

Sediment Contaminant Concentrations from outside Southern and Northern Resident Killer Whale Critical Habitat, British Columbia in 2020

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2023

Canadian Data Report of Fisheries and Aquatic Sciences 1372



Canadian Data Report of Fisheries and Aquatic Sciences

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Fisheries and Aquatic Sciences 1372

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AND NORTHERN RESIDENT KILLER WHALE CRITICAL HABITAT, BRITISH
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Department of Fisheries and Oceans, 2023.

Cat. No. Fs97-13/1372E-PDF ISBN 978-0-660-48331-3 ISSN 1488-5395

Correct citation for this publication:

Brown, T.M., Holbert, S., Gallilee, C.A., Colbourne, K. 2023. Sediment contaminant concentrations from outside Southern and Northern Resident Killer Whale Critical Habitat, British Columbia in 2020. Can. Data Rep. Fish. Aquat. Sci. 1372: ix + 42 p.

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LIST OF ACRONYMS

Acronyms/Abbreviations/Symbols	Meaning
BC	British Columbia
CCGS	Canadian Coast Guard Ship
CCME	Canadian Council of Ministers of the Environment
CEPA	Canadian Environmental Protection Act
CSSF	Canadian Scientific Submersible Facility
DAS	Disposal at Sea
DDT	Dichlorodiphenyltrichloroethane
DFO	Fisheries and Oceans Canada
DL	detection limit
dw	dry weight
EC	Environment Canada
ECCC	Environment and Climate Change Canada
HBCDD	hexabromocyclododecane
HDPE	High density polyethylene
HRGC/HRMS	high resolution gas chromatography / high resolution mass spectrometry
mg/kg	milligrams per kilograms
NCAG	National Contaminants Advisory Group
ND	not detected
ng/g	nanograms per gram
NRKW	Northern Resident Killer Whales
PAHs	polycyclic aromatic hydrocarbons
PBDE	polybrominated diphenyl ether
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzo-p-dioxin
PCDF	polychlorinated dibenzo-p-furan
PFASs	per- and polyfluoroalkyl substances
pg/g	picograms per gram
PPCPs	pharmaceuticals and Personal Care Products
SARA	Species At Risk Act
SQG	sediment quality guideline
SRKW	Southern Resident Killer Whales
TBT	tributyltin
TBBPA	tetrabromobisphenol A
TEQ	toxic equivalent quotient
TOC	Total Organic Carbon
US EPA	United States Environmental Protection Agency
ww	wet weight
µg/kg	microgram per kilogram

ABSTRACT

Brown, T.M., Holbert, S., Gallilee, C.A., Colbourne, K. 2023. Sediment contaminant concentrations from outside Southern and Northern Resident Killer Whale Critical Habitat, British Columbia in 2020. *Can. Data Rep. Fish. Aquat. Sci.* 1372: ix + 42 p.

This study characterizes priority contaminants in the habitat of the *Endangered* Southern Resident killer whales (SRKW) and *Threatened* Northern Resident killer whales (NRKW) and their primary prey Chinook salmon. Surficial sediment samples (n = 8) were collected from outside SRKW and NRKW Critical Habitat (CH). Samples were analyzed for 13 contaminant classes: polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), alkylphenols, Hexabromocyclododecane (HBCDD), legacy and current-use pesticides, Per- and polyfluoroalkyl substances (PFASs), pharmaceuticals and personal care products (PPCPs), Tetrabromobisphenol A (TBBPA), polycyclic aromatic hydrocarbon (PAHs), chlorinated paraffins (CPs), and metals.

Results reveal relatively higher average concentrations of PCBs, PBDEs, PCDDs, PCDFs, DDT, HCH, Chlordanes, Dieldrin, and Endrin and most metals, including arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), mercury (Hg) and zinc outside CH compared to concentrations inside CH. Average PCB concentrations outside CH exceeded the PCB interim sediment quality guideline (0.0037 ng/g dw) deemed to be protective of resident killer whales. Average PBDE, PCDD, PCDF, Cd, Pb, and Hg sediment concentrations outside CH were below the PBDE interim sediment quality guideline (1 ng/g dw) protective of resident killer whales, the PCDDs and PCDFs (0.85 ng TEQ fish/kg), Cd (0.7 mg/kg dw), Pb (30.2 mg/kg dw), and Hg (0.13 mg/kg dw) CCME sediment quality guidelines to protect aquatic biota. Average As and Cu concentrations outside CH exceeded the CCME sediment quality guidelines for these two metals (7.24 and 18.7 mg/g dw, respectively). These high-resolution data for 13 contaminant classes are relevant to the protection and recovery of SARA-listed SRKW and NRKW.

RÉSUMÉ

Brown, T.M., Holbert, S., Gallilee, C.A., Colbourne, K. 2023. Sediment contaminant concentrations from outside Southern and Northern Resident Killer Whale Critical Habitat, British Columbia in 2020. *Can. Data Rep. Fish. Aquat. Sci.* 1372: ix + 42 p.

Cette étude caractérise les contaminants prioritaires dans l'habitat des épaulards *en voie de disparition* résidents du sud (ERS) et des épaulards *menacés* résidents du nord (ERN), ainsi que de leur principale proie, le saumon chinook. Des échantillons de sédiments de surface ($n = 8$) ont été prélevés à l'intérieur et à l'extérieur de l'habitat essentiel des ERS et ERN, puis analysés pour 13 classes de contaminants: polychlorobiphényles (BPC), polybromodiphényléthers (PBDE), polychlorodibenzo-p-dioxines (PCDD), polychlorodibenzofuranes (PCDF), alkylphénols, hexabromocyclododécane (HBCDD), pesticides anciens et actuels, substances perfluoroalkyliques et polyfluoroalkyliques (SPFA), produits pharmaceutiques et de soins personnels (PPSP), tétrabromobisphénol A (TBBPA), hydrocarbures aromatiques polycycliques (HAP), paraffines chlorées (PC) et métaux.

Les résultats révèlent des concentrations moyennes relativement plus élevées de PCB, de PBDE, de PCDD, de PCDF, de DDT, de HCH, de chlordanes, de dieldrine et d'endrine et de la plupart des métaux, y compris l'arsenic (As), le cadmium (Cd), le cuivre (Cu), le plomb (Pb), le mercure (Hg) et le zinc à l'extérieur de l'habitat essentiel comparativement aux sites situés à l'intérieur. Les concentrations moyennes de BPC à l'extérieur de l'habitat essentiel dépassaient le seuil de 0.0037 ng/g dw de la recommandation pour la qualité de l'environnement pour la protection des épaulards résidents et de leurs proies. Les concentrations moyennes de PBDE, PCDD, PCDF, Cd, Pb et Hg dans les sédiments à l'extérieur de l'habitat essentiel étaient inférieures aux seuils de la recommandation pour la qualité des sédiments pour la protection des épaulards résidents et de leurs proies et des recommandations canadiennes pour la qualité des sédiments du conseil canadien des ministres (CCME) de l'environnement pour les PBDE (1 ng/g ps), les PCDD et les PCDF (0,85 ng TEQ poisson/kg), le Cd (0,7 mg/kg ps), le Pb (30,2 mg/kg ps) et le Hg (0,13 mg/kg ps). Les concentrations moyennes d'As et de Cu à l'extérieur de l'habitat essentiel dépassaient les recommandations du CCME pour la qualité des sédiments (7,24 et 18,7 mg/g ps, respectivement). Ces données à haute résolution pour 13 classes de contaminants sont en lien direct avec la protection et le rétablissement des ERS et ERN, tous deux inscrits dans la *Loi sur les espèces en péril*.

1.0 Introduction

Environment and Climate Change Canada (ECCC) regulates Disposal at Sea (DAS) in Canadian waters, ensuring consistency with the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Convention) and the 1996 Protocol to the Convention (London Protocol). Disposal at Sea is managed through a permit system under the *Disposal at Sea Regulations* under the *Canadian Environmental Protection Act* (CEPA 1999; Porebski and Osborne 1999). As part of its administration of Disposal at Sea activities, ECCC monitors sediment concentrations for contaminants of concern at representative disposal sites.

Fisheries and Oceans Canada (DFO) operates a Whale Contaminants Research Program which has implemented research and partnership initiatives to inform mitigation and recovery actions for the Endangered Southern Resident killer whales (SRKWs), including research to investigate contaminants of greatest concern to SRKWs and their prey. DFO is focusing research efforts on both SRKW and the Threatened Northern Resident killer whales (NRKW) and their prey in "critical" and surrounding habitats in partnership with First Nations, NGOs, universities, and other agencies. Research carried out under this program is providing guidance on the recovery of at-risk species identified under the terms of the *Species at Risk Act* (SARA).

DFO has partnered with ECCC's DAS program to study contaminant distribution in local resident killer whale habitats. DFO's National Contaminants Advisory Group (NCAG) has funded a contaminant sediment monitoring program (i.e., *PollutionTracker* Program) through partnerships with Ocean Wise Conservation Association. Together, this multi-sectoral effort will allow DFO to conduct a more rigorous risk-based evaluation of different contaminants in Southern Resident killer whale habitat, identify hot spots, and enable a prioritization of contaminants of concern to the whales and their prey. Further, this sediment data will be used in food web bioaccumulation models for killer whales and their prey (salmon) and will support the development of a protocol for the derivation of environmental quality guidelines for the protection of marine mammals from bioaccumulative substances. Collectively results from this work will contribute to the Government of Canada's initiative to implement measures for the protection and recovery of endangered SRKW.

Polychlorinated biphenyls (PCBs) were banned in Canada in 1977, but their legacy persists in environmental compartments and continued scrutiny is both required under CEPA Disposal at Sea regulations and warranted from an environmental health perspective. A prolonged period of exponential increases in polybrominated diphenyl ethers (PBDEs) in biota in the northeastern Pacific region (Rayne et al., 2003; Ross et al., 2013), and the increasing dominance of this contaminant in municipal wastewater (Dinn et al., 2012), marine water (Frouin et al., 2013), and marine sediments (Grant et al., 2011) in British Columbia has required that this contaminant class be assessed and monitored for any dredging and/or disposal of dredged material in SRKW Critical Habitat, as per draft joint DFO-ECCC SOP. Polycyclic aromatic hydrocarbons (PAHs), and metals are also assessed and monitored under CEPA Disposal at Sea regulations. Other pollutants, including Alkylphenols (APs), Per- and Polyfluoroalkyl Substances (PFASs), Pharmaceuticals and Personal Care Products (PPCPs), Chlorinated Paraffins (CPs), tetrabromobisphenol A (TBBPA), and legacy and current use pesticides have been highlighted in

the killer whale recovery strategy as chemicals of concern, which suggests that the assessment of sediment samples for these contaminants is warranted.

Sediment dredged from the lower Fraser River and other locations is periodically disposed of at marine sites in coastal British Columbia. Currently, the Disposal at Sea Regulations uses two Action Levels to evaluate material proposed for Disposal at Sea. The 'Lower Level' of the National Action List identifies screening criteria for specified substances to determine whether the material is acceptable for disposal (CEPA 2001; Environment Canada 2006). There are Lower Action Levels identified for the following substances: total PCBs at 100 $\mu\text{g}\cdot\text{kg}^{-1}$ dry weight, mercury (Hg; 750 $\mu\text{g}\cdot\text{kg}^{-1}$, dry weight), cadmium (Cd; 600 $\mu\text{g}\cdot\text{kg}^{-1}$ dry weight), and total PAHs (2,500 $\mu\text{g}\cdot\text{kg}^{-1}$ dry weight) (Environment Canada 2006). Any sediments proposed for Disposal at Sea with concentrations above the Lower Levels of the National Action List must additionally be assessed with: (1) an acute lethality test, (2) two sub-lethal tests or (3) one sub-lethal test and one bioaccumulation test. If the acute lethality test or the other two tests fail to meet the criteria set out for those tests, then the sediments shall be considered to be above the Upper Level of the National Action List, and Disposal at Sea is prohibited (CEPA 2001; Environment Canada 2006).

Other criteria used for screening sediment for Disposal at Sea includes the Interim Sediment Quality Guidelines (ISQG) for the protection of aquatic biota developed by the Canadian Council of Ministers of the Environment (CCME) for the following five substances: arsenic at 7.24 $\text{mg}\cdot\text{kg}^{-1}$ dry weight, chromium at 52.3 $\text{mg}\cdot\text{kg}^{-1}$ dry weight, copper at 18.7 $\text{mg}\cdot\text{kg}^{-1}$ dry weight, lead at 30.2 $\text{mg}\cdot\text{kg}^{-1}$ dry weight, zinc at 124 $\text{mg}\cdot\text{kg}^{-1}$ dry weight, and polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) at 0.85 ng TEQ fish/kg.

In addition, food web bioaccumulation modelling work led to the development of a PCB and PBDE concentrations in sediments of 0.0037 $\mu\text{g}\cdot\text{kg}^{-1}$ dry weight (Alava et al. 2012; Lachmuth et al. 2010) and 1.0 $\mu\text{g}\cdot\text{kg}^{-1}$ dry weight (Alava et al. 2016) that would reduce health risks to resident killer whales. These criteria are currently not used by the DAS Program to screen sediment. In accordance with the Standard Operating procedures developed with DFO, material is assessed and screened against background levels found at the disposal site.

This report provides a detailed summary of PCBs, PBDEs, PCDD/Fs, APs, Hexabromocyclododecane (HBCDD), legacy and current-use pesticides, Per- and polyfluoroalkyl substances (PFASs), PPCPs, TBBPA, PAHs, CPs, and metals in surficial sediment samples collected by Environment and Climate Change Canada and Fisheries and Oceans Canada in 2020 at eight sites located outside SRKW Critical Habitat. Contaminant concentrations are compared to concentrations reported in sediments collected in 2019 from within resident killer whale Critical Habitat. Contaminant analyses were carried out by SGS AXYS Analytical Ltd. in Sidney, BC. This data report represents the fourth such collaboration between ECCC and DFO on the monitoring of Disposal at Sea sites, with the first having evaluated PCBs, PBDEs, PCDDs and PCDFs from Point Grey and Sand Heads in the Strait of Georgia in 2010 (Ross et al. 2011), the second having evaluated the PCBs, PBDEs, PCDDs and PCDFs at Brown Passage and Douglas Channel in 2011 (Ross et al. 2012), the third having evaluated the same contaminants as this report but at sites located both within Disposal at Sea Sites at Point Grey and Sand Heads and inside and outside SRKW Critical Habitat (Brown et al.

2022) and is the second collaboration under the Government of Canada's Whale Initiative to inform priority contaminant actions for SRKWs.

2.0 Methods

2.1 Sample collection

A total of eight sediment samples were collected by ECCC and DFO staff from outside SRKW and NRKW Critical Habitat (Figure 1). Samples were collected using a Smith-McIntyre grab sampler aboard the Canadian Coast Guard Ship (CCGS) Vector July 28 to August 8, 2020, and using a Petit-Ponar grab sampler aboard a Hurricane rib September 20, 2020. Sample penetration was typically 10-15 cm for Smith-McIntyre and Petit-Ponar grab samples.

2.2 Sample analysis

A total of eight samples from outside resident killer whale (SRKW and NRKW) Critical Habitat were submitted to SGS AXYS Analytical Ltd. in Sidney, British Columbia, ALS Canada Ltd. in Burnaby, British Columbia, and Pacific Rim Laboratories in Surrey, British Columbia and analyzed for PCBs, PBDEs, PCDDs, PCDFs, alkylphenols, HBCDD, legacy and current-use pesticides, PFASs, pharmaceuticals and personal care products, TBBPA, PAHs, tributyltin (TBT), and metals (Table 1).

2.3 Data analysis

Values in summary tables (Tables 4 and 5) are presented on a dry weight basis and have been blank corrected. When congeners or analytes were undetected, detection limit substitutions were substituted with 0. Concentrations of sumPCBs denotes 159 congeners (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12/13, 14, 15, 16, 17, 18/30, 19, 20/28, 21/33, 22, 23, 24, 25, 26/29, 27, 31, 32, 34, 35, 36, 37, 38, 39, 40/41/71, 42, 43, 44/47/65, 45/51, 46, 48, 49/69, 50/53, 52, 54, 55, 56, 57, 58, 59/62/75, 60, 61/70/74/76, 63, 64, 66, 67, 68, 72, 73, 77, 78, 79, 80, 81, 82, 83/99, 84, 85/116/117, 86/87/97/109/119/125, 88/91, 89, 90/101/113, 92, 93/95/98/100/102, 94, 96, 103, 104, 105, 106, 107, 108/124, 110/115, 111, 112, 114, 118, 120, 121, 122, 123, 126, 127, 128/166, 129/138/160/163, 130, 131, 132, 133, 134/143, 135/151/154, 136, 137, 139/140, 141, 142, 144, 145, 146, 147/149, 148, 150, 152, 153/168, 155, 156/157, 158, 159, 161, 162, 164, 165, 167, 169, 170, 171/173, 172, 174, 175, 176, 177, 178, 179, 180/193, 181, 182, 183/185, 184, 186, 187, 188, 189, 190, 191, 192, 194, 195, 196, 197/200, 198/199, 201, 202, 203, 204, 205, 206, 207, 208, 209), sumPBDEs denotes 40 congeners (7, 8/11, 10, 12/13, 15, 17/25, 28/33, 30, 32, 35, 37, 47, 49, 51, 66, 71, 75, 77, 79, 85, 99, 100, 105, 116, 119/120, 126, 128, 138/166, 140, 153, 154, 155, 181, 183, 190, 203, 206, 207, 208, 209), sumPFAS denotes 33 congeners (PFBA, PFeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnA, PFDoA, PFTrDA, PFTeDA, PFBS, PFPeS, PFHxS, PFOS, PFNS, PFDS, PFDoS, 4:2 FTS, 8:2 FTS, PFOSA, N-MeFOSA, N-EtFOSA, MeFOSAA EtFOSAA, N-MeFOSE, N-EtFOSE, HFPO-DA, ADONA, 9Cl-PF3ONS, 11Cl-PF3OUdS), SumPAHs denotes 75 congeners (naphthalene, acenaphthylene, acenaphthene, 2-methylfluorene, C2 phenanthrenes/anthracenes, flourene, phenanthrene, C1 phenanthrenese/anthracenes, fluoranthene, pyrene, ben[a]anthracene, chrysene,

benzo[b]fluoranthene, benzo[j,k]fluoranthenes, benzo[e]pyrene, benzo[a]pyrene, perylene, dibenzo[a,h]anthracene, benzo[ghi]perylene, 2-methylnaphthalene, 1-methylnaphthalene, C1-naphthalenes, biphenyl, C1-biphenyls, C2-biphenyls, C2-naphthalenes, 1,2-dimethylnaphthalene, 2,6-dimethylnaphthalene, C3-naphthalenes, 2,3,6-trimethylnaphthalene, 2,3,5-trimethylnaphthalene, C4-naphthalenes, C1-acenaphthenes, C1-fluorenes, 1,7-dimethylfluorene, C2-fluorene, C3-fluorene, dibenzothiophene, C1-dibenzothiophenes, 2/3-methyldibenzothiophenes, C2-dibenzothiophenes, 2,4-dimethyldibenzothiophene, 4,6-dimethyldibenzothiophene, C3-dibenzothiophenes, C4-dibenzothiophenes, 3-methylphenanthrene, 2-methylphenanthrene, 2-methylanthracene, 9/4-methylphenanthrene, 1-methylphenanthrene, 3,6-dimethylphenanthrene, 2,6-dimethylphenanthrene, 1,7-dimethylphenanthrene, 1,8-dimethylphenanthrene, C3-phenanthrenes/anthracenes, 1,2,6-trimethylphenanthrene, retene, C4-phenanthrenes/anthracenes, C1-fluoranthenes/pyrenes, 3-methylfluoranthene/benzo[a]fluorene, C2-fluoranthenes/pyrenes, C3-fluoranthenes/pyrenes, C4-fluoranthenes/pyrenes, C1-benzo[a]anthracenes/chrysenes, 5/6-methylchrysene, 1-methylchrysene, C2-benzo[a]anthracenes/chrysenes, 5,9-dimethylchrysene, C3-benzo[a]anthracenes/chrysenes, C4-benzo[a]anthracenes/chrysenes, C1-benzofluoranthenes/benzopyrenes, 7-methylbenzo[a]pyrene, C2-benzofluoranthenes/benzopyrenes, 1,4,6,7-Tetramethylnaphthalene) legacy pesticides (sumHCH denotes (alpha-, beta-, gamma-, delta-hexachlorocyclohexane); sumChlordanes denotes (alpha- and gamma-chlordane; cis-nonachlor; trans-nonachlor; oxychlordane; heptachlor epoxide); sumEndosulphan denotes (alpha-, gamma-endosulphan; endosulphan sulphate); sumDDT denotes dichlorodipenyldichloroethane [2, 4'-DDD; 4, 4'-DDD]; dichlorodipenyldichloroethylene [2, 4'-DDE; 4, 4'-DDE]; dichlorodipenyltrichlorethane [2, 4'-DDT; 4, 4'-DDT]; hexachlorobenzene [HCB]; dieldrin); current-use pesticides (alachlor; sumEndrin denotes endrin ketone and endrin); sumHBCDD denotes alpha-, beta-, gamma-hexabromocyclododecane; sumPCDDs denotes 7 congeners (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, 1,2,3,4,6,7,8-HPCDD, OCDD) and sumPCDFs denotes 10 congeners (2,3,7,8-TCDF, 1,2,3,7,8-PECDF, 2,3,4,7,8-PECDF, 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, 1,2,3,4,7,8,9-HPCDF, OCDF); sumAlkylphenols (4-Nonylphenols, 4-Nonylphenol monoethoxylates, 4-Nonylphenol diethoxylates, 4-n-Octylphenol); sumCPs denotes (66 homologs: 21 short-chain (C10-C13), 28 medium-chain (C14-C17), 17 long-chain (C18-C20)).

Data presented in Tables 8-20 are presented on a dry weight basis with procedural blank subtraction only, with detection limit values indicated.

3.0 Results

PCBs were detected in all sediment samples ($n = 8$) outside SRKW and NRKW Critical Habitat (Table 8). Of the 159 congeners, 100 were detected in all of the samples. The top six PCB congeners outside resident killer whale Critical Habitat accounted for 26.5 % to 35.5 % of total PCBs in sediments. PCB-70 was found at the highest concentration, followed by PCB-118 at the West Coast Vancouver Island site (SKRW-20-001) and one of the central coast sites (SRKW-20-002) (Table 6, Figure 1). PCB-138 or PCB-153 was found at the highest concentration, followed

by either PCB-118 or PCB-153 at three of the central coast sites (SKRW-20-003, SKRW-20-004, SKRW-20-005) and the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007). PCB-110, followed by PCB-138 and PCB-101 were the top three congeners at the Cowichan Bay site (COW-20-Sept). Average total PCB concentrations outside resident killer whale Critical Habitat (1.297 ng/g dw, Table 4) were slightly higher than the concentration in 2019 sediments from inside SRKW Critical Habitat (1.184 ng/g dw, Brown et al. 2022). Average concentrations outside critical habitat exceeded the interim sediment quality guideline (0.0037 ng/g dw) for PCBs protective of killer whales by 351-fold.

Of the 40 PBDE congeners, 10 were detected in all of the 8 samples. The top six PBDE congeners outside resident killer whale Critical Habitat accounted for 80.2 % to 99.4 % of total PBDEs in sediments. PBDE-47 was found at the highest concentration, followed by PBDE-99 or PBDE-154 at the West Coast Vancouver Island site (SKRW-20-001), three of the central coast sites (SRKW-20-002, SRKW-20-004, SRKW-20-005) and the Cowichan Bay site (COW-20-Sept) (Table 6, Figure 1). PBDE-209 was found at the highest concentration, followed by PBDE-47 at the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) and followed by PBDE-206 at one north coast site (SRKW-20-003). Average PBDE sediment concentration outside Critical Habitat (0.434 ng/g dw, Table 4) was slightly higher than average concentration in 2019 sediments from inside SRKW Critical Habitat (0.395 ng/g dw, Brown et al. 2022). Average concentrations outside critical habitat did not exceed the interim sediment quality guideline (1 ng/g dw) for PBDEs protective of killer whales (Table 6). However, one site, located on the north coast (SRKW-20-003), did exceed the guideline by 2.4-fold for PBDEs protective of killer whales (Figure 2).

The PCDD and PCDF concentrations were greatest in the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007), followed by north coast site: SRKW-20-003 (Figure 2). Average PCDD (0.100 ng/g dw, Table 4) and PCDF (0.014 ng/g dw) sediment concentrations outside Critical Habitat were 1.7- and 2.7-fold higher, respectively, than the average concentrations in 2019 sediments from inside SRKW Critical Habitat (PCDD: 0.060 ng/g dw; PCDF: 0.005 ng/g dw, Brown et al. 2022). While average concentrations outside Critical Habitat were below the PCDD and PCDF CCME sediment quality guideline (0.00085 ng TEQ fish/g), the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) exceeded this sediment quality guideline by nearly one order of magnitude.

SumDDT concentrations were greatest in the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) and were at least one order of magnitude greater than the other sites (Figure 2). Average \sum DDT (0.092 ng/g dw, Table 4) sediment concentrations outside Critical Habitat were 1.2-fold higher than the average concentration in 2019 sediments from inside SRKW Critical Habitat (0.077 ng/g dw, Brown et al. 2022).

SumHCH concentrations were detected in four of the eight sites (Table 4). Average \sum HCH (0.025 ng/g dw, Table 4) sediment concentrations outside Critical Habitat were 1.8-fold greater than the average concentration in 2019 sediments from inside SRKW Critical Habitat (0.014 ng/g dw, Brown et al. 2022).

SumEndosulphan concentrations were detected in three of the eight sites (Table 4). Average \sum Endosulphan (0.030 ng/g dw, Table 4) sediment concentrations outside Critical Habitat were

2.4-fold lower than the average concentration in 2019 sediments from inside SRKW Critical Habitat (0.072 ng/g dw, Brown et al. 2022).

Dieldrin concentrations were detected in three of the eight sites (Table 4). Average dieldrin (0.004 ng/g dw, Table 4) sediment concentrations outside Critical Habitat were 8.7-fold higher than the average concentration in 2019 sediments from inside SRKW Critical Habitat (0.0008 ng/g dw, Brown et al. 2022).

HCB concentrations were detected in six of the eight sites (Table 4). Average HCB (0.024 ng/g dw, Table 4) sediment concentrations outside Critical Habitat were 1.3-fold lower than the average concentration in 2019 sediments from inside SRKW Critical Habitat (0.031 ng/g dw, Brown et al. 2022). TBBPA was not detected in any of the sediment samples outside resident killer whale Critical Habitat (Table 5).

Of the remaining legacy pesticides, Σ chlordanes Σ endrin, and heptachlor were only present in two of the eight sites. Gamma-HBCDD and Alachlor were present in one of the eight sites. Only one of the 42 current-use pesticides, alachlor, was detected in one of the sediment samples (COW-20-Sept) outside Critical Habitat (Table 12).

SumAlkylphenol (APs) concentrations were greatest in the central coast site (SRKW-20-003), followed by the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) and central coast site (SRKW-20-002) (Table 4, Figure 2). Average Σ APs (1.208 ng/g dw, Table 4) sediment concentrations outside Critical Habitat were 8-fold lower than the average concentration in 2019 sediments from inside SRKW Critical Habitat (9.897 ng/g dw, Brown et al. 2022).

SumPAH concentrations were greatest in the central coast site (SRKW-20-003), followed by the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) (Table 4, Figure 2). Average Σ PAH sediment concentration outside Critical Habitat (259.6 ng/g dw) was 2-fold lower than the average concentration in 2019 sediments from inside SRKW Critical Habitat (1025 ng/g dw, Brown et al. 2022).

SumPFASs was only detected in six of the eight sites sampled, with the greatest concentrations found in the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) (Table 4). Average Σ PFASs sediment concentration outside Critical Habitat (0.452 ng/g dw) was 1.3-fold greater than the average concentration in 2019 sediments from inside SRKW Critical Habitat (0.357 ng/g dw, Brown et al. 2022).

Tributyltin (TBT) was not detected in any of the sediment samples outside resident killer whale Critical Habitat (Table 20).

Arsenic (As) concentrations were detected at all sites and were greatest at the north coast site (SKRW-20-003), followed by the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) (Table 5, Figure 3), with all of these sites exceeding the CCME sediment quality guideline for As (7.24 mg/kg dw) by up to 2.4-fold (Figure 3). Average As concentrations outside Critical Habitat (6.416 mg/kg dw) were similar to the average concentration in 2019 sediments from inside SRKW Critical Habitat (6.350 mg/kg dw, Brown et al. 2022) and did not exceed the CCME sediment quality guideline (Figure 3).

Cadmium (Cd) concentrations were detected at all sites and were greatest at north coast site (SKRW-20-004), followed by the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) (Table 5, Figure 3). Average Cd concentrations outside Critical Habitat (0.3705 mg/kg dw) were 2.5-fold greater than average concentrations in 2019 sediments from inside SRKW Critical Habitat (0.1458 mg/kg dw, Brown et al. 2022). While average Cd concentrations outside Critical Habitat were below CCME sediment quality guideline (0.7 mg/kg dw), the north coast site (SRKW-20-004) did however exceed it by 2.1-fold (Figure 3).

Copper (Cu) concentrations were detected at all sites and were greatest at the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007), followed by the Cowichan Bay site (COW-20-Sept) (Table 5, Figure 3). Average Cu concentrations were 1.7-fold higher outside Critical Habitat (32.18 mg/kg dw) than the average concentration in 2019 sediments from inside SRKW Critical Habitat (18.70 mg/kg dw, Brown et al. 2022). Average Cu concentrations outside Critical Habitat exceeded the CCME sediment quality guideline (18.70 mg/kg dw) by 1.7-fold (Figure 3).

Lead (Pb) concentrations were detected at all sites and were greatest at the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007), followed by north coast site (SRKW-20-003) (Table 5, Figure 3). Average Pb concentrations were 1.2-fold higher outside Critical Habitat (7.579 mg/kg dw) than the average concentration in 2019 sediments from inside SRKW Critical Habitat (6.565 mg/kg dw, Brown et al. 2022). Average Pb concentrations outside Critical Habitat, as well as concentrations at all sites, were below the CCME sediment quality guideline (30.20 mg/kg dw) (Figure 3).

Mercury (Hg) concentrations were detected at all sites and were greatest at the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) (Table 5, Figure 3). Average Hg concentrations were 1.3-fold higher outside Critical Habitat (0.0581 mg/kg dw) than the average concentration in 2019 sediments from inside SRKW Critical Habitat (0.435 mg/kg dw, Brown et al. 2022). Average Hg concentrations outside Critical Habitat, as well as concentrations at all sites, were below the CCME sediment quality guideline (0.13 mg/kg dw) (Figure 3).

Zinc (Zn) concentrations were detected at all sites and was greatest at the north coast site (SRKW-20-003), followed by the two Strait of Georgia sites (SKRW-20-006, SKRW-20-007) and north coast site (SRKW-20-002) (Table 5, Figure 3). Average Zn concentrations were 1.1-fold higher outside Critical Habitat (65.70 mg/kg dw) than the average concentration in 2019 sediments from inside SRKW Critical Habitat (60.42 mg/kg dw, Brown et al. 2022). Average Zn concentrations outside Critical Habitat, as well as concentrations at all sites, were below the CCME sediment quality guideline (124 mg/kg dw) (Figure 3).

For the other 30 remaining metals average concentrations outside resident killer whale Critical Habitat were below the average concentration in 2019 sediments from inside SRKW Critical Habitat, except for beryllium, bismuth, chromium, iron, lithium, titanium, and zirconium (Table 5, Brown et al. 2022).

4.0 Acknowledgements

The authors wish to acknowledge the financial contribution and logistical support of Environment and Climate Change Canada and its Disposal at Sea program. In particular, we thank Roanna Leung for her assistance on sampling, study design, and monitoring of Disposal at Sea sites. The authors also wish to thank the crew of the CCGS *Vector* for expert support.

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Figure 1. Locations of sediment sampling outside Southern Resident and Northern Resident Killer Whale Critical Habitat in coastal British Columbia, Canada

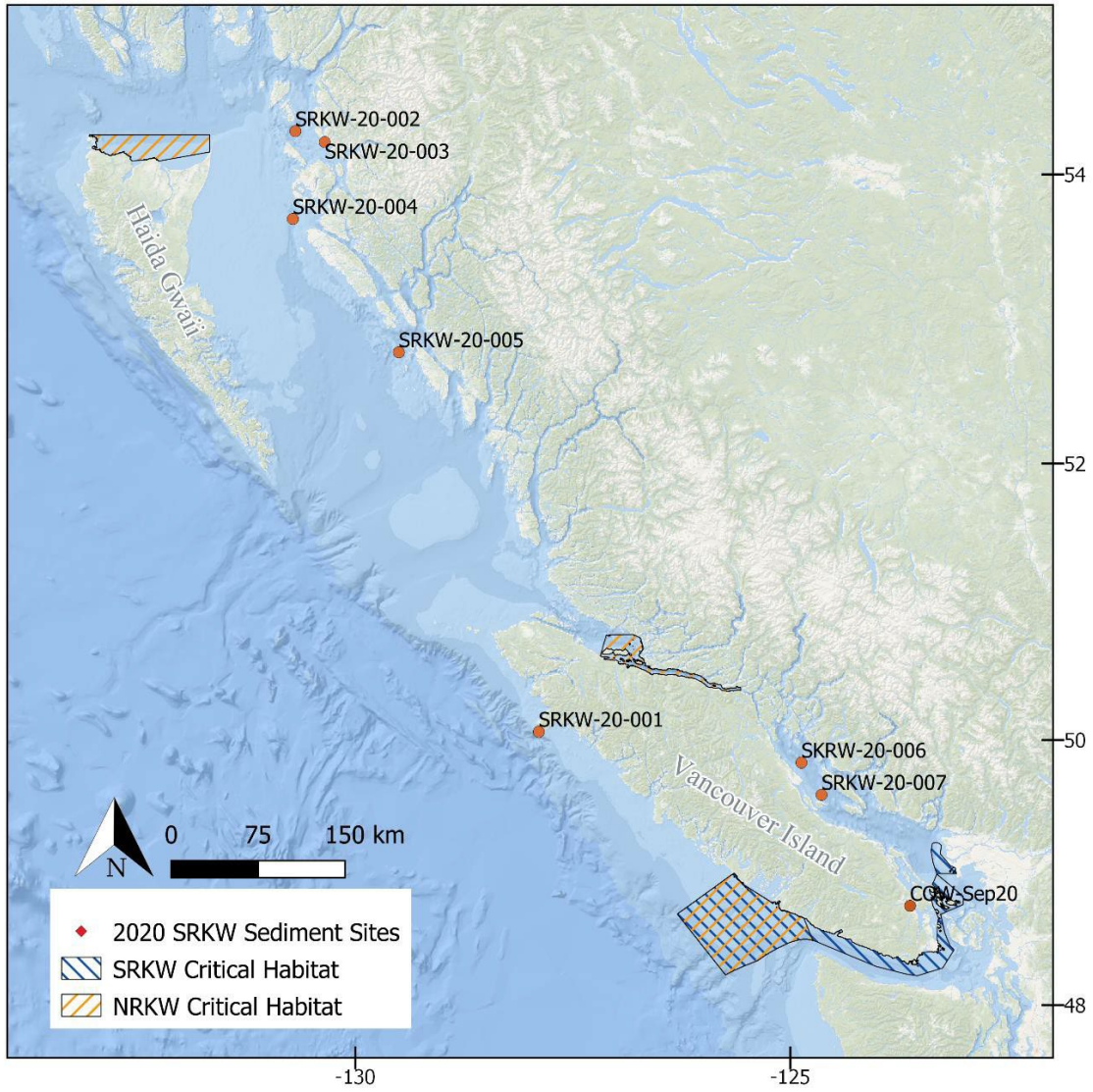


Figure 2. Priority contaminant (PCBs, PBDEs, PCDDs, PCDFs, DDTs, Alkylphenols) concentrations in sediment samples collected from sites located outside Southern and Northern Resident Killer Whale Critical Habitat. Interim Sediment Quality Guideline for PCBs and PBDEs protective of killer whales is denoted by horizontal lines.

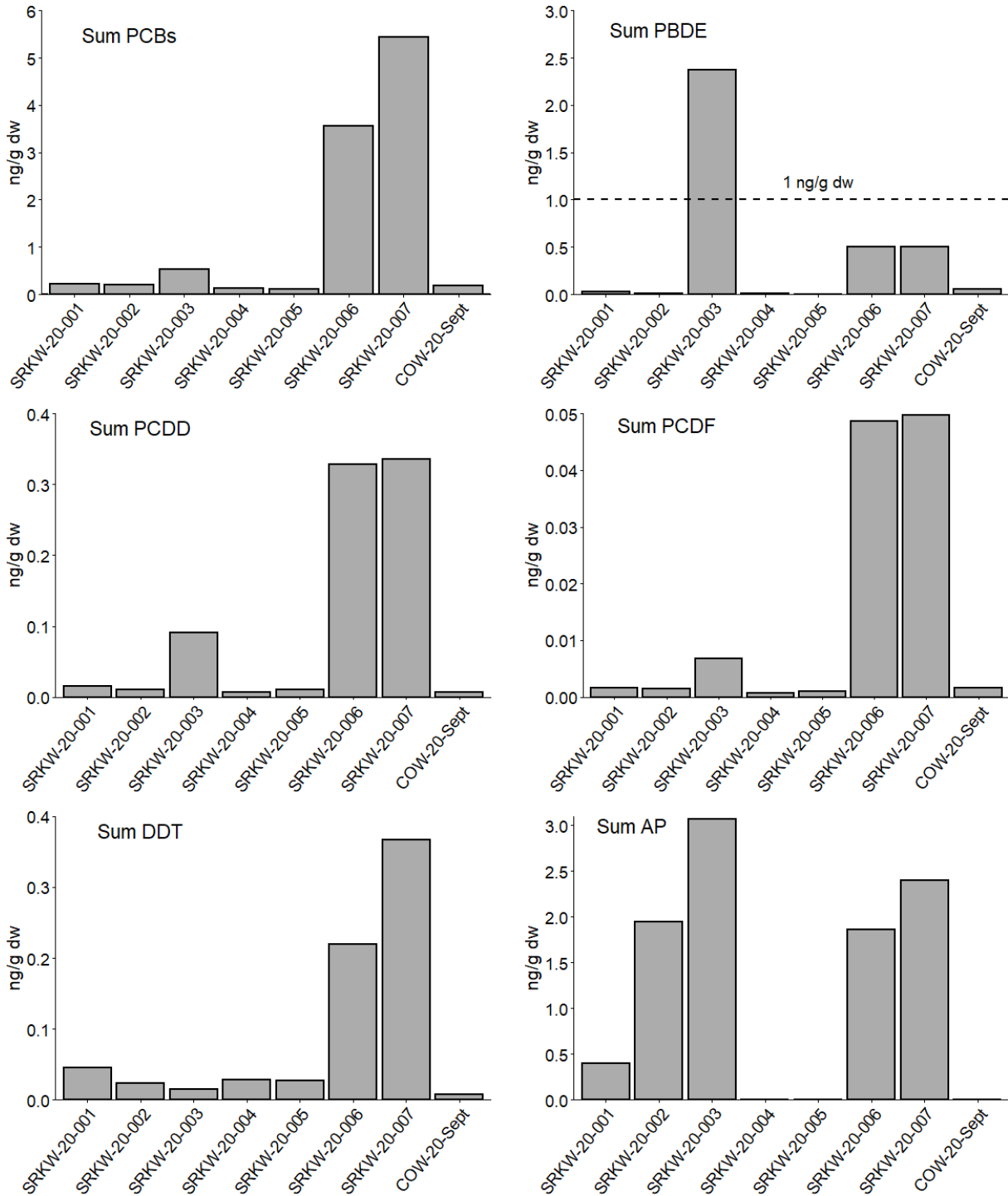


Figure 3. Metal (Arsenic, Cadmium, Copper, Lead, Mercury, Zinc) concentrations in sediment samples collected from sites located outside Southern and Northern Resident Killer Whale Critical Habitat. CCME Interim Sediment Quality Guideline for each of these metals is indicated by the horizontal line.

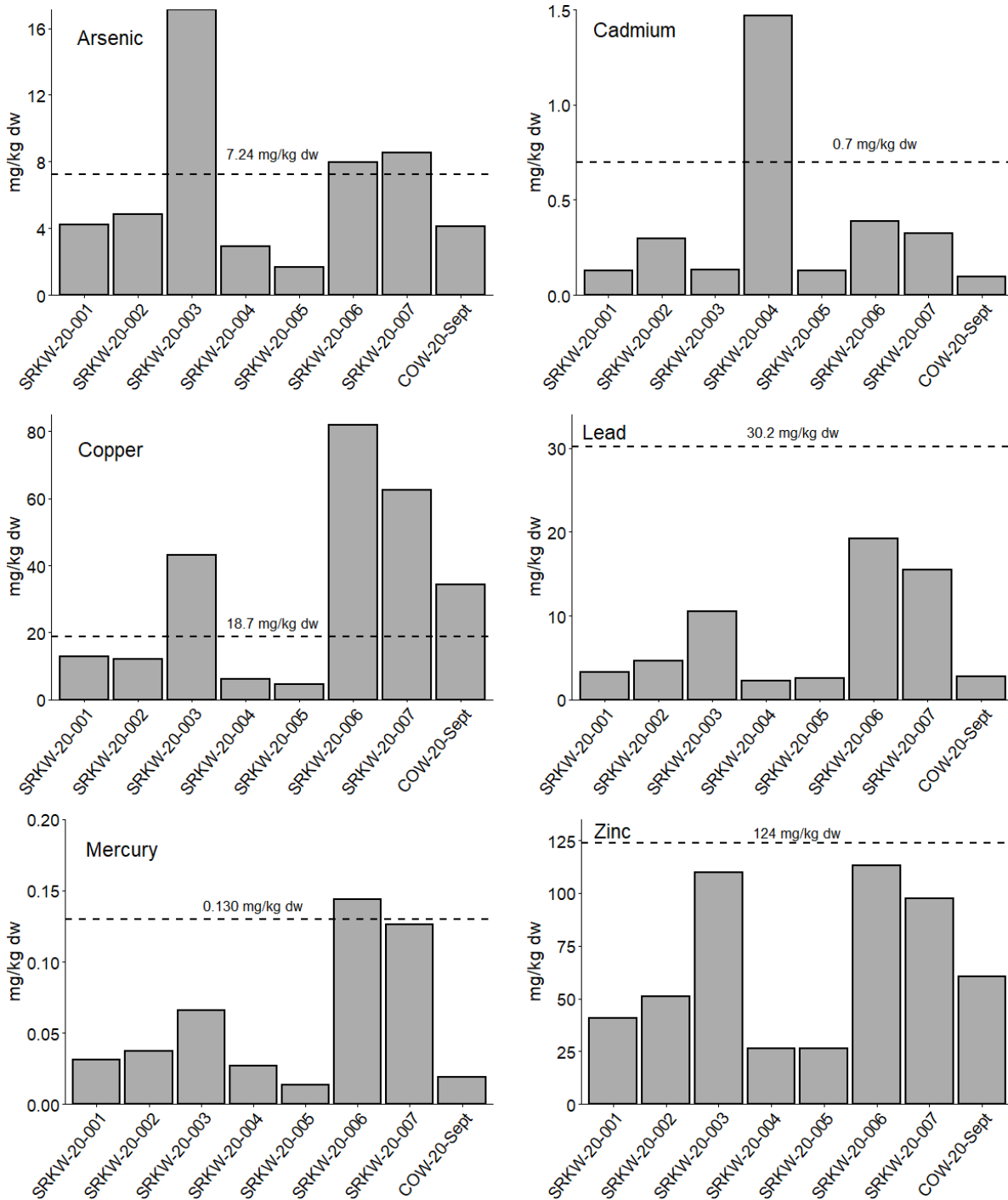


Table 1. Analyte group, method, and laboratory used for contaminant analyses in sediment samples.

Analyte Group (where applicable published reference method indicated)	Laboratory
Legacy and Current Use Pesticides by HRMS (EPA 1699)	SGS AXYS Analytical Ltd.
209 PCB Congeners by HRMS (EPA 1668C or Equivalent)	SGS AXYS Analytical Ltd.
PBDE Congeners by HRMS (EPA 1614A)	SGS AXYS Analytical Ltd.
Dioxins and Furans by HRMS (EPA 1613B)	SGS AXYS Analytical Ltd.
PFAS by LC MS/MS Isotope Dilution (40 compound minimum)	SGS AXYS Analytical Ltd.
PAHs, Alkylated PAHs, Alkylated PAH Groups by Isotope Dilution GC/MS (8270D modified by EPA 1625)	SGS AXYS Analytical Ltd.
PPCPs by LC MS/MS (Modified EPA 1694)	SGS AXYS Analytical Ltd.
Alkylphenols by Isotope dilution GC/MS or LC MS/MS	SGS AXYS Analytical Ltd.
HBCDD isomers by LC-MS/MS using LC MS/MS isotope dilution quantification	SGS AXYS Analytical Ltd.
Polychlorinated paraffins by LR-GC-MS	SGS AXYS Analytical Ltd.
TBBPA by LC-MS/MS	SGS AXYS Analytical Ltd.
Mercury by CVAAS, methylmercury by GCAFS and metals by CRC ICPMS	ALS Canada Ltd.
Tributyltin	Pacific Rim Laboratories

Table 2. Surficial sediment samples collected outside Southern and Northern Resident Killer Whale Critical Habitat (CH) from July 28 to September 9, 2020.

Sample ID	Date	Latitude	Longitude	Depth (m)	Area	Collection Method
SRKW-20-001	28-Jul-20	50.060	-127.891	-103	Outside KWCH	GRB-(Smith-Mac)
SRKW-20-002	28-Jul-20	54.292	-130.688	-208	Outside KWCH	GRB-(Smith-Mac)
SRKW-20-003	28-Jul-20	54.219	-130.352	-55	Outside KWCH	GRB-(Smith-Mac)
SRKW-20-004	31-Jul-20	53.699	-130.718	-140	Outside KWCH	GRB-(Smith-Mac)
SRKW-20-005	4-Aug-20	52.781	-129.499	-435	Outside KWCH	GRB-(Smith-Mac)
SKRW-20-006	8-Aug-20	49.832	-124.871	-337	Outside KWCH	GRB-(Smith-Mac)
SRKW-20-007	8-Aug-20	49.593	-124.639	-167	Outside KWCH	GRB-(Smith-Mac)
COW-Sep20	9-Sep-20	48.758	-123.6219	-1.8	Outside KWCH	GRB-(Petit-Ponar)

Table 3. Surficial sediment properties for sites outside Southern Resident Killer Whale (SRKW) Critical Habitat sites included % total organic carbon (TOC), % moisture, and percentages of gravel, sand, silt, and clay.

Sample	% TOC	% moisture	% sand	% silt	% clay	% gravel
SRKW-20-001	0.382	23.9	76.6	3.9	2.8	16.7
SRKW-20-002	1.11	50.4	51.4	35.6	13	<1.0
SRKW-20-003	1.66	54	1.5	66.5	31.7	<1.0
SRKW-20-004	0.562	35	81.4	14.8	3.8	<1.0
SRKW-20-005	<0.731	31.1	59.6	3.9	3.1	33.4
SKRW-20-006	3.46	84.9	<1.0	63.7	35.9	<1.0
SRKW-20-007	3.81	78.7	<1.0	69.7	29.6	<1.0
COW-Sep20	0.556	21.4	65.4	13.3	2.2	19.1

Table 4. PCBs, PBDEs, HBCDD, TBBPA, PAHs, PCDD, PCDF, APs, PFASs, legacy and current-use pesticide, and chlorinated paraffins concentrations (ng/g dw) in sites located outside Southern and Northern Resident Killer Whale Critical Habitat.

	SRKW- 20-001	SRKW- 20-002	SRKW- 20-003	SRKW- 20-004	SRKW- 20-005	SRKW- 20-006	SRKW- 20-007	COW- 20-Sept	Average ± SD
∑PCBs ₁₅₉	0.2204	0.1944	0.5208	0.1216	0.1188	3.5605	5.4471	0.1905	1.297 ± 2.047
∑PBDEs ₄₀	0.0231	0.0010	2.3714	0.0067	0.0027	0.5012	0.4985	0.0546	0.434 ± 0.813
∑HBCDD ₃	0	0	0	0	0	0	0	0.197	0.025 ± 0.070
TBBPA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
∑PAHs ₇₆	211.7	146.8	1193.0	57.66	49.42	1091.1	1373.9	113.0	529.6 ± 578.5
∑PCDDs ₇	0.0154	0.0010	0.0904	0.0066	0.0104	0.3287	0.3354	0.0069	0.100 ± 0.146
∑PCDFs ₁₀	0.0016	0.0015	0.0069	0.0008	0.0010	0.0486	0.0497	0.0016	0.014 ± 0.012
TEQs	0.0002	0.0002	0.0005	0.00008	0.0001	0.0072	0.008	0.00003	0.002 ± 0.004
∑APs ₄	0.40	1.95	3.07	0.00	0.00	1.86	2.40	0.00	1.208 ± 1.248
∑PFASs ₃₃	0	0.163	0.195	0.021	0.147	1.61	1.478	0	0.452 ± 0.679
HCB	0.007	0.021	0.035	0.01	0	0.058	0.063	0	0.024 ± 0.025
∑HCHs ₄	0	0.011	0.021	0	0	0.093	0.076	0	0.025 ± 0.038
∑DDTs ₆	0.046	0.024	0.015	0.029	0.027	0.22	0.367	0.008	0.092 ± 0.131
∑Chlordane ₅	0.025	0	0	0	0	0.003	0	0	0.004 ± 0.005
∑Heptachlor ₂	0	0	0	0	0	0.002	0.003	0	0.001 ± 0.001
Alachlor	0	0	0	0	0	0	0	0.113	0.014 ± 0.040
∑Endosulphan ₃	0	0	0	0	0.005	0.139	0.097	0	0.030 ± 0.055
Dieldrin	0	0	0.001	0	0	0.013	0.017	0	0.004 ± 0.007
Captan	0	0	0	0	0	0	0	0	0.00
Perthane	0	0	0	0	0	0	0	0	0.00
∑Endrin ₃	0	0	0	0	0	0.018	0.004	0	0.003 ± 0.006
Chlorinated Paraffins ₆₆	0	0	2.478	0.255	0	0	0	0	0.342 ± 0.868

Note: The following pesticides were not detected in any of the samples; Mirex, Methoxychlor, Desethylatrazine, Simazine, Atrazine, Ametryn, Metribuzin, Cyanazine, Hexazinone, Phorate, Terbufos, Diazinon-Oxon, Diazinon, Disulfoton, Fonofos, Dimethoate, Chlorpyrifos-Methyl, Parathion-Methyl, Pirimiphos-Methyl, Chlorpyrifos, Fenitrothion, Malathion, Parathion-Ethyl, Chlorpyrifos-Oxon, Disulfoton Sulfone, Ethion, Phosmet, Azinphos-Methyl, Permethrin, Cypermethrin, Butylate, Ethalfluralin, Trifluralin, Triallate, Dimethenamid, Methoprene, Butralin, Flufenacet, Metolachlor, Linuron, Pendimethalin, Flutriafol, Tebuconazol, Quintozene, Chlorothalonil, Aldrin, Dacthal, Octachlorostyrene, Tecnazene.

Table 5. Metal concentrations (mg/kg dw; methylmercury µg/kg) in sites located outside Northern and Southern Resident Killer Whale Critical Habitat.

	SRKW- 20-001	SRKW- 20-002	SRKW- 20-003	SRKW- 20-004	SRKW- 20-005	SRKW- 20-006	SRKW- 20-007	COW- 20-Sept	Average ± SD
Aluminum	14600	10200	24200	5680	3410	21700	18800	20800	14923 ± 7262
Antimony	0.31	0.28	0.71	0.2	0.18	1.04	0.71	0.17	0.45 ± 0.31
Arsenic	4.2	4.84	17.1	2.94	1.64	7.95	8.54	4.12	6.42 ± 4.59
Barium	11.8	40.1	103	18	17.3	76.1	69.8	18.6	44.33 ± 32.14
Beryllium	0.24	0.23	0.46	0.12	0.14	0.48	0.44	0.35	0.308 ± 0.135
Bismuth	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.034 ± 0.089
Boron	26.4	32.5	30.3	16.1	31.5	76.6	71.8	10.1	36.91 ± 22.77
Cadmium	0.13	0.298	0.134	1.47	0.129	0.386	0.323	0.094	0.371 ± 0.428
Calcium	20000	20800	11800	7280	149000	10200	9330	8820	29654 ± 45360
Chromium	34.7	21.3	33.4	13	9.35	36.1	33.7	39.6	27.64 ± 10.74
Cobalt	8.88	6.46	14.2	2.8	2.74	22.5	15.1	15	10.96 ± 6.48
Copper	12.8	12.1	43.2	6.02	4.49	82	62.4	34.4	32.18 ± 26.81
Iron	26100	20300	43400	8670	11500	30600	26000	35900	25309 ± 10961
Lead	3.26	4.65	10.5	2.21	2.59	19.2	15.5	2.72	7.579 ± 6.234
Lithium	16.2	11.5	25.7	5.5	5.2	24.4	20.8	22.1	16.43 ± 7.670
Magnesium	9480	7070	12800	3340	4080	15600	13100	14200	9959 ± 4397
Manganese	319	262	609	111	115	1170	395	486	433.4 ± 321.2
Methylmercury	0.168	0.409	0.535	0.32	0.105	0.901	0.814	0.307	0.445 ± 0.269
Mercury	0.0313	0.0374	0.0661	0.027	0.0138	0.144	0.126	0.0192	0.058 ± 0.047
Molybdenum	0.45	0.6	1.24	0.49	0.16	1.25	2.04	0.39	0.828 ± 0.588
Nickel	21.2	16.7	30.5	10.8	6.42	35.6	30.7	25.5	22.18 ± 9.629
Phosphorus	464	931	1480	562	333	916	755	952	799.1 ± 336.5
Potassium	1270	2440	3390	1090	1600	5330	4780	830	2591 ± 1622
Selenium	0.00	0.56	0.52	0.42	0.34	1.7	1.84	0.00	0.673 ± 0.665
Silver	0.00	0.00	0.19	0.00	0.00	0.26	0.31	0.00	0.095 ± 0.127
Sodium	4490	12900	15000	5960	6700	46600	38900	3490	16755 ± 15584
Strontium	82.3	113	84.9	38.8	550	87	79.8	62.1	137.2 ± 157.2
Sulfur	1100	2100	2100	1300	0.00	6100	8700	1100	2813 ± 2796
Thallium	0.227	0.157	0.106	0.462	0.082	0.101	0.09	0.00	0.153 ± 0.131
Tin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Titanium	907	510	988	475	160	1010	1020	1830	862.5 ± 470.1
Tungsten	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uranium	0.392	0.754	0.923	0.499	0.492	1.86	2.1	0.558	0.947 ± 0.619
Vanadium	62.6	40.2	87.6	20.7	15.4	78.5	64.7	102	58.96 ± 29.18
Zinc	40.7	51.2	110	26.5	26.4	113	97.3	60.5	65.7 ± 33.80
Zirconium	2.7	1.5	3.1	1.4	<1.0	5.4	5.9	7.1	3.871 ± 2.09

Table 6. Top six PCB and PBDE congeners by concentration (ng/g dw) at all sites outside Southern and Northern Resident Killer Whale Critical Habitat.

	SRKW-20-001 WCVI		SRKW-20-002 North Coast		SRKW-20-003 North Coast		SRKW-20-004 North Coast		SRKW-20-005 North Coast		SRKW-20-006 Strait of Georgia		SRKW-20-007 Strait of Georgia		COW-20-Sept Cowichan Bay	
PCBs	70	0.0119	70	0.0128	138	0.0281	138	0.0071	153	0.007	138	0.204	138	0.365	110	0.014
	118	0.0104	118	0.0100	118	0.0249	153	0.0069	138	0.007	118	0.194	118	0.337	138	0.013
	138	0.0103	138	0.0090	153	0.0247	70	0.0064	118	0.005	70	0.186	110	0.320	101	0.011
	153	0.0097	153	0.0086	70	0.0229	118	0.0059	70	0.005	153	0.176	153	0.262	118	0.011
	28	0.0081	28	0.0082	180	0.0208	101	0.0048	149	0.004	66	0.152	101	0.253	153	0.011
	66	0.0079	66	0.0078	110	0.0206	149	0.0045	99	0.004	110	0.144	95	0.232	95	0.009
PBDEs	47	0.0092	47	0.0038	209	2.1669	47	0.0022	47	0.0008	209	0.3164	209	0.3184	47	0.0200
	99	0.0046	99	0.0018	206	0.0952	99	0.0012	154	0.0004	47	0.0558	47	0.0444	99	0.0105
	100	0.0028	49	0.0007	207	0.0434	203	0.0008	100	0.0003	99	0.0200	207	0.0219	17 + 25	0.0056
	154	0.0015	154	0.0006	208	0.0325	100	0.0004	49	0.0003	100	0.0180	49	0.0144	49	0.0051
	153	0.0011	100	0.0006	47	0.0106	154	0.0004	183	0.0002	49	0.0170	99	0.0138	100	0.0032
	49	0.0010	28 + 33	0.0004	99	0.0082	153	0.0004	99	0.0002	17 + 25	0.0124	100	0.0120	28 + 33	0.0018

Table 7. Percent detect for PCB ($n = 159$) and PBDE ($n = 40$) congener data.

PCBs	Frequency Detected	Number of Congeners
All Sites ($n = 8$)	0%	19
	>0 to <70%	30
	70 to 100%	10
	100%	100
PBDEs		
All Sites ($n = 8$)	0%	11
	>0 to <70%	14
	<70 to <100%	5
	100%	10

Table 8. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for 159 polychlorinated biphenyls (PCBs). All values are reported in pg/g dry weight. <= values below reporting limit (RL). NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration. The dominant congeners are in bold for coeluting congeners. Blanks = data not quantifiable.

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
PCB-1							10.3		
PCB-2							34.8		
PCB-3							11.4	11.8	0.869
PCB-4	1.1(NDR)	1.29	2.09	2.58	0.49	0.907(NDR)	21.6	24.5	0.503
PCB-5	< 0.121	0.077	0.203	0.156	< 0.0633	< 0.0709	0.492(NDR)	0.727	0.088(NDR)
PCB-6	0.743	0.579	1.47	1.83	0.362	0.39	6.99	9.4	0.296
PCB-7	0.189	0.154(NDR)	0.327(NDR)	0.467	0.086	0.138	2.16	2.64	0.108
PCB-8	3.667	2.867	7.947	9.627	1.107	1.737	35.927	45.227	0.807
PCB-9	0.174(NDR)	0.174(NDR)	0.351	0.483	0.114	0.123(NDR)	1.52	1.71	0.131(NDR)
PCB-10	< 0.109	< 0.0467	< 0.0883	0.088	< 0.0569	< 0.0637	0.83	1.01(NDR)	< 0.0465
PCB-11	6.36	3.24	4.21	5.78	1.04	1.43	23.14	19.24	3.29
PCB-12 + 13	1.05(NDR)	1.16	1.41(NDR)	1.88(NDR)	0.598(NDR)	0.622	11.5	15.1	0.493(NDR)
PCB-14	0.256(NDR)	0.323	0.233(NDR)	0.265(NDR)	0.181(NDR)	0.156	1.14	1.46	0.33(NDR)
PCB-15	3.11	3.5	12.2	12.8	1.22	1.51	51.2	52.8	1.41
PCB-16	0.909	0.74(NDR)	2.149	2.079	0.254	0.348(NDR)	10.219	11.619	0.331
PCB-17	1.145(NDR)	0.935	2.285	2.695	0.353(NDR)	0.517	14.435	18.835	0.372(NDR)
PCB-18 + 30	1.896	1.566	3.876	4.216	0.726	0.605	21.466	21.666	0.616
PCB-19	0.204	0.217	0.654(NDR)	0.603	0.137	0.161(NDR)	4.75	6.08	0.159(NDR)
PCB-20 + 28	8.143	8.173	15.543	17.643	3.423	3.313	97.343	100.243	2.513
PCB-21 + 33	3.141	3.001	6.241	6.831	1.341	1.431	39.351	42.951	0.851
PCB-22	2.278	2.478	5.238	5.888	0.938	0.728	23.588	22.288	0.677
PCB-23	< 0.049	< 0.0415	< 0.0556	< 0.0637	< 0.0468	< 0.0491	< 0.134	< 0.114	< 0.0465
PCB-24	< 0.049	< 0.0415	0.052(NDR)	0.071	< 0.0468	< 0.0491	0.388	0.288	< 0.0465
PCB-25	0.534	0.441	0.864	1.059	0.209	0.2	5.699	6.089	0.137
PCB-26 + 29	0.972	0.922	1.962	2.452	0.373	0.288	10.352	8.512	0.273
PCB-27	0.214(NDR)	0.197	0.37(NDR)	0.446	0.08	0.116(NDR)	3.34	4.1	0.081(NDR)
PCB-31	5.173	6.023	11.583	13.383	2.403	1.863	59.683	57.283	1.803
PCB-32	1.138	0.65	1.848	1.978	0.267	0.566	16.868	23.568	0.246
PCB-34	< 0.049	< 0.0415	< 0.0576	< 0.0659	< 0.0468	< 0.0491	0.492(NDR)	0.613	< 0.0465
PCB-35	0.421(NDR)	0.374	0.469	0.502	0.204	0.192	4.84	5.34	0.145(NDR)
PCB-36	0.208	0.154(NDR)	< 0.051	< 0.0585	0.08(NDR)	0.082(NDR)	1.13	0.816	0.054(NDR)
PCB-37	2.843	2.493	5.243	5.713	1.053	1.183	51.353	52.253	0.683
PCB-38	0.122(NDR)	0.163(NDR)	0.23	0.254(NDR)	0.096	< 0.0491	0.624(NDR)	0.673(NDR)	0.234(NDR)
PCB-39	0.091(NDR)	0.129(NDR)	0.101	0.082(NDR)	0.052(NDR)	< 0.0491	0.969	1.13	0.047
PCB-40 + 41 + 71	2.449	1.899	4.439	4.699	1.049	0.929	45.929	54.129	1.039
PCB-42	1.379	1.109	2.279	2.459	0.58	0.583	25.999	31.599	0.633

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
PCB-43	0.144(NDR)	0.158	0.31(NDR)	0.318	0.071(NDR)	0.074(NDR)	2.11(NDR)	1.95(NDR)	0.073(NDR)
PCB-44 + 47 + 65	4.53	3.96	8.98	9.33	2.1	1.84	80.58	107.38	2.98
PCB-45 + 51	0.44(NDR)	0.346	1.101	1.111	0.116(NDR)	0.225(NDR)	11.331	16.331	0.169
PCB-46	0.283	0.161	0.394	0.422(NDR)	0.127(NDR)	0.112(NDR)	3.86	5.4	0.119(NDR)
PCB-48	0.697	0.605	1.636	1.726	0.265	0.293	11.396	11.296	0.422(NDR)
PCB-49 + 69	2.995	2.785	5.715	6.165	1.495	1.385	59.755	74.755	2.025
PCB-50 + 53	0.421	0.347	0.914	0.914	0.251	0.301	10.13	13.13	0.261
PCB-52	5.235	5.155	10.665	11.965	3.025	2.445	88.065	131.465	5.895
PCB-54	< 0.0516	< 0.0415	< 0.0525	< 0.0515	< 0.0468	< 0.0491	0.147(NDR)	0.236(NDR)	< 0.0465
PCB-55	< 0.0989	< 0.0594	< 0.0851	< 0.116	< 0.0486	< 0.0491	< 0.316	< 0.347	< 0.067
PCB-56	3.441	3.061	5.081	5.351	1.431	1.241	58.931	62.331	1.231
PCB-57	< 0.0951	< 0.0571	< 0.0819	< 0.112	< 0.0468	< 0.0491	< 0.3	0.451(NDR)	< 0.0657
PCB-58	< 0.0998	< 0.0599	< 0.0859	< 0.117	< 0.049	< 0.0491	0.439(NDR)	0.756(NDR)	< 0.0723
PCB-59 + 62 + 75	0.446	0.431	0.815	0.863	0.202	0.218	7.5	8.56	0.266
PCB-60	2.4	2.43	3.36	3.47	1.14	1.01	33.4	33.4	0.875
PCB-61 + 70 + 74 + 76	11.902	12.802	21.202	24.602	6.372	4.772	185.502	212.502	7.142
PCB-63	0.284	0.305	0.404	0.448	0.189(NDR)	0.141(NDR)	4.55	4.51	0.174(NDR)
PCB-64	1.838	1.728	4.168	4.258	0.848	0.634	27.488	34.488	1.358
PCB-66	7.919	7.789	12.349	13.649	3.659	3.219	151.749	164.749	3.239
PCB-67	0.175	0.199	0.294	0.31	0.105	0.088(NDR)	2.66	2.27	0.115(NDR)
PCB-68	0.122(NDR)	0.16	0.122	0.119	0.101(NDR)	0.103	1.6	1.72(NDR)	0.086
PCB-72	< 0.092	0.081	0.105	< 0.108	0.074(NDR)	0.065	1.55(NDR)	1.79(NDR)	< 0.0676
PCB-73	< 0.049	< 0.0415	< 0.0494	< 0.0488	< 0.0468	< 0.0491	< 0.106	< 0.0915	< 0.0465
PCB-77	1.89	1.38	1.48	1.55	0.789	0.897	28.2	29.9	0.624(NDR)
PCB-78	< 0.103	< 0.0615	< 0.0882	< 0.12	< 0.0503	< 0.0491	< 0.311	< 0.342	< 0.0743
PCB-79	0.122	0.146	0.144(NDR)	0.214(NDR)	0.075(NDR)	0.079(NDR)	1.86(NDR)	2.41(NDR)	0.118
PCB-80	< 0.093	< 0.0558	< 0.0801	< 0.109	< 0.0468	< 0.0491	< 0.285	< 0.313	< 0.0613
PCB-81	< 0.116	< 0.0675	< 0.0989	< 0.136	< 0.0558	< 0.052	0.908	0.85	< 0.0678
PCB-82	0.983	0.759	2.25	1.78	0.509	0.469(NDR)	20.2	34.5	1.4(NDR)
PCB-83 + 99	6.279	5.549	10.739	11.539	3.849	3.619	119.539	190.539	7.789
PCB-84	1.54(NDR)	1.25	3.65	3.73	1.01	0.949	34.2	81.2	2.49
PCB-85 + 116 + 117	1.855	1.635	3.355	3.365	1.065	1.115	35.715	56.215	2.355
PCB-86 + 87 + 97 + 109 + 119 + 125	4.887	4.587	11.937	11.837	3.097	2.337	92.937	187.637	7.727
PCB-88 + 91	0.878(NDR)	0.738(NDR)	2.25	2.23	0.57	0.553	21.4	43.8	1.28
PCB-89	< 0.149	0.078(NDR)	0.133(NDR)	< 0.135	< 0.0955	< 0.115	2.36	3.71	< 0.0465
PCB-90 + 101 + 113	7.664	6.824	16.754	18.054	4.804	4.134(NDR)	131.454	253.454	10.954
PCB-92	1.336	1.146	2.756	2.876(NDR)	0.976	0.785	24.766	48.266	2.106
PCB-93 + 95 + 98 + 100 + 102	5.079	4.709	11.659	12.059	3.529	3.099	105.559	231.559	8.569
PCB-94	< 0.149	< 0.0755	< 0.127	< 0.135	< 0.0956	< 0.115	0.876(NDR)	1.46	0.063(NDR)
PCB-96	< 0.0743	< 0.0415	< 0.079	0.07(NDR)	< 0.0468	< 0.0491	0.907	1.66	< 0.0465
PCB-103	< 0.121	< 0.0611	0.156(NDR)	0.212	< 0.0774	< 0.0932	1.73(NDR)	2.6	0.092(NDR)

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
PCB-104	< 0.0792	< 0.0415	< 0.0884	< 0.0759	< 0.0488	< 0.0572	< 0.157	< 0.112	< 0.0465
PCB-105	5.104	4.354	9.664	10.374	2.754	2.524	93.174	144.774	4.494
PCB-106	< 0.128	< 0.0841	< 0.221	< 0.171	< 0.0656	< 0.0896	< 0.493	< 0.455	< 0.111
PCB-107	0.885	0.827	1.48	1.73	0.611	0.623	15.6	25.2	0.854
PCB-108 + 124	0.358(NDR)	0.314	0.632	0.762	0.236	0.167(NDR)	5.24	10.3	0.421(NDR)
PCB-110 + 115	7.511	6.161	20.681	20.581	4.111	3.091	144.381	320.381	13.681
PCB-111	< 0.106	< 0.0537	< 0.0906	< 0.0958	< 0.068	< 0.0819	0.203	0.187(NDR)	< 0.0465
PCB-112	< 0.0926	< 0.047	< 0.0793	< 0.0839	< 0.0595	< 0.0716	< 0.132	< 0.157	< 0.0465
PCB-114	0.177(NDR)	0.186(NDR)	0.484(NDR)	0.535	0.194(NDR)	0.116	3.46	6.79	0.221
PCB-118	10.361	9.961	23.461	26.361	5.941	5.201	194.261	337.261	10.861
PCB-120	< 0.0992	< 0.0503	0.086(NDR)	< 0.0898	0.069(NDR)	< 0.0767	0.88	1.12	0.06(NDR)
PCB-121	< 0.108	< 0.0547	< 0.0924	< 0.0977	< 0.0693	< 0.0834	< 0.169	< 0.201	< 0.0465
PCB-122	< 0.143	< 0.0941	< 0.247	0.279	0.087(NDR)	< 0.1	2.09	4	< 0.138
PCB-123	0.266(NDR)	0.153(NDR)	0.358(NDR)	0.384(NDR)	0.158	0.118(NDR)	3.73(NDR)	5.7(NDR)	0.157(NDR)
PCB-126	< 0.172	0.119(NDR)	< 0.27	< 0.217	< 0.0862	< 0.112	0.934(NDR)	1.27(NDR)	< 0.139
PCB-127	< 0.137	< 0.0901	< 0.236	< 0.184	< 0.0702	< 0.096	< 0.677	< 0.625	< 0.115
PCB-128 + 166	1.685	1.395	3.865	4.005	0.995	1.145	33.995	69.495	2.045
PCB-129 + 138 + 160 + 163	10.343	8.963	26.443	29.843	7.103	7.033	204.443	365.443	13.043
PCB-130	0.721	0.536	1.41(NDR)	1.63	0.473(NDR)	0.446	11.3	21.1	0.976
PCB-131	< 0.147	< 0.105	< 0.34	0.271	< 0.123	< 0.14	1.23(NDR)	3.65	0.187(NDR)
PCB-132	2.626	2.036	7.906	7.906	1.756	1.796	48.046	104.846	4.096
PCB-133	0.201(NDR)	0.183	0.406(NDR)	0.373	0.124	< 0.136	2.95	< 0.511	0.223(NDR)
PCB-134 + 143	0.346(NDR)	0.326	1.07	1.22(NDR)	< 0.121	0.311(NDR)	2.3	15.6	0.609
PCB-135 + 151 + 154	2.736	1.976	6.466	6.686	1.886	1.786	50.936	77.736	2.816
PCB-136	0.747	0.679	2.16	2.21	0.594	0.646	17.7	37.9	1.12(NDR)
PCB-137	0.307(NDR)	0.614(NDR)	0.946(NDR)	0.924	0.289(NDR)	0.232	4.75	14.4	0.673
PCB-139 + 140	0.16	0.133(NDR)	0.341(NDR)	0.387	< 0.107	< 0.122	2.43(NDR)	5.19	0.266
PCB-141	0.867	0.553	3.67	4.32	0.499	< 0.121	10.5	29	1.65
PCB-142	< 0.141	< 0.101	< 0.326	< 0.238	< 0.117	< 0.134	< 0.632	< 0.513	< 0.0897
PCB-144	0.372	0.196	0.929	1.1	0.151(NDR)	0.117(NDR)	4.47	8.73	0.425(NDR)
PCB-145	< 0.0871	< 0.0415	< 0.086	< 0.081	< 0.0589	< 0.0609	< 0.134	< 0.109	< 0.0465
PCB-146	1.94	1.51	3.46	3.75	1.32	1.51	29.8	44.1	2
PCB-147 + 149	6.013	5.103	17.303	19.103	4.543	4.403	116.703	200.703	7.643
PCB-148	1.12(NDR)	1.24(NDR)	0.752(NDR)	0.731(NDR)	1.05(NDR)	2.12	0.936	0.778(NDR)	< 0.053
PCB-150	< 0.0833	< 0.0415	< 0.0823	< 0.0775	< 0.0563	< 0.0583	0.483(NDR)	0.577	< 0.0465
PCB-152	< 0.0785	< 0.0415	< 0.0775	< 0.073	< 0.0531	< 0.0549	0.148	0.342	< 0.0465
PCB-153 + 168	9.7	8.6	23.4	26	6.93	7.41	175.6	261.6	10.5
PCB-155	< 0.0781	< 0.0415	< 0.0817	< 0.0682	< 0.0569	< 0.0606	0.117(NDR)	0.138(NDR)	< 0.0465
PCB-156 + 157	1.11(NDR)	0.964	3.29	3.96	0.599	0.706	16	38.9	1.59
PCB-158	0.658	0.516	2.32	2.65	0.348(NDR)	0.324	9.42	24.3	1.13
PCB-159	< 0.106	< 0.0754	< 0.244	< 0.178	< 0.0878	< 0.1	0.887(NDR)	< 0.392	< 0.0604
PCB-161	< 0.0963	< 0.0687	< 0.222	< 0.162	< 0.0801	< 0.0913	< 0.428	< 0.347	< 0.0588

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
PCB-162	< 0.107	< 0.0763	< 0.247	< 0.18	< 0.0888	< 0.101	< 0.497	0.714(NDR)	< 0.0633
PCB-164	0.451(NDR)	0.365	1.56(NDR)	1.91	0.248	0.293	8.34	16.9	0.781
PCB-165	< 0.114	< 0.0817	< 0.264	< 0.193	< 0.0952	< 0.109	< 0.496	< 0.402	< 0.0722
PCB-167	0.43(NDR)	0.386	1.17	1.21	0.266	0.262	6.72	14	0.513
PCB-169	< 0.137	< 0.108	< 0.307	< 0.228	< 0.113	< 0.123	< 0.602	< 0.449	< 0.0727
PCB-170	1.89	1.21	7.86	8.63	1.19	1.17	15.5	29.4	1.45(NDR)
PCB-171 + 173	0.664	0.478	2.39(NDR)	2.6	0.42	0.371(NDR)	7.11	12.9	0.441
PCB-172	0.455	0.323(NDR)	1.34	1.36(NDR)	0.28(NDR)	0.257(NDR)	2.61(NDR)	4.32	0.316(NDR)
PCB-174	1.67(NDR)	1.08	7.41	7.56	0.88(NDR)	0.985	20.2	35.3	1.22
PCB-175	< 0.0855	< 0.057	0.337	0.349	0.087(NDR)	0.077(NDR)	0.945	1.74	0.093(NDR)
PCB-176	0.27(NDR)	0.272	0.981	1(NDR)	0.172	0.17	3.88	5.75	0.183(NDR)
PCB-177	1.85	1.4	5.97	5.92	1.1	1.31	25.4	38.5	0.876(NDR)
PCB-178	0.895	0.615	1.81	1.9(NDR)	0.481(NDR)	0.575	12.7	15.8	0.451(NDR)
PCB-179	1.03	0.854(NDR)	3.16	3.11	0.62	0.691	16.2	20.5	0.628
PCB-180 + 193	4.21	2.52	19.96	21.56	2.63	2.56	37.26	65.66	2.99
PCB-181	< 0.1	< 0.0667	< 0.088	< 0.115	< 0.0697	< 0.0732	0.348(NDR)	0.676	< 0.0465
PCB-182	< 0.0886	< 0.0591	< 0.0779	< 0.101	< 0.0617	< 0.0648	< 0.198	< 0.117	< 0.0465
PCB-183 + 185	1.175	0.803	5.045	5.285	0.798	0.759(NDR)	12.425	20.525	0.935(NDR)
PCB-184	< 0.0618	< 0.0415	< 0.0543	< 0.0707	< 0.0468	< 0.0491	< 0.145	0.193	< 0.0465
PCB-186	< 0.0676	< 0.045	< 0.0594	< 0.0773	< 0.0471	< 0.0494	< 0.158	< 0.0932	< 0.0465
PCB-187	4.27	3.16	10.1	11.2	2.78	3.04	62.2	79.9	2.29
PCB-188	< 0.0666	< 0.0455	< 0.0591	< 0.0762	< 0.0468	< 0.0522	0.183(NDR)	0.312(NDR)	< 0.0465
PCB-189	0.096	0.083	0.333	0.378	0.08	0.085	0.782(NDR)	1.65(NDR)	0.101(NDR)
PCB-190	0.398(NDR)	0.23	1.48	1.81(NDR)	0.162	0.226(NDR)	4.09	6.38	0.241(NDR)
PCB-191	< 0.0853	< 0.0568	0.298(NDR)	0.404	< 0.0594	< 0.0624	0.411(NDR)	0.871	< 0.0465
PCB-192	< 0.0864	< 0.0576	< 0.0759	< 0.0988	< 0.0602	< 0.0632	< 0.184	< 0.108	< 0.0465
PCB-194	1.05(NDR)	0.587	4.67	4.91	0.604	0.834	5.61	11	0.524
PCB-195	0.523	0.361	2.26	2.37	0.292(NDR)	0.444(NDR)	5.73	8.78	0.247(NDR)
PCB-196	0.448	0.367	2.13	2.24	0.355	0.413	4.26	7.45	0.303
PCB-197 + 200	0.174(NDR)	0.139(NDR)	0.706	0.596	0.142	0.182(NDR)	2.88	3.44	0.083
PCB-198 + 199	1.76	1.49(NDR)	5.17	5.34	1.4	1.47(NDR)	22.4	31.9	0.756
PCB-201	0.191(NDR)	0.148	0.614(NDR)	0.599	0.171(NDR)	0.234(NDR)	3.29	4.41	0.121
PCB-202	0.539	0.46	1.07(NDR)	1.2	0.436(NDR)	0.487(NDR)	6.84	8.52	0.193
PCB-203	0.896	0.571	2.89	2.72	0.482	0.621	10.7	14.2	0.463(NDR)
PCB-204	< 0.0545	< 0.0415	< 0.0725	< 0.0602	< 0.0468	< 0.0491	< 0.151	< 0.125	< 0.0465
PCB-205	< 0.0878	< 0.0415	0.261(NDR)	0.212(NDR)	0.065(NDR)	< 0.0717	0.794	1.03(NDR)	< 0.0465
PCB-206	1.07(NDR)	0.857	1.92	1.98	0.669	1.1	12.6	16.1	0.512
PCB-207	< 0.115	0.155(NDR)	0.184	0.282	< 0.162	0.191(NDR)	1.46	3	0.063(NDR)
PCB-208	0.435	0.314(NDR)	0.588	0.508	0.334	0.482	5.03	5.8	0.195(NDR)
PCB-209	1.596	1.226	2.006	1.406	0.946	1.376	15.316	63.016	0.565(NDR)
Total Monochloro Biphenyls							56.5	11.8	0.869
Total Dichloro Biphenyls	14.07	13.07	28.47	33.77	4.42	5.99	156.37	172.37	6.42

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
Total Trichloro Biphenyls	27.8	27.8	58.1	66.1	11.8	11.2	366.1	384.1	8.5
Total Tetrachloro Biphenyls	49.22	48.02	86.42	94.32	24.12	20.72	840.72	997.72	28.22
Total Pentachloro Biphenyls	53.28	49.38	122.68	126.68	34.48	24.78	1047.68	1987.68	74.68
Total Hexachloro Biphenyls	38.78	34.58	103.58	118.58	27.08	30.38	755.58	1358.58	50.58
Total Heptachloro Biphenyls	16.725	12.025	65.925	67.125	10.125	10.625	217.825	338.825	7.635
Total Octachloro Biphenyls	4.17	2.49	17.8	20	2.98	1.87	62.5	89.7	1.98
Total Nonachloro Biphenyls	0.435	0.857	2.69	2.77	1	1.58	19.1	24.9	0.512
Decachloro Biphenyl	1.596	1.226	2.006	1.406	0.946	1.376	15.316	63.016	
TOTAL PCBs	206.2	189.2	488.2	530.2	117.2	108.2	3539.2	5429.2	179.2

Table 9. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for 40 polybrominated diphenyl ethers (PBDE). All values are reported in pg/g dry weight. < = values below reporting limit (RL). NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration.

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
BDE-7	< 0.152	< 0.142	0.141	< 0.099	< 0.117	< 0.098	0.737(NDR)	1.82	0.45
BDE-8 + 11	0.155(NDR)	0.193	0.33	0.478	< 0.094	< 0.098	5.18	3.06	1.08
BDE-10	< 0.171	< 0.161	< 0.13	< 0.116	< 0.132	< 0.098	< 0.425	< 0.342	< 0.142
BDE-12 + 13	< 0.106	< 0.099	< 0.099	0.136	< 0.094	< 0.098	0.525	0.324(NDR)	0.22
BDE-15	0.172(NDR)	0.238(NDR)	0.353	0.372(NDR)	0.124(NDR)	0.106(NDR)	4.94	3.29	1.71
BDE-17 + 25	0.492	0.369	1.09	1.04	0.207(NDR)	< 0.098	12.4	11.4	5.6
BDE-28 + 33	0.682(NDR)	0.428	0.872	0.828	0.213	0.143(NDR)	6.4	5.54	1.76
BDE-30	< 0.098	< 0.089	< 0.099	< 0.121	< 0.094	< 0.098	< 0.208	< 0.183	< 0.093
BDE-32	< 0.098	< 0.083	< 0.099	< 0.098	< 0.094	< 0.098	0.456	0.372(NDR)	< 0.093
BDE-35	< 0.098	< 0.083	< 0.099	< 0.098	< 0.094	< 0.098	< 0.208	< 0.183	< 0.093
BDE-37	0.034(NDR)	0	0.005	0	0	0	0.53	0.375(NDR)	0.191
BDE-47	9.18	3.81	10.38	10.88	2.16	0.76	55.78	44.38	19.98
BDE-49	0.998	0.656	2.118	2.458	0.283	0.27(NDR)	16.998	14.398	5.118
BDE-51	0.139(NDR)	0.135(NDR)	0.246	0.289	< 0.094	< 0.098	5.35	4.09	0.46
BDE-66	0.347(NDR)	0.225(NDR)	0.302	0.289(NDR)	0.119	< 0.098	2.24	1.69(NDR)	0.821
BDE-71	< 0.098	< 0.083	0.101(NDR)	0.2(NDR)	< 0.094	< 0.098	1.05(NDR)	0.608(NDR)	0.64(NDR)
BDE-75	< 0.098	< 0.083	< 0.099	< 0.098	< 0.094	< 0.098	< 0.208	< 0.183	< 0.093
BDE-77	< 0.098	< 0.083	< 0.099	< 0.098	< 0.094	< 0.098	< 0.208	< 0.183	< 0.093
BDE-79	0.12(NDR)	< 0.083	< 0.099	< 0.098	< 0.094	< 0.098	< 0.208	0.207(NDR)	< 0.093
BDE-85	< 0.183	< 0.161	0.272(NDR)	< 0.302	0.142	< 0.098	0.406	< 0.384	0.258
BDE-99	4.633	1.783	8.273	8.213	1.203	0.213	20.003	13.803	10.503
BDE-100	2.817	0.612	2.147	2.067	0.414	0.287	17.967	11.967	3.207
BDE-105	< 0.241	< 0.213	< 0.169	< 0.348	< 0.124	< 0.098	< 0.235	< 0.506	< 0.143
BDE-116	< 0.281	< 0.249	< 0.249	< 0.514	< 0.144	< 0.122	< 0.312	< 0.591	< 0.19
BDE-119 + 120	< 0.188	< 0.167	< 0.17	< 0.351	< 0.097	< 0.098	0.497(NDR)	0.41	0.157(NDR)
BDE-126	< 0.114	< 0.102	< 0.099	< 0.191	< 0.094	< 0.098	0.246	< 0.238	< 0.093
BDE-128	< 0.248	< 0.33	< 0.668	< 1.33	< 0.299	< 0.241	< 0.552	< 0.656	< 0.484
BDE-138 + 166	< 0.14	< 0.193	< 0.245	< 0.504	< 0.118	< 0.098	< 0.234	< 0.359	< 0.122
BDE-140	< 0.108	< 0.149	< 0.197	< 0.405	< 0.094	< 0.098	0.227(NDR)	< 0.278	< 0.098
BDE-153	1.06	0.359(NDR)	1.49	1.48	0.371	0.18(NDR)	3.06	2.29	1.05
BDE-154	1.47	0.626	1.5	1.54	0.407	0.382	8.16	6.25	1.05
BDE-155	0.314(NDR)	0.15	0.92(NDR)	0.85(NDR)	0.035(NDR)	0.094(NDR)	5.1	3.88	0.102(NDR)
BDE-181	< 0.194	< 0.177	< 0.108	< 0.251	< 0.193	< 0.105	< 0.237	< 0.395	< 0.13
BDE-183	0.197(NDR)	0.229	0.608	0.994	0.195(NDR)	0.235(NDR)	2.06(NDR)	1.56	0.245(NDR)
BDE-190	< 0.318	< 0.289	< 0.173	< 0.401	< 0.316	< 0.171	< 0.389	< 0.648	< 0.214
BDE-203	0.034	0.138	0.843	2.493	0.793	0	1.503	2.693(NDR)	0
BDE-206	0	0	18.59	171.89	0	0	5.09	9.39(NDR)	0
BDE-207	0	0	5.97	80.87	0	0	4.27	21.87	0

BDE-208	0.3	0	5.4	59.6	0	0	3.64	14.4(NDR)	0
BDE-209	0	0	401.4	3932.4	0	0	316.4	318.4	0

Table 10. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for tetrabromobisphenol A (TBBPA). All values are reported in ng/g dry weight. < = values below reporting limit (RL).

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
TBBPA	< 0.969	< 0.829	< 0.932	< 0.858	< 1.02	< 0.953	< 2.18	< 1.82	< 1.01

Table 11. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for hexabromocyclododecane (HBCDD). All values are reported in ng/g dry weight. < = values below reporting limit (RL).

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
alpha-HBCDD	< 0.131	< 0.159	< 0.216	< 0.204	< 0.14	< 0.149	< 0.51	< 0.455	< 0.119
beta-HBCDD	< 0.131	< 0.159	< 0.216	< 0.204	< 0.14	< 0.149	< 0.51	< 0.455	< 0.119
gamma-HBCDD	< 0.131	< 0.159	< 0.216	< 0.204	< 0.14	< 0.149	< 0.51	< 0.455	0.197

Table 12. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for legacy and current-use pesticides. All values are reported in ng/g dry weight. < = values below reporting limit (RL). NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration.

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
2,4'-DDD	< 0.0117	< 0.0089	< 0.0144	< 0.0096	< 0.0187	< 0.0134	< 0.0427	0.035(NDR)	< 0.0091
2,4'-DDE	< 0.0082	< 0.0072	< 0.0077	< 0.0076	< 0.0089	< 0.0082	< 0.0294	< 0.0192	< 0.0048
2,4'-DDT	< 0.0469	< 0.0388	< 0.0811	< 0.0504	< 0.0868	< 0.0858	< 0.274	< 0.254	< 0.0521
4,4'-DDD	< 0.022	< 0.0185	< 0.0365	< 0.0245	< 0.0423	< 0.0391	< 0.131	< 0.127	< 0.0258
4,4'-DDE	0.046	0.024	0.016	0.014	0.029	0.027	0.22	0.332	0.008
4,4'-DDT	< 0.0448	< 0.0377	< 0.0785	< 0.0499	< 0.0911	< 0.0841	< 0.281	< 0.274	< 0.0557
Alachlor	0	< 0.0412	< 0.0887	< 0.0804	< 0.0487	< 0.0461	< 0.109	< 0.121	0.113(NDR)
Aldrin	0	0	0	0	0	0	0	0	0
alpha-Endosulphan	0	0	0	0	0	0.005(NDR)	0.135(NDR)	0.097(NDR)	0
Ametryn	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Atrazine	< 0.105	< 0.0948	< 0.0554	< 0.0901	< 0.135	< 0.104	< 0.288	< 0.221	< 0.0851
Azinphos-Methyl	< 0.1	< 0.1	< 0.171	< 0.189	< 0.154	< 0.115	< 0.349	< 0.259	< 0.123
beta-Endosulphan	0	0	0	0	< 0.0447	0	0.004(NDR)	< 0.064	0
Butralin	< 0.054	< 0.072	< 0.159	< 0.156	< 0.304	< 0.181	< 0.248	< 0.211	< 0.175
Butylate	< 0.0237	< 0.0251	< 0.0276	< 0.0269	< 0.0195	< 0.0198	< 0.0487	< 0.0392	< 0.0187
Captan	< 0.347	< 0.334	< 0.349	< 0.332	< 0.606	< 0.493	< 1.05	< 0.717	< 0.282
Chlordane, alpha (cis)	0	< 0.0034	< 0.0041	< 0.0037	0	< 0.0036	< 0.0088	0	< 0.0026
Chlordane, gamma (trans)	< 0.0029	< 0.0037	< 0.0046	< 0.0042	< 0.0026	< 0.0041	0	< 0.0075	0
Chlordane, oxy-	0.025(NDR)	0	0	0	< 0.0079	0	0.001(NDR)	0	< 0.0048
Chlorothalonil	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Chlorpyrifos	< 0.0196	< 0.0181	< 0.0199	< 0.0219	< 0.0195	< 0.0236	< 0.0507	< 0.0371	< 0.0187
Chlorpyrifos-Methyl	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Chlorpyrifos-Oxon	< 0.0196	< 0.0152	< 0.0199	< 0.0206	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Cyanazine	< 0.141	< 0.12	< 0.128	< 0.184	< 0.227	< 0.15	< 0.311	< 0.296	< 0.168
Cypermethrin	< 0.0352	< 0.0239	< 0.0343	< 0.0318	< 0.0391	< 0.0333	< 0.104	< 0.0637	< 0.0288
Dacthal	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Desethylatrazine	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Diazinon	< 0.0597	< 0.0592	< 0.0642	< 0.0843	< 0.0909	< 0.0775	< 0.194	< 0.165	< 0.063
Diazinon-Oxon	< 0.0876	< 0.0656	< 0.0628	< 0.0857	< 0.0751	< 0.0773	< 0.249	< 0.1	< 0.0458
Dieldrin	0	0	0.002(NDR)	< 0.0022	< 0.0019	0	0.013	0.017(NDR)	0
Dimethenamid	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Dimethoate	< 0.278	< 0.154	< 0.167	< 0.166	< 0.191	< 0.199	< 0.502	< 0.33	< 0.162
Disulfoton	< 0.0374	< 0.0446	< 0.0373	< 0.0429	< 0.0533	< 0.0502	< 0.104	< 0.0535	< 0.039
Disulfoton Sulfone	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Endosulphan Sulphate	< 0.0108	< 0.0144	< 0.0278	< 0.0137	< 0.0395	< 0.0221	< 0.0513	< 0.0566	< 0.0186
Endrin	0	0	0	0	0	0	0.018(NDR)	0.004(NDR)	0
Endrin Ketone	< 0.0085	< 0.0063	< 0.0191	< 0.0203	< 0.0155	< 0.0093	< 0.0351	< 0.035	< 0.0074

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
Ethalfuralin	< 0.0196	< 0.0156	< 0.0199	< 0.02	< 0.0245	< 0.0204	< 0.0426	< 0.0371	< 0.0195
Ethion	< 0.0244	< 0.0178	< 0.0219	< 0.0288	< 0.0308	< 0.0258	< 0.0616	< 0.041	< 0.0194
Fenitrothion	< 0.0196	< 0.0194	< 0.0203	< 0.0265	< 0.0248	< 0.0209	< 0.0485	< 0.0371	< 0.0187
Flufenacet	< 0.473	< 0.377	< 0.327	< 0.461	< 0.273	< 0.171	< 0.605	< 0.819	< 0.22
Flutriafol	< 0.0523	< 0.0632	< 0.114	< 0.111	< 0.0923	< 0.0745	< 0.146	< 0.151	< 0.0834
Fonofos	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
HCH, alpha	0	0.005	0.013	0.011	0	0	0.048	0.046	0
HCH, beta	0	0.006	0.01	0.008	0	0	0.045	0.03	0
HCH, delta	< 0.0052	< 0.0036	< 0.004	< 0.004	< 0.0054	< 0.0041	< 0.0137	0	0
HCH, gamma	< 0.0071	< 0.0052	< 0.0085	< 0.0081	< 0.0065	< 0.0079	< 0.0242	< 0.0161	< 0.0046
Heptachlor	< 0.002	< 0.0015	< 0.002	< 0.002	0	< 0.002	< 0.0043	< 0.0037	< 0.0019
Heptachlor Epoxide	0	0	0	0	0	0	0.002	0.003(NDR)	0
Hexachlorobenzene	0.007	0.021	0.038	0.032	0.01	0	0.058	0.063	0
Hexazinone	< 0.0378	< 0.04	< 0.0403	< 0.0646	< 0.0617	< 0.0556	< 0.125	< 0.0721	< 0.0663
Linuron	< 0.189	< 0.191	< 0.166	< 0.111	< 0.126	< 0.251	< 0.446	< 0.219	< 0.0929
Malathion	< 0.135	< 0.149	< 0.116	< 0.148	< 0.144	< 0.103	< 0.306	< 0.172	< 0.116
Methoprene	< 4.72	< 2.8	< 11.3	< 6.25	< 7.03	< 3.34	< 4.33	< 10.6	< 11.2
Methoxychlor	< 0.0377	< 0.0368	< 0.0863	< 0.0897	< 0.045	< 0.0408	< 0.139	< 0.142	< 0.0437
Metolachlor	0	< 0.0326	0	< 0.156	0	0	< 0.448	< 0.339	< 0.0448
Metribuzin	< 0.0231	< 0.0234	< 0.044	< 0.0437	< 0.0217	< 0.0213	< 0.0691	< 0.0432	< 0.0259
Mirex	< 0.002	< 0.0015	< 0.0025	< 0.0028	< 0.0019	< 0.002	< 0.0057	< 0.0053	< 0.0019
Nonachlor, cis-	< 0.0048	< 0.0064	0	0	< 0.0118	< 0.0065	0.002(NDR)	< 0.0179	< 0.0053
Nonachlor, trans-	< 0.0026	< 0.0035	< 0.0044	< 0.0036	< 0.0025	< 0.0038	0(NDR)	< 0.0073	< 0.0028
Octachlorostyrene	< 0.002	< 0.0015	< 0.002	< 0.002	< 0.0019	< 0.002	< 0.0043	< 0.0037	< 0.0019
Parathion-Ethyl	< 0.0424	< 0.0484	< 0.042	< 0.0601	< 0.0549	< 0.0694	< 0.136	< 0.0663	< 0.0416
Parathion-Methyl	< 0.157	< 0.178	< 0.198	< 0.238	< 0.233	< 0.184	< 0.545	< 0.311	< 0.185
Pendimethalin	< 0.69	< 0.86	< 4.58	< 2.57	< 3.73	< 1.16	< 2.97	< 5.18	< 2.44
Permethrin	< 0.0349	< 0.0342	< 0.0573	< 0.0642	< 0.0403	< 0.0423	< 0.114	< 0.0978	< 0.0471
Perthane	< 0.0607	< 0.0607	< 0.113	< 0.131	< 0.0924	< 0.0815	< 0.362	< 0.235	< 0.394
Phorate	< 0.0215	< 0.0173	< 0.0199	< 0.02	< 0.0242	< 0.0198	< 0.0503	< 0.0371	< 0.0187
Phosmet	< 0.0328	< 0.0295	< 0.0569	< 0.0655	< 0.0555	< 0.0405	< 0.116	< 0.0917	< 0.0371
Pirimiphos-Methyl	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Quintozene	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Simazine	< 0.0574	< 0.0483	< 0.0798	< 0.0716	< 0.0723	< 0.056	< 0.2	< 0.199	< 0.0522
Tebuconazol	< 0.119	< 0.225	< 0.703	< 0.307	< 1.17	< 0.394	< 0.823	< 0.924	< 0.622
Tecnazene	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Terbufos	< 0.0316	< 0.0329	< 0.0263	< 0.02	< 0.0408	< 0.038	< 0.0734	< 0.0545	< 0.0402
Triallate	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187
Trifluralin	< 0.0196	< 0.0152	< 0.0199	< 0.02	< 0.0195	< 0.0198	< 0.0426	< 0.0371	< 0.0187

Table 13. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for polyaromatic hydrocarbons (PAH). All values are reported in ng/g dry weight. < = values below reporting limit (RL). NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration. Blanks = data not quantifiable

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
1-Methylchrysene	0.488	0.229	2.24	2.5	0.103	0.089	2.02	2.31	0.21
1-Methylnaphthalene	3.08	2.23	24.2	24.9	0.751	0.915	22.1	25.1	0.713
1-Methylphenanthrene	2.4	1.29	11.2	11.6	0.578	0.632	15.4	19.4	0.89
1,2-Dimethylnaphthalene	1.24(NDR)	0.483	4.14	4.63	0.217	< 0.558	7.04	10.1	0.229(NDR)
1,2,6-Trimethylphenanthrene	0.385	0.138	1.45	1.56	0.068	< 0.0454	2.24	2.54	0.054(NDR)
1,4,6,7-Tetramethylnaphthalene	0.832	0.255(NDR)	1.9(NDR)	1.99(NDR)	0.132(NDR)	0.148(NDR)	5	7.3	< 0.0648
1,7-Dimethylfluorene	0.4	< 0.247	1.7	2.18	< 0.106	< 0.177	1.28	1.69	0.109
1,7-Dimethylphenanthrene	1.27	0.606	7.36	7.94	< 0.243	0.258	9.62	13.7	0.321(NDR)
1,8-Dimethylphenanthrene	0.323	< 0.0968	0.987	1.02	< 0.243	< 0.115	1.22	1.81	< 0.165
2-Methylanthracene	0.368	< 0.197	2.38	3.05	< 0.122	< 0.113	2.52	3.47	0.233
2-Methylfluorene	0.341	0.314	2.65	2.88	0.099	0.157	1.56	2.01	0.216
2-Methylnaphthalene	3.75	3.79	47.1	48	0.98	0.948	24.9	27	1.89
2-Methylphenanthrene	3.69	2.84	20.5	21.4	1.1	1.03	15.6	17.5	2.98
2,3,5-Trimethylnaphthalene	3.38	1.26	11.8	12.6	0.585	0.85	23.8	34.1	0.363
2,3,6-Trimethylnaphthalene	3.3	1.43	15.5	16.4	0.576	0.771	21	30.2	0.36
2,4-Dimethyldibenzothiophene	0.182(NDR)	0.228	1.53	1.65	< 0.132	< 0.111	< 1.41	1.19	< 0.204
2,6-Dimethylnaphthalene	5.9	5.33	28.7	29.7	3.34	1.36	18.5	22.1	3.14
2,6-Dimethylphenanthrene	0.891	0.498	3.93	4.35	< 0.243	0.211(NDR)	2.74	3.05	0.422
2/3-Methyldibenzothiophenes	0.3	0.39	3.88	4.23	0.124	< 0.0475	1.38	2.04	0.204
3-Methylfluoranthene/Benzo[a]fluorene	2.08	1.36	11	12.6	0.531	0.552	11.7	13.8	1.21
3-Methylphenanthrene	2.66	2.1	13.4	14.1	0.686	0.716	10.3	11.9	1.92
3,6-Dimethylphenanthrene	0.806(NDR)	0.396(NDR)	2.67(NDR)	3.11(NDR)	< 0.243	0.183(NDR)	2.5(NDR)	3.14(NDR)	0.321(NDR)
4,6-Dimethyldibenzothiophene	0.217	0.189	1.74	1.9	< 0.103	< 0.0867	< 1.1	0.883	< 0.159
5,9-Dimethylchrysene	1.1	0.334	3.81	4.35	0.114	0.145	2.3	2.92	0.223
5/6-Methylchrysene	0.254	0.13	1.24	1.36	0.05	0.047	1.14	1.38	0.101
7-Methylbenzo[a]pyrene	0.176	< 0.149	0.804	0.724	< 0.133	< 0.147	0.584	< 1	< 0.151
9/4-Methylphenanthrene	2.98	1.51	10.6	11.2	0.613	0.777	11.7	15.1	0.842
Acenaphthene	0.242	0.182	1.02	1.23	< 0.115	< 0.0895	1.91	1.55	0.232
Acenaphthylene	0.079	< 0.117	0.449	0.661	< 0.0364	0.07	2.78	3	0.17
Anthracene	0.422	0.334	2.79	3.71	0.113	0.099	3.46	4.09	0.495
Benz[a]anthracene	0.649	0.619	7.58	9.3	0.247	0.242	11(NDR)	11.6(NDR)	1.34
Benzo[a]pyrene	0.775	0.582	6.97	8.8	0.35	0.38	11.7	11.8	1.13
Benzo[b]fluoranthene	1.46	1.94	8.37	10.8	1.06	0.772	13.8	15.3	1.97
Benzo[e]pyrene	1.58	1.33(NDR)	7.85	9.74	0.617	0.575	11.2	12	1.47
Benzo[ghi]perylene	1.77	1.65	7.71	9.3	1.18	1	14.2	16.4	1.16
Benzo[j,k]fluoranthenes	0.66	0.689	4.8	5.47	0.38	0.322	10.3	12	1.21

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
Biphenyl	1.624	2.224	17.864	18.664	0.467	0.255	5.754	5.964	1.004
C1-Phenanthrenes/Anthracenes	12.1	7.74	58	61.4	2.97	3.15	55.5	67.3	6.87
C1-Acenaphthenes	< 0.0952	< 0.112	< 0.437	< 0.324	< 0.072	< 0.116	< 0.374	< 0.611	< 0.122
C1-Benzo[a]anthracenes/Chrysenes	3.83	2.28	22.3	24.5	1.03	0.697	15.1	17.7	2.5
C1-Benzofluoranthenes/Benzopyrenes	5.3	2.68	23.7	28	1.18	0.773	14.8	17	2.3
C1-Biphenyls	1.98	2.06	19.5	20.7	0.579	0.519	7.76	8.76	1.24
C1-Dibenzothiophenes	0.914	1.07	9.59	10.5	0.307	0.156	4.63	6.12	0.517
C1-Fluoranthenes/Pyrenes	4.62	3.02	23.8	27.1	1.08	1.1	24.2	28.6	3.79
C1-Fluorenes	1.86	1.64	11.8	14.2	0.497	0.521	7.57	8.76	1.03
C1-Naphthalenes	6.83	6.03	71.3	72.9	1.73	1.86	47	52.1	2.6
C2-Phenanthrenes/Anthracenes	7.63	4.23	35.2	37.8	1.5	1.46	3.69	45.6	2.7
C2-Benzo[a]anthracenes/Chrysenes	5.44	1.29	16.7	18.3	0.759	0.703	11.1	13.7	1.21
C2-Benzofluoranthenes/Benzopyrenes	2.94	0.874	11.1	13.2	< 0.169	< 0.177	5.1	4.99	0.592
C2-Biphenyls	2.25	1.6	11.3	12.1	0.589	0.633	7.07	7.94	0.918
C2-Dibenzothiophenes	1.58	1.24	15.2	17	0.435	0.452	8.44	10.6	0.722
C2-Fluoranthenes/Pyrenes	6.85	2.65	25.8	28.4	1.07	1.18	24.7	26.9	1.96
C2-Fluorenes	3.93	3.93	16	17.2	1.38	1.11	12.5	18	2.15
C2-Naphthalenes	17.959	12.159	101.059	105.059	6.059	4.399	96.359	118.059	6.459
C3-Benzo[a]anthracenes/Chrysenes	1.11	0.119	2.95	3	< 0.0476	< 0.0431	2.02	1.87	< 0.0559
C3-Dibenzothiophenes	1.12	0.776	9.52	10.6	0.206	0.392	7.47	6.57	0.388
C3-Fluoranthenes/Pyrenes	4.1	1.07	7.44	10.1	1.39	0.525	9	9.1	0.913
C3-Fluorenes	4.04	1.33	11.6	13.1	0.715	0.233	12.4	13.6	0.528
C3-Naphthalenes	13.7	6.13	55.8	60	2.58	3.42	101	144	1.58
C3-Phenanthrenes/Anthracenes	5.36	2.03	18.2	19.9	0.84	0.863	23.4	30.8	1.07
C4-Benzo[a]anthracenes/Chrysenes	0.195	0.345	1.36	1.06	< 0.0544	< 0.044	0.938	2.08	< 0.051
C4-Dibenzothiophenes	0.153	0.176	3.85	3.92	< 0.0693	< 0.0731	1.98	2.49	< 0.0514
C4-Fluoranthenes/Pyrenes	1.81	0.186	2.52	3.72	< 0.0284	0.062	1.8	2.12	< 0.0696
C4-Naphthalenes	7.08	2.21	19.5	19.6	1.07	1.26	46.6	67.7	0.396
C4-Phenanthrenes/Anthracenes	11.2	6.88	83.2	88.2	2.18	2.02	59.9	76	6.15
Chrysene	1.812	2.072	16.372	18.772	0.806	0.611	14.872	14.972	3.032
Dibenz[a,h]anthracene	0.215	0.214(NDR)	2.336	2.586	0.108	0.092	2.276	2.476	0.302
Dibenzothiophene	0.613	0.81	4.32	4.86	0.222	0.162	2.94	3.63	0.414
Fluoranthene	1.761	2.451	11.251	12.751	0.949	0.778	24.551	27.451	3.741
Fluorene	0.754	0.911	5.3	5.77	0.233	0.168	3.43	3.99	0.732
Indeno[1,2,3-cd]pyrene	0.97	0.843	3.61	4.72	0.9(NDR)	0.852(NDR)	11.92	14.12	0.918(NDR)
Naphthalene	1.786	2.206	22.766	22.366	0.473	0.403	20.866	20.966	1.286
Perylene	4.92	14.3	17.5	20.4	5.28	2.3	15.3	19	13.5
Phenanthrene	5.35	5.83	34.81	38.31	1.76	1.64	31.71	34.11	6.63
Pyrene	1.869	1.879	11.069	12.769	0.778	0.614	23.169	25.169	3.419
Retene	3.77	2.63	24.9	25.2	0.948	0.807	23.8	30.1	3.28

Table 14. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for perfluorinated organics (PFAS). All values are reported in ng/g dry weight. < = values below reporting limit (RL).

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-004	SRKW-20-004 (Duplicate)	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
PFBA	< 0.156	< 0.155	< 0.171	< 0.154	< 0.151	< 0.151	< 0.42	< 0.38	< 0.162
PFPeA	< 0.0779	< 0.0773	< 0.0853	< 0.0772	< 0.0756	< 0.0757	< 0.21	< 0.19	< 0.081
PFHxA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFHpA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFOA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	0.142	0.129	< 0.0405
PFNA	< 0.0389	0.086	0.107	< 0.0386	< 0.0378	0.077	0.254	0.232	< 0.0405
PFDA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	0.196	0.177	< 0.0405
PFUnA	< 0.0389	0.077	0.088	< 0.0386	0.042	0.07	0.285	0.223	< 0.0405
PFDoA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFTTrDA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	0.133	0.106	< 0.0405
PFTeDA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFBS	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFPeS	< 0.0391	< 0.0389	< 0.0429	< 0.0388	< 0.038	< 0.038	< 0.105	< 0.0954	< 0.0407
PFHxS	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFHpS	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFOS	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	0.465	0.472	< 0.0405
PFNS	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
PFDS	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	0.135	0.139	< 0.0405
PFDoS	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
4:2 FTS	< 0.156	< 0.155	< 0.171	< 0.154	< 0.151	< 0.151	< 0.42	< 0.38	< 0.162
6:2 FTS	< 0.14	< 0.139	< 0.154	< 0.139	< 0.136	< 0.136	< 0.378	< 0.342	< 0.146
8:2 FTS	< 0.156	< 0.155	< 0.171	< 0.154	< 0.151	< 0.151	< 0.42	< 0.38	< 0.162
PFOSA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
N-MeFOSA	< 0.0448	< 0.0445	< 0.0491	< 0.0444	< 0.0435	< 0.0435	< 0.121	< 0.109	< 0.0465
N-EtFOSA	< 0.0974	< 0.0966	< 0.107	< 0.0964	< 0.0945	< 0.0946	< 0.262	< 0.237	< 0.101
MeFOSAA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
EtFOSAA	< 0.0389	< 0.0387	< 0.0427	< 0.0386	< 0.0378	< 0.0378	< 0.105	< 0.0949	< 0.0405
N-MeFOSE	< 0.389	< 0.387	< 0.427	< 0.386	< 0.378	< 0.378	< 1.05	< 0.949	< 0.405
N-EtFOSE	< 0.291	< 0.289	< 0.319	< 0.289	< 0.283	< 0.283	< 0.785	< 0.71	< 0.303
HFPO-DA	< 0.148	< 0.147	< 0.162	< 0.147	< 0.144	< 0.144	< 0.399	< 0.361	< 0.154
ADONA	< 0.156	< 0.155	< 0.171	< 0.154	< 0.151	< 0.151	< 0.42	< 0.38	< 0.162
9Cl-PF3ONS	< 0.156	< 0.155	< 0.171	< 0.155	< 0.152	< 0.152	< 0.421	< 0.381	< 0.162
11Cl-PF3OUdS	< 0.156	< 0.155	< 0.171	< 0.155	< 0.151	< 0.152	< 0.42	< 0.38	< 0.162

Table 15. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for pharmaceutical and personal care products (PPCPs). All values are reported in ng/g dry weight. < = values below reporting limit (RL). NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration. Blanks = data not quantifiable.

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-004	SRKW-20-004 (Duplicate)	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
<i>List 1 - Acid Extraction in Positive Ionization</i>									
Acetaminophen	< 14.7	< 15.4	< 15	< 14.6	< 14.2	< 14.7	< 12.1	< 12.2	< 14.8
Azithromycin									
Caffeine	< 14.7	< 15.4	< 15	< 14.6	< 14.2	< 14.7	< 12.1	< 12.2	< 14.8
Carbadox							< 1.21		< 1.48
Carbamazepine	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Cefotaxime							< 48.5		< 59.4
Ciprofloxacin									
Clarithromycin	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Clinafloxacin									
Cloxacillin							< 2.42		< 2.97
Dehydronifedipine							< 0.485		< 0.594
Digoxigenin							< 12.1		< 14
Digoxin							< 4.85		< 5.94
Diltiazem							< 0.305		< 0.297
1,7-Dimethylxanthine	< 59	< 61.7	< 59.8	< 58.3	< 56.6	< 58.6	< 48.5	< 49	< 59.4
Diphenhydramine							0.891		< 0.594
Enrofloxacin									
Erythromycin-H2O	< 2.44	< 2.37	< 2.29	< 2.23	3.96	< 2.25	< 1.86		< 2.28
Flumequine							< 1.21		< 1.48
Fluoxetine	< 4.39	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Lincomycin							< 2.42		< 2.97
Lomefloxacin									
Miconazole							< 1.21		< 1.48
Norfloxacillin									
Norgestimate							< 2.42		< 7.65
Ofloxacin									
Ormetoprim							< 0.485		< 0.594
Oxacillin							< 2.42		< 2.97
Oxolinic Acid							< 0.485		< 0.594
Penicillin G							< 2.42		< 2.97
Penicillin V							< 2.42		< 2.97
Roxithromycin	< 0.295	< 0.309	< 0.299	< 0.291	< 0.283	< 0.293	< 0.242	< 0.245	< 0.297

	SRKW- 20-001	SRKW- 20-002	SRKW- 20-003	SRKW- 20-004	SRKW- 20-004 (Duplicate)	SRKW- 20-005	SRKW- 20-006	SRKW- 20-007	COW-20- Sept
Sarafloxacin	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Sulfachloropyridazine	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Sulfadiazine	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Sulfadimethoxine	< 0.295	< 0.309	< 0.705	< 0.296	< 0.377	< 0.293	< 0.242	< 0.248	< 0.297
Sulfamerazine	< 0.59	< 0.617	< 0.598	< 0.583	< 0.675	< 0.586	< 0.485	< 0.49	< 0.594
Sulfamethazine	< 0.59	< 0.786	< 1.41	< 0.583	< 0.566	< 0.586	< 0.626	< 0.49	< 0.594
Sulfamethizole	< 0.67	< 0.617	< 0.598	< 0.608	< 0.737	< 0.586	< 0.485	< 0.49	< 0.673
Sulfamethoxazole	< 0.59	< 0.651	< 0.598	< 0.583	< 0.733	< 0.586	< 0.485	< 0.49	< 0.594
Sulfanilamide	< 14.7	< 15.4	< 15	< 14.6	< 16.9	< 14.7	< 12.1	< 12.2	< 14.8
Sulfathiazole	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Thiabendazole	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42		< 1.21		< 1.48
Trimethoprim	< 1.47	2.78	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Tylosin	< 5.9	< 6.17	< 5.98	< 5.83	< 5.66	< 5.86	< 4.85	< 4.9	< 5.94
Virginiamycin M1							< 2.42		< 2.97
List 2 - Tetracyclines in Positive Ionization									
Anhydrochlortetracycline [ACTC]		< 15.4	< 15	< 14.6	< 14.2		< 12.1		< 14.8
Anhydrotetracycline [ATC]		< 15.4	< 15	< 14.6	< 14.2		< 12.1		< 14.8
Chlortetracycline [CTC]		< 6.17	< 5.98	< 5.83	< 5.66		< 4.85		< 5.94
Demeclocycline		< 15.4	< 15	< 14.6	< 14.2		< 12.1		< 14.8
Doxycycline		< 6.17	< 5.98	< 5.83	< 5.66		< 4.85		< 5.94
4-Epianhydrochlortetracycline [EACTC]		< 61.7	< 59.8	< 58.3	< 56.6		< 48.5		< 59.4
4-Epianhydrotetracycline [EATC]		< 15.4	< 15	< 14.6	< 14.2		< 12.1		< 14.8
4-Epichlortetracycline [ECTC]		< 15.4	< 15	< 14.6	< 14.2		< 12.1		< 14.8
4-Epioxytetracycline [EOTC]		< 6.17	< 5.98	< 5.83	< 5.66		< 4.85		< 5.94
4-Epitetracycline [ETC]		< 6.17	< 5.98	< 5.83	< 5.66		< 4.85		< 5.94
Isochlortetracycline [ICTC]		< 6.17	< 5.98	< 5.83	< 5.66		< 4.85		< 5.94
Minocycline		< 61.7	< 59.8	< 58.3	< 56.6		< 48.5		< 59.4
Oxytetracycline [OTC]		< 6.17	< 5.98	< 5.83	< 5.66		< 4.85		< 5.94
Tetracycline [TC]		< 6.17	< 5.98	< 5.83	< 5.66		< 4.85		< 5.94
List 3 - Acid Extraction in Negative Ionization									
Bisphenol A	< 5.9	< 6.17	< 5.98	< 5.83	< 5.66	< 5.86	< 4.85	< 4.9	< 5.94
Furosemide	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Gemfibrozil	< 0.786	< 0.823	< 0.797	< 0.777	< 0.755	< 0.781	< 0.646	< 0.653	< 0.792
Glipizide	< 0.786	< 0.823	< 0.797	< 0.777	< 0.755	< 0.781	< 0.646	< 0.653	< 0.792
Glyburide	< 0.786	< 0.823	< 0.797	< 0.777	< 0.755	< 0.781	< 0.646	< 0.653	< 0.792
Hydrochlorothiazide	< 8.65	< 9.05	< 8.77	< 8.55	< 8.31	< 8.6	< 7.11	< 7.18	< 8.71
2-Hydroxy-ibuprofen	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Ibuprofen	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96

	SRKW- 20-001	SRKW- 20-002	SRKW- 20-003	SRKW- 20-004	SRKW- 20-004 (Duplicate)	SRKW- 20-005	SRKW- 20-006	SRKW- 20-007	COW-20- Sept
Naproxen	< 1.97	< 2.06	< 1.99	< 1.94	< 1.89	< 1.95	< 1.62	< 1.63	< 1.98
Triclocarban	< 0.393	< 0.412	< 0.399	< 0.389	< 0.378	< 0.391	2.15	1.85	< 0.396
Triclosan	< 5.9	< 6.17	< 5.98	< 5.83	< 5.66	< 5.86	< 4.85	< 4.9	< 5.94
Warfarin	< 0.393	< 0.412	< 0.399	< 0.389	< 0.378	< 0.391	< 0.323	< 0.327	< 0.396
List 4 - Basic Extraction in Positive Ionization									
Albuterol	< 0.296	< 0.308	< 0.298	< 0.289	< 0.282	< 0.29	< 0.241	< 0.246	< 0.299
Amphetamine	< 0.296	< 0.308	< 0.298	< 0.289	< 0.282	< 0.29	< 0.241	< 0.246	< 0.299
Atenolol	< 0.296	< 0.308	< 0.298	< 0.289	< 0.282	< 0.29	< 0.241	< 0.246	< 0.299
Atorvastatin									< 1.2
Cimetidine	< 0.591	< 0.616	< 0.595	< 0.578	< 0.564	< 0.58	< 0.481	< 0.492	< 0.598
Clonidine	< 1.18	< 1.23	< 1.19	< 1.16	< 1.13	< 1.16	< 0.962	< 0.985	< 1.2
Codeine	< 1.18	< 1.23	< 1.19	< 1.16	< 1.13	< 1.16	< 0.962	< 0.985	< 1.2
Cotinine	< 0.296	< 0.308	< 0.298	< 0.289	< 0.282	< 0.29	< 0.241	< 0.246	< 0.299
Enalapril	< 0.296	< 0.308	< 0.298	< 0.289	< 0.282	< 0.29	< 0.241	< 0.246	< 0.299
Hydrocodone	< 1.18	< 1.23	< 1.19	< 1.16	< 1.13	< 1.16	< 0.962	< 0.985	< 1.2
Metformin	< 0.296	< 0.308	< 0.298	< 0.289	0.293	< 0.29	0.559	0.471	< 0.299
Oxycodone	< 0.591	< 0.616	< 0.595	< 0.578	< 0.564	< 0.58	< 0.481	< 0.492	< 0.598
Ranitidine	< 0.591	< 0.616	< 0.595	< 0.578	< 0.564	< 0.58	< 0.481	< 0.492	< 0.598
Triamterene	< 0.296	< 0.308	< 0.298	< 0.289	< 0.282	< 0.29	< 0.241	< 0.246	< 0.299
List 5 - Acid Extraction in Positive Ionization									
Alprazolam	< 0.295	< 0.309	< 0.299	< 0.291	< 0.283	< 0.293	< 0.242	< 0.245	< 0.297
Amitriptyline	< 1.23	< 0.328	< 0.944	< 0.358	< 0.429	< 1.59	< 0.242	< 1.12	< 0.297
Amlodipine	< 0.989	< 1.04	< 1	< 0.977	< 0.95	< 0.983	< 0.812	< 0.821	< 0.996
Benzoyllecgonine	< 0.147	< 0.154	< 0.15	< 0.146	< 0.142	< 0.147	< 0.121	< 0.122	< 0.148
Benztropine	< 0.688	< 0.72	< 0.698			< 0.741	< 0.565		< 0.693
Betamethasone	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Cocaine	< 0.147	< 0.154	< 0.15			< 0.147	< 0.121		< 0.148
DEET	0.01	0.27	0	0.16	0.08	0	0	0	0.61
Desmethyldiltiazem	< 0.147	< 0.154	< 0.15	< 0.146	< 0.142	< 0.147	< 0.121	< 0.122	< 0.148
Diazepam	< 0.493	< 0.516	< 0.5	< 0.488	< 0.474	< 0.49	< 0.405	< 0.41	< 0.497
Fluocinonide	< 1.98	< 2.07	< 2	< 1.95	< 1.9	< 1.96	< 1.62	< 1.64	< 1.99
Fluticasone propionate	< 1.98	< 2.07	< 2	< 1.95	< 1.9	< 1.96	< 1.62	< 1.64	< 1.99
Hydrocortisone	< 5.9	< 6.17	< 5.98	< 5.83	< 5.66	< 5.86	< 4.85	< 4.9	< 5.94
10-hydroxy-amitriptyline							< 0.121		< 0.148
Meprobamate	< 1.47	< 1.54	< 1.5	< 1.46	< 1.42	< 1.47	< 1.21	< 1.22	< 1.48
Methylprednisolone	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Metoprolol	< 0.493	< 0.516	< 0.5	< 0.488	< 0.474	< 0.49	< 0.405	< 0.992	< 0.497
Norfluoxetine	< 0.493	< 0.516	< 0.5	< 0.488	< 0.474	< 0.49	< 0.405	< 0.41	< 0.497

	SRKW- 20-001	SRKW- 20-002	SRKW- 20-003	SRKW- 20-004	SRKW- 20-004 (Duplicate)	SRKW- 20-005	SRKW- 20-006	SRKW- 20-007	COW-20- Sept
Norverapamil	< 0.147	< 0.154	< 0.15	< 0.146	< 0.142	< 0.147	< 0.121		< 0.148
Paroxetine	< 0.989	< 1.04	< 3.17	< 0.977	< 0.95	< 0.983	< 0.812	< 0.821	< 0.996
Prednisolone	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Prednisone	< 5.9	< 6.17	< 5.98	< 5.83	< 5.66	< 5.86	< 4.85	< 4.9	< 5.94
Promethazine	< 0.295	< 0.309	< 0.43	< 0.291	< 0.283	< 0.293	< 0.242	< 0.331	< 0.297
Propoxyphene	< 0.295	< 0.309	< 0.299	< 0.291	< 0.283	< 0.293	< 0.242	< 0.245	< 0.297
Propranolol	< 1.66	< 0.309	< 0.299	< 0.526	< 0.283	< 1.95	< 0.242	< 1.93	< 0.297
Sertraline	< 0.381	< 0.309	< 0.299	< 0.291	< 0.283	< 0.77	< 0.242	< 0.585	< 0.297
Simvastatin	< 1.98	< 2.07	< 2	< 1.95	< 1.9	< 1.96	< 1.62	< 1.64	< 1.99
Theophylline	< 5.9	< 6.17	< 5.98	< 5.83	< 5.66	< 5.86	< 4.85	< 4.9	< 5.94
Trenbolone	< 1.98	< 2.07	< 2	< 1.95	< 1.9	< 1.96	< 1.62	< 1.64	< 1.99
Trenbolone acetate	< 0.295	< 0.309	< 0.299	< 0.291	< 0.283	< 0.293	< 0.242	< 0.245	< 0.297
Valsartan	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Verapamil	< 0.174	< 0.186	< 0.15	< 0.146	< 0.142	< 0.147	< 0.121	< 0.122	< 0.148
List 6 - Acid Extraction in Positive Ionization									
Amsacrine							< 0.0323		
Azathioprine	< 0.983	< 1.03	< 0.997	< 0.972	< 0.944	< 0.977	< 0.808	< 0.816	< 0.99
Busulfan	< 1.97	< 2.06	< 1.99	< 1.94	< 1.89	< 1.95	< 1.62	< 1.63	< 1.98
Citalopram	< 1.55	< 1.38	< 3.93			< 1.3	< 0.323		< 0.408
Clotrimazole	< 0.564	< 0.842	< 0.399	< 0.454	< 0.378	< 0.391	< 0.323	< 0.63	< 0.396
Colchicine	< 0.786	< 0.823	< 0.797	< 0.777	< 0.755	< 0.781	< 0.646	< 0.653	< 0.792
Cyclophosphamide	< 0.393	< 0.412	< 0.399	< 0.389	< 0.378	< 0.391	< 0.323	< 0.327	< 0.396
Daunorubicin	< 1.97	< 2.06	< 1.99	< 1.94	< 1.89	< 1.95	< 1.62	< 1.74	< 1.98
Diatrizoic acid	< 11.8	< 12.3	< 12	< 11.7	< 11.3	< 11.7	< 9.69	< 9.8	< 11.9
Doxorubicin							< 4.85		< 5.94
Drospirenone	< 7.86	< 8.23	< 7.97	< 7.77	< 7.55	< 7.81	< 6.46	< 6.53	< 7.92
Etoposide	< 0.983	< 1.03	< 0.997	< 0.972	< 0.944	< 0.977	< 0.808	< 0.816	< 0.99
Iopamidol	< 78.6	< 82.3	< 79.7	< 77.7	< 75.5	< 78.1	< 64.6	< 65.3	< 79.2
Medroxyprogesterone Acetate	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Melphalan	< 23.6	< 24.7	< 23.9	< 23.3	< 22.7	< 39.9	< 19.4	< 63.3	< 23.8
Metronidazole	< 1.97	< 2.06	< 1.99	< 1.94	< 1.89	< 1.95	< 1.62	< 1.63	< 1.98
Moxifloxacin									
Oxazepam	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Rosuvastatin	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Tamoxifen	< 0.393	< 0.412	< 0.399	< 0.389	< 0.378	< 0.391	< 0.323	< 0.327	< 0.396
Teniposide	< 3.93	< 4.12	< 3.99	< 3.89	< 3.78	< 3.91	< 3.23	< 3.27	< 3.96
Venlafaxine							< 0.323		< 0.396
Zidovudine	< 5.9	< 6.17	< 5.98	< 5.83	< 5.66	< 5.86	< 4.85	< 4.9	< 5.94

Table 16. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for chlorinated paraffins. All values are reported in ng/g dry weight. < = values below reporting limit (RL). NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration. Blanks = data not quantifiable.

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	SRKW-20-007 (Duplicate)	COW-20-Sept
C10C15	< 0.306	< 0.841	< 0.889	< 0.826	< 0.353	< 2.15	< 0.53	< 1.82	< 0.914
C10C16	< 0.11	< 0.143	< 0.213	< 0.124	< 0.0799	< 0.716	< 0.403	< 0.538	< 0.156
C10C17	< 0.125	< 0.11	< 0.207	< 0.121	< 0.121	< 0.782	< 0.603	< 0.552	< 0.118
C10C18	< 0.103	< 0.108	< 0.0868	< 0.108	< 0.0948	< 0.644	< 0.541	< 0.527	< 0.321
Sum C10	0	0	0	0	0	0	0	0	0
C11C15	< 0.15	< 0.0026	< 0.279	< 0.999	< 0.0024	< 1.74	< 0.709	< 2.29	< 0.418
C11C16	< 0.0743	< 0.0927	< 0.104	< 0.0719	< 0.0695	< 0.317	< 0.501	< 0.508	< 0.301
C11C17	< 0.0694	< 0.0665	< 0.0833	< 0.0859	< 0.0573	< 0.307	< 0.395	< 0.301	< 0.12
C11C18	< 0.181	< 0.161	< 0.218	< 0.244	< 0.169	< 0.771	< 0.817	< 0.725	< 0.359
C11C19	< 0.0808	< 0.0893	< 0.154	< 0.102	< 0.0999	< 0.588	< 0.697	< 0.508	< 0.189
Sum C11	0	0	0	0	0	0	0	0	0
C12C15	< 0.0037	< 0.0015	< 0.106	< 0.0015	< 0.088	< 1.91	< 1.47	< 0.0067	< 0.116
C12C16	< 0.0877	< 0.0849	< 0.104	< 0.0825	< 0.0616	< 0.33	< 0.472	< 0.44	< 0.155
C12C17	< 0.0382	< 0.0435	< 0.0716	< 0.0405	< 0.0338	< 0.209	< 0.327	< 0.154	< 0.0859
C12C18	< 0.0439	< 0.0336	< 0.0678	< 0.0606	< 0.0572	< 0.225	< 0.337	< 0.241	< 0.0965
C12C19	< 0.0757	< 0.0351	< 0.142	< 0.0903	< 0.0509	< 0.273	< 0.414	< 0.38	< 0.105
C12C110	< 0.0587	< 0.0428	< 0.0597	< 0.0509	< 0.037	< 0.336	< 0.225	< 0.252	< 0.0956
Sum C12	0	0	0	0	0	0	0	0	0
C13C15	< 0.0396	< 0.128	< 0.0526	< 0.011	< 0.0009	< 0.0048	< 0.307	< 0.427	< 0.002
C13C16	< 0.0507	< 0.0377	< 0.0575	< 0.0296	< 0.049	< 0.168	< 0.197	< 0.155	< 0.0737
C13C17	< 0.0307	< 0.0262	< 0.0354	< 0.0349	< 0.0186	< 0.151	< 0.15	< 0.098	< 0.049
C13C18	< 0.462	< 0.368	< 0.585	< 0.439	< 0.386	< 2.11	< 2.32	< 1.59	< 0.53
C13C19	< 0.0683	< 0.0736	< 0.0724	< 0.0802	< 0.0423	< 0.242	< 0.316	< 0.215	< 0.102
C13C110	< 0.0495	< 0.0663	< 0.0798	< 0.0799	< 0.0404	< 0.33	< 0.413	< 0.3	< 0.143
Sum C13	0	0	0	0	0	0	0	0	0
C14C15	< 0.002	< 0.0091	< 0.0059	< 0.0065	< 0.0033	< 0.109	< 0.0066	< 0.0002	< 0.0656
C14C16	< 0.0476	< 0.0536	0.427(NDR)	0.255(NDR)	< 0.045	< 0.291	< 0.437	< 0.251	< 0.141
C14C17	< 0.126	< 0.194	< 0.213	< 0.243	< 0.177	< 0.995	< 0.691	< 0.752	< 0.278
C14C18	< 0.354	< 0.239	< 0.264	< 0.237	< 0.27	< 1.12	< 1.4	< 1.03	< 0.297
C14C19	< 0.282	< 0.299	< 0.513	< 0.278	< 0.406	< 1.38	< 1.38	< 1.47	< 0.812
C14C110	< 0.0206	< 0.0287	< 0.0384	< 0.0235	< 0.0225	< 0.0988	< 0.169	< 0.13	< 0.054
C14C111	< 0.0199	< 0.0284	< 0.0284	< 0.0221	< 0.0161	< 0.135	< 0.0594	< 0.0618	< 0.0369

Table 17. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for metals. < = values below reporting limit (RL).

	Units	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
Total Organic Carbon (TOC)	(%)	0.382	1.11	1.66	0.562	<0.731	3.46	3.81	0.556
Metals									
aluminum	mg/kg	14600	10200	24200	5680	3410	21700	18800	20800
antimony	mg/kg	0.31	0.28	0.71	0.20	0.18	1.04	0.71	0.17
arsenic	mg/kg	4.20	4.84	17.1	2.94	1.64	7.95	8.54	4.12
barium	mg/kg	11.8	40.1	103	18.0	17.3	76.1	69.8	18.6
beryllium	mg/kg	0.24	0.23	0.46	0.12	0.14	0.48	0.44	0.35
bismuth	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	0.27	<0.20	<0.20
boron	mg/kg	26.4	32.5	30.3	16.1	31.5	76.6	71.8	10.1
cadmium	mg/kg	0.130	0.298	0.134	1.47	0.129	0.386	0.323	0.094
calcium	mg/kg	20000	20800	11800	7280	149000	10200	9330	8820
chromium	mg/kg	34.7	21.3	33.4	13.0	9.35	36.1	33.7	39.6
cobalt	mg/kg	8.88	6.46	14.2	2.80	2.74	22.5	15.1	15.0
copper	mg/kg	12.8	12.1	43.2	6.02	4.49	82.0	62.4	34.4
iron	mg/kg	26100	20300	43400	8670	11500	30600	26000	35900
lead	mg/kg	3.26	4.65	10.5	2.21	2.59	19.2	15.5	2.72
lithium	mg/kg	16.2	11.5	25.7	5.5	5.2	24.4	20.8	22.1
magnesium	mg/kg	9480	7070	12800	3340	4080	15600	13100	14200
manganese	mg/kg	319	262	609	111	115	1170	395	486
mercury	mg/kg	0.0313	0.0374	0.0661	0.0270	0.0138	0.144	0.126	0.0192
molybdenum	mg/kg	0.45	0.60	1.24	0.49	0.16	1.25	2.04	0.39
nickel	mg/kg	21.2	16.7	30.5	10.8	6.42	35.6	30.7	25.5
phosphorus	mg/kg	464	931	1480	562	333	916	755	952
potassium	mg/kg	1270	2440	3390	1090	1600	5330	4780	830
selenium	mg/kg	<0.20	0.56	0.52	0.42	0.34	1.70	1.84	<0.20
silver	mg/kg	<0.10	<0.10	0.19	<0.10	<0.10	0.26	0.31	<0.10
sodium	mg/kg	4490	12900	15000	5960	6700	46600	38900	3490
strontium	mg/kg	82.3	113	84.9	38.8	550	87.0	79.8	62.1
sulfur	mg/kg	1100	2100	2100	1300	<1000	6100	8700	1100
thallium	mg/kg	0.227	0.157	0.106	0.462	0.082	0.101	0.090	<0.050
tin	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
titanium	mg/kg	907	510	988	475	160	1010	1020	1830
tungsten	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
uranium	mg/kg	0.392	0.754	0.923	0.499	0.492	1.86	2.10	0.558
vanadium	mg/kg	62.6	40.2	87.6	20.7	15.4	78.5	64.7	102
zinc	mg/kg	40.7	51.2	110	26.5	26.4	113	97.3	60.5
zirconium	mg/kg	2.7	1.5	3.1	1.4	<1.0	5.4	5.9	7.1
Extractable Metals									
cadmium	µmole/g	<0.0050	<0.0050	<0.0050	0.0117	<0.0222	<0.0088	<0.0050	<0.0050
copper	µmole/g	0.016	0.062	0.247	0.017	<0.047	0.884	0.431	0.097

	Units	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
lead	μmole/g	<0.020	<0.020	0.028	<0.020	<0.070	0.120	0.063	<0.020
mercury	μmole/g	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
nickel	μmole/g	<0.050	0.051	0.061	<0.050	<0.102	0.272	0.138	<0.050
zinc	μmole/g	0.0780	0.219	0.392	0.140	0.101	1.06	0.678	0.0990
Speciated Metals									
methylmercury (as MeHg)	μg/kg	0.168	0.409	0.535	0.320	0.105	0.901	0.814	0.307

Table 18. Sediment samples from sites located outside Southern and Northern Resident Killer Whale Critical Habitat were analyzed for Dioxins (PCDD) and Furans (PCDF). All values are reported in pg/g dry weight. <= values below reporting limit (RL). NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration.

	SRKW-20-001	SRKW-20-002	SRKW-20-003	SRKW-20-003 (Duplicate)	SRKW-20-004	SRKW-20-005	SRKW-20-006	SRKW-20-007	COW-20-Sept
2,3,7,8-TCDD	0.0543(NDR)	< 0.042	0.0515(NDR)	0.102(NDR)	< 0.047	< 0.049	0.447(NDR)	0.53	< 0.046
1,2,3,7,8-PECDD	0.0768	0.0603	0.12	0.166	0.0504	0.0505(NDR)	3.52	3.74	< 0.046
1,2,3,4,7,8-HXCDD	0.0712	0.0505(NDR)	0.128(NDR)	0.108(NDR)	< 0.047	0.0621	1.15	1.34	< 0.046
1,2,3,6,7,8-HXCDD	0.259	0.333	0.725	0.815	0.185	0.217	37.1	49.8	0.249
1,2,3,7,8,9-HXCDD (225)	0.149(NDR)	0.322(NDR)	1.92(NDR)	0.709(NDR)	0.127(NDR)	0.196(NDR)	18.6	23.2	0.138(NDR)
1,2,3,7,8,9-HXCDD	0.207	0.291	0.455	0.719	0.177	0.243	20.3	28.9	0.158(NDR)
1,2,3,4,6,7,8-HPCDD	2.0236	1.7636	4.3036	7.9536	1.1736	1.7736	51.2336	56.1336	1.2936
OCDD	12.7076	7.4676	35.2076	129.9076	4.9976	8.0776	214.9076	194.9076	5.2076
2,3,7,8-TCDF (225)	0.139	0.473	1.89	1.79	0.114(NDR)	0.0959	15.3	17.6	0.0842
2,3,7,8-TCDF	0.224	0.575	1.72	2	0.169	0.151	17.8	20.8	0.136
1,2,3,7,8-PECDF	< 0.049	0.0912(NDR)	0.104(NDR)	0.0842	0.0587	0.0506(NDR)	0.747	0.87	< 0.046
2,3,4,7,8-PECDF	0.0562(NDR)	0.0702(NDR)	0.123(NDR)	0.0617	< 0.047	0.0602(NDR)	1.5	1.78	< 0.046
1,2,3,4,7,8-HXCDF	0.0768(NDR)	0.0581	0.104	0.0661	0.0647(NDR)	0.0674(NDR)	1.05	1.43	0.0499(NDR)
1,2,3,6,7,8-HXCDF	< 0.049	0.0433(NDR)	0.0902(NDR)	0.0521	< 0.047	< 0.049	0.484	0.577	< 0.046
1,2,3,7,8,9-HXCDF	0	0	0.0988(NDR)	0	< 0.047	< 0.049	0.1048	0.0948	< 0.046
2,3,4,6,7,8-HXCDF	0.0557(NDR)	0.0666(NDR)	0.0778(NDR)	0.0492	0.0478(NDR)	0.052	0.93(NDR)	1.07	< 0.046
1,2,3,4,6,7,8-HPCDF	0.4881	0.2481(NDR)	0.7781	0.9631	0.1861	0.3181	11.7331	11.2331	0.8071
1,2,3,4,7,8,9-HPCDF	< 0.049	< 0.042	0.139(NDR)	0.0739	< 0.047	< 0.049	0.473	0.53	< 0.046
OCDF	0.738	0.391	2.52	4.44	0.219	0.32	13.8	11.3	0.577
TOTAL TETRA-DIOXINS	< 0.049	0.227	< 0.049	0.178	0.091	0.0581	11.7	13.7	0.0713
TOTAL PENTA-DIOXINS	0.205	0.279	0.21	0.308	0.169	< 0.049	29.6	30.2	0.184
TOTAL HEXA-DIOXINS	2.27	2.69	5.31	6.02	1.51	2.18	251	339	1.7
TOTAL HEPTA-DIOXINS	6.3236	4.4936	12.7336	19.0336	2.8336	4.0736	107.9336	108.9336	2.7336
TOTAL TETRA-FURANS	0.453	2.14	2.5	3.92	0.857	0.63	44.5	49.1	0.353
TOTAL PENTA-FURANS	< 0.049	0.332	0.208	0.282	0.596	0.465	16.3	16.6	0.389
TOTAL HEXA-FURANS	0.4218	0.1418	0.7198	0.8458	0	0.2398	17.3388	18.0388	0.7758
TOTAL HEPTA-FURANS	1.23	< 0.042	2.84	3.15	0.389	0.629	34.1	26.1	1.78

