FERRY ROAD'	ROOSEVELT	WA		
,IL,	BOARDMAN MOBIL SERVICE	100 FRONT NW	BOARDMAN	OR		
,IL,	BONBRIGHT, GEORGE	1251 6TH ST	UMATILLA	OR		
,IL,	BROWNS AUTO & TRUCK STOP	300 SE HWY 730	IRRIGON	OR		
,IL,	CRIS, INC.	500 WILLAMETTE	UMATILLA	OR		
,IL,	DAN DALTOSO - HOT	123 COLUMBIA NW	BOARDMAN	OR		
,IL,	DEWEY'S CHEVRON	101 N MAIN	BOARDMAN	OR		
,IL,	HEATING OIL TANK	123 COLUMBIA NW	BOARDMAN	OR		
,IL,	HEATING OIL TANK	1251 6TH ST	UMATILLA	OR		
,IL,	HEATING OIL TANK	375 W HEMLOCK ST	ARLINGTON	OR		
,IL,	JOHN R. DUNN	730 6TH	UMATILLA	OR		
,IL,	PHOTOGRAPHY +	220 SW SIXTH STREET	UMATILLA	OR		
,IL,	UMATILLA SHELL	730 6TH	UMATILLA	OR		
,IL,	UMATILLA TEXACO	1100 6TH ST	UMATILLA	OR		
,DA,	WATTS BROTHERS FROZEN FOODS LLC	187107 S WATTS ROAD	PATERSON	WA	99345	BENTON
,EC,BB,	DEVIN OIL CO INC	300 E HWY 730	IRRIGON	OR	97844	MORROW
,DA,	HATTENHAUER DISTRIBUTING COMPANY	100 NORTH MAIN STREET	BOARDMAN	OR		MORROW
,DA,	CONAGRA FOODS LAMB WESTON BOARDMAN EAST PLANT	700 COLUMBIA AVENUE NE	BOARDMAN	OR		MORROW
,AM,BO,	ASI TRUCK ACCIDENT SPILL	SR 14 MP 133.5	ROOSEVELT	WA		KLICKITAT
,H,	RAY-D-ANT CLEANERS (FORMER)	6TH ST. NEAR SWITZLER AVE.	UMATILLA	OR	97882	
,K,	BOARDMAN MOBIL SERVICE	100 FRONT NW	BOARDMAN	OR	97818	

Database in which site is listed	Site Name	Address	City	State	ZIP	County
,DA,	HATTENHAUER FUEL SPILL	ST ROUTE 14, MILE POST 123	THE DALLES	WA	98000	KLICKITAT
,DA,	HATTENHAUER FUEL SPILL	ST ROUTE 14, MILE POST 123	THE DALLES	WA	98000	KLICKITAT
,DA,	HATTENHAUER FUEL SPILL	ST ROUTE 14, MILE POST 123	THE DALLES	WA	98000	KLICKITAT
,DA,	HATTENHAUER FUEL SPILL	ST ROUTE 14, MILE POST 123	THE DALLES	WA	98000	KLICKITAT
,DA,	HATTENHAUER FUEL SPILL	ST ROUTE 14, MILE POST 123	THE DALLES	WA	98000	KLICKITAT
,K,U,	GRONQUIST TEXACO	LOCUST ST & BEECH ST	ARLINGTON	OR	97812	
,U,	BOARDMAN MOBIL SERVICE	100 FRONT ST	BOARDMAN	OR	97818	
,K,U,	BOARDMAN, CITY OF - SEWER SYSTEM	COLUMBIA AVE AT RIPPEE RD	BOARDMAN	OR	97818	
,U,	RIVERSIDE HIGH SCHOOL	BOX 140, BOARDMAN AVE	BOARDMAN	OR	97818	
,U,	WESTERN ALFALFA, INC.	PATTERSON FERRY RD 6 MI SSW	IRRIGON	OR	97844	
,DA,EC,BB,	CROSSROADS TRUCK STOP	2020 HWY 730	UMATILLA	OR	97882	UMATILLA
,U,	MCNARY SUBSTATION	1910 3RD ST	UMATILLA	OR	97882	
,U,	PRICE-LESS GAS	6TH & 'G' ST	UMATILLA	OR	97882	
,U,	TWO OVER PAR, DBA UMATILLA GOLF COURSE	705 WILLAMETTE ST	UMATILLA	OR	97882	
,H,K,M,O,U,	BONOCO GAS STATION - UMATILLA	1251 6TH ST.	UMATILLA	OR	97882	UMATILLA
,U,	UMATILLA SCHOOL DISTRICT 6-R	1400 7TH ST	UMATILLA	OR	97882	
,BO,U,	ROOSEVELT STORAGE SITE	HWY 14	ROOSEVELT	WA	99356	
,BO,U,	WHITCOMB WA LINE SEG 47 PRINT 406	MP 169 2ND SUB PORTLAND	PATERSON	WA	99345-9999	
,U,	MCNARY GROCERY	205 WILLAMETTE	UMATILLA	OR	97882	
,U,	ARLINGTON SHELL	100 BEECH ST	ARLINGTON	OR	97812	
,U,	UNITED TELEPHONE CO/NW	1190 W. 1ST STREET	ARLINGTON	OR	97812	
,K,U,	PHOTOGRAPHY +	220 SW SIXTH STREET	UMATILLA	OR	97882	
,K,U,	CRIS, INC.	500 WILLAMETTE	UMATILLA	OR	97882	
,K,U,	BROWNS AUTO & TRUCK STOP	300 SE HWY 730	IRRIGON	OR	97844	
,K,U,	BOARDMAN, CITY OF - SEWER SYSTEM	COLUMBIA AVE AT N MAIN ST	BOARDMAN	OR	97818	
,U,	UMATILLA FISH HATCHERY	73959 RIVERVIEW LANE	IRRIGON	OR	97844	
,U,	WILBUR-ELLIS CO	711 RIVER RD	UMATILLA	OR	97882	
,U,	REMINGTON STATION	1271 6TH	UMATILLA	OR	97882	
,U,	CROSSROADS TRUCK STOP	2020 HWY 730	UMATILLA	OR	97882	

Table 5-2. Database Codes

Code	Database Name/Code Meaning
3	Hazmat/Incidents
AF	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
AT	Recycling Facility List
AX	Voluntary Cleanup Program Sites
B	PCB Activity Database System
BB	Above Ground Storage Tanks
BG	Department of Defense Sites
BO	Facility/Site Identification System Listing
BP	Hazardous Waste Manifest Data
BQ	Permitted Sources & Emissions Listing
BS	Risk Management Plans
CC	Superfund Enterprise Management System Archive
CF	Indian Reservations
CT	Independent Cleanup Reports
DA	Underground Injection Wells Database Listing
DI	Wastewater Permits Database
DY	Financial Assurance Information Listing
DZ	Integrated Compliance Information System
EC	Hazardous Substance Information Survey
EC	Tier 2 Data Listing
FC	FIFRA/TSCA Tracking System Administrative Case Listing
FL	RCRA - Conditionally Exempt Small Quantity Generators
FM	RCRA - Non Generators / No Longer Regulated
G	RCRA - Small Quantity Generators
H	Environmental Cleanup Site Information System
H	CECRA (Non-NPL) Priority Sites List
H	Confirmed and Suspected Contaminated Sites List
H	This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.
HE	Enforcement & Compliance History Information
HH	Mines Master Index File
I	Facility Index System/Facility Registry System
IA	EPA Fuels Program Registered Listing
IL	Recovered Government Archive Leaking Underground Storage Tank
IM	Recovered Government Archive State Hazardous Waste Facilities List
IN	Recovered Government Archive Solid Waste Facilities List
K	Leaking Underground Storage Tanks Site List
L	Solid Waste Facility Database
M	Hazardous Material Spills Report
O	Confirmed Release List and Inventory
OO	Section 7 Tracking Systems
S	Toxic Chemical Release Inventory System
SS	Hazardous Sites List
U	Underground Storage Tank Database
X	Toxic Substances Control Act
ZM	Aerometric Information Retrieval System Facility Subsystem (AFS)
DS	EDR proprietary database of gas stations/automotive maintenance sites