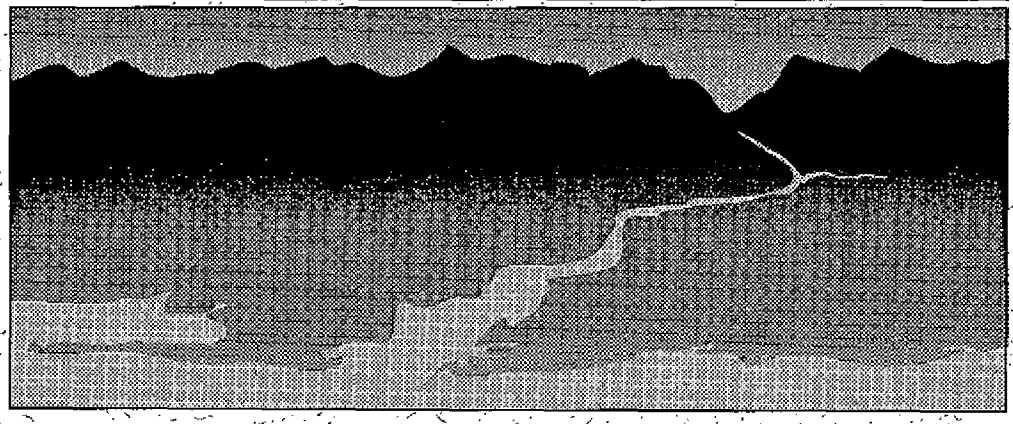
FINAL REPORT
TC 9968-04

LOWER COLUMBIA RIVER



BI-STATE PROGRAM

ASSESSING HUMAN HEALTH RISKS FROM CHEMICALLY CONTAMINATED FISH IN THE LOWER COLUMBIA RIVER

DATA REPORT

AUGUST 7, 1995

Prepared By:
TETRA TECH

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The Lower Columbia River
Bi-State Water Quality Program

Prepared By:

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ACKNOWLEDGMENTS

This report was prepared by Tetra Tech, Inc. of Redmond, Washington for the Lower Columbia River Bi-State Water Quality Program under Contract Nos. C0091228 (WDOE) and 78-91 (ODEQ). The Project Coordinators for the Bi-State Program were Don Yon from the Oregon Department of Environmental Quality and Brian Offord from the Washington Department of Ecology. Tetra Tech's Project Manager for the Lower Columbia River Bi-State Water Quality Program was Dr. Steven Ellis. The principal authors of the document were Tad Deshler, Kathy Rogovin, and Paul Bean. Word processing support was provided by Lisa Fosse.

The following laboratories provided analytical services for this project:

- Pacific Analytical -- Dioxins/furans, pesticides/PCBs, semi-volatiles
- Battelle Marine Science Lab -- Metals
- Triangle Labs -- Dioxins/furans (four samples only)

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TABLES

1.0 INTRODUCTION

The Lower Columbia River Bi-State Water Quality Program (Bi-State Program) is conducting a study to characterize the human health risks associated with the consumption of fish from the lower Columbia River. This study consists of four tasks: 1) review and evaluation of existing fish tissue contaminant data; 2) design and implementation of a field collection effort to fill data gaps; 3) QA/QC review and presentation of data collected during task 2; and 4) characterization and evaluation of potential human health risks. Tasks 1 and 2 have been completed; this report was prepared as part of task 3. A brief summary of the activities accomplished as part of tasks 1 and 2 are provided below:

- **Task 1:** Fish tissue contaminant data in the lower Columbia River Basin from 1984 through 1994 were compiled and evaluated (Tetra Tech 1994a). The majority of data on fish contaminant levels consisted of analyses of whole-body composite samples of bottom fish. Collection of additional data on contaminant levels in fillets was recommended to characterize human health risks.

- **Task 2:** To fill the data gaps identified in task 1, a study was designed to analyze contaminant levels in fillets of both resident and migratory species of fish in the lower Columbia River (Tetra Tech 1994b). Collection of fish samples took place from September 1994 through February 1995.

This data report includes data that will be used for the human health risk assessment. This report provides documentation on the collection methods, sample processing, laboratory analysis, and QA/QC data evaluation. Chain-of-Custody Records are included in Appendix A of this document. Appendices B through E contain the contaminant data for metals, semi-volatiles, pesticides/PCBs and dioxins/furans, respectively. No interpretation or analysis of the data is provided in this report; this will be accomplished as part of Task 4.

2.0 FIELD SAMPLING PROCEDURES

Field sampling was conducted throughout the lower Columbia River from September 1994 through February 1995. Sample collection, processing and handling methods are described in separate sections below.

2.1 FISH COLLECTION METHODS

Five of the seven proposed target species listed in the Sampling and QA/QC Plan (Tetra Tech 1994b) were collected during the sampling effort in the lower Columbia River. Steelhead, largescale sucker, and carp were obtained by electrofishing. Only one of the nine composite samples of carp originally specified in the sampling design could be obtained, even after extensive sampling effort. Chinook and coho salmon were collected at hatchery facilities. Walleye and smallmouth bass, the two remaining target species, could not be caught in the lower Columbia River despite repeated attempts to capture fish using hook and line, gill nets, and electroshocking. Implementation of the original sampling design was intended to occur during the summer months when both of these species are commonly targeted by recreational fishermen. During the winter, these two species apparently inhabit deeper water. Because of the difficulty in capturing these two target species, an additional target species, white sturgeon, was selected during the field effort. Sturgeon were caught by hook-and-line.

Table 2-1 provides the data for each specimen collected including: specimen number, species, collection method, collection location, total length, weight, and sex.

2.1.1 Electroshocking

Steelhead, largescale sucker, and carp were collected using a Model 7.5 GPP (Smith-Root, Vancouver, WA) electrofishing unit mounted aboard a 20-ft Wooldridge jet sled. Two anodes, swing-mounted off the bow of the boat, generated approximately three amps DC (direct current) pulsed in 10 second bursts at 120 cycles/second. Stunned fish were identified by field personnel and dip nets were used to transfer

TABLE 2-1. CAPTURE DATE, METHOD, LOCATION, AND PHYSICAL INFORMATION FOR EACH LOWER COLUMBIA RIVER SPECIMEN (Page 1 of 5)

Specimen #	Species	Date Captured	Method	Location	Length (in)	Weight (g)	Sex
126	Carp	12/7/94	EF	Martin Slough	20.9	2437.7	M
153	Carp	2/6/95	EF	Carrolls Channel	21.6	2086.2	M
154	Carp	2/6/95	EF	Carrolls Channel	22.4	2449	M
155	Carp	2/6/95	EF	Carrolls Channel	26.0	3718.8	M
156	Carp	2/7/95	EF	Scappoose Bay	25.0	3809.5	F
157	Carp	2/6/95	EF	Carrolls Channel	23.8	3537.4	F
158	Carp	2/6/95	EF	Carrolls Channel	26.0	3809.5	M
1	Chinook	9/22/94	Hatchery	Kalama River	35.2	n/a	M
3	Chinook	9/29/94	Hatchery	Big Creek	27.7	3306	F
11	Chinook	9/29/94	Hatchery	Big Creek	34.8	n/a	F
12	Chinook	9/29/94	Hatchery	Big Creek	34.1	n/a	F
13	Chinook	9/29/94	Hatchery	Big Creek	36.4	n/a	F
14	Chinook	9/29/94	Hatchery	Big Creek	34.1	n/a	F
15	Chinook	9/29/94	Hatchery	Big Creek	30.5	n/a	F
16	Chinook	9/29/94	Hatchery	Big Creek	31.0	n/a	F
17	Chinook	9/29/94	Hatchery	Big Creek	31.4	n/a	F
18	Chinook	9/29/94	Hatchery	Big Creek	29.7	n/a	F
22	Chinook	9/22/94	Hatchery	Kalama River	32.0	n/a	M
26	Chinook	9/29/94	Hatchery	Big Creek	27.6	3080	F
28	Chinook	9/22/94	Hatchery	Kalama River	33.5	n/a	M
32	Chinook	9/29/94	Hatchery	Big Creek	30.4	4738	F
33	Chinook	9/22/94	Hatchery	Kalama River	36.0	n/a	M
34	Chinook	9/22/94	Hatchery	Kalama River	34.0	n/a	M
35	Chinook	9/22/94	Hatchery	Kalama River	31.6	n/a	M
37	Chinook	9/29/94	Hatchery	Big Creek	30.3	4178	F
40	Chinook	9/22/94	Hatchery	Kalama River	30.5	n/a	M
41	Chinook	9/22/94	Hatchery	Kalama River	31.4	n/a	M
43	Chinook	9/22/94	Hatchery	Kalama River	38.2	n/a	M
45	Chinook	9/22/94	Hatchery	Kalama River	38.1	n/a	M
46	Chinook	9/22/94	Hatchery	Kalama River	35.3	n/a	M
48	Chinook	9/29/94	Hatchery	Big Creek	30.0	3986	F
2	Coho	9/29/94	Hatchery	Big Creek	25.0	2270	F
4	Coho	9/29/94	Hatchery	Big Creek	26.1	2944	M

TABLE 2-1. CAPTURE DATE, METHOD, LOCATION, AND PHYSICAL INFORMATION FOR EACH LOWER COLUMBIA RIVER SPECIMEN (Page 2 of 5)

Specimen #	Species	Date Captured	Method	Location	Length (in)	Weight (g)	Sex
5	Coho	9/22/94	Hatchery	Lewis River	27.5	3305	M
6	Coho	9/29/94	Hatchery	Big Creek	25.0	2236	F
7	Coho	9/22/94	Hatchery	Lewis River	27.4	3040	M
8	Coho	9/22/94	Hatchery	Lewis River	23.3	1941	M
9	Coho	9/29/94	Hatchery	Big Creek	23.4	1822	F
10	Coho	9/29/94	Hatchery	Big Creek	22.0	1563	F
19	Coho	9/22/94	Hatchery	Lewis River	25.0	2401	M
20	Coho	9/29/94	Hatchery	Big Creek	22.8	1377	F
21	Coho	9/29/94	Hatchery	Big Creek	26.1	2192	F
23	Coho	9/29/94	Hatchery	Big Creek	23.6	1812	F
24	Coho	9/22/94	Hatchery	Lewis River	24.9	2243	M
25	Coho	9/29/94	Hatchery	Big Creek	20.8	1411	F
27	Coho	9/22/94	Hatchery	Lewis River	25.2	2513	M
29	Coho	9/22/94	Hatchery	Lewis River	25.6	2396	M
30	Coho	9/22/94	Hatchery	Lewis River	25.9	2488	M
31	Coho	9/22/94	Hatchery	Lewis River	25.1	2441	M
36	Coho	9/29/94	Hatchery	Big Creek	20.6	1271	F
38	Coho	9/22/94	Hatchery	Lewis River	25.0	2546	M
39	Coho	9/22/94	Hatchery	Lewis River	26.1	2658	M
42	Coho	9/29/94	Hatchery	Big Creek	23.6	2395	F
44	Coho	9/29/94	Hatchery	Big Creek	25.5	2297	F
47	Coho	9/22/94	Hatchery	Lewis River	24.1	2319	M
49	LS Sucker	12/2/94	EF	Cottonwood Point	17.0	855.8	F
50	LS Sucker	12/1/94	EF	Bridal Veil	17.2	n/a	M
51	LS Sucker	12/3/94	EF	Hayden Island	20.2	1408	F
52	LS Sucker	12/3/94	EF	Pearcy Island	20.8	1441.2	F
53	LS Sucker	12/2/94	EF	Government Island	19.4	1100.3	F
54	LS Sucker	12/2/94	EF	Cottonwood Point	18.8	1071.2	F
55	LS Sucker	12/3/94	EF	Tomahawk Island	16.6	736	M
56	LS Sucker	12/1/94	EF	Bridal Veil	19.0	n/a	F
57	LS Sucker	12/3/94	EF	Hayden Island	19.2	1152.7	F
58	LS Sucker	12/3/94	EF	Pearcy Island	17.7	967.5	F
59	LS Sucker	12/3/94	EF	Tomahawk Island	18.0	855.3	F

TABLE 2-1. CAPTURE DATE, METHOD, LOCATION, AND PHYSICAL INFORMATION FOR EACH LOWER COLUMBIA RIVER SPECIMEN (Page 3 of 5)

Specimen #	Species	Date Captured	Method	Location	Length (in)	Weight (g)	Sex
60	LS Sucker	12/3/94	EF	Pearcy Island	17.4	824.9	F
61	LS Sucker	12/2/94	EF	Government Island	20.1	1204	F
62	LS Sucker	12/3/94	EF	Pearcy Island	17.5	815.3	F
63	LS Sucker	12/1/94	EF	Bridal Veil	16.0	n/a	F
64	LS Sucker	12/2/94	EF	Cottonwood Point	15.6	630.3	F
65	LS Sucker	12/1/94	EF	Bridal Veil	19.3	n/a	F
66	LS Sucker	12/1/94	EF	Bridal Veil	18.1	n/a	F
67	LS Sucker	12/2/94	EF	Government Island	19.9	1165	F
68	LS Sucker	12/2/94	EF	Flag Island	18.4	1066	F
69	LS Sucker	12/2/94	EF	Government Island	18.3	908	F
70	LS Sucker	12/2/94	EF	Cottonwood Point	16.8	655	M
71	LS Sucker	12/1/94	EF	Bridal Veil	18.9	n/a	F
72	LS Sucker	12/2/94	EF	Flag Island	19.4	1145	F
100	LS Sucker	12/9/94	EF	Kalama River Marina	18.5	n/a	F
101	LS Sucker	12/9/94	EF	Kalama River Marina	18.5	n/a	F
102	LS Sucker	12/9/94	EF	Kalama River Marina	19.5	n/a	F
103	LS Sucker	12/9/94	EF	Kalama River Marina	16.3	n/a	F
104	LS Sucker	12/9/94	EF	Kalama River Marina	20.5	n/a	F
105	LS Sucker	12/9/94	EF	Kalama River Marina	19.5	n/a	F
106	LS Sucker	12/9/94	EF	Kalama River Marina	17.3	n/a	F
107	LS Sucker	12/9/94	EF	Kalama River Marina	18.5	n/a	F
108	LS Sucker	12/8/94	EF	Scappoose Bay	18.5	n/a	F
109	LS Sucker	12/8/94	EF	Scappoose Bay	17.8	n/a	F
110	LS Sucker	12/8/94	EF	Scappoose Bay	15.0	n/a	F
111	LS Sucker	12/8/94	EF	Scappoose Bay	16.8	n/a	F
112	LS Sucker	12/8/94	EF	Scappoose Bay	16.5	n/a	F
113	LS Sucker	12/8/94	EF	Scappoose Bay	18.5	n/a	F
114	LS Sucker	12/8/94	EF	Scappoose Bay	17.8	n/a	M
115	LS Sucker	12/8/94	EF	Scappoose Bay	18.0	n/a	F
116	LS Sucker	12/7/94	EF	Coon Island	15.3	n/a	M
117	LS Sucker	12/7/94	EF	Coon Island	20.5	1133.8	F
119	LS Sucker	12/7/94	EF	Coon Island	20.5	1247.2	F
120	LS Sucker	12/8/94	EF	Scappoose Bay	16.5	n/a	F

TABLE 2-1. CAPTURE DATE, METHOD, LOCATION, AND PHYSICAL INFORMATION FOR EACH LOWER COLUMBIA RIVER SPECIMEN (Page 4 of 5)

Specimen #	Species	Date Captured	Method	Location	Length (in)	Weight (g)	Sex
121	LS Sucker	12/8/94	EF	Scappoose Bay	18.3	n/a	F
122	LS Sucker	12/8/94	EF	Scappoose Bay	18.5	n/a	F
123	LS Sucker	12/8/94	EF	Scappoose Bay	20.0	n/a	F
127	LS Sucker	12/4/94	EF	Bachelor Isl. Slough	20.3	1275.5	F
128	LS Sucker	2/2/95	EF	Clatskanie River	18.5	n/a	F
129	LS Sucker	2/2/95	EF	Clatskanie River	17.7	n/a	F
130	LS Sucker	2/2/95	EF	Clatskanie River	15.6	n/a	F
131	LS Sucker	2/5/95	EF	Knappa Slough	16.7	n/a	F
132	LS Sucker	2/2/95	EF	Clatskanie River	18.2	n/a	F
133	LS Sucker	2/2/95	EF	Clatskanie River	17.5	n/a	F
134	LS Sucker	2/5/95	EF	Blind Slough	16.7	n/a	F
135	LS Sucker	2/2/95	EF	Clatskanie River	19.3	n/a	F
136	LS Sucker	2/6/95	EF	Clatskanie River	15.7	n/a	F
137	LS Sucker	12/29/94	EF	Near Bug Hole	19.0	n/a	F
138	LS Sucker	2/2/95	EF	Clatskanie River	14.8	n/a	F
139	LS Sucker	2/6/95	EF	Clatskanie River	19.5	n/a	F
140	LS Sucker	2/2/95	EF	Clatskanie River	20.3	n/a	F
141	LS Sucker	12/29/94	EF	John Day River	17.0	n/a	F
142	LS Sucker	2/5/95	EF	Knapper Slough	15.6	n/a	F
143	LS Sucker	2/6/95	EF	Clatskanie River	15.9	n/a	F
144	LS Sucker	2/5/95	EF	Blind Slough	17.5	n/a	F
145	LS Sucker	2/3/95	EF	Clifton Channel	17.9	n/a	F
146	LS Sucker	2/3/95	EF	Clifton Channel	19.3	n/a	F
147	LS Sucker	2/2/95	EF	Clatskanie River	14.8	n/a	M
148	LS Sucker	2/3/95	EF	Clifton Channel	16.5	n/a	F
149	LS Sucker	12/29/94	EF	Near Bug Hole	19.5	n/a	F
150	LS Sucker	12/30/94	EF	Young's Bay	21.0	n/a	F
151	LS Sucker	2/2/95	EF	Clatskanie River	18.9	n/a	F
152	LS Sucker	2/9/95	EF	Clatskanie River	17.5	n/a	F
73	Steelhead	12/28/94	EF	Cowlitz River	32.0	n/a	M
74	Steelhead	12/28/94	EF	Cowlitz River	27.5	n/a	M
75	Steelhead	12/28/94	EF	Cowlitz River	29.0	n/a	M
76	Steelhead	12/28/94	EF	Cowlitz River	27.0	n/a	M

TABLE 2-1. CAPTURE DATE, METHOD, LOCATION, AND PHYSICAL INFORMATION FOR EACH LOWER COLUMBIA RIVER SPECIMEN (Page 5 of 5)

Specimen #	Species	Date Captured	Method	Location	Length (in)	Weight (g)	Sex
77	Steelhead	12/27/94	EF	Eagle Cliff	28.0	n/a	M
78	Steelhead	12/27/94	EF	Eagle Cliff	26.0	n/a	F
79	Steelhead	12/28/94	EF	Cowlitz River	31.0	n/a	F
80	Steelhead	12/28/94	EF	Cowlitz River	29.0	n/a	F
81	Steelhead	12/28/94	EF	Cowlitz River	30.0	n/a	F
82	Steelhead	12/16/94	EF	Eagle Cliff	26.2	n/a	M
83	Steelhead	12/28/94	EF	Cowlitz River	25.8	n/a	M
84	Steelhead	12/16/94	EF	Eagle Cliff	24.8	n/a	F
85	Steelhead	12/16/94	EF	Eagle Cliff	32.3	n/a	F
86	Steelhead	12/16/94	EF	Eagle Cliff	26.2	n/a	F
87	Steelhead	12/16/94	EF	Eagle Cliff	27.2	n/a	M
88	Steelhead	12/16/94	EF	Eagle Cliff	34.6	n/a	M
89	Steelhead	12/16/94	EF	Eagle Cliff	25.6	n/a	M
90	Steelhead	12/15/94	EF	Eagle Cliff	27.9	n/a	M
91	Steelhead	12/16/94	EF	Eagle Cliff	25.4	n/a	M
92	Steelhead	12/16/94	EF	Eagle Cliff	29.3	n/a	F
93	Steelhead	12/15/94	EF	Eagle Cliff	24.8	n/a	F
94	Steelhead	12/16/94	EF	Eagle Cliff	31.9	n/a	M
124	Steelhead	12/11/94	EF	Clatskanie River	25.8	n/a	M
125	Steelhead	12/10/94	EF	Longview	25.3	n/a	M
95	Sturgeon	1/11/95	Hook	Mouth of Willamette	45.5	6258.5	F
96	Sturgeon	1/11/95	Hook	Mouth of Willamette	43.0	6848.1	M
97	Sturgeon	1/11/95	Hook	Mouth of Willamette	46.0	10249.4	M
159	Sturgeon	1/17/95	Hook	Hayden Island	42.0	n/a	n/a
160	Sturgeon	1/17/95	Hook	Hayden Island	42.0	n/a	n/a
161	Sturgeon	1/17/95	Hook	Hayden Island	45.0	n/a	n/a
162	Sturgeon	1/17/95	Hook	Hayden Island	45.5	n/a	n/a
163	Sturgeon	3/17/95	Hook	Near Trojan NPP	47.5	n/a	M
164	Sturgeon	2/17/95	Hook	Briz Bay	43.5	n/a	M
165	Sturgeon	2/18/95	Hook	Near Trojan NPP	45.5	n/a	F
166	Sturgeon	2/18/95	Hook	Near Trojan NPP	n/a	n/a	n/a
167	Sturgeon	2/18/95	Hook	Near Trojan NPP	47.5	n/a	F

EF = Electrofishing
Hook = Rod and Reel
n/a = Information not available

selected fish to holding containers aboard the boat. Upon retrieval, fish identification was verified by trained personnel and the total length of each specimen was measured to be certain that it was within the desired size range. Each fish was sacrificed by a blow to the head with a wooden club, weighed, double wrapped in heavy-duty aluminum foil and placed in a plastic bag with a water-proof tag stating the species type, collection date, collection location, length, and weight. Each specimen was then immediately placed on dry ice in a cooler.

2.1.2 Hatchery Collections

Coho and chinook were obtained from three State hatcheries. Male coho and chinook were obtained from Washington State hatcheries located on the Lewis River and Kalama River, respectively. Female coho and chinook were obtained from the Oregon State hatchery located on Big Creek. The male fish received from the Washington hatcheries were sacrificed prior to spawning by a blow to the head with a wooden club. They were immediately wrapped in aluminum foil and placed on ice. The female fish received from the Oregon hatchery were sacrificed by hatchery personnel after spawning by anesthetization (ESS) followed by a blow to the head. They were immediately wrapped in aluminum foil and placed on ice.

2.1.3 Hook and Line

White sturgeon were caught by hook and line. Each fish was sacrificed by a blow to the head with a wooden club. The fish were filleted at a shore station, double wrapped in heavy-duty aluminum foil and placed in a plastic bag with a water-proof tag stating the species type, collection date, approximate collection location, and length. Each specimen was then immediately placed on ice in a cooler.

2.2 SAMPLE PROCESSING

Fish fillets were removed by trained personnel following guidance provided in U.S. EPA (1993). All fillets included skin. Before processing, each fish was partially thawed. The following steps were followed during the processing of samples:

Step 1. The filleter's hands were washed with ivory soap, rinsed with tap water, and then rinsed with distilled water prior to filleting. Fish were processed on a cutting board covered with heavy duty aluminum foil which was changed between fish. Prior to processing

each specimen, all stainless steel utensils were washed with soap, rinsed with tap water, and then rinsed with distilled water.

Step 2. The scales were removed (largescale sucker and carp only) by placing the specimen flat against the cutting board and scraping with the edge of a stainless steel knife. The specimen was then rinsed with distilled water to remove the scales.

Step 3. The initial incision consisted of a shallow cut through the skin on either side of the dorsal fin from the top of the head to the base of the tail. Additionally, an incision was made behind the entire length of the gill cover, cutting through the skin and flesh to the bone. Following this cut, a shallow incision was made along the belly from the base of the pectoral fin to the tail. Care was taken to ensure that there was no cut into the gut cavity so as to not contaminate fillet tissues. Finally, a single cut was made from behind the gill cover to the anus and followed by an incision made on both sides of the anal fin. The fillet was removed and the remaining carcass was discarded.

Step 4. The fillet was wrapped in heavy duty aluminum foil and place in a plastic bag with the waterproof tag. The plastic bag was sealed and stored frozen.

2.3 SAMPLE COMPOSITING

Samples were composited in accordance with U.S. EPA (1993) recommended guidelines. Each fish was ground individually using a Hobart grinder with 5 mm holes in the inner plate. To prepare the composite samples, equal aliquots from each fish were removed and homogenized. In this manner, each fish contributed equally to the total composite weight, thereby reducing possible bias from fish that were not equal in size.

Each composite sample consisted of eight fish (except for carp which consisted of seven fish). Three composite samples from steelhead, chinook and coho salmon and one composite sample from carp were analyzed. For largescale sucker, three composite samples from each of the following stretches of the lower Columbia River were analyzed: Estuary (RM 0-48), Middle (RM 48-101), Upper (RM 101-146).

Sturgeon samples consisted of individual fillets. Composite information, including the composite sample identification number, specimens which constitute the composite, and the individual's sex (if available), is located in Table 2-2. Additional information about each sample, including the mean length and weight of fish in the composite, percent lipid, and percent moisture, is included in Table 2-3. The ages of the fish were not determined.

2.4 SAMPLE CUSTODY AND SHIPPING PROCEDURES

Samples obtained in the field were strictly controlled by chain-of-custody procedures. A field logbook was maintained to document the collection of each sample. Samples were wrapped in foil and placed in a resealable plastic bag. Waterproof labels, included with the samples in each bag, contained the following information: station location, sampling date, species type, and specimen's weight and length.

Prior to shipping, samples were securely packed inside the cooler with the chain-of-custody forms enclosed in a plastic bag and taped to the inside of the cooler. The chain-of-custody form records the number of included samples in the shipment and the requested analyses. The individuals relinquishing and receiving the samples signed, dated, and noted the time on the chain-of-custody form. Copies of all forms are included as Appendix A. The cooler was sealed with fiber tape and a custody seal. All samples were shipped to the laboratory frozen via overnight delivery.

TABLE 2-2. COMPOSITE IDENTIFICATION (Page 1 of 2)

Composite ID:	LSCmp1-1				Composite ID:	DCmp1			
Species:	LS Sucker				Species:	Steelhead			
Number in Composite:	8				Number in Composite:	8			
Specimen #:	138 (F)	139 (F)	142 (F)	144 (F)	Specimen #:	78 (F)	79 (F)	80 (F)	81 (F)
	145 (F)	149 (F)	150 (F)	152 (F)		84 (F)	85 (F)	86 (F)	92 (F)
Composite ID:	LSCmp1-2				Composite ID:	DCmp2			
Species:	LS Sucker				Species:	Steelhead			
Number in Composite:	8				Number in Composite:	8			
Specimen #:	128 (F)	130 (F)	131 (F)	132 (F)	Specimen #:	73 (M)	74 (M)	75 (M)	76 (M)
	133 (F)	135 (F)	136 (F)	143 (F)		77 (M)	82 (M)	83 (M)	87 (M)
Composite ID:	LSCmp1-3				Composite ID:	DCmp3			
Species:	LS Sucker				Species:	Steelhead			
Number in Composite:	8				Number in Composite:	8			
Specimen #:	129 (F)	134 (F)	137 (F)	140 (F)	Specimen #:	88 (M)	89 (M)	90 (M)	91 (M)
	141 (F)	146 (F)	148 (F)	151 (F)		93 (F)	94 (M)	124 (M)	125 (M)
Composite ID:	LSCmp2-1				Composite ID:	KCmp1			
Species:	LS Sucker				Species:	Chinook			
Number in Composite:	8				Number in Composite:	8			
Specimen #:	101 (F)	103 (F)	106 (F)	107 (F)	Specimen #:	1 (M)	22 (M)	28 (M)	33 (M)
	110 (F)	112 (F)	114 (M)	121 (F)		34 (M)	35 (M)	40 (M)	41 (M)
Composite ID:	LSCmp2-2				Composite ID:	KCmp2			
Species:	LS Sucker				Species:	Chinook			
Number in Composite:	8				Number in Composite:	8			
Specimen #:	102 (F)	104 (F)	105 (F)	109 (F)	Specimen #:	3 (F)	26 (F)	32 (F)	37 (F)
	113 (F)	115 (F)	119 (F)	122 (F)		43 (M)	45 (M)	46 (M)	48 (F)

TABLE 2-2. COMPOSITE IDENTIFICATION (Page 2 of 2)

Composite ID:	LSCmp2-3				Composite ID:	KCmp3		
Species:	LS Sucker				Species:	Chinook		
Number in Composite:	8				Number in Composite:	8		
Specimen #:	100 (F)	108 (F)	111 (F)	116 (M)	Specimen #:	11 (F)	12 (F)	13 (F)	14 (F)
	117 (F)	120 (F)	123 (F)	127 (F)		15 (F)	16 (F)	17 (F)	18 (F)
Composite ID:	LSCmp3-1				Composite ID:	HCmp1		
Species:	LS Sucker				Species:	Coho		
Number in Composite:	8				Number in Composite:	8		
Specimen #:	50 (M)	63 (F)	65 (F)	66 (F)	Specimen #:	5 (M)	7 (M)	8 (M)	19 (M)
	69 (F)	70 (M)	71 (F)	72 (F)		24 (M)	27 (M)	29 (M)	30 (M)
Composite ID:	LSCmp3-2				Composite ID:	HCmp2		
Species:	LS Sucker				Species:	Coho		
Number in Composite:	8				Number in Composite:	8		
Specimen #:	49 (F)	51 (F)	52 (F)	53 (F)	Specimen #:	4 (M)	25 (F)	31 (M)	38 (M)
	55 (M)	58 (F)	62 (F)	68 (F)		39 (M)	42 (F)	44 (F)	47 (M)
Composite ID:	LSCmp3-3				Composite ID:	HCmp3		
Species:	LS Sucker				Species:	Coho		
Number in Composite:	8				Number in Composite:	8		
Specimen #:	54 (F)	56 (F)	57 (F)	59 (F)	Specimen #:	2 (F)	6 (F)	9 (F)	10 (F)
	60 (F)	61 (F)	64 (F)	67 (F)		20 (F)	21 (F)	23 (F)	36 (F)
Composite ID:	CCmp1							
Species:	Carp							
Number in Composite:	7							
Specimen #:	126 (M)	153 (M)	154 (M)	155 (M)				
	156 (F)	157 (F)	158 (M)					

Sex of each specimen given in parentheses next to specimen number

TABLE 2-3. BIOLOGICAL DATA FOR EACH FISH SAMPLE

Sample ID	Species	Number Fillets per Sample	Mean Length (in)	Mean Weight (g)	% Lipid	% Moisture
LSCmp1-1	Largescale Sucker	8	17.9	n/a	1.17	79.08
LSCmp1-2	Largescale Sucker	8	17.2	n/a	0.79	80.09
LSCmp1-3	Largescale Sucker	8	18.3	n/a	1.08	79.80
LSCmp2-1	Largescale Sucker	8	17.3	n/a	1.45	80.85
LSCmp2-2	Largescale Sucker	8	19.1	n/a	2.06	78.68
LSCmp2-3	Largescale Sucker	8	18.3	n/a	2.26	77.94
LSCmp3-1	Largescale Sucker	8	18.0	n/a	1.41	79.55
LSCmp3-2	Largescale Sucker	8	18.5	1048.8	2.88	80.86
LSCmp3-3	Largescale Sucker	8	18.5	986.2	1.69	79.88
CCmp1	Carp	7	23.7	3121.2	4.37	72.51
DCmp1	Steelhead	8	28.5	n/a	2.87	73.86
DCmp2	Steelhead	8	27.9	n/a	4.06	74.39
DCmp3	Steelhead	8	28.0	n/a	4.82	70.60
KCmp1	Chinook	8	33.3	n/a	3.51	66.52
KCmp2	Chinook	8	32.1	3566.5	1.71	73.99
KCmp3	Chinook	8	33.2	n/a	0.72	76.24
HCmp1	Coho	8	25.6	2548.4	1.67	71.80
HCmp2	Coho	8	24.6	2384.6	0.48	73.52
HCmp3	Coho	8	24.0	1896.0	0.85	74.22
SIND1	White Sturgeon	1	45.5	6258.5	2.17	78.78
SIND2	White Sturgeon	1	43.0	6848.1	1.69	76.73
SIND3	White Sturgeon	1	46.0	10249.4	0.86	77.75
SIND4	White Sturgeon	1	42.0	n/a	1.00	77.71
SIND5	White Sturgeon	1	42.0	n/a	0.69	77.07
SIND6	White Sturgeon	1	45.0	n/a	2.46	75.02
SIND7	White Sturgeon	1	45.5	n/a	0.99	77.03
SIND8	White Sturgeon	1	47.5	n/a	0.88	77.83
SIND9	White Sturgeon	1	43.5	n/a	0.04	80.26
SIND10	White Sturgeon	1	45.5	n/a	0.14	81.80
SIND11	White Sturgeon	1	na	n/a	0.36	80.64
SIND12	White Sturgeon	1	47.5	n/a	0.41	80.55

n/a= not available

3.0 LABORATORY PROCEDURES

This section describes the process by which the analytical laboratories [Pacific Analytical, Inc., Carlsbad, CA and Battelle Marine Sciences Lab (MSL), Sequim, WA] received, processed, and analyzed each fish sample. Pacific Analytical analyzed each sample for dioxins/furans, semi-volatile organics, pesticides, and PCBs, while Battelle Marine Science Lab analyzed each sample for selected trace metals. Four salmon samples were reanalyzed by Triangle Labs for dioxins/furans because of blank contamination noted in the original analyses.

3.1 SAMPLE PROCESSING

Pacific Analytical was responsible for all initial processing of fish fillets. The 31 samples were received frozen by overnight courier in 5 different batches and immediately placed in a freezer at -10°C until processing. Each batch was processed separately. Each fillet was homogenized separately after partial thawing using a Hobart meat grinder with 5 mm holes in the inner plate and placed in individual jars. For the 19 composite samples, aliquots for each of the analyses were prepared by taking equal amounts (weight dependent on the type of analysis) from each of the individual specimen jars. For the 12 samples consisting of individual filets (sturgeon), all of the required sample amount was taken from one jar. All homogenized tissue in excess of what Pacific Analytical needed for the three analyses they performed on each sample was shipped frozen by overnight courier to Battelle Marine Science Lab. Battelle prepared composite and individual samples in a manner identical to Pacific Analytical.

3.2 SAMPLE ANALYSES

The extraction/digestion and analytical methods for each of the analyses are described in separate sections below.

3.2.1 Lipids

The percentage of lipid in each of the samples was determined gravimetrically using petroleum ether as a solvent. The petroleum ether fraction was partitioned from a homogenized aliquot of the sample and then evaporated. The residue (i.e., lipid) was then weighed and compared to the original aliquot weight.

3.2.2 Dioxins/Furans

All 31 samples were analyzed for the seventeen 2,3,7,8-substituted polychlorinated dioxins/furans by isotope dilution high-resolution gas chromatography/high resolution mass spectroscopy (HRGC/HRMS) (U.S. EPA Method 1613A). The sample size extracted was increased to 50 g (20 g samples are typical) in order to achieve lower detection limits. After removing the moisture from the homogenized tissue with a Dean-Stark apparatus, the solid residue was soxhlet extracted. The extract was washed (back extracted) with base and acid, followed by silica gel and celite (AX-21) cleanups (used to remove nonpolar interferences) and alumina column cleanup (used to remove polar interferences). HRGC/HRMS analysis proceeded as described in the method. All 2,3,7,8-congeners were quantified using a DB-5 GC column as primary. All positive results for 2,3,7,8-TCDF were confirmed using a dissimilar GC column (Rtx-200) as required by the method. The lower of the concentrations from the two columns for this congener were reported. Each batch included the analysis of all QC samples required by the method.

3.2.3 Semi-volatile Organics

Fourteen semi-volatile organic compounds were analyzed by GC/MS in the selective ion monitoring (SIM) mode (U.S. EPA Method 8270). These 14 compounds are a subset of the compounds normally quantified using Method 8270 and are listed in the data appendix. During the study design, it was determined that these compounds represented a potential source of risk to human health from the consumption of fish in the Columbia River (Tetra Tech 1994b).

For each composite or individual sample, a 30 g aliquot was ground with anhydrous sodium sulfate and methylene chloride in a tissue homogenizer. The sample was then soxhlet extracted using methylene chloride and concentrated to 2 mL using a Kuderna-Danish (KD) apparatus. The extract was cleaned using gel permeation chromatography (GPC), followed by further concentration using KD and nitrogen blowdown to 0.5 mL. Compounds were quantified as described in the method using a DB-5 GC column with a MS detector in SIM mode. Each batch included the analysis of all QC samples required by the method.

3.2.4 Pesticides and PCBs

Pesticides and PCBs were analyzed by GC/Electron Capture Detection (ECD) (U.S. EPA Method 8081). In addition to the compounds normally detected using this method, two additional pesticides (mirex and methyl parathion) and two semi-volatile organic compounds (hexachlorobenzene and hexachlorobutadiene) were also analyzed. Additional calibration standards for these compounds were added to the initial and continuing calibration run sequences. Hexachlorobenzene and hexachlorobutadiene were quantified using this method rather than method 8270 because of the lower detection limits that could be achieved.

For each composite or individual sample, a 30 g aliquot was ground with anhydrous sodium sulfate and petroleum ether in a tissue homogenizer. The sample was then concentrated to 2 mL using a Snyder column. The extract was cleaned using gel permeation chromatography (GPC), followed by a solvent exchange with hexane, and cleanup with sulfuric acid. The resulting extract was eluted through a Florisil column with petroleum ether (PCB fraction), 6 percent ethyl ether in petroleum ether (pesticide fraction 1), and 15 percent ethyl ether in petroleum ether (pesticide fraction 2). The PCB fraction was further cleaned using an acidic silica gel, followed by the use of KD and nitrogen blowdown which concentrated the extract to 0.2 mL. Each of the three fractions were analyzed on two dissimilar megabore GC columns (DB-608 and DB-1701) using an ECD detector. The DB-608 was typically used for quantitation, while the DB-1701 was used for confirmation. Each batch included the analysis of all QC samples required by the method.

3.2.5 Metals

All samples were analyzed for ten trace metals (Ag, As, Ba, Cd, Cu, Hg, Ni, Pb, Sb, and Se). Concentrations of all metals except mercury and selenium were determined by inductively coupled plasma mass spectroscopy (ICP/MS)(U.S. EPA Method 200.8). Mercury was determined by cold vapor atomic absorption (CVAA) and selenium was determined by graphite furnace atomic absorption (GFAA). Total arsenic was determined by ICP/MS. Inorganic arsenic and methylated (monomethyl and dimethyl) arsenic were determined by hydride AA. The difference between total arsenic and the sum of the inorganic and methylated forms of arsenic is generally assumed to be organoarsenic compounds which are not easily quantified.

Each sample was digested with a 4:1 mixture of nitric acid to perchloric acid in a teflon bomb heated to 130^{o} C for 4 hours. All samples analyzed for arsenic speciation were digested instead with sodium

hydroxide which was intended to dissolve the tissue without decomposing the organoarsenic compounds. The samples were analyzed following standard operating procedures used by Battelle MSL (MSL-M-024-01, MSL-M-031-00, and MSL-M-035-01) which are patterned closely after U.S. EPA methods. Each batch included the analysis of a procedural blank, laboratory duplicate, matrix spike, and standard reference material (DORM-2).

4.0 RESULTS

All analytical data for this project are reported in Appendices B-E and will not be presented in the text. All data are reported on a wet-weight basis.

A thorough data validation was performed for all data according to guidance provided by U.S. EPA (1994a,b,c). Several types of QA/QC data were examined, including initial and continuing calibration; instrument performance checks; preparation blanks; internal standard, surrogate, and matrix spike recoveries; laboratory control standards; certified reference materials; and laboratory duplicates. Data qualifiers were added, as appropriate, to data appendix tables. The definition of all data qualifiers is also included in each data table.

None of the data collected during this study have been qualified as unusable for the human health risk assessment. A brief summary of the data validation performed for the analytical data is provided below for each analytical group. The summary includes an explanation for all data qualifiers that were added.

4.1 METALS DATA VALIDATION

Thirty-one fish tissue samples were analyzed for the presence of eleven trace metals. The samples were analyzed in three batches. Quality control samples analyzed with each batch included preparation blanks, certified reference material (CRM)(DORM-2), laboratory control standards (two batches only), matrix spikes, and laboratory duplicates. If the results for any metal in a particular QC sample were outside the data quality objectives (Tetra Tech 1994b), all of the data for that metal in that batch were qualified.

Data qualifiers were not added to detected concentrations for the following metals: 1) antimony, 2) arsenic (total), 3) cadmium, 4) copper and, 5) mercury. Qualifiers for the other trace elements are described below.

4.1.1 Arsenic (inorganic)

Six of the thirty-one samples were qualified as estimates (J_6) because a single matrix spike had a recovery outside the acceptable QC range of (75-125 percent). The percent recovery for this matrix spike was 58 percent. Low spike recoveries could indicate that the associated sample concentrations have been underestimated.

4.1.2 Barium

Ten of the thirty-one samples were qualified as estimates (J_8) because duplicate precision requirements ($\pm$30 percent) were not met. The relative percent difference (RPD) between the duplicates was 36 percent. In addition, two samples were also qualified as undetected due to blank contamination (BU) because sample concentrations were less than five times the blank concentration (i.e., the 5X rule). The concentration of barium detected in the blank (0.016 μg/g dry) was slightly higher than the detection limit (0.011 μg/g dry).

4.1.3 Lead

Twenty-five of the thirty-one samples were qualified during the QC review. Thirteen of the samples were qualified (BUJ_8) because sample concentrations did not exceed blank concentrations by 5X and duplicate precision requirements ($\pm$30 percent) were not met. Nine additional samples were also qualified as undetected due to blank contamination (BU) and three additional samples were qualified as estimates (J_8) because of duplicate analyses. RPDs for the two duplicate pairs which exceeded precision criteria were 84 and 53 percent. Lead was detected in two preparation blanks at concentrations 3X (0.044 vs. 0.014 μg/g dry) and 2X (0.006 vs. 0.003 μg/g dry) the detection limit.

4.1.4 Nickel

Six of the thirty-one samples were qualified as estimates (J_7) because reference material concentrations were slightly outside the acceptable QC range (70-130 percent) of the certified value. The RPDs between measured and certified values for two replicate measurements of the CRM were 34 and 42 percent. These results could indicate that the associated sample concentrations have been underestimated.

4.1.5 Selenium

Nine of the thirty-one samples were qualified as estimates (J_8) because a single duplicate analysis was outside precision criteria. The RPD for this duplicate sample analysis was 63 percent.

4.1.6 Silver

Six of the thirty-one samples were qualified as estimates (J_6) because of a single matrix spike recovery outside the acceptable QC range. The percent recovery for this matrix spike was 31 percent.

4.2 SEMIVOLATILE ORGANICS DATA VALIDATION

Thirty-one fish tissue samples were analyzed for the presence of thirteen semivolatile chemicals. These samples were analyzed in five batches. Quality control samples analyzed with each batch included method blanks, matrix spikes, and surrogate spikes (every sample). If the results for any compound or surrogate in a particular QC sample were outside the data quality objectives (Tetra Tech 1994b), all of the data for that compound or associated compounds in that batch were qualified.

Detected concentrations were qualified as estimates for at least a portion of the 31 samples for 3 of the 13 compounds. For the other 10 compounds, two undetected sample concentrations for each compound were qualified (UJ_5) because of surrogate spike recoveries outside acceptable QC recovery limits. The three compounds for which detected concentrations were qualified are described individually below.

4.2.1 bis(2-Ethylhexyl)phthalate

Thirty of the thirty-one samples were qualified in the QC review. Twenty-eight of the thirty-one samples were qualified undetected due to blank contamination (BU) because sample concentrations did not exceed blank concentrations by more than 10X. One sample was qualified as BUJ_5 because of blank contamination and low surrogate recoveries, while one additional sample was qualified as J_5 because of low surrogate spike recoveries. Low surrogate recoveries could indicate that the associated sample concentrations have been underestimated. Blank contamination was noted in each of the five batches at concentrations ranging from 8-60 μg/kg (nominal reporting limit = 10 μg/kg). Sample concentrations as high as 223 μg/kg were qualified as undetected because of the blank contamination. Contamination from bis(2-ethylhexyl)phthalate is commonly observed in this method (U.S. EPA 1994a).

4.2.2 4-Methylphenol

Five of the thirty-one samples were qualified in the QA review. Two samples were qualified (J_5) because surrogate spike recoveries were outside acceptable QC recovery limits. Three samples were qualified (J_1) because sample concentrations were below nominal reporting limits (10 μg/kg). The J_1 qualifier indicates that the analyst was confident that the compound was present in the sample, but the actual concentration reported is less certain than reported concentrations greater than 10 μg/kg.

4.2.3 Phenol

Twenty-five of the thirty-one samples were qualified in the QA review. Twenty-three of the samples were qualified as undetected due to blank contamination (BU) because sample concentrations did not exceed blank concentrations by more than 5X. Two samples were qualified (J_5) because surrogate spike recoveries were outside the acceptable QC recovery limits. Blank contamination was noted in four of the five batches at concentrations ranging from 8-17 μg/kg (nominal reporting limit = 10 μg/kg). Sample concentrations as high as 52 μg/kg were qualified as undetected because of the blank contamination. Phenol is a commonly observed laboratory contaminant in this method (U.S. EPA 1994a).

4.3 PESTICIDES/PCBS DATA VALIDATION

Thirty-one fish tissue samples were analyzed for the presence of thirty-two pesticides/PCBs. These samples were analyzed in five batches. Quality control samples analyzed with each batch included method blanks, matrix spikes, and surrogate spikes (every sample). If the results for any compound or surrogate in a particular QC sample were outside the data quality objectives (Tetra Tech 1994b), all of the data for that compound or associated compounds in that batch were qualified.

None of the compounds were qualified as estimates for any of the samples. Two compounds were qualified as undetected due to blank contamination for at least some samples. These compounds are described below.

4.3.1 Endrin Ketone

One of the thirty-one samples was qualified (BU) because the sample concentration (0.41 μg/kg) did not exceed the blank concentration (0.33 μg/kg) by more than 5X.

4.3.2 Hexachlorobutadiene

One of the thirty-one samples was qualified (BU) because the sample concentration (0.17 μg/kg) did not exceed the blank concentration (0.06 μg/kg) by more than 5X.

4.4 DIOXINS/FURANS DATA VALIDATION

Thirty-one fish tissue samples were analyzed for the presence of 17 dioxins/furan congeners. These samples were analyzed in 5 batches. Quality control samples analyzed with each batch included method blanks, ongoing precision and recovery (OPR) samples, and internal standards (each sample). If the results for any compound or internal standard in a particular QC sample were outside the data quality objectives (Tetra Tech 1994b), all of the data for that compound or associated compounds in that batch were qualified. Four of the salmon samples (KCMP2, KCMP3, HCMP2, and HCMP3) were reanalyzed by Triangle Labs in two different batches because blank contamination had previously been noted for the most toxic congener (2,3,7,8-TCDD). Each batch included the analysis of a method (preparation) blank and and OPR sample, both of which consisted of sodium sulfate.

None of the congeners were qualified as estimates for any of the samples. Several of the congeners were qualified as undetected due to blank contamination for at least one sample. These congeners are discussed below.

None of the congeners were qualified as estimates for any of the samples. Several congeners were qualified as undetected due to blank contamination for at least one sample. These congeners are discussed below.

4.4.1 1,2,3,4,6,7,8-HpCDD

Two of the thirty-one samples were qualified (BU) because sample concentrations (0.08-0.16 ng/kg) did not exceed the blank concentration (5.9 ng/kg) by 5X. The laboratory believed the high concentration in the blank was due to defective glassware and not contamination in the analytical apparatus.

4.4.2 OCDD

One of the thirty-one samples was qualified (BU) because the sample concentration (0.17 ng/kg) did not exceed the blank concentration (90.4 ng/kg) by 5X. The laboratory believed the high concentration in the blank was due to defective glassware and not contamination in the analytical apparatus.

4.4.3 1,2,3,6,7,8-HxCDF

One of the thirty-one samples was qualified (BU) because the sample concentration (0.14 ng/kg) did not exceed the blank concentration (0.04 ng/kg) by more than 5X.

4.4.4 2,3,4,6,7,8-HxCDF

One of the thirty-one samples was qualified (BU) because the sample concentration (0.15 ng/kg) did not exceed the blank concentration (0.15 ng/kg) by more than 5X.

4.4.5 1,2,3,7,8,9-HxCDF

One of the thirty-one samples was qualified (BU) because the sample concentration (0.28 ng/kg) did not exceed the blank concentration (0.07 ng/kg) by 5X.

4.4.6 1,2,3,4,6,7,8-HpCDF

One of the thirty-one samples was qualified (BU) because the sample concentration (0.18 ng/kg) did not exceed the blank concentration (0.05 ng/kg) by 5X.

4.4.7 Interlaboratory Comparison

Four salmon samples were analyzed by both Pacific Analytical and Triangle Labs. The data for these four samples in the draft data report (Tetra Tech 1995) were from Pacific Analytical. The data for these four samples which were used in this risk assessment and included in Appendix E of this document were from Triangle Labs.

The estimated detection limits achieved by Triangle Labs were generally lower than those achieved by Pacific Analytical. The results for the two labs were generally in agreement with respect to whether the congener was detected. Some of the congeners were detected by Triangle Labs but not by Pacific Analytical, but in most of these cases, the Triangle Labs detection limit was much lower; thus, these

results should not be seen as disagreeing. No blank contamination for 2,3,7,8-TCDD was noted in either method blank analyzed by Triangle Labs.

4.5 DATA VALIDATION SUMMARY

None of the data collected during this study have been qualified as unusable for the human health risk assessment. A total of 73 target analytes were analyzed for each of 31 samples. Of the total number of data points (73 x 31 =2263), three percent (69/2263) were qualified as estimates due after evaluation of the QC results. Data points qualified as estimated were still considered useable for the risk assessment, although the final risk estimates for compounds with estimated data points might be more uncertain. Detected values which were less than 5X (or 10X for common laboratory contaminants such as phenol and phthalates) greater than concentrations detected in associated laboratory blanks were qualified as undetected. An additional four percent (84/2263) of the data points were qualified in this manner.

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APPENDIX A

CHAIN OF CUSTODY FORMS

Q983110

Q983110

CARCASS AND EGG DISPOSAL

LEWIS RIVER HATCHERY

52 99914

DATE 09 22 96

DEALER – TETRA TECH –

REDMOND, WA

WA. LIC# 051-CWL

HATCHERY SIGNATURE: [signature]

RECEIVER SIGNATURE: [signature]

STATE OF WASHINGTON DEPARTMENT OF FISHERIES
CARCASS & EGG DISPOSAL TICKET

Joint study with Dept. of Ecology

SPECIES: 001-9 SPRING CHINOOK	SPECIES: 001-0 FALL CHINOOK	SPECIES: 004 COHO	SPECIES: 002 CHUM	SPECIES: 003 PINK	SPECIES: 005 SOCKEYE	SEX: 1 MALE	SEX: 2 FEMALE	SEX: 3 JACKS	SEX: 4 JUVENILE	SEX: 5 EGGS	CARCASS: 1 SPAWNED	CARCASS: 2 ROUND	CARCASS: 3 STRIPPED	USE: 1 CONDITION 1	USE: 2 CONDITION 2	USE: 3 CONDITION 3	EGGS: 1 GREEN	EGGS: 2 EYED	EGGS: 3 HATCHERY MORTALITY	EGGS: 4 NON-VIABLE	DISTRIBUTION: 1 DONATION	DISTRIBUTION: 2 SOLD	DISTRIBUTION: 3 INDIAN	DISTRIBUTION: 4 DISPOSAL	NUMBER OF FISH OR EGGS	ESTIMATED WEIGHT	ACTUAL WEIGHT	VALUE	AMOUNT
		X				X						X			X					X				X	12	72	72		

1	2	3	4	5	6	7	8	9	10

AMOUNT DUE

DEALER COPY

FORM FS-DP-113 REV 2/89

Q983258

Modrow Trap on Kalama River below hatchery.

Q983258

DATE

DEALER

BUYER Tetra Tech Inc Redmond WA

HATCHERY SIGNATURE Steve Gross 7474

RECEIVER SIGNATURE Paul Hershberger

STATE OF WASHINGTON DEPARTMENT OF FISHERIES
CARCASS & EGG DISPOSAL TICKET

SPECIES						SEX					CARCASS			USE			EGGS				DISTRIBUTION								
001-9 SPRING CHINOOK	001-0 FALL CHINOOK	004 COHO	005 CHUM	006 PINK	007 SOCKEYE	1 MALE	2 FEMALE	3 JACKS	4 JUVENILE	5 EGGS	1 SPAWNED	2 ROUND	3 STRIPPED	1 CONDITION 1	2 CONDITION 2	3 CONDITION 3	1 GREEN	2 EYED	3 [illegible]	4 NON-VIABLE	1 DONATION	2 SOLD	3 INDIAN	4 DISPOSAL	NUMBER OF FISH OR EGGS	ESTIMATED WEIGHT	ACTUAL WEIGHT	VALUE	AMOUNT
	X					X						X		X							X				11	165	165		

1 2 3 4 5 6 7 8 9 10

DEALER COPY

FORM FS-DP-113 REV 2/89

AMOUNT DUE

#3630

DATE 09 / 29 / 94 (MO. / DAY / YR.)

ANADROMOUS ADULT TRANSACTION

OREGON Fish & Wildlife

Coho SPECIES CO

LOT 1394 (STOCK BROOD YEAR)

HATCHERY CODE BC (TWO LETTERS) NAME Big Creek Hatchery (ADMINISTRATIVE UNIT)

FISH CONDITION

L = LIVE D = DIED K = KILLED

CIRCLE ONE LETTER | CIRCLE ONE ACTION

TYPE of TRANSACTION

1† = COLLECTED (FISH IN)	2 = TRANS IN (FISH IN)	3 = TRANS OUT (FISH OUT)	4 = RELEASE (FISH OUT)	5 = BURY (FISH OUT)	6 = RENDER (FISH OUT)	7 = SOLD (FISH OUT)	8 = PROCESS (FISH OUT)	9 = GIVE AWAY (FISH OUT)	10* = OTHER (FISH OUT)	11 = LIVE SPAWN	12 = FREEZER

FROM/TO Tetra Tech. 15400 NE 90th St, Suite 100 Redmond, WA 98052 (IN FROM OR OUT TO)

	NUMBER (not reruns)	RERUNS (for collections only)	WEIGHT SAMPLE LBS./FISH
MALES			
FEMALES UN-SPAWNED			
SPAWNED FEMALES			
FEMALES EGGS REMOVED (NON-VIABLE EGGS TAKEN)	12		4.3
JACKS			
SUB-JACKS			
JENNIES			

FISH GRADE 3

AMOUNT RECEIVED $.

X RECEIVER

ODFW REP. Mike Posey

MEDICATION STATUS (PRINT TYPE OF MEDICATION WHERE APPROPRIATE)

ANESTHETIC USED ES5

INJECTED WITH

OTHER* (MALACHITE GREEN, FORMALIN, ETC.)

†COLLECTION STATUS (COMPLETE ONLY WHEN COLLECTING FISH)

METHOD: 1. TRAP 2. SEINED 3. ELECTRO-FISH 4. OTHER*

CIRCLE APPROPRIATE WORD

BEGIN SEASON ☐ END SEASON ☐ CHECK A BOX ONLY ONCE PER SEASON

REMARKS:

Tad Deshler will be picking up Females for Tetra Tech

Entered into Computer

ID# 53630

Analyze Fish For Chemicals

FC 6/84

WHITE COPY TO FISH CULTURE
CANARY COPY TO RECEIVER
GREEN COPY TO HATCHERY

*EXPLAIN IN REMARKS

53628

DATE 09 / 29 / 94 (MO. / DAY / YR.)

ANADROMOUS ADULT TRANSACTION

OREGON Fish & Wildlife

Chinook

SPECIES CHF

LOT 1394 (STOCK BROOD YEAR)

HATCHERY CODE BC (TWO LETTERS) NAME Big Creek Hatchery (ADMINISTRATIVE UNIT)

FISH CONDITION

L = LIVE D = DIED (K) = KILLED

CIRCLE ONE LETTER / CIRCLE ONE ACTION

TYPE of TRANSACTION

1† = COLLECTED (FISH IN)	2 = TRANS IN (FISH IN)	3 = TRANS OUT (FISH OUT)	4 = RELEASE (FISH OUT)	5 = BURY (FISH OUT)	6 = RENDER (FISH OUT)	7 = SOLD (FISH OUT)	8 = PROCESS (FISH OUT)	(9) = GIVE AWAY (FISH OUT)	10* = OTHER (FISH OUT)	11 = LIVE SPAWN	12 = FREEZER

Trap w Lower Dam

FROM/TO Tetra Tech 15400 NE 90th, Suite 100, Redmond, WA 98052 (IN FROM OR OUT TO)

	NUMBER (not reruns)	RERUNS (for collections only)	WEIGHT SAMPLE LBS./FISH
MALES			
FEMALES UN-SPAWNED			
SPAWNED FEMALES	13		12.1
FEMALES EGGS REMOVED (NON-VIABLE EGGS TAKEN)			
JACKS			
SUB-JACKS			
JENNIES			

FISH GRADE 3

AMOUNT RECEIVED $.

X RECEIVER

ODFW REP. Mike Posey

MEDICATION STATUS
(PRINT TYPE OF MEDICATION WHERE APPROPRIATE)

ANESTHETIC USED ESS

INJECTED WITH

OTHER* (MALACHITE GREEN, FORMALIN, ETC.)

†COLLECTION STATUS
(COMPLETE ONLY WHEN COLLECTING FISH)

METHOD: 1. TRAP 2. SEINED 3. ELECTRO-FISH 4. OTHER*

CIRCLE APPROPRIATE WORD

BEGIN SEASON ☐
END SEASON ☐

CHECK A BOX ONLY ONCE PER SEASON

REMARKS:
Tad Deshler will be picking
~~30~~ Carcasus up for Tetra Tech
Entered into Computer
10 = 53628
Analyze Fish For chemicals

FC 6/84

WHITE COPY TO FISH CULTURE
CANARY COPY TO RECEIVER
GREEN COPY TO HATCHERY

*EXPLAIN IN REMARKS

TETRA TECH, INC.
15400 NE 90th, Suite 100
Redmond, Washington 98052
(206) 883-1912
FAX (206) 881-6997

CHAIN OF CUSTODY

DOCUMENT 1 of 1

PROJECT NAME: Lower Columbia River Human Health — PROJECT NO.: 9968-03

SAMPLERS: (signature) Tad Deshler

Tt Contact: Tad Deshler

SAMPLE ID	TIME	DATE	MEDIA: Air	Surface Water	Ground Water	Soil	Sediment	Fish Homogenate	NUMBER OF CONTAINERS	ANALYSIS: Arsenic Speciation	Hg by CVAA	Sb, Ba, Cd, Co, Pb, Ni, Se, Ag by ICP/MS	REMARKS
KCmp1		9/23/94						X	1	X	X	X	
KCmp2								X	1	X	X	X	
KCmp3								X	1	X	X	X	
HCmp1								X	1	X	X	X	
HCmp2								X	1	X	X	X	
HCmp3		9/22/94						X	1	X	X	X	

RELINQUISHED BY (signature): Tad Deshler	DATE/TIME: 11/12/94 1600	TOTAL NUMBER OF COTNAINERS: 6		RECEIVED FOR LAB BY (Signature)	DATE/TIME
RECEIVED BY (signature)	DATE/TIME	RELINQUISHED BY (signature)	DATE/TIME	CONDITION OF CONTENTS	TEMPERATURE UPON RECEIPT
RELINQUISHED BY (signature)	DATE/TIME	RECEIVED BY (signature)	DATE/TIME	REMARKS: Archive extra tissue	
RECEIVED BY (signature)	DATE/TIME	METHOD OF SHIPMENT	AIRBILL NO.		

h Copy Pink C

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CHAIN OF CUSTODY

DOCUMENT 1 of 1

Pacific Analytical

PROJECT NAME: Lower Columbia River Human Health
PROJECT NO.: 9968-03
SAMPLERS: (signature) T. Dechter, K. Kogawa, J. Stark, G. Brown, P. Bero
TI Contact: [redacted] Steve Ellis

SAMPLE ID	TIME	DATE	MEDIA: Air	Surface Water	Ground Water	Soil	Sediment	Fish Fillets	NUMBER OF CONTAINERS	ANALYSIS: EPA 8270 (SIM for PAHs)	EPA 8080	EPA 1613A	REMARKS
LSCMP2-1		12-8 to 12-9/94						X	1	X	X	X	*after homogenizing samples, please send 40z jar of homogenate to Battelle Marine Science Lab (see Tom a[illegible] and 40z jar to Tetra Tech.
LSCMP2-2		12-8 to 12-9/94						X	1	X	X	X	
LSCMP2-3		12/6 to 12/6/94						X	1	X	X	X	
LSCMP3-1		12/2 to 12/2/94						X	1	X	X	X	
LSCMP3-2		12/1 to 12/3/94						X	1	X	X	X	
LSCMP3-3		12/2 to 12/2/94						X	1	X	X	X	

RELINQUISHED BY (signature) [signature]	DATE/TIME 12/14/94	TOTAL NUMBER OF CONTAINERS 6		RECEIVED FOR LAB BY (Signature)	DATE/TIME
RECEIVED BY (signature)	DATE/TIME	RELINQUISHED BY (signature)	DATE/TIME	CONDITION OF CONTENTS	TEMPERATURE UPON RECEIPT
RELINQUISHED BY (signature)	DATE/TIME	RECEIVED BY (signature)	DATE/TIME	REMARKS - Please call to confirm receipt - Refer to Technical Services Agreement for additional information including reporting detection limits	
RECEIVED BY (signature)	DATE/TIME	METHOD OF SHIPMENT	AIRBILL NO.		

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CHAIN OF CUSTODY

DOCUMENT 1 of 1

PROJECT NAME: Lower Columbia River Human Health | PROJECT NO.: 9968-03

SAMPLERS: (signature) Tad Deshler

Tt Contact: Tad Deshler

SAMPLE ID	TIME		MEDIA: Air	Surface Water	Ground Water	Soil	Sediment	Fish	NUMBER OF CONTAINERS	ANALYSIS: 8270	8081	1613A	REMARKS
DCmp1		12/16/99						X	1	X	X	X	each bag contains 8 fillets to be composited
DCmp2		12/14/99						X	1	X	X	X	
DCmp3		12/15/99						X	1	X	X	X	

RELINQUISHED BY (signature): Tad Deshler	DATE/TIME: 1/5/00 1500	TOTAL NUMBER OF CONTAINERS: 3		RECEIVED FOR LAB BY (Signature)	DATE/TIME
RECEIVED BY (signature)	DATE/TIME	RELINQUISHED BY (signature)	DATE/TIME	CONDITION OF CONTENTS	TEMPERATURE UPON RECEIPT
RELINQUISHED BY (signature)	DATE/TIME	RECEIVED BY (signature)	DATE/TIME	REMARKS: Send aliquot to Battelle as specified in earlier shipments.	
RECEIVED BY (signature)	DATE/TIME	METHOD OF SHIPMENT	AIRBILL NO.		

Distribution: Original - Lab Copy Yellow copy - Final Tetra Tech Copy Pink Copy - Field File Copy

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FAX (206) 881-6997

CHAIN OF CUSTODY

DOCUMENT 1 of 1

PROJECT NAME: Lower Col. Riv. Human Health
PROJECT NO.: 9968.03
SAMPLERS: (signature) Tad Deshler
TT Contact: Tad Deshler

SAMPLE ID	TIME	DATE	MEDIA: Air	Surface Water	Ground Water	Soil	Sediment	Fish Tissue	NUMBER OF CONTAINERS	ANALYSIS: 1613	8280 Dest	8280 PCB	8270	REMARKS
LSCMP1-1		12/31/94						X	1	X	X	X	X	8 fish
LSCMP1-2		12/29/94						X	1	X	X	X	X	8 fish
LSCMP1-3		12/29/94						X	1	X	X	X	X	8 fish
CCmp1		12/7/94						X	1	X	X	X	X	7 fish
SInd1		1/11/95						X	1	X	X	X	X	1 fish
SInd2		1/11/95						X	1	X	X	X	X	1 fish
SInd3		1/6/95						X	1	X	X	X	X	1 fish
SInd4		1/17/95						X	1	X	X	X	X	1 fish
SInd5		1/17/95						X	1	X	X	X	X	1 fish
SInd6		1/17/95						X	1	X	X	X	X	1 fish
SInd7		1/17/95						X	1	X	X	X	X	1 fish

RELINQUISHED BY (signature): Tad Deshler	DATE/TIME: 2/16/95 1600	TOTAL NUMBER OF CONTAINERS		RECEIVED FOR LAB BY (Signature)	DATE/TIME
RECEIVED BY (signature)	DATE/TIME	RELINQUISHED BY (signature)	DATE/TIME	CONDITION OF CONTENTS	TEMPERATURE UPON RECEIPT
RELINQUISHED BY (signature)	DATE/TIME	RECEIVED BY (signature)	DATE/TIME	REMARKS: Send aliquot to Battelle as per SOW	
RECEIVED BY (signature)	DATE/TIME	METHOD OF SHIPMENT	AIRBILL NO.		

White Copy Pink Copy

TETRA TECH, INC.
15400 NE 90th, Suite 100
Redmond, Washington 98052
(206) 883-1912
FAX (206) 881-6997

CHAIN OF CUSTODY

DOCUMENT 1 of 1

PROJECT NAME: Lower Columbia River Human Hlth | PROJECT NO: 9968-03

SAMPLERS: (signature) Tad Deshler

Tt Contact: Tad Deshler

SAMPLE ID	TIME		MEDIA: Air	Surface Water	Ground Water	Soil	Sediment	Fish	NUMBER OF CONTAINERS	ANALYSIS: 1613	8270 SIM	8081	REMARKS
SInd 8		3/17/95						X	1	X	X	X	
SInd 9		3/17/95						X	1	X	X	X	
SInd 10		3/18/95						X	1	X	X	X	
SInd 11		3/18/95						X	1	X	X	X	
SInd 12		3/18/95						X	1	X	X	X	

RELINQUISHED BY (signature): Tad Deshler	DATE/TIME: 1600 3/23/95	TOTAL NUMBER OF CONTAINERS: 5		RECEIVED FOR LAB BY (Signature)	DATE/TIME
RECEIVED BY (signature)	DATE/TIME	RELINQUISHED BY (signature)	DATE/TIME	CONDITION OF CONTENTS	TEMPERATURE UPON RECEIPT
RELINQUISHED BY (signature)	DATE/TIME	RECEIVED BY (signature)	DATE/TIME	REMARKS	
RECEIVED BY (signature)	DATE/TIME	METHOD OF SHIPMENT	AIRBILL NO.		

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APPENDIX B

METALS DATA

METAL RESULTS FROM THREE COMPOSITES OF EIGHT CHINOOK SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Silver (Ag)			Arsenic (As)-ICP/MS			Barium (Ba)			Cadmium (Cd)			Copper (Cu)		
CAS #	7440-22-4			7440-38-2			7440-39-3			7440-43-9			7440-50-8		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.
KCMP1	0.002	0.07		1.235	35.20		0.050		U	0.005		U	1.011	28.81	
KCMP2	0.001	0.08		0.884	51.72		0.039		U	0.004		U	0.770	45.02	
KCMP3	0.001	0.18		0.760	105.60		0.036		U	0.004		U	0.804	111.71	

Chemical	Mercury (Hg)			Nickel (Ni)			Lead (Pb)			Antimony (Sb)			Selenium (Se)			Arsenic Speciation					
																Inorganic			Methylated		
CAS #	7439-97-6			7440-02-0			7439-92-1			7440-36-0			7782-49-2								
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	(ug/g lipid)	Data qual.
KCMP1	0.089	2.54		0.020		UJ_7	0.004		BUJ_8	0.004		U	0.338	9.63		0.023	0.65	J_6	0.038	1.09	
KCMP2	0.080	4.67		0.030	1.76	J_7	0.010	0.61	J_8	0.003		U	0.263	15.36		0.001		UJ_6	0.078	4.56	
KCMP3	0.130	18.05		0.015	2.05	J_7	0.009	1.25	J_8	0.003		U	0.241	33.50		0.015	2.11	J_6	0.034	4.79	

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_6= Estimated value due to matrix spike recoveries not meeting QC criteria.

J_7= Estimated value due to accuracy of reference material analysis not meeting QC criteria.

J_8= Estimated value due to precision of duplicate analysis not meeting QC criteria.

METAL RESULTS FROM THREE COMPOSITES OF EIGHT COHO SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Silver (Ag)			Arsenic (As)-ICP/MS			Barium (Ba)			Cadmium (Cd)			Copper (Cu)		
CAS #	7440-22-4			7440-38-2			7440-39-3			7440-43-9			7440-50-8		
	Conc.	Conc.*		Conc.	Conc.*		Conc.	Conc.*		Conc.	Conc.*		Conc.	Conc.*	
Sample	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.
HCMP1	0.001	0.08		0.415	24.82		0.147	8.80		0.005	0.27		0.854	51.17	
HCMP2	0.001		U	0.344	71.72		0.082	17.05		0.004		U	0.829	172.67	
HCMP3	0.001		U	0.361	42.46		0.097	11.43		0.004		U	0.750	88.26	

Chemical	Mercury (Hg)			Nickel (Ni)			Lead (Pb)			Antimony (Sb)			Selenium (Se)			Arsenic Speciation					
																Inorganic			Methylated		
CAS #	7439-97-6			7440-02-0			7439-92-1			7440-36-0			7782-49-2								
	Conc.	Conc.*		Conc.	Conc.*		Conc.	Conc.*		Conc.	Conc.*		Conc.	Conc.*		Conc.	Conc.*		Conc.		
Sample	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.	(ug/g)	(ug/g lipid)	Data qual.
HCMP1	0.045	2.67		0.043	2.55	J_7	0.003		BUJ_8	0.003		U	0.155	9.29		0.001		UJ_6	0.056	3.38	
HCMP2	0.048	10.04		0.025	5.13	J_7	0.004		BUJ_8	0.003		U	0.188	39.17		0.007	1.38	J_6	0.029	6.07	
HCMP3	0.039	4.58		0.028	3.31	J_7	0.009	1.03	J_8	0.003		U	0.162	19.11		0.001		UJ_6	0.039	4.55	

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_6= Estimated value due to matrix spike recoveries not meeting QC criteria.

J_7= Estimated value due to accuracy of reference material analysis not meeting QC criteria.

J_8= Estimated value due to precision of duplicate analyses not meeting QC criteria.

METAL RESULTS FROM NINE COMPOSITES OF EIGHT LARGESCALE SUCKER
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Silver (Ag)			Arsenic (As)-ICP/MS			Barium (Ba)			Cadmium (Cd)			Copper (Cu)		
CAS #	7440-22-4			7440-38-2			7440-39-3			7440-43-9			7440-50-8		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.
LSCMP1-1	0.001		U	0.151	12.95		0.098	8.35		0.009		U	0.745	63.65	
LSCMP1-2	0.001		U	0.133	16.78		0.087	10.96		0.008		U	0.577	73.09	
LSCMP1-3	0.001		U	0.143	13.24		0.064	5.93		0.008		U	0.772	71.45	
LSCMP2-1	0.001		UJ_6	0.113	7.77		0.095	6.54		0.003		U	0.398	27.47	
LSCMP2-2	0.001		UJ_6	0.181	8.77		0.185	8.97		0.004	0.20		0.458	22.25	
LSCMP2-3	0.001		UJ_6	0.170	7.51		0.133	5.88		0.004		U	0.483	21.38	
LSCMP3-1	0.001		UJ_6	0.098	6.93		0.156	11.04		0.004		U	0.451	31.98	
LSCMP3-2	0.001		UJ_6	0.178	6.17		0.080	2.76		0.003		U	0.433	15.02	
LSCMP3-3	0.001		UJ_6	0.168	9.93		0.099	5.86		0.004		U	0.453	26.79	

Chemical	Mercury (Hg)			Nickel (Ni)			Lead (Pb)			Antimony (Sb)			Selenium (Se)			Arsenic Speciation					
CAS #	7439-97-6			7440-02-0			7439-92-1			7440-36-0			7782-49-2			Inorganic			Methylated		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	(ug/g lipid)	Data qual.
LSCMP1-1	0.120	10.30		0.060	5.13		0.038		BU	0.004		U	0.257	21.99	J_8	0.017	1.45		0.007	0.59	
LSCMP1-2	0.125	15.85		0.047	5.97		0.026		BU	0.004		U	0.263	33.27	J_8	0.024	3.02		0.004	0.53	
LSCMP1-3	0.140	12.92		0.040	3.74		0.035		BU	0.004		U	0.265	24.50	J_8	0.038	3.55		0.007	0.69	
LSCMP2-1	0.154	10.63		0.010	0.67		0.008	0.54		0.0004	0.03		0.121	8.32		0.012	0.81		0.004	0.26	
LSCMP2-2	0.141	6.85		0.029	1.41		0.020	0.97		0.001	0.06		0.126	6.11		0.008	0.40		0.007	0.34	
LSCMP2-3	0.193	8.53		0.025	1.10		0.017	0.77		0.001	0.03		0.099	4.39		0.004	0.16		0.011	0.48	
LSCMP3-1	0.189	13.41		0.018	1.26		0.008	0.59		0.0004	0.03		0.137	9.72		0.006	0.39		0.001		U
LSCMP3-2	0.170	5.91		0.010		U	0.006	0.20		0.001	0.02		0.096	3.32		0.001		U	0.011	0.38	
LSCMP3-3	0.145	8.57		0.010		U	0.007	0.40		0.001	0.04		0.155	9.17		0.003	0.15		0.007	0.43	

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_6= Estimated value due to matrix spike recoveries not meeting QC criteria.

J_8= Estimated value due to precision of duplicate analyses not meeting QC criteria.

METAL RESULTS FROM TWELVE INDIVIDUAL WHITE STURGEON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Silver (Ag)			Arsenic (As)-ICP/MS			Barium (Ba)			Cadmium (Cd)			Copper (Cu)		
CAS #	7440-22-4			7440-38-2			7440-39-3			7440-43-9			7440-50-8		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.
SIND1	0.001		U	1.793	82.63		0.133	6.14	J_s	0.009		U	0.236	10.85	
SIND2	0.002		U	0.563	33.32		0.176	10.44	J_s	0.010		U	0.230	13.60	
SIND3	0.002		U	0.558	64.94		0.44	50.97	J_s	0.009		U	0.352	40.88	
SIND4	0.002		U	0.533	53.27		0.096	9.58	J_s	0.009		U	0.261	26.08	
SIND5	0.002		U	0.275	39.88		0.058	8.37	J_s	0.010		U	0.151	21.83	
SIND6	0.002		U	0.485	19.70		0.149	6.04	J_s	0.010		U	0.219	8.89	
SIND7	0.002		U	0.395	39.91		0.115	11.60	J_s	0.010		U	0.189	19.12	
SIND8	0.002		U	0.357	40.56		0.067	7.56		0.009		U	0.226	25.70	
SIND9	0.001		U	0.669	1672.97		0.037	92.78		0.008		U	0.223	557.66	
SIND10	0.001		U	0.748	534.30		0.051	36.14		0.008		U	0.198	141.70	
SIND11	0.001		U	0.240	66.68		0.039	10.81		0.008		U	0.207	57.54	
SIND12	0.001		U	0.311	75.90		0.046	11.20		0.008		U	0.193	47.15	

Chemical	Mercury (Hg)			Nickel (Ni)			Lead (Pb)			Antimony (Sb)			Selenium (Se)			Arsenic Speciation					
CAS #	7439-97-6			7440-02-0			7439-92-1			7440-36-0			7782-49-2			Inorganic			Methylated		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc. (ug/g lipid)	Data qual.
SIND1	0.067	3.08		0.065	3.00		0.023		BUJ_s	0.004		U	0.405	18.68		0.034	1.56		0.038	1.76	
SIND2	0.057	3.39		0.024	1.40		0.012		BUJ_s	0.005		U	0.312	18.45		0.011	0.63		0.023	1.38	
SIND3	0.045	5.28		0.587	68.30		0.032		BUJ_s	0.004		U	0.490	56.92		0.047	5.43		0.019	2.20	
SIND4	0.049	4.86		0.040	4.03		0.030		BUJ_s	0.004		U	0.368	36.78		0.045	4.46		0.013	1.27	
SIND5	0.053	7.68		0.021		U	0.034		BUJ_s	0.005		U	0.280	40.54		0.050	7.31		0.007	1.00	
SIND6	0.056	2.29		0.043	1.76		0.029		BUJ_s	0.005		U	0.440	17.87		0.047	1.93		0.009	0.37	
SIND7	0.061	6.13		0.071	7.22		0.019		BUJ_s	0.005		U	0.432	43.62		0.039	3.94		0.010	1.04	
SIND8	0.071	8.04		0.020		U	0.034		BU	0.004		U	0.528	59.96	J_s	0.040	4.53		0.003	0.35	
SIND9	0.087	218.62		0.018		U	0.016		BU	0.004		U	0.428	1070.90	J_s	0.043	108.57		0.010	26.16	
SIND10	0.111	79.04		0.016		U	0.014		BU	0.004		U	0.320	228.80	J_s	0.033	23.40		0.130	93.21	
SIND11	0.049	13.55		0.017		U	0.014		BU	0.004		U	0.368	102.18	J_s	0.039	10.76		0.009	2.64	
SIND12	0.053	12.81		0.018		U	0.020		BU	0.004		U	0.410	100.10	J_s	0.041	9.96		0.010	2.42	

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_s = Estimated value due to precision of duplicate analyses not meeting QC criteria.

METAL RESULTS FROM THREE COMPOSITES OF EIGHT STEELHEAD
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Silver (Ag)			Arsenic (As)-ICP/MS			Barium (Ba)			Cadmium (Cd)			Copper (Cu)		
CAS #	7440-22-4			7440-38-2			7440-39-3			7440-43-9			7440-50-8		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.
DCMP1	0.002		U	0.677	23.59		0.020		BUJ_s	0.011		U	0.784	27.32	
DCMP2	0.002		U	0.753	18.55		0.021	0.51	J_s	0.011		U	0.809	19.93	
DCMP3	0.002		U	0.703	14.58		0.008		BUJ_s	0.012		U	0.650	13.48	

Chemical	Mercury (Hg)			Nickel (Ni)			Lead (Pb)			Antimony (Sb)			Selenium (Se)			Arsenic Speciation					
																Inorganic			Methylated		
CAS #	7439-97-6			7440-02-0			7439-92-1			7440-36-0			7782-49-2								
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	(ug/g lipid)	Data qual.
DCMP1	0.065	2.25		0.028	0.99		0.038		BUJ_s	0.005		U	0.405	14.12		0.018	0.62		0.021	0.72	
DCMP2	0.058	1.43		0.028	0.69		0.026		BUJ_s	0.005		U	0.438	10.79		0.001	0.03		0.033	0.82	
DCMP3	0.068	1.42		0.026		U	0.028		BUJ_s	0.006		U	0.444	9.21		0.001		U	0.031	0.64	

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_s = Estimated value due to precision of duplicate analyses not meeting QC criteria.

METAL RESULTS FROM ONE COMPOSITE OF SEVEN CARP
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Silver (Ag)			Arsenic (As)-ICP/MS			Barium (Ba)			Cadmium (Cd)			Copper (Cu)		
CAS #	7440-22-4			7440-38-2			7440-39-3			7440-43-9			7440-50-8		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.
CCMP1	0.002		U	0.221	5.06		0.102	2.33		0.012		U	1.237	28.31	

Chemical	Mercury (Hg)			Nickel (Ni)			Lead (Pb)			Antimony (Sb)			Selenium (Se)			Arsenic Speciation					
CAS #	7439-97-6			7440-02-0			7439-92-1			7440-36-0			7782-49-2			Inorganic			Methylated		
Sample	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	Conc.* (ug/g lipid)	Data qual.	Conc. (ug/g)	(ug/g lipid)	Data qual.
CCMP1	0.145	3.31		0.030	0.69		0.028		BU	0.005		U	0.528	12.08	J_s	0.001	0.03		0.020	0.45	

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_s = Estimated value due to precision of duplicate analyses not meeting QC criteria.

APPENDIX C

SEMIVOLATILE ORGANIC DATA

SEMI-VOLATILE RESULTS FROM THREE COMPOSITES OF EIGHT CHINOOK SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Phenol			2-Chlorophenol			1,4-Dichlorobenzene			4-Methylphenol		
CAS #	108-95-2			95-57-8			106-46-7			106-44-5		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
Kcmp1	49		BU	20		U	20		U	20		U
Kcmp2	43		BU	10		U	10		U	10		U
Kcmp3	191	26.5		10		U	10		U	10		U

Chemical	N-nitroso-di-n-propylamine			Isophorone			1,2,4-Trichlorobenzene			Acenaphthene		
CAS #	621-44-5			78-59-1			120-82-1			83-32-9		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
Kcmp1	20		U	20		U	20		U	20		U
Kcmp2	10		U	10		U	10		U	10		U
Kcmp3	10		U	10		U	10		U	10		U

Chemical	4-Nitrophenol			2,4-Dinitrotoluene			Pyrene			Chrysene			bis(2-Ethylhexyl)phthalate		
CAS #	100-02-7			121-14-2			129-00-0			218-01-9			117-81-7		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
Kcmp1	20		U	20		U	20		U	20		U	64		BU
Kcmp2	10		U	10		U	10		U	10		U	79		BU
Kcmp3	10		U	10		U	10		U	10		U	38		BU

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.

SEMI-VOLATILE RESULTS FROM THREE COMPOSITES OF EIGHT COHO SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Phenol			2-Chlorophenol			1,4-Dichlorobenzene			4-Methylphenol		
CAS #	108-95-2			95-57-8			106-46-7			106-44-5		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
Hcmp1	52		BU	10		U	10		U	10		U
Hcmp2	40		BU	10		U	10		U	10		U
Hcmp3	61	7.2	J_5	10		UJ_5	10		UJ_5	10		UJ_5

Chemical	N-nitroso-di-n-propylamine			Isophorone			1,2,4-Trichlorobenzene			Acenaphthene		
CAS #	621-44-5			78-59-1			120-82-1			83-32-9		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
Hcmp1	10		U	10		U	10		U	10		U
Hcmp2	10		U	10		U	10		U	10		U
Hcmp3	10		UJ_5	10		UJ_5	10		UJ_5	10		UJ_5

Chemical	4-Nitrophenol			2,4-Dinitrotoluene			Pyrene			Chrysene			bis(2-Ethylhexyl)phthalate		
CAS #	100-02-7			121-14-2			129-00-0			218-01-9			117-81-7		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
Hcmp1	10		U	10		U	10		U	10		U	49		BU
Hcmp2	10		U	10		U	10		U	10		U	61		BU
Hcmp3	10		UJ_5	10		UJ_5	10		UJ_5	10		UJ_5	93		BUJ_5

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_5 = Estimated value due to surrogate spike recoveries not meeting QC criteria.

SEMI-VOLATILE RESULTS FROM NINE COMPOSITES OF EIGHT LARGESCALE SUCKER (Page 1 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Phenol			2-Chlorophenol			1,4-Dichlorobenzene			4-Methylphenol		
CAS #	108-95-2			95-57-8			106-46-7			106-44-5		
Sample	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.
LSCMP1-1	24		BU	10		U	10		U	10		U
LSCMP1-2	24		BU	10		U	10		U	10		U
LSCMP1-3	18		BU	10		U	10		U	10		U
LSCMP2-1	10		U	10		U	10		U	10		U
LSCMP2-2	10		U	10		U	10		U	10		U
LSCMP2-3	23	1.0		10		U	10		U	11	0.5	
LSCMP3-1	15	1.1		10		U	10		U	11	0.8	
LSCMP3-2	21	0.7	J_5	10		UJ_5	10		UJ_5	10	0.3	J_5
LSCMP3-3	13		U	10		U	10		U	9	0.5	J_1

Chemical	N-nitroso-di-n-propylamine			Isophorone			1,2,4-Trichlorobenzene			Acenaphthene		
CAS #	621-44-5			78-59-1			120-82-1			83-32-9		
Sample	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.
LSCMP1-1	10		U	10		U	10		U	10		U
LSCMP1-2	10		U	10		U	10		U	10		U
LSCMP1-3	10		U	10		U	10		U	10		U
LSCMP2-1	10		U	10		U	10		U	10		U
LSCMP2-2	10		U	10		U	10		U	10		U
LSCMP2-3	10		U	10		U	10		U	10		U
LSCMP3-1	10		U	10		U	10		U	10		U
LSCMP3-2	10		UJ_5	10		UJ_5	10		UJ_5	10		UJ_5
LSCMP3-3	10		U	10		U	10		U	10		U

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.
J_1 = Value is below nominal reporting limit.
J_5 = Estimated value due to surrogate spike recoveries not meeting QC criteria.

SEMI-VOLATILE RESULTS FROM NINE COMPOSITES OF EIGHT LARGESCALE SUCKER (Page 2 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	4-Nitrophenol			2,4-Dinitrotoluene			Pyrene			Chrysene			bis(2-Ethylhexyl)phthalate		
CAS #	100-02-7			121-14-2			129-00-0			218-01-9			117-81-7		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
LSCMP1-1	99	8.5		10		U	10		U	10		U	223		BU
LSCMP1-2	48	6.1		10		U	10		U	10		U	29		BU
LSCMP1-3	89	8.2		10		U	10		U	10		U	23		BU
LSCMP2-1	10		U	10		U	10		U	10		U	61		BU
LSCMP2-2	10		U	10		U	10		U	10		U	781	37.9	
LSCMP2-3	10		U	10		U	10		U	10		U	116		BU
LSCMP3-1	10		U	10		U	10		U	10		U	22		BU
LSCMP3-2	10		UJ_5	10		UJ_5	10		UJ_5	10		UJ_5	1101	38.2	J_5
LSCMP3-3	10		U	10		U	10		U	10		U	74		BU

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_5 = Estimated value due to surrogate spike recoveries not meeting QC criteria.

SEMI-VOLATILE RESULTS FROM TWELVE INDIVIDUAL WHITE STURGEON (Page 1 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Phenol			2-Chlorophenol			1,4-Dichlorobenzene			4-Methylphenol		
CAS #	108-95-2			95-57-8			106-46-7			106-44-5		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
SIND1	16		BU	10		U	10		U	10		U
SIND2	12		BU	10		U	10		U	10		U
SIND3	13		BU	10		U	10		U	10		U
SIND4	14		BU	10		U	10		U	10		U
SIND5	12		BU	10		U	10		U	10		U
SIND6	11		BU	10		U	10		U	10		U
SIND7	12		BU	10		U	10		U	10		U
SIND8	19		BU	10		U	10		U	15	1.7	
SIND9	17		BU	10		U	10		U	18	45.0	
SIND10	14		BU	10		U	10		U	12	8.6	
SIND11	13		BU	10		U	10		U	12	3.3	
SIND12	21		BU	10		U	10		U	9	2.2	J_1

Chemical	N-nitroso-di-n-propylamine			Isophorone			1,2,4-Trichlorobenzene			Acenaphthene		
CAS #	621-44-5			78-59-1			120-82-1			83-32-9		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
SIND1	10		U	10		U	10		U	10		U
SIND2	10		U	10		U	10		U	10		U
SIND3	10		U	10		U	10		U	10		U
SIND4	10		U	10		U	10		U	10		U
SIND5	10		U	10		U	10		U	10		U
SIND6	10		U	10		U	10		U	10		U
SIND7	10		U	10		U	10		U	10		U
SIND8	10		U	10		U	10		U	10		U
SIND9	10		U	10		U	10		U	10		U
SIND10	10		U	10		U	10		U	10		U
SIND11	10		U	10		U	10		U	10		U
SIND12	10		U	10		U	10		U	10		U

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.
J_1 = Value is below nominal reporting limit.

SEMI-VOLATILE RESULTS FROM TWELVE INDIVIDUAL WHITE STURGEON (Page 2 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	4-Nitrophenol			2,4-Dinitrotoluene			Pyrene			Chrysene			bis(2-Ethylhexyl)phthalate		
CAS #	100-02-7			121-14-2			129-00-0			218-01-9			117-81-7		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
SIND1	69	3.2		10		U	10		U	10		U	25		BU
SIND2	69	4.1		10		U	10		U	10		U	26		BU
SIND3	24	2.8		10		U	10		U	10		U	62		BU
SIND4	89	8.9		10		U	10		U	10		U	47		BU
SIND5	71	10.3		10		U	10		U	10		U	30		BU
SIND6	87	3.5		10		U	10		U	10		U	16		BU
SIND7	119	12.0		10		U	10		U	10		U	59		BU
SIND8	10		U	10		U	10		U	10		U	32		BU
SIND9	10		U	10		U	10		U	10		U	42		BU
SIND10	10		U	10		U	10		U	10		U	24		BU
SIND11	10		U	10		U	10		U	10		U	136		BU
SIND12	10		U	10		U	10		U	10		U	42		BU

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.

SEMI-VOLATILE RESULTS FROM THREE COMPOSITES OF EIGHT STEELHEAD
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Phenol			2-Chlorophenol			1,4-Dichlorobenzene			4-Methylphenol		
CAS #	108-95-2			95-57-8			106-46-7			106-44-5		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
DCMP1	41		BU	10		U	10		U	12	0.4	
DCMP2	35		BU	10		U	10		U	9	0.2	J_1
DCMP3	29		BU	10		U	10		U	11	0.2	

Chemical	N-nitroso-di-n-propylamine			Isophorone			1,2,4-Trichlorobenzene			Acenaphthene		
CAS #	621-44-5			78-59-1			120-82-1			83-32-9		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
DCMP1	10		U	10		U	10		U	10		U
DCMP2	10		U	10		U	10		U	10		U
DCMP3	10		U	10		U	10		U	10		U

Chemical	4-Nitrophenol			2,4-Dinitrotoluene			Pyrene			Chrysene			bis(2-Ethylhexyl)phthalate		
CAS #	100-02-7			121-14-2			129-00-0			218-01-9			117-81-7		
Sample	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (µg/kg)	Conc. * (mg/kg lipid)	Data qual.
DCMP1	25	0.9		10		U	10		U	10		U	20		BU
DCMP2	23	0.6		10		U	10		U	10		U	55		BU
DCMP3	28	0.6		10		U	10		U	10		U	19		BU

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

J_1 = Value is below nominal reporting limit.

SEMI-VOLATILE RESULTS FROM ONE COMPOSITE OF SEVEN CARP
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Phenol			2-Chlorophenol			1,4-Dichlorobenzene			4-Methylphenol		
CAS #	108-95-2			95-57-8			106-46-7			106-44-5		
Sample	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.
CCMP1	18		BU	20		U	20		U	20		U

Chemical	N-nitroso-di-n-propylamine			Isophorone			1,2,4-Trichlorobenzene			Acenaphthene		
CAS #	621-44-5			78-59-1			120-82-1			83-32-9		
Sample	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.
CCMP1	20		U	20		U	20		U	20		U

Chemical	4-Nitrophenol			2,4-Dinitrotoluene			Pyrene			Chrysene			bis(2-Ethylhexyl)phthalate		
CAS #	100-02-7			121-14-2			129-00-0			218-01-9			117-81-7		
Sample	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc. * (mg/kg lipid)	Data qual.
CCMP1	106	2.4		20		U	20		U	20		U	23		BU

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.

APPENDIX D

PESTICIDE/PCB DATA

PESTICIDE/PCB RESULTS FROM THREE COMPOSITES OF EIGHT CHINOOK SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Hexachlorobutadiene			Hexachlorobenzene			alpha-BHC			gamma-BHC			Heptachlor			Aldrin			beta-BHC			Methyl parathion		
CAS #	87-68-3			118-74-1			319-84-6			58-89-9			76-44-8			309-00-2			319-85-7			298-00-0		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
KCMP1	0.02		U	0.02		U	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U
KCMP2	0.02		U	0.02		U	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U
KCMP3	0.02		U	0.02		U	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U

Chemical	delta-BHC			Heptachlor Epoxide			Endosulfan I			gamma-Chlordane			alpha-Chlordane			p,p'-DDE			Dieldrin			Endrin		
CAS #	319-86-8			1024-57-3			959-98-8			5566-34-7			5103-71-9			72-55-9			60-57-1			72-20-8		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
KCMP1	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	11.33	0.32		0.09		U	0.09		U
KCMP2	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	4.57	0.27		0.09		U	0.09		U
KCMP3	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	9.67	1.34		0.09		U	0.09		U

Chemical	p,p'-DDD			Endosulfan II			p,p'-DDT			Endrin Aldehyde			Mirex			Endosulfan Sulfate			Methoxychlor			Endrin Ketone		
CAS #	72-54-8			33213-65-9			50-29-3			7421-93-4			2385-85-5			1031-07-8			72-43-5			53494-70-5		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
KCMP1	5.67	0.16		0.09		U	3.07	0.09		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U
KCMP2	2.13	0.12		0.09		U	0.80	0.05		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U
KCMP3	3.33	0.46		0.09		U	0.53	0.07		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U

Chemical	Arochlor 1016			Arochlor 1221			Arochlor 1232			Arochlor 1242			Arochlor 1248			Arochlor 1254			Arochlor 1260			Toxaphene		
CAS #	12674-11-2			11104-28-2			11141-16-5			53469-21-9			12672-29-6			11097-69-1			11096-82-5			8001-35-2		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
KCMP1	1.78		U	1.78		U	1.78		U	1.78		U	1.78		U	1.78		U	14.88	0.42		8.89		U
KCMP2	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	2.77	0.16		4.44		U
KCMP3	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	12.25	1.70		4.44		U

* = lipid-normalized data presented only when a compound is detected.

U = Compound was not detected at the detection limit shown.

PESTICIDE/PCB RESULTS FROM THREE COMPOSITES OF EIGHT COHO SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Hexachlorobutadiene			Hexachlorobenzene			alpha-BHC			gamma-BHC			Heptachlor			Aldrin			beta-BHC			Methyl parathion		
CAS #	87-68-3			118-74-1			319-84-6			58-89-9			76-44-8			309-00-2			319-85-7			298-00-0		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
HCMP1	0.02		U	0.02		U	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U
HCMP2	0.02		U	0.02		U	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U
HCMP3	0.02		U	0.02		U	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U

Chemical	delta-BHC			Heptachlor Epoxide			Endosulfan I			gamma-Chlordane			alpha-Chlordane			p,p'-DDE			Dieldrin			Endrin		
CAS #	319-86-8			1024-57-3			959-98-8			5566-34-7			5103-71-9			72-55-9			60-57-1			72-20-8		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
HCMP1	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	4.51	0.27		0.09		U	0.09		U
HCMP2	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	2.26	0.47		0.09		U	0.72	0.15	
HCMP3	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	2.33	0.27		0.09		U	0.09		U

Chemical	p,p'-DDD			Endosulfan II			p,p'-DDT			Endrin Aldehyde			Mirex			Endosulfan Sulfate			Methoxychlor			Endrin Ketone		
CAS #	72-54-8			33213-65-9			50-29-3			7421-93-4			2385-85-5			1031-07-8			72-43-5			53494-70-5		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
HCMP1	1.40	0.08		0.09		U	0.60	0.04		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U
HCMP2	0.09		U	0.09		U	1.07	0.22		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U
HCMP3	1.53	0.18		0.09		U	1.07	0.13		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U

Chemical	Arochlor 1016			Arochlor 1221			Arochlor 1232			Arochlor 1242			Arochlor 1248			Arochlor 1254			Arochlor 1260			Toxaphene		
CAS #	12674-11-2			1110-428-2			1114-116-5			5346-921-9			1267-229-6			1109-769-1			1109-682-5			8001-35-2		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
HCMP1	1.78		U	1.78		U	1.78		U	1.78		U	1.78		U	1.78		U	4.08	0.24		8.89		U
HCMP2	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	2.09	0.44		4.44		U
HCMP3	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	0.89		U	2.99	0.35		4.44		U

* = lipid-normalized data presented only when a compound is detected.

U = Compound was not detected at the detection limit shown.

PESTICIDE/PCB RESULTS FROM NINE COMPOSITES OF EIGHT LARGESCALE SUCKER (Page 1 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Hexachlorobutadiene			Hexachlorobenzene			alpha-BHC			gamma-BHC			Heptachlor			Aldrin			beta-BHC			Methyl parathion		
CAS #	87-68-3			118-74-1			319-84-6			58-89-9			76-44-8			309-00-2			319-85-7			298-00-0		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
LSCMP1-1	0.01		U	1.53	0.13		0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
LSCMP1-2	0.01		U	0.20	0.03		0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
LSCMP1-3	0.01		U	0.30	0.03		0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
LSCMP2-1	0.01		U	0.32	0.02		0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.44		U
LSCMP2-2	0.01		U	0.66	0.03		0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.44		U
LSCMP2-3	0.01		U	0.24	0.01		0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.44		U
LSCMP3-1	0.01		U	0.25	0.02		0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.44		U
LSCMP3-2	0.01		U	0.68	0.02		0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.44		U
LSCMP3-3	0.01		U	0.32	0.02		0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.44		U

Chemical	delta-BHC			Heptachlor Epoxide			Endosulfan I			gamma-Chlordane			alpha-Chlordane			p,p'-DDE			Dieldrin			Endrin		
CAS #	319-86-8			1024-57-3			959-98-8			5566-34-7			5103-71-9			72-55-9			60-57-1			72-20-8		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
LSCMP1-1	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	36.23	3.10		0.02		U	0.02		U
LSCMP1-2	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	31.83	4.03		0.02		U	0.02		U
LSCMP1-3	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	30.22	2.80		0.02		U	0.02		U
LSCMP2-1	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	7.50	0.52		0.04		U	0.04		U
LSCMP2-2	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	28.03	1.36		0.04		U	0.04		U
LSCMP2-3	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	24.32	1.08		0.04		U	0.04		U
LSCMP3-1	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	27.07	1.92		0.04		U	0.04		U
LSCMP3-2	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	44.63	1.55		0.04		U	0.04		U
LSCMP3-3	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	28.10	1.66		0.04		U	0.04		U

* = lipid-normalized data presented only when a compound is detected.

U = Compound was not detected at the detection limit shown.

PESTICIDE/PCB RESULTS FROM NINE COMPOSITES OF EIGHT LARGESCALE SUCKER (Page 2 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	p,p'-DDD			Endosulfan II			p,p'-DDT			Endrin Aldehyde			Mirex			Endosulfan Sulfate			Methoxychlor			Endrin Ketone		
CAS #	72-54-8			33213-65-9			50-29-3			7421-93-4			2385-85-5			1031-07-8			72-43-5			53494-70-5		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
LSCMP1-1	5.87	0.50		0.02		U	0.42	0.04		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
LSCMP1-2	4.43	0.56		0.02		U	0.43	0.05		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
LSCMP1-3	6.29	0.58		0.02		U	0.48	0.04		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
LSCMP2-1	5.18	0.36		0.04		U	1.23	0.08		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
LSCMP2-2	10.43	0.51		0.04		U	2.15	0.10		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
LSCMP2-3	9.05	0.40		0.04		U	0.02		U	0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
LSCMP3-1	7.60	0.54		0.04		U	2.45	0.17		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
LSCMP3-2	18.37	0.64		0.04		U	6.93	0.24		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
LSCMP3-3	11.67	0.69		0.04		U	4.57	0.27		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U

Chemical	Arochlor 1016			Arochlor 1221			Arochlor 1232			Arochlor 1242			Arochlor 1248			Arochlor 1254			Arochlor 1260			Toxaphene		
CAS #	12674-11-2			1110-428-2			1114-116-5			5346-921-9			1267-229-6			1109-769-1			1109-682-5			8001-35-2		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
LSCMP1-1	1.11		U	1.11		U	1.11		U	1.11		U	18.33	1.57		1.11		U	49.17	4.20		5.56		U
LSCMP1-2	1.11		U	1.11		U	1.11		U	1.11		U	11.47	1.45		1.11		U	34.00	4.30		5.56		U
LSCMP1-3	1.11		U	1.11		U	1.11		U	1.11		U	10.86	1.01		1.11		U	34.49	3.19		5.56		U
LSCMP2-1	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	13.87	0.96		11.11		U
LSCMP2-2	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	39.62	1.92		11.11		U
LSCMP2-3	2.22		U	2.22		U	2.22		U	2.22		U	11.6	0.51		2.22		U	45.37	2.01		11.11		U
LSCMP3-1	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	28.6	2.03		11.11		U
LSCMP3-2	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	57.66	2.00		11.11		U
LSCMP3-3	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	29.14	1.72		11.11		U

* = lipid-normalized data presented only when a compound is detected.

U = Compound was not detected at the detection limit shown.

PESTICIDE/PCB RESULTS FROM TWELVE INDIVIDUAL WHITE STURGEON (Page 1 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Hexachlorobutadiene			Hexachlorobenzene			alpha-BHC			gamma-BHC			Heptachlor			Aldrin			beta-BHC			Methyl parathion		
CAS #	87-68-3			118-74-1			319-84-6			58-89-9			76-44-8			309-00-2			319-85-7			298-00-0		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
SIND1	0.01		U	0.53	0.02		0.11	0.01		0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
SIND2	0.01		U	0.20	0.01		0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
SIND3	0.01		U	0.17	0.02		0.02	0.002		0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
SIND4	0.09	0.01		0.46	0.05		0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
SIND5	0.06	0.01		0.27	0.04		0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
SIND6	0.11	0.004		1.01	0.04		0.13	0.01		2.26	0.09		0.01		U	0.01		U	0.01		U	0.22		U
SIND7	0.06	0.01		0.48	0.05		0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	0.22		U
SIND8	0.46	0.05		0.70	0.08		0.04	0.005		0.02		U	0.02		U	0.02		U	0.02		U	0.44		U
SIND9	0.51	1.28		0.12	0.30		0.02		U	0.02		U	0.02		U	0.09	0.23		0.02		U	0.44		U
SIND10	0.36	0.26		0.01		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.44		U
SIND11	0.58	0.16		0.50	0.14		0.02	0.01		0.02		U	0.02		U	0.12	0.03		0.02		U	0.44		U
SIND12	0.49	0.12		0.07	0.02		0.02		U	0.24	0.06		0.02		U	0.02		U	0.02		U	0.44		U

Chemical	delta-BHC			Heptachlor Epoxide			Endosulfan I			gamma-Chlordane			alpha-Chlordane			p,p'-DDE			Dieldrin			Endrin		
CAS #	319-86-8			1024-57-3			959-98-8			5566-34-7			5103-71-9			72-55-9			60-57-1			72-20-8		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
SIND1	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	76.60	3.53		0.02		U	0.02		U
SIND2	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	33.88	2.00		0.02		U	0.02		U
SIND3	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	27.22	3.17		0.02		U	0.02		U
SIND4	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	38.95	3.90		0.02		U	0.02		U
SIND5	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	22.57	3.27		0.02		U	0.02		U
SIND6	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	60.50	2.46		0.02		U	0.02		U
SIND7	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	47.27	4.77		0.02		U	0.02		U
SIND8	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	52.93	6.01		0.04		U	0.04		U
SIND9	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	13.17	32.93		0.04		U	0.04		U
SIND10	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	29.63	21.16		0.04		U	0.04		U
SIND11	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	59.16	16.43		0.04		U	0.04		U
SIND12	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	34.97	8.53		0.04		U	0.04		U

* = lipid-normalized data presented only when a compound is detected.

U = Compound was not detected at the detection limit shown.

PESTICIDE/PCB RESULTS FROM TWELVE INDIVIDUAL WHITE STURGEON (Page 2 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	p,p'-DDD			Endosulfan II			p,p'-DDT			Endrin Aldehyde			Mirex			Endosulfan Sulfate			Methoxychlor			Endrin Ketone		
CAS #	72-54-8			33213-65-9			50-29-3			7421-93-4			2385-85-5			1031-07-8			72-43-5			53494-70-5		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
SIND1	8.09	0.37		0.02		U	1.03	0.05		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
SIND2	8.48	0.50		0.02		U	1.2	0.07		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
SIND3	3.80	0.44		0.02		U	0.36	0.04		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
SIND4	6.74	0.67		0.02		U	0.09	0.01		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
SIND5	2.56	0.37		0.02		U	0.48	0.07		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
SIND6	0.69	0.03		0.02		U	0.12	0.005		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
SIND7	6.33	0.64		0.02		U	0.28	0.03		0.02		U	0.02		U	0.02		U	0.11		U	0.02		U
SIND8	10.48	1.19		0.04		U	1.37	0.16		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
SIND9	3.68	9.20		0.04		U	1.09	2.73		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
SIND10	4.60	3.29		0.04		U	1.16	0.83		0.04		U	0.04		U	0.04		U	0.22		U	0.04		U
SIND11	9.99	2.78		0.04		U	2.84	0.79		0.04		U	0.15	0.04		0.04		U	0.22		U	0.18	0.05	
SIND12	9.32	2.27		0.04		U	2.78	0.68		0.04		U	0.51	0.12		0.04		U	0.22		U	0.04		U

Chemical	Arochlor 1016			Arochlor 1221			Arochlor 1232			Arochlor 1242			Arochlor 1248			Arochlor 1254			Arochlor 1260			Toxaphene		
CAS #	12674-11-2			1110-428-2			1114-116-5			5346-921-9			1267-229-6			1109-769-1			1109-682-5			8001-35-2		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
SIND1	1.11		U	1.11		U	1.11		U	1.11		U	25.14	1.16		1.11		U	59.67	2.75		5.56		U
SIND2	1.11		U	1.11		U	1.11		U	1.11		U	18.17	1.08		1.11		U	26.33	1.56		5.56		U
SIND3	1.11		U	1.11		U	1.11		U	1.11		U	13.33	1.55		1.11		U	22.50	2.62		5.56		U
SIND4	1.11		U	1.11		U	1.11		U	1.11		U	17.67	1.77		1.11		U	40.00	4.00		5.56		U
SIND5	1.11		U	1.11		U	1.11		U	1.11		U	10.07	1.46		1.11		U	26.62	3.86		5.56		U
SIND6	1.11		U	1.11		U	1.11		U	1.11		U	27.67	1.12		1.11		U	86.50	3.52		5.56		U
SIND7	1.11		U	1.11		U	1.11		U	1.11		U	23.00	2.32		1.11		U	75.33	7.61		5.56		U
SIND8	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	54.39	6.18		11.11		U
SIND9	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	32.78	81.95		11.11		U
SIND10	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	40.37	28.84		11.11		U
SIND11	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	61.10	16.97		11.11		U
SIND12	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	2.22		U	30.70	7.49		11.11		U

* = lipid-normalized data presented only when a compound is detected.
U = Compound was not detected at the detection limit shown.

PESTICIDE/PCB RESULTS FROM THREE COMPOSITES OF EIGHT STEELHEAD
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Hexachlorobutadiene			Hexachlorobenzene			alpha-BHC			gamma-BHC			Heptachlor			Aldrin			beta-BHC			Methyl parathion		
CAS #	87-68-3			118-74-1			319-84-6			58-89-9			76-44-8			309-00-2			319-85-7			298-00-0		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
DCMP1	0.02		U	0.55	0.02		0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U
DCMP2	0.17		BU	0.45	0.01		0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	0.89		U
DCMP3	0.31	0.01		2.2	0.05		0.22	0.005		0.04		U	0.04		U	0.04		U	0.04		U	0.89		U

Chemical	delta-BHC			Heptachlor Epoxide			Endosulfan I			gamma-Chlordane			alpha-Chlordane			p,p'-DDE			Dieldrin			Endrin		
CAS #	319-86-8			1024-57-3			959-98-8			5566-34-7			5103-71-9			72-55-9			60-57-1			72-20-8		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
DCMP1	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	1.55	0.05		0.09		U	0.57	0.02	
DCMP2	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	1.35	0.03		0.09		U	0.09		U
DCMP3	0.04		U	0.04		U	0.04		U	0.04		U	0.04		U	3.87	0.08		0.09		U	0.09		U

Chemical	p,p'-DDD			Endosulfan II			p,p'-DDT			Endrin Aldehyde			Mirex			Endosulfan Sulfate			Methoxychlor			Endrin Ketone		
CAS #	72-54-8			33213-65-9			50-29-3			7421-93-4			2385-85-5			1031-07-8			72-43-5			53494-70-5		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
DCMP1	1.15	0.04		0.09		U	2.2	0.08		0.09		U	0.09		U	0.09		U	0.44		U	0.41		BU
DCMP2	3.4	0.08		0.09		U	4.13	0.10		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U
DCMP3	2.73	0.06		0.09		U	3.19	0.07		0.09		U	0.09		U	0.09		U	0.44		U	0.09		U

Chemical	Arochlor 1016			Arochlor 1221			Arochlor 1232			Arochlor 1242			Arochlor 1248			Arochlor 1254			Arochlor 1260			Toxaphene		
CAS #	12674-11-2			1110-428-2			1114-116-5			5346-921-9			1267-229-6			1109-769-1			1109-682-5			8001-35-2		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
DCMP1	4.44		U	4.44		U	4.44		U	4.44		U	4.44		U	4.44		U	3.51	0.12		22.22		U
DCMP2	4.44		U	4.44		U	4.44		U	4.44		U	4.44		U	4.44		U	3.61	0.09		22.22		U
DCMP3	4.44		U	4.44		U	4.44		U	4.44		U	4.44		U	4.44		U	8.07	0.17		22.22		U

* = lipid-normalized data presented only when a compound is detected.

B = Background levels may impact this data point.

U = Compound was not detected at the detection limit shown.

PESTICIDE/PCB RESULTS FROM ONE COMPOSITE OF SEVEN CARP
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	Hexachlorobutadiene			Hexachlorobenzene			alpha-BHC			gamma-BHC			Heptachlor			Aldrin			beta-BHC			Methyl parathion		
CAS #	87-68-3			118-74-1			319-84-6			58-89-9			76-44-8			309-00-2			319-85-7			298-00-0		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
CCMP1	0.02	0.0005		0.83	0.02		0.21	0.005		0.23	0.01		0.01		U	0.01		U	0.01		U	0.22		U

Chemical	delta-BHC			Heptachlor Epoxide			Endosulfan I			gamma-Chlordane			alpha-Chlordane			p,p'-DDE			Dieldrin			Endrin		
CAS #	319-86-8			1024-57-3			959-98-8			5566-34-7			5103-71-9			72-55-9			60-57-1			72-20-8		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
CCMP1	0.01		U	0.01		U	0.01		U	0.01		U	0.01		U	131.4	3.01		0.02		U	0.02		U

Chemical	p,p'-DDD			Endosulfan II			p,p'-DDT			Endrin Aldehyde			Mirex			Endosulfan Sulfate			Methoxychlor			Endrin Ketone		
CAS #	72-54-8			33213-65-9			50-29-3			7421-93-4			2385-85-5			1031-07-8			72-43-5			53494-70-5		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
CCMP1	5.86	0.13		0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.11		U	0.02		U

Chemical	Arochlor 1016			Arochlor 1221			Arochlor 1232			Arochlor 1242			Arochlor 1248			Arochlor 1254			Arochlor 1260			Toxaphene		
CAS #	12674-11-2			1110-428-2			1114-116-5			5346-921-9			1267-229-6			1109-769-1			1109-682-5			8001-35-2		
Sample	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.	Conc. (ug/kg)	Conc.* (mg/kg lipid)	Data qual.
CCMP1	1.11		U	1.11		U	1.11		U	1.11		U	50.5	1.16		1.11		U	138	3.16		5.56		U

* = lipid-normalized data presented only when a compound is detected.
U = Compound was not detected at the detection limit shown.

APPENDIX E

DIOXIN/FURAN DATA

DIOXIN/FURAN RESULTS FROM THREE COMPOSITES OF EIGHT CHINOOK SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	2,3,7,8-TCDD			1,2,3,7,8-PeCDD			1,2,3,4,7,8-HxCDD			1,2,3,6,7,8-HxCDD			1,2,3,7,8,9-HxCDD		
CAS #	1746-01-6			40321-76-4			39227-28-6			57653-85-7			19408-74-3		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
KCMP1	0.64	0.02		0.45		U	0.26		U	0.26		U	0.32		U
KCMP2	0.05		U	0.16	0.01		0.08	0.005		0.19	0.01		0.12	0.01	
KCMP3	0.08		U	0.20		U	0.10		U	0.20		U	0.10		U

Chemical	1,2,3,4,6,7,8-HpCDD			OCDD			2,3,7,8-TCDF			1,2,3,7,8-PeCDF			2,3,4,7,8-PeCDF		
CAS #	35822-46-9			3268-87-9			51207-31-9			57177-41-6			57117-31-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
KCMP1	0.52	0.01		3.15	0.09		0.94	0.03		0.32		U	0.29		U
KCMP2	0.20		U	0.70		U	1.2	0.07		0.12	0.01		0.17	0.01	
KCMP3	0.20		U	0.40		U	2.7	0.38		0.08		U	0.20		U

Chemical	1,2,3,4,7,8-HxCDF			1,2,3,6,7,8-HxCDF			1,2,3,7,8,9-HxCDF			2,3,4,6,7,8-HxCDF			1,2,3,4,6,7,8-HpCDF		
CAS #	70648-26-9			57117-44-9			72918-21-9			60851-34-5			67562-39-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
KCMP1	0.12		U	0.10		U	0.28		BU	0.19		U	0.18		BU
KCMP2	0.08	0.005		0.07	0.004		0.09	0.01		0.15		BU	0.09		U
KCMP3	0.09		U	0.06		U	0.10		U	0.08		U	0.10		U

Chemical	1,2,3,4,7,8,9-HpCDF			OCDF			TEC (FULL)			TEC (HALF)			TEC (ZERO)		
CAS #	55673-89-7			39001-02-0											
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
KCMP1	0.25		U	0.23		U	1.29			1.03			0.77		
KCMP2	0.07	0.004		0.40	0.02		0.97			0.85			0.72		
KCMP3	0.10		U	0.25	0.03		0.81			0.52			0.23		

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.

DIOXIN/FURAN RESULTS FROM THREE COMPOSITES OF EIGHT COHO SALMON
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	2,3,7,8-TCDD			1,2,3,7,8-PeCDD			1,2,3,4,7,8-HxCDD			1,2,3,6,7,8-HxCDD			1,2,3,7,8,9-HxCDD		
CAS #	1746-01-6			40321-76-4			39227-28-6			57653-85-7			19408-74-3		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
HCMP1	0.89	0.05		1.31		U	0.08		U	0.51	0.03		0.10		U
HCMP2	0.03	0.01		0.05		U	0.04		U	0.09	0.02		0.04	0.01	
HCMP3	0.05	0.01		0.04		U	0.05		U	0.06		U	0.05		U

Chemical	1,2,3,4,6,7,8-HpCDD			OCDD			2,3,7,8-TCDF			1,2,3,7,8-PeCDF			2,3,4,7,8-PeCDF		
CAS #	35822-46-9			3268-87-9			51207-31-9			57177-41-6			57117-31-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
HCMP1	0.47	0.03		0.88		U	0.94	0.06		1.10	0.07		0.09		U
HCMP2	0.16		BU	0.50		U	0.50	0.10		0.07	0.01		0.07	0.01	
HCMP3	0.08		BU	0.17		BU	0.59	0.07		0.10		U	0.11	0.01	

Chemical	1,2,3,4,7,8-HxCDF			1,2,3,6,7,8-HxCDF			1,2,3,7,8,9-HxCDF			2,3,4,6,7,8-HxCDF			1,2,3,4,6,7,8-HpCDF		
CAS #	70648-26-9			57117-44-9			72918-21-9			60851-34-5			67562-39-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
HCMP1	0.10		U	0.63	0.04		0.15		U	0.06		U	0.38	0.02	
HCMP2	0.03		U	0.02		U	0.03		U	0.08	0.02		0.03		U
HCMP3	0.10	0.01		0.04	0.005		0.04		U	0.09	0.01		0.07		U

Chemical	1,2,3,4,7,8,9-HpCDF			OCDF			TEC (FULL)			TEC (HALF)			TEC (ZERO)		
CAS #	55673-89-7			39001-02-0											
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
HCMP1	0.10		U	0.56	0.03		1.91			1.54			1.16		
HCMP2	0.03		U	0.07		U	0.66			0.49			0.33		
HCMP3	0.06		U	0.10		U	0.47			0.37			0.27		

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.

DIOXIN/FURAN RESULTS FROM THREE COMPOSITES OF EIGHT STEELHEAD
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	2,3,7,8-TCDD			1,2,3,7,8-PeCDD			1,2,3,4,7,8-HxCDD			1,2,3,6,7,8-HxCDD			1,2,3,7,8,9-HxCDD		
CAS #	1746-01-6			40321-76-4			39227-28-6			57653-85-7			19408-74-3		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
DCMP1	0.01		U	0.14		U	0.05	0.002		0.13		U	0.12		U
DCMP2	0.13		U	0.17		U	0.15		U	0.16		U	0.18		U
DCMP3	0.14		U	0.24		U	0.13		U	0.14		U	0.15		U

Chemical	1,2,3,4,6,7,8-HpCDD			OCDD			2,3,7,8-TCDF			1,2,3,7,8-PeCDF			2,3,4,7,8-PeCDF		
CAS #	35822-46-9			3268-87-9			51207-31-9			57177-41-6			57117-31-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
DCMP1	0.15	0.01		0.32		U	0.23	0.01		0.13	0.005		0.10		U
DCMP2	0.15		U	0.33		U	0.21	0.01		0.22		U	0.19		U
DCMP3	0.12		U	0.41		U	0.27	0.01		0.18	0.004		0.19		U

Chemical	1,2,3,4,7,8-HxCDF			1,2,3,6,7,8-HxCDF			1,2,3,7,8,9-HxCDF			2,3,4,6,7,8-HxCDF			1,2,3,4,6,7,8-HpCDF		
CAS #	70648-26-9			57117-44-9			72918-21-9			60851-34-5			67562-39-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
DCMP1	0.10		U	0.14		BU	0.12		U	0.12		U	0.12		U
DCMP2	0.21		U	0.20		U	0.31		U	0.22		U	0.16		U
DCMP3	0.27		U	0.25		U	0.25		U	0.19		U	0.22		U

Chemical	1,2,3,4,7,8,9-HpCDF			OCDF			TEC (FULL)			TEC (HALF)			TEC (ZERO)		
CAS #	55673-89-7			39001-02-0											
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
DCMP1	0.16		U	0.08		U	0.24			0.15			0.05		
DCMP2	0.20		U	0.23		U	0.49			0.26			0.02		
DCMP3	0.33		U	0.09		U	0.54			0.29			0.04		

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.

DIOXIN/FURAN RESULTS FROM NINE COMPOSITES OF EIGHT LARGESCALE SUCKER (Page 1 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	2,3,7,8-TCDD			1,2,3,7,8-PeCDD			1,2,3,4,7,8-HxCDD			1,2,3,6,7,8-HxCDD			1,2,3,7,8,9-HxCDD		
CAS #	1746-01-6			40321-76-4			39227-28-6			57653-85-7			19408-74-3		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
LSCMP1-1	0.77		U	0.55		U	0.16		U	0.17		U	0.19		U
LSCMP1-2	0.14		U	0.38		U	0.14		U	0.14		U	0.17		U
LSCMP1-3	0.22		U	0.42		U	0.16		U	0.17		U	0.19		U
LSCMP2-1	0.22		U	0.64		U	0.21	0.01		0.35	0.02		0.15		U
LSCMP2-2	0.73		U	1.24		U	1.02		U	1.06		U	1.21		U
LSCMP2-3	0.51		U	0.70		U	0.59		U	0.61		U	0.7		U
LSCMP3-1	0.17		U	0.34		U	0.21		U	0.21		U	0.25		U
LSCMP3-2	0.44		U	0.51		U	0.38		U	0.39		U	0.45		U
LSCMP3-3	0.24		U	0.27		U	0.14		U	0.14		U	0.16		U

Chemical	1,2,3,4,6,7,8-HpCDD			OCDD			2,3,7,8-TCDF			1,2,3,7,8-PeCDF			2,3,4,7,8-PeCDF		
CAS #	35822-46-9			3268-87-9			51207-31-9			57177-41-6			57117-31-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
LSCMP1-1	0.18		U	0.28		U	0.87	0.07		0.76		U	0.30		U
LSCMP1-2	0.15		U	0.20		U	0.81	0.10		0.54		U	0.21		U
LSCMP1-3	0.16		U	0.34		U	1.06	0.10		0.74		U	0.19		U
LSCMP2-1	0.61		U	3.26	0.22		0.88	0.06		1.66	0.11		0.19		U
LSCMP2-2	0.90	0.04		2.47	0.12		1.13	0.05		1.63		U	0.87		U
LSCMP2-3	0.48	0.02		1.13		U	1.66	0.07		2.82		U	0.43		U
LSCMP3-1	0.24		U	0.11		U	0.98	0.07		0.82		U	0.15		U
LSCMP3-2	0.89	0.03		3.01	0.10		2.42	0.08		1.82	0.06		0.66		U
LSCMP3-3	0.24		U	0.45		U	1.53	0.09		0.75	0.04		0.13		U

* = lipid-normalized data presented only when a compound is detected.

U = Compound was not detected at the detection limit shown.

DIOXIN/FURAN RESULTS FROM NINE COMPOSITES OF EIGHT LARGESCALE SUCKER (Page 2 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	1,2,3,4,7,8-HxCDF			1,2,3,6,7,8-HxCDF			1,2,3,7,8,9-HxCDF			2,3,4,6,7,8-HxCDF			1,2,3,4,6,7,8-HpCDF		
CAS #	70648-26-9			57117-44-9			72918-21-9			60851-34-5			67562-39-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
LSCMP1-1	0.22		U	0.20		U	0.70	0.06		0.20		U	0.15		U
LSCMP1-2	0.16		U	0.16		U	0.23		U	0.17		U	0.13		U
LSCMP1-3	0.23		U	0.22		U	0.62	0.06		0.19		U	0.14		U
LSCMP2-1	0.24		U	0.84	0.06		1.81	0.12		0.64	0.04		0.25		U
LSCMP2-2	0.99		U	1.59	0.08		1.25		U	0.94		U	0.61		U
LSCMP2-3	1.69		U	1.70		U	1.33		U	1.27		U	0.37		U
LSCMP3-1	0.70		U	0.67		U	0.45		U	0.37		U	1.81	0.13	
LSCMP3-2	1.42		U	1.31		U	1.58		U	1.18		U	2.67	0.09	
LSCMP3-3	0.47		U	0.44		U	0.13		U	0.30		U	0.19		U

Chemical	1,2,3,4,7,8,9-HpCDF			OCDF			TEC (FULL)			TEC (HALF)			TEC (ZERO)		
CAS #	55673-89-7			39001-02-0											
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
LSCMP1-1	0.22		U	0.18		U	1.52			0.84			0.17		
LSCMP1-2	0.18		U	0.17		U	0.67			0.38			0.09		
LSCMP1-3	0.15		U	0.25		U	0.88			0.54			0.20		
LSCMP2-1	0.24		U	0.16		U	1.24			0.90			0.56		
LSCMP2-2	0.86		U	0.87	0.04		2.81			1.55			0.28		
LSCMP2-3	0.41		U	0.48		U	2.19			1.18			0.17		
LSCMP3-1	0.27		U	5.96	0.42		0.89			0.52			0.14		
LSCMP3-2	0.39		U	1.63	0.06		2.13			1.28			0.43		
LSCMP3-3	0.32		U	0.25	0.01		0.82			0.50			0.19		

* = lipid-normalized data presented only when a compound is detected.
U = Compound was not detected at the detection limit shown.

DIOXIN/FURAN RESULTS FROM TWELVE INDIVIDUAL WHITE STURGEON (Page 1 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	2,3,7,8-TCDD			1,2,3,7,8-PeCDD			1,2,3,4,7,8-HxCDD			1,2,3,6,7,8-HxCDD			1,2,3,7,8,9-HxCDD		
CAS #	1746-01-6			40321-76-4			39227-28-6			57653-85-7			19408-74-3		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
SIND1	0.28		U	0.20		U	0.37		U	0.34		U	0.44		U
SIND2	0.23		U	0.32		U	0.15		U	0.16		U	0.18		U
SIND3	0.20		U	0.18		U	0.20		U	0.21		U	0.24		U
SIND4	0.19		U	0.31		U	0.15		U	0.16		U	0.18		U
SIND5	0.31		U	0.25		U	0.27		U	0.29		U	0.32		U
SIND6	0.32		U	0.33		U	0.22		U	0.23		U	0.26		U
SIND7	0.22		U	0.20		U	0.19		U	0.19		U	0.23		U
SIND8	0.21		U	0.22		U	0.14		U	0.13		U	0.17		U
SIND9	0.18		U	0.18		U	0.21		U	0.21		U	0.26		U
SIND10	0.09		U	0.13		U	0.13		U	0.13		U	0.16		U
SIND11	0.12		U	0.14		U	0.11		U	0.11		U	0.13		U
SIND12	0.10		U	0.17		U	0.08		U	0.08		U	0.10		U

Chemical	1,2,3,4,6,7,8-HpCDD			OCDD			2,3,7,8-TCDF			1,2,3,7,8-PeCDF			2,3,4,7,8-PeCDF		
CAS #	35822-46-9			3268-87-9			51207-31-9			57177-41-6			57117-31-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
SIND1	0.48	0.02		1.40		BU	5.70	0.26		1.14		U	0.40		U
SIND2	0.20		U	0.47		U	4.46	0.26		0.50	0.03		0.14		U
SIND3	0.23		U	1.02		BU	1.70	0.20		0.41		U	0.12		U
SIND4	0.14		U	0.30		U	4.30	0.43		0.32		U	0.12		U
SIND5	0.15		U	0.53		U	1.61	0.23		0.22		U	0.11		U
SIND6	0.25		U	0.58		U	5.94	0.24		0.83		U	0.19		U
SIND7	0.15		U	0.35		U	2.63	0.27		0.66		U	0.12		U
SIND8	0.39	0.04		0.85		U	2.70	0.31		0.33		U	0.08	0.01	
SIND9	0.20		U	0.35		U	0.22	0.55		0.09		U	0.13		U
SIND10	0.44		U	0.26		U	0.51	0.36		0.14		U	0.07		U
SIND11	0.31		U	1.21	0.34		1.10	0.31		0.14		U	0.06		U
SIND12	0.32		U	2.89	0.70		1.38	0.34		0.19		U	0.08		U

* = lipid-normalized data presented only when a compound is detected.
B = Background levels may impact this data point.
U = Compound was not detected at the detection limit shown.

DIOXIN/FURAN RESULTS FROM TWELVE INDIVIDUAL WHITE STURGEON (Page 2 of 2)
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	1,2,3,4,7,8-HxCDF			1,2,3,6,7,8-HxCDF			1,2,3,7,8,9-HxCDF			2,3,4,6,7,8-HxCDF			1,2,3,4,6,7,8-HpCDF		
CAS #	70648-26-9			57117-44-9			72918-21-9			60851-34-5			67562-39-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
SIND1	0.73		U	7.75		U	0.87	0.04		0.41	0.02		1.06	0.05	
SIND2	0.20		U	0.38		U	0.59	0.03		0.24		U	0.18		U
SIND3	0.19		U	0.19		U	0.19		U	0.16		U	0.14		U
SIND4	0.16		U	0.14		U	0.36	0.04		0.18		U	0.21		U
SIND5	0.25		U	0.24		U	0.17		U	0.14		U	0.20		U
SIND6	0.24		U	0.23		U	0.51	0.02		0.13		U	0.16		U
SIND7	0.20		U	0.22		U	0.36	0.04		0.14		U	0.13		U
SIND8	0.18		U	0.17		U	0.36	0.04		0.14		U	0.17		U
SIND9	0.14		U	0.12		U	0.20		U	0.15		U	0.17		U
SIND10	0.11		U	0.11		U	0.25		U	0.09		U	1.64	1.17	
SIND11	0.09		U	0.08		U	0.10		U	0.15		U	0.14		U
SIND12	0.09		U	0.08		U	0.17	0.04		0.09		U	0.13		U

Chemical	1,2,3,4,7,8,9-HpCDF			OCDF			TEC (FULL)			TEC (HALF)			TEC (ZERO)		
CAS #	55673-89-7			39001-02-0											
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
SIND1	0.32		U	0.67	0.03		2.42			2.01			1.59		
SIND2	0.24		U	0.20		U	1.13			0.83			0.53		
SIND3	0.11		U	0.22		U	0.69			0.43			0.18		
SIND4	0.12		U	0.15		U	1.00			0.74			0.48		
SIND5	0.14		U	0.23		U	0.84			0.51			0.17		
SIND6	0.17		U	0.25		U	1.42			1.04			0.66		
SIND7	0.11		U	0.20		U	0.86			0.59			0.32		
SIND8	0.26		U	0.24		U	0.78			0.57			0.35		
SIND9	0.17		U	0.26		U	0.50			0.26			0.02		
SIND10	0.63		U	5.78	4.13		0.38			0.23			0.07		
SIND11	0.07		U	0.06		U	0.42			0.27			0.11		
SIND12	0.11		U	0.46	0.11		0.45			0.30			0.16		

* = lipid-normalized data presented only when a compound is detected.
U = Compound was not detected at the detection limit shown.

DIOXIN/FURAN RESULTS FROM ONE COMPOSITE OF SEVEN CARP
COLUMBIA RIVER BI-STATE PROGRAM

Chemical	2,3,7,8-TCDD			1,2,3,7,8-PeCDD			1,2,3,4,7,8-HxCDD			1,2,3,6,7,8-HxCDD			1,2,3,7,8,9-HxCDD		
CAS #	1746-01-6			40321-76-4			39227-28-6			57653-85-7			19408-74-3		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
CCMP1	1.14		U	1.14		U	0.45	0.01		1.91	0.04		0.20		U

Chemical	1,2,3,4,6,7,8-HpCDD			OCDD			2,3,7,8-TCDF			1,2,3,7,8-PeCDF			2,3,4,7,8-PeCDF		
CAS #	35822-46-9			3268-87-9			51207-31-9			57177-41-6			57117-31-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
CCMP1	3.90	0.09		5.14	0.12		4.36	0.10		4.62	0.11		0.71		U

Chemical	1,2,3,4,7,8-HxCDF			1,2,3,6,7,8-HxCDF			1,2,3,7,8,9-HxCDF			2,3,4,6,7,8-HxCDF			1,2,3,4,6,7,8-HpCDF		
CAS #	70648-26-9			57117-44-9			72918-21-9			60851-34-5			67562-39-4		
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
CCMP1	1.43		U	1.65		U	3.32		U	6.77	0.15		0.35		U

Chemical	1,2,3,4,7,8,9-HpCDF			OCDF			TEC (FULL)			TEC (HALF)			TEC (ZERO)		
CAS #	55673-89-7			39001-02-0											
Sample	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.	Conc. (ng/kg)	Conc.* (ug/kg lipid)	Data qual.
CCMP1	0.28		U	0.18		U	4.36			2.99			1.62		

* = lipid-normalized data presented only when a compound is detected.
U = Compound was not detected at the detection limit shown.