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## Environmental Restoration Division ORNL Environmental Restoration Program

# Screening of Contaminants in Waste Area Grouping 2 at Oak Ridge National Laboratory, Oak Ridge, Tennessee

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# **ABBREVIATIONS**

	<b>1 1 1 1 1 1</b>
ARAR	applicable or relevant and appropriate requirement
BAF	bioaccumulation factors
BCF	bioconcentration factors
BMAP	Biological Monitoring and Abatement Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRRFI	Clinch River RFI
DOE	Department of Energy
EC	effective concentration
EPA	Environmental Protection Agency
ER	environmental restoration
ESP	Environmental Surveillance Program
FFA	Federal Facility Agreement
HEAST	Health Effects Assessment Summary Tables
HFIR	High Flux Isotope Reactor
HRE	Homogeneous Reactor Experiment
HSWA	Hazardous and Solid Waste Amendments
IRIS	Integrated Risk Information System
LC	lethal concentrations
LD	lethal dose
NAWQC	National Ambient Water Quality Criteria
NOEC	no observed effects concentration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
PCB	polychlorinated biphenyl
QSAR	quantitative structure-activity relationships
RCRA	Resource Conservation and Recovery Act of 1976
RFD	reference dose
RFI	RCRA facility investigation
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
SARA	Superfund Amendments and Reauthorization Act of 1986
SI	screening index
TDEC	Tennessee Department of Environment and Conservation
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
UCL	upper confidence limit
WAG	waste area grouping
WOC	White Oak Creek
WOCE	White Oak Creek Embayment
WOL	White Oak Lake
WOD	White Oak Dam
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### EXECUTIVE SUMMARY

Waste Area Grouping 2 (WAG 2) of the Oak Ridge National Laboratory (ORNL) is located in the White Oak Creek Watershed and is composed of White Oak Creek Embayment, White Oak Lake and associated floodplain, and portions of White Oak Creek (WOC) and Melton Branch downstream of ORNL facilities. Contaminants leaving other ORNL WAGs in the WOC watershed pass through WAG 2 before entering the Clinch River. Health and ecological risk screening analyses were conducted on contaminants in WAG 2 to determine which contaminants were of concern and would require immediate consideration for remedial action and which contaminants could be assigned a low priority for further study.

For screening purposes, WAG 2 was divided into four geographic reaches: Reach 1, a portion of WOC; Reach 2, Melton Branch; Reach 3, White Oak Lake and the floodplain area to the weirs on WOC and Melton Branch; and Reach 4, the White Oak Creek Embayment, for which an independent screening analysis has been completed.

Screening analyses were conducted using data bases compiled from existing data on carcinogenic and noncarcinogenic contaminants, which included organics, inorganics, and radionuclides. Contaminants for which at least one sample had a concentration above the level of detection were placed in a detectable contaminants data base. Those contaminants for which all samples were below the level of detection were placed in a nondetectable contaminants data base.

Health Risk. Screening indices were used to evaluate the potential human health risk from contaminants found in WAG 2. The screening index for a carcinogen is an estimate of exposure (ingestion, inhalation, external) multiplied by an Environmental Protection Agency (EPA)-approved or -suggested slope factor to indicate the potential lifetime risk of excess cancer. A risk  $\ge 10^{-4}$  excess cancers for a lifetime exposure to carcinogens is considered an action level by the EPA. Risks between  $10^{-4}$  and  $10^{-6}$  excess cancers per lifetime is a range where risk levels are of concern and negotiation on remedial action alternatives occurs and additional investigation is probably justified. A risk below  $10^{-6}$  excess cancers per lifetime indicates that a carcinogen is of little concern and can be assigned a low priority for further investigation.

Screening indices for noncarcinogens are an estimate of the daily ingestion or inhalation of the contaminant divided by a "reference dose (RfD) factor". The RfD is an EPA-approved daily noncarcinogenic contaminant exposure level below which adverse effects should not occur. For noncarcinogens a screening index  $\geq 1.0$  is considered an action level, an index between 0.1 and 1.0 requires further investigation before taking action, and an index  $\leq 0.1$  indicates a low priority for further action.

A conservative and nonconservative screening approach was used in the health risk analysis. Conservative screening is designed to not underestimate potential risk and was used to identify contaminants with a low priority for further consideration; nonconservative screening is designed to provide a more realistic estimate of potential risk and was used to identify contaminants that have a high priority and require immediate consideration for remedial action. In addition an intruder (illegal hunter/fisherman) scenario was included, which represents a realistic, although highly improbable, situation that could occur under current conditions.

Because relatively high levels of <sup>137</sup>Cs are known to exist in the sediment and floodplain soils of White Oak Lake, the area will require remedial action before public access is allowed. However, WAG 2 is surrounded by a personnel exclusion fence that is patrolled on a regular schedule, and it is highly unlikely that institutional control will be lost in the near future. Therefore, only the following four hypothetical exposure pathways were considered: (1) external exposure to sediment or floodplain soils, (2) ingestion of fish, (3) ingestion of soil, and (4) ingestion of water. Analytical results were available for all media in these pathways.

Nonconservative screening of the carcinogens in the detectable contaminants data bases identified the following as high priority for remedial action: <sup>60</sup>Co in Reaches 1, 2, and 3 for external exposure, <sup>137</sup>Cs in Reaches 1 and 3 for external exposure, PCBs (Aroclor 1254) in Reach 1 and 3 for the fish ingestion, and arsenic in Reaches 2 and 3 for the drinking water pathway. Arsenic is a possible artifact because of the small number of samples with detectable concentrations.

Ten carcinogens (dichlorobromomethane, Aroclor-1254, Aroclor-1260, <sup>137</sup>Cs, <sup>90</sup>Sr, <sup>3</sup>H, <sup>152</sup>Eu, <sup>134</sup>Cs, <sup>154</sup>Eu, and <sup>234</sup>U) in the detectable contaminants data bases were classified as requiring further investigation in one or more reaches. Limited data were available for <sup>134</sup>Cs, <sup>152</sup>Eu, <sup>154</sup>Eu and <sup>234</sup>U for some of the reaches; therefore, additional analyses are needed. Although they were not classified as requiring further action, data for <sup>241</sup>Am, <sup>244</sup>Cm, <sup>238</sup>Pu, and <sup>239</sup>Pu were limited and additional data will be required.

Nonconservative screening of the detectable contaminants data bases for noncarcinogens identified only thallium in Reaches 1, 2, and 3 as a high priority contaminant. However, this is a possible artifact, because only one sample was analyzed in each reach; thus, additional data are needed. Mercury in Reach 1 in the fish ingestion pathway and arsenic in Reach 2 in the water ingestion pathway will also require further investigation because their screening indices were between 0.1 and 1.0.

Conservative screening of the detectable contaminants data bases identified the following as low priority contaminants for further consideration: 3 organics, 12 radionuclides, and most metals in one or more reaches of WAG 2. However, because of limited information on some of these contaminants, additional data will be needed.

For contaminants with no detectable concentrations, a screening was conducted using the nominal value of the detection limits. Results of the nondetectable contaminants data bases should be viewed with caution because of the uncertainty associated with the contaminant concentrations. Nonconservative screening identified as high priority contaminants one organic carcinogen (acenaphthylene) in the fish ingestion pathway and two (benzidine and n-nitrosodimethylamine) in the sediment ingestion pathway as high priority contaminants. However, better detection limits are needed or a review of source-term data is appropriate. None of the noncarcinogens in the nondetectable contaminants data bases were identified by nonconservative screening as high priority contaminants in WAG 2.

Groundwater was screened as an independent pathway. Nonconservative screening of the detectable contaminants data base for groundwater indicated that none of the carcinogens or noncarcinogens could be assigned a high priority. However, because of the lack of verification of the limited data base, additional data will be required for groundwater. Lead was not included in the screening analysis because an EPA-approved RfD was not available, but an EPA Uptake/Biokinetic model predicted that it would be a problem in groundwater in Reaches 1 and 3.

Results of the hypothetical intruder scenario indicated that the potential lifetime risk of excess cancers was  $>10^4$  from the ingestion of fish in Reaches 1 and 3 and from external exposure in Reaches 1, 2, and 3. PCBs and <sup>137</sup>Cs in Reach 1 and PCBs in Reach 3 were the greatest contributors to risk in the fish ingestion pathway. Cobalt-60 and <sup>137</sup>Cs in Reaches 1 and 3 and <sup>60</sup>Co in Reach 2 had screening indices  $>10^4$  in the external exposure pathway.

Ecological Risk. A screening assessment of ecological effects in WAG 2 was conducted concurrently with the human health assessment. This assessment considered three lines of evidence concerning the risks to nonhuman organisms posed by contaminants in WAG 2: biological surveys, toxicity tests of ambient media, and exposure/response analysis for measured contaminant concentrations. The biological survey data indicate that aquatic effects are not severe because a diverse and productive aquatic community is found in WAG 2. However, comparison of the aquatic biota to those of reference streams indicates that the composition of the benthic invertebrate community may be modified and fish reproduction may be disrupted. Biological survey data are not available for terrestrial biota.

Recent toxicity tests of water from WAG 2 do not indicate toxicity to *Ceriodaphnia* dubia or to larval fathead minnows in 7-day exposures. No toxicity tests have been performed on sediments or soils.

Comparison of media concentrations to toxicological benchmarks produced ambiguous results because of the large number of chemicals that were not detected but had limits of detection higher than potentially toxic concentrations. Mercury and PCBs were found at potentially toxic concentrations in both water and sediments in all reaches. Aluminum, cadmium, chromium, copper, and lead exceeded national ambient water quality criteria and state standards, and twelve other metals exceeded potentially toxic concentrations. Of the chemicals that had been detected in sediments and for which available concentrations could be estimated, barium, cobalt, mercury, silver, zinc, benzene, di-n-butyl phthalate, methylene chloride, and PCBs are potentially toxic to benthic organisms. Selenium and possibly cadmium were found in fish flesh at concentrations indicative of toxic effects. Mercury and PCBs occurred in fish flesh at concentrations that are potentially toxic to piscivorous wildlife based on dietary toxicity data, and many other chemicals occurred at concentrations that would exceed the reference dose for human health effects when wildlife consumption rates were used. No analyses could be performed for toxic effects on terrestrial organisms other than piscivorous wildlife.

One can conclude from this evidence that ecotoxicological effects may be occurring in WAG 2, but they are not as severe as would be suggested by the exposure/response analysis using the reported chemical concentrations. This discrepancy is due in part to the conservatism of the screening criteria, but the authors believe that the principal factor is the inappropriateness of many of the analyses as estimators of bioavailable concentrations. Therefore, future activities should focus on estimation of actual exposure levels. In addition, chemical and biological data are needed from terrestrial portions of WAG 2. Future assessments will focus on improving the relevance of exposure/response estimates to conditions in WAG 2 and will continue to attempt to reconcile the three lines of evidence concerning ecological effects.

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## 1. INTRODUCTION

The purpose of this report is to present the results of a health risk and ecological risk screening analysis for Waste Area Grouping 2 (WAG 2) using available data to identify contaminants and environmental pathways that will require either further investigation or immediate consideration for remediation based on the screening indices. The screening analysis will also identify contaminants that can be assigned a low priority for further investigation and those that require additional data.

WAG 2 is located in the White Oak Creek (WOC) watershed and is the integrating WAG for the Oak Ridge National Laboratory (ORNL) because it receives effluents from many upgradient WAGs. WAG 2 receives subsurface flow and surface drainage from the ORNL Main Plant area (WAG 1), from solid waste storage areas (WAGs 3, 4, 5, and 6), liquid waste seepage pits and trenches (WAG 7), and the experimental reactor facilities (WAGs 8 and 9). Any contaminated water from these WAGs flows through WAG 2 to the Clinch River. WAG 2 is surrounded by a personnel exclusion fence that is patrolled on a regular schedule.

A full-scale Remedial Investigation (RI) and an implementation of corrective measures are not planned for WAG 2 until remediation of upgradient WAGs is completed. However, there is an obvious need to have a quantitative understanding of contaminants entering WAG 2 and the fluxes of these contaminants to (1) protect the public and environment, (2) monitor contaminants released from ORNL WAGs, and (3) develop information and data for preparing a remedial action plan for WAG 2. The RI for WAG 2 (ORNL 1990) calls for characterizing the area, monitoring contaminant levels, performing a risk assessment, and identifying remedial action needs and alternatives.

The U. S. Department of Energy (DOE) Oak Ridge Reservation (ORR) was added to the National Priorities List (NPL) in December 1989. A Federal Facility Agreement (FFA) [under Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendment and Reauthorization Act (SARA) and Section 6001 of the Resource Conservation and Recovery Act (RCRA)] between DOE, the Environmental Protection Agency (EPA) Region IV, and the Tennessee Department of Environment and Conservation (TDEC) has been signed. These parties intend to coordinate DOE's CERCLA/RCRA response obligation with the corrective measures required and conducted by DOE under its current permit under the Hazardous and Solid Waste Amendments (HSWA) of 1984 to RCRA of 1976, and they expect that the response actions under the FFA, together with corrective measures, will achieve comprehensive remediation of releases and potential releases of contaminants from ORNL. The current screening analysis is part of WAG 2's RI, which is being initiated in compliance with Section 3004(u) of the HSWA of RCRA.

## 2. DESCRIPTION OF AREA

WAG 2 is located in the WOC watershed, which has a drainage area of approximately 16.8 km<sup>2</sup> (6.5 sq miles) (Fig. 2.1). The creek originates on Chestnut Ridge and flows southward for approximately 2.5 km (1.6 miles) before entering the fenced area of ORNL. As the stream flows through ORNL, the flow rate is increased substantially by waste v ater entering the stream from ORNL facilities. Melton Branch, which has a drainage area of  $3.8 \text{ km}^2$  (1.5 sq miles), enters WOC at km 2.5 (mile 1.56). White Oak Dam (WOD), a small earthen dam constructed in 1943, is located on WOC 1 km (0.6 miles) upstream from the Clinch River. White Oak Creek Embayment (WOCE) extends downstream from WOD to the Clinch River at km 33.5 (mile 20.8).

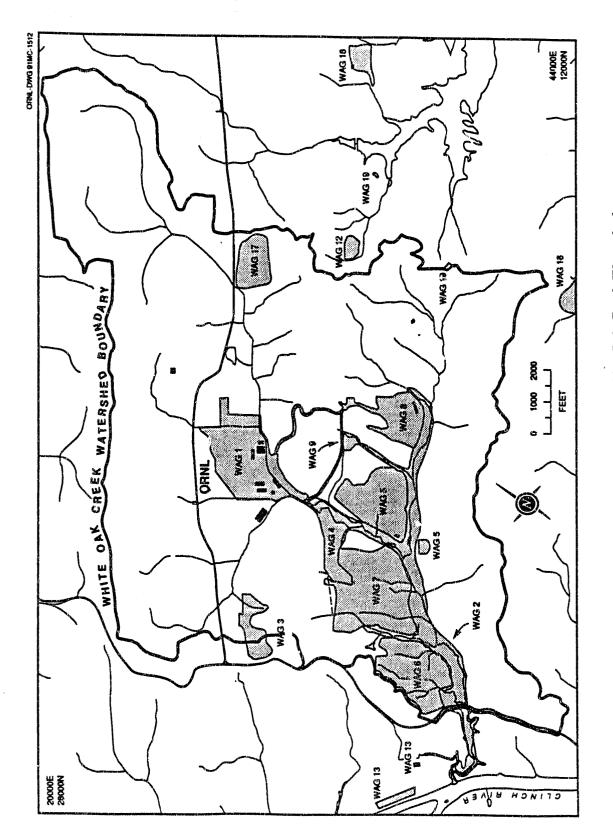
WAG 2 consists of the WOC drainage downstream of the ORNL discharge points and includes associated floodplain and subsurface environments. Because of the large number of waste sites and the hydrologic complexity at ORNL, hydrologic units that contain contiguous remedial action sites have been placed into WAGs. WAG 2 is made up of WOCE, White Oak Lake (WOL) and its former lake bed and current floodplain area, WOC and associated floodplain upstream to WOC km 3.45 at the 7500 Bridge on Melton Valley Drive, and Melton Branch and associated floodplain to Melton Branch km 1.5 just above the tributary entering Melton Branch from the High Flux Isotope Reactor (HFIR). Detailed maps of the area are given in the WAG 2 RI (ORNL 1990). Because WAG 2 interfaces with the other WAGs, the boundaries between WAG 2 and these WAGs have not been clearly defined.

For screening purposes, WAG 2 was divided into 4 units identified as reaches (Fig. 2.2). Reach 1 extends from the weir on WOC at km 2.65 (mile 1.56) to the 7500 bridge on Melton Valley Drive at WOC km 3.54. Reach 2 extends from the weir on Melton Branch at km 0.16 upstream to km 1.5, which is just above the tributary from HFIR. Reach 3 extends upstream from WOD to the WOC and Melton Branch weirs. Reach 4 is WOCE, which is not included in the current screening analysis because an independent screening analysis was completed for the embayment (Blaylock et al. 1991). For a detailed description and history of these areas, see the RI Plan for WAG 2 (ORNL 1990) and the Interim Site Characterization and Contaminant Screening Report on the WOCE (Blaylock et al. 1991).

#### 2.1 WHITE OAK LAKE

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WOL was created in 1943 by placing interlocking steel pilings and a sluice gate upstream from a culvert and road fill that was constructed at km 1.0 on WOC by TVA in 1941. The lake is currently maintained at an elevation of 745 ft msl which results in a standing pond behind the dam of approximately 6.9 ha (17 acres); however, the size of the standing pond has changed many times during the past five decades from the original 17.9 ha (44.2 acres) to about one acre when the lake was drained in 1955 (ORNL 1990, Blaylock et al. 1991).

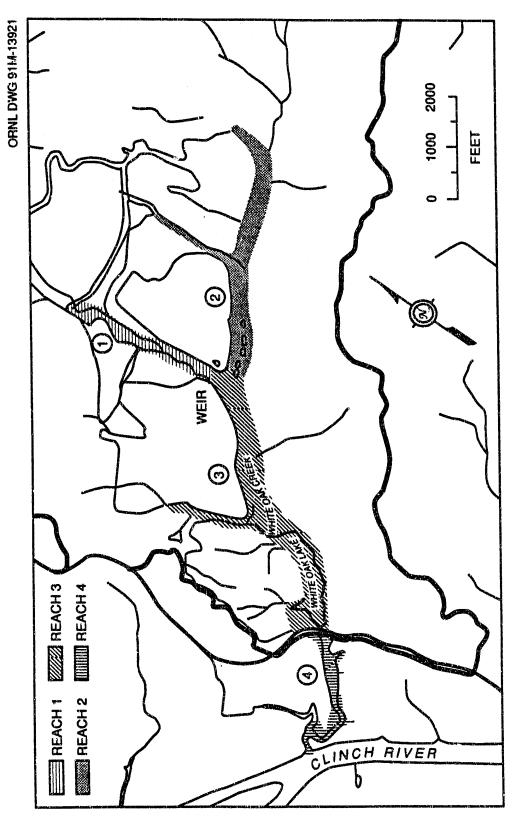


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Fig. 2.1. Waste Area Grouping in White Oak Creek Watershed.

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The lake has served as the final settling basin for low-level radioactive effluents from ORNL since 1943. Although low levels of radioactivity have been released over the dam since 1943, current levels are much lower than releases made in previous years (Table 2.1) (Blaylock et al. 1991). Radionuclides and other contaminants have accumulated in the bottom sediments of WOL (Lomenick and Gardiner 1965; Oakes et al. 1982; Sherwood and Loar 1987; and Loar ed. 1989). The most recent estimate of the radionuclide inventory of 434 Ci of different radionuclides in the sediment of WOL was made by Blaylock and Mohrbacher (Loar ed. 1989) in 1988.

#### 2.2 FLOODPLAIN

The former lake bed and floodplain of WOL and WOC extend from the upper reaches of the standing pond at an elevation of 745 ft msl to WOC and Melton Branch weirs. In 1943, the floodplain area was cleared of trees but is now covered with secondary growth and is being reforested with sycamore, ash, and maple trees. Since WOL is maintained at a lower elevation than when it was first formed, a large portion of the former lake bed is now exposed (ORNL 1990). The former lake bed contains concentrations of radionuclides similar to those in the sediment of WOL.

#### 2.3 WHITE OAK CREEK

Upstream from the lake, WOC is a small stream passing through a second growth forest. The mean annual flow of WOC at the weir (km 2.65) is approximately 230 L/s (Loar ed. 1988; 1991). The floodplain upstream from the weir is covered by forest and contains, at WOC km 3.2 and km 3.4, the former sites of two earthen dikes, which were washed out in 1944. The former ponds, which contained trace quantities of <sup>238</sup>Pu, <sup>239,240</sup>Pu, <sup>241</sup>Am, and <sup>244</sup>Cm, are now a 3-ha contaminated floodplain covered by a second growth forest. This area is estimated to contain 0.5 Ci of <sup>239,240</sup>Pu in the top 20 cm of soil. Another weir and monitoring station is located just below the bridge on Melton Valley Drive at WOC km 3.4.

#### 2.4 MELTON BRANCH

Melton Branch, which originates at the eastern end of Melton Valley and joins WOC at km 2.6 (Fig. 2.1), is the largest tributary of WOC. It is a small stream with an annual average flow of about 60 L/s at the Melton Branch Weir (km 0.16) (Loar ed. 1988; 1991). No flow has been recorded on several occasions during dry periods at the upper gaging station at km 1.93 (Loar ed. 1988). Stream flow in lower Melton Branch is augmented by periodic discharges from several process waste basins and by cooling tower blowdown from HFIR. Cobalt-60 and tritium (<sup>3</sup>H) are the radionuclides that are found at the highest concentrations in Melton Branch.

Year	<sup>137</sup> Cs	<sup>106</sup> Ru	90Sr	<sup>131</sup> I	60Co	зН	TRU <sup>a</sup>
1949	77	110	150	77		NA <sup>b</sup>	0.04 <sup>c</sup>
1950	19	23	38	19			0.04
1951	20	18	29	18			0.08
1952	10	15	72	20			0.03
1953	6	26	130	2			0.08
1954	22	11	140	4	NA		0.07
1955	63	31	93	7	7		0.25
1956	170	29	100	4	46		0.28
1957	89	60	83	1	5		0.15
1958	55	42	150	8	9		0.08
1959	76	520	60	1	77		0.68
1960	31	1900	28	5	72		0.19
1961	15	2000	22	4	31		0.07
1962	6	1400	9	0.4	14		0.06
1963	4	430	8	0.4	14		0.17
1964	6	190	7	0.3	15	1,900	0.08
1965	2	69	3	0.2	12	1,200	0.50
1966	2	29	3	0.2	7	3,100	0.16
1967	3	7	5	0.9	3	13,300	1.03
1968	1	5	3	0.3	1	9,700	0.04
1969	1	2	3	0.5	1	12,200	0.20
1970	2	1	4	0.3	1	9,500	0.40
1971	1	0.5	3	0.2	1	8,900	0.05
1972	2	0.5	6	0.3	1	10,600	0.07
1973	2	0.7	7	0.5	1	15,000	0.08
1974	1	0.2	6	0.2	0.6	8,600	0.02
1975	0.6	0.3	7	0.3	0.5	11,000	0.02
1976	0.2	0.2	5	0.03	0.9	7,400	0.01
1977	0.2	0.2	3	0.03	0.4	6,200	0.03
1978	0.3	0.2	2	0.04	0.4	6,300	0.03
1979	0.2	0.1	2.4	0.04	0.4	7,700	0.03
1980	0.6	0	1.5	0.04	0.4	4,600	0.04
1981	0.2	0.1	1.5	0.04	0.7	2,900	0.04
1982	1.5	0.2	2.7	0.06	1.0	5,400	0.03
1983	1.2	0.2	2.1	0.004	0.3	5,600	0.05
1984	0.6	0.2	2.6	0.05	0.2	6,400	0.03
1985	0.4	0.007	3.0		0.6	3,700	0.008
1986	1.0	0	1.8		0.54	2,600	0.024
1987	0.6	0	1.2		0.12	2,500	0.006
1988	0.4	0	1.1		<0.07	1,700	
1989	1.2	0	2.9		0.13	4,100	
1990	1.1	0	3.1		0.12	3,100	
	696.3	6,931.6	1,204.9	175.33	325.26	175,200	5.248

Table 2.1. Estimated discharges of selected radionuclides from White Oak Creek to the Clinch River (curies)

"Transuranics.

<sup>b</sup>No analysis performed. Estimated from measurements made during the last quarter of 1949.

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#### 2.5 WHITE OAK CREEK EMBAYMENT

WOCE extends 1 km downstream from WOD and is the hydrologic link between WOD and the Clinch River. The surface area of the creek as it flows through the embayment is controlled by the summer and winter elevations of Watts Bar Reservoir. At the summer pool elevation of 741 ft msl at the mouth of the embayment, the creek covers approximately 8.5 acres; but, at the winter pool level, much of the embayment is a mud flat with a small stream meandering through it to the Clinch River.

A screening analysis has been completed for WOCE (Blaylock et al. 1991); therefore, the embayment will not be included in the current screening analysis of WAG 2. However, the results of the screening analysis of WOCE will be considered in the conclusions.

## 3. SOURCES OF INFORMATION

The data used in the screening analyses include a compilation of existing data from previous and current monitoring programs, surveys, and scientific studies. Monitoring activities and scientific studies have been conducted on WOL and the WAG 2 area for more than four decades; and, as a result, a large amount of data has accumulated. A systematic review of all available data was conducted to compile a data base suitable for a screening analysis. These data were summarized to obtain source terms for predicting the risk level to humans and biota exposed to the environmental contaminants. Data from many of the earlier radiological studies were not included in the data base because many of the radionuclides previously reported are no longer released and have relatively short half-lives; therefore, the environmental concentrations of these radionuclides are very low. For example, <sup>106</sup>Ru, which was one of the major dose contributors found in WOL in the early 1960s, is practically undetectable today because of its relatively short half-life (1 year) and because it was readily transported from the WAGs in the water. The current data bases represent measurements of contaminants in sediment, surface water, groundwater, and fish. Data used in the screening analyses are contained in the appendices.

## 4. SCREENING RISK ASSESSMENT FOR HUMAN EXPOSURE

#### 4.1 APPROACH

The approach used in the current screening analysis is similar to the one used for the preliminary screening analysis of the Clinch River off-site environment (Hoffman et al. 1990) and WOCE (Daylock et al. 1991). Because of the relatively high levels of <sup>137</sup>Cs that are known to exist in the sediments and floodplain of WOL, the area will require remedial action. In addition, WAG 2 is surrounded by a personnel exclusion fence that is patrolled on a regular schedule, and it is highly unlikely that institutional control of this area will be lost; therefore, calculations based on a homesteader scenario and inclusion of dredging and irrigation scenarios were not considered in this screening analysis. Two screening procedures-a conservative and a nonconservative approach-were used in this analysis. The conservative approach is highly unlikely to underestimate potential maximum exposures to individuals who might use the WAG 2 environment, but may substantially overestimate the majority of the actual exposures to individuals. The nonconservative screening approach provides a more realistic estimate of exposure and should not substantially overestimate the maximum exposure to individuals in the area. However, under some circumstances, nonconservative screening could underestimate maximum exposures. Calculations were also made for an intruder (illegal entry) scenario similar to the one made for the WOCE (Blaylock et al. 1991).

#### **4.2 SCREENING INDICES**

The screening index for a carcinogen is an estimate of exposure to the contaminant via external exposure, ingestion, or inhalation multiplied by the EPA approved or suggested slope factor for radioactive and nonradioactive substances to indicate the potential lifetime risk of excess cancer (EPA 1990). The slope factor is based upon an estimate of the lifetime risk of additional cancer incidence per unit of exposure.

The screening index for noncarcinogens is an estimate of the daily ingestion or inhalation of the contaminant divided by a "reference dose (RfD) factor". The RfD is an EPA-approved, daily noncarcinogenic-contaminant exposure level below which adverse effects should not occur.

To estimate the potential risk from all contaminants in a particular exposure pathway, the screening indices are summed for all contaminants in the pathway. Summation is conducted separately for carcinogens and noncarcinogens. To estimate the potential risk from exposure to multiple pathways, the screening indices are summed across pathways.

#### **4.3 PATHWAYS**

Only four exposure pathways were considered: (1) external exposure from shoreline sediment and floodplain soils, (2) ingestion of sediment and floodplain soil, (3) ingestion

of fish, and (4) the ingestion of water, both surface and groundwater. The ingestion of surface water was included in the basic screening analysis, and groundwater was screened separately (Sect. 4.8.4). Other exposure pathways were not considered because WAG 2 is surrounded by a personnel exclusion fence and it is highly unlikely that institutional control of the area will be lost in the foreseeable future. Modeling concentrations for exposure pathways was unnecessary because measured concentrations of most contaminants were available for the environmental media of concern. All scenarios are hypothetical and were created for screening purposes only.

#### **4.4 INTRUDER SCENARIO**

In addition to the conservative and nonconservative screening analyses, calculations were made for an intruder scenario. Such a scenario represents a more realistic, although highly improbable, situation that could occur under current conditions. The scenario selected involves an individual who illegally enters WAG 2 to hunt and fish. For fishing, he enters the area 10 days per year for 25 years and remains in the area for 4 hours per trip. He catches an average of 10 kg of fish per year, of which 33% is edible. The same intruder is also a deer and waterfowl hunter who enters WAG 2 to hunt deer 10 days per year for 10 years and remains in the area for 6 hours each day. The hunter kills one deer per year, which weighs 54 kg, of which 33% is edible tissue. The intruder enters WAG 2 to hunt waterfowl 5 days per year for 10 years and remains in the area for 4 hours per day. He kills a total of 10 waterfowl per year, which weigh 1 kg each, of which 33% is edible tissue. The intruder is assumed to consume all the fish and game he poaches. Because of the short amount of time the intruder spends on WAG 2, the only pathway other than fish and game ingestion that was considered was external exposure from floodplain soil and shoreline sediment.

#### **4.5 DATA BASES**

The data were divided into two categories—detectable and nondetectable contaminants. Contaminants for which at least one measurement was above the level of detection were included in the detectable data bases. Contaminants for which all measurements were below the level of detection were included in the nondetectable data bases. For conservative screening, the upper 95% confidence limit of the arithmetic mean of the lognormally distributed data for both the detectable and nondetectable contaminant data sets was used to represent the concentration in the environmental medium. For nonconservative screening, the geometric mean of each contaminant in the detectable data set and the lowest detection limit in the nondetectable data set were used as the contaminant concentration in the environmental medium.

#### 4.6 USAGE FACTORS

Usage factors for conservative and nonconservative screening are listed in Table 4.1. These factors are similar to the ones used by Hoffman et al. (1990) and Blaylock et al.

Exposure route	Conservative screening	Nonconservative screening
ingestion		
Fish Carcinogens <sup>b</sup> Noncarcinogens <sup>c</sup>	33 g/d 65 g/d	3.3 g/d 6.5 g/d
Drinking water	2.0 L/d	0.2 L/d
Sediment	0.1 g/d	0.01 g/d
External exposure		
Radioactive sediment	1000 h/year	100 h/year

Table 4.1. Usage factors for conservative and nonconservative screening\*

"Usage factors for the intruder scenario are given in Sect. 4.4.

Exposure duration 350 d/year for 30 years.

Exposure duration 350 d/year for 1 year.

(1991). However, EPA has reconsidered the maximum exposure duration and now recommends a lifetime exposure period of 350 days per year for 30 years. The usage factor for carcinogens is then a 30-year intake divided by a 70-year lifespan (OSWER 1991).

Noncarcinogens, unlike carcinogens, have a threshold value; therefore, a maximum intake of a noncarcinogen over a short period, which would result in exceeding the threshold value, is more critical than a long-term, low-level ingestion of the contaminant. To obtain a realistic maximum exposure for conservative screening for noncarcinogenic contaminants, the usage factor for fish ingestion was assumed to be two 0.5-lb (230-g) fish meals per week or 65 g/day for an exposure duration of one year.

#### 4.7 SCREENING CRITERIA

A risk  $\geq 10^4$  excess cancers for a lifetime exposure to carcinogens is considered an action level by EPA (Federal Register, March 8, 1990). Between  $10^4$  and  $10^6$  excess cancers per lifetime is a range where risk levels are of concern, negotiation on remedial action alternatives occurs, and additional investigation is probably justified. A risk below  $10^6$  excess cancers per lifetime indicates that a carcinogen is of little concern and can be assigned a low priority for further investigation. The conservative screening approach is

used to identify contaminants that have a low priority for further investigation. In contrast, the nonconservative screening approach is used to identify contaminants with a high priority that require either immediate consideration for remedial action or further study.

#### 4.7.1 Carcinogen Screening

Screening criteria used in this report for carcinogens are summarized in Fig. 4.1. For conservative screening of carcinogens, substances having screening indices  $\leq 10^{-6}$  are low priority for further consideration. Carcinogens with screening indices between  $10^{-6}$  and  $10^{-4}$  require further investigation before either taking action or designating these substances as low priority. Carcinogens with screening indices  $\geq 10^{-4}$  require further investigation.

For r onconservative screening of carcinogens, substances having screening indices  $\geq 10^{-4}$  are high priority substances which require immediate consideration for remedial action. Carcinogens with screening indices between  $10^{-4}$  and  $10^{-6}$  are substances requiring further investigation before taking action (i.e., re-examination of the data base, checking parameter values, recalculating screening indices, etc.). Because nonconservative screening employs parameter values that should not greatly overestimate maximum exposures to a contaminant, nonconservative screening is not used to identify contaminants with low priority for further consideration.

#### 4.7.2 Noncarcinogen Screening

Figure 4.2 summarizes the screening criteria for noncarcinogens. For conservative screening of noncarcinogens, contaminants with screening indices (exposure divided by an RfD)  $\leq 0.1$  are low priority for further consideration, and contaminants with screening indices between 1.0 and 0.1 require further investigation before either taking action or designating the substance as a low priority substance. Noncarcinogens with conservative screening indices  $\geq 1.0$  require further investigation before taking action.

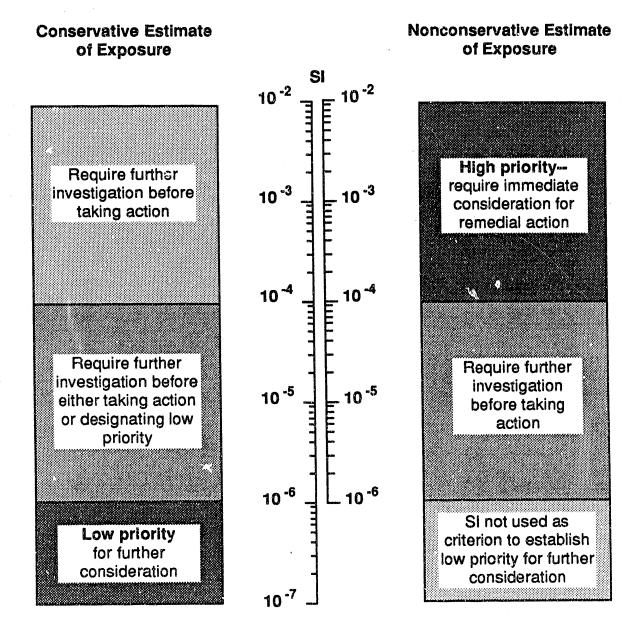
For nonconservative screening of noncarcinogens, contaminants with screening indices  $\geq 1.0$  are high priority substances requiring immediate consideration for remedial action, and contaminants with screening indices between 1.0 and 0.1 require further investigation before taking action. Screening indices <0.1 are not used to designate low priority substances for reasons similar to those previously given for nonconservative screening of carcinogens (i.e., nonconservative screening employs parameter values that should not greatly overestimate maximum exposures to a contaminant).

#### **4.8 CONTAMINANT SCREENING RESULTS**

#### **4.8.1 Detectable Contaminants**

Results of nonconservative and conservative screening for individual contaminants for each of the three reaches that had at least one value above the detection limit are given

# Screening Criteria for Carcinogens

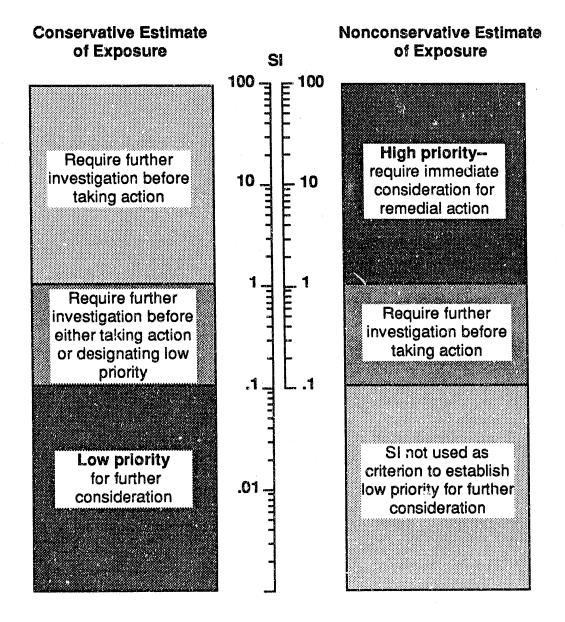


Screening index (SI) = exposure multiplied by a lifetime cancer slope factor



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# Screening Criteria for Noncarcinogens



Screening index (SI) = exposure divided by reference dose factor (RfD)



in Appendix A and Appendix B. Results of the screening for the intruder scenario are given in Appendix C.

#### 4.8.1.1 Nonconservative screening of detectable contaminants

Nonconservative screening is conducted to identify contaminants with a high priority for immediate consideration for remedial action. In the current screening analysis, individual carcinogens that have a screening index  $\geq 10^4$  and noncarcinogens that have a screening index  $\geq 1.0$  were classified as high priority contaminants (Figs. 4.1 and 4.2).

**Carcinogens.** A summary is given in Table 4.2 of nonconservative screening indices for the classes of contaminants (radionuclides, organics, and inorganics), exposure pathways, and individual reaches. Screening indices for individual carcinogens are given in Table A1 (Appendix A). Screening indices are summed for the classes of contaminants and for exposure pathways, which are then summed to obtain the total screening index for the individual reach.

All three reaches had screening indices > 10<sup>4</sup>, requiring immediate consideration for remediation for all three (Table 4.2). Reaches 1 and 3 had screening indices  $\geq 10^{-3}$ . In Reach 1, the exposure pathways that contribute the greatest risk are ingestion of fish and external exposure to sediment. These pathways had screening indices of  $2 \times 10^{-4}$  and  $7 \times 10^{-4}$ , respectively. Organic contaminants contribute the greatest risk in the fish ingestion pathway. Radionuclides in sediment, the only external exposure pathway, had an external exposure screening index of  $7 \times 10^{-4}$ . The ingestion of water, with a screening index of  $7 \times 10^{-5}$ , requires further investigation.

In Reach 2 external exposure to sediment and ingestion of water had screening indices  $\geq 10^{-4}$ , requiring immediate consideration for remedial action (Table 4.2). Inorganics in the water ingestion pathway and radionuclides in the external exposure pathway are the primary contributors to the screening indices.

In Reach 3 all pathways, except the ingestion of sediment, had screening indices  $\geq 10^4$ , requiring immediate consideration for remedial action (Table 4.2). External exposure to radionuclides in sediment had the highest screening index of 1 x 10<sup>-3</sup>. Organic contaminants in the fish ingestion pathway and inorganic contaminants in the water ingestion pathway were the major contributors to the screening indices.

Individual carcinogens designated as high priority by nonconservative screening (screening indices >10<sup>4</sup>) and those requiring further investigation (screening indices 10<sup>4</sup> to 10<sup>-6</sup>) are listed in Table A1 (Appendix A) according to contaminant type, reach, and exposure pathway. The following contaminants have screening indices  $\geq 10^{-4}$  and are designated as high priority contaminants that require immediate consideration for remedial action: arsenic in water in Reaches 2 and 3; PCB (Aroclor 1254) in fish in Reaches 1 and 3; external exposure from <sup>60</sup>Co in sediment in Reaches 1, 2, and 3; and external exposure from <sup>137</sup>Cs in sediment in Reaches 1 and 3.

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Reach	Mectia	Contaminant type	Sums of carcinogen screening indices
1	Fish	Organic	2E-04
1	Fish	Radionuclide	7E-05
1	Fish	All	2E-04
1	Sediment ingestion	Inorganic	1E-06
1	Sediment ingestion	Organic	5E-07
1	Sediment ingestion	Radionuclide	7E-07
1	Sediment ingestion	<b>All</b>	2E-06
1	External exposure	Radionuclide	7E-04
1	Sediment	All	7E-04
1	Water	Organic	5E-05
1	Water	Radionuclide	2E-05
1	Water	All	7E-05
1		Reach total	1E-03
2	Fish	Organic	3E-05
2	Fish	Radionuclide	2E-05
2	Fish	AB	5E-05
2	Sediment ingestion	Inorganic	5E-07
2	Sediment ingestion	Organic	4E-07
2	Sediment ingestion	Radionuclide	2E-07
2	Sediment ingestion	All	1E-05
2	External exposure	Radionuclide	5E-04
2	Sediment	All	5E-04
2	Water	Inorganic	3E-04
2	Water	Organic	2E-05
	Water	Radionuclide	1E-05
2 2	Water	AN	3E-04
an a	TT CA454		
2		Reach total	9E-04
3	Fish	Organic	2E-04
3	Fish	Radionuclide	1E-05
3	Fish	All	2E-04
			15.04
3	Sediment ingestion	Inorganic	1E-06
3	Sediment ingestion	Organic	3E-07
3	Sediment ingestion	Radionuclide	9E-07
3	Sediment ingestion	All	2E-06
3	External exposure	Radionuclide	1E-03
3	Sediment	All	1E-03
3	Water	Inorganic	2E-04
3	Water	Organic	2E-05
	Water	Radionuclide	5E-05
3 3	Water	All	2E-04
		an a	
3		Reach total	1E-03

#### Table 4.2. Summary table for nonconservative screening of detected carcinogens

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Arsenic was detected in only 4 of 75 water samples analyzed for Reach 2 and in only 2 of 38 samples analyzed for Reach 3 (Table A1); therefore, it is questionable whether arsenic should be assigned to the category requiring immediate consideration for remedial action.

Contaminants requiring further investigation (screening indices of 10<sup>-4</sup> to 10<sup>-6</sup>) in different reaches and pathways are shown in Table 4.3. Dichlorobromomethane was detected in only 3 of 29 water samples in Reach 1 and may be an artifact of sample analysis (Table A1, Appendix A). Of the 7 radionuclides listed as requiring further investigation, limited data are available for <sup>134</sup>Cs, <sup>152</sup>Eu, <sup>154</sup>Eu, and <sup>234</sup>U for some of the reaches and pathways (Table A1); therefore, additional data are needed. For the same reasons, radionuclides such as <sup>241</sup>Am, <sup>244</sup>Cm, <sup>238</sup>Pu, and <sup>239</sup>Pu in sediment, which were not listed as requiring further consideration in Reach 1 because the screening was based on measurements made of only one sample, should be considered for further sampling and analysis.

Noncarcinogens. Nonconservative screening indices for reaches, classes of contaminants, and exposure pathways are summarized for the detected noncarcinogens in Table 4.4. The noncarcinogen analyses do not include an external exposure pathway because radionuclides that produce the external exposure are classified as carcinogens. Reaches 1, 2, and 3 had screening indices  $\geq 1.0$  and were classified as requiring immediate consideration for remediation. In all three reaches, inorganics in the water ingestion pathway was the only class of contaminant that had screening indices > 1.0. Inorganics in the fish ingestion pathway in Reach 1 was the only class of contaminant that had a screening index between 0.1 and 1.0 and requires further investigation before taking action (Fig. 4.2). Table 4.5 shows that thallium in the water ingestion pathway was the only contaminant that had a screening index  $\geq 1.0$ . Based on the screening index, thallium would be classified as a contaminant requiring immediate consideration for remedial action; however, because only one water sample from each reach was analyzed for thallium (Table A2, Appendix A), additional data are required before classifying it.

Mercury in the fish ingestion pathway in Reach 1 and arsenic in water in Reach 2 were the only contaminants that had screening indices between 0.1 and 1.0, requiring further investigation before taking action. Arsenic was detected in only 4 of 75 water samples analyzed for Reach 2; therefore, it may be an artifact of sample analysis.

#### 4.8.1.2 Conservative screening of detectable contaminants

Conservative screening is conducted to identify contaminants that can be assigned a low priority for further investigation. In the current screening analysis, low priority contaminants include individual carcinogens that have a screening index  $\leq 10^{-6}$  and noncarcinogens that have a screening index  $\leq 0.1$  (Figs. 4.1 and 4.2).

**Carcinogens.** Screening indices for the individual contaminants are summed by classes of carcinogens (radionuclides, organics, and inorganics) for each exposure pathway. The sum for each pathway and each individual reach are given in Table 4.6. All pathways and reaches had screening indices  $\geq 10^{-6}$ ; therefore, none of the pathways or reaches can be

Contaminant type	Contaminant	Reach	Exposure pathway
High	priority—require immediate conside Screening indices $\geq$		edial action
Inorganic	Arsenic	2,3	water ingestion
Organic	PCB-1254 (Aroclor 1254)	1,3	fish ingestion
Radionuclide	<sup>60</sup> Co <sup>137</sup> Cs	1,2,3 1,3	external exposure external exposure
	Require further investigation bef Screening indices 10 <sup>4</sup>		ion
Organic	Dichlorobromomemthane PCB-1254 (Aroclor 1254) PCB-1254 (Aroclor 1254) PCB-1254 (Aroclor 1260) PCBs (total)	1 2 1 1,2,3 1,2,3	water ingestion fish ingestion water ingestion fish ingestion water ingestion
Radionuclide	$^{137}Cs$ $^{137}Cs$ $^{90}Sr$ $^{3}H$ $^{152}Eu$ $^{152}Eu$ $^{154}Eu$ $^{154}Eu$ $^{234}U$	1,2,3 2 1,3 1,2,3 1,2,3 1,2,3 2 1,2,3 1,2,3 2,3 2 3	fish ingestion external exposure water ingestion water ingestion external exposure water ingestion external exposure external exposure external exposure water ingestion water ingestion

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## Table 4.3. Carcinogens assigned to different screening categories by nonconservative screening of data base where at least one value for each contaminant was above detection limits

Reach	Media	Contaminant type	Sums of noncarcinogen screening indices
1 ACCESSION			
1	Fish	Inorganic	1E-01
, <b>1</b>	Fish	All	1E-01
1	Water	Inorganic	4E+00
1	Water	Organic	4E-03
1	Water	All	4E.+00
1		Reach total	4E+00
•	Fish	Inorganic	SE-02
2 2	Fish	All	5E-02
2	Sediment ingestion	Inorganic	3E-03
2	Sediment ingestion	Organic	8E-06
2	Sediment ingestion	All	3E-03
2	Water	Inorganic	4E+00
2	Water	Organic	3E-03
2	Water	ÂU	4E+00
2		Reach total	4E+00
		Increanie	7E-02
3	Fish Fish	Inorganic All	7E-02
3			
3	Sediment ingestion	Inorganic	4E-03
3	Sediment ingestion	Organic	1E-05
3	Sediment ingestion	Âll	4E-03
		Increania	4E-03
3	Water	Inorganic Organic	4E-05 1E-05
3 3	Water <b>Water</b>	Ali	4E-03
3		Reach total	3E+00

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Table 4.4. Summary table for nonconservative screening of detected noncarcinogens

# Table 4.5. Noncarcinogens assigned to different screening categories by nonconservative screening of data base where at least one value for each contaminant was above detection limits

Contaminant type	Contaminant	Reach	Exposure pathway
High prior	ty—require immediate co Screening ind		nedial action
Inorganic	Thallium	1,2,3	water ingestion
R	equire further investigati Screening indic		tion
Inorganic	Arsenic	2	water ingestion
_	Mercury	1	fish ingestion

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Reach	Media	Contaminant type	Sums of noncarcinogen screening indices
1	Fish	Organic	3E-03
1	Fish	Inorganic	1E-03
1	Fish	All	4E-03
1	Sediment ingestion	Inorganic	2E-05
1	Sediment ingestion	Organic	3E-05
	Sediment ingestion	Radionuclide	5E-05
1	Sediment ingestion	All	1E-04
1	External exposure	Radionuclide	1E-01
1	Sediment	All	1E-01
1	Water	Organic	8E-04
1	Water	Radionuclide	4E-04
1	Water	All	1E-03
- 1999 ( <b>1</b>		Reach total	18-01
2	Fish	Organic	2E-03
2	Fish	Radionuclide	3E-04
2	Fish	Ali	<u>2E-03</u>
2	Sediment ingestion	Inorganic	8E-06
2	Sediment ingestion	Organic	2E-05
2	Sediment ingestion	Radionuclide	2E-05
2	Sediment ingestion	All	5E-05
2	External exposure	Radionuclide	5E-02
2	Sediment	All	5E-02
2	Water	Inorganic	3E-03
2	Water	Organic	4E-04
2	Water	Radionuclide	1E-03
2	Water	Al	4E-03
2	t – proposition de la sectión de la secti La sectión de la sectión de	Reach total	6 <b>E-C3</b>
3	Fish	Organic	3E-03
3	Fish	Radionuclide	3E-04
3	Fish	All .	4E-03
3	Sediment ingestion	Inorganic	5E-05
3	Sediment ingestion	Organic	4E-05
3	Sediment ingestion	Radionuclide	6E-05
3	Sediment ingestion	<u>IA</u>	5E-02
3	External exposure	Radionuclide	2E-01 2E-01
3	Sediment	Ali .	
3	Water	Inorganic	2E-03 5E-04
3	Water	Organic	6E-04
3	Water Water	Radionuclide Ali	6E-04 3E-03
3			2E-01
3	terre and a Marine provide state of spaces and spaces and state of the	Reach total	

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Table 4.6. Summary table for conservative screening of detected carcinogens

given low priority for further consideration (Fig 4.1). Reaches 1 and 3 had screening indices  $\geq 10^{-1}$  and Reach 2 had a screening index of 6 x  $10^{-3}$ . Exposure to the sediment pathway in all reaches was the major contributor to the total screening index for each reach. Fish ingestion in Reaches 1 and 2 and the ingestion of sediment in Reach 3 were the next most important pathways.

Table 4.7 lists the carcinogens with screening indices  $<10^{-6}$ , which can be given a low priority for further consideration based on conservative screening. However, because of the small number of sediment samples analyzed for <sup>241</sup>Am, <sup>244</sup>Cm, <sup>238</sup>Pu, <sup>239</sup>Pu, <sup>234</sup>U, <sup>235</sup>U, and <sup>238</sup>U in Reaches 1, 2, and 3 (Table B1, Appendix B), these contaminants cannot be eliminated from consideration for the sediment pathways and require further investigation. Table 4.7 also lists contaminants (screening indices  $10^{-6}$  to  $10^{-4}$ ) that require further investigation before either taking action or designating them as low priority and contaminants with screening indices  $\geq 10^{-4}$  that require further investigation before taking action. The radionuclides already listed in this paragraph require further investigation or designation as a low priority for the water ingestion pathway. However, the data for the uranium isotopes (<sup>224</sup>U, <sup>235</sup>U, and <sup>238</sup>U) are too limited to provide reliable screening results (Table B1).

Noncarcinogens. Summaries of the conservative screening indices for the noncarcinogens in the detectable data base are given in Table 4.8. All reaches had screening indices >0.1 and therefore cannot be given a low priority for further consideration. The screening indices for all reaches were  $\geq 3 \times 10^{1}$ ; however, these indices are misleading because they result primarily from concentrations of thallium obtained from a single water sample taken from each reach. For this reason, the data are insufficient other than to conclude that thallium was detected and additional sampling is needed (Table B2, Appendix B). In addition, thallium has an RfD that is one to two orders of magnitude less than the RfDs for other inorganics so that concentrations near the detection limits can produce relatively high screening indices.

The sediment ingestion pathways in Reaches 1 and 2 have screening indices <0.1 and can be assigned low priority for further consideration, as can organics in the water ingestion pathways for all reaches. The fish ingestion pathways in Reaches 1 and 3 have screening indices  $\geq 1.0$  and require further investigation before taking action (Fig. 4.2). All other sediment and fish pathways have screening indices between 0.1 and 1.0, thus requiring further investigation before assigning the pathway a low priority or taking action.

Noncarcinogens that can be assigned a low priority in the detectable data base by conservative screening (screening indices <0.1) are listed by contaminant, reach, and exposure pathway in Table 4.9. Most inorganics for which data are available can be assigned a low priority for further study for sediment ingestion in all reaches. Barium, copper, mercury, nickel, and zinc can be assigned a low priority for further study in all reaches for the water and sediment ingestion pathways. All detectable noncarcinogenic organics in all reaches for which data are available can be assigned a low priority for further study for further investigation (Table B2). Noncarcinogenic contaminants with screening indices of 0.1 to 1.0, which require further investigation before taking action or designating the

Contaminant type	Contaminant	Reach	Exposure pathway
	Low priority for further co Screening indices <		
	ner consideration of a		
Organic	Benzene	3	sediment ingestion
	Cnloroform	3	sediment ingestion
	Methylene chloride	3	sediment ingestion
Radionuclide	<sup>241</sup> Am	1,2,3	external exposure
	<sup>241</sup> Am	1,2,3	sediment ingestion
	<sup>244</sup> Cm	1,2,3	external exposure
	244Cm	1,2,3	sediment ingestion
	60 <sub>Co</sub>	3	fish ingestion
	<sup>134</sup> Cs	1,2,3	sediment ingestion
	<sup>152</sup> Eu	1,2,3	sediment ingestion
	154 <sub>Eu</sub>	1,2,3	sediment ingestion
	238Pu	1,2,3	external exposure
	238Pu	1,2,3	sediment ingestion
	238Pu	3	water ingestion
	239Pu	1,2,3	external exposure
	239Pu	1,2,3	sediment ingestion
	239Pu	3	water ingestion
	<sup>90</sup> Sr	2,3	sediment ingestion
	234U	1,2,3	external exposure
	234U	1,2,3	sediment ingestion
	235U	1,2,3	external exposure
	<sup>235</sup> U	1,2,3	sediment ingestion
	238 <sub>U</sub>	1,2,3	external exposure
	<sup>238</sup> U	1,2,3	sediment ingestion
	Require further investigation bef	ore taking action	1
	or designating as low		
	Screening indices 10 <sup>-6</sup>		
Inorganic	Arsenic	1,2,3	sediment ingestion
<b>0</b>	Beryllium	1,2,3	sediment ingestion
Organic	Benzene	1	water ingestion
~	Chloroform	1,2,3	water ingestion
	Dichlorobromomethane	1	water ingestion
	Methylene chloride	1,2,3	water ingestion
	PCB-1254 (Aroclor 1254)	1,2,3	sediment ingestion
	PCB-1260 (Aroclor 1260)	1,2	sediment ingestion
	Tetrachloroethylene	1,3	water ingestion
	Trichloroethylene	1,2,3	water ingestion

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# Table 4.7. Carcinogens assigned to different screening categories by conservative screening of data base where at least one value for each contaminant was above detection limits

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Table 4.7 (continued)

Contaminant type	Contaminant	Reach	Exposure pathway
Radionuclide	<sup>241</sup> Am	3	water ingestion
	<sup>244</sup> Cm	3	water ingestion
	<sup>60</sup> Co	1,2,3	sediment ingestion
	<sup>60</sup> C0	1,3	water ingestion
	137 <sub>Cs</sub>	1,2,3	sediment ingestion
	<sup>137</sup> Cs	2,3	water ingestion
	<sup>154</sup> Eu	1	external exposure
	154 <sub>Eu</sub>	2	water ingestion
	<sup>90</sup> Sr	3	fish ingestion
	90 <sub>Sr</sub>	1	sediment ingestion
	234 <sub>U</sub>	3	water ingestion
	235 <sub>U</sub>	3	water ingestion
	238 <sub>U</sub>	3	water ingestion
	Require further investigation be Screening indices 2		
Inorganic	Arsenic	2,3	water ingestion
Organic	PCBs (total)	1,2,3	water ingestion
	PCB-1254 (Arocior 1254)	1,2,3	fish ingestion
	PCB-1254 (Aroclor 1254)	1	water ingestion
	PCB-1260 (Arocior 1260)	1,2,3	water ingestion
Radionuclide	<sup>60</sup> Co	1,2,3	external exposure
	<sup>60</sup> Co	2	water ingestion
	134 <sub>Ce</sub>	1,2,3	external exposure
	13705	1,2,3	fish ingestion
	137 <sub>C8</sub>	1,2,3	external exposure
	137	1	water ingestion
	152 <sub>Eu</sub>	1,2,3	external exposure
	152Eu	2	water ingestion
	154Eu	2,3	external exposure
	3H	1,2,3	water ingestion
	90 Sr	1,2,3	water ingestion

Reach	Media	Contaminant type	Sums of noncarcinogen screening indices
. 1	Fish	Inorganic	2E+00
1	Fish	<u>All</u>	2E-00
1	Sediment ingestion	Inorganic	9E-02
1	Sediment	All	9E-02
1	Water	Inorganic	4E+01
1	Water	Organic	6E-02
ī	Water	ĂU	4E+01
1		Reach total	<b>4E+-01</b>
2	Fish	Inorganic	8E-01
2	Fish	AII	8E-01
2	Sediment ingestion	Inorganic	4E-02
2	Sediment ingestion	Organic	2E-04
2	Sediment ingestion	All	4E-02
2	Water	Inorganic	4E+01
$\frac{1}{2}$	Water	Organic	5E-02
2	Water	ĂII	4E+01
2		Reach total	413+01
3	Fish	Inorganic	1E+00
3	Fish	All	1E-00
3	Sediment ingestion	Inorganic	2E-01
3	Sediment ingestion	Organic	3E-04
3	Sediment ingestion	All	2E-01
3	Water	Inorganic	3E+01
3	Water	Organic	6E-02
3	Water	All	3E+01
3		Reach total	3E+01

Table 4.8. Summary table for conservative screening of detected noncarcinogens

Contaminant type	Contaminant	Reach	Exposure pathway
	Low priority for further co	nsideration	
	Screening indices <		
Inorganic	Antimony	1,2	sediment ingestion
	Arsenic	1,2,3	sediment ingestion
	Barium	1,2,3	sediment ingestion
	Barium	1,2,3	water ingestion
	Beryllium	1,2,3	sediment ingestion
	Boron	1,2,3	sediment ingestion
	Cadmium	1,2,3	sediment ingestion
	Chromium	1,2,3	sediment ingestion
	Chromium	1,2	water ingestion
	Copper	1,2,3	fish ingestion
	Copper	1,2,3	sediment ingestion
	Copper	1,2,3	water ingestion
	Mercury	1,2,3	sediment ingestion
	Mercury	1,2,3	water ingestion
	Molybdenum	1,2,3	sediment ingestion
	Nickel	1,2,3	sediment ingestion
	Nickei	1,2,3	water ingestion
	Selenium	3	fish ingestion
	Selenium	1,2,3	sediment ingestion
	Silver	1,2,3	sediment ingestion
	Tin	1,2,3	sediment ingestion
	Vanadium	1,2,3	sediment ingestion
	Vanadium	2	water ingestion
	Zinc	1,2,3	fish ingestion
	Zinc	1,2,3	sediment ingestion
	Zinc	1,2,3	water ingestion
Organic	1,1-Dichloroethane	2	water ingestion
·	1,2-Dichloroethane (total)	2	water ingestion
	4-Methyl-2-pentanone	3	water ingestion
	Acetone	1,2,3	water ingestion
	Carbon disulfide	1,2,3	water ingestion
	Chloroform	3	sediment ingestion
	Chloroform	1,2,3	water ingestion
	Dichlorobromomethane	1	water ingestion
	Di-n-butyl phthalate	2,3	sediment ingestion
	Ethyibenzene	1	water ingestion
	Methylene chloride	3	sediment ingestion
	Methylene chloride	1,2,3	water ingestion
	Tetrachloroethylene	1.3	water ingestion
	Toluene	3	sediment ingestion
	Toluene	1,2,3	sediment ingestion
	Xylene	1,2,3	water ingestion
	•		water ingestion

Table 4.9. Noncarcinogens assigned to different screening categories by conservative screening of data base where at least one value for each contaminant was above detection limits

Table	4.9	(continued)
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Contaminant type	Contaminant	Reach	Exposure pathway
	Require further investigation or designating as I Screening indices	ow priority	
Inorganic	Antimony	3	sediment ingestion
U	Cadmium	1,2,3	fish ingestion
	Cadmium	2	water ingestion
	Chromium	3	water ingestion
	Mercury	2,3	fish ingestion
	Selenium	1,2,3	fish ingestion
	Require further investigation Screening indic		1
Inorganic	Arsenic	2,3	water ingestion
	Mercury	1	fish ingestion
	Thailium	1.2.3	water ingestion

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contaminant as low priority, and contaminants with screening indices  $\geq 1.0$ , which require further investigation before taking action, are also listed in Table 4.9.

#### 4.8.1.3 Intruder scenario

The intruder scenario is a hypothetical situation that is intended to represent a maximally exposed individual who enters WAG 2 illegally to hunt and fish and consumes game and fish from the area. Only the detectable contaminants data bases were used in the intruder scenario. The assumptions are reasonable but would be applicable to very few individuals because of security and other safeguards that are intended to limit human access to the area. The ingestion rates used in the intruder scenario are less conservative than those used in the nonconservative screening because the intruder enters WAG 2 a limited number of times. Only the ingestion of fish, venison, and waterfowl and external exposure to radionuclides accumulated in the shore line sediment and floodplain soil were considered in this scenario. The ingestion of waterfowl was considered only for Reach 1 (Table 4.10) because most of the waterfowl are associated with WOL and the floodplain area. The ingestion of soil and the consumption of water were not considered because of the limited amount of time (4 to 6 hours per trip) the intruder would spend in the WAG 2 area.

**Carcinogens.** Calculations for the intruder scenario were made using only the detectable contaminants data base. Results of these calculations are summarized for the carcinogens in Table 4.10 for each class of contaminant (organics, inorganics, and radionuclides), for each exposure pathway, and for each reach. The screening indices for individual carcinogens are given in Table C1 (Appendix C) along with the geometric means of the data that were used as the concentration of each contaminant. All reaches had screening indices >10<sup>-4</sup>. The fish ingestion pathway contributed the greatest risk for all reaches; radionuclides in fish contributed the greatest risk in Reaches 1 and 2, and organic contaminants in fish the greatest in Reach 3.

The screening indices for the external exposure pathway for all reaches were  $>10^4$ , which was less than the values calculated for nonconservative screening. This result can be attributed to the relatively short time (maximum of 120 hours per year for 25 years or less) that the intruder spent in WAG 2. Individual radionuclides and their contribution to the external exposure screening indices are given in Table C2 (Appendix C).

Noncarcinogens. Results of the calculations for noncarcinogens in the intruder scenario are listed in Table 4.11, and the screening indices for individual contaminants are given in Table C3 (Appendix C), along with the geometric mean for the concentrations of individual contaminants. Only the ingestion pathways were considered for the noncarcinogens, and the sums of the screening indices for noncarcinogens for all reaches were <1.0. The noncarcinogen showing the highest screening index ( $1.5 \times 10^{-1}$ ) was mercury in fish in Reach 1.

Reach no.	Exposure pathway	Contaminant type	Carcinogen screening indice
1	Fish ingestion	Radionuclide	2E-04
1	Fish ingestion	Organic	2E-04
1	Fish total		3E-04
1	Venison ingestion	Radionuclide	1E-06
1	Total ingestion		3E-04
1	External Exposure	Radionuclide	4E-04
1	Reach total		81E-04
			4E-05
2 2	Fish ingestion Fish ingestion	Radionuclide Organic	4E-05 3E-05
2	Fish total		8E-05
2	Venison ingestion	Radionuclide	1E-06
	Total ingestion		8E-05
2	External Exposure	Radionuclide	3E-04
2	Reach total		4E-04
	Fish ingestion	Radionuclide	3E-05
3 3	Fish ingestion	Organic	2E-04
3	Fish total	<u>and print the start of the sta</u>	2E-04
3	Venison ingestion	Radionuclide	1E-06
3	Duck flesh ingestion	Radionuclide	4E-07
3	Game total		1E-06
3	Total ingestion	nandaran'i Armania ang Jangang Jangang Tangga Salaga Salaga Mang	2E-04
3	External Exposure	Radionuclide	6E-04
3	Reach total		8E-04

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## Table 4.10. Summary table for intruder screening scenario for detected carcinogens

Reach no.	Exposure pathway	Contaminant type	Noncarcinogen screening indices
1	Fish ingestion	Inorganic	2E-01
1	Reach total		2E-01
2	F sh ingestion	Inorganic	6E-02
2	Reach total		6E-02
3	Fish ingestion Duck flesh ingestion	Inorganic Inorganic	9E-02 7E-03
3	Reach total	morganie	1E-01

#### Table 4.11. Summary table for intruder screening scenario for detected noncarcinogens

#### 4.8.2 Nondetectable Contaminants

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The nondetectable contaminant data base contained approximately three times as many contaminants as the detectable contaminant data base. Some contaminants are included in both data bases because the contaminant was present in detectable quantities in one medium and not in another. Screening would not be complete without including the nondetectable contaminants; however, caution should be exercised in interpreting the results because of the uncertainty associated with the contaminant concentrations.

#### 4.8.2.1 Nonconservative screening

Nonconservative screening of the nondetectable contaminants is used to identify contaminants that have a high priority for action to lower detection limits and those for which source-term data are needed to determine whether, in the past, extremely small, if any, quantities of these contaminants have been released from ORNL. Results of the nonconservative screening for the nondetectable contaminant data bases are given in Tables D1 and D2 (Appendix D). Screening indices for individual contaminar is are listed according to exposure pathway and reach, and concentrations are the minimum detection limits in the data base. Pathways for which values are not given are either in the detectable contaminant data base or data were not available. Screening indices were not summed for contaminant type, pathway, or reach because the uncertainty resulting from using detection limits would make the sums overly conservative.

**Carcinogens.** Only three organic carcinogens—acenaphtylene in the fish ingestion pathway and benzidine and n-nitrosodimethylamine in the sediment ingestion

pathway-had screening indices >10<sup>4</sup> (Table D1, Appendix D). Normally, such screening indices would identify these carcinogens as high priority contaminants that require immediate consideration for remedial action; however, because the screening analysis was based on minimum detection limits, the indices indicate that better detection limits are needed and/or a review of source-term data is appropriate. Two inorganics and 57 organic contaminants had screening indices between 10<sup>4</sup> and 10<sup>6</sup>, which would require further investigation before taking action.

**Noncarcinogens.** All noncarcinogens in the nondetectable contaminant data base had screening indices <1.0 (Table D2, Appendix D); therefore, they would not be considered high priority contaminants requiring immediate consideration for remedial action. Antimony in the fish and water ingestion pathways, 4,6-dinitro-ortho-cresol in the fish ingestion pathway, and heptachlor epoxide in the sediment ingestion pathway had screening indices between 0.1 and 1.0 and would require further investigation before taking action.

#### 4.8.2.2 Conservative screening

The purpose of conservative screening is to identify contaminants with a low priority for further consideration: contaminants that have screening indices  $<1J^{-6}$  for carcinogens and <0.1 for noncarcinogens (Figs. 4.1 and 4.2). Values for nondetectable contaminants are based on detection limits; therefore, contaminant concentrations that were used in the screening are greater than concentrations actually present in the samples. This bias can significantly increase the conservatism of the screening, so the number of contaminants identified as low priority will probably be small.

**Carcinogens.** Conservative screening of the nondetectable contaminants data base for carcinogens showed that 25 organic contaminants in the sediment ingestion pathway had screening indices  $<10^{-6}$  and can be assigned low priority for further consideration (Table E1, Appendix E). Two inorganics, arsenic and beryllium, in the fish and water ingestion pathways and 46 organics in at least one pathway had screening indices  $\geq 10^{-4}$  and would require further investigation before taking action. The remaining organic contaminants had screening indices between  $10^{-4}$  and  $10^{-6}$ , which would require further investigation or designating the contaminants as low priority.

**Noncarcinogens.** Inorganic noncarcinogens that had screening indices <0.1 and can be assigned low priority for further considerations include the following: chromium and nickel in the fish ingestion pathway; boron, vanadium, and tin in the water ingestion pathway; cyanide in the sediment ingestion pathway; and silver and beryllium in the fish and water ingestion pathways (Table E2, Appendix E). Thirteen organics in the fish ingestion pathway and two in the sediment ingestion pathways also had screening indices <0.1 and can be assigned low priority for further consideration.

Inorganic noncarcinogens that have screening indices >1.0 in one or more reaches and that would require further investigation before taking action are antimony in the fish ingestion and antimony and arsenic in the water ingestion pathways. Molybdenum, selenium, and cadmium in the water ingestion pathway, and thallium in the sediment ingestion pathway have screening indices between 0.1 and 1.0. Eight organics contaminants in the fish ingestion pathway, including two in both the fish and sediment ingestion pathways, had screening indices >1.0. The remaining organics listed in Table E2 (Appendix E) have screening indices between 0.1 and 1.0 and would require further consideration before taking action or designating the contaminants as low priority.

#### 4.8.3 Nonclassified Contaminants

Contaminants in the detectable and nondetectable contaminants data bases for which RfDs or slope factors were not available are listed in Table 4.12. Dose conversion factors are available for the radionuclides listed in Table 4.12; however, the EPA has not provided slope factors for these radionuclides. Groundwater is not included in the nondetectable contaminant listing because the data are undergoing verification. Lead is the only contaminant that was detected in fish (Reaches 1 and 3) that did not have a screening factor, but it is doubtful that lead concentrations would present a problem in the fish ingestion pathway (Sect. 4.8.5).

#### 4.8.4 Groundwater

Groundwater was screened independently of the other pathways for Reaches 1, 2, and 3. Either groundwater or surface water can be used for the water ingestion pathway, but because the consumption rate (2 L/d) is limited, only one source can be summed with the other pathways to obtain a screening index for a reach. Because the data base for groundwater is being revised and additional data are becoming available, the decision was made to use surface water in the screening analysis and perform independent calculations for the groundwater pathway. In addition, the data base for the nondetectable contaminants for groundwater has not been verified; therefore, conservative and nonconservative screening will be conducted only on the detectable data base.

#### 4.8.4.1 Nonconservative screening of detectable contaminants in groundwater

Carcinogen. Screening indices for the nonconservative screening of carcinogens in the groundwater are given in Appendix F for each class of contaminant, exposure pathway, and reach. Reach 3 had a screening index for groundwater  $\geq 10^{-4}$ , indicating it as a high priority reach requiring immediate consideration for remedial action (Table F1, Appendix F). However, screening indices for individual contaminants in the groundwater in Reach 3 range from 2 x 10<sup>-5</sup> to 8 x 10<sup>-9</sup>, and only the contaminants that have screening indices between 10<sup>4</sup> and 10<sup>6</sup> require investigation before taking action. One of the major contributors to the screening index in Reach 3 was arsenic, but because it was detected in only 2 of 74 samples analyzed, it is a possible artifact of the analytical procedure. The other major contributors to the screening index in Reach 3 were the radionuclides <sup>224</sup>Ra, <sup>234</sup>Th, and <sup>234</sup>U. These data are questionable because of the small number of samples analyzed for these radionuclides; therefore, additional sampling is required. Reaches 1 and 2 had total screening indices  $1 \times 10^{-5}$  and  $2 \times 10^{-5}$ , respectively, indicating that further action is required before taking action. In Reach 1, the major contributor to the screening index was beryllium, with a screening index of  $1 \times 10^{-5}$ . In Reach 2, the major contributor was tritium, with a screening index of 1 x 10<sup>-5</sup>. Additional data are needed because of the

#### Table 4.12. Contaminants that were reported in either the detectables or nondetectables data bases for which screening factors were not available

#### Ratio of 95% upper detected Geometric conf bound Contaminant to total mean on mean Media name Reach samples (mg/kg wet) (mg/kg wet) name 7/43 1.7E-01 Lead 1 4.3E-02 Fish 3 7/36 5.6E-02 2.1E-01 Lead Fish (mg/L)(mg/L)1/5 3 1.2E-02 1,2-Benzenedicarboxylic acid 7.9E-03 Groundwater 3 1/1 4.0E-03 4.0E-03 Groundwater 2-Pentanone(4,4-dimethyl) Groundwater Aluminum 1 13/19 4.4E-01 9.0E+00 Aluminum 2 12/15 2.5E-01 4.7E+00 Groundwater Aluminum 3 19/35 2.4E-01 4.7E+00 Groundwater 3 1/1 7.0E-03 7.0E-03 Groundwater Benzenamine, n-phenyl Benzene, methyl 3 1/5 4.2E-03 6.1E-03 Groundwater Beta-BHC 3 2/7 6.3E-05 9.8E-05 Greundwater 3/19 1.9E-02 Cobalt 1 7.0E-03 Groundwater 2 2/15 6.3E-03 1.2E-02 Groundwater Cobalt 3 9/36 1.2E-02 2.2E-02 Groundwater Cobalt 3 4/5 8.9E-03 1.6E-02 Groundwater Dichloromethane 3.8E-02 3 1/1 3.8E-02 Groundwater Hexane, 3, 4-bis(1,1-dimethyl) 1.7E-01 1/19 5.8E-02 Groundwater Lead 1 6.6E-02 Lead 3 6/74 2.4E-02 Groundwater 1.2E+01 Lithium 1 1/18 2.2E+00 Groundwater 18/18 3.7E-01 1.4E+00 Groundwater Strontium 1 2 11/11 1.9E-01 5.8E-01 Strontium Groundwater Strontium 3 13/13 3.1E-01 7.4E-01 Groundwater 2.1E-02 2.1E-02 Titanium 1 3/18 Groundwater 5.0E-02 Titanium 2 2/11 2.4E-02 Groundwater 2.6E-02 5/13 3.8E-02 Titanium 3 Groundwater 7.8E-04 2/8 5.8E-04 Groundwater **Total Uranium** î 5.4E-04 2 1/9 5.1E-04 Groundwater Total Uranium 7.4E-03 Total Uranium 3 3/12 8.1E-04 Groundwater 5.7E-03 3 4.5E-03 Trichloromethane 1/5 Groundwater

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#### Detectable contaminants

#### Table 4.12 (continued)

Detectable contaminants

			<b>.</b>		0.8.64
			Ratio of	Geometric	95% upper
			detected	mean	conf bound
Media	Contaminant	Dent	to total	(mg/kg or	on mean
name	name	Reach	samples	Bq/kg dry)	(mg or Bq/kg)
Sediment	Aluminum	1	31/31	1.3E+03	5.3E+03
Sediment	Aluminum	2	111/111	6.0E+02	2.0E+03
Sediment	Aluminum	3	58/58	1.5E+03	1.0E + 04
Sediment	<sup>57</sup> Co	2	4/4	8.0E+01	1.6E+02
Sediment	<sup>57</sup> Co	3	2/2	2.7E+02	5.9E+02
Sediment	Cobalt	1	31/31	6.4E+00	8.8E+00
Sediment	Cobalt	2	111/111	1.0E+01	1.1E+01
Sediment	Cobalt	3	54/58	1.2E+01	1.9E+01
Sediment	<sup>155</sup> Eu	2	13/13	1.1E+02	2.4E+02
Sediment	<sup>155</sup> Eu	3	8/8	1.2E+02	2.2E+02
Sediment	Lead	1	15/31	1.1E + 01	2.1E+01
Sediment	Lead	2	41/111	3.4E+00	5.6E+00
Sediment	Lead	3	34/62	8.0E+00	2.6E+01
Sediment	Lithium	2	4/111	5.6E+00	2.6E+02
Sediment	Lithium	3	2/54	1.5E+01	5.5E+02
Sediment	<sup>191</sup> Os	2	1/1	2.9E+01	2.9E+01
Sediment	<sup>125</sup> Sb	1	2/2	7.4E+02	1.7E+03
Sediment	<sup>125</sup> Sb	3	4/4	2.5E+02	3.9E+02
Sediment	<sup>75</sup> Se	3	2/2	8.6E+01	4.2E+02
Sediment	Strontium	1	31/31	6.1E+00	9.1E+00
Sediment	Strontium	2	111/111	8.2E+00	8.8E+00
Sediment	Strontium	3	54/58	6.7E+00	9.5E+00
Sediment	Titanium	1	22/31	5.5E+00	5.1E+01
Sediment	Titanium	2	95/111	9.0E-01	2.2E+01
Sediment	Titanium	3	55/58	4.9E+00	7.3E+02
Sediment	Total Plutonium	3	4/4	4.6E+02	5.1E+02
Sediment	Zirconium	1	24/31	1.9E+00	2.9E+00
Sediment	Zirconium	2	106/111	1.2E+00	1.5E+00
Sediment	Zirconium	3	53/58	2.3E+00	4.0E+01
				(Mg or Bq/L)	(Mg or Bq/L)
Surface water	1,2-Dichloroethene (total)	2	2/29	4.9E-03	6.9E-03
Surface water	Aluminum	1	27/32	3.0E-01	9.9E-01
Surface water	Aluminum	2	27/32	4.8E-01	2.7E+00
Surface water	Aluminum	3	28/32	5.7E-01	1.2E + 00
Surface water	<sup>155</sup> Eu	2	6/6	8.4E+00	1.6E+01
Surface water	Lead	1	4/33	5.4E-03	1.3E-02
Surface water	Lead	2	5/76	1.4E-02	2.4E-02
Surface water	Lead	3	7/33	5.2E-03	1.3E-02
Surface water	<sup>191</sup> Os	3	2/2	3.3E+00	3.3E+00
Surface water	Strontium	1	3/3	8.7E-02	1.1E-01
Surface water	Strontium	2	3/3	1.1E-01	1.7E-01
Surface water	Strontium	3	3/3	9.0E-02	9.6E-02
Surface water	Titanium	2	1/3	2.9E-02	9.4E-02

#### Table 4.12 (continued)

Nondetectable	contaminente

Media type	Contaminant name	Reach	Total number of samples	Minimun detection limits (mg/kg wet)	95% upper conf bound on mean (mg/kg wet)
Fish	1,3-Dichlorobenzene	1	12	2.0E-01	2.0E+00
Fish	1,3-Dichlorobenzene	2	8	2.0E-01	1.9E+00
Fish	1,3-Dichlorobenzene	3	16	2.0E-01	2.0E+00
Fish	2-Methyinaphthalene	1	12	2.0E-01	2.0E+00
Fish	2-Methylnaphthalene	2	8	2.0E-01	1.9E+00
Fish	2-Methyinaphthalene	3	16	2.0E-01	2.0E+00
Fish	2-Methylphenol	1	12	2.0E-01	2.0E+00
Fish	2-Methylphenol	2	8	2.0E-01	1.9E+00
Fish	2-Methylphenol	3	16	2.0E-01	2.0E+00
Fish	2-Nitroaniline	1	12	1.0E + 00	9.8E+00
Fish	2-Nitroaniline	2	8	1.0E+00	9.5E+00
Fish	2-Nitroaniline	3	16	1.0E+00	9.9E+00
Fish	2-Nitrophenol	1	24	2.0E-01	6.0E+00
Fish	2-Nitrophenol	2	16	2.0E-01	5.5E+00
Fish	2-Nitrophenol	3	32	2.0E-01	6.2E+00
Fish	3-Nitroaniline	1	12	1.0E + 00	9.8E+00
Fish	3-Nitroaniline	2	8	1.0E+00	9.5E+00
Fish	3-Nitroaniline	3	16	1.0E+00	9.9E+00
Fish	4-Bromophenyl phenyl ether	1	12	2.0E-01	2.CE+00
Fish	4-Bromophenyi phenyi ether	2	8	2.0E-01	1.9E+00
Fish	4-Bromophenyl phenyl ether	3	16	2.0E-01	2.0E+00
Fish	4-Chlorophenyi phenyi ether	1	12	2.0E-01	2.0E+00
Fish	4-Chlorophenyl phenyl ether	2	8	2.0E-01	1.9E+00
Fish	4-Chlorophenyi phenyi ether	3	16	2.0E-01	2.0E+00
Fish	4-Nitroaniline	1	12	1.0E+00	9.8E+00
Fish	4-Nitroaniline	2	8	1.0E + 00	9.5E+00
Fish	4-Nitroaniline	3	16	1.0E+00	9.9E+00
Fish	Bis(2-chlorodisopropyl)ether	1	12	2.0E-01	2.0E+00
Fish	Bis(2-chlorodisoprojayl)ether	2	8	2.0E-01	1.9E+00
Fish	Bis(2-chlorodisopropyl)ether	3	16	2.0E-01	2.0E+00
Fish	Bis(2-chloroethoxy)methane	1	12	2.0E-01	2.0E+00
Fish	Bis(2-chloroethoxy)methane	2	8	2.0E-01	1.9E+00
Fish	Bis(2-chloroethoxy)methane	3	16	2.0E-01	2.0E+00
Fish	Delta BHC	1	12	5.0E-03	3.9E-02
Fish	Deita BHC	2	8	5.0E-63	3.8E-02
Fish	Delta BHC	3	16	5.0E-03	4.0E-02
Fish	Dibenzofuran	1	12	2.0E-01	2.0E+00
Fish	Dibenzofuran	2	8	2.0E-01	1.9E+00
Fish	Dibenzofuran	3	16	2.0E-01	2.0E+00
Fish	Endosulfan sulfate	1	12	9.0E-03	2.0E-01
Fish	Endosulfan sulfate	2	8	9.0E-03	1.9E-01
Fish	Endosulfan sulfate	3	16	9.0E-03	2.0E-01
Fish	Endrin ketone	1	12	9.0E-03	3.9E-02
Fish	Endrin ketone	2	8	9.0E-03	3.8E-02
Fish	Endrin ketone	3	16	9.0E-03	4.0E-02

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Nondetectable contaminants

Media type	Contaminant name	Reach	Total number of samples	Minimun detection limits (mg/kg wet)	95% upper conf bound on mean (mg/kg wet)
Fish	Lead	2	19	2.0E-02	3.4E-01
Fish	Parachiorometa cresol	1	12	2.0E-01	2.0E+00
Fish	Parachlorometa cresol	2	8	2.0E-01	1.9E+00
Fish	Parachiorometa cresol	3	16	2.0E-01	2.0E+00
			•	(mg/kg dry)	(mg/kg dry)
Sediment	1,2-Dichloropropene	3	2 2	1.0E-02	1.0E-02
Sediment	1,3-Dichlorobenzene	1		1.0E+01	1.0E+01
Sediment	1,3-Dichlorobenzene	2	10	1.0E+01	1.0E+01
Sediment	1,3-Dichiorobenzene	3	16	9.1E-01	1.1E+01 1.0E-02
Sediment	2-Chloroethyl vinyl ether	3	1	1.0E-02	
Sediment	2-Chlorovinyl ether	3	1	1.0E-02	1.0E-02
Sediment	2-Methylnaphthalene	1	2	1.0E+01	1.0E+01
Sediment	2-Methylnaphthalene	2	10	1.0E+01	1.0E+01
Sediment	2-Methylnaphthalene	3	14	1.0E+01	1.0E+01
Sediment	2-Methylphenol	1	3	1.0E+01	1.0E+01
Sediment	2-Methylphenol	2	10	1.0E+01	1.0E+01
Sediment	2-Methylphenol	3	14	1.0E+01	1.0E+01
Sediment	2-Nitroaniline	1	2	1.0E+01	2.8E+02
Sediment	2-Nitroaniline	2	10	1.0E+01	4.1E+01
Sediment	2-Nitroaniline	3	14	1.0E+01	2.8E+01
Sediment	2-Nitrophenol	1	3	1.0E+01	3.1E+01
Sediment	2-Nitrophenol	2	10	1.0E+01	2.0E+01
Sediment	2-Nitrophenol	3	14	1.0E+01	2.0E+01
Sediment	3-Nitroaniline	1	2	1.0E+01	2.8E+02
Sediment	3-Nitroaniline	2	10	1.0E+01	4.1E+01
Sediment	3-Nitroaniline	3	14	1.0E+01	2.8E+01
Sediment	4-Bromophenyl phenyl ether	1	2	1.0E+01	1.0E+01
Sediment	4-Bromophenyl phenyl ether	2	10	1.0E+01	1.0E+01
Sediment	4-Bromophenyl phenyl ether	3	16	9.1E-01	1.1E+01
Sediment	4-Chlorophenyl phenyl ether	1	2	1.0E+01	1.0E+01
Sediment	4-Chiorophenyi phenyi ether	2	10	1.0E+01	1.0E+01
Sediment	4-Chlorophenyl phenyl ether	3	16	9.1E-01	1.1E+01
Sediment	4-Nitroaniline	1	2	1.0E+01	2.8E+02
Sediment	4-Nitroaniline	2	10	1.0E+01	4.1E+01
Sediment	4-Nitroaniline	3	14	1.0E + 01	2.8E+01
Sediment	4-Nitrophenol	1	3	5.0E+01	5.0E+01
Sediment	4-Nitrophenol	2	10	5.0E+01	5.0E+01
Sediment	4-Nitrophenol	3	16	9.1E-01	5.3E+01
Sediment	Bis(2-chloroethoxy)methane	1	2	1.0E+01	1.0E + 01
Sediment	Bis(2-chloroethoxy)methane	2.	10	1.0E+01	1.0E+01
Sediment	Bis(2-chloroethoxy)methane	3	16	9.1E-01	1.1E+01
Sediment	Delta BHC	1	2	1.0E+01	1.0E+01
Sediment	Delta BHC	2	6	1.0E+01	1.0E+01
Sediment	Delta BHC	3	13	9.1E-01	1.1E+01
Sediment	Dibenzofuran	1	3	1.0E+01	1.0E+01
Sediment	Dibenzofuran	2	10	1.0E+01	1.0E+01
Sediment	Dibenzofuran	3	14	1.0E+01	1.0E+01

#### Table 4.12 (continued)

Nondetectable contaminants

Media type	Contaminant name	Reach	Total number of samples	Minimun detection limits mg/kg dry	95% upper conf bound on mean mg/kg dry
Sediment	Endosulfan sulfate	1	1	1.0E+01	1.0E+01
Sediment	Endosulfan sulfate	2	6	1.0E+01	1.0E+01
Sediment	Endosulfan sulfate	3	13	9.1E-01	1.1E+01
Sediment	Endrin aldehyde	1	1	1.0E+01	1.0E+01
Sediment	Endrin aldehyde	2	6	1.0E+01	1.0E+01
Sediment	Endrin aldehyde	3	13	9.1E-01	1.1E+01
Sediment	Gallium	1	18	2.9E+00	1.5E+01
Sediment	Gallium	2	98	3.0E+00	6.2E+00
Sediment	Gallium	3	45	2.9E+00	2.4E+01
Sediment	Litb/um	1	30	2.0E+00	1.0E+03
Sediment	Parachlorometa cresol	1	2	1.0E+01	1.0E+01
Sediment	Parachlorometa cresol	2	10	1.0E+01	1.0E+01
Sediment	Parachlorometa cresol	3	16	9.1E-01	1.1E+01
Sediment	Silvex	3	5	1.0E+01	1.0E+01
				(Mg or Bq/L)	(Mg or Bq/L)
Surface water	1,2-Dichloroethene (total)	1	29	5.0E-03	7.1E-03
Surface water	1,2-Dichloroethene (total)	3	28	5.0E-03	7.2E-03
Surface water	2-Hexanone	1	29	1.0E-02	1.4E-02
Surface water	1,2-Dichloroethene (total)	2	29	1.0E-02	1.4E-02
Surface water	2-Hexanone	3	28	1.0E-02	1.4E-02
Surface water	Cobalt	1	3	4.0E-03	4.0E-03
Surface water	Cobalt	2	3	4.0E-03	4.0E-03
Surface water	Cobalt	3	3	4.0E-03	4.0E-03
Surface water	<sup>129</sup> I	3	10	1.0E-02	1.0E-01
Surface water	Lithium	1	3	1.5E+01	1.5E+01
Surface water	Lithium	2	3	1.5E+01	1.5E+01
Surface water	Lithium	3	3	1.5E+01	1.5E+01
Surface water	Titanium	1	3	2.0E-02	2.0E-02
Surface water	Titanium	3	3	2.0E-02	2.0E-02
Surface water	Zirconium	1	3	2.0E-02	2.0E-02
Surface water	Zirconium	2	3	2.0E-02	2.0E-02
Surface water	Zirconium	3	3	2.0E-02	2.0E-02

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limitations of the data bases used in the screening analyses of groundwater; however, the detectable contaminants in the data bases are useful to verify that a contaminant is present in groundwater.

Noncarcinogen. Screening indices for the nonconservative screening of detectable noncarcinogens are listed in Table F2, Appendix F. All reaches had screening indices <1.0, indicating that noncarcinogens in groundwater in the three reaches are not high priority contaminants that would require immediate consideration for remedial action. Reaches 1 and 2 had screening indices of  $6.5 \times 10^{-1}$  and  $1.0 \times 10^{-1}$ , respectively, which would require further investigation before taking action. Antimony, with a screening index of  $5.7 \times 10^{-1}$ , is the only noncarcinogen that would require further investigation in Reach 1. However, this analysis is based on two detectable measurements out of a total of 20 analyzed, indicating that additional sampling is needed and that the analytical procedures should be reviewed. All other contaminants in Reach 1 have screening indices <0.1. For Reach 3, the screening index for inorganics was  $1.0 \times 10^{-1}$ ; however, none of the individual contaminants had screening indices  $\geq 0.1$ .

#### 4.8.1.2 Conservative screening of detectable contai linants in groundwater

**Caucinogen.** Conservative screening of carcinogens in groundwater did not eliminate from further investigation any of the contaminants in the detectable contaminants data base (Table F3, Appendix F). All reaches had screening indices  $>10^{-3}$ . Beryllium and tritium had screening indices  $>10^{-4}$  in all three reaches. Strontium-90 in Reaches 1 and 2 and arsenic, <sup>234</sup>U, <sup>60</sup>Co, <sup>224</sup>Ra, <sup>241</sup>Am, and <sup>234</sup>Th in Reach 3 had screening indices  $>10^{-4}$ . However, the data for <sup>234</sup>U, <sup>224</sup>Ra, <sup>241</sup>Am, and <sup>234</sup>Th in Reach 3 is limited and should only be used to support additional data collection.

Noncarcinogen. Conservative screening of noncarcinogens in groundwater indicated that none of the reaches could be assigned low priority for further consideration (Table F4, Appendix F). Organics in Reach 3 was the only class of noncarcinogens that could be assigned a low priority for further investigation. Antimony in Reach 1 was the only carcinogen that had a screening index  $\geq 1.0$ . Four inorganics in Reach 1, six in Reach 2, and five in Reach 3 had screening indices <0.1, but most of these cannot be eliminated from further consideration because of the limited data.

#### 4.8.5 Special Case-Lead

Although an action level for lead of 0.015 mg/L has been adopted by EPA (EPA 1991), specific toxicity values are not available (Table 4.12); therefore, an EPA Uptake/Biokinetic model designed to a target population of children (0 to 6 years old) was used to evaluate the risk from lead in WAG 2. Results obtained using this model indicate that concentrations in groundwater in Reaches 1 and 3 would present a problem. This scenario is hypothical because WAG 2 is a fenced area where public access is not allowed.

### 4.9 CONCLUSIONS FOR SCREENING RISK ASSESSMENT FOR HUMAN EXPOSURE

#### 4.9.1 Reaches 1 through 3

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Nonconservative screening of the detectable and nondetectable contaminants data bases for four exposure pathways was used to identify high priority contaminants for the three reaches of WAG 2. The carcinogens in the detectable contaminants data bases that were assigned high priority were <sup>60</sup>Co in Reaches 1, 2, and 3 and <sup>137</sup>Cs in Reaches 1 and 3 for the external exposure pathway; PCB (Aroclor 1254) in Reach 1 and 3 for the fish ingestion pathway; and arsenic in Reaches 2 and 3 for the drinking (surface) water pathway. Arsenic is a possible artifact because of the small number of samples in which the concentration was above the limits of detection.

Ten carcinogens (dichlorobromomethane, Aroclor 1254, Aroclor 1260, <sup>137</sup>Cs, <sup>90</sup>Sr, <sup>3</sup>H, <sup>152</sup>Eu, <sup>134</sup>Cs, <sup>154</sup>Eu, and <sup>234</sup>U) in the detectable contaminants data bases were classified as requiring further investigation in one or more reaches. Three of these contaminants were organics and seven were radionuclides. Limited data were available for <sup>134</sup>Cs, <sup>152</sup>Eu, <sup>154</sup>Eu and <sup>234</sup>U for some of the reaches; therefore, additional analyses are needed for these radionuclides. Limited data also were available for <sup>241</sup>Am, <sup>244</sup>Cm, <sup>238</sup>Pu, and <sup>239</sup>Pu; thus, although they were not classified as requiring further action, additional data are required.

For noncarcinogens in the detectable contaminants data bases, only thallium was assigned high priority for immediate consideration for remedial action in Reaches 1, 2, and 3. However, because only one sample was analyzed in each reach, thallium may be an artifact and it requires additional data. Mercury in Reach 1 in the fish ingestion pathway and arsenic in Reach 2 in the water ingestion pathway were the only noncarcinogens in the detectable contaminants data bases that would require further investigation.

Conservative screening of the detectable contaminants data bases identified 3 organic and 12 radionuclides in one or more reaches of WAG 2 as low priority carcinogens for further consideration. However, because of limited information on some of these contaminants, additional data are needed. Most inorganic noncarcinogens in the sediment ingestion pathway in all reaches can be assigned a low priority. Low priority was assigned to barium, copper, mercury, nickel, and zinc in the sediment and water ingestion pathways in all reaches.

Results of the nondetectable contaminants data bases should be viewed with caution because of the uncertainty associated with the contaminant concentrations. Nonconservative screening identified as high-priority contaminants one organic carcinogen in the fish ingestion pathway and two in the sediment ingestion pathway. However, because the screening analysis was based on minimum detection limits, better detection limits are needed, and a review of source-term data is appropriate. None of the noncarcinogens were identified by nonconservative screening as high priority contaminants in WAG 2. Conservative screening of the nondetectable data bases identified 25 organic carcinogens that can be assigned low priority for further consideration in the sediment ingestion pathway. Low priority can also be given to 29 organic noncarcinogens plus chronium and nickel in the fish ingestion pathway; boron, vanadium, and tin in the water ingestion pathway; cyanide in the sediment ingestion pathway; and silver and beryllium in the fish and water ingestion pathways.

Nonconservative screening of the detectable contaminants data base for groundwater indicated that no carcinogen or noncarcinogen could be assigned a high priority. However, because of the lack of verification of the limited data base, additional data will be required for groundwater. Lead was not included in the screening analysis, but an EPA Uptake/Biokinetic model predicted that it would be a problem in groundwater in Reaches 1 and 3.

Results of the intruder scenario indicated that the greatest risk in this hypothetical scenario was from the ingestion of fish in all reaches. In the fish ingestion pathway, radionuclides contributed the greatest risk in Reaches 1 and 2 and PCBs in Reach 3.

#### 4.9.2 Results for Screening Risk Assessment for Human Exposure for WOCE

As the result of a CERCLA removal action in response to uncontrolled contaminated sediments in WOCE, the information available for the extent of contamination in WOCE was more thorough than that available for the remainder of WAG 2 (Blaylock et al. 1991). A screening analysis was conducted using methods similar to those described herein. The screening analysis for carcinogens identified several substances as definitely high priority and requiring immediate consideration: arsenic in water ingestion, PCBs in fish ingestion, and <sup>60</sup>Co and <sup>137</sup>Cs in the sediment external exposure pathway. Arsenic in water was a possible artifact, because arsenic was detected in only 2 of 24 samples analyzed. Two organic contaminants, six inorganic, and six radiological contaminants had screening indices that would require further investigation before taking action.

The screening for noncarcinogens did not identify any contaminant that could definitely be assigned high priority.

Screening of the WOCE nondetectable contaminants data base identified 16 organic carcinogens as definitely high priority. For these compounds it will be necessary to either improve the detection limits or to use source-term data to verify their presence.

#### 5. SCREENING ASSESSMENT OF ECOLOGICAL RISKS

As discussed in Sect. 1, the purpose of the screening risk assessment is to identify hazards associated with wastes in WAG 2, prioritize them with respect to their potential risks, and identify data needs on the basis of that analysis. The ecological assessment is concerned with risks to populations and communities of nonhuman organisms that occur on the site or may occur there in the future. The assessment uses the format of a standard risk assessment, with a hazard definition phase followed by parallel exposure and effects assessments and ending with risk characterization.

#### 5.1 ECOLOGICAL HAZARD DEFINITION

The hazard definition phase of a risk assessment defines the scope of the assessment, the sources being assessed, and the endpoints of the assessment. An ecological hazard consists of a source of potentially toxic exposure combined with a valued and potentially susceptible receptor (the endpoint organisms) in a particular environment.

#### 5.1.1 Sources and Routes of Exposure

WAG 2 consists of two streams (WOC and Melton Branch) and their associated floodplains, which continue to receive seepage and runoff from waste sites as well as point source emissions. Therefore, the ultimate sources of contaminant exposure in WAG 2 are the aqueous point sources, which are permitted under NPDES and are not of concern in this assessment, and the releases of contaminants by waste sites, which are the subject of the ongoing environmental restoration process. The proximate sources of exposure are (1) contaminants in the stream sediments and floodplain soils, (2) water contamination (which results from current point and nonpoint input, desorbtion and resuspension from sediments, and erosion and leaching from floodplain soils), and (3) contaminants in the biota, which act as a source of exposure for their consumers (e.g., contaminated fish eaten by herons). These sources are characterized by chemical analyses. The sources and nature of these data and the procedure used to compile them are discussed in Sect. 3; however, the existing data do not constitute a complete description of the proximate sources. In particular, contamination of floodplain soils has not been characterized for chemicals other than radionuclides.

#### 5.1.2 Exposed Environment

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The spatial scope of the assessment (see Sect. 2 for a more detailed description) is WOL, WOC below the main ORNL plant (i.e., WAG 1), Melton Branch, and the floodplains of the creeks and lake. WOC is coded as Reach 1, Melton Branch is Reach 2, and WOL is Reach 3. The ecology of this area is described in Loar (1988-1991), Loar et al. (1981 and 1987), Boyle et al. (1982), Mann and Kitchings (1982), Oakes et al. (1982), and Sherwood and Loar (1987).

The aquatic communities of WAG 2 are well characterized due to five years of monitoring by the Biological Monitoring and Abatement Program (BMAP) (Loar et al.

1987, Loar 1988-1990). The BMAP has identified 14 species of fish in the watershed, including seven species of centrarchids (relatively large predatory species that could serve as game fish). Fish production is generally similar to similar streams in the region, although considerable variation occurs among reaches (Loar 1990).

The floodplains of WOC and Melton Branch are dominated by hardwood forests. The floodplain of WOL, particularly at the confluence of the creek, is dominated by shrubby vegetation, principally box elder and willows.

Although several federally listed threatened or endangered species occur in the region (Kroodsma 1987), none are known to occur on WAG 2. However, the endangered Indiana bat (*Myotis sodalis*) is suspected to occur on the lower East Fork Poplar Creek and may occur on WOC as well. Several state-listed species occur on the Oak Ridge Reservation and may occur on WAG 2 (Table 5.1).

Wetlands and floodplains are protected by Executive Orders 11990 and 11988, respectively. Although no official wetlands survey has been conducted for WAG 2, apparent wetlands occur in the floodplains of the creeks and the lake, and the floodplains clearly qualify as floodplains.

#### 5.1.3 Ecological Endpoints

The endpoints for this assessment are those described and justified in the "Approach and Strategy for Performing Ecological Risk Assessments for the Oak Ridge Operations Environmental Restoration Program" (in press). In brief, they are (1) no reduction greater than 20% in the abundance or productivity of populations of fishes, birds, mammals, or vascular plants, (2) no injury of individuals of threatened or endangered species sufficient to impair survival or reproduction, and (3) no loss of wetland or floodplain communities. The 20% figure in the first endpoint is derived from an analysis of EPA regulatory criteria and is intended to approximate the agency's *de facto* but unstated level of protection (Suter et al. 1992). No particular species are chosen to represent the endpoints because most-sensitive species cannot be identified a priori, and in most cases the toxicity and exposure data do not permit discrimination amo 'adividual members of taxa or trophic groups.

#### 5.2 EXPOSURE ASSESSMENT

#### 5.2.1 Water

Fish and invertebrates inhabiting the water column are assumed to be exposed to chemicals in the water primarily through respiratory uptake. This assumption is accurate for nearly all chemicals except for the few that bioaccumulate through food chains to a significant extent (i.e., PCBs, methyl mercury, and selenium). However, measured body burdens are more reliable measures of exposure (Sect. 5.2.3). In addition, the sample preparation and analysis techniques used to measure concentrations in water are intended to measure total contaminant concentrations rather than bioavailable concentrations.

Common Name	Scientific Name	Administrative Status
Fish		
Tennessee dace	Phonixus oreas	IMN
Birds		
Black-crowned night heron	Nycticorax nycticorax	INM
Black Vulture	Coragyps atratus	INM
Common barn owl	Tyto alba	INM
Cooper's hawk	Accipiter cooperii	ST
Grasshopper sparrow	Ammodramus savannarum	ST
Osprey	Pandion haliaetus	SE
Red-shouldered hawk	Buteo lineatus	ST
Sharp-shinned hawk	Accipter striatus	ST
Mammals		
Indiana bat	Myotis sodalis	FE,SE
<u>Plants</u>		
Spreading false foxglove	Aureolaria patula	ST
Appalachian bugbane	Cimicifuga rubifolia	ST
Pink lady's slipper	Cypripedium acaule	SL
Tall larkspur	Delphinium exaltatum	SE
Northera bush honeysuckle	Diervilla lonicera	ST
Nutall waterweed	Elodea nuttallii	SS
Mountain witch alder	Fothergilla major	ST
Golden seal	Hydrostis canadensis	ST
Butternut	Juglans cinerea	ST
Canada lily	Lilium canadense	ST

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# Table 5.1. Federally and state listed threatened and/or endangered speciesand species designated In Need of Management by the State ofTennessee known or expected to occur on theOak Ridge Reservation

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Table 5.1 (continued)

Common Name	Scientific Name	Administrative Status
Michigan lily	Lilium michiganense	ST
Fen orchid	Liparis loeselii	SE
Ginseng	Panax quinquefolium	ST
Tubercled rein orchid	Platanthera flava var herbiola	ST
Purple fringeless orchid	Platanthera peranoena	ST
Carey saxifrage	Saxifraga careyana	SS
Lesser ladies' tresses	Spiranthes ovalis	SS

\*Status Codes:

FE - Federally Endangered FT - Federally Threatened SE - State Endangered ST - State Threatened SS - State Special Concern INM - In Need of Management according to the State of Tennessee

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Therefore, the reported concentrations may be very conservative estimates of aqueous exposure.

#### 5.2.2 Sediment

The sediment composition data available for this assessment are concentrations in dry sediment. However, effects of a particular dry sediment concentration on sediment-dwelling (benthic) organisms are highly inconsistent, because benthic organisms are exposed primarily to chemicals in the aqueous phase of sediments (Adams et al. 1985, OWRS 1989); therefore, it is necessary to estimate the concentration in pore (interstitial) water. In riffles, the substrate consists of stones and gravels that retain relatively low concentrations of sorbed contaminants, and exchange of water occurs between the substrate and overlying water. For those areas, the surface water analyses are the best estimators of the exposure of benthic organisms to contaminants. However, there is obviously a gradient from large gravels which are bathed in surface water to fine sediments with distinct pore water.

In WOL and in pools of the streams where finer sediments collect, pore-water concentrations must be estimated from sediment concentrations. Pore-water concentrations of neutral (non-ionic) organic chemicals can be calculated by assuming equilibrium partitioning between the pore water and the organic matter fraction of the sediment (OWRS 1989). The partitioning coefficient  $(K_p)$  is the product of the organic matter/water partitioning coefficient  $(K_{oc})$  and the fractional organic matter content of the sediment ( $f_{oc}$ ). Because sediment-dwelling organisms are approximately as sensitive to chemicals in water as the population of species that was used to derive the National Ambient Water Quality Criteria (NAWQC) (OWRS 1989), the same screening criteria can be used as for water but corrected for partitioning. The formula is:

$$C_{s} = K_{p}C_{w}, \text{ or}$$
$$C_{s} = K_{oc}f_{oc}C_{w},$$

where  $C_s$  and  $C_w$  are equivalent concentrations in sediment and water, respectively.  $K_{oc}$  is seldom available, but it is accurately approximated by the octanol/water partitioning coefficient ( $K_{ow}$ ) (DiToro 1985). This approach is being used by the EPA to derive sediment quality criteria (OWRS 1988).

Concentrations of ionic organic chemicals and inorganic chemicals in pore water could, in theory, also be calculated from an equilibrium partitioning model. However, these chemicals are sorbed to multiple sediment components so they would require several-phase partitioning models with a partitioning coefficient and concentration in sediment for each phase; such information is not available. We assume that ionic organics behave like neutral organics, only partitioning between water and sediment organic matter. This is a conservative assumption because partitioning to other phases would lower the aqueous-phase concentration, thereby lowering the toxicity of a given whole-sediment concentration. For metals in sediments, we use generic  $K_p$  values from the International Atomic Energy Agency (1982).

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Another approach is to derive site-specific, sediment-water partitioning coefficients. Blaylock et al. (in review) have proposed a sediment-water partitioning coefficient for mercury in Watts Bar Reservoir of  $10^5$ . This value is derived from concentrations of mercury in suspended particulate matter and filtered water from Tennessee River Mile 545. It is probably a reasonable estimate of the mercury  $K_p$ , although suspended solids differ from bed sediments, and  $K_p$  varies with solids concentration and redox potential (OWRS 1989).

Besides the risks to benthic organisms, it is necessary to consider risks to water-column species from chemicals associated with resuspended sediments. We believe that the screening criteria for benthic organisms are sufficiently conservative for this purpose. That belief is based on the following arguments: (1) the screening criteria are based on an assumption of chronic exposure, but exposures to suspended sediments would be acute; (2) dilution would rapidly decrease the aqueous concentration outside the plume and also within the plume once the particulate concentration dropped sufficiently to prevent attainment of equilibrium; and (3) the biological component of the sediment criteria is applicable because it is based primarily on water-column species.

#### 5.2.3 Tissue Concentrations as Indicators of Effects on Fish

Tissue concentrations can be used in two ways to derive screening criteria. First, for a few chemicals there are data on the tissue concentrations at which effects occurred. When they are available, these data will be used to derive criteria. When they are not available, it is necessary to use conventional aquatic toxicity data that are expressed as aqueous concentrations. In that case, bioaccumulation factors (BAFs) or bioconcentration factors (BCFs) are used to estimate the average water concentrations to which fish have been exposed (fish tissue concentration/BAF = water concentration). When available, field-derived BAFs are used. Otherwise, laboratory-derived BCFs or BCFs derived from models of laboratory data [i.e., quantitative structure-activity relationships (QSARs)] are used. The laboratory-derived factors are likely to overestimate the water concentrations for those chemicals that are accumulated through food chains, but these overestimates will tend to highlight those chemicals. The same upper and lower criteria that are used for water concentrations are then applied to the calculated water concentration to serve as a screen for the fish tissue concentrations.

#### 5.2.4 Tissue Concentrations and Piscivorous Wildlife

The contamination in fish and aquatic invertebrate tissues represents a route of exposure for piscivorous animals. Doses (mg of chemical/kg of animal) must be converted to concentrations in food by dividing by consumption (kg of food/kg of animal). Local piscivorous birds range from kingfishers to great blue herons, ospreys, and bald eagles. The highest dose would be obtained by the smallest bird (because of higher metabolism), and a predatory bird the size of a kingfisher consumes food equivalent to approximately 8% of its body weight per day (Kenaga 1973). The principal piscivorous mammal in the area is the mink. We assume that mink consume food equal to 5% of their body weight per day and that the food consists entirely of fish. The 8% figure is used to calculate the screening criteria because it is more conservative, but we consider effects on mink in the discussion of results because of their sensitivity. For the conversion of acute dose to

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concentration in diet, we assume that one day's consumption is equivalent to an acute dose.

Because the studies of chemical concentrations in fish that were conducted in the Oak Ridge area were designed for human health risk assessments, the reported concentrations refer to the "edible portion." Piscivores typically consume the entire fish, and the organs and bones contain higher levels of nearly all chemical contaminants than the muscles. Metals concentrations in whole fish (minus gut contents) tend to be approximately 1.5 to 2 times as high as in fillets or carcasses (Lemly and Smith n.d., Brumbaugh and Kane 1985). Hydrophobic organic chemicals like PCBs occur in whole fish at 2 to 3 times the concentration in fillets. Therefore, we apply a factor of 2 to metal concentrations in fish and a factor of 3 to organic chemical concentrations in fish when calculating lower screening criteria.

Another source of error is the moisture content of the food. The concentrations reported from dietary toxicity data are usually based on the weight of the food as consumed by the animal (i.e., fresh weight), but may be reported as dry weight. In addition, the water content of foods is variable and is often unreported in dietary toxicity studies. The concentrations in fish provided for this assessment are fresh weight. We assume, unless the source indicates otherwise, that the toxic concentrations are also fresh weight and that the water content of the diet and of fish fillets is approximately equal. This assumption could result in an error of approximately a factor of 5 in the results.

In addition to the uncertainties discussed above, this analysis of risks to piscivorous birds and mammals does not include other animals that feed on aquatic organisms. Reptiles and amphibians feed on aquatic invertebrates and fish, but few data exist on dietary toxicity for these taxa. Raccoons and diving ducks consume aquatic invertebrates, but tissue analyses are not available for invertebrates in the waters being assessed. We assume that, because they feed from a variety of sources other than aquatic invertebrates, these populations will be protected by the criteria for piscivores. Dabbling ducks consume aquatic macrophytes, but there are not enough data concerning contamination of these sources to perform an assessment. Dietary exposure of predatory fish to contaminated fish and invertebrates is not a significant route of exposure except for the most bioaccumulative chemicals, which are discussed along with the results on exposure to water.

#### 5.3 EFFECTS ASSESSMENT

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In a screening assessment the exposure/response relationship is reduced to a threshold concentration or dose below which exposures can be assumed to be safe (the lower screening criterion) and a concentration or dose above which severe effects are certain (the upper screening criterion). In this section both the approaches used to develop these benchmark values and the derivation of the individual values are explained.

#### 5.3.1 Methods for Deriving Benchmarks

#### 5.3.1.1 Water

The NAWQC for protection of freshwater aquatic life are ARARs; therefore, they provide the basis for the screening criteria for contaminants in water. The acute NAWQC are calculated by the EPA as the fifth percentile of the distribution of 48- to 96-hr LC<sub>50</sub> values or equivalent effective concentration ( $EC_{50}$ ) values for each criterion chemical (Stephan et al. 1985). Hence, the acute NAWQC correspond to concentrations that would cause 50% mortality in 5% of exposed populations in a few days. This is a reasonable upper screening criterion because this assessment is concerned with continuous exposures, rather than the episodic exposures to which the acute NAWQC is applied. The chronic NAWQC are based on the threshold for statistically significant effects in chronic or subchronic toxicity tests, adjusted to estimate the concentration that would equal that threshold in 5% of species (Stephan et al. 1985). It is intended to be protective in chronic exposures and is used in this assessment as one estimator of the lower screening criterion.

If NAWQC are not available for a chemical, they are estimated using the method of for calculating advisory values when there are insufficient data to calculate criteria. Advisory values are concentrations that would be expected to be higher than NAWQC in no more than 5% of cases. Therefore, they serve as conservative estimates of the ARARs.

For particular chemicals, the lower screening criterion could be lower than the chronic NAWQC for any one of the following five reasons. First, the chronic NAWQC are based on a threshold for statistical significance rather than biological significance. In some chronic tests, because of highly variable results, the statistical threshold corresponds to greater than 50% effect on a response parameter (Stephan and Rogers 1985, Suter et al. 1987). Second, not all important responses are included in the subchronic toxicity tests that are used to calculate many chronic NAWQC. In particular, effects on fecundity, which is the most sensitive response parameter on average in fish toxicity tests (Suter et al. 1987), are not included. Third, the chronic NAWQC are based on the most statistically sensitive of the measured response parameters in each chronic or subchronic test. Therefore, cumulative effects over the life cycle of fish and invertebrates are not considered. Fourth, the criteria are set at a level that protects "most species most of the time." A lower screening criterion should protect all species nearly all of the time. Finally, because many of the criteria have not been revised since 1980, they do not incorporate recent data. In addition, available data for most chemicals are insufficient to calculate water quality criteria.

For these reasons, we evaluate six alternative benchmarks, and, for the sake of this screening assessment, we use the lowest benchmark for each chemical as the lower screening criterion (Table 5.2). The first is the chronic NAWQC, which is discussed above (this section). The second and third are the lowest chronic values for fish and invertebrates reported in the literature. The fourth is the highest tested concentration causing less than 20% reduction in (1) the weight of young fish per initial female fish in a life cycle or partial life cycle test or (2) the weight of young per egg in an early life-stage test. The fifth is the highest tested concentration causing less than 20% reduction in the

	NAW	NAWO Criteria	Lowes	Lowest Chronic		Lowest EC20	
	idda *	* approximated	Valu	Value for:		Value for:	
Chemical name	Acute	Chronic	Fish	Daphnids	Fish	Dæphnids	5%ECZU
INORGANICS							
Aluminum	750	87	5800	1900	4700	540	21
Antimony	* 220	* 18	1600	5400	2310	1900	•
	360	190	2962	914.1	633	633	105
Arcure III Arconic V	* 17	* 0.47	891.6	ı	1500	>932	۰
Rarium	* 4.4	* 0.11	•	•	ı	•	ı
Berulling	* 40	* 0.44	•	5.3	ı	3.0	•
			•	•	ı	5	١
boron	30	anno Anno Anno	1.7	0.15	1.8	0.75	0.032
Caumum			•	ł	·	ı	•
Calcium		-	60 03	< 44	08	ł	69
Chromium III	N/1	017	00.00	C 127	) <b>;</b>	50	013
Chromium VI	16		/3.10	0.132	10	~ ~ ~	
Cobalt	* 24	• 0.29	067	1.0	010	***	, <b>.</b>
Conner	18	12	3.873	0.23	S	<b>CU2.U</b>	1.1
Cranide	22	5.2	7.8	8	<5.7	•	<2.9
Cyannuc Elitorine	* 2700	* 140	•	4400	•	3706	ı
	)   	1000	ı	158	•	16	ı
LIUII Leod	82	3.2	18.88	12.26	52	ł	1.5
I ithium	ł	ı	٠	ı	ŧ.	•	ı
	* 65	* 0.16		•	•	•	ł
Magicaium	* 320	+ 11	1770	<1100	1270	<1100	ı
Mangancse	0CC	0.012	<0.23	0.96	0.87	0.87	1.3
	+ 3200	* 30	ı	880	ı	360	•
Molyodenum Mistel	1400	1 <u>60</u>	<35	<5	35	<45	10
		ı	·	•	·	•	١
HUDOIN	57 47 41	+ 013	•	•	i	I	ı
POTASSIUM							

Table 5.2 Summary of Benchmarks for Priority Contaminants in Freshwater (all values in µg/)

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Table

	NAV	NAWQ Criteria	Lowe	Lowest Chronic		Lowest EC20	
Chemical name	* apj Acute	* approximated ute Chronic	<b>Valu</b> Fish	Value for: th Daphnids	Fish	Value for: Daphnids	5%EC20
INORGANICS (continued)							
Potassium	* 53	• 0.13	,	·	•	•	9
Selenium	260	35	88.32	91.65	40	25	15
Silver	4,1	0.12	0.12	2.6	0.20	<0.56	0.18
Sodium	* 19,000	* 480	·	ŕ	•	a	•
Strontium	•	·	•	•	•	•	1
Thallium	* 24	* 2.2	57	130	81	64	•
Thorium	·	·	ı		i 1		ė
Tin	•	•	I	ł	·	•	•
Titanium	ð	•	ı	ı	ı	ı	1
Uranium	·	ı	ı	•	i	•	9
Vanadium	* 36	* 9.4	8	1900	41	430	ı
Zinc	120	110	36.41	46.73	47	1	7.5
Zirconium	a	ı	ı		£	1	•
ORGANICS							
Acenapthene	* 29	* 2.2	413	ı	<197		•
Acetone	* 25,000	<b>*</b> 640	ı	ı	ı	•	ı
Anthracene	<b>* 0.00058</b>	* 0.00001	•	<2.1	ı	>8.2	•
Benzene	* 100	* 2.6	•	>98,000	21	,	•
Benzidene	* 1.5	* 0.037	ı	ı	,	•	ı
Benzo(a)anthracene	* 0.11	* 0.0027	•	0	ı	•	•
Benzo(a)pyrene	* 0.053	* 0.0013	•		>2.99	ł	ł
Benzo(b)fluoranthene	ł	•	•	•	•	ı	•
Benzo(g,h,i)perylene	t		ı	¢	•	•	•

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	NAN Ma	NAWQ Criteria	Lowes	Lowest Chronic Value for:		Lowest EC20 Value for:	
Chemical name	Acute	Chronic	Fsh	Daphnids	Fish	Daphnids	5%EC20
ORGANICS (continued)							
Benzo(k)fluoranthene	ı	,	ŧ	•	١	8	•
Benzoic acid	* 18	* 0.45	•	·	ı	1	•
Benzyl alcohol	* 1.0	<b>*</b> 0.025	•	I	•	ı	1
BHC (lindane)	2.0	0.08	14.6	14.5	<1.1	<11>	0.066
BHC (other)	* 9.5	* 0.24	ı	•	•	١	•
Bis(2-ethylhexyl)						'	
phthalate	* 2.6	* 0.087	8.4	₹	>54	3	•
Butane,							
1.1-oxybis	·	•	•	٩	ı	8	١
(2.1-ethanedivloxy)bis	•	•	ı	•	١	ŧ	ł
2-Butanone	* 55,000	* 1400	ı		١	1	ł
4-chloro-4.4-difluoro-	I	•	ı	I	١	•	•
Carbon disulfide	* 36	* 0.91	ŧ	•	•	9	•
Carbon tetrachloride	* 610	<b>*</b> 55	>3400	ŀ	65	•	ľ
Chlordane	2.4	0.0043	1.6	16	<0.25	12.1	0.020
Chlorobenzene	* 340	* 8.4	•	ı	9	•	•
Chloroethane	,	١	·	ı	I	·	•
Chloroform	+ 570	* 14	·	ı	8400	•	•
Chrysene	•	ı	•	ł	•	•	•
DDD							
p, p,	* 0.0016	* 0.00004	ı	ı	•	•	
other	•	·	•	·	9	•	•
DDT	1. I	0.001	0.74	·	0.35	•	0.016
Decane	* 190	* 4.8	•	1	•	•	ı
Di-n-butyl phthalate	* 32	* 3.1	117	551	270	200	i

(continued)
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Table

	NAWC	NAWQ Criteria	Lower	Lowest Chronic		Lowest EC20	
	* appr	* approximated	Valu	Value for:	1	Value for:	
Chemical name	Acute	Chronic	Fish	Daphnids	Fish	Daphnets	3%ECZI
ORGANICS (continued)							
Dibenzofuran	* 80	* 2.0	·	•	ı	1	•
Dichlorodifluoromethane	·	•	•	•	ı	Ą	١
1.1-Dichloroethane	* 20	<b>* 0.51</b>	ı	.•	•		ı
1.2-Dichloroethane	* 2000	* 130	20,000	15,200	29,000	<11,000	•
1.1-Dichloroethene	+ 520	* 13	>2800	ŧ	ı	•	٠
1,2-Dichloroethenes	* 14	* 0.34	I	ı	•	5	,
1,3-Dichloropropene							
trans-	•	,	•	•	ł	1	•
total	* 100	* 2.6	ı	ı	ŀ	ı	•
Diethyl phthalate	* 1100	* 27	1	U	ı	ł	•
Di-n-octyl phthalate	•	ı	2700	570	<100	310	•
Dimethyl naphthalene	ı	,	·	•	ı	·	•
4,6-Dinitro-ortho-cresol	·	8	•	¢	١	ļ	•
Ethenyl methyl benzene	•	ı	ı	•	ł	ı	,
Ethyl benzene	<b>*</b> 780	* 20	>440	·	ı	8	•
Ethyl methyl benzene	•	•	·	•	•	ı	•
Ethyl dimethyl benzene	٠	I	·	•	ı	1	1
Huoranthene	<b>69</b> *	+ 1.7	·	•		•	•
Freon 113	ı	•	•	•	H	ł	·
Freon 123	ı	۱		·	1	ı	\$ .
Heptachlor	0.52	0.0038	1.26	ł	0.86	ſ	0.0089
Hexane	* 82	* 2.1	ł	ŀ	*	ı	<b>9</b>
2.5-Hexanedione	ł	ı	ı	•	•	•	ł
2-Hexanone	* 43	* 1.1	·	1	٠	ł	•
1-methylpentyl							

Table 5.2 (continued)

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	NAV	NAWQ Criteria	Lowes	Lowest Chronic	-	Lowest EC20	
	* apj	* approximated	Valu	Value for:		Value Ior.	
Chemical name	Acute	Chronic	Fish	Daphnids	4 2 4	Daphnes	D/20CLQN
<b>ORGANICS</b> (continued)							
hydroperoxide	ı	•	•	ı	•	•	•
Indeno(1,2,3-c,d)pyrene	·	·	•	•	1	•	•
Methyl cyclopentane	,	ı	·	•	•	•	•
1-Methyl naphthalene	* 0.90	* 0.023	٠	¥	•	ł	•
2-Methyl naphthalene	•	·	•	8	ļ	•	•
4-Methyl-2-pentanone	* 51	* 2.3	75,000	ľ	5		•
2-Methyl phenol	* 160	* 4.1	ł	•	•	ą	
Methyl nronenyl benzene	٠	·	ı	•	•	•	•
Methyl mercury	* 0.0028	<b>*</b> 0.00005	0.52	<0.04	<0.03	0.87	•
Methyloropyl benzene	۰	,	٠	•	•	•	I
Methylene chloride	* 3800	* 190	108,000	·	410	•	•
Naphthalene	* 45	* 1.8	620	•	450	>600	•
Nitrophenols						0002	
4-	* 190	# 1 1 1 1 1	1	7100	·	m	ł
total	•	•	•	<b>c</b>	8	•	•
N-Nitroso-di-n-propylamine	١	·	•	•	•	3	·
N-Nitrosodiphenylamine	• 100	* 2.5	8	٠	e	•	•
Nonane	8	•	• .	ı	·	9	•
3-Octanone	* 1400	* 34	ł	5	•	•	8
9-Octadecenamide, (z)	ı		•	·	•	•	•
PCB's							
Aroclor <sup>•</sup> 1221	* 0.12	* 0.0029	•	<b>1</b>	• .	ı	•
Aroclor <sup>®</sup> 1232	* 0.23	* 0.0058	ı	•	• •	•	•
Aroclor <sup>e</sup> 1242	* 0.016	+ 0.00097	0.0	•	<2.9	1	۱
Aroclor <sup>•</sup> 1248	* 0.15	* 0.0062	0.2	4.3	0.4	2.2	ð

Table 5.2 (continued)

	NAW	NAWQ Criteria	Lowe	Jowest Chronic		Lowest EC20	
	* app	<ul> <li>approximated</li> </ul>	Valu	Value for:		Value for:	
Chemical name	Acute	Chionic	Fish	Daphnids	Fish	Daphnids	5%EC20
ORGANICS (continued)							
Aroclor <sup>2</sup> 1260	* 4.5	* 0.11	23	'n	2.1	P*	١
1-Pentanol	* 240	* 5.9	J	·		,	. • ,
Phenanthrene	<b>*</b> 8.4	* 0.43	ł	200	٠	110	, ¥
Phenol	* 260	* 12	1369	·	<230	•	1
2-Propanol	* 100	* 2.6 ·	·	•	8	•	•
Pyrene	•	•	F	•	•	•	ł
1.1.2.2-Tetrachloroethane	* 350	* 27	2400	0066	1400	<420	8
Tetrachloroethene	* 130	* 6.5	840	750	500	510	•
Toluene	+ 300	* 7.5	ł	•	<26	ı	
1.1.1-Trichloroethane	* 4.0	* 0.24	ł	1770	·	1300	ı
1,1,2-Trichloroethane	* 1400	* 92.	9400	18,400	14,800	13,000	1
Trichloroethene	* 490	* 30	11,060	8	5758	•	ı
Trichlorofluoromethane	,	ı	,	B	8	٤	1
Trimethyl benzene	ı	•	•	·	\$	•	ı
Vinyl acetate	<b>* 1.3</b>	* 0.034	,	ı	ı	,	•
Vinyl chloride	* 38	* 0.95	ı	•	ł	•	•
Xylene	* 10	* 0.25	•	ł	2680	•	١

product of growth, fecundity, and survivorship in a chronic test with a daphnid species. The sixth is the lowest  $C^{\beta}$  benchmarks two through five, adjusted to approximate the fifth percentile of the species sensitivity distribution for the chemical as in the chronic NAWQC (Stephan et al. 1985).

NAWQC for several metals are functions of water hardness; the criteria are lower for lower hardness levels. Individual hardness measurements in WAG 2 range from 51 to 800 mg/L with a mean of 150 mg/L. Therefore, we used 100 mg/L to calculate criteria that are conservative but not extreme for WAG 2.

#### 5.3.1.2 Consumed fish flesh

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As with the other analyses, the upper screening criteria for piscivores are based on acute lethality. Usually these are acute median lethal doses  $(LD_{50})$ , but lethal concentrations in food  $(LC_{50} \text{ or } LC_x)$  are preferred.

The lower screening criteria for aquatic foodchain exposures are quite diverse, because test data for chronic oral exposures to birds and mammals are quite diverse. When data are available concerning the dietary toxicity of a chemical to wildlife, the lowest test concentration that reflects a potential effect on populations is used. If there are no wildlife data, any available data on domestic animals other than ruminants are used. In many cases, there are no useful wildlife or domestic animal data, and the same laboratory rodent data that are used for human health effects are used in the screening criteria. Toxicity data for ruminants are the least desirable because their peculiar digestive systems make their responses unrepresentative of nonruminants. Data from dietary toxicity tests are preferred to chronic oral dosing tests. The effects include systemic toxicity, reduced reproduction, severe histological damage, and terata. An alternative benchmark for the wildlife is the RfD developed by the EPA for assessment of risks of toxic effects other than cancer in humans. We do not assess cancer induction in nonhuman species, because the higher wildlife exposure is not sufficient to overcome the extremely low frequencies of cancer induction (i.e., 10<sup>-6</sup>) used for the human health screening analysis. Although tumors have frequently been found in fish in other studies, effects of cancer on fish population size or productivity have not been demonstrated.

Unlike the screening criteria that are based on NAWQC, these criteria do not reflect the diversity of organisms that are exposed by this route. If chronic sublethal effects data are available for either mammals or birds but not both, a correction factor of 10 for differences in sensitivity is applied. This factor is based on limited studies that indicate that birds and mammals can differ in sensitivity by at least an order of magnitude, and either can be more sensitive (Sigal and Suter 1989). If there are data for both birds and mammals, but fewer than five species with fewer than two birds, a factor of 5 correction for differences in sensitivity is assumed. If there are data for five or more species including at least two avian species, we assume that the variance in sensitivity of the test species approximates the variance in all avian and mammalian species and apply no factor for differences among species. If the most sensitive test end point is death or another severe effect (e.g., reproductive failure), a factor of 5 is applied to estimate the threshold for effects on individuals that could result in population reductions (Tucker and Lietzke 1979). These factors are not applied to the upper criterion, which is intended to be a concentration at which effects are certain.

#### 5.3.2 Screening Criteria for Individual Chemicals

#### 5.3.2.1 Water

The alternative aquatic toxicity benchmarks for the contaminants that have been detected on the Oak Ridge Reservation are listed in Table 5.2. The lowest benchmark for each chemical is used as the lowest screening criterion for aquatic life, and the acute criteria or estimated acute criteria are used as the upper screening criterion. The sources of data for the approximated criteria are listed in Appendix G, and sources for the other benchmarks are discussed later in this section. For chemicals that are not listed in Table 5.2, NAWQC are used as screening criteria.

#### INORGANICS

Aluminum. The toxicity of aluminum has been shown to vary widely with water hardness and pH (among others are Ingersoll et al. 1990a and b; Woodward et al. 1989; and Sadler and Lynam 1988). The benchmarks were calculated using only tests in circumneutral water. Lowest chronic values for fish are from Kimball (Manuscript) and for daphnids from McCauley et al. (1986). Lowest EC20 values are from Kimball (Manuscript). The 5% EC20 is lower than the chronic criterion.

Antimony. Chronic and EC20 values for antimony are from Kimball (Manuscript).

Arsenic III. Official criteria are listed for arsenic III. The lowest chronic values for fish and daphnids are given by Call et al. (1983) and Lima et al. (1984). The EC20 values are from Lima et al. (1984) for fish and from Call et al. (1983) and Lima et al. (1984) for daphnids.

Arsenic V. The chronic and EC20 values for fish are from Defoe (1982), and the EC20 for daphnids is from Spehar et al. (1980).

Beryllium. The chronic and EC20 values for daphnids are from Kimball (Manuscript).

Boron. The EC20 value for daphnids is from Gerisch (1984).

Cadmium. There are official criteria listed for cadmium. The lowest chronic value is from Sauter et al. (1976) for fish and Chapman et al. (Manuscript) for daphnids. The EC20 values are from Carlson et al. (1982) for fish and Elnabarawy et al. (1986) for daphnids. The latter report, which post dates the latest NAWQ report (EPA 1980g), needs comment. The EC20 value is not particularly low, but the acute-EC20 ratio is unusually high. For this reason, the 5% EC20 value varies significantly from the final chronic value.

Chromium III. Official criteria are listed for chromium III. The lowest chronic value is from Stevens and Chapman (1984) for fish and from Chapman et al. (Manuscript) for daphnids. Stevens and Chapman (1984) also provided data for the EC20 value for fish. The 5% EC20 value is notably lower than the chronic criterion. Chromium VI. There are official criteria for chromium VI. The chronic and EC20 values for fish are from Sauter et al. (1976). For daphnids, the chronic value is EPA (1985b) and EC20 from Elnabarawy et al. (1986). As with cadmium, this latter report provided an unusually large acute-EC20 ratio for Chromium VI, thus explaining the orders of magnitude difference between the 5% EC20 and the chronic criterion.

Cobalt. The chronic and EC20 values for Cobalt are from Kimball (Manuscript).

Copper. Official criteria are listed for copper. The chronic and EC20 values for fish are from Sauter et al. (1976). The chronic and EC20 values for daphnids are from Dave (1984a). The 5% EC20 level is considerably lower than the chronic criterion. Dave (1984a), which was not considered in the most recent NAWQC support document (EPA 1985c), contributes unusually low EC20 and chronic values.

Cyanide. There are official criteria for cyanide. The chronic and EC20 values for fish were both from Koenst et al. (1977).

Fluoride ion. Chronic and EC20 values for daphnids are from Dave (1984b).

Iron. The data for the effects of iron on daphnids was from Dave (1984c).

Lead. There are official criteria listed for lead. The lowest chronic value for fish is from Goettl et al. (1972), Davies and Everhart (1973), and Davies et al. (1976) and for daphnids from Chapman et al. (Manuscript). The EC20 value for fish is from Sauter et al. (1976). The 5% EC20 level is lower than the chronic criterion, apparently due to a high acute value in the latter report. The acute-EC20 ratio from which the 5% EC20 was calculated had to be obtained using a species mean acute value for Salmo gairdneri (EPA 1985d), since no acute value was reported by Sauter et al.

Manganese. All chronic and EC20 values for manganese are from Kimball (Ma ascript).

Mercury II. Mercury has official criteria. The chronic and EC20 values for fish are from Call et al. (1983) and those for daphnids are from Biesinger and Christensen (1972). The 5% EC20 is higher than the chronic criterion. The acute-EC20 ratio used to calculate this value had to be derived using a species mean acute value (EPA 1985e), as no acute value was reported in Biesinger and Christensen. The EC20 derived from Call et al. was equivalent to that in Biesinger et al., but the acute-EC20 ratio for Daphnia magna (the species used in the latter report), 3.629, is lower than that of Pimephales promelas (used by Call et al.), 172.4. As a conservative measure, the lower acute-EC20 ratio was used in the calculation.

Molybdenum. The chronic and EC20 values for daphnids are from Kimball (Manuscript).

Nickel. There are official criteria for nickel. The chronic and EC20 values for fish are from Nebeker et al. (1985). For daphnids, the chronic value was from I azareva (1985), and the EC20 was from Münzinger (1990). The EC20 value from Nebeker et al. is lower than the chronic criterion, and the acute value is higher than the

NAWQC acute value; thus, the acute-EC20 ratio is high and the 5% EC20 is significantly lower than the chronic criterion.

Selenium. Official criteria are listed for selenium. The chronic and EC20 values for fish are from Goettl and Davies (1976). The chronic value for daphnids is from Kimball (Manuscript), and the EC20 is from Johnston (1987). The 5% EC20 is lower than the chronic criterion. The acute-EC20 ratio from which the latter value was calculated had to be derived using a species mean acute value for *Daphnia magna* (EPA 1987a), because no acute value was reported by Johnston.

Silver. There is an official acute criterion for silver. The chronic value for fish is from Davies et al. (1978). The chronic value for daphnids and the EC20 for fish are from Nebeker et al. (1983). The EC20 for daphnids is from Elnabarawy et al. (1986). The 5% EC20 level is higher than the approximated chronic criterion, though this is expected since approximations lean heavily to the conservative side.

Thallium. All chronic and EC20 values are from Kimball (Manuscript).

Vanadium. The chronic and EC20 values for fish are from Holdway and Sprague (1979) and for daphnids from Kimball (Manuscript).

Zinc. There are official criteria for zinc. The chronic and EC20 values for fish are from Spehar (1976), and the chronic value for daphnids is from Chapman et al. (Manuscript). The acute LC50/chronic EC20 ratio calculated from Spehar's data is high, because of a relatively large acute value; in fact, the acute-chronic ratio based on a chronic value from Spehar is the highest reported by the EPA (1987b). The 5% EC20 level, then, is considerably lower than the chronic national criterion.

#### ORGANICS

Acenapthene. The chronic and EC20 values for fish are from Cairns and Nebeker (1982).

Anthracene. The chronic and EC20 values for daphnids are from Holst and Giesy (1989).

Benzene. The lowest chronic value for daphnids is given by EPA (1978) and the EC20 value for fish is from Black and Birge (1982). Black and Birge conducted a series of screening tests for a large number of chemicals on several freshwater organisms. Survival was only recorded to four days post-hatch, and no statistical analysis was done on the results. These tests, then, are not representative of most of the other chronic tests cited in this report.

Benzo(a)pyrene. The EC20 for fish is derived from Hannah et al. (1982).

BHC (lindane). There are official criteria listed for lindane. All chronic and EC20 values are from Macek et al. (1976a). The 5% EC20 level is comparable to the chronic criterion. The acute-EC20 ratio from which the 5% EC20 was calculated was derived

using a species mean acute value for Salvelinus fontinalis (EPA 1980s) since no acute data was reported by Macek et al.

**Bis(2-ethylhexyl)phthalate.** The chronic and EC20 values for fish are from Mehrle and Mayer (1976). The chronic and EC20 values for daphnids are from Mayer and Sanders (1973).

Carbon tetrachloride. The chronic value for fish is from EPA (1978), and the EC20 value is from Black and Birge (1982).

**Chlordane.** Official criteria are listed for chlordane. The chronic values for fish and daphnids and the EC20 value for fish are from Cardwell et al. (1977). The EC20 value for daphnids is from Cardwell et al. (1977). The 5% EC20 level is higher than the chronic criterion.

Chloroform. The EC20 value for fish is from Black and Birge (1982).

DDT. Official criteria are listed for DDT. The chronic and EC20 values for fish are from Jarvinen et al. (1977). The 5% EC20 level is higher than the chronic criterion.

**Di-n-butyl phthalate.** All chronic and EC20 values are from McCarthy and Whitmore (1985).

1,2-Dichloroethane. The chronic value for fish is from Ahmed et al. (1984), and the EC20 value for fish is from Benoit et al. (1982). The chronic and EC20 values for daphnids are from Richter et al. (1983).

1,1-Dichloroethene. The chronic value for fish is from EPA (1978).

**Di-n-octyl phthalate**. All chronic and EC20 values are from McCarthy and Whitmore (1985).

Ethyl benzene. The chronic value for fish is from EPA (1978).

Heptachlor. There are official criteria listed for heptachlor. The chronic and EC20 values for fish are from Macek et al. (1976b). The 5% EC20 value was calculated using an acute-EC20 ratio that was derived from a species mean acute value for *Pimephales promelas* (EPA 1980r) because no acute data is available from Macek et al.

4-Methyl-2-pentanone. The chronic value for fish is from Veith et al. (1983).

Methyl mercury. The chronic and EC20 values for fish are from McKim et al. (1976). The chronic and EC20 values for daphnids are from Biesinger and Christensen. (1982).

Methylene chloride. The chronic value for fish is from Dill et al. (1987), and the EC20 value is from Black and Birge (1982).

Napthalene. The chronic and EC20 values for fish are from DeGraeve et al. (1982), and the EC20 value for daphnids is from Geiger and Buikema (1982).

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4-Nitrophenol. The chronic and EC20 values for daphnids are from Francis et al. (1986).

PCBs: Aroclor<sup>®</sup> 1242. The chronic and EC20 values for fish are from Nebeker and Puglisi (1974).

PCBs: Aroclor<sup>®</sup> 1248. The chronic and EC20 values for fish are from DeFoe et al. (1978), and the chronic and EC20 values for daphnids are from Nebeker and Puglisi (1974).

PCBs: Aroclor<sup>•</sup> 1254. The chronic value for fish is from Mauck et al. (1978), and the EC20 value is from Nebeker and Puglisi (1974). The chronic and EC20 values for daphnids are from Nebeker and Puglisi (1974).

PCBs: Aroclor<sup>•</sup> 1260. The chronic and EC20 values for fish are from DeFoe et al. (1978).

Phenanthrene. The chronic and EC20 values for daphnids are from Geiger and Buikema (1982).

Phenol. The chronic and EC20 values for fish are from DeGraeve et al. (1980).

1,1,2,2-Tetrachloroethane. The chronic and EC20 values for fish are from Ahmed et al. (1984), and the values for daphnids are from Richter et al. (1983).

Tetrachloroetheme. The chronic and EC20 values for fish are from Ahmed et al. (1984). The chronic and EC20 values for daphnids are from Richter et al. (1983).

Toluene. The EC20 value for fish is from Black and Birge (1982).

1,1,1-Trichloroethane. The chronic and EC20 values for daphnids are from Thompson and Carmichael (1989).

1,1,2-Trichloroethane. The chronic and EC20 values for fish are from Anmed et al. (1984), and the chronic and EC20 values for daphnids are from Richter et al. (1983).

Trichloroethene. The chronic and EC20 values for fish are from Smith et al. (1991).

Xylene. The EC20 value for fish is from Black and Birge (1982).

#### 5.3.2.2 Consumed fish flesh

Alternative lower screening criteria are provided by the RfD values for human health assessment (from IRIS and HEAST) and the values developed from dietary toxicity data using the criteria presented in Sect. 5.3.1.2. The latter are discussed next in this section, along with upper screening criteria.

### INORGANICS

Antimony. Antimony causes liver damage in rabbits at 5.5 mg/kg in diet (National Research Council 1980). Application of a factor of 10 for variance in sensitivity and 2 for the whole-fish conversion yields a lower criterion of 0.3 mg/kg for piscivores.

Arsenic. The toxicity and bioaccumulation of arsenic are highly dependent on the form. The most toxic and bioaccumulative form is inorganic trivalent arsenic (arsenite salts). Median lethal dietary concentrations for wildlife range from 99.8 mg/kg in cowbirds to >5000 mg/kg in mallards depending on the arsenical species as well as the biological test species (National Research Council 1977, NIOSH 1988), so the upper criterion for piscivores is set at an approximate median of 1000 mg/kg. Reported sublethal effects of inorganic arsenic largely fall in this interval, but there is very little information on sublethal effects on birds. The most sensitive reported dietary effect in mammals or birds is the NOEC for growth of rats of 31 mg/kg (National Research Council 1977, EPA 1985a). Applying a factor of 5 for species sensitivities and 2 for whole fish results in a lower criterion of 3 mg/kg for effects on piscivores.

Beryllium. Beryllium is a serious respiratory toxin and carcinogen, but has not been noted to cause dietary toxicity. The oral  $LD_{50}$  in rats is 9.7 mg/kg (EPA 1980r), giving a dietary upper screening criterion of 120 mg/kg. Weight loss occurred in rats fed a diet containing 500 mg/kg beryllium (EPA 1987c). Applying a factor of 10 for variance in sensitivity and 2 for the whole-fish conversion yields a lower screening criterion of 25 mg/kg for piscivores.

Cadmium. The National Research Council (1980) set the maximum tolerable level for cadmium in animal feed at 0.5 mg/kg based on observed toxic effects in mammals on 1-mg/kg diets. This appears to be sufficient to protect birds because the lowest-reported-effects level in birds is 4 mg/kg (Heinz et al. 1983). The factor of 2 for whole-fish concentrations gives a lower screening criterion of 0.25 mg/kg for piscivores.

Chromium. Chromium is most toxic to aquatic organisms in the hexavalent form, the form used in cooling towers, and the form that we assume for the aqueous chromium concentrations used in this assessment. However, it is likely that much of the chromium has been reduced to the trivalent form in fish tissues. There are little appropriate data for estimating chromium effects on wildlife, but young black ducks experienced reduced growth and survival at 10 mg/kg chromium (III) in diet (Eisler 1986). We apply a factor of 5 for variance in sensitivity and 2 for whole fish to derive a lower screening criterion of 1 mg/kg for piscivores.

Copper. Copper is a well-regulated essential nutrient that is seldom toxic in terrestrial vertebrates. The National Research Council (1980) set the maximum tolerable level for the most sensitive mammal (sheep) at 25 mg/kg, for nonruminant mammals at 100 to 800 mg/kg, and for chickens and turkeys at 300 mg/kg. Applying a factor of 2 to the lowest nonruminant level yields a lower screening criterion of 50 mg/kg for piscivores.

Lead. The National Research Council (1980) recommended that lead in livestock food be limited to 30 mg/kg, which appears to be protective of other species (EPA 1984a,

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Eisler 1988). We apply a factor of 2 for whole fish to derive a lower screening criterion of 15 mg/kg for piscivores.

Mercury. A U.S. Fish and Wildlife Service report has recommended that mercury in wildlife food be limited to 0.1 mg/kg, because this concentration of methylmercury caused reduced reproduction in ducks (Eisler 1987). Applying a factor of 5 for threshold effects and 2 for whole fish yields a lower criterion of 0.01 mg/kg for piscivores. Lethal dietary concentrations of methylmercury range from 1 mg/kg for mink to 250 mg/kg for chickens (National Research Council 1980, Sheffy and St. Amant 1982, Wren et al. 1987, Eisler 1987). We use 30 mg/kg, the approximate median  $LC_{50}$ , as an upper criterion for piscivores. Inorganic mercury is not relevant to this endpoint, because the mercury in local fish is almost entirely methylmercury.

Nickel. The National Research Council (1980) set the maximum tolerable level of nickel at 50 mg/kg, based on weight loss of cattle at 100 mg/kg in diet, but no observed effects at 50 mg/kg. Chickens, the only tested bird, showed a statistically significant decrease in growth at 500 mg/kg in diet, but not at 300 mg/kg (National Research Council 1980). Application of factors of 5 for variance in sensitivity and 2 for whole-fish concentration yields a lower chronic criterion of 50 mg/kg for piscivores. The oral  $LD_{50}$  in rats is 350 mg/kg (National Research Council 1980). Conversion to dietary concentration yields an upper criterion of 4400 mg/kg, which is consistent with the sublethal dietary toxicity data.

Selenium. Dietary selenium effects are difficult to assess because the toxic levels are near the deficiency levels, uptake is highly variable among species, and uptake is highly dependent on the form of the selenium and how it is incorporated into food. Rats experience histological damage and reduced longevity in lifetime exposures to 3 mg/kg in naturally contaminated feed, but the same effects occurred at 0.75 mg/kg in spiked feed (Eisler 1985). Five mg/kg was a to-observed-effects level in feeding studies of mallards, and 6 to 9 mg/kg in feed reduced the hatchability of chicken eggs (Eisler 1985). Mortality and severe reproductive effects in birds occurred in an area with concentrations of 22 to 175 mg/kg in food items (Ohlendorf et al. 1986). Based on these data, the lowest observed effects level is 1 mg/kg, which is just above recommended concentrations in diet to prevent selenium deficiency of 0.1 to 0.05 mg/kg (Eisler 1985). That threshold value is divided by 2 for the whole-fish conversion for a lower screening criterion of 0.5 mg/kg in fish for piscivores. The upper criterion is set at 100 mg/kg, the lethal dietary concentration in mallards (Eisler 1985).

Silver. The National Research Council (1980) set the maximum tolerable level for silver in animal food at 100 mg/kg based on studies of rats, chickens, and turkeys. Application of factors of 5 for variance in sensitivity and 2 for the whole-fish conversion yields a lower screening criterion of 10 mg/kg for piscivores.

Thallium. Thallium is highly toxic to mammals, and thallium salts have been used as rodenticides (Venugopal and Luckey 1978). It is also highly toxic to birds with an acute lethal threshold in diet of 12 mg/kg in bobwhite quail (EPA 1980a). The no-observed-effect level for thallium in the diet of rats is 5 mg/kg (EPA 1980a). Applying factors of 5 for variance in sensitivity and 2 for the whole-fish conversion yields a lower

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screening criterion of 0.5 mg/kg for piscivores. The upper criterion is set at the dietary  $LC_{s0}$  of 30 mg/kg in rats (EPA 1980a).

Zinc. The National Research Council (1980) set the maximum tolerable level for zinc in sheep feed at 300 mg/kg and in swine and poultry feed at 1000 mg/kg, but adverse effects on young Japanese quail fed laboratory diets occurred at 125 mg/kg (Hamilton et al. 1979). Using the Japanese quail datum as the lowest-observed-effect level and applying a factor of 2 for the whole-fish conversion yields a lower screening criterion of 60 mg/kg for piscivores.

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Hexachlorobenzene (HCB). The acute lethal dose for HCB is 1000 mg/kg or greater (EPA 1980i, EPA 1984b, NIOSH 1988), so the upper criterion for concentrations in fish is 12,500 mg/kg. HCB causes liver damage in Japanese quail at 5 mg/kg in diet (EPA 1980i) and causes immunosuppression in mink and ferrets (by different criteria) at 25 and 1 mg/kg in diet (Bleavins et al. 1983). Using the 1 mg/kg level as the lowest-observed-effects level and applying a factor of 3 for whole-fish basis yield a lower screening criterion of 0.3 mg/kg for piscivores.

DDT and metabolites. DDT and its metabolites DDD and DDE are notorious for their effects on piscivorous birds. Birds experience reduced survival or reproduction at 3 to 0.15 mg/kg in diet (Lincer 1975, Anderson et al. 1975). Applying a factor of 5 for an effects threshold and 3 for the whole-fish conversion yields a lower criterion of 0.01 mg/kg for piscivores. The acute oral  $LD_{50}$  for birds is approximately 1000 mg/kg (Matsumura 1985), which is equivalent to a dietary concentration of approximately 12,500 mg/kg in kingfishers, the upper criterion for piscivores. Fish themselves experience effects at 3 to 11 mg/kg body burden (EPA 1980m). Because 3 mg/kg is lethal to cutthroat trout fry, we apply the factors of 5 for an effects threshold and 3 for whole-fish basis to obtain a lower criterion of 0.2 mg/kg for protection of fish.

Polychlorinated biphenyls (PCBs). PCBs are persistent, bioaccumulative, and highly toxic. Mink are the most sensitive species to PCBs, experiencing reproductive failure at 0.64 mg/kg in diet (Ringer 1983, Fuller and Hobson 1986). Birds experience reproductive and immunotoxic effects at 10 to 40 mg/kg in diet (Peakall 1986). Because these levels induce catastrophic reproductive effects, the International Joint Commission (1988) recommends a concentration of 0.1 mg/kg in fish to protect piscivores. Using the mink-effects level and applying the factor of 5 for effects thresholds approximately yield this criterion. Applying the factor of 3 for organics in whole fish yields a lower criterion of 0.04 mg/kg for piscivores. The acute dietary  $LC_{50}$  in birds is 747 to 12,000 mg/kg (Peakall 1986). Using 1000 mg/kg and dividing by 3 for the whole-fish conversion yields an upper criterion of 300 mg/kg.

Other organics. All of the other organic chemicals that were analyzed in fish tissues were not detected. Except for the pesticides, which are not generated or used in large amounts by DOE operations, there are very few dietary toxicity data or avian toxicity data of any sort for these chemicals. If available, RfDs were used as screening criteria for these chemicals.

### 5.3.2.3 Radionuclides

Effects of radionuclides on nonhuman biota are not analyzed in this assessment for three reasons. First, previous studies of radionuclide exposure and effects in WOL found no evidence of effects or of exposures sufficient to cause effects in controlled exposures (Blaylock and Trabalka 1978). Second, the mode of action of radionuclides is the same in nonhuman organisms as in humans, so the ranking of radionuclides produced by the human health assessment, which includes bioaccumulation by fish and ingestion of fish by humans, would be applicable to ecological effects. Third, a screening assessment of radionuclide effects on nonhuman populations would have no consequences, because an extensive off-site radionuclide monitoring program will be conducted for human health assessment regardless of potential ecological effects. The results of those studies, including body burden data for fish, birds, and mammals, will be analyzed for evidence of ecological risks in future assessments.

# 5.4 RISK CHARACTERIZATION

Risk characterization is based on three independent lines of evidence. First, the estimates of exposure (Sect. 5.2) are compared to the toxicological benchmarks (Sect. 5.3) to determine for which chemicals the benchmarks are exceeded. Second, toxicity tests have been conducted with water collected from WOC and Melton Branch. These tests can be used to determine whether the waters have been toxic to standard test organisms. Third, biological surveys have been conducted in WAG 2 that can be used to estimate the actual levels of effects experienced by the receiving community.

# 5.4.1 Exposure/Response Integration

Exposure/response integration for this screening assessment is performed by calculating the quotients of chemical concentrations divided by screening criteria. For each detected chemical two exposure concentrations are used, the geometric mean and the arithmetic upper 95% confidence limit (UCL). If the calculated UCL exceeded the maximum observed concentration, the maximum value was used. These values were chosen to be consistent with the human health risk assessment (Sect. 4.5) because they are reasonable estimates of the chronic and episodic exposure levels, respectively. The concentrations, screening criteria, and quotients are presented in Tables G.3 to G.11, located in Appendix G.

## 5.4.1.1 Aqueous concentrations/aquatic life effects

The reported mean concentrations of most of the 17 metals and 6 out of 15 organic chemicals detected in water exceeded the lower screening criteria (Table G.4). Aluminum, cadmium, chromium, copper (UCL only), lead, and PCB concentrations exceed their chronic criteria. The largest quotients were for mercury and PCBs. In all reaches mean total mercury concentrations exceeded the lower screening criterion, which is the approximated chronic criterion for methyl mercury. (The actual chronic criterion for mercury is not used because it is based on mammalian toxicity rather than toxicity to aquatic life.) The mean and UCL total mercury concentration also exceed the lowest chronic value for daphnids and the lowest EC20 value for fish, but are well below all of

the benchmarks for divalent mercury. The Arochlor<sup>•</sup> 1254 detected in WOC (Reach 1) and the total PCB concentrations in all reaches greatly exceeded the approximated acute and chronic criteria for all of the Arochlor<sup>•</sup> mixtures and barely exceeded chronic values and EC20s for fish. Based on these results, the water in all reaches should be causing toxic effects in aquatic populations.

Most of the detection limits for chemicals that were not detected in water exceeded lower screening criteria. In addition, arsenic, cadmium, selenium, silver, and PCB detection limits exceed chronic NAWQC.

### 5.4.1.2 Concentrations in sediment/aquatic life effects

Sediment  $K_d$  values could be found for only six of the metals detected in WAG 2 sediments (Table G.6). All of these (barium, chromium, cobalt, mercury, silver, and zinc), have estimated pore-water values that exceed the lower screening criteria for aquatic life. In addition, mercury, silver, and zinc are estimated to exceed their chronic NAWQC in pore-water. Of the few organic chemicals detected in WAG 2 sediments, estimated porewater concentrations exceeded lower screening criteria for benzene, di-n-butyl phthalate, methylene chloride, an PCBs. Pore-water concentrations estimated to occur at the detection limits of most of the chemicals not detected in WAG 2 exceeded lower screening criteria for aquatic life (Table G.7).

### 5.4.1.3 Concentrations in fish/fish effects

Only seven chemicals were detected in fish flesh (Table G.8). Of these, only selenium in Reach 1 occurred at mean concentrations that suggested that the fish may have been exposed to toxic aqueous concentrations. Upper confidence limits on the distributions of concentrations of cadmium and selenium in all reaches were barely high enough to suggest that toxic aqueous concentrations were exceeded. Seven metals and many organic compounds were not detected in fish flesh but had detection limits that exceeded concentrations that imply toxic aqueous concentrations (Table G.9).

#### 5.4.1.4 Concentrations in fish/piscivore effects

Of the seven chemicals detected in fish flesh, only mercury and PCBs occurred at concentrations that could be toxic to piscivorous wildlife by the lower screening criteria for wildlife (Table G.10). However, cadmium, selenium, and zinc concentrations were sufficient to exceed the RfD for an organism consuming fish equal to 8% of its body weight per day (e.g., a kingfisher). Many undetected chemicals had detection limits in fish flesh that exceeded either lower screening criteria for wildlife or RfDs for kingfishers (Table G.11).

### 5.4.2 Ambient Media Toxicity Tests

The toxicity of surface waters in WOC and Melton Branch have been tested on a regular basis since 1986. Because of the major changes that have occurred in effluent input and toxicity in that interval, this discussion will emphasize the most recent results (Loar 1991). The tests employed are the standard 7-d static renewal tests measuring the growth and survival of fathead minnow (*Pimephales promelas*) larvae and the survival and

growth of the daphnid cladoceran Ceriodaphnia dubia (Horning and Weber 1985). During 1990, one or both of these tests were performed monthly with water taken from WOC just above the confluence of Melton Branch and from Melton Branch just above its mouth. In all cases, survival and growth of C. dubia were high. Fathead minnow survival was less than 70% for the Melton Branch samples in four months and for the WOC samples in one month. However, in each case of low survival, minnow growth was good and variance in survival among replicates was high. Hence, the observations of low minnow survival were attributed to disease rather than toxicity by the authors (A. J. Stewart and L. A. Kszos in Loar 1991). Results in 1989 were similar but with a higher frequency of tests with low minnow survival (Loar 1990).

### 5.4.3 Biological Surveys

The following brief discussion of biological survey results is based on the results of studies done by the Biological Monitoring and Abatement Program at ORNL (Loar et al. 1987, Loar 1988-1991).

### 5.4.3.1 Fish

Redbreast sunfish (Lepomis auritus) have been collected from WOC in WAG 2 (WCK 2.2 - 2.7) and from three reference streams for studies of the biomarkers of contaminant exposure, indicators of the health of individual fish, and population parameters. The fish from WAG 2 differed from those of the reference sites in the following ways:

- 1. liver detoxification enzymes were elevated;
- 2. creatinine levels were elevated, a possible sign of kidney damage;
- 3. condition indices were slightly lower; and
- 4. fish were larger.

The redbreast sunfish in WAG 2 appear to be exposed to organic contaminants to the extent of elevating enzymes that may affect hormone levels; they are in slightly poorer condition on average but are growing well; and they are producing abundant viable eggs, but are reproducing earlier in the season than at reference sites. The early reproduction, which may be due to elevated water temperatures, may be the cause of the larger fish. Adams and Greeley (in Loar 1991) suggest that poor early life-stage survival may also be involved, but no direct evidence currently exists for this hypothesis.

Surveys of the fish community have also been conducted by electrofishing. Thirteen of the fourteen species occurring in the WOC watershed were found in WAG 2 in 1990. The density is relatively stable at approximately 0.5 fish/m<sup>2</sup>. Growth rates of redbreast sunfish are indistinguishable from those at a reference stream (Brushy Fork) and bluegill (Lepomis macrochirus) growth rates are higher.

A fish/amphibian kill was observed in Melton Branch in 1990, apparently due to high temperatures associated with the operation of the HFIR reactor. Other kills that have been reported in the WOC watershed have also been associated with point-source effluents rather than wastes.

### 5.4.3.2 Benthic macroinvertebrates

Surveys of benthic macroinvertebrates in WAG 2 are available only through 1987. Those surveys found low taxonomic richness and relatively high frequencies of "pollution tolerant species" (Loar 1991). However, the community characteristics are improved relative to upstream areas that are more directly exposed to point-source effluents. The cause of the apparently degraded condition of the benthic macroinvertebrate community is unclear. Possible causes include upstream point-source emissions, siltation, temperature, and natural factors as well as toricant sources within WAG 2. Interpretation is particularly inhibited by the lack of data from reference streams; all comparisons were to reference sites that were upstream in WOC and Melton Branch.

### 5.4.3.3 Periphyton

Periphyton, along with allochthonous material, form the base of the food web in streams. Periphyton downstream of ORNL, including Melton Branch and WOC in W AG 2, are more productive than those in uncontaminated reference sites. This result is attributed to nutrient input and indicates that the base of the food web is unimpaired. "Chlorophyll-adjusted photosynthetic rates" of periphyton in WAG 2 (WCK 3.4, WCK 2.9, and MEK 0.6) have been low during some measurement periods, but it is not clear whether this is due to natural factors or upstream effluents. In any case, this effect has no apparent ecosystem-level consequences.

# 5.4.3.4 Terrestrial

The terrestrial studies conducted in WAG 2 have addressed bioaccumulation and transfer of contaminants rather than effects of contaminants. Species used in bioaccumulation studies have included turtles, small mammals, waterfowl, and vascular plants. The abundant vegetation of WAG 2 suggests that severe phytotoxic effects are not occurring. Avian and mammalian wildlife appear to be abundant on WAG 2. However, given the mobility of these species, one cannot infer from this that wildlife on WAG 2 are unaffected. Even high mortality rates or very low reproductive rates could be replaced by immigrants from surrounding habitats.

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# 5.4.4 Weight of Evidence and Uncertainties

### 5.4.4.1 Water

The analysis of chemical concentrations in water indicates that toxic effects on aquatic organisms cannot be precluded from consideration but are not likely to be severe. The toxicological benchmarks that were exceeded are intended to be conservative, and the concentrations that were reported may overestimate bioavailable concentrations, so the quotients are expected to be conservative estimators of the potential for effects. The possibility that exposure is overestimated is supported by the relatively low concentrations in fish flesh, which are suggestive of lower water concentrations than are reported in the analyses. However, this analysis is based on concentrations in fillets, which are likely to be lower than whole fish concentrations that are the basis for the bioconcentration factors. The results of recent toxicity tests with WAG 2 water do not indicate toxicity, but they include only two species and one life stage of the fish. The most recent aquatic biological survey results indicate that sources in WAG 2 are not causing severe toxic effects. However, fish reproduction may be disturbed in WAG 2, and the benthic invertebrate community may be affected by an unidentified source of toxic or physical stress.

### 5.4.4.2 Sediments

Estimated sediment pore-water concentrations of several chemicals are sufficient to cause toxic effects. However, these estimates are uncertain because they are not based on site-specific partitioning data. The apparent effects on the benthic invertebrate community are consistent with mild toxic effects, but, because riffle areas were sampled, the surface water may be the primary source of exposure. No sediment toxicity tests have been conducted with WAG 2 sediments.

### 5.4.4.3 Fish and piscivores

Mercury and PCB concentrations in fish flesh are high enough to indicate a hazard to piscivorous wildlife. There are no biosurvey data for piscivorous wildlife in WAG 2, but elevated PCB and mercury concentrations have been found in eggs at a great blue heron rookery at K-25. Great blue herons that forage in WAG 2 are believed to be from this rookery.

# 5.4.4.4 Terrestrial communities

Nothing is known about the nonradiological contamination of the floodplain habitats in WAG 2. There is no apparent ecological damage to the floodplain community, but no studies of potential toxic effects have been conducted.

# 5.4.4.5 Summary of the ecological risk characterization

Because there is no complete inventory of the chemicals that have been disposed of in the White Oak Creek watershed, it is not possible to identify a list of potential contaminants of concern *a priori*. Instead, it is necessary to either establish that no significant toxic effects are occurring in WAG 2 or perform a survey of watershed contaminants that is sufficiently sensitive and reliable for a complete screening to be performed. This assessment was not able to complete either of these strategies. Although severe effects are not occurring in the aquatic habitats of WAG 2, there is some evidence of effects on fish reproduction and on benthic invertebrate community composition. Toxicity tests of surface water have not found toxicity, but tests have not been conducted for sediment or soil. Some chemicals in all media occurred at concentrations that are potentially toxic and many chemicals that were not detected had detection limits that were higher than both toxic and regulatory thresholds. Therefore, although it is clear that severe toxic effects are not occurring, there are still significant uncertainties concerning the ecological risks posed by WAG 2. These uncertainties are reflected in the following list of data needs.

## 5.5 DATA NEEDS

# 5.5.1 Biota and Communities

A survey of threatened and endangered species should be conducted.

Wetland communities and seeps where contaminants may accumulate should be identified.

Benthic invertebrate communities in fine sediments should be surveyed in WAG 2 and reference sites.

### 5.5.2 Sources and Exposure

Species of arsenic, chromium, and mercury should be determined in each medium.

Sediment pore-water should be extracted and analyzed at a set of sites that are representative of the range of sediments (other than gravels) found in WAG 2. These samples will be used to derive site-specific  $K_d$  values. Percent organic matter and acid-volatile sulfides should be determined for those sediments.

Whole fish should be analyzed, including some small fish representative of the fish consumed by kingfishers. For the larger fish that are currently filleted, the non-fillet remainder of fish should be analyzed to establish fillet-to-whole-fish ratios. Whole-fish analysis is the best measure of piscivore dietary exposure and is the most generally useful measure of fish internal exposure.

Soil should be analyzed for nonradiological chemicals in areas where contaminants are likely to have accumulated. Aqueous extracts as well as the conventional acid and organic extracts should be analyzed.

Water should be analyzed for dissolved chemical concentrations.

### 5.5.3 Toxicity Testing

If pore-water analyses indicate potential sediment toxicity, sediment toxicity tests should be performed.

If soil analyses indicate potential soil toxicity, soil toxicity tests should be performed.

Tests of effects of WAG 2 waters on fish reproduction should be continued to resolve the nature and cause of apparent effects.

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# APPENDIX A

# NONCONSERVATIVE SCREENING OF THE DETECTABLE CONTAMINANTS DATA BASE FOR CARCINOGENS AND NONCARCINOGENS

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	Fish Lish	Organic	PCB-1254 (Arodor 1254)	11097-69-1	62/62	3.2E-01	7.7E+00	1.5E-05	1E-04
		)	PCB-1260 (Arodor 1260)	11096-82-5	79/79	1.2E-01	7.7E+00	5.6E-06	4E-05
*	Fish	Organic	Total						2E-04
						(Bq/kg wet)	(1/84)	(Bq/lifetime)	
•	Fish	Radionuclide	Cs-137	10045-97-3	42/42	2.6E+03	7.6E-10	9.1E+04	7E-05
-	Fish	All	Total				, and the second s		2E-04
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ų	Sed intestion	Inoroanic	Arsenic	7440-38-2	13/31	3.8E+00	1.8E+00	5.4E-07	1E-06
		0	Berthum	7440-41-7	19/27	2.4E-01	4.3E+00	3.4E-08	2E-07
<del></del>	Sed ingestion	Incrganic	Total						1E-06
-	Sed incestion	Organic	PCB-1260 (Arodor 1260)	11096-82-5	7/13	2.8E-01	7.7E+00	4.0E-08	3E-07
		•	PCB-1254 (Arodor 1254)	11097-69-1	13/13	1.3E-01	7.7E+00	1.8E-08	1E-07
-	Sed ingestion	Crganic	[otal						5E-07
						(Bq/kg dry)	(1/8d)	(Bq/lifetime)	
-	Sed incestion	Radionuclide	Cs-137	10045-97-3	17/18	5.5E+03	7.6E-10	5.8E+02	4E-07
	0		Sr-90	10098-97-2	33/33	2.0E+03	8.9E-10	2.1E+02	2E-07
			Co-83	10198-40-0	18/18	1.3E+03	4.1E-10	1.4E+02	6E-08
			Åm-241	14596-10-2	1/1	1.4E+01	8.4E-09	1.5E+00	1E-08
			Cm-244	13981-15-2	1/1	1.8E+01	5.4E-09	1.9E+00	1E-08
			Cs-134	13967-70-9	8/8	7.8E+01	1.1E-09	8.2E+00	9E-09
			Pu-238	13981-16-3	1/1	2.0E+00	7.6E-09	2.1E-01	2E-09
			U-234	13966-29-5	1/1	3.8E+00	<b>3.8E-09</b>	4.0E-01	2E-09
			Eu-152	14683-23-9	4/4	2.3E+02	5.7E-11	2.4E+01	1E-09
			Pu-239	15117-48-3	1/1	1.0E+01	8.4E-10	1.1E+00	9E-10
			U-238	7440-61-1	1/1	1.6E+00	3.5E-09	1.7E-01	6E-10
			Eu-154	15585-10-1	1/1	4.3E+01	8.1E-11	4.5E+00	4E-10
			U-235	15117-96-1	1/1	4.2E-01	3.5E-09	4.4E-02	2E-10
	Sed ingestion	Radionuclide	Total						7E-07
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		tvna	name	CAS no.	samples	(Bq/kg dry)	(1/Bq)	(Bq/ilfetime)	indices
2.	Sod out our	Badinouclida	Cs-137	10045-97-3	17/18	5.5E+03	9.2E-10	3.8E+05	4E-04
- •	dva wa nac		Cn-60	10198-40-0	18/18	1.3E+03	3.5E-09	8.8E+04	3E-04
			Eucles Eucles	14683-23-9	4/4	2.3E+02	1.7E-09	1.5E+04	3E-05
- •			Ce-134	13967-70-9	8/8	7.8E+01	2.4E-09	5.4E+03	1E-05
			E11-154	15585-10-1	1/1	4.3E+01	1.8E-09	2.9E+03	5E-06
,			500-241	14596-10-2	1/1	1.4E+01	4.3E-11	9.6E+02	4E-08
- •			11.038	15117-96-1	1/1	4.2E-01	2.6E-10	2.9E+01	8E-09
<b>-</b> - 4				13981-15-2	1/1	1.8E+01	1.6E-12	1.2E+03	2E-09
			Dir. 230	15117-48-3	1/1	1.0E+01	7.0E-13	6.3E+02	5E-10
,			11.034	13966-29-5	1/1	3.8E+00	1.5E-12	2.6E+02	4E-10
<b>,</b>			D1-238	13981-16-3	1/1	2.0E+00	1.6E-12	1.4E+02	2E-10
			11-238	7440-61-1	1/1	1.6E+00	1.2E-12	1.1E+02	1E-10
		:							7E-04
<del>-</del> •	Sed ext exp	Radionucide	l otal Total						7E-04
						(mail)	1/ <i>imc/kc/d</i> )	(mo/ka/d)	
			•		0670		1 - Russinki	3 0F-06	2E-05
<b>*</b>	Water	Organic	PCBs total	1330-30-4	0017	1 00-00	7 75+00	2 9E-06	2E-05
			PCB-1254 (Arodor 1254)	1-89-/6011	07/1				2E-D6
			Dichiorobromomethane	75-27-4	3/29	4.3E-U3	10-20.1	50-17.1	
			Tetrachloroethylene	127-18-4	1/29	5.1E-03	5.1E-02	1.55-05	
			Renzene	71-43-2	1/28	4.8E-03	2.9E-02	1.4E-05	4E-07
			Trichloroethylene	79-01-6	4/46	4.4E-03	1.1E-02	1.3E-05	1E-07
			Mathulana chinrida	75-09-2	15/29	3.7E-03	7.5E-03	1.1E-05	8E-08
			Chloroform	67-66-3	18/30	3.6E-03	6.1E-03	1.0E-05	6E-08
-	Water	Organic	Total						5E-05
						(Bc/L)	(1/Bq)	(Bq/lifetime)	
			6 6	10098-97-2	34/34	5.1E+00	8.9E-10	1.1E+04	1E-05
-	Waler	Hadiofiucioe	6-5 6-1	10028-17-8	34/34	2.4E+03	1.5E-12	5.1E+06	8E-06
			Ce-137	10045-97-3	29/34	2.7E+00	7.6E-10	5.7E+03	4E-06
				10198-40-0	3/34	1.2E-02	4.1E-10	2.5E+01	1E-08
,		On diamondary	Total						2E-05
- •	water	naura lucico A li	Total						7E-05
-									

(continued)
A1
Table

Containinati i ype         Containing memory         Containing containing         Containing contai         Containing <thcontaining< th=""></thcontaining<>						Ratio of		Cancer		
Work         Upper         Upper         Upper         CAS no.         Samples         (mg/kg/d)	Dente	Lodie	Conteminent	Contemporat		detected to total	Geometric	siope factor	Intake	screening
Fish         Organic         PCB-1254         (Index of r264)         11097-69-1         24/24         4.7E-02         7.7E+00           Fish         Crganic         Total         Total         Total         Total         7.7E+00         7.7E+00           Fish         Crganic         Total         Total         Total         Total         7.7E+00         7.7E+00           Fish         All         Total         Total         Total         Total         Total         Total         Total         Total         7.6E+10         7.6E+10         7.6E+10           Sed ingestion         Inorganic         Cs-137         10045-97-3         10/10         7.0E+02         7.6E+10           Sed ingestion         Inorganic         Arsenic         7.440-41-7         81/39         1.0E+10         4.3E+00           Sed ingestion         Organic         PCB-1260 (Aroctor 1260)         11096-82-5         3/13         3.2E+01         4.3E+00           Sed ingestion         Organic         PCB-1260 (Aroctor 1260)         11097-69-1         11/113         3.2E+01         4.3E+00           Sed ingestion         Organic         PCB-1260 (Aroctor 1260)         11097-69-1         11/113         3.2E+01         7.7E+00           Sed		84D6	type		CAS No.	samples	(mg/kg wet)	1/(mg/kg/d)	(mg/kg/d)	indices
Fish         Organic         Total         11096-82-5         24/24         4.0E-02         7.7E+00           Fish         All         Total         10045-97-3         10/10         7.0E+02         7.7E+00           Fish         All         Total         10045-97-3         10/10         7.6E+02         7.6E+10           Fish         All         Total         Total         10045-97-3         10/10         7.6E+02         7.6E+10           Sed ingestion         Inorganic         Arsenic         7.440-41-7         81/99         1/(mg/kg/d)           Sed ingestion         inorganic         Parenic         7.440-41-7         81/99         1/(mg/kg/d)           Sed ingestion         Organic         Total         7.440-41-7         81/99         1.0E+00           Sed ingestion         Organic         Total         7.440-41-7         81/99         1.0E+01           Sed ingestion         Organic         Total         7.440-41-7         81/99         1.0E+01           Sed ingestion         Organic         Total         7.440-41-7         81/99         1.0E+01         4.8E+00           Sed ingestion         Organic         Total         7.440-41-7         81/99         1.0E+02         7.7E+00	8	Fish	Organic	I	11097-69-1	24/24	4.7E-02	7.7E+00	2.2E-06	2E-05
Fish         Organic         Total           Fish         All         Total         76E-10         7.6E-10         7.6E-10           Fish         All         Total         Total         740-38-2         10/10         7.0E+02         7.6E-10           Fish         All         Total         Total         7440-38-2         4/111         1.5E+00         1.8E+00           Sed ingestion         inorganic         Arsenic         7.440-38-2         4/111         1.5E+00         1.8E+00           Sed ingestion         organic         Desplitum         7.440-41-7         81/99         1.06-01         4.3E+00           Sed ingestion         organic         Desplitum         7.440-41-7         81/99         1.06-01         4.3E+00           Sed ingestion         Organic         PCB-1256 (Arocior 1264)         11097-69-1         11/113         3.2E-01         7.7E+00           Sed ingestion         Organic         PCB-1256 (Arocior 1264)         11097-69-1         11/113         3.2E-02         7.7E+00           Sed ingestion         Organic         PCB-1254 (Arocior 1264)         11097-69-1         11/113         4.5E+00         7.7E+00           Sed ingestion         Radionucide         Co-60         10036-29-5 <td>I</td> <td></td> <td>0</td> <td>-</td> <td>11096-82-5</td> <td>24/24</td> <td>4.0E-02</td> <td>7.7E+00</td> <td>1.9E-06</td> <td>2E-05</td>	I		0	-	11096-82-5	24/24	4.0E-02	7.7E+00	1.9E-06	2E-05
Fah         Radionuclide         Cs-137         10045-97-3         10/10         7.0E+02         7.6E-10           Fah         All         Total         Total         10/10         7.0E+02         7.6E-10         7.6E-10           Fah         All         Total         7.440-31-7         81/99         1.0E-01         4.3E+00         1.8E+00           Sed ingestion         Inorganic         Berylium         7.440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         Berylium         7.440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         PCB-1264 (Arocior 1260)         11005-82-5         3/13         3.2E-01         7.7E+00           Sed ingestion         Organic         PCB-1264 (Arocior 1260)         11005-82-5         3/13         3.2E-01         7.7E+00           Sed ingestion         Radionuclide         Co-60         10108-40-0         12/1/134         1.4E+02         7.7E+00           Sed ingestion         Radionuclide         Co-13         130/134         6.3E+02         7.7E+00           Sed ingestion         Radionuclide         Co-60         10108-40-0         12/1/134 <th1.4e+02< th="">         7.7E+00      &lt;</th1.4e+02<>	2	Fish	Organic	Total				·		3E-05
Fish         All         Total         All         Total           Fish         All         Total         7440-38-2         4/111         1.5E+00         1.6E+00           Sed ingestion         inoganic         Maenic         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         inoganic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         PCB-1254 (Arockor 1254)         11097-66-1         11/113         5.8E-02         7.7E+00           Sed ingestion         Organic         PCB-1254 (Arockor 1254)         11097-66-1         11/113         5.8E-02         7.7E+00           Sed ingestion         Organic         PCB-1254 (Arockor 1254)         11094-90-0         121/134         1.4E+02         4.1E+10           Sed ingestion         Radionucide         Co-50         10045-97-3         11/11         8.2E+02         7.7E+100           Sed ingestion         Radionucide	0	П. Цсј	Radiomiclide	Cs-137	10045-97-3	10/10	7.0E+02	7.6E-10	2.4E+04	2E-05
Sed ingestion         Inorganic         Arsenic         7440-31-7         81/193         10E-01         1.8E+00         1.8E+00           Sed ingestion         inorganic         Beryllium         7440-41-7         81/93         1.0E-01         4.3E+00         1.8E+00           Sed ingestion         Organic         Total         7440-41-7         81/13         3.2E-01         1.8E+00           Sed ingestion         Organic         Total         7440-41-7         81/13         3.2E-01         7.7E+00           Sed ingestion         Organic         Total         11097-65-1         11/113         5.8E-02         7.7E+00           Sed ingestion         Organic         Total         10945-97-3         30/134         6.8E+02         7.7E+00           Sed ingestion         Radionucide         Co-60         10198-40-0         12/1734         14E+03         4.1E-10           Sed ingestion         Radionucide         Co-51         10945-97-3         30/134         6.3E+02         7.7E+00           Sed ingestion         Radionucide         Co-50         10198-40-0         12/1734         14E+02         1.1E-09           Sed ingestion         Radionucide         Co-51         10945-97-3         130/134         6.5E+02 <t< td=""><td>1 <b>N</b></td><td>Fish</td><td>AII</td><td>Total</td><td></td><td></td><td></td><td></td><td></td><td>5E-05</td></t<>	1 <b>N</b>	Fish	AII	Total						5E-05
Sed ingestion         Inorganic         Arsenic         7440-41-7         81/99         1.0E-01         1.8E+00           Sed ingestion         inorganic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         inorganic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         PCB-1260 (Arocior 1264)         11097-69-1         11/13         3.2E-01         7.7E+00           Sed ingestion         Organic         Total         Total         11097-69-1         11/13         5.9E-02         7.7E+00           Sed ingestion         Organic         Total         100945-97-3         130/134         6.3E+02         7.7E+00           Sed ingestion         Radionuclide         Co-60         10198-40-0         121/134         1.4E+03         7.7E+00           Sed ingestion         Radionuclide         Co-60         10198-40-0         121/134         1.4E+03         7.7E+00           Sed ingestion         Radionuclide         Co-60         10045-97-3         130/134         6.3E+02         7.7E+10<							(malka drv)	1//mc/ko/d)	(ma/ka/d)	
Sed ingestion         Incganic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         Total         7440-41-7         81/99         1.0E-01         4.3E+00           Sed ingestion         Organic         Total         1.095-65-1         11/13         5.9E-02         7.7E+00           Sed ingestion         Organic         Total         1.095-15-4         11097-65-1         11/11         5.9E-02         7.7E+00           Sed ingestion         Organic         Total         1.0045-97-3         11/113         5.9E-02         7.7E+00           Sed ingestion         Radionuclide         Co-60         10198-40-0         12/1/134         1.4E+03         4.1E+10           Care 13         13067-70-9         10/104         1.4E+02         11.E09         5.7E+11           Sed ingestion         Radionuclide         Co-60         10198-40-0         12/1/14         3.5E+02         5.7E+11           Sed ingestion         Radionuclide         Co-11         10068-97-2         91/96         4.5E+00         5.7E+10           Care 244	c	Cod indefine	Inornanic	Arcanic	7440-38-2	4/111	1.5E+00	1.8E+00	2.2E-07	4E-07
Sed ingestion         frorganic         Total           Sed ingestion         Organic         Total         3.2E-01         7.7E+00           Sed ingestion         Organic         Total         3.2E-01         7.7E+00           Sed ingestion         Organic         Total         3.2E-01         7.7E+00           Sed ingestion         Organic         Total         11097-69-1         11/13         5.9E-02         7.7E+00           Sed ingestion         Organic         Total         10045-97-3         1017134         1.4E+03         4.1E-10           Sed ingestion         Radionucide         Co-60         10198-40-0         12/1/134         1.4E+02         1.1E-09           Sed ingestion         Radionucide         Co-50         10045-97-3         130/134         6.3E+02         7.6E-10           Co-137         10045-97-3         130/134         6.3E+02         7.6E-10         3.9E-03           Co-137         100468-29-5         4/14         4.1E+00         3.9E-03         5.7E+11           Sed ingestion         U-234         13966-29-5         4/14         4.1E+00         3.5E-03           Co-1325         T-44         4.1E+00         3.5E+02         3.5E+02         3.5E+03	J	inneoßii noo		Bervlium	7440-41-7	81/99	1.0E-01	<b>≰</b> .3E+00	1.4E-08	6E-08
Sed ingestion         Organic         PCB-1250         (Arocior 1254)         11097-69-1         11/13         3.2E-01         7.7E+00           Red ingestion         Organic         Total         1097-69-1         11/13         5.9E-02         7.7E+00           Sed ingestion         Organic         Total         1097-69-1         11/13         5.9E-02         7.7E+00           Sed ingestion         Organic         Total         1098-40-0         121/134         14E+03         4.1E+00           Sed ingestion         Radionuclide         Co-60         10198-40-0         121/134         1.4E+02         7.6E-10           Sed ingestion         Radionuclide         Co-60         10198-40-0         121/134         1.4E+02         7.6E-10           Sed ingestion         Radionuclide         Co-60         101945-97-3         130/134         6.5E+02         7.6E-10           Ca-137         10045-97-3         10/10         1.4E+02         1.1E-02         5.7E-11           Sed ingestion         Eu-152         14683-229-9         11/11         8.2E+02         8.9E-10           Cm-244         13966-29-5         4/4         3.5E+02         8.1E+11         5.7E+01         8.9E-10           Cm-244         13966-29-5 <td>2</td> <td>Sed ingestion</td> <td>inorganic</td> <td>Total</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>5E-07</td>	2	Sed ingestion	inorganic	Total						5E-07
PCB-1254 (Arodor 1254)         11097-69-1         11/13         5.9E-02         7.7E+00           Sed ingestion         Organic         Total         (Bq/lg dry)         (1/Bq)         (1/Bq)           Sed ingestion         Radionuclide         Co-60         10198-40-0         12/1/134         1.4E+03         4.1E-10           Sed ingestion         Radionuclide         Co-60         10198-40-0         12/1/134         1.4E+02         1.1E-09           Sed ingestion         Radionuclide         Co-50         10045-97-3         130/134         6.3E+02         7.5E-10           Sed ingestion         Radionuclide         Co-50         10198-40-0         12/1/134         1.4E+02         1.1E-09           Sed ingestion         Radionuclide         Co-134         13965-70-9         10/10         1.4E+02         1.1E-09           Sed ingestion         U-234         13966-29-5         4/4         4.1E+00         3.6E+02         5.7E+11           Pu-238         7.440-61-1         1.4/14         3.5E+02         8.1E-01         3.6E+02         5.7E+00         8.4E+03         5.4E+00         3.6E+02         5.7E+11           Revision         Pu-238         7.440-61-1         4/14         4.1E+00         3.6E+02         3.6E+02	~	Sed indestion	Organic	-	11096-82-5	3/13	3.2E-01	7.7E+00	4.6E-08	4E-07
Sed ingestion         Organic         Total           Sed ingestion         Organic         Total           Sed ingestion         Radionuclide         Co-60         10198-40-0         127/134         1.4E-103         4.1E-10           Sed ingestion         Radionuclide         Co-513         10045-97-3         130/134         6.3E+02         7.5E-10           Cs-134         13967-70-9         10/10         1.4E+02         1.1E-09         1.1E-09           Cs-134         13966-29-5         4/4         9.1E+00         3.8E+02         5.7E-11           Cs-234         13966-29-5         4/14         9.1E+00         3.8E-09         9.1E+00         3.8E-09           Cm-244         13966-29-5         4/4         9.1E+00         3.8E-09         9.1E+00         3.8E-09           Mm-241         13966-10-2         14/14         3.5E+02         8.1E-11         0.122-00         8.1E-10         3.8E-09           Mm-241         13966-10-2         4/4         4.1E+00         3.5E-09         9.1E-00         3.5E-09         9.1E-00         3.6E-09           Pu-238         13981-15-2         4/4         4.1E+00         3.5E-09         9.1E-00         3.5E-09         9.122+00         8.4E-09         9.1E-0	,	0		(Arodor	11097-69-1	11/13	5.9E-02	7.7E+00	8.4E-09	7E-08
Sed ingestion       Radionuclide       Co-60       10198-40-0       121/134       1.4E+03       4.1E-10         Cs-137       10945-97-3       130/134       6.3E+02       7.6E-10       4.1E-10         Cs-137       10945-97-3       130/134       6.3E+02       7.6E-10       4.1E-00         Cs-134       13967-70-9       10/10       1.4E+03       4.1E-00       3.6E-01         Cs-134       13967-70-9       10/10       1.4E+02       1.1E-09         Sr-90       10998-97-2       9/195       4.14       3.8E-01       8.9E-10         U-238       15585-10-1       14/14       3.5E+02       8.1E-11       1.2E+00       3.8E-09       9.1E-03       4.1E+00       3.8E-09       9.1E-03       4.1E+00       3.8E-09       9.1E-13       4.1A       4.1E+00       3.8E-09       9.1E-13       4.1A       4.1E+00       3.8E-09       9.1E-13       9.1E-13       9.1E-13       9.1E-13       9.1E-13       9.1E-13       9.1E-13       9.1E-13 <td< td=""><td>N</td><td>Sed ingestion</td><td>Organic</td><td><b>—</b></td><td></td><td></td><td></td><td></td><td></td><td>4E-07</td></td<>	N	Sed ingestion	Organic	<b>—</b>						4E-07
Sed ingestion       Radionuclide       Co-60       10198-40-0       121/134       1.4E+03       4.1E-10         Cs-137       10945-97-3       130/134       6.3E+02       7.6E+10       7.6E+10         Cs-134       13967-70-9       10/10       1.4E+02       1.1E-09       7.6E+10         Cs-134       13967-70-9       10/10       1.4E+02       1.1E-09       7.6E+10         Cs-134       13966-29-5       14/4       8.2E+02       5.7E+11         Sr-90       10098-97-2       91/95       4.5E+01       8.9E+10         U-234       13966-29-5       4/14       9.1E+00       3.8E-09         U-238       7440-61-1       4/14       3.5E+02       8.1E+11         Mm-241       13961-15-2       4/14       4.1E+00       3.5E-09         Mm-238       13961-16-3       4/14       4.1E+00       3.5E-09         Mm-241       140-61-1       4/14       4.1E+00       3.5E-09         Pu-238       15117-96-1       4/14       1.2E+00       8.4E-09         Pu-239       15117-98-3       4/14       3.6E-01       7.6E-09         Sed ingestion       Audite       101       1.2E+00       8.4E-01         Sed ingestion							(Bq/kg dry)	(1/Bq)	(Bq/lifetime)	
Cs-137       10945-97-3       130/134       6.3E+02       7.6E-10         Cs-134       13967-70-9       10/10       1.4E+02       1.1E-09         Eu-152       14683-23-9       11/11       8.2E+02       5.7E-11         Sr-90       10098-97-2       91/95       4.5E+01       8.9E-10         U-234       13966-29-5       4/4       9.1E+00       3.8E-09         U-234       15585-10-1       14/14       3.5E+02       8.1E-11         Cm-244       15585-10-1       14/14       3.5E+02       8.1E-11         Cm-244       15585-10-1       14/14       3.5E+02       8.1E-11         Cm-244       13981-15-2       4/4       4.1E+00       5.4E-09         U-238       7440-61-1       4/4       4.1E+00       5.4E-09         U-238       14596-10-2       4/4       4.1E+00       3.5E-09         Pu-238       13981-16-3       4/4       3.8E-01       7.4E-09         Value       10-235       15117-96-1       4/4       3.8E-01       7.6E-09         Vultion       10-235       15117-96-3       4/4       3.8E-01       7.6E-09         Value       11       4/4       6.6E-01       3.8E-01       7.6E-09 </td <td>0</td> <td>Sed intestion</td> <td>Radionucide</td> <td>C0-60</td> <td>10198-40-0</td> <td>121/134</td> <td>1.4E+03</td> <td>4.1E-10</td> <td>1.5E+02</td> <td>6E-08</td>	0	Sed intestion	Radionucide	C0-60	10198-40-0	121/134	1.4E+03	4.1E-10	1.5E+02	6E-08
Cs-134       13967-70-9       10/10       1.4E+02       1.1E-09         Eu-152       14683-23-9       11/11       8.2E+02       5.7E-11         Sr-90       10098-97-2       91/95       4.5E+01       8.9E-10         U-234       13966-29-5       4/4       9.1E+00       3.8E-09         Eu-154       15585-10-1       14/14       3.5E+02       8.1E-11         Cm-244       13966-29-5       4/4       4.1E+00       3.8E-09         U-238       7440-61-1       4/4       4.1E+00       5.4E-09         Mm-241       13981-15-2       4/4       4.1E+00       5.4E-09         Mm-238       7440-61-1       4/4       4.1E+00       5.4E-09         Pu-238       13981-15-2       4/4       4.1E+00       5.6E-09         Pu-235       15117-96-1       4/4       1.2E+00       8.4E-09         Pu-235       15117-96-1       4/4       6.6E-01       7.6E-09         Pu-239       15117-96-1       4/4       8.5E-02       8.4E-10         Sed ingestion       Rationuclide       Total       3.6E-02       8.4E-10         Sed ingestion       Ald       8.5E-02       8.4E-10       3.5E-09		1		Cs-137	10045-97-3	130/134	6.3E+02	7.6E-10	6.7E+01	5E-08
Eu-152     14683-23-9     11/11     8.2E+02     5.7E-11       Sr-90     10098-97-2     91/95     4.5E+01     8.9E-10       Sr-90     13966-29-5     4/4     9.1E+00     3.8E-09       U-234     15585-10-1     14/14     3.5E+02     8.1E-11       Cm-244     13966-29-5     4/4     9.1E+00     3.8E-09       U-238     7440-61-1     4/1     3.5E+02     8.1E-11       D-238     7440-61-1     4/4     4.1E+00     5.4E-09       Nm-241     14596-10-2     4/4     4.1E+00     3.5E-09       Nm-235     15117-96-1     4/4     1.2E+00     8.4E-09       U-235     15117-96-1     4/4     3.5E-02     8.4E-09       U-235     15117-96-1     4/4     3.5E-02     8.4E-09       U-235     15117-96-1     4/4     8.5E-02     8.4E-10       Sed ingestion     Rationuclide     Total     3.5E-02     8.4E-10       Sed ingestion     Ali     8.5E-02     8.4E-10     3.5E-09       No     10     10     8.5E-02     8.4E-10     3.5E-09				Cs-134	13967-70-9	10/10	1.4E+02	1.1E-09	1.5E+01	2E-08
Sr-90     10098-97-2     91/95     4.5E+01     8.9E-10       U-234     13966-29-5     4/4     9.1E+00     3.8E-09       Eu-154     15585-10-1     14/14     3.5E+02     8.1E-11       Cm-244     13961-15-2     4/4     4.1E+00     5.4E-09       U-238     7440-61-1     4/4     4.1E+00     3.5E-09       Am-241     14596-10-2     4/4     1.2E+00     8.4E-09       Pu-235     15117-96-1     4/4     3.8E-01     7.6E-09       Pu-239     15117-96-1     4/4     8.5E-02     8.4E-10       Sed ingestion     Rationuclide     Total     3.6E-02     8.4E-10       Sed ingestion     Alionuclide     Total     4/4     8.5E-02				Eu-152	14683-23-9	11/11	8.2E+02	5.7E-11	8.6E+01	5E-09
U-234       13966-29-5       4/4       9.1E+00       3.8E-09         Eu-154       15585-10-1       14/14       3.5E+02       8.1E-11         Cm-244       13981-15-2       4/4       4.1E+00       5.4E-09         U-238       7440-61-1       4/4       4.1E+00       5.5E-09         Am-241       14596-10-2       4/4       1.2E+00       8.4E-09         Pu-238       13981-16-3       4/4       1.2E+00       8.4E-09         Pu-235       15117-96-1       4/4       3.8E-01       7.6E-09         Value       D-235       15117-48-3       4/4       8.5E-02       8.4E-10         Sed ingestion       Rationuclide       Total       3.5117-48-3       4/4       8.5E-02       8.4E-10         Sed ingestion       All       1.2E+00       8.4E-10       8.4E-10       3.5E-09         Pu-239       15117-48-3       4/4       8.5E-02       8.4E-10       3.5E-09         Sed ingestion       Aldionuclide       Total       3.5117-48-3       4/4       8.5E-02       8.4E-10				06-JS	10098-97-2	91/95	4.5E+01	8.9E-10	4.7E+00	4E-09
Eu-154       15585-10-1       14/14       3.5E+02       8.1E-11         Cm-244       13981-15-2       4/4       4.1E+00       5.4E-09         U-238       7440-61-1       4/4       4.1E+00       3.5E-09         Am-241       14596-10-2       4/4       4.1E+00       3.5E-09         Pu-238       14596-10-2       4/4       1.2E+00       8.4E-09         Pu-235       15117-96-1       4/4       3.8E-01       7.6E-09         Pu-239       15117-96-1       4/4       8.5E-02       8.4E-10         Sed ingestion       Rationuclide       Total       3.5117-48-3       4/4       8.5E-02         Sed ingestion       All       1.2t+00       3.4f-4       8.5E-02       8.4E-10         Sed ingestion       Ald       1.2t+00       8.4E-10       3.5E-09         Modeline       Total       1.0tal       3.5117-48-3       4/4       8.5E-02				U-234	13966-29-5	4/4	9.1E+00	3.8E-09	9.5E-01	4E-09
Cm-244     13981-15-2     4/4     4.1E+00     5.4E-09       U-238     7440-61-1     4/4     4.1E+00     3.5E-09       Am-241     14596-10-2     4/4     1.2E+00     8.4E-09       Pu-236     13981-16-3     4/4     1.2E+00     8.4E-09       Pu-235     15117-96-1     4/4     6.6E-01     3.5E-09       Sed ingestion     Rationuclide     Total     4/4     8.5E-02     8.4E-10       Sed ingestion     Rationuclide     Total     4/4     8.5E-02     8.4E-10				Eu-154	15585-10-1	14/14	3.5E+02	8.1E-11	3.7E+01	3E-09
U-238     7440-61-1     4/4     4.1E+00     3.5E-09       Am-241     14596-10-2     4/4     1.2E+00     8.4E-09       Pu-236     13981-16-3     4/4     3.8E-01     7.6E-09       U-235     15117-96-1     4/4     6.6E-01     3.5E-09       Pu-239     15117-48-3     4/4     8.5E-02     8.4E-10       Sed ingestion     Rationuclide     Total     1.24     3.5E-09       Sed ingestion     All     1.217-48-3     4/4     8.5E-02       Sed ingestion     All     Total     1.24				Cm-244	13981-15-2	4/4	4.1E+00	5.4E-09	4.3E-01	2E-09
Am-241       14596-10-2       4/4       1.2E+00       8.4E-09         Pu-236       13981-16-3       4/4       3.8E-01       7.6E-09         U-235       15117-96-1       4/4       6.6E-01       3.5E-09         Pu-239       15117-48-3       4/4       8.5E-02       8.4E-10         Sed ingestion       Rationuclide       Total       1.21       1.4       8.5E-02       8.4E-10         Sed ingestion       Rationuclide       Total       1.5117-48-3       4/4       8.5E-02       8.4E-10				U-238	7440-61-1	414	4.1E+00	3.5E-09	4.3E-01	25-09
Pu-238         13981-16-3         4/4         3.8E-01         7.6E-09           U-235         15117-96-1         4/4         6.6E-01         3.5E-09           Pu-239         15117-48-3         4/4         8.5E-02         8.4E-10           Sed ingestion         Rationuclide         Total         1.5117-48-3         4/4         8.5E-02         8.4E-10           Sed ingestion         Rationuclide         Total         1.5117-48-3         4/4         8.5E-02         8.4E-10				Am-241	14596-10-2	4/4	1.2E+00	8.4E-09	1.2E-01	1E-09
U-235 15117-96-1 4/4 6.6E-01 3.5E-09 Pu-239 15117-48-3 4/4 8.5E-02 8.4E-10 Sed ingestion Radionuclide Total Sed Incestion All Total				Pu-238	13981-16-3	4/4	<b>3.8E-01</b>	7.6E-09	3.9E-02	3E-10
Pu-239 15117-48-3 4/4 8.5E-02 8.4E-10 Sed ingestion Radionuclide Total Sed Incestion All Total				U-235	15117-96-1	4/4	6.6E-01	3.5E-09	6.9E-02	2E-10
Sed ingestion Radionuclide Sed Ingestion All				Pu-239	15117-48-3	4/4	8.5E-02	8.4E-10	8.9E-03	8E-12
Sed incestion All	2	Sed indestion	Radionuclide	Total						2E-07
	10	Sed incestion		Total						1E-06

(continued)
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Table

					detected	Geometric	slope	Daliy	Carcinogen
Reach	Media	Contaminant	Contaminant		to total	means	factor	intake	screening
no.	type	type	name	CAS no.	semples	(Bq/kg dry)	(i/Bq)	(Bq/lifetime)	Indices
2	Sed ext exp	Radionuclide	Co-60	10198-40-0	121/134	1.4E+03	3.5E-09	9.6E+04	36-04
			Eu-152	14683-23-9	11/11	8.2E+02	1.7E-09	5.6E+04	1E-04
			Eu-154	15585-10-1	14/14	3.5E+02	1.8E-09	2.4E+04	4E-05
			Cs-137	10045-97-3	130/134	6.3E+02	9.2E-10	4.3E+04	4E-05
			Cs-134	13967-70-9	10/10	1.4E+02	2.4E-09	9.8E+03	2E-05
			UI-235	15117-98-1	414	6.6E-01	2.6E-10	4.5E+01	1E-08
			Am-241	14596-10-2	4/4	1.2E+00	4.3E-11	7.9E+01	3E-09
			11-234	13966-29-5	4/4	9.1E+00	1.5E-12	6.2E+02	9E-10
			Cm-244	13981-15-2	4/4	4.1E+00	1.6E-12	2.8E+02	5E-10
			11-238	7440-61-1	4/4	4.1E+00	1.2E-12	2.8E+02	3E-10
			P11-238	13981-16-3	4/4	3.8E-01	1.6E-12	2.6E+01	4E-11
			P11-239	15117-48-3	4/4	8.5E-02	7.0E-13	5.8E+00	4E-12
	-								5E-04
	Sed ext exp	Hachonucide							SE-DA
	Sediment	AII	10181						, , ,
						(mg/L)	1/(mg/kg/d)	(mg/kg/d)	
	Water	Inorganic	Arsenic	7440-38-2	4/75	5.1E-02	1.8E+00	1.5E-04	3E-04
	Water	Organic	PCBs total	1336-36-3	2/30	1.0E-03	7.7E+00	3.0E-06	2E-05
		3	Trichloroethylene	79-01-6	10/46	3.6E-03	1.1E-02	1.0E-05	1E-07
			Methylene chloride	75-09-2	15/29	3.2E-03	7.5E-03	9.1E-06	7E-08
			Chicroform	67-66-3	6/30	3.5E-03	6.1E-03	1.0E-05	6E-08
~	Water	Organic	Total						2E-05
						(Bq/L)	(1/Bq)	(Bg/lifetime)	
	Water	Radionucide	Н-3	10028-17-8	63/64	1.9E+03	1.5E-12	4.0E+06	6E-06
4			Eu-154	15585-10-1	5/5	1.9E+01	8.1E-11	4.0E+04	3E-06
			Eu-152	14683-23-9	212	1.8E+01	5.7E-11	3.8E+04	2E-06
			Sr-90	10098-97-2	43/66	8.4E-01	8.9E-10	1.8E+03	2E-06
			Co-60	10198-40-0	27174	1.2E-01	4.1E-10	2.5E+02	1E-07
			Cs-137	10045-97-3	15/74	1.1E-02	7.6E-10	2.2E+01	2E-08
c	Water	Radioniscide	Total						1E-05
J									35-04

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h         Media         Contaminant         Contaminant <thcontamina< th=""><th></th><th></th><th></th><th></th><th></th><th>detected</th><th>Geometric</th><th>slope</th><th>Daily</th><th>Carcinogen</th></thcontamina<>						detected	Geometric	slope	Daily	Carcinogen
Vps         Vps         Normaliant         Sec of a	ach	Media	Contaminant	Contaminant		to total	means //co	factor 1//mg/kg/d)	intake (ma/ka/d)	screening indices
Fish         Organic         PCB-1264 (voctor 1260)         11095-82-5         797.9         1.2-01         7.7-00         7.8-06           Fish         Organic         PCB-1264 (voctor 1260)         11095-82-5         797.9         1.2-01         7.7-00         7.8-06           Fish         Radionucide         C137         10045-97-3         106/105         5.8-06         1109-109         9770         5.8-06         4.16-10         1.8-04           Fish         Radionucide         C60         10199-40-0         9770         5.8-05         4.16-10         1.8-03           Fish         Radionucide         C60         10199-40-0         9770         5.8-06         4.16-10         1.8-03           Fish         Admunicide         Total         140-41-7         40/54         2.8-00         1.86-07         3.86-07           Sed ingestion         Inorganic         Partinit         2.8-00         1.86-07         3.86-07         3.66-03         3.600           Sed ingestion         Organic         Total         7.40-41-7         4.05-3         2.77-00         3.600         3.600           Sed ingestion         Norganic         Partinit         2.8-00         1.86/10         1.16-02         3.6-00 <th< td=""><td>ö</td><td>type</td><td>type</td><td>аше</td><td>CAS NO.</td><td>Samples</td><td>o of nt</td><td>7 7F±00</td><td>1.4E-05</td><td>1E-04</td></th<>	ö	type	type	аше	CAS NO.	Samples	o of nt	7 7F±00	1.4E-05	1E-04
Fait         Organic         Total         106/106         5.5E-05         106/106         5.5E-05         4.1E-10         136/10         86/10         136/10         86/10         136/10         86/10         136/10         86/10         136/10         86/10         136/10         86/10         136/10 <td><b>ლ</b></td> <td>Fish</td> <td>Organic</td> <td>(, Vrocior</td> <td>1109/-09-1</td> <td>79/79</td> <td>1.7E-01</td> <td>7.7E+00</td> <td>7.8E-06</td> <td>6E-05</td>	<b>ლ</b>	Fish	Organic	(, Vrocior	1109/-09-1	79/79	1.7E-01	7.7E+00	7.8E-06	6E-05
Feh         Redenucide         Cs-137         10045-97-3         106/106         5.5E-402         7.5E-10         8.6E-10         8.6E-402           Fah         Radionucide         Cs-60         10169-40-0         9770         5.5E-05         4.1E-10         1.8E-04           Fah         Radionucide         Cs-60         10169-40-0         9770         5.5E-05         4.1E-10         1.8E-00           Sed ingestion         Inorganic         Total         7.40-33-2         6/60         3.2E-00         1.8E-00         3.6E-03           Sed ingestion         Inorganic         Total         7.40-33-2         6/60         1.8E-00         3.6E-03         3.6E-03           Sed ingestion         Inorganic         Total         7.40-33-2         1.17         4.15         2.6E-01         4.5E-00         3.6E-08           Sed ingestion         Organic         PE-154         4.00-41-7         4.015         2.6E-00         3.6E-08         3.6E-08           Sed ingestion         Organic         PE-154         4.00-41-7         4.015         4.6E-07         3.6E-08           Sed ingestion         Organic         PE-154         4.005         1.1097-69         7.7E-00         3.6E-08         3.6E-08           S			Oraznic		0-30-06011		•			2E-04
Fah         Radrouctide         Ca-137         1005/105         S.EE-02         7.8F-10         1.8E-04           Fah         Radrouctide         C-60         10198-40-0         9/70         S.EE-02         7.8F-10         1.8E-04           Fah         Radrouctide         C-60         10198-40-0         9/70         S.EE-02         7.8F-10         1.8E-04           Fah         Radrouctide         Total         Total         10198-40-0         9/70         S.EE-02         7.8F-10         1.8E-03           Sed ingestion         Inorganic         Arsenic         740-38-2         6/60         3.2E-00         1.8E-03         4.6E-07           Sed ingestion         Inorganic         Pervilum         740-41-7         4/054         2.8E-01         4.8E-07           Sed ingestion         Inorganic         Particit         740-41-7         4/054         2.8E-00         4.6E-07           Sed ingestion         Inorganic         Total         740-41-7         4/054         2.4E-01         4.8E-00         4.8E-00           Sed ingestion         Organic         Total         740-41-7         4.054         2.4E-02         3.8E-03         3.8E-03           Sed ingestion         Organic         Particit	'n		Cigain	0.00						
Fish         Radionuclide         Cs-137         10045-97/2         3 106/106         5.5E+02         7.6E+10         19E+04           Fish         Radionuclide         Cs-90         1098-40-0         9/70         5.5E+03         4.6E+10         19E+04           Fish         Radionuclide         Total         Total         10198-40-0         9/70         5.5E+03         4.6E+10         19E+03           Fish         Radionuclide         Total         740-39-2         6/16         3.2E+00         1.9E+03         3.5E-03           Sed ingestion         Inorganic         Mark         740-39-2         6/16         3.2E+00         1.9E+00         3.5E-03           Sed ingestion         Organic         Deltail         740-41-7         40/54         2.2E+00         4.6E-07         4.6E-07           Sed ingestion         Organic         PCB-154         11097-99-1         4/15         2.2E+00         3.5E-03         <							(Bq/kg wet)	(1/Bq)	(Bq/lifetime)	
Feb         Radionucide All         C-60         10080-97.2         13/13         2.65-01         8.65-02         8.65-02           Fah         All         Total         Total         10181         Total         9.70         5.55-05         4.15-10         9.65-03         9.65-03           Fah         All         Total         Total         740-44-7         40/54         5.55-05         4.15-10         9.65-03         8.65-03           Sed ingestion         Inorganic         All         Total         740-44-7         40/54         2.45-00         4.15-10         4.65-07           Sed ingestion         Organic         PCB-1254         7440-44-7         40/54         2.45-01         4.15-10         4.65-07           Sed ingestion         Organic         PCB-1254         7440-44-7         40/54         2.45-00         4.15-10         4.65-07           Sed ingestion         Organic         PCB-1254         7440-44-7         4.05-3         2.55-03         4.16-10         1.26-03         3.55-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03         3.65-03		L L	Dedicantalida	Ce-137	10045-97-3	106/106	5.2E+02	7.6E-10	1.8E+04	1E-05
Feh         Radonucids         Co-60         10199-400         9/70         5.E-05         4.1E-10         1.9E-03           Fish         All         Total         10191         10191         10191         10191         10191           Fish         All         Total         10191         10191         10191         10191         10191         10191           Sed ingestion         Inorganic         Arsenic         7440-31-7         40/54         2.4E-01         4.1E-10         1.9E-03           Sed ingestion         Inorganic         Pashinic         7440-41-7         40/54         2.4E-01         4.5E-00         3.5E-00         4.6E-07         4.6E-07           Sed ingestion         Organic         Pashinina         7440-41-7         40/54         2.4E-01         4.5E-00         3.5E-00         3.5E-00 <t< td=""><td>~</td><td>rsn</td><td>Hadionucide</td><td>Co-137 27-00</td><td>10098-97-2</td><td>13/13</td><td>2.5E+01</td><td>8.9E-10</td><td>8.6E+02</td><td>8E-07</td></t<>	~	rsn	Hadionucide	Co-137 27-00	10098-97-2	13/13	2.5E+01	8.9E-10	8.6E+02	8E-07
Fish         Radrouctide All         Total         Magric Total         Total           Fish         All         Total         (mg/kg dry)         1/(mg/kg dry)         1/(mg/kg/d)           Sed ingestion         Inorganic         Arsenic         7440-41-7         40/54         2.4E-01         4.5E-00         3.5E-00           Sed ingestion         Inorganic         Total         7440-41-7         40/54         2.4E-01         4.5E-00         3.5E-00           Sed ingestion         Inorganic         Total         7440-41-7         40/54         2.4E-01         4.5E-00         3.5E-00           Sed ingestion         Organic         PCB-1254         11007-69-1         4/15         2.2E-01         4.5E-00         3.5E-00           Sed ingestion         Organic         PCB-1254         11007-69-1         4/15         2.4E-01         4.5E-00         3.5E-00           Sed ingestion         Organic         Total         71-43-2         2.17         2.4E-01         4.5E-00         3.5E-00           Sed ingestion         Radionuclide         C-60         10045-97-2         2.17         2.4E-01         1.2E-00         3.5E-00         1.2E-00           Sed ingestion         Radionuclide         C-46-3         1.0045-97-2 </td <td></td> <td></td> <td></td> <td></td> <td>10108-40-0</td> <td>9/70</td> <td>5.5E-05</td> <td>4.1E-10</td> <td>1.9E-03</td> <td>8E-13</td>					10108-40-0	9/70	5.5E-05	4.1E-10	1.9E-03	8E-13
Fish         All         Total           Sed ingestion         Inoganic         Arsenic         740-31-2         6/60         3.2E+00         1.8E+00         3.5E-00           Sed ingestion         Organic         Denzion         Total         740-31-2         4/15         2.8E-01         1.8E+00         3.5E-00         <			:		0-04-00-01					1E-05
Sed ingestion         Inorganic         Arsenic         740-41-7         4.0/54         2.4E-00         1.8E+00         4.6E-07         3.5E-08           Sed ingestion         Inorganic         Total         7.40-31-7         4.0/54         2.4E-01         4.5E-00         3.5E-08           Sed ingestion         Organic         Total         7.40-31-7         4.0/54         2.4E-01         4.5E-00         3.5E-08           Sed ingestion         Organic         FCD-1254         11097-69-1         1/15         2.8E-01         7.5E-00         4.6E-07         3.5E-08           Sed ingestion         Organic         PCD-1254         11097-69-1         1/17         2.8E-02         2.5E-03         3.4E-03	~ <b>~</b>	rish List	Hadionucide All	Total						2E-04
Sed ingestion         Inorganic         Arsenic         7440-34-7         6/60         3.25-00         4.50-00         4.50-00							(under od) one)	1 (ma/ka/d)	(ma/ka/d)	
Sed ingestion         Inorganic         Arsenic         Vatu-3-2         Volution         2.4E-01         4.5E+00         3.5E-08           Sed ingestion         Inorganic         Total         740-41-7         40/54         2.4E-01         4.5E+00         3.5E-08           Sed ingestion         Organic         FOB-1254 (Acodor 1254)         11097-69-1         4/15         2.4E-01         4.7E+00         4.0E-08           Sed ingestion         Organic         FCB-1254 (Acodor 1254)         11097-69-1         4/15         2.4E-02         2.4E-03         3.4E-09           Sed ingestion         Organic         Total         75-09-2         2/17         2.4E-02         3.4E-09         3.4E-09           Sed ingestion         Organic         Total         10045-97-3         2/17         2.4E-02         3.4E-09         3.4E-09           Sed ingestion         Organic         Total         10045-97-3         2/17         2.4E-02         3.4E-09         1.1E+02						0313	Con Rushin	1 8F+00	4.6E-07	8E-07
Sed ingestion         Inorganic         Total         Advantage         Advantage <t< td=""><td>~</td><td>Seá ingestion</td><td>Inorganic</td><td>Arsenic</td><td>7440-99-2</td><td>40154</td><td>2.4E-01</td><td>4.3E+00</td><td>3.5E-08</td><td>2E-07</td></t<>	~	Seá ingestion	Inorganic	Arsenic	7440-99-2	40154	2.4E-01	4.3E+00	3.5E-08	2E-07
Sed ingestion         Total           Sed ingestion         Organic         Total           Sed ingestion         Organic         PCB-1254 (Arocker 1254)         11097-69-1         4/15         2.8E-01         7.7E+00         4.0E-08           Benzene         71-43-2         1/17         1.8E-02         2.9E-02         2.6E-09         3.4E-09           Benzene         71-43-2         1/17         1.8E-02         2.9E-02         3.4E-09           Benzene         71-43-2         1/17         1.8E-02         2.9E-02         3.4E-09           Benzene         Total         67-66-3         2/17         2.8E-01         7.7E+00         4.0E-08           Sed ingestion         Organic         Total         67-66-3         2/17         2.8E-02         3.4E-00           Sed ingestion         Organic         0.1938-40-0         2.04/208         1.1E-02         1.1E+02           Sed ingestion         Radionuclide         Cs-137         10045-97-2         2.01/7         3.1E-00         3.4E-01           Co-sid         10188-40-0         2.04/208         1.1E+02         1.1E+02         1.1E+02         1.1E+02           Cs-sid         10188-40-0         2.04/208         1.1E+02         3.7E+01				Beryllium	1-14-0461	*0.5				1E-06
Sed ingestion         Organic         PCB-1254         11097-69-1         4/15         2.8E-01         7.7E+00         4.0E-08           Benzene         71-43-2         1/17         1.8E-02         2.9E-02         2.6E-03         2.4E-03         3.4E-09           Benzene         75-09-2         2/17         8.7E-02         7.5E-03         3.4E-09         3.4E-09           Sed ingestion         Organic         Total         5.69-2         2.17         8.7E-02         7.5E-03         3.4E-09           Sed ingestion         Organic         Total         6.7E-03         2.12E-03         1.2E-03         1.4E-03         1.2E-03         3.4E-09           Sed ingestion         Organic         Total         10045-97-3         2.21/7         8.7E-00         4.0E-03         1.2E-03         3.4E-09           Sed ingestion         Radionuclide         Cs-137         10045-97-3         2.23/223         1.0E+04         7.6E-10         1.0E+03           Sed ingestion         Radionuclide         Cs-134         13967-70-9         7.77         1.1E+02         1.1E+02         1.1E+02         1.1E+02         1.1E+02         1.1E+02         1.1E+03         1.1E+02         1.1E+03         1.1E+02         1.1E+02         1.1E+02         1.1E	m	Sed ingestion	Inorganic	Total						
Sed ingestion         Organic         Pro-tron transmission         71.43-2         1/7         1.8E-02         2.9E-02         2.6E-03         3.4E-03         3.4E-01         1.0E+02         3.4E-01         1.0E+02         3.4E-01         1.0E+02         3.4E-01         1.0E+02         3.4E-01         1.0E+02         3.4E-01         1.0E+02         3.4E-01         1.1E+02		:		DCB 1251 (Aredas 1264)	11007-69-1	4/15	2.8E-01	7.7E+00	4.0E-08	3E-07
Retrylene chorde         75-0-2         2/7         2.4E-02         7.5E-03         3.4E-09           Sed ingestion         Organic         Total         (7.66-3         2/7         8.7E-03         6.1E-03         1.2E-09           Sed ingestion         Organic         Total         (7.66-3         2/7         8.7E-03         6.1E-03         1.2E-09           Sed ingestion         Radionucide         Cs-137         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sed ingestion         Radionucide         Cs-134         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sed ingestion         Radionucide         Cs-134         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sed ingestion         Radionucide         Cs-134         13967-70-9         7/7         1.1E+02         1.1E+01         1.1E+01           Cu-234         13965-70-9         7/7         1.1E+02         3.7E+01         3.7E+01           Cu-234         13967-70-9         7/7         1.1E+02         3.7E+01         3.7E+01           Cu-235         1.11         2.224         13965-25         1/1         3.2E+00         3.2E-01	m)	Sed ingestion	Organic	PCD-1234 (AUGG 1237) Boyrono	71-43-2	1/7	1.8E-02	2.9E-02	2.6E-09	8E-11
Sed ingestion         Organic         Total         6.16-3         2.17         8.7E-03         6.1E-03         1.2E-09           Sed ingestion         Organic         Total         (1/64)         (1/64)         (1/64)         (1/64)           Sed ingestion         Organic         Total         (1/64)         (1/64)         (1/64)         (1/64)           Sed ingestion         Cracio         10045-97-3         223/223         1.06404         7.6E-10         1.0E+03           Sed ingestion         Radionucide         Cs-137         10045-97-3         223/223         1.06404         7.6E-10         1.06+03           Sed ingestion         Radionucide         Cs-50         10198-40-0         2.04/208         1.16+02         1.16+02           Sed ingestion         Radionucide         Cs-137         13967-70-9         7/7         1.16+02         1.16+02         2.16+11         3.76+01           U-234         13967-70-9         7/7         1.16+02         3.76+01         3.76+01         3.76+01         3.76+01           U-234         13967-70-9         7/7         1.16+02         3.76+01         3.76+01         3.76+01         3.76+01           U-234         139667-70-9         7/7         1.16+02				atoticens atotices chloride	76.00-2	217	2.4E-02	7.5E-03	3.4E-09	3E-11
Sed ingestion         Organic         Total           Sed ingestion         Organic         Total         (Bq/kg dry)         (1/Bq)         (Bq/lifetime)           Sed ingestion         Radionuclide         Cs-137         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sed ingestion         Radionuclide         Cs-137         10045-97-3         223/223         1.0E+04         7.6E-10         1.6E+03           Sr-90         10198-97-2         60/60         2.04/208         1.1E+03         4.1E-10         1.1E+02           Sr-90         1098-97-2         60/60         2.04/208         1.1E+02         1.1E+02         1.1E+02           Sr-90         1098-97-2         60/60         2.0E+02         8.9E-10         2.1E+01           Cs-134         13966-70-9         7/7         1.1E+02         1.1E+02         1.1E+02           Lu-154         1556-01         1.16+02         1.1E+02         3.5E+01         3.7E+01           Lu-154         15565-10-1         9/9         1.8E+02         3.5E+01         3.7E+01           Lu-238         74406-1         1/1         3.0E+00         3.8E+01         1.8E+01           Lu-238         141381-16-1         1/1 <td></td> <td></td> <td></td> <td></td> <td>67.66.3</td> <td>217</td> <td>8.7E-03</td> <td>6.1E-03</td> <td>1.2E-09</td> <td>8E-12</td>					67.66.3	217	8.7E-03	6.1E-03	1.2E-09	8E-12
Sed ingestion         Radionuclide         Cs-137         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sed ingestion         Radionuclide         Cs-137         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sr-90         10098-97-2         60/60         2.04/208         1.1E+03         1.1E+01         1.1E+01           Cs-134         13965-70-9         7/7         1.1E+02         1.1E+01         1.1E+01           Cs-134         13965-29-5         1/1         1.1E+02         1.1E+01         1.1E+01           U-234         13965-29-5         1/1         4.2E+00         3.2E-01         3.7E+01           U-235         15117-96-1         1/1         3.2E+00         3.4E-01         3.4E-01           U-235         15117-96-1         1/1         3.2E+00         3.5E-09         3.4E-01           U-238         1556-20-2         1/1         1.1E+02         3.4E-01         3.4E-01           U-238         15117-96-1         1/1         3.2E+02         3.4E-01         3.4E-01           U-238         15117-96-2         1/1         1.1         3.2E-02         3.4E-01         3.4E-01           U-238		Sod incertion		Total		Ì				3E-07
Sed ingestion         Radionuclide         Cs-137         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sed ingestion         Radionuclide         Cs-137         10045-97-3         223/223         1.0E+04         7.6E-10         1.0E+03           Sr-90         10198-40-0         204/208         1.1E+03         4.1E-10         1.1E+02           Sr-90         10098-97-2         60/60         2.0E+02         8.9E-10         1.1E+01           Cs-134         13965-70-9         7/7         1.1E+02         1.1E+01         1.1E+01           Cs-134         13965-29-5         1/1         4.2E+00         3.8E-09         4.4E-01           U-235         15117-961         1/1         3.2E+00         3.8E-09         3.4E-01           U-238         7440-61-1         1/1         3.2E+00         3.5E-09         3.4E-01           U-238         7440-61-1         1/1         3.2E+00         3.5E-09         3.4E-01           U-238         7440-61-1         1/1         3.2E+00         3.5E+09         3.4E-01           U-238         7440-61-1         1/1         3.2E+00         3.5E+01         3.4E-01           U-238         1177-48-3         1/1	<b>0</b>	unechil noc		•						
Sed ingestionRadionuclideCs-13710045-97-3223/2231.0E+047.6E-101.0E+03Sr-90T0098-97-260/602.0E+028.9E-101.1E+02Sr-9010098-97-260/602.0E+028.9E-101.1E+02Sr-9010098-97-260/602.0E+028.9E-102.1E+01Sr-91Cs-13413967-70-97/71.1E+021.1E+02Cs-13413967-70-97/71.1E+021.1E+021.1E+02U-23413966-29-51/14.2E+003.8E-094.4E-01U-23515117-96-11/13.2E+028.1E-111.8E+01U-23815117-96-11/13.2E+003.6E-093.6E-02Am-24115117-96-11/13.2E+003.5E-093.6E-02Am-24114596-10-21/11.13.2E+003.5E-09Pu-23813981-15-21/11.15E-015.4E-096.1E-02Pu-23915117-48-31/15.8E-027.6E-096.1E-03Pu-23915117-48-31/18.7E-028.4E-109.1E-03Pu-23915117-48-31/15.8E-027.6E-096.1E-03Pu-23915117-48-31/15.8E-028.4E-109.1E-03Pu-23915117-48-31/15.8E-028.4E-109.1E-03Pu-23915117-48-31/15.8E-028.4E-109.1E-03Pu-23915117-48-31/15.8E-028.4E-109.1E-03Pu-23915117-48-3							(Bq/kg dry)	(1/Bq)	(Bq/lifetime)	
Sed ingestion       Radionuclide       10193-40-0       204/208       1.1E+02       1.1E+02       1.1E+02         Sr-90       10093-97-2       60/60       2.0E+02       8.9E-10       2.1E+01         Sr-90       10093-97-2       60/60       2.0E+02       8.9E-10       2.1E+01         Co-152       13467-70-9       7/7       1.1E+02       1.1E+01       2.1E+01         Co-152       14683-23-9       2/2       3.5E+02       5.7E-11       3.7E+01         U-234       13966-29-5       1/1       4.2E+00       3.8E-09       4.4E-01         U-235       15117-96-1       1/1       3.2E+00       3.8E-09       4.4E-01         U-238       7440-61-1       1/1       3.2E+00       3.5E-09       3.2E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.4E-01         Du-238       13981-15-2       1/1       1.5E-01       5.8E-00       3.6E-02         Pu-238       13981-15-2       1/1       1.5E-01       5.8E-02       3.6E-01         Pu-239       10-238       13981-15-2       1/1       1.5E-01       5.8E-02       6.6E-02         Pu-239       10-238       13981-15-2       1/1       5.8E-02 </td <td>¢</td> <td>Cod incontion</td> <td></td> <td>Ce-137</td> <td>10045-97-3</td> <td>223/223</td> <td>1.0E+04</td> <td>7.6E-10</td> <td>1.0E+03</td> <td>8E-07</td>	¢	Cod incontion		Ce-137	10045-97-3	223/223	1.0E+04	7.6E-10	1.0E+03	8E-07
Sr-90       10098-97-2       60/60       2.0E+02       8.9E-10       2.1E+01         Cs-134       13967-70-9       7/7       1.1E+02       1.1E+01       1.1E+01         Cs-134       13965-70-9       7/7       1.1E+02       1.1E+01       1.1E+01         U-234       13965-29-5       1/1       4.2E+00       3.8E-09       4.4E-01         U-235       15117-96-1       1/1       1/1       3.2E+01       3.5E-09       3.4E-01         U-238       7440-61-1       1/1       3.2E+00       3.5E-09       3.4E-01       3.6E+00       3.6E-09       3.4E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.4E-01       3.6E+00       3.5E-09       3.4E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.4E-01         U-238       7440-61-2       1/1       3.0E+00       3.5E-09       3.4E-01         Pu-238       13981-15-2       1/1       1.1E-01       5.4E-09       6.6E-02         Pu-238       13981-15-2       1/1       1.5E-01       5.4E-09       6.6E-02         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-10       9.1E-03         Pu-239<	<b>5</b>	innshii nac		09-00 09-00	10198-40-0	204/208	1.1E+03	4.1E-10	1.1E+02	5E-08
Sed ingestion       Total       11111       11111       111				00-12	10098-97-2	60/60	2.0E+02	8.9E-10	2.1E+01	2E-08
Sed ingestion       Total       1/1       5.7E+11       3.7E+01         Sed ingestion       Eu-152       14683-23-9       2/2       3.5E+02       5.7E-11       3.7E+01         U-234       13966-29-5       1/1       4.2E+00       3.8E-09       4.4E-01         U-235       15117-96-1       1/1       9/9       1.8E+02       8.1E-11       1.8E+01         U-235       15117-96-1       1/1       3.2E+00       3.5E-09       3.4E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.4E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.4E-01         U-238       7440-61-2       1/1       1.1       3.0E+00       3.2E-01         Dm-241       14596-10-2       1/1       1.5E-01       5.4E-09       1.6E-02         Pu-238       13981-15-2       1/1       1.5E-01       5.4E-09       6.6E-03         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-109       6.6E-03         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-109       6.1E-03					13967-70-9	717	1.1E+02	1.1E-09	1.1E+01	1E-08
Sed ingestion       Radionuclide       1/1       4.2E+00       3.8E-09       4.4E-01         U-234       13966-29-5       1/1       4.2E+00       3.8E-09       4.4E-01         U-235       15117-96-1       1/1       9/9       1.8E+02       3.4E-01         U-235       15117-96-1       1/1       3.2E+00       3.5E-09       3.4E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.4E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.2E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.2E-01         Dm-244       13981-15-2       1/1       1.5E-01       5.4E-09       1.6E-02         Pu-238       13981-15-2       1/1       1.5E-01       5.4E-09       6.6E-03         Pu-239       13981-16-3       1/1       5.8E-02       7.6E-09       6.1E-03         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-109       9.1E-03				C3-101	14683-23-9	212	3.5E+02	5.7E-11	3.7E+01	2E-09
Sed ingestion       B:15:1       1:8:401       1:8:401         0-235       1:517-96-1       1/1       3:2:400       3:4:401         10-235       1:517-96-1       1/1       3:2:400       3:4:401         10-238       7440-61-1       1/1       3:0:400       3:5:09       3:4:401         10-238       7440-61-1       1/1       3:0:400       3:5:09       3:4:601         10-238       7440-61-1       1/1       1:5:01       5:4:09       1:6:02         0:244       13981-15-2       1/1       1:5:01       5:4:09       1:6:02         0:223       1/1       1:5:01       5:4:09       6:6:03       6:6:03         0:238       13981-15-2       1/1       1:5:01       5:4:09       6:6:02         11       1:5:01       5:4:09       6:6:03       6:6:03       6:6:03         11       5:8:0-10-2       1/1       1:5:01       5:4:09       6:6:03       6:6:03         11       1:5:17-48-3       1/1       8:7:0-02       8:4:100       9:1:0-03         11       1:1       5:8:02       8:4:100       9:1:0-03       1:0         11       1:1       1:1       8:7:02       8:4:03       0:1:0-03					13966-29-5	1/1	4.2E+00	3.8E-09	4.4E-01	2E-09
Sed ingestion       Radionuclide       1/1       3.2E+00       3.5E-09       3.4E-01         U-235       15117-96-1       1/1       3.0E+00       3.5E-09       3.2E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.2E-01         U-238       7440-61-1       1/1       3.0E+00       3.5E-09       3.2E-01         Dm-241       14596-10-2       1/1       1.5E-01       5.4E-09       6.6E-02         Pu-238       13981-16-3       1/1       6.3E-02       8.4E-09       6.6E-03         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-10       9.1E-03					15585-10-1	6/6	1.8E+02	8.1E-11	1.8E+01	2E-09
Cm-233       7440-61-1       1/1       3.0E+00       3.5E-09       3.2E-01         U-238       7440-61-1       1/1       1.5E-01       5.4E-09       1.6E-02         Cm-244       13981-15-2       1/1       1.5E-01       5.4E-09       1.6E-02         Am-241       14596-10-2       1/1       6.3E-02       8.4E-09       6.6E-03         Pu-238       13981-16-3       1/1       5.8E-02       7.6E-09       6.1E-03         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-10       9.1E-03         Sed ingestion       Radionuclide       Total       1/1       8.7E-02       8.4E-10       9.1E-03					15117-96-1	1/1	3.2E+00	3.5E-09	3.4E-01	1E-09
O-230       0-244       13981-15-2       1/1       1.5E-01       5.4E-09       1.6E-02         Cm-244       13981-15-2       1/1       6.3E-02       8.4E-09       6.6E-03         Am-238       13981-16-3       1/1       5.8E-02       7.6E-09       6.1E-03         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-10       9.1E-03         Sed ingestion       Radionuclide       Total       1/1       8.7E-02       8.4E-10       9.1E-03					7440-61-1	1/1	3.0E+00	3.5E-09	3.2E-01	1E-09
Cirr-244       14596-10-2       1/1       6.3E-02       8.4E-09       6.6E-03         Am-241       14596-10-2       1/1       5.8E-02       7.6E-09       6.1E-03         Pu-238       13981-16-3       1/1       5.8E-02       7.6E-09       6.1E-03         Pu-239       15117-48-3       1/1       8.7E-02       8.4E-10       9.1E-03         Sed ingestion       Radionuclide       Total       5.11       1/1       8.7E-02       8.4E-10       9.1E-03				0-230	13081-15-2	4/4	1.5E-01	5.4E-09	1.6E-02	9E-11
Allr-41         43281-16-3         1/1         5.8E-02         7.6E-09         6.1E-03           Pu-238         13981-16-3         1/1         8.7E-02         8.4E-10         9.1E-03           Sed ingestion         Radionuclide         Total         1/1         8.7E-02         8.4E-10         9.1E-03				CIII-244	1 4 506-10-2	1/1	6.3E-02	8.4E-09	6.6E-03	6E-11
Pu-239 15117-48-3 1/1 8.7E-02 8.4E-10 9.1E-03 Sed ingestion Radionucide Total				AIII-241 D:: 236	1 3081-16-3	1/1	5.8E-02	7.6E-09	6.1E-03	5E-11
Sed ingestion Radionucide Total				Di. 220	15117-48-3	1/1	8.7E-02	8.4E-10	9.1E-03	8E-12
Sed ingestion Hadionucioe						•				9E-07
	ო	Sed ingestion								2E-06

(continued)
Table A1

Reach         Madia         Contantinant         Contantinant         Contantinant           0.         type	sugen s	factor	Leny Intake	screening
Type         name         construction         construthter <thconstruction< th=""> <thc< th=""><th>(Ba/ka drv)</th><th>(1/Ba)</th><th>(Bq/lifetime)</th><th>Indices</th></thc<></thconstruction<>	(Ba/ka drv)	(1/Ba)	(Bq/lifetime)	Indices
Hadronuckie     Cos-10     10002-0     204/208       Eu-152     Eu-154     15555-10-1     9/9       Eu-154     15555-10-1     9/9       Eu-154     12555-10-1     9/9       Eu-154     12555-10-1     9/9       Eu-154     12555-10-1     9/9       Eu-154     12555-10-1     9/9       Cos-134     13965-29-5     1/1       U-238     13965-29-5     1/1       U-238     13961-15-2     1/1       Pu-238     13981-15-2     1/1       Pu-238     13914-16-3     1/1       Pu-238     15117-48-3     1/1       Pu-238     15117-48-3     1/1       Pu-239     15117-48-3     1/1       Inrorganic     Arsenic     7440-61-4       All     Total     75-09-2     1/1       All     1336-36-3     12/28       Tetrachoroethylene     75-09-2     16/28       Crashic     Total     75-09-2     16/28       Crashic     Total     75-09-2     16/29       Cra-60     <	1.0E+04	9.2E-10	6.8E+05	6E-04
Eurisz       Eurisz       1460-1       1/1         U-235       Eurisz       15565-10-9       7/7         U-235       Eurisz       15565-10-9       7/7         U-235       Eurisz       15565-10-1       9/9         Cs-134       13967-70-9       7/7         U-235       Eurisz       15585-10-1       9/9         Cs-134       13966-10-2       1/1         U-238       7440-51-1       1/1         U-238       13961-15-2       1/1         Du-238       14596-10-2       1/1         Pu-239       15117-48-3       1/1         Pu-239       1336-36-3       12/28         Organic       Pu-234       1336-36-3       12/29         Organic       Pretachloroethylene       7440-38-2       1/144         Pu-234       1336-36-3       12/28       1/144         Trichloroethylene       740-38-2       2/38       1/144         Pu-234       1336-36-3       12/29       1/144	1.1E+03	3.5E-09	7.4E+04	3E-04
Eurist     1558-10.1     9/9       Eurist     1558-10.1     9/9       Cs-134     13967-70-9     7/7       U-235     15117-96-1     1/1       U-238     7440-61-1     1/1       U-238     7440-61-1     1/1       All     7,140-61-1     1/1       All     0.238     15117-48-3     1/1       All     101al     145961-0.2     1/1       All     101al     13981-15-2     1/1       All     101al     144.596     1/1       All     101al     13981-15-2     1/1       All     101al     101al     12336-35     1/1       All     101al     101al     1336-36-3     2/30       All     101al     1336-36-3     2/30       Organic     Arsenic     7440-38-2     2/38       Organic     Pclis total     127-18-4     1/24       Arechtylene chloride     75-09-2     16/28       Cradionolorm     67-66-3     12/29       Organic     Total     734-0-61     1/1       U-234     11336-37-3     12/29       Cradionolorm     67-66-3     12/29       U-234     10098-97-2     51/51       U-234     10098-97-2     <	3.5E+02	1.7E-09	2.4E+04	4E-05
Ca-134       13967-70-9       7/7         U-238       13966-29-5       1/1         U-238       13966-29-5       1/1         U-238       7440-61-1       1/1         U-238       7440-61-2       1/1         U-238       7440-61-2       1/1         Pu-239       15117-48-3       1/1         All       Total       1/1         All       Total       1/1         All       Tetrachloroethylene       1/2/18-4         Trichhoroethylene       7/2/18-4       1/144         Trichhoroethylene       7/2/18-4       1/144         Crganic       Pc65 total       1/2/28         Crganic       Total       1/2/18-4       1/2/28         Crganic       Pu-238       1/0028-17-8       4/49         Crganic       Pu-238       1/0028-17-8	1.8E+02	1.8E-09	1.2E+04	2E-05
$U_{-238}$ $V_{-440}^{-1}$ $V_{11}^{-1}$ $U_{-238}$ $T_{440}^{-61}$ $V_{11}^{-1}$ $U_{-238}$ $T_{440}^{-61}$ $V_{11}^{-1}$ $U_{-238}$ $T_{440}^{-61}$ $V_{11}^{-1}$ $U_{-238}$ $T_{3981}^{-15.2}$ $V_{11}^{-1}$ $P_{-238}^{-238}$ $T_{3981}^{-16.3}$ $V_{11}^{-1}$ $P_{-238}^{-238}$ $T_{3981}^{-16.3}$ $V_{11}^{-1}$ $P_{-238}^{-238}$ $T_{3981}^{-16.3}$ $V_{11}^{-1}$ $P_{-238}^{-16.3}$ $T_{11}^{-1}$ $V_{11}^{-1}$ $P_{-16}^{-1}$ $V_{11}^{-1}$ $V_{11}^{-1}$ $All$ $Total$ $T_{10}^{-38.2}$ $Z_{13}^{-38}$ $Organic       PC68 total       1336.36.3 Z_{12}^{-1} V_{11}^{-1} V_{12}^{-16.1} V_{11}^{-1} V_{12}^{-1} Organic       PC68 total       1236.36.32 Z_{13}^{-1} V_{12}^{-1} Organic       PC68 total       1236.36.32 Z_{13}^{-1} V_{12}^{-1} Organic       PC68 total       1236.36.36.32 126.92 11/4 Organic       PC68 total       12028.17.68 $	1.1E+02	2.4E-09	7.5E+03	2E-05
U-234       13966-29-5       1/1         U-234       13966-10-2       1/1         U-234       13966-10-2       1/1         LU-239       13961-15-2       1/1         Radionuclide       Total       1440-61-1       1/1         All       Total       13961-15-2       1/1         All       Total       13961-16-3       1/1         All       Total       13961-16-3       1/1         All       Total       101al       13966-36-3       1/1         All       Total       101al       1316-36-3       1/1         All       Total       101al       144       1/1         All       Total       1336-36-3       1/1         All       Total       127-18-4       1/28         Organic       PC65 total       1236-36-3       1/144         All       1336-36-3       1/144       1/144         Organic       PC65 total       1236-36-3       1/144         Ciganic       Total       1236-36-3       1/144         Organic       Total       1236-36-3       1/144         Organic       Total       1236-36-5       1/11         U-238	3.2E+00	2.6E-10	2.2E+02	6E-08
U-238       740-61-1       1/1         An-241       13981-15-2       1/1         An-239       15117-48-3       1/1         Pu-238       7440-61-1       1/1         Pu-239       15117-48-3       1/1         Radionuclide       Total       13981-16-2       1/1         All       Total       13981-16-3       1/1         All       Total       13981-16-3       1/1         All       Total       13081-16-3       1/1         All       Total       13081-16-3       1/1         All       Total       13081-16-3       1/1         All       Total       13081-16-2       1/1         All       Total       12/14       1/2         Criganic       PC85 lotal       1336-36-3       2/30         Organic       PC65 lotal       1336-36-3       1/144         Trichloroethylene       127-18-4       1/228         Organic       Preachloroethylene       72-01-6       1/44         Organic       Total       127-18-4       1/228         Organic       Total       12/2-18-4       1/228         Organic       Total       12/2-18-4       1/2/29	4.2E+00	1.5E-12	2.9E+02	4E-10
Total     H-230     15117-48-3     1/1       Rm-241     13381-15-2     1/1       Pu-239     15117-48-3     1/1       Pu-239     15117-48-3     1/1       Pu-239     15117-48-3     1/1       Pu-239     15117-48-3     1/1       Pu-239     Total     13381-16-3     1/1       All     Total     13381-16-3     1/1       All     Total     13381-16-3     1/1       All     Total     10181     1336-36-3     2/30       Organic     PC85 total     1336-36-3     2/30       Creanic     PC85 total     1336-36-3     2/30       Organic     PC85 total     1336-36-3     1/2/28       Creanic     PC85 total     1336-36-3     1/2/29       Organic     PC85 total     127-18-4     1/2/28       Creanic     Tetrachloroethylene     75-09-2     16/28       Organic     Total     127-18-4     1/14       Organic     Total     127-18-4     1/14       U-238     Total     127-18-4     1/14       U-238     Total     120-2     1/17       U-238     Total     10028-17-8     49/49       Sr-90     Total     100058-97-2     1/17 </td <td>3 0E+00</td> <td>1.2E-12</td> <td>2.1E+02</td> <td>3E-10</td>	3 0E+00	1.2E-12	2.1E+02	3E-10
Amm-zat         Total         Total <thtotal< th=""> <thtota< td=""><td>6.3E-02</td><td>4.3E-11</td><td>4.3E+00</td><td>2E-10</td></thtota<></thtotal<>	6.3E-02	4.3E-11	4.3E+00	2E-10
Pur-238         13381-16-3         1/1           Pu-238         13381-16-3         1/1           Pu-238         15117-48-3         1/1           Pu-238         15117-48-3         1/1           All         Total         Arsenic         740-38-2         2/38           Inorganic         Arsenic         740-38-2         2/38         1/1           All         Total         1336-36-3         2/30         1/1           All         Total         1336-36-3         2/30         1/14           Trichloroethylene         75-09-2         16/28         1/28         1/14           Criganic         Total         1336-36-3         1/2/28         1/14           Criganic         PC65 total         1336-36-3         1/2/28         1/2/28           Criganic         PC65 total         1336-36-3         1/2/28         1/2/28           Criganic         Totoform         67-66-3         12/29         1/2/29           Criganic         Total         730-01-6         1/14           U-236         H-3         10028-17-8         49/49           Criganic         Lotal         10028-17-8         49/49           Badionucidide         H-3 </td <td>1.5E-01</td> <td>1.6E-12</td> <td>1.0E+01</td> <td>2E-11</td>	1.5E-01	1.6E-12	1.0E+01	2E-11
Pu-238         15901-10-3         1/1           All         Total         13901-10-3         1/1           All         Total         13901-10-3         1/1           All         Total         1336-13         1/1           Inorganic         Arsenic         7440-38-2         2/38           Inorganic         PCBs total         1336-36-3         2/30           Organic         PCBs total         127-18-4         1/28           Trichloroethylene         79-01-6         1/44           Methylene chloride         75-09-2         16/28           Criganic         Total         73-01-6         1/44           Methylene chloride         75-09-2         16/28           Chloroform         67-66-3         12/29           Criganic         Total         740-61-1         1/1           U-238         10045-97-3         131/135         1/1           U-238	5 8E-02	1 6E-12	4.0E+00	6E-12
Fadionucide         Pu-239         1511/-48-3         1/1           All         Total         1013         1014         1014           All         Total         1014         1014         1014           All         Total         1014         2/38         1/1           Inorganic         Arsenic         740-38-2         2/38         1/1           Organic         PC85 total         1336-35-3         2/30         1/28           Trichloroethylene         79-01-6         1/44         1/28         1/144           Methylene chloride         75-09-2         16/28         1/26-3         12/29           Criganic         Total         73-66-3         12/29         12/29           Radionucide         H-3         10028-17-8         49/49           Sr-90         10045-97-2         1/11         1/15           U-238         10045-97-3         131/135         1/11           U-238         10045-97-3         1/11         1/11           U-238         10045-97-3         1/11         1/11           U-238         10045-97-3         1/11         1/11           U-238         10045-97-3         1/11         1/11	0.0L-02 0 7E 00	7 0E-13	6 0E+00	4E-12
Radionuclide         Total           All         Total           All         Total           Inorganic         Arsenic         7440-38-2         2/38           Inorganic         Arsenic         7440-38-2         2/38           Inorganic         PC8s total         1336-36-3         2/30           Organic         PC8s total         1336-36-3         2/30           Trichlorcethylene         79-01-6         1/44         1/228           Methylene chloride         75-09-2         16/28         1/2/28           Criganic         Total         57-66-3         12/29         1/1           Organic         Total         10028-17-8         49/49         1/1           Radionuclide         H-3         10028-17-8         49/49         1/1           U-234         10038-97-2         51/51         1/1         1/1           U-235         10045-97-3         131/135         1/1         1/1           M-241         10045-97-3         131/135         1/1         1/1           U-238         100198-40-0         1038-40-0         1/1         1/1           U-238         10045-97-3         131/135         1/1         1/1 <tr< td=""><td>0.1 E-02</td><td>0 10. 5</td><td></td><td>1E-03</td></tr<>	0.1 E-02	0 10. 5		1E-03
All         Total         Total           Inorganic         Arsenic         7440-38-2         2/38           Inorganic         Arsenic         7440-38-2         2/38           Organic         PC8s total         1336-36-3         2/30           Trichloroethylene         79-01-6         1/44           Trichloroethylene         79-01-6         1/44           Organic         PC8s total         127-18-4         1/28           Chloroform         67-66-3         12/29         1/2/29           Criganic         Total         57-66-3         12/29           Organic         Total         10028-17-8         49/49           Sr-90         10008-97-2         51/51         1/1           U-234         10028-17-96-1         1/1         1/1           U-234         10045-97-3         131/135         1/1 <td></td> <td></td> <td></td> <td>1E-03</td>				1E-03
Inorganic         Arsenic         740-38-2         2/38           Inorganic         Arsenic         740-38-2         2/30           Organic         PC8s total         1336-36-3         2/30           Trichloroethylene         79-01-6         1/44           Trichloroethylene         79-01-6         1/44           Organic         PC8s total         127-18-4         1/28           Trichloroethylene         79-01-6         1/44           Organic         Total         75-09-2         16/28           Criganic         Total         172-18-4         1/229           Organic         Total         172-18-4         1/2/29           Addionucide         H-3         10028-17-8         49/49           Sr-90         10028-17-8         49/49         1/1           U-234         10028-17-8         49/49         1/1           U-234         10028-17-8         49/49         1/1           U-234         10028-17-9         1/1         1/1           U-235         10028-17-9         1/1         1/1           U-234         10028-17-9         1/1         1/1           U-235         100028-17-8         49/49         1/1				22.
Inorganic         Arsenic         7440-38-2         2/38           Inorganic         PCBs total         1336-36-3         2/30           Organic         PCBs total         1336-36-3         2/30           Trichloroethylene         79-01-6         1/44           Trichloroethylene         79-01-6         1/44           Trichloroethylene         79-01-6         1/44           Criganic         Total         127-18-4         1/228           Cupanic         Total         127-09-2         16/28           Radionuclide         H-3         10028-17-8         49/49           Sr-90         10038-97-2         51/51         1/1           U-233         10028-17-8         49/49         1/1           U-234         10028-17-8         49/49         1/1           U-235         10045-97-3         11/1         1/1           U-238         100098-97-2         1/1         1/1	(mg/L)	1/(mg/kg/d)	(mg/kg/d)	
Organic         PCBs total         1336-36-3         2/30           Tetrachloroethylene         127-18-4         1/28           Trichloroethylene         79-01-6         1/44           Trichloroethylene         79-01-6         1/44           Trichloroethylene         79-01-6         1/144           Criganic         Total         75-09-2         16/28           Methylene chloride         75-09-2         16/28           Chloroform         67-66-3         12/29           Crganic         Total         10028-17-8         49/49           Sr-90         10008-97-2         51/51         1/1           U-234         10028-17-8         49/49         1/1           U-234         10028-17-8         49/49         1/1           U-234         10028-17-8         49/49         1/1           U-234         10045-97-3         11/135         1/1           U-234         10045-97-3         11/135         1/1           U-234         10045-97-3         11/135         1/1           U-238         10045-97-3         11/1         1/1           U-238         10045-97-3         11/1         1/1           U-238         10045-97-3 </td <td>3.1E-02</td> <td>1.8E+00</td> <td>8.8E-05</td> <td>2E-04</td>	3.1E-02	1.8E+00	8.8E-05	2E-04
Organic         Trichloroethylene         127-18-4         1/28           Trichloroethylene         75-09-2         16/28           Trichloroethylene         75-09-2         16/28           Chloroform         67-66-3         12/29           Crganic         Total         12/509-2         16/28           Radionucide         H-3         10028-17-8         49/49           Sr-90         10028-17-8         49/49         51/51           Crganic         Total         10028-17-8         49/49           Sr-90         10028-17-8         49/49         51/51           U-235         1-234         10028-97-2         51/51           U-238         1-234         130/45-97-3         131/135           U-238         10045-97-3         131/135         1/1           U-238         10045-97-3         131/135         1/1           U-238         10045-97-3         131/135         1/1           U-238         10045-97-3         11/1         1/1           U-238         10045-97-3         11/1         1/1           U-238         15177-96-1         1/1         1/1           U-238         10198-40-0         103/135         1/1     <	1.0E-03	7.7E+00	2.9E-06	2E-05
Trichloroethylene       75-09-2       1/44         Trichloroethylene       75-09-2       16/28         Chloroform       67-66-3       12/29         Crganic       Total       12/29         Adionuclide       H-3       10028-17-8       49/49         Sr-90       10028-17-8       49/49         Sr-90       10028-97-2       51/51         U-235       1-0098-97-2       51/51         U-236       10045-97-3       131/135         U-238       10045-97-3       11/11         U-238       10198-40-0       103/135         Am-241       14596-10-2       14/19         Pu-238       13981-15-2       8/10         Pu-239       15117-48-3       11/20         Pu-239       15117-48-3       11/20	5.1E-03	5.1E-02	1.5E-05	8E-07
Intrantocentyrere         75-09-2         16/28           Criganic         Total         67-66-3         12/29           Crganic         Total         67-66-3         12/29           Crganic         Total         67-66-3         12/29           Radionuclide         H-3         10028-17-8         49/49           Sr-90         10028-97-2         51/51           Cas-137         10028-97-2         51/51           U-235         10045-97-3         131/135           U-238         10045-97-3         131/135           U-238         10045-97-3         131/135           U-238         10045-97-3         11/1           U-238         10045-97-3         131/135           U-238         10045-97-3         11/11           U-238         15177-96-1         1/1           U-238         16199-40-0         103/135           Am-241         14596-10-2         14/19           Cm-244         13981-15-2         8/10           Pu-239         15117-48-3         11/20           Pu-239         15117-48-3         11/20	5.0E-03	1.1E-02	1.4E-05	2E-07
Crganic         Total         67-66-3         12/29           Crganic         Total         67-66-3         12/29           Crganic         Total         67-66-3         12/29           Radionucide         H-3         10028-17-8         49/49           Sr-90         10028-17-8         49/49           Sr-90         10028-97-2         51/51           U-235         110045-97-3         131/135           U-238         140-61-1         1/1           U-238         7440-61-1         1/1           U-238         14199         439/135           Am-241         14596-10-2         14/19           Cm-244         13981-15-2         8/10           Pu-238         13981-15-2         8/10           Pu-239         15117-48-3         11/20	3.1E-03	7.5E-03	8.8E-06	7E-08
Crganic         Total         Curation           Crganic         Total         10028-17-8         49/49           Radionuclide         H-3         10028-17-8         49/49           Sr-90         10098-97-2         51/51           Cs-137         10045-97-3         131/135           U-235         10045-97-3         131/135           U-235         10045-97-3         11/1           U-235         15177-96-1         1/1           U-238         7440-61-1         1/1           U-238         10198-40-0         103/135           Am-241         14596-10-2         14/19           Cm-244         13981-15-2         8/10           Pu-238         13981-15-2         8/10           Pu-239         15117-48-3         11/20	3.1E-03	6.1E-03	9.0E-06	6E-08
Organic       H-3       10028-17-8       49/49         Radionuclide       H-3       10028-17-8       49/49         Sr-90       10098-97-2       51/51       51/51         Cs-137       10045-97-3       131/135       1/1         U-234       13966-29-5       1/1       1/1         U-235       15117-96-1       1/1       1/1         U-238       7440-61-1       1/1       1/1         U-238       14098-40-0       103/135       14/19         Am-241       14596-10-2       14/19       1/1         Pu-238       13981-15-2       8/10       103/135         Pu-239       15117-48-3       11/20       1/1/20				2E-05
H-3         10028-17-8         49/49           Sr-90         10098-97-2         51/51           Sr-90         10098-97-2         51/51           Cs-137         10045-97-3         131/135           U-234         13966-29-5         1/1           U-235         1517-96-1         1/1           U-238         7440-61-1         1/1           U-238         7440-61-1         1/1           U-238         14596-10-2         14/19           Cm-241         13981-15-2         8/10           Pu-238         13981-15-2         8/10           Pu-239         15117-48-3         5/20           Pu-239         15117-48-3         11/20				
RadionuclideH-310028-17-849/49Sr-90Sr-9010098-97-251/51Cs-13710045-97-3131/135U-23413966-29-51/1U-23515117-96-11/1U-2387440-61-11/1U-23810198-40-0103/135Am-24114596-10-214/19Cm-24413981-15-28/10Pu-23813981-15-28/10Pu-23915117-48-311/20	(Bq/L)	(1/Bq)	(Bq/lifetime)	
nation to the strength     Sr-90     10098-97-2     51/51       Cs-137     10045-97-3     131/135       U-234     13966-29-5     1/1       U-235     15117-96-1     1/1       U-238     7440-61-1     1/1       U-238     7440-61-1     1/1       Co-60     10198-40-0     103/135       Am-241     14596-10-2     14/19       Cm-244     13981-15-2     8/10       Pu-238     13981-15-2     8/10       Pu-239     15117-48-3     11/20	8.5E+03	1.5E-12	1.8E+07	3E-05
10045-97-3 13966-29-5 15117-96-1 7440-61-1 10198-40-0 14596-10-2 13981-15-2 13981-16-3 15117-48-3	6.7E+00	8.9E-10	1.4E+04	1E-05
13966-29-5 15117-96-1 7440-61-1 10198-40-0 14596-10-2 13981-15-2 13981-16-3 15117-48-3	1.7E+0C	7.6E-10	3.5E+03	3E-06
15117-96-1 15117-96-1 10198-40-0 14596-10-2 13981-15-2 13981-16-3 15117-48-3		<b>3.8E-09</b>	4.0E+02	2E-06
7440-61-1 10198-40-0 14596-10-2 13981-15-2 13981-16-3 15117-48-3	6.4E-02	3.5E-09	1.3E+02	5E-07
10198-40-0 14596-10-2 13981-15-2 13981-16-3 15117-48-3	3.4E-02	3.5E-09	7.1E+01	3E-07
14596-10-2 13981-15-2 13981-16-3 15117-48-3		4.1E-10	3.5E+02	2E-07
13981-15-2 13981-16-3 15117-48-3		8.4E-09	1.7E+01	1E-07
13981-16-3 15117-48-3	1.0E-02	5.4E-09	2.2E+01	1E-07
15117-48-3	8.3E-04	7.6E-09	1.7E+00	1E-08
	1.2E-03	8.4E-10	2.5E+00	2E-09
111-1 Dedicented				56-05
3 Water Fracionucide 104				2E-04

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					Ratio of				
					defected	Geometric	Oral	Daily	Noncarcinogen
Reach	Media	Contaminant	Contaminant		to total	mean	0£	intake	screening
no.		êype	name	CAS no.	samples	(mg/kg_wet)	(mg/kg/d)	(mg/kg/d)	indices
-	LS.	Inorganic	Mercury	7439-97-6	87/87	3.6E-01	3.0E-04	<b>3.3E-05</b>	1E-01
		•	Selenium	7782-49-2	35/35	3.7E-01	3.0E-03	3.5E-05	1E-02
			Cadmium	7440-43-9	35/43	1.3E-02	5.0E-04	1.2E-06	2E-03
			Copper	7440-50-8	22/35	3.0E-01	3.7E-02	2.8E-05	8E-04
			Zinc	7440-66-6	35/35	1.5E+00	2.0E-01	1.4E-04	7E-04
	Fish	Inorganic	Total					4	1E-01
-	Fish	AII	Total			-			1E-01
						(mg/kg dry)	(mg/kg/d)	(mg/kg/d)	
-	Sediment	Inorganic	Antimony	7440-36-0	11/27	5.8E+00	4.0E-04	8.2E-07	2E-03
			Arsenic	7440-38-2	13/31	3.8E+00	1.0E-03	5.4E-07	5E-04
			Selenium	7782-49-2	2/31	5.8E+00	3.0E-03	8.2E-07	3E-04
			Chromium	7440-47-3	23/31	8.3E+00	5.0E-03	1.2E-06	2E-04
			Mercury	7439-97-6	19/19	3.2E-01	3.0E-04	4.6E-08	2E-04
			Barium	7440-39-3	31/31	7.3E+01	7.0E-02	1.0E-05	2E-04
			Nickel	7440-02-0	27/31	1.7E+01	2.0E-02	2.4E-06	1E-04
			Silver	7440-22-4	13/31	2.5E+00	3.0E-03	<b>3.5E-07</b>	1E-04
			Vanadium	7440-62-2	20/22	4.9E+00	7.0E-03	7.0E-07	1E-04
			Molybdenum	7439-98-7	5/27	2.6E+00	4.0E-03	3.7E-07	9E-05
			Cadmium	7440-43-9	16/31	2.2E-01	5.0E-04	3.2E-08	6E-05
			Zinc	7440-66-5	31/31	5.2E+01	2.0E-01	7.4E-06	4E-05
			Copper	7440-50-8	27/31	6.2E+00	3.7E-02	8.9E-07	2E-05
			Beryllium	7440-41-7	19/27	2.4E-01	5.0E-03	3.4E-08	7E-06
			Boron	7440-42-8	6/30	4.2E+00	9.0E-02	6.0E-07	7E-06
			Tin	7440-31-5	9/20	4.7E+00	6.0E-01	6.7E-07	1E-06
-	Sediment	Inorganic	Total						4E-03
	Sediment		Total						4E-03

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Table

Media         Contaminant         Contaminant         Contaminant         Daily           1ype         1ype         Inplex         Inplex         Inplex         Inplex         Daily           1ype         1ype         Inplex         Inplex         Inplex         Inplex         Daily           1ype         1ype         Table         Inplex         Inplex         Inplex         Pro         Daily           1ype         1ype         Table         Contaminant         ZAS no.         amplex         (mg/L)         (mg/L)         Inplex         Daily           Water         Thorganic         Thallium         7440-39-3         3/3         3.35-02         7.6E-03         2.2E-05         9.4E-05           Nuckei         7440-50-8         11/32         8.0E-03         2.0E-03         2.7E-02         9.4E-05           Nater         Organic         Table         7440-50-8         9.1/32         8.0E-04         1.7E-07           Water         Organic         Total         129-9         9.1/32         2.6E-03         2.6E-05           Water         Organic         Table         9.1/32         2.6E-03         2.6E-05         1.7E-05           Water         Organic						Ratio of			:	•
Contaminant         Contaminant         Io total         mean         nu         nume           type         name         CAS no.         samples         (mg/L)         (mg/L)         (mg/L)         nume           type         name         CAS no.         samples         (mg/L)						detected	Geometric	E O	Daily	Noncercinogen
type         type <th< th=""><th>Ð</th><th>Media</th><th>Contaminant</th><th>Contaminant</th><th></th><th>to total</th><th>uesu</th><th></th><th></th><th>acreening</th></th<>	Ð	Media	Contaminant	Contaminant		to total	uesu			acreening
Water         fnorganic         Thallium         7440-28-0         1/1         8 6E-02         7 0E-05         2 25E-04           Water         fnorganic         Thallium         7440-47-3         2 5/32         7 0E-05         2 2E-05         3 / 3 / 3 / 3 / 3 / 3 / 3 / 3 / 3 / 3 /		1480	(v De		CAS no.	semples	(mg/L)	(mg/kg/d)	(mg/kg/d)	Indices
Organic         740-47-3         25/32         7 (E-03         5 (E-03)         2 2 (E-05)           Bariam         740-47-3         2 5/32         7 (E-03)         5 (E-03)         2 2 (E-05)         9 (E-05		Water	Increation	Thailinm	7440-28-0	1/1	8.6E-C2	7.0E-05	2.5E-04	45+00
Barium         740-39-3         3/3         3.3E-02         7.0E-02         9.4E-05           Nicket         7440-50-8         11/32         9.0E-03         2.0E-02         17E-05           Coppet         7440-66-6         11/32         9.0E-03         3.7E-02         2.6E-05           Mercury         7439-97-6         9/32         6.0E-05         3.0E-04         1.7E-02           Zinc         Total         7440-66-6         3.1/32         2.9E-02         2.6E-05         3.0E-04         1.7E-07           Zinc         Total         7440-66-6         3.1/32         2.9E-02         2.0E-01         8.4E-05           Organic         Total         1         1/29         5.1E-03         1.0E-02         1.7E-05           Organic         Tetrachloroethylene         127-18-4         1/29         5.1E-03         1.0E-02         1.6E-05           Organic         Tetrachloroethylene         127-18-4         1/29         5.1E-03         1.0E-02         1.2E-05           Organic         Tetrachloroethylene         127-18-4         1/29         5.1E-03         1.0E-02         1.2E-05           Dicthionobroundentane         67-64-1         14/58         1.0E-02         1.0E-02         1.2E-05     <		101011		Chromit	7440-47-3	25/32	7.6E-03	5.CE-03	2.2E-05	4E-03
Nickei         7440-02-0         4/32         6.0E-03         2.0E-02         1.7E-05           Nickei         7440-50-8         11/32         9.0E-03         3.7E-02         2.6E-02         1.7E-07           Mercury         7440-50-8         11/32         9.0E-03         3.7E-02         2.6E-05         3.0E-04         1.7E-07           Inorganic         Total         7440-66-6         3.1/32         2.9E-02         1.7E-02         2.6E-05         3.0E-04         1.7E-07           Coppanic         Total         7440-66-6         3.1/32         2.9E-02         2.6E-01         8.4E-05           Charolor         Total         172.9         5.1E-03         1.0E-02         1.2E-05           Organic         Tetrachloroetrylens         127-18-4         1/2.9         5.1E-03         1.0E-02         1.2E-05           Organic         Tetrachloroetrylens         75-27-4         3/2.9         4.3E-03         1.0E-02         1.2E-05           Methylene chloride         75-27-4         3/2.9         4.3E-03         1.0E-02         1.1E-05           Ethylbenzene         75-14         3/2.9         5.1E-03         1.0E-02         1.1E-05           Methylene chloride         75-15-0         3.7E-03				Baring	7440-39-3	3/3	3.3E-02	7.0E-02	9.4E-05	1E-03
Coper         7440-50-8         11/32         9.05-03         3.7E-02         2.6E-05         3.0E-04         1.7E-07           Mercury         Zanc         7440-56-8         3.1/32         5.0E-05         3.0E-04         1.7E-07         2.6E-05         3.0E-04         1.7E-07         3.0E-04         1.7E-07         3.0E-04         1.7E-07         3.0E-04         1.7E-07         3.0E-04         1.7E-05         3.0E-04         1.7E-05         3.0E-04         1.7E-05         3.0E-03         1.0E-02         1.0E-05         1.2F-05         3.2E-03         1.0E-02         1.2E-05         3.7E-03         3.0E-03         1.0E-01         2.9E-05         3.7E-03         5.0E-05         3.7E-05         3.7E-05<					7440-02-0	4/32	6.0E-03	2.0E-02	1.7E-05	9E-04
Mercury         7430-56-6         9/32         6.0E-05         3.0E-04         1.7E-07           Zanc         T440-66-6         31/32         2.9E-02         2.0E-u1         6.4E-05           Zanc         Total         7440-66-6         31/32         2.9E-02         2.6E-u1         6.4E-05           Organic         Total         Tetrachloroethyleme         127-18-4         1/29         5.1E-03         1.0E-02         1.5E-05           Organic         Tetrachloroethyleme         127-18-4         1/29         5.1E-03         1.0E-02         1.6E-05           Organic         Tetrachloroethyleme         127-18-4         1/29         5.1E-03         1.0E-02         1.6E-05           Dictriorohm         67-66-3         18/30         3.6E-03         1.0E-02         1.2E-05           Acetome         67-64-1         14/58         1.0E-02         1.2E-05         1.1E-05           Methyleme chloride         75-15-0         2/229         5.1E-03         1.0E-01         1.5E-05           Ethylbenzene         100-41-4         1/29         5.1E-03         1.0E-01         1.5E-05           Cubon disulfide         75-15-0         2/229         5.1E-03         1.0E-01         1.1E-05           Yy					7440-50-8	11/32	9.0E-03	3.7E-02	2.6E-05	7E-04
Inorganic         Tatic         740-66-6         31/32         2.9E-02         2.6E-u1         8.4E-05           Zinc         Total         10000         1000         1000         10					7439-97-6	9/32	6.0E-05	3.0E-04	1.7E-07	6E-04
Inorganic         Total           Inorganic         Total           Organic         Total           Organic         Tetrachloroethyleme           Tetrachloroethyleme         127-18-4           Chhoroform         67-66-3           Chhoroform         67-66-3           Chhoroform         67-66-3           Chhoroform         67-66-3           Chhoroform         67-66-3           Chhoroform         67-67-4           Acetone         67-64-1           Total         75-19-2           Carbon disulfide         75-19-2           Totuene         100-41-4           1/29         5.16-03           Totuene         100-41-4           1/29         5.16-03           Total         108-01           Total         108-33           Adoto         108-33           Total         11/29           S.16E-03         1.0E-01					7440.68.6	31/32	2 9E-02	2.05-01	6.4E-05	4E-04
Inorganic         Total           Organic         Tetrachloroethylene         127-18-4         1/29         5.1E-03         1.0E-02         1.5E-05           Organic         Tetrachloroethylene         127-18-4         1/29         5.1E-03         1.0E-02         1.5E-05           Organic         Chhorobronnethane         67-68-3         18/30         3.6E-03         1.0E-02         1.2E-05           Dichlorobronnethane         75-27-4         3/29         4.3E-03         2.0E-02         1.2E-05           Acetone         67-64-1         14/58         1.0E-02         1.2E-05         1.2E-05           Rehtylene chloride         75-09-2         15/29         3.7E-03         1.0E-01         2.9E-05           Ethylbenzene         100-41-4         1/29         5.1E-03         1.0E-01         1.5E-05           Carbon disutifie         75-15-0         2/29         5.1E-03         1.0E-01         1.5E-05           Toluene         100-41-4         1/29         5.1E-03         1.0E-01         1.5E-05           Toluene         108-88-3         4/28         4.3E-03         2.0E-01         1.2E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E+00         1.5E-05				200C		1				45+00
Organic         Tetrachloroethylene         127-18-4         1/29         5.1E-03         1.0E-02         1.5E-05           Chloroform         67-66-3         18/30         3.6E-03         1.0E-02         1.0E-02         1.0E-05           Dichloroform         67-66-3         18/30         3.6E-03         1.0E-02         1.0E-02         1.0E-05           Dichloroform         67-66-3         18/30         3.6E-03         1.0E-02         1.2E-05           Acentone         67-64-1         14/58         1.0E-02         1.2E-05         1.26-05           Methylens chloride         75-27-4         3/29         4.3E-03         1.0E-01         2.9E-05           Ethylbenzene         100-41-4         1/29         5.1E-03         1.0E-01         1.5E-05           Carbon disulfide         75-15-0         2/29         5.1E-03         1.0E-01         1.5E-05           Toluene         100-41-4         1/29         5.1E-03         1.0E-01         1.5E-05           Toluene         108-88-3         4/28         4.3E-03         2.0E-01         1.2E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E-01         1.2E-05           Capton         1729         5.1E-03		Water	inorganic	0181						
Organic       Total       1/2       18/30       3.6E-03       1.0E-02       1.0E-05         Chloroform       67-66-3       18/30       3.6E-03       1.0E-02       1.2E-05         Dichloromethane       75-27-4       3/29       4.3E-03       2.0E-02       1.2E-05         Acentore       67-64-1       14/58       1.0E-02       1.2E-05       1.2E-05         Methylene chloride       75-09-2       15/29       3.7E-03       6.0E-02       1.1E-05         Ethylbenzene       100-41-4       1.229       5.1E-03       1.0E-01       1.5E-05         Carbon disulfide       75-15-0       2/29       5.1E-03       1.0E-01       1.5E-05         Toluene       108-88-3       4/28       4.3E-03       2.0E-01       1.2E-05         Xylene       1330-20-7       1/29       5.1E-03       1.0E-01       1.2E-05         Xylene       1330-20-7       1/29       5.1E-03       2.0E-01       1.2E-05         Capanic       Total       1729       5.1E-03       2.0E-01       1.2E-05				Totrachlocrothylene	127-18-4	1/28	5.1E-03	1.0E-02	1.5E-05	2E-03
Dick/korobromonethane         75-27-4         3/29         4.3E-03         2.0E-02         1.2E-05           Aceatone         67-64-1         14/58         1.0E-02         1.2E-05         1.2E-05           Methylene chloride         75-09-2         15/29         3.7E-03         6.0E-02         1.1E-05           Ethylbenzene         100-41-4         1.229         5.1E-03         1.0E-01         1.5E-05           Carbon disulfide         75-15-0         2.229         5.1E-03         1.0E-01         1.5E-05           Toluene         100-41-4         1.229         5.1E-03         1.0E-01         1.5E-05           Toluene         108-88-3         4/28         4.3E-03         1.0E-01         1.5E-05           Xylene         1330-20-7         1/29         5.1E-03         1.0E-01         1.2E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E-01         1.2E-05           Xylene         1/29         5.1E-03         2.0E-01         1.2E-05           Xylene         1/29         5.1E-03         2.0E-01         1.2E-05		Maier		Chardren	67-68-3	18/30	3.6E-03	1.0E-02	1.0E-05	1E-03
Creations         67-64-1         14/58         1.0E-02         1.0E-01         2.9E-05           Methyleme chloride         75-09-2         15/29         3.7E-03         6.0E-02         1.1E-05           Methyleme chloride         75-09-2         15/29         3.7E-03         6.0E-02         1.1E-05           Ethylbenzene         100-41-4         1.229         5.1E-03         1.0E-01         1.5E-05           Carbon disulfide         75-15-0         2/29         5.1E-03         1.0E-01         1.5E-05           Toluene         108-88-3         4/28         4.3E-03         1.0E-01         1.5E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E-01         1.2E-05           Capanic         Total         1230-20-7         1/29         5.1E-03         2.0E+00         1.5E-05				Dicklosebromomothand	75-27-4	3/29	4.3E-03	2.0E-02	1.2E-05	6E-04
Methylene chloride         75-09-2         15/29         3.7E-03         6.0E-02         1.1E-05           Rethylena chloride         75-09-2         15/29         3.7E-03         6.0E-02         1.1E-05           Ethylbenzene         100-41-4         1.229         5.1E-03         1.0E-01         1.5E-05           Carbon disulfide         75-15-0         2/29         5.1E-03         1.0E-01         1.5E-05           Toluene         108-88-3         4/28         4.3E-03         2.0E-01         1.2E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E+00         1.5E-05           Crganic         Total         1202         5.1E-03         2.0E+00         1.5E-05					67-64-1	14/58	1.0E-02	1.0E-01	2.9E-05	3E-04
Totue         100-41-4         1.29         5.1E-03         1.0E-01         1.5E-05           Ethylbenzene         100-41-4         1.29         5.1E-03         1.0E-01         1.5E-05           Carbon disulfide         75-15-0         2/29         5.1E-03         1.0E-01         1.5E-05           Tohuene         108-88-3         4/28         4.3E-03         2.0E-01         1.2E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E+00         1.5E-05           Capanic         Total         1.29         5.1E-03         2.0E+00         1.5E-05				thetheline chickle	75-09-2	15/29	3.7E-03	6.0E-02	1.1E-05	2E-04
Lunycontent         75-15-0         2/29         5.1E-03         1.0E-01         1.5E-05           Carbon disulfde         75-15-0         2/29         5.1E-03         1.0E-01         1.5E-05           Tokuene         108-88-3         4/28         4.3E-03         2.0E-01         1.2E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E+00         1.5E-05           Crganic         Total         1         20-20-7         1/29         5.1E-03         2.0E+00         1.5E-05				Ethidherrand	100-41-4	1,29	5.1E-03	1.0E-01	1.5E-05	2E-04
Cationi usual         108-88-3         4/28         4.3E-03         2.0E-01         1.2E-05           Toluene         108-88-3         4/28         4.3E-03         2.0E+00         1.5E-05           Xylene         1330-20-7         1/29         5.1E-03         2.0E+00         1.5E-05           Crganic         Total         1         5.1E-03         2.0E+00         1.5E-05				Catoo faultdo	75-15-0	2129	5.1E-03	1.0E-01	1.5E-05	2E-34
Xylene         1330-20-7         1/29         5.1E-03         2.0E+00         1.5E-05           Crganic         Total         Total         1/29         5.1E-03         2.0E+00         1.5E-05				Toburo	108-88-3	4/28	4.3E-03	2.0E-01	1.2E-05	6E-05
Crganic Total					1330-20-7	1/29	5.1E-03	2.0E+00	1.5E-05	7E-06
Cygarac Cara										4E-03
		Water	2 Coantra							4E+00

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(continued)
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				detected	Geometric	Oral	Daily	Noncarcinogen
	Contaminant	Conteminant		to total	mean	CHR CHR	intake	screening
	type	emen	CAS no.	samples	(mg/kg wet)	(mg/kg/d)	(mp/kg/d)	Indices
ł I	Irrorganic	Mercury	7439-97-6	33/33	9.1E-02	3.0E-04	8.4E-06	3E-02
	•	Selenium	7782-49-2	11/11	2.7E-01	3.0E-03	2.5E-05	8E-03
		Cadmium	7440-43-9	11/19	3.9E-02	5.0E-04	3.6E-06	7E-03
		Zinc	7440-66-6	11/11	1.3E+00	2.0E-01	1.2E-04	6E-04
		Copper	7440-50-8	7/11	1.85-01	3.7E-02	1.7E-05	5E-04
	Inorganic	Total						5E-02
- 1	ĂII	Total	and and the second s					5E-02
					(mg/kg dry)	(mg/kg/d)	(mg/kg/d)	
Sediment	Inorganic	Antimony	7440-36-0	73/99	4.9E+00	4.0E-04	7.1E-07	2E-03
	5	Bariurn	7440-39-3	111/111	1.5E+02	7.0E-02	2.4E-05	3E-04
		Arsenic	7440-38-2	4/111	1.5E+00	1.0E-03	2.2E-07	2E-04
		Chromium	7440-47-3	95/111	6.1E+00	5.0E-03	8.8E-07	2E-04
		Selenium	7782-49-2	14/111	3.1E+00	3.0E-03	4.4E-07	2E-04
		Molybdenum	7439-98-7	65/33	2.1E+00	4.0E-03	3.1E-07	8E-05
		Nickel	7440-02-0	106/111	5.0E+00	2.0E-02	7.1E-07	4E-05
		Varadium	7440-62-2	89/91	1.7E+00	7.0E-03	2.5E-07	4E-05
		Silver	7440-22-4	13/111	7.1E-01	3.0E-03	1.0E-07	3E-05
		Zinc	7440-66-6	<b>58/98</b>	4.8E+01	2.0E-01	6.8E-0 <del>8</del>	3E-05
		Mercury	7439-97-6	25/25	5.2E-02	3.0E-04	7.4E-09	3E-05
		Cadmium	7440-43-9	6/111	7.6E-02	5.0E-04	1.1E-08	2E-05
		Copper	7440-50-8	101/111	2.6E+00	3.7E-02	3.7E-07	1E-05
		Boron	7440-42-8	78/111	2.7E+00	9.0E-02	3.8E-07	4E-06
		Beryllium	7440-41-7	81/99	1.0E-01	5.0E-03	1.45-08	3E-06
		Tn	7440-31-5	10/29	3.2E+00	6.6E-01	4.6E-07	8E-07
Sediment	Inorganic	Totai						3E-03
Sediment	Organic	Di-n-butyl phthalate	84-74-2	3/10	5.6E+00	1.0E-01	8.1E-07	8E-06
Sediment	All	Tořal						3E-03

(continued)	Ratio of
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					hatactah	Geometric	Oral	Dally	Noncarcinogen
Reach	Media	Contaminant	Contaminant		to total	nean	OHH	intake	screening
10.	1 V D O	(VDe	•weu	CAS no.	samples	(mg/L)	(mg/kg/d)	(mg/kg/d)	indices
~	Water	Increanic	Thallium	7440-28-0	1/1	9.4E-02	7.0E-05	2.7E-04	4E+00
J			Arsenic	7440-38-2	4/75	5.1E-02	1.0E-03	1.5E-04	2E-01
			Cadmium	7440-43-9	6/76	2.8E-03	5.0E-04	7.9E-06	2E-02
			Chromium	7440-47-3	54/75	7.6E-03	5.0E-03	2.2E-05	4E-03
			Barium	7440-39-3	3/3	7.3E-02	7.0E-02	2.1E-04	3E-03
			Conner	7440-50-8	53/75	3.1E-02	3.7E-02	9.0E-05	2E-03
			Vanadinim	7440-62-2	1/3	2.9E-03	7.0E-03	8.4E-06	1E-03
			Nick of	7440-02-0	8/75	7.6E-03	2.0E-02	2.2E-05	1E-03
			Zinc	7440-66-6	66/75	4.5E-02	2.0E-01	1.3E-04	7E-04
			Mercuiry	7439-97-6	5/32	5.3E-05	3.0E-04	1.5E-07	5E-04
2	Water	Inorganic	Total						4E+00
c			1.9. Nichloroetheese (total)	156-59-2	2/29	4.9E-03	1.0E-02	1.4E-05	1E-03
N	AVAILOT	Closinc	r, z-okultovouterio (total) Chloroform	67-66-3	6/30	3.5E-03	1.0E-02	1.0E-05	1E-03
			Aretone	67-64-1	11/58	8.9E-03	1.0E-01	2.5E-05	3E-04
			Methylene chloride	75-09-2	15/29	3.2E-03	6.0E-02	9.1E-06	2E-04
			Carbon disulfide	75-15-0	2/29	5.1E-03	1.0E-01	1.5E-05	2E-04
			1 1-Dichloroethane	75-34-3	2/29	4.7E-03	1.0E-01	1.4E-05	1E-04
			Tokene	108-88-3	1/28	5.0E-03	2.0E-01	1.4E-05	7E-05
			Xviene	1330-20-7	1/29	5.0E-03	2.0E+00	1.4E-05	7E-06
c	Water	Oreanin	Total						3E-03
10	Water	All	Total						4E+00
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					detected	Geometric	Oral	Daily	Noncarcinogen
Reach	Media	Contaminant	Contaminant		to total	mean	RfD	intake	screening
00-	tvpe	type	ame	CAS no.	semples	(mg/kg wet)	(mg/kg/d)	(mg/kg/d)	Indices
6	E L	Inoroanic	Mercury	7439-97-6	88/88	1.8E-01	3.0E-04	1.6E-05	6E-02
•		0	Selenium	7782-49-2	27/28	2.4E-01	3.0E-03	2.3E-05	8E-03
			Cadmium	7440-43-9	28/36	2.0E-02	5.0E-04	1.8E-06	4E-03
			Zinc	7440-66-6	26/26	1.7E+00	2.0E-01	1.6E-04	8E-04
			Conner	7440-50-8	14/28	2.2E-01	3.7E-02	2.1E-05	6E-04
~	Fish	Inorganic	Total						7E-02
3	Fish	AII	Total						7E-02
						(mg/kg dry)	(mg/kg/d)	(mg/kg/d)	
	Sediment	Increanic	Antimony	7440-36-0	24/54	5.5E+00	4.0E-04	7.8E-07	2E-03
>			Arsenic	7440-38-2	6/60	3.2E+00	1.0E-03	4.6E-07	5E-04
			Selenium	7782-49-2	1/62	5.7E+00	3.0E-03	8.1E-07	3E-04
			Barium	7440-39-3	58/58	1.2E+02	7.0E-02	1.7E-05	2E-04
			Chronium	7440-47-3	44/62	5.3E+00	5.0E-03	7.6E-07	2E-04
			Vanadium	7440-62-2	48/51	3.8E+00	7.0E-03	5.4E-07	8E-05
			Silver	7440-22-4	19/61	1.4E+00	3.0E-03	2.0E-07	7E-05
			Molybdenum	7439-98-7	11/52	1.7E+00	4.0E-03	2.5E-07	6E-05
			Cadmium	7440-43-9	7/60	1.8E-01	5.0E-04	2.6E-08	5E-05
			Nickel	7440-02-0	53/60	6.7E+00	2.0E-02	9.5E-07	5E-05
			Mercury	7439-97-6	21/21	6.6E-02	3.0E-04	9.4E-09	3E-05
			Zinc	7440-66-6	57/60	1.9E+01	2.0E-01	2.7E-06	1E-05
			Concer	7440-50-8	49/60	3.1E+00	3.7E-02	4.5E-07	1E-05
			Beryllium	7440-41-7	40/54	2.4E-01	5.0E-03	3.5E-08	7E-06
			Boron	7440-42-8	25/54	2.6E+00	9.0E-02	<b>3.8E-07</b>	4E-06
			ţ	7440-31-5	12/29	4.9E+00	6.0E-01	7.0E-07	1E-06
e	Sediment	Inorganic	Total						4E-03
~	Sediment	Ornanic	Di-n-butvi ohthalate	84-74-2	3/16	6.6E+00	1.0E-01	9.5E-07	1E-05
>		and a state of the	Chloroform	67-66-3	217	8.7E-03	1.0E-02	1.2E-09	1E-07
			Methylene chloride	75-09-2	217	2.4E-02	6.0E-02	3.4E-09	6E-08
			Tohene	108-88-3	117	1.7E-02	2.0E-01	2.4E-09	1E-08
~	Sadiment	Ornanin	Total						1E-05
<b>.</b> .	Codimon		Tetai						4E-03

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Table A2

					detected	Geometric	Oral	Daily	Noncarcinogen
Reach	äledis	Contaminant	Contaminant		to total	mean	0°	intake	screening
02		tvne		CAS no.	sampies	(mg/L)	(mg/kg/d)	(mg/kg/d)	indices
2	Water	Incranic	Thallium	7440-28-0	1/1	7.0E-02	7.0E-05	2.0E-04	3E+00
<b>)</b>			Arsenic	7440-33-2	2/38	3.1E-02	1.0E-03	8.8E-05	9E-02
			Chromium	7440-47-3	28/32	1.4E-02	5.0E-03	3.9E-05	8E-03
			Selenium	7782-49-2	2/14	7.8E-03	3.0E-C3	2.2E-05	7E-03
			Baria	7440-35-3	3/3	3.7E-02	7.0E-02	1.1E-04	2E-03
			Nite	7440-02-0	3/32	6.1E-03	2.0E-02	1.7E-05	9E-04
			Conver	7440-50-8	14/32	8.7E-03	3.7E-02	2.5E-05	7E-04
			Merculty	7439-97-6	9/32	5.5E-05	3.0E-04	1.6E-07	5E-04
			Zinc	7440-66-6	30/32	2.1E-02	- 2.0E-01	6.0E-05	3E-04
e	Water	inorganic	Total				4 -		3E+00
					00.1		1 01 00		26.03
<b>ر</b> ې	Water	Organic	Tetrachloroethylene	12/-18-4	07/1	9.1 E-03	1.05-02	1.35-03	21-03
1		0	Chloroform	67-66-3	12/29	3.1E-03	1.0E-02	9.0E-06	9E-04
			4-Methyl-2-pentanone	108-10-1	1/28	9.6E-03	5.0E-02	2.8E-05	6E-04
			Aratone	67-64-1	13/56	9.6E-03	1.0E-01	2.7E-05	3E-04
			Carbon disulfide	75-15-0	1/28	5.3E-03	1.0E-01	1.5E-05	2E-04
			Mathviene chinride	75-09-2	13/28	3.1E-03	6.0E-02	8.8E-06	2E-04
			Toluene	108-88-3	4/27	4.3E-03	2.0E-01	1.2E-05	6E-05
			Yutena	1330-20-7	1/28	5.1E-03	2.0E+00	1.5E-05	7E-06
c	Water	Omanin	Total						4E-03
<b>.</b>	Water	All All	Total						3E+00
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### APPENDIX B

# CONSERVATIVE SCREENING OF THE DETECTABLE CONTAMINANTS DATA BASE FOR CARCINOGENS

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ч н П Table B1. Results of conservative screening for carcinogens where at least one value was above detection limits

Solution         Slope         Daily           on mean         factor         Intake         Daily           (mg/kg wei) $1/(mg/kg/d)$ (mg/kg/d)         Gaily           5.8E-01 $7.7E+00$ $2.7E-04$ $3.3E-04$ $3.3E-04$ 5.8E-01 $7.7E+00$ $2.7E-04$ $3.3E-04$ $3.3E-04$ $3.3E-04$ 5.8E+03 $7.6E-10$ $1.1E-05$ $2.7E-04$ $3.5E-04$ $3.7E-06$ $3.8E+03$ $7.6E-10$ $1.3E+00$ $1.1E-05$ $4.3E-07$ $7.5E+00$ $1.8E+00$ $1.1E-05$ $4.3E-07$ $7.5E+00$ $7.7E+00$ $3.7E-06$ $5.4E-07$ $7.5E+00$ $7.7E+100$ $3.7E-06$ $5.4E-01$ $7.5E+00$ $7.7E+100$ $3.7E-06$ $5.4E-01$ $7.7E+00$ $7.7E+100$ $3.7E-06$ $5.4E-01$ $7.7E+00$ $7.7E+00$ $7.8E-07$ $5.4E-01$ $2.4E+04$ $4.1E-01$ $2.8E+04$ $2.8E+04$ $2.8E+004$ $3.8E-09$ $1.7E+02$ $1.4E+01$ $1.$										
Media         Contaminant         Contaminant <thcontaminant< th=""> <th< th=""><th></th><th></th><th></th><th></th><th></th><th>Ratio of detected</th><th>95% upper</th><th>slope</th><th>Daily</th><th>Carcinogen</th></th<></thcontaminant<>						Ratio of detected	95% upper	slope	Daily	Carcinogen
Type         Upper         Column         CAS no.         samples         (mg/kg well)         (mg/kg/d)         (mg/kg/d)<	den of		(ceteminent	Conteminent		to total	on mean	factor	intake	screening
Tps         Ups         Ups <thups< th=""> <thups< th=""> <thups< th=""></thups<></thups<></thups<>	Lionau				CAS no.	samples	(ma/kg wet)	1/(mg/kg/d)	(mg/kg/d)	indices
Organic Granic         Cost         Total         1006-82-5         79/79         3.3.5-01         7.7.5-00         1.5.5-06         1.5.5-06           Organic         Total         10145         97.3         10045-97-3         42/42         3.85-403         7.65-10         1.5.5-406         1.5.5-407         1.5.5-406         1.5.5-407         1.5.5-406         1.5.5-406         1.5.5-406         1.5.5-406         1.5.5-406         1.5.5-406         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407         2.5.5-407 </th <th><u>e</u>,</th> <th>ed/i</th> <th>Canin</th> <th>DCB-1254 (Arcclor 1254)</th> <th>11097-69-1</th> <th>79/79</th> <th>5.8E-01</th> <th>7.7E+00</th> <th>2.7E-04</th> <th>2E-03</th>	<u>e</u> ,	ed/i	Canin	DCB-1254 (Arcclor 1254)	11097-69-1	79/79	5.8E-01	7.7E+00	2.7E-04	2E-03
Organic         Total         (1/8q)         (1/8q)<	-		Oganic	PCB-1260 (Aroclor 1260)	11096-82-5	19/79	3.3E-01	7.7E+00	1.6E-04	1E-03
Rationucitie         Cs-137         10045-97-3         42/42         3.6E+03         7.6E-10         1.3E+06           All         Total         (mg/kg/d)         (mg/kg/d)         (mg/kg/d)         (mg/kg/d)         1.3E+06         1.3E+06           Inorganic         Arsenic         7440-41-7         19/27         4.3E+00         1.8E+00         1.1E-05         1.3E+06         6.2E-07           Inorganic         Beryllium         7440-41-7         19/27         4.3E-00         1.8E+00         1.1E-05         6.2E-07           Organic         Dest total         Total         7.440-41-7         19/27         4.3E-00         7.7E+00         3.7E-06         3.7E-06           Organic         Dest total         Total         7.440-41-7         19/27         4.3E-00         7.7E+00         7.8E-07           Organic         Dest total         Total         7.440-41-7         19/27         4.3E-00         7.7E+00         7.8E-07           Corganic         Total         11007-69-1         17/13         5.4E-01         7.7E+00         7.8E-07           Protocior         Total         10045-97-3         17/13         5.4E-01         7.7E+00         7.8E-07           Radonucide         Cs-137         10045		Fish	Organic	Total			(Ba/ka wet)	(1/84)	(Bq/lifetime)	3E-03
All         Total         Total           All         Total         Total         (mg/kg/dr/)         (mg/kg/dr/) <td>-</td> <td>Har Tech</td> <th>Rationucide</th> <td>Cs-137</td> <td>10045-97-3</td> <td>42/42</td> <td>3.8E+03</td> <td>7.6E-10</td> <td>1.3E+06</td> <td>1E-03</td>	-	Har Tech	Rationucide	Cs-137	10045-97-3	42/42	3.8E+03	7.6E-10	1.3E+06	1E-03
Inorganic         Arsenic         7440-41-7         19/27         4.3E-00         1.16-05         0.1.1E-05           Inorganic         Beryllium         7440-41-7         19/27         4.3E-00         1.1E-05         0.2E-07           Inorganic         Foldal         7440-41-7         19/27         4.3E-01         1.1E-05         0.2E-07           Organic         PCB-1250 (Arockor 1264)         11097-69-1         13/13         2.6E+00         7.7E+00         3.7E-06           Organic         PCB-1254 (Arockor 1264)         11097-69-1         13/13         2.6E+00         7.7E+00         3.7E-06           Organic         PCB-1254 (Arockor 1264)         11097-69-1         13/13         2.6E+00         7.7E+00         3.7E-06           Organic         PCB-1254 (Arockor 1264)         11097-69-1         13/13         5.4E-01         7.7E+00         3.7E-06           Organic         Total         10096-87-23         17/18         2.4E-04         7.6E-10         2.6E+04           Ammotide         Cs-134         10098-97-2         33/13         9.2E+03         8.9E+10         4.6E+04           Ammotide         Cs-134         10098-97-2         3/13         9.2E+03         8.9E+10         9.6E+02           Ammot	. <b>.</b>	Fish	AII	Total						4E-03
Inorganic         Arsenic         7440-41-7         19/27         4.3E-00         1.1E-05           Inorganic         Total         7440-41-7         19/27         4.3E-00         1.1E-05           Crganic         Total         7440-41-7         19/27         4.3E-00         1.1E-05           Organic         PCB-1250 (Arcolor 1260)         11097-69-1         13/13         2.6E+00         7.7E+00         3.7E-06           Organic         PCB-1250 (Arcolor 1260)         11097-69-1         13/13         2.6E+00         7.7E+00         3.7E-06           Organic         PCB-1250 (Arcolor 1260)         11097-69-1         13/13         5.4E-01         7.7E+00         3.7E-06           Organic         Total         10045-97-3         17/18         2.4E+04         7.6E+00         7.8E-07           Organic         Cs-137         10045-97-3         17/18         2.4E+04         4.1E-10         2.6E+02           Radionuclide         Cs-134         10098-97-2         33/33         9.2E+03         8.9E+10         3.6E+03           Sr-90         1098-97-2         33/33         9.2E+03         8.9E+10         3.6E+02         2.1E+02           Am-241         14599         1.6E+10         1.1E+02         1.1E+02<							(mathematical)	1 ((ma/ka/d)	(mo/ka/d)	
Inorganic Inorganic         Barylium Framinic         7440-41-7         19/27         4.3E-01         4.3E+00         6.2E-07           Inorganic         Total         1006-82-5         7/13         2.6E+00         7.7E+00         3.7E-06           Organic         PCB-1256 (Aroctior 1260)         11096-82-5         7/13         2.6E+00         7.7E+00         3.7E-06           Organic         Total         10045-97-3         17/13         2.6E+04         7.7E+00         3.7E-06           Organic         Total         10045-97-3         17/18         2.4E-04         7.7E+00         3.7E-06           Organic         Total         10045-97-3         17/18         2.4E+04         7.6E-10         2.5E+04           Radionuckide         Cs-137         10045-97-3         17/18         2.4E+04         7.6E-10         2.5E+04           Sr-90         10998-97-2         3/33         9.2E+03         8.9E-10         9.5E+04           Sr-90         10998-97-2         3/13         1.1E+01         1.8E+01         9.5E+04           Sr-90         10998-97-2         3/13         9.2E+03         1.2E+02         1.2E+02           Ca-152         Ga-14         1.86+10         7.6E-10         2.5E+04         1.	•			di ce conic	7440-38-2	13/31	(mg/kg ary) 7.5E+00	1.8E+00	1.1E-05	2E-05
Inorganic         Total           Inorganic         Total           Organic         PCB-1250           Arcelor 1260)         11095-69-5         7/13         2.6E+00         7.7E+00         3.7E-06           Organic         PCB-1254         (Arcelor 1260)         11095-69-1         13/13         5.4E-01         7.7E+00         3.7E-06           Organic         Total         2.6E+04         7.7E+00         3.7E-06         7.8E-07           Arcelor 1254)         11095-69-1         13/13         5.4E-01         7.7E+00         3.7E-06           Organic         Total         10045-97-3         17/13         2.6E+04         7.6E-10         2.6E+04           Arcelor         10198-40-0         18/18         2.4E+04         7.6E-10         2.5E+04           Sr-90         10198-40-2         18/18         2.4E+04         7.6E-10         2.5E+04           Sr-90         10908-70-3         8/18         4.4E+04         4.1E-10         2.6E+04           Sr-90         10098-70-2         3/13         1.4E+01         8.4E+03         1.5E+01           Am-241         1.1E-03         1.1E+03         1.2E+02         1.2E+02         1.2E+02           Cs-134         13981-15-2 </td <td><b>,</b></td> <td>Sed ingesuon</td> <th>inorganic</th> <td>Revisitor</td> <td>7440-41-7</td> <td>19/27</td> <td>4.3E-01</td> <td>4.3E+00</td> <td>6.2E-07</td> <td>3E-06</td>	<b>,</b>	Sed ingesuon	inorganic	Revisitor	7440-41-7	19/27	4.3E-01	4.3E+00	6.2E-07	3E-06
Organic pcB-1254 (Arocior 1260)         11097-69-1         3/13         2.6E+00         7.7E+00         3.7E-06           Organic         Total         1097-69-1         13/13         5.4E-01         7.7E+00         7.8E-07           Organic         Total         1097-69-1         13/13         5.4E-01         7.7E+00         7.8E-07           Organic         Total         (Bq/kg dry)         (1/8q)         (Bq/lifetime)         7.8E-01         7.8E-07           Radfonuctide         Cs-137         10045-97-3         17/18         2.4E+04         7.6E+10         2.8E-04           Radfonuctide         Cs-137         10045-97-3         17/18         2.4E+04         7.6E+10         2.8E-04           Sr-90         10998-97-2         33/33         9.2E+03         8.9E-10         2.5E+04         2.6E+03           Sr-90         10998-97-2         33/33         9.2E+03         8.9E-10         2.8E+03         1.8E+01         2.9E+03           Radfonuctide         Cs-152         110391-15-2         1/11         1.4E+01         8.4E+03         1.9E+02           Am-241         13991-15-2         1/11         1.4E+01         8.4E+03         1.9E+02           Cm-234         13981-15-2         1/11	-	Sed ingestion	Inorganic	Total						2E-05
Organic         T.ZE-01         7.ZE-00         7.8E-07           Organic         Total         (1097-69-1         13/13         5.4E-01         7.ZE+00         7.8E-07           Organic         Total         (84/kg dry)         (1/8q)         (84/lifetime)         2.8E+04         2.6E+04           Radionuctide         Cs-137         10045-97-3         17/18         2.4E+04         7.6E+10         2.8E+04           Sr-90         10098-97-2         33/33         9.2E+03         8.9E+10         9.6E+03           Sr-91         10098-97-2         33/33         9.2E+03         8.9E+10         9.6E+03           Sr-91         10098-97-2         33/33         9.2E+03         8.9E+10         9.6E+03           Sr-91         10998-97-2         33/33         9.2E+03         8.9E+10         9.6E+03           Sr-92         13981-16-2         1/1         1.4E+01         8.4E-09         1.5E+02           Am-234         13981-16-3         1/1         1.4E+01         5.4E-03         1.9E+01           Ca-134         13981-16-3         1/1         1.8E+01         5.4E+03         1.9E+01           Ca-152         14.4833-23-9         4//4         2.8E+00         2.9E+03         1.9E+01	•	anitana ka 0	Lincord	DCB_1960 (Arochor 1960)	11096-82-5	7/13	2.6E+00	7.7E+00	3.7E-06	3E-05
Organic         Total         (Bq/kg dry)         (1/Bq)         (Bq/lifetime)           Radionuckide         Cs-137         10045-97-3         17/18         2.4E+04         7.6E-10         2.5E+04           Radionuckide         Cs-134         10045-97-3         17/18         2.4E+04         7.6E-10         2.5E+04           Sr-90         10098-97-2         33/33         9.2E+03         8.9E-10         9.6E+03           Sr-90         10098-97-2         33/33         9.2E+03         8.9E-10         2.5E+04           Cs-134         13967-70-9         8/18         1.1E+02         1.1E-09         1.2E+02           Am-241         14596-10-2         1/1         1.4E+01         8.4E-09         1.2E+02           Cm-244         13981-15-2         1/1         1.4E+01         8.4E-09         1.2E+02           Du-238         13966-29-5         1/1         1.4E+01         8.4E-09         1.2E+02           Pu-238         13961-16-3         1/1         1.6E+01         8.4E-09         1.2E+02           Pu-238         1217-48-3         1/1         1.4E+01         8.4E-09         1.2E+02           Pu-238         12117-48-3         1/1         1.6E+01         3.5E-09         2.1E+02		indexination and the second		PCB-1254 (Arocior 1254)	11097-69-1	13/13	5.4E-01	7.7E+00	7.8E-07	6E-06
Radionucide         Cs-137         10045-97-3         17/18         2.4E+04         7.6E-10         2.5E+04           Sr-90         10198-40-0         18/18         2.4E+04         7.6E-10         2.5E+04           Sr-90         10198-40-0         18/18         2.4E+04         7.6E-10         2.5E+04           Sr-90         10098-97-2         33/33         9.2E+03         8.9E-10         9.6E+03           Sr-90         10098-97-2         33/33         9.2E+03         8.9E-10         9.6E+03           Cs-134         13967-70-9         8/18         1.1E+02         1.1E+02         1.2E+01           Am-241         13966-10-2         1/1         1.4E+01         8.4E-09         1.5E+01           Cm-244         13981-15-2         1/1         1.4E+01         8.4E-09         1.5E+01           Cm-243         13981-15-2         1/1         1.4E+01         8.4E-09         1.5E+01           Cm-238         13981-15-2         1/1         1.4E+01         8.4E+01         1.5E+01           Lu-238         13981-15-2         1/1         1.4E+01         8.4E+01         1.5E+01           Lu-238         10-238         17/1         2.8E+02         5.7E+01         1.5E+01 <tr< td=""><td>-</td><td>Sed ingestion</td><th>Organic</th><td>Total</td><td></td><td></td><td></td><td></td><td></td><td>3E-05</td></tr<>	-	Sed ingestion	Organic	Total						3E-05
RadionucideCs-13710045-97-317/18 $2.4E+04$ $7.6E+10$ $2.5E+04$ Sr-9057-9010198-40-018/18 $4.4E+04$ $4.1E-10$ $4.6E+04$ Sr-9010098-97-233/33 $9.2E+03$ $8.9E+10$ $4.6E+04$ Sr-9010098-97-233/33 $9.2E+03$ $8.9E+10$ $4.6E+04$ Sr-9010098-97-233/33 $9.2E+03$ $8.9E+10$ $4.6E+03$ Ca-13413967-70-9 $8/18$ $1.1E+02$ $1.1E-09$ $1.2E+02$ Am-24113981-15-2 $1/11$ $1.4E+01$ $8.4E-09$ $1.5E+01$ Cm-24413981-16-3 $1/11$ $1.4E+01$ $8.4E-09$ $1.5E+02$ Cm-24313981-16-3 $1/11$ $1.4E+01$ $8.4E-09$ $1.5E+02$ Pu-23813981-16-3 $1/11$ $1.8E+01$ $5.4E-09$ $1.5E+02$ Pu-23813981-16-3 $1/11$ $1.8E+01$ $5.4E-09$ $1.5E+02$ Pu-23813981-16-3 $1/11$ $1.8E+01$ $8.4E-10$ $1.5E+02$ Pu-2387440-61-1 $1/11$ $2.0E+00$ $3.8E-09$ $4.0E+00$ U-2387440-61-1 $1/11$ $4.3E+01$ $8.4E-10$ $1.7E+00$ U-23815117-96-1 $1/11$ $4.2E-01$ $3.5E-09$ $1.7E+00$ U-23815117-96-1 $1/11$ $4.2E-01$ $3.5E-09$ $4.4E-01$ U-23815117-96-1 $1/11$ $4.2E-01$ $3.5E-09$ $4.4E-01$ U-23815117-96-1 $1/11$ $4.2E-01$ $3.5E-09$ $4.4E-01$ <tr< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th>(Ba/ka dry)</th><th>(1/Bq)</th><th>(Bq/lifetime)</th><th></th></tr<>							(Ba/ka dry)	(1/Bq)	(Bq/lifetime)	
AutomotionCo-6010198-40-018/18 $4.4\pm0.4$ $4.1E-10$ $4.6E+0.4$ Sr-9057-9010098-97-233/339.2E+03 $8.9E-10$ 9.6E+03Sr-91Cs-13413967-70-9 $8/8$ $1.1E+02$ $1.1E+02$ $1.2E+02$ Can-244133961-5-2 $1/1$ $1.4E+01$ $8.4E-09$ $1.2E+02$ Cm-244133981-15-2 $1/1$ $1.4E+01$ $8.4E-09$ $1.2E+02$ Cm-244133981-15-2 $1/1$ $1.4E+01$ $8.4E-09$ $1.2E+02$ Cu-238133981-16-3 $1/1$ $1.2E+02$ $5.7E-11$ $2.9E+02$ Pu-239 $1.234$ $133981-16-3$ $1/1$ $2.0E+00$ $7.6E-09$ $1.2E+02$ Pu-238 $133981-16-3$ $1/1$ $2.0E+00$ $7.6E-09$ $1.2E+02$ Pu-238 $13396-29-5$ $1/1$ $2.0E+00$ $7.6E-09$ $2.1E+00$ U-238 $15117-48-3$ $1/1$ $1.0E+01$ $8.4E-10$ $1.7E+00$ U-238 $740-61-1$ $1/1$ $4.2E-01$ $3.5E-09$ $1.7E+00$ U-235 $15117-96-1$ $1/1$ $4.2E-01$ $3.5E-09$ $1.7E+00$ U-235 $15117-96-1$ $1/1$ $4.2E-01$ $3.5E-09$ $4.4E-01$ AutomotideTotal $1/1$ $4.2E-01$ $3.5E-09$ $4.4E-01$ AutomotideTotal $1/1$ $4.2E-01$ $3.5E-09$ $4.4E-01$	•			Ce.137	10045-97-3	17/18	2.4E+04	7.6E-10	2.5E+04	2E-05
Sr-9010098-97-2 $33/33$ $9.2E+03$ $8.9E-10$ $9.6E+03$ Sr-90Cs-13413967-70-9 $8/8$ $1.1E+02$ $1.1E+02$ $1.2E+02$ Cs-13413967-70-9 $8/8$ $1.1E+02$ $1.1E+02$ $1.2E+02$ Am-24114596-10-2 $1/1$ $1.4E+01$ $8.4E-09$ $1.2E+02$ Cm-24413981-15-2 $1/1$ $1.4E+01$ $8.4E-09$ $1.2E+02$ Cm-24413981-15-2 $1/1$ $1.8E+01$ $5.4E-09$ $1.9E+01$ Cm-23813981-16-3 $1/1$ $1.8E+01$ $2.1E+00$ $2.1E+00$ U-23413981-16-3 $1/1$ $2.0E+00$ $7.6E-09$ $2.1E+00$ U-23415117-48-3 $1/1$ $1.0E+01$ $8.4E-10$ $1.1E+01$ U-2387440-61-1 $1/1$ $1.0E+01$ $8.4E-10$ $1.1E+01$ U-23815117-48-3 $1/1$ $1.0E+01$ $8.4E-10$ $1.1E+01$ U-23815585-10-1 $1/1$ $4.3E+01$ $8.4E-10$ $1.1E+01$ U-23515117-96-1 $1/1$ $4.2E-01$ $3.5E-09$ $4.4E-01$ U-2351611 $1/1$ $4.2E-01$ $3.5E-09$ $4.4E-01$ AutomodideTotal $1.11$ $4.2E-01$ $3.5E-09$ $4.4E-01$ AutomodideTotal $1/1$ $4.2E-01$ $3.5E-09$ $4.4E-01$	-	sed ingesuon		C3-101	10198-40-0	18/18	4.4E+04	4.1E-10	4.6E+04	2E-05
Am       241       13967-70-9       8/8       1.1E+02       1.1E+02       1.2E+02         Am-241       14596-10-2       1/1       1.4E+01       8.4E-09       1.2E+02         Am-244       13981-15-2       1/1       1.4E+01       8.4E-09       1.5E+01         Cm-244       13981-15-2       1/1       1.4E+01       8.4E-09       1.5E+01         Cm-244       13981-15-2       1/1       1.8E+01       5.4E-09       1.5E+01         Cu-238       13981-16-3       1/1       1.8E+01       5.4E-09       1.5E+02         Pu-238       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         U-234       15117-48-3       1/1       1.0E+01       8.4E-10       1.1E+01         U-238       7440-61-1       1/1       1.0E+01       8.4E-10       1.1E+01         U-238       7440-61-1       1/1       4.2E-01       3.5E-09       1.7E+00         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       1.7E+00         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01   <				20-20 20-20	10098-97-2	33/33	9.2E+03	8.9E-10	9.6E+03	9E-06
Am       241       14596-10-2       1/1       1.4E+01       8.4E-09       1.5E+01         Cm-244       13981-15-2       1/1       1.8E+01       5.4E-09       1.9E+01         Cm-244       13981-15-2       1/1       1.8E+01       5.4E-09       1.9E+01         Cm-244       13981-15-2       1/1       1.8E+01       5.4E-09       1.9E+01         Pu-238       13981-16-3       1/1       2.8E+02       5.7E-11       2.9E+02         Pu-238       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         U-238       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         U-238       15117-48-3       1/1       1.0E+01       8.4E-10       1.1E+01         U-238       7440-61-1       1/1       1.0E+01       8.4E-10       1.7E+00         U-235       15117-96-1       1/1       4.3E+01       8.4E-10       1.7E+00         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         Matoucide       Total       1       1.1       4.2E-01       3.5E-09       4.4E-01 </td <td></td> <td></td> <th></th> <td>00 00 00-134</td> <td>13967-70-9</td> <td>8/8</td> <td>1.1E+02</td> <td>1.1E-09</td> <td>1.2E+02</td> <td>1E-07</td>				00 00 00-134	13967-70-9	8/8	1.1E+02	1.1E-09	1.2E+02	1E-07
Cm-244       13981-15-2       1/1       1.8E+01       5.4E-09       1.9E+01         Eu-152       Eu-152       14683-23-9       4/4       2.8E+02       5.7E-11       2.9E+02         Eu-152       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         Pu-238       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         U-234       13966-29-5       1/1       1.0E+01       8.4E-10       1.1E+01         Pu-239       15117-48-3       1/1       1.0E+01       8.4E-10       1.1E+01         U-238       7440-61-1       1/1       1.6E+00       3.5E-09       1.7E+00         U-235       15117-96-1       1/1       4.3E+01       8.4E-10       1.7E+00         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         Autoride       Total       1.01       1.6E+00       3.5E-09       4.4E-01				Am-241	14596-10-2	1/1	1.4E+01	8.4E-09	1.5E+01	1E-07
Eu-152       14683-23-9       4/4       2.8E+02       5.7E-11       2.9E+02         Pu-238       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         Pu-239       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         Pu-239       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         Pu-239       15117-48-3       1/1       1.0E+01       8.4E-10       1.1E+01         Pu-239       7440-61-1       1/1       1.0E+01       8.4E-10       1.7E+00         U-235       15117-96-1       1/1       4.3E+01       8.1E-11       4.5E+01         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         Min       Total       Ait       1.6E+01       3.5E-09       4.4E-01				Cm-244	13981-15-2	1/1	1.8E+01	5,4E-09	1.9E+01	1E-07
Pu-238       13981-16-3       1/1       2.0E+00       7.6E-09       2.1E+00         U-234       13966-29-5       1/1       3.8E+00       3.8E-09       4.0E+00         U-239       15117-48-3       1/1       1.0E+01       8.4E-10       1.1E+01         U-239       7440-61-1       1/1       1.0E+01       8.4E-10       1.7E+00         U-235       7440-61-1       1/1       1.6E+00       3.5E-09       1.7E+00         U-235       15117-96-1       1/1       4.3E+01       8.1E-11       4.5E+01         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         Autoridide       Total       Autoridide       1.7       4.2E-01       3.5E-09       4.4E-01				EI-152	14683-23-9	4/4	2.8E+02	5.7E-11	2.9E+02	2E-08
U-234       13966-29-5       1/1       3.8E+00       3.8E-09       4.0E+00         Pu-239       15117-48-3       1/1       1.0E+01       8.4E-10       1.1E+01         U-238       7440-61-1       1/1       1.6E+00       3.5E-09       1.7E+00         U-235       15117-48-3       1/1       1.6E+00       3.5E-09       1.7E+00         U-235       15117-96-1       1/1       4.3E+01       8.1E-11       4.5E+01         Radionuclide       Total       1.0tal       3.5E-09       4.4E-01				Pi1-238	13981-16-3	1/1	2.0E+00	7.6E-09	2.1E+00	2E-08
Pu-239       15117-48-3       1/1       1.0E+01       8.4E-10       1.1E+01         U-238       7440-61-1       1/1       1.6E+00       3.5E-09       1.7E+00         Eu-154       15585-10-1       1/1       4.3E+01       8.1E-11       4.5E+01         U-235       15117-96-1       1/1       4.2E-01       3.5E-09       4.4E-01         Attorncide       Total       Attornetide       1.71       4.2E-01       3.5E-09       4.4E-01				766-11	13966-29-5	1/1	3.8E+00	3.8E-09	4.0E+00	2E-08
U-238 7440-61-1 1/1 1.6E+00 3.5E-09 1.7E+00 Eu-154 15585-10-1 1/1 4.3E+01 8.1E-11 4.5E+01 U-235 15117-96-1 1/1 4.2E-01 3.5E-09 4.4E-01 Radionuclide Total All Total				D11-239	15117-48-3	1/1	1.0E+01	8.4E-10	1.1E+01	9E-09
Eu-154 15585-10-1 1/1 4.3E+01 8.1E-11 4.5E+01 U-235 15117-96-1 1/1 4.2E-01 3.5E-09 4.4E-01 Radionuclide Total All Total				11-238	7440-61-1	1/1	1.6E+00	3.5E-09	1.7E+00	6E-09
U-235 15117-96-1 1/1 4.2E-01 3.5E-09 4.4E-01 Radionuclide Total All Total				Eu-154	15585-10-1	1/1	4.3E+01	8.1E-11	4.5E+01	4E-09
Radionucide Total Ali Total				11-235	15117-96-1	1/1	4.2E-01	3.5E-09	4.4E-01	2E-09
	•			Total						5E-05
	•	Sed ingestion		Total						1E-04

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Media         Contaminant         Conten         Conten         Conten </th <th></th> <th></th> <th></th> <th></th> <th></th> <th>detected</th> <th>cont bound</th> <th>siope</th> <th>Daily</th> <th>Carcinogen</th>						detected	cont bound	siope	Daily	Carcinogen
Itpe         name         CAS no.         samples         [17:18]         definition         Constraints         Constraints <thconstraints< th="">         Constraints         <thconstraints< th="">         Constraints</thconstraints<></thconstraints<>	Reach	Media	Contaminant	Contaminant		to total	on mean	factor	intake	screening
Radiomedia         Co-60         10199-40-0         18/18         4.4f-04         3.5E-09         3.0E-07           E-132         10045-97-3         1/14         2.4f-04         3.5E-09         3.0E-07           E-132         10045-97-3         1/11         4.4f-04         3.5E-09         3.0E-07           E-132         10045-97-3         1/11         4.4f-01         3.5E-09         7.7f-04           E-154         13585-10-1         1/11         4.4f-01         4.6f-01         3.6f-07           Ca-335         15117-96-1         1/11         4.4f+01         3.6f-07         2.6f-09         7.7f-04           Amountain         U-233         15117-96-1         1/11         4.2f-01         2.6f-01         2.6f+03           Packenuction         U-233         15117-96-1         1/11         4.2f-01         2.6f+03         1.6f+03           U-234         13966-26-5         1/11         1.6f+01         7.6f-13         2.6f+03           U-233         10-121         1/11         1.6f+01         7.6f-13         2.6f+03           U-234         13961-16-3         1/11         1.6f+01         7.6f-13         2.6f+03           U-234         10-121         U-234         1096-16	°.	type	type	name	CAS no.	samples	(Bq/kg dry)	(1/8q)	(Bq/lifetime)	Indices
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Sed ext exp	Racionuclide	Co-60	10198-40-0	18/18	4.4E+04	3.5E-09	3.0E+07	1.0E-01
Class         Eu-152         14683-23-9         4/4 $2.86+02$ $1.76-03$ $1.96+05$ Co-134         13967-0-9         8/8         1.16-02 $2.46-03$ $7.76+04$ Eu-154         15386-10-2         1/1 $4.26+01$ $2.66+03$ $7.76+04$ Am-241         19589-10-2         1/1 $1.46+01$ $4.36+11$ $2.66+03$ U-235         15117-66-1         1/1 $1.66+01$ $7.76+04$ $2.96+02$ U-238         19381-16-2         1/1 $1.16+01$ $7.66+01$ $2.66+03$ U-238         13981-16-3         1/1 $1.06+01$ $7.66+10$ $7.66+10$ $7.66+02$ PL-238         13981-16-3         1/1 $1.06+01$ $7.66+10$ $7.66+03$ $7.66+03$ PL         Total         Total         Total $1.74+03$ $7.76+00$ $7.66-05$ All         Total         Total $1.74+02$ $7.76+00$ $7.66-05$ PL         Total         Total $1.74+02$ $7.76+00$ $7.66-05$ PCBs tabal         Total				Cs-137	10045-97-3	17/18	2.4E+04	9.2E-10	1.6E+07	1.5E-02
Cs-134         13967-70-9         8/8         1.1E.402         2.4E.09         7.7E+04 $Tm-241$ 15585-10-1         1/1         4.3E.101         18E-09         2.9E+03 $Tm-241$ 15585-10-1         1/1         1.45.01         1.8E-01         2.9E+03 $U-239$ 15117-48-3         1/1         1.4E+01         2.6E-10         2.9E+03 $U-239$ 15117-48-3         1/1         1.6E-12         1.2E+03         2.9E+03 $U-239$ 15117-48-3         1/1         1.6E+12         1.2E+03         2.9E+03 $U-238$ 13991-15-2         1/1         1.1E+03         2.9E+00         1.1E+03 $U-238$ 13991-15-2         1/1         1.1E+01         2.6E+00         1.1E+03 $U-238$ 13991-15-2         1/1         1.1E+01         2.1E+02         1.1E+03 $Mathon         U-238         13991-15-2         1/1         1.1E+00         1.1E+03           Mathon         Total Total Total Mathon         2.6E+00         1.1E+02         1.1E+02           Mathon         Total Total 1.336-36-3         2.7E+00     $				Eu-152	14683-23-9	4/4	2.8E+02	1.7E-09	1.9E+05	3.3E-04
Eurisa         15585-10-1         1/1         4,3E+01         1.8E-09         2.8E+04 $Mm-241$ 15585-10-2         1/1         1,4E+01         4.8E-11         2.8E+02 $Mm-241$ 13966-10-2         1/1         1,4E+01         1.6E-12         1.2E+02 $Mm-241$ 13966-10-2         1/1         1,8E+01         1.6E+12         1.2E+02 $Mm-241$ 13966-29-5         1/1         1,1E+03         1.1E+03         1.1E+03 $U-238$ 13991-16-3         1/1         1.0E+01         7.0E+12         1.4E+03 $U-238$ 13991-16-3         1/1         1.0E+01         7.0E+12         1.1E+03 $U-238$ 13991-16-3         1/1         1.0E+01         7.0E+12         1.1E+03 $U-238$ 10e1         1.0E         7.0E+13         6.8E+03         1.1E+03 $MI$ I         1.0E+01         1.1E+12         1.1E+03         1.1E+03 $MI$ I         1.0E+01         1.0E+01         7.0E+12         1.1E+03 $MI$ I         1.0E+01         1.0E+02         7.0E+02         2.6E+03 $MI$ I				Cs-134	13967-70-9	8/8	1.1E+02	2.4E-09	7.7E+04	1.8E-04
Am 241         1450-10-2         1/1         1.4E+01         4.3E-11         9.6E+03           U-235         15117-96-1         1/1         1.6E+01         2.6E+03         2.9E+02           U-239         15117-96-1         1/1         1.6E+01         7.6E+12         2.9E+02           U-239         15117-96-1         1/1         1.6E+01         7.6E+12         2.9E+02           U-238         13961-16-3         1/1         1.0E+01         7.6E+12         2.9E+03           U-238         13961-16-3         1/1         1.0E+01         7.6E+12         2.9E+03           U-238         13961-16-3         1/1         1.0E+01         7.6E+12         2.9E+03           U-238         10al         Ual         1.01         1.06-01         7.6E+12         1.4E+03           Mit         Total         Total         Total         1.01         1.0E+01         7.7E+00         7.6E+03           All         Total         1336-36-3         1/12         1.16E+03         7.7E+00         3.0E+03           All         Total         1336-36-3         17/28         1.0E+03         7.7E+00         3.0E+05           Coganic         PCB-1254         Arocior 1254)         11/28				Eu-154	15585-10-1	1/1	4.3E+01	1.8E-09	2.9E+04	5.3E-05
U-235         15117-06-1         1/1         4.2E-01         2.6E-10         2.9E+02 $P_{-233}$ 15117-48-3         1/1         1.0E+01         1.6E+12         1.2E+04 $P_{-233}$ 13961-15-2         1/1         1.0E+01         1.6E+12         1.2E+04 $P_{-233}$ 13961-16-3         1/1         1.0E+00         1.6E+12         1.2E+04 $P_{-233}$ 13961-16-3         1/1         1.0E+00         1.6E+12         1.2E+04 $P_{-233}$ 13981-16-3         1/1         1.0E+00         1.6E+12         1.2E+03 $P_{-238}$ 13981-16-1         1/1         1.0E+00         1.6E+12         1.1E+03 $P_{-238}$ 13981-16-1         1/1         1.0E+00         1.6E+12         1.1E+03           All         Total         1/1         2.6E+00         1.6E+12         1.1E+03           Organic         PCBs tatal         1336-36-3         2/30         2.2E+12         1.1E+03           PCB         PCBs tatal         1/336-36-3         1/12         1.6E+03         7.7E+00         3.0E+04           PCB         PCBs tatal         1/336-36-3         1/228         1/26-03         2.1E+03 <td></td> <td></td> <td></td> <td>Am-241</td> <td>14596-10-2</td> <td>1/1</td> <td>1.4E+01</td> <td>4.3E-11</td> <td>9.6E+03</td> <td>4.1E-07</td>				Am-241	14596-10-2	1/1	1.4E+01	4.3E-11	9.6E+03	4.1E-07
Cm-244         13991-15-2         1/1         1.8E+01         1.5E-12         1.2E+04           Pu-239         15117-48-3         1/1         1.0E+01         7.0E+13         6.8E+03           Pu-238         13991-15-2         1/1         1.0E+01         7.0E+12         1.4E+03           Pu-238         13991-16-3         1/1         1.0E+00         1.5E-12         1.4E+03           Pu-238         7440-61-1         1/11         1.0E+00         1.5E-12         1.4E+03           Pu-238         7440-61-1         1/11         1.6E+00         1.5E-12         1.4E+03           PU-238         7440-61-1         1/11         1.6E+00         1.5E-12         1.4E+03           All         Total         Total         10137-69-1         1/11         1.6E+00         7.5E+00         3.6E-04           All         Total         1336-59-1         1/228         1.0E-03         7.7E+00         3.0E-04           Methylene         75-27-4         3/29         6.8E-03         7.7E+00         3.0E-04           Benzene         71-43-2         11/29         7.7E+00         3.0E-04         1.9E-02         2.0E-04           Methylene         77-18-4         1/29         7.7E+03				11-235	15117-96-1	1/1	4.2E-01	2.6E-10	2.9E+02	7.5E-08
Pu-239         15117-48-3         1/1         1.0E+01         7.0E-13         6.8E+03           Pu-238         13966-29-5         1/1         3.8E+00         1.5E-12         2.6E+03           Pu-238         13961-16-3         1/1         1.6E+00         1.5E-12         1.4E+03           Pu-238         13991-16-3         1/1         1.6E+10         1.5E-12         1.4E+03           Pu-238         Total         T440-61-1         1/1         1.6E+00         1.2E-12         1.1E+03           Probations         Total         Total         Total         T440-61-1         1/1         1.6E+00         1.2E-12         1.1E+03           All         Total         Total         Total         Total         1.7E+00         2.0E-06           All         Total         1736-35-3         1.20         1.7E+00         7.7E+00         3.0E-05           Probioobonomentane         7.729         1.728         1.728         7.7E+00         3.0E-05           Penzene         7.74-3.2         1/29         7.7E-03         5.1E-02         2.7E+00         3.0E-05           Penzene         7.74-3.2         1/29         7.7E-03         3.6E-02         1.7E-04         1.7E-04         1.7E-04     <				C.m-244	13981-15-2	1/1	1.8E+01	1.6E-12	1.2E+04	2.0E-08
Pu-238         13966-29-5         1/1         3.8E+00         1.5E-12         2.6E+03           Pu-238         13961-16-3         1/1         1.6E-10         1.5E-12         1.4E+03           Pu-238         Total         U-238         7440-61-1         1/1         1.6E+00         1.5E-12         1.4E+03           In-238         Total         Total         101-238         1/1         2.0E+00         1.5E-12         1.1E+03           All         Total         Total         101-23         1/1         1.6E+00         1.2E-12         1.1E+03           All         Total         Total         1035-69-1         1/1         1.6E+00         1.2E-12         1.1E+03           All         Total         1336-36-3         2/30         2.5E-03         7.7E+00         3.0E-05           PcBatzene         75-27-4         3/29         6.8E-03         1.2E-02         2.0E-04           Methylene         127-18-4         1/29         1/29         1.2E-03         3.0E-05           Methylene         127-18-4         1/29         1.2E-02         2.0E-04         1.2E-02         2.0E-04           Methylene         127-18-4         1/29         1/29         1.2E-02         2.0E-03				Di1-230	15117-48-3	1/1	1.0E+01	7.0E-13	6.8E+03	4.8E-09
Pu-238         13981-16-3         1/1         2.0E+00         1.6E-12         1.4E+03           Radonucide         Total         1         1         1.6E+12         1.4E+03           All         Total         Total         1         1.6E+00         1.6E+12         1.4E+03           All         Total         Total         1         1.1         1.6E+00         1.6E+12         1.4E+03           All         Total         Total         1         1.1         1.6E+00         1.2E+12         1.1E+03           All         Total         Total         1         1.091         5         1.1E+03         1.1E+03           Organic         PCB-t254         1007-69-1         1/28         1.0E-03         7.7E+00         7.0E-05           Dichlorobromomethane         72-714         3/29         6.8E-03         7.7E+00         7.0E-05           Reaction         714-3-2         1/229         7.1E-03         7.1E-03         3.8E-04           Methylene         71-43-2         1/229         7.1E-03         3.8E-04         1.7E-04           Canalic         Total         7.14-30         6.7E-03         3.8E-02         1.7E-04           Cashon colorinet         7.14-30<				11-234	13966-29-5	1/1	3.8E+00	1.5E-12	2.6E+03	3.9E-09
Hademucide All         U-238         7440-61-1         1/1         1.6E+00         1.2E-12         1.1E+03           All         Total         1043         1031         1/1         1.6E+00         1.2E-12         1.1E+03           All         Total         1043         1037-69-1         1/1         1.6E+00         1.2E-12         1.1E+03           Organic         PCBs total         1336-36-3         2/30         2.5E-03         7.7E+00         7.0E-05           Dichlorobrumortame         75-27-44         3/29         6.8E-03         7.7E+00         3.0E-05           Dichlorobrumortame         75-27-44         1/29         7.7E+00         3.0E-05         3.0E-05           Rethylene         75-27-4         3/29         6.8E-03         1.3E-01         1.9E-04           Organic         Total         77-43-2         1/28         7.1E-03         2.9E-02         2.0E-04           Methylene chloride         75-09-2         138-01         1.9E-03         1.7E-04         1.7E-04           Organic         Total         1/29-3         1.128         7.1E-03         2.9E-02         2.0E-04           Redonucide         S-190         6.9E-03         1.7E-03         1.7E-04         1.7E-04				0.239	13081-16-3	1/1	2.0E+00	1.6E-12	1.4E+03	2.2E-09
Radionucide All         Total Total         Total         Total           All         Total         Total         Image         Mage         Ma				11.028	7440-61-1	1/1	1.6E+00	1.2E-12	1.1E+03	1.3E-09
All         Total         (mg/L) $1/(mg/kg/d)$ (mg/kg/d)         (mg/kg	,			0-500 Totol						1.2E-01
All         Total         Total           And         PCBs total         1336-36-3         2/30         2/5E-03         7.7E+00         7.0E-05           Organic         PCBs total         1336-36-3         2/30         2.5E-03         7.7E+00         7.0E-05           PCB-1254 (Aroctor 1254)         11097-69-1         128         1.0E-03         7.7E+00         3.0E-05           PCB-1254 (Aroctor 1254)         11097-59-1         1229         5.8E-03         1.3E-01         1.9E-04           PCB-1254 (Aroctor 1254)         11097-59-1         1229         5.1E-02         2.0E-04         3.0E-05           Dichlorobromomentane         127-18-4         1/29         7.0E-03         5.1E-02         2.0E-04           Methylene chloride         75-09-2         15/29         1.3E-02         7.1E-02         2.0E-04           Trichloroethylene         79-01-6         4/46         6.0E-03         1.1E-02         1.7E-04           Organic         Total         6.766-3         18/30         6.1E-03         1.7E-04           Organic         Total         6.766-3         18/30         6.1E-03         1.7E-04           Redonuclide         S-90         10098-97-2         34/34         5.3E-03         1.7E	<b>*</b> **	Sed ext exp	Hadonucioe							1E-01
Organic         PCBs total         1336-36-3 $2/30$ $2.5E-03$ $7.7E+00$ $7.0E-05$ PCB-1254         Aroclor 1254)         11097-69-1 $1/28$ $1.0E-03$ $7.7E+00$ $7.0E-05$ PCB-1254         Aroclor 1254)         11097-69-1 $1/28$ $1.0E-03$ $7.7E+00$ $3.0E-05$ PCB-1254         Aroclor 1254) $11097-69-1$ $1/28$ $1.0E-03$ $7.7E+00$ $3.0E-05$ Dichlorobromomethane $75-27-4$ $3/29$ $6.8E-03$ $1.3E-01$ $1.9E-04$ Dichlorobromomethane $75-27-4$ $3/29$ $6.8E-03$ $1.3E-01$ $1.9E-04$ Dichlorobromomethane $71-43-2$ $1/29$ $7.1E-03$ $2.9E-02$ $2.0E-04$ Methylene chloride $75-09-2$ $162-03$ $1.1E-02$ $2.0E-04$ Trichloroethylene $79-01-6$ $4/46$ $6.0E-03$ $1.7E-04$ Organic         Total $67-66-3$ $18/30$ $6.0E-03$ $1.7E-03$ $1.7E-04$ Organic         Total $67-66-3$ $18/30$		Codiment	AII	10101						
Organic         PCBs total         1336-36-3         2/30         2.5E-03         7.7E+00         7.0E-05           PCB-1254         Aroclor         128         1.057-69-1         1/28         1.0E-03         7.7E+00         3.0E-05           PCB-1254         Aroclor         7.29         6.8E-03         7.7E+00         3.0E-05           Dichlorobromomethane         75-27-4         3/29         6.8E-03         1.3E-01         1.9E-04           Benzene         71-43-2         1/28         7.1E-03         2.9E-02         2.0E-04           Methylene chloride         71-43-2         1/28         7.1E-03         2.9E-02         2.0E-04           Organic         Teirchloroethylene         71-43-2         1/28         7.1E-03         2.9E-02         2.75E-03         3.8E-04           Methylene chloride         75-09-2         15/29         1.3E-02         7.5E-03         3.8E-04           Organic         Total         77-66-3         18/30         6.0E-03         1.7E-04         1.7E-04           Organic         Total         6.7-66-3         18/30         6.1E-03         1.7E-04         1.7E-04           Ardionuclide         Sr-90         10098-97-2         34/34         6.3E-01         1.7E-0							(Eng/L)	1/(mg/kg/d)	(mg/kg/d)	
PCB-1254 (Aroctor 1254)       11097-69-1       1/28       1.0E-03       7.7E+00       3.0E-05         Dichlorobromomethane       75-27-4       3/29       6.8E-03       1.3E-01       1.9E-04         Terachloroethylene       127-18-4       1/29       7.0E-03       5.1E-02       2.0E-04         Benzene       71-43-2       1/28       7.1E-03       2.9E-02       2.0E-04         Methylene chloride       75-09-2       15/29       1.3E-02       2.0E-04         Chlorobrum       71-43-2       1/28       7.1E-03       2.9E-02       2.0E-04         Methylene chloride       75-09-2       15/29       1.3E-02       7.5E-03       3.8E-04         Organic       Total       79-01-6       4/46       6.0E-03       1.7E-04       1.7E-04         Organic       Total       79-313       18/30       6.0E-03       1.1E-02       1.7E-04         Radionucide       Sr-90       10038-97-2       34/34       6.3E+00       3.8E-05       1.7E-04         Radionucide       Sr-90       10028-97-3       29/34       7.3E+00       3.6E-10       1.3E+05         Hadionucide       Sr-90       10028-97-3       29/34       7.3E+00       3.6E-10       1.4E+07		Water	Ornanic	PCBs total	1336-36-3	2/30	2.5E-03	7.7E+00	7.0E-05	5E-04
Pictulorobromometrane         75-27-4         3/29         6.8E-03         1.3E-01         1.9E-04           Tetrachloroethylene         127-18-4         1/29         7.0E-03         5.1E-02         2.0E-04           Benzene         71-43-2         1/28         7.1E-03         5.1E-02         2.0E-04           Methylene chloride         75-09-2         15/29         1.3E-02         2.0E-04         2.0E-04           Trichloroethylene         75-09-2         15/29         1.3E-02         7.5E-03         3.8E-04           Trichloroethylene         75-09-2         15/29         1.3E-02         7.5E-03         3.8E-04           Chloroform         6.7-66-3         18/30         6.0E-03         1.1E-02         1.7E-04           Chloroform         6.7-66-3         18/30         6.0E-03         6.1E-03         1.7E-04           Cropanic         Total         734         6.3E+00         8.9E-10         1.3E+05           Radionuclide         Sr-90         10008-97-2         34/34         6.3E+00         1.5E-12         7.1E+07           H-3         10028-17-8         34/34         6.5E-01         1.3E+05         7.1E+07           Co-60         10198-40-0         3/34         6.5E-01 <t< td=""><td>-</td><td></td><td></td><td>PCB-1254 (Aroclor 1254)</td><td>11097-69-1</td><td>1/28</td><td>1.0E-03</td><td>7.7E+00</td><td>3.0E-05</td><td>2E-04</td></t<>	-			PCB-1254 (Aroclor 1254)	11097-69-1	1/28	1.0E-03	7.7E+00	3.0E-05	2E-04
Tetrachloroethylene       127-18-4       1/29       7.0E-03       5.1E-02       2.0E-04         Tetrachloroethylene       71-43-2       1/28       7.1E-03       2.9E-02       2.0E-04         Benzene       71-43-2       1/28       7.1E-03       2.9E-02       2.0E-04         Benzene       71-43-2       1/28       7.1E-03       2.9E-02       2.0E-04         Trichloroethylene       75-09-2       15/29       1.3E-02       7.5E-03       3.8E-04         Chloroform       6.7-66-3       18/30       6.0E-03       1.1E-02       1.7E-04         Chloroform       6.7-66-3       18/30       6.0E-03       1.1E-02       1.7E-04         Coganic       Total       73-13       10038-97-2       34/34       6.3E+00       8.9E-10       1.3E+05         Radionuclide       Sr-90       10068-97-2       34/34       6.3E+00       8.9E-10       1.3E+05         H-3       10028-17-8       34/34       7.3E+00       7.1E+07       7.1E+07         Radionuclide       Total       10198-40-0       3/34       6.5E-01       1.4E+04         Radionuclide       Total       10198-40-0       3/34       6.5E-01       4.1E+07         Radionuclide       Total				Dichlorobromomethane	75-27-4	3/29	6.8E-03	1.3E-01	1.9E-04	3E-05
Redionucide         Sr-90         1/23         7/15-03         2.95-02         2.05-04           Methylene chloride         75-09-2         15/29         1.35-02         7.55-03         3.85-04           Trichloroethylene         79-01-6         4/46         6.05-03         1.15-02         1.75-04           Chloroform         6.7-66-3         18/30         6.05-03         1.15-02         1.7E-04           Chloroform         6.7-66-3         18/30         6.05-03         1.15-02         1.7E-04           Chloroform         6.7-66-3         18/30         6.05-03         1.15-04         1.7E-04           Chloroform         6.7-66-3         18/30         6.05-03         1.7E-04         1.7E-04           Chloroform         6.7-66-3         18/30         6.05-03         1.7E-04         1.7E-04           Adionuclide         Sr-90         10038-97-2         34/34         6.35+00         8.9E-10         1.3E+05           H-3         10045-97-3         29/34         7.35+00         7.1E+07         7.1E+07           Co-60         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04           Radionuclide         Total         10198-40-0         3/34         6.5E-01				Tetrachloroethvlane	127-18-4	1/29	7.0E-03	5.1E-02	2.0E-04	1E-05
Methylene chloride         75-09-2         15/29         1.3E-02         7.5E-03         3.8E-04           Trichloroethylene         79-01-6         4/46         6.0E-03         1.1E-02         1.7E-04           Chloroform         67-66-3         18/30         6.0E-03         1.1E-02         1.7E-04           Organic         Total         6.7-66-3         18/30         6.0E-03         1.7E-04           Radionuclide         Sr-90         10098-97-2         34/34         6.3E+00         8.9E-10         1.3E+05           Radionuclide         Cs-137         10028-97-2         34/34         6.3E+00         8.9E-10         1.3E+05           H-3         10028-97-3         29/34         7.3E+00         8.9E-10         1.5E+05           H-3         10028-17-8         34/34         6.5E-01         4.1E-07         1.4E+07           Co-60         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04				Renzene	71-43-2	1/28	7.1E-03	2.9E-02	2.0E-04	6E-06
Trichloroethylene         79-01-6         4/46         6.0E-03         1.1E-02         1.7E-04           Chloroform         6.7-66-3         18/30         6.0E-03         1.1Fe-02         1.7E-04           Organic         Total         6.1-603         6.1E-03         1.7E-04         1.7E-04           Anic         Total         6.1-603         6.1E-03         1.7E-04         1.7E-04           Radionuclide         Sr-90         10098-97-2         34/34         6.2E+00         8.9E-10         1.3E+05           H-3         10028-97-3         29/34         7.3E+00         8.9E-10         1.5E+05           H-3         10028-17-8         34/34         6.5E-01         4.1E-10         1.5E+05           H-3         10028-17-8         34/34         5.5E-01         1.4E+07           Co-60         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04				Methylene chloride	75-09-2	15/29	1.3E-02	7.5E-03	3.8E-04	3E-06
Chloroform         67-66-3         18/30         6.0E-03         6.1E-03         1.7E-04           Organic         Total         (Bq/L)         (1/Bq)         (Bq/lifetime)           Radionuclide         Sr-90         10098-97-2         34/34         6.3E+00         8.9E-10         1.3E+05           Radionuclide         Sr-90         10098-97-2         34/34         5.3E+00         8.9E-10         1.3E+05           H-3         10028-17-8         34/34         7.3E+00         7.5E+12         7.1E+07           Radionuclide         Total         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04				Trichloroethylene	79-01-6	4/46	6.0E-03	1.1E-02	1.7E-04	2E-06
Organic         Total         (1/Bq)         (Bq/L)         (1/Bq)         (Bq/lifetime)           Radionuclide         Sr-90         10098-97-2         34/34         6.3E+00         8.9E-10         1.3E+05           Radionuclide         Sr-90         10098-97-2         34/34         5.3E+00         8.9E-10         1.3E+05           H-3         10045-97-3         29/34         7.3E+00         7.6E-10         1.5E+05           H-3         10028-17-8         34/34         3.4E+03         1.5E-12         7.1E+07           Co-60         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04				Chloroform	67-66-3	18/30	6.CE-03	6.1E-03	1.7E-04	1E-06
Radionuclide         Sr-90         10098-97-2         34/34         6.3E+00         8.9E-10         1.3E+05           Radionuclide         Sr-90         10098-97-2         34/34         6.3E+00         8.9E-10         1.3E+05           H-3         10045-97-3         29/34         7.3E+00         7.6E-10         1.5E+05           H-3         10028-17-8         34/34         3.4E+03         1.5E-12         7.1E+07           Co-60         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04		Weer	Ornanin	Total						8E-04
Radionucide         Sr-90         10098-97-2         34/34         6.3E+00         8.9E-10         1.3E+05           Cs-137         10045-97-3         29/34         7.3E+00         7.6E-10         1.5E+05           H-3         10028-17-8         34/34         3.4E+03         1.5E-12         7.1E+07           Co-60         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04           Radionucide         Total         10198-40-0         3/34         6.5E-01         4.1E-10         1.4E+04	_	101044	2000				(Bq/L)	(1/84)	(Bq/lifetime)	
Radionuclide         Total	•	Water	Doržoni vrlida	00-30 00-30	10098-97-2	34/34	6.3E+00	8.9E-10	1.3E+05	1E-04
H-3 10028-17-8 34/34 3.4E+03 1.5E-12 7.1E+07 Co-60 10198-40-0 3/34 6.5E-01 4.1E-10 1.4E+04 Racionucide Total	-	101014		C:	10045-97-3	29/34	7.3E+00	7.6E-10	1.5E+05	1E-04
Co-60 10198-40-0 3/34 6.5E-01 4.1E-10 1.4E+04 Radionucide Total				H-3	10028-17-8	34/34	3.4E+03	1.5E-12	7.1E+07	1E-04
Radionucide Total				Co-60	10198-40-0	3/34	6.5E-01	4.1E-10	1.4E+04	6E-06
	•	Mator	Barinning	Total						4E-04
	1		All							1E-03

(continued)	
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					Ratio of detected	95% upper conf bound	Cancer slope	Daily	Carcinogen
Reach	Media	Contaminant	Contaminanî		to total	on meen	factor	intake	screening
no.	type	type	ewen	CAS no.	samples	(mg/kg wet)	1/(mg/kg/d)	(mg/kg/d)	indices
2	LST LST	Organic	PCB-1254 (Aroclor 1254)	11097-69-1	24/24	2.8E-01	7.7E+00	1.3E-04	1E-03
		,	PCB-1260 (Arocior 1260)	11096-82-5	24/24	1.3E-01	7.7E+00	6.3E-05	5E-04
8	Fish	Organic	Total						2E-03
						(Bq/kg wet)	(1/Bq)	(Bq/ilfetime)	
ର	Fish	Racionucide	Cs-137	10045-97-3	10/10	1.0E+03	7.6E-10	3.6E+05	3E-04
8	Fish	AII	Total						2E-03
						(ma/ka drv)	(ma/ka_dry) 1/(ma/ka/d)	(ma/ka/d)	indices
c	Cod incretion	Increasion	Arenic	7440-38-2	4/111	2.5E+00	1.8E+00	3.6E-06	6E-06
V			Bervllium	7440-41-7	81/99	1.8E-01	4.3E+00	2.6E-07	1E-06
0	Sed ingestion	Inorganic	Total						8E-06
c	Cad incretion	Qrnanic	PCR-1260 (Araciar 1260)	11096-82-5	3/13	1.6E+00	7.7E+00	2.3E-06	2E-05
4			PCB-1254 (Arocior 1254)	11097-69-1	11/13	1.3E-01	7.7E+00	1.9E-07	2E-06
0	Sed ingestion	Organic	Total						2E-05
~	Sed incestion	Radionuclide	Cs-137	10045-97-3	130/134	1.5E+04	7.6E-10	1.6E+04	1E-05
,			Co-60	10198-40-0	121/134	1.5E+04	4.1E-10	1.6E+04	6E-06
			U-234	13966-29-5	4/4	1.3E+02	3.8E-09	1.3E+02	5E-07
			Sr-90	10098-97-2	91/95	4.4E+02	8.9E-10	4.6E+02	4E-07
			Cs-134	13967-70-9	10/10	2.6E+02	1.1E-09	2.8E+02	3E-07
			Cm-244	13981-15-2	4/4	5.1E+01	5.4E-09	5.3E+01	3E-07
			U-238	7440-61-1	4/4	3.9E+01	3.5E-09	4.1E+01	1E-07
			Eu-152	14683-23-9	11/11	1.9E+03	5.7E-11	2.0E+03	1E-07
			Eu-154	15585-10-1	14/14	6.8E+02	8.1E-11	7.1E+02	6E-08
			Pu-238	13981-16-3	4/4	6.5E+00	7.6E-09	6.8E+00	5E-08
			Am-241	14596-10-2	4/4	4.6E+00	8.4E-09	4.8E+00	4E-08
			U-235	15117-96-1	414	3.5E+00	3.5E-09	3.7E+00	1E-08
			Pu-239	15117-48-3	4/4	6.3E-01	8.4E-10	6.6E-01	6E-10
0	Sed incestion	Radionuciide	Total						2E-05
5	Sed incestion		Totai						5E-05

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Dimension         Contaminant         Contaminant <thconting< th=""> <thcontinter< th="">         Con</thcontinter<></thconting<>					4	Hatto of	No % upper	Cancer	Cetter	accordination of the second
Weater Media         Continuent Continuent         Case Continuent         Case Continuent         Case Continuent         Continuent         Continuent <thcontinuent< th="">         Continuent         Continue</thcontinuent<>				Contominant		to total	con mean	factor	Jany Intake	screening
Sed ext exp         Radionactide         Co-eto         10198-40         121/134         15E-44         3.5E-09         10E-07           Sed ext exp         Eu-154         1588-70-9         17/11         15E-04         3.5E-09         10E-07           Eu-154         Eu-154         1588-70-9         17/11         15E-04         3.5E-09         16E-07           Eu-154         1588-70-9         17/11         5.5E-00         18E-05         2.5E-03         18E-05           C-3-134         13966-10-2         4/4         3.5E-00         10E-07         2.4E+03         1.5E-04         3.2E+03         1.5E-04         3.2E+03         1.5E+03         1.5E+03         1.5E+03         3.2E+03         1.5E+03         3.2E+03         1.5E+03         3.2E+03         1.5E+03         3.2E+03         3.2E+02         3.2E+03         3.2E+02         3.2E+02         3.2E+02         3.2E+02         3.2E+02         3.2E+02         3.2E+02         3.2E+02 <t< th=""><th>Keach</th><th></th><th>Contamican</th><th>name</th><th>CAS no.</th><th>samples</th><th>(Bq/kg dry)</th><th>(1/8q)</th><th>(Bq/lifetime)</th><th>Indices</th></t<>	Keach		Contamican	name	CAS no.	samples	(Bq/kg dry)	(1/8q)	(Bq/lifetime)	Indices
C4-137       10045-97-3       130/1/34       15E-04       92E-10       10E+07         Eu-152       Eu-152       1483-23-9       11/11       19E+03       17E+06       16E+07         Eu-152       Eu-152       14863-23-9       11/11       19E+03       17E+06       4.6E+02       14E+05         Eu-152       Eu-152       14965-10-5       4/4       3.5E+00       2.5E+10       2.6E+03       4.6E+03         C-1234       13967-70-9       10/10       2.6E+02       2.4E+03       1.8E+05       2.4E+03         Mm-244       13961-15-2       4/4       3.5E+00       4.6E+10       2.6E+04       3.2E+04         Valuer       U-234       13961-15-2       4/4       3.5E+00       1.6E+12       3.6E+04         Valuer       Nation       U-238       13961-15-2       4/4       5.1E+01       1.6E+12       3.6E+04         Valuer       Nation       Mater       Total       1396-36-3       4/4       5.1E+00       1.6E+02       1.6E+03         Water       Organic       Asenic       7/40-31-5       4/4       5.1E+00       1.6E+03       1.6E+03       1.6E+03       1.6E+03       1.6E+03       1.6E+03       1.6E+03       1.6E+03       1.6E+03		Sed ext exn	Radionuclida	Co-60	10198-40-0	121/134	1.5E+04	3.5E-09	1.0E+07	3.6E-02
EU-152         14883-23-9         11/11         195-03         1.75-09         1.55-06         2.65-02         1.85-03         1.65-06         1.85-03         1.65-05         1.65-05         1.65-05         1.65-05         1.65-05         1.65-05         1.65-05         1.65-05         1.65-05         1.65-05         1.65-03 <th1.60< th=""> <th1.62-03< th=""> <th1.60-< th=""><td>J</td><td></td><td></td><td>Cs-137</td><td>10045-97-3</td><td>130/134</td><td>1.5E+04</td><td>9.2E-10</td><td>1.0E+07</td><td>9.4E-03</td></th1.60-<></th1.62-03<></th1.60<>	J			Cs-137	10045-97-3	130/134	1.5E+04	9.2E-10	1.0E+07	9.4E-03
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				Eu-152	14683-23-9	11/11	1.9E+03	1.7E-09	1.3E+06	2.2E-03
Cs-134     13967-70-9     10/10     2.6E+02     2.4E-09     1.8E+05       M-231     15117-96-1     4.14     3.5E+00     2.6E+10     2.4E+03       M-233     15117-96-1     4.14     3.5E+00     2.6E+10     2.4E+03       U-233     15117-96-1     4.14     3.5E+00     1.6E+12     2.4E+03       U-233     PU-239     13981-15-2     4.14     5.5E+00     1.6E+12     2.4E+03       Valer     U-233     13991-15-2     4.14     5.5E+00     1.6E+12     2.4E+03       PU-235     15117-48-3     4.14     5.5E+00     1.6E+12     2.4E+03       PU-235     15117-48-3     4.14     5.5E+00     1.6E+12     2.4E+03       Sediment     AII     Total     1.396-30-3     1.61-10     4.6E+103       Sediment     AII     Total     7.40-39-2     4.75     5.2E-02     1.6E+02       Water     Inorganic     Arsenic     7.40-39-2     4.75     5.2E-03     1.15-03     3.6E+04       Water     Organic     PCBs babal     1336-36-3     2/30     1.8E-03     7.7E+00     5.5E-03       Water     Organic     PCBs babal     1336-36-3     2/30     1.8E-03     1.6E-04       Water     Organic     PCBs babal<				Eu-154	15585-10-1	14/14	6.8E+02	1.8E-09	4.6E+05	8.4E-04
U-235     15117-96-1     4/4     3.55+00     2.45+03       U-238     U-238     14966-10-2     4/4     3.55+00     3.55+03       U-228     U-238     14966-10-2     4/4     3.55+00     3.55+03       U-238     U-238     14966-11-1     4/4     3.55+01     1.55-12     3.55+04       U-238     U-238     13981-15-2     4/4     5.15+01     1.55-12     3.55+04       U-238     Total     U-238     15117-48-3     4/4     5.501     1.55-12     3.55+04       Sed ext exp     Radenuctide     Total     U-238     15117-48-3     4/4     5.501     1.55-12     3.55+04       Water     Organic     Total     Total     Total     144     3.55-01     7.75+03     4.35+02       Water     Organic     Arsenic     7440-38-2     4/75     5.25-02     1.85+03     1.55-03       Water     Organic     Problocolum     6.7-66-3     6/176     1.046     5.52-02     1.65-03       Water     Organic     Total     1336-36-3     2/30     1.85-03     1.16-03     1.55-03       Water     Organic     Total     1336-36-3     1.046     7.75-03     5.52-02     1.66-03       Water     Organic				Cs-134	13967-70-9	10/10	2.6E+02	2.4E-09	1.8E+05	4.3E-04
Am-241       14506-10-2       4/4       4,65+00       4,35-11       3,25+03         U-238       U-238       13966-29-5       4/4       1,35-02       155-12       8,65+04         U-238       U-238       13961-16-3       4/4       1,35-02       155-12       8,65+04         U-238       U-238       13991-16-3       4/4       1,35-02       155-12       8,65+04         V-238       T440-61-1       4/4       3,95+01       1,25-12       8,65+04         V-238       Total       3991-16-3       4/4       6,35-00       165-12       4,65+03         Sediment       All       Total       100       4,14       3,95+01       1,25+12       2,55+04         Water       Organic       Arsenic       7,440-38-2       4/75       5,25+02       1,85+00       1,55+00       1,55+02         Water       Organic       Arsenic       7,440-38-2       5,72+02       3,56+04       1,56+00       1,55+00       1,56+00       1,55+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00       1,56+00 <t< th=""><td></td><td></td><td></td><td>U-235</td><td>15117-96-1</td><td>4/4</td><td>3.5E+00</td><td>2.6E-10</td><td>2.4E+03</td><td>6.2E-07</td></t<>				U-235	15117-96-1	4/4	3.5E+00	2.6E-10	2.4E+03	6.2E-07
U-234         13966-29-5         4/4         13E+02         15E+12         86E+04           Cm-244         13891-15-2         4/4         5.1E+01         16E-12         3.6E+04           U-238         7440-16-3         4/4         5.1E+01         16E-12         3.6E+04           U-238         7440-16-3         4/4         5.1E+01         16E-12         3.6E+04           Valer         Total         7440-16-3         4/4         5.1E+01         1.6E-12         3.6E+04           Sediment         All         Total         7440-38-2         4/14         5.1E+01         1.6E-12         3.6E+02           Water         Inorganic         Arsenic         7440-38-2         4/15         5.2E-02         1.8E+00         1.5E-03           Water         Organic         Peebo         75-09-2         15/29         1.1E-02         1.5E-03         3.6E-04           Water         Organic         Total         1336-36-3         2/30         1.8E-00         1.5E-03         3.6E-04           Water         Organic         Forod         1.8E-03         7.7E+00         5.6E-03         1.6E-04           Water         Organic         Total         75-09-2         1.6E-02         1.6E-04 </th <td></td> <td></td> <td></td> <td>Am-241</td> <td>14596-10-2</td> <td>4/4</td> <td>4.6E+00</td> <td>4.3E-11</td> <td>3.2E+03</td> <td>1.4E-07</td>				Am-241	14596-10-2	4/4	4.6E+00	4.3E-11	3.2E+03	1.4E-07
Cm-244         13981-15-2         4/4         5.1E+01         1.5E-12         3.5E+04           U-238         7440-61-1         4/4         3.9E+01         1.2E-12         3.5E+04           Pu-238         7440-61-1         4/4         3.9E+01         1.2E-12         3.5E+04           Pu-238         15117-48-3         4/4         5.8E-01         1.5E-12         3.5E+04           Sed ext exp         Rationucide         Total         1.01al         101al         101al         4.4         3.9E+01         1.2E-12         3.5E+04           Water         Inorganic         Total         1.01al         1.01al         4.46-03         4.5E+00         1.5E+03           Water         Organic         Arsenic         7.440-38-2         4.75         5.2E+02         1.8E+00         1.5E+03           Water         Organic         PCBs total         1336-36-3         2.30         1.8E+03         1.5E+03         1.5E+03           Water         Organic         Total         75-09-2         15/29         1.8E+00         1.5E+03         1.6E+04           Water         Organic         Total         75-09-2         15/29         1.5E+03         1.6E+04         1.6E+04           Water				U-234	13966-29-5	4/4	1.3E+02	1.5E-12	8.6E+04	1.3E-07
U-23B         7440-61-1         4/4         3.95+01         1.25-12         2.65+04           Pu-23B         13991-16-3         4/4         6.55+00         1.65-12         2.44+03           Pu-23B         15117-48-3         4/4         6.55+00         1.65-12         2.44+03           Sediment         All         Total         7.11-48-3         4/4         6.55+00         1.65-12         2.44+03           Sediment         All         Total         Total         Total         7.06-13         4.35+00         1.55-03         4.44+03           Water         Organic         Arsenic         740-38-2         1/75         5.25-92         1.86+00         1.55-03         3.56-04           Water         Organic         PCBs tabal         1336-36-3         2/30         1.86-03         1.16-03         1.86-04           Water         Organic         Total         75-09-2         15/23         3.66-04         1.86-04           Water         Organic         Total         75-09-2         1.86-03         1.86-04           Water         Organic         Total         6.766-3         6/30         6.46-03         1.86-04           Water         Organic         Total         77-61-3				Cm-244	13981-15-2	4/4	5.1E+01	1.6E-12	3.5E+04	5.6E-08
Pu-238         13981-16-3         4/4         6.5E+00         1.6E-12         4.4E+03           Sed art exp         Rationuckie         Total         8.3E-01         7.0E-13         4.3E+02           Sed art exp         Inorganic         Arsenic         7.01al         1.336-36-3         4/4         6.3E+00         1.6E-12         4.4E+03           Sed art exp         Inorganic         Arsenic         Total         1.01al         1.01al         4.3E+02         4.3E+02           Sediment         Alter         Coganic         Arsenic         7.440-38-2         4/75         5.2E-02         1.8E+00         1.5E-03           Water         Organic         PCBs batal         1336-36-3         2/30         1.8E+00         1.5E-03         3.6E-04           Water         Organic         Forol         1.36-02         7.52-02         1.8E+00         1.5E-03         3.6E-04           Water         Organic         Forol         1.336-36-3         5/7.2E-02         1.8E+00         1.5E-03         3.6E-04           Water         Organic         Total         10038-17-8         6/36         6.4E-03         3.6E-04         1.8E-04           Water         Proporticle         H-3 <th10 46<="" th="">         5.6E-</th10>				U-238	7440-61-1	4/4	3.9E+01	1.2E-12	2.6E+04	3.2E-08
Pu-23s         15117-48-3         4/4         6.3E-01         7.0E-13         4.3E+02           Sed ext exp         Radonucide         Total         All         6.3E-01         7.0E-13         4.3E+02           Sed intent         All         Total         Total         All         (mg/L)         1/(mg/kg/d)         4.3E+02           Water         Organic         Arsenic         740-38-2         4/15         5.2E-02         1.8E+00         1.5E-03           Water         Organic         Problement         Arsenic         740-38-2         1.57.99         1.3E-02         1.5E-03         3.5E-04           Water         Organic         Persbatal         1336-36-3         2/30         1.8E-03         1.1E-02         1.6E-04           Water         Organic         Total         7.7E+00         5.3E-05         1.8E-04           Water         Organic         Total         7.7E+00         5.3E-05         1.6E-04           Water         Organic         Total         7.7E+00         5.7E+03         3.6E-04           Water         Propoloritie         7.5-63         6.12E-02         1.8E-04         1.8E-04           Water         Propoloritie         1.028-17-8         6.766-03				Pu-238	13981-16-3	4/4	6.5E+00	1.6E-12	4.4E+03	7.1E-09
Sed ext exp         Radionucide All         Total           Sediment         All         Total           Arsenic         Total         (mg/L)         1/(mg/kg/d)         (mg/kg/d)           Water         Inorganic         Arsenic         7440-38-2         4/75         5.2E-02         1.8E+00         1.5E-03           Water         Organic         PCBs total         1336-36-3         2/30         1.8E-03         1.5E-03         3.5E-04           Water         Organic         PCBs total         1336-36-3         5/20         1.8E-03         1.5E-03         3.5E-04           Water         Organic         PCBs total         1336-36-3         6/120         5.5E-02         1.8E-03         1.1E-02         1.5E-03           Water         Organic         Total         1336-36-3         6/130         6.4E-03         5.1E-04         1.5E-04           Water         Organic         Total         10/46         5.6E-02         1.16E-01         1.8E-04           Water         Organic         Total         100146         7.774         1.2E-02         1.6E-04         1.5E-04           Water         Organic         Total         1.00045-97-2         5.774         1.5E-02         1.8E-03				Pu-235	15117-48-3	414	6.3E-01	7.0E-13	4.3E+02	3.0E-10
Sediment         Total         Total           Sediment         All         Total         (mg/L)         1/(mg/kg/d)         (mg/kg/d)           Water         Inorganic         Arsenic         7440-38-2         4/75         5.2E-02         1.8E+00         1.5E-03           Water         Organic         Reshtylene choride         75-09-2         15/29         1.8E-03         7.7E+00         5.3E-05           Water         Organic         PCBs total         1336-36-3         2/30         1.8E-03         7.7E+00         5.3E-05           Water         Organic         Trichionoethylene         75-09-2         15/29         1.3E-02         7.5E-03         3.6E-04           Water         Organic         Total         57-66-3         6/766-3         6/16/10         1.6E-04         1.6E-04           Water         Organic         Total         57-66-3         6/766-3         6/16/10         1.8E-03         3.6E-04           Water         Organic         Total         57-66-3         6/766-3         6/16/10         1.8E-04         1.8E-04           Water         Chonucide         H-3         10028-17-8         6/766-3         6/16/10         1.8E-05         5/6-04         1.8E-04	(	-		lete T						4.8E-02
Sedurer         Arsenic         7440-38-2         4/75         5.2E-02         1.8E+00         1.5E-03           Water         Organic         Arsenic         7440-38-2         4/75         5.2E-02         1.8E+00         1.5E-03           Water         Organic         PCBs total         1336-36-3         2/30         1.8E-03         7.7E+00         5.5E-03           Water         Organic         PCBs total         75-09-2         15/29         1.3E-03         3.6E-04           Water         Organic         Trichlorostrylene         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Organic         Total         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Criganic         Total         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Radionucide         H-3         10028-17-8         6/36         6.1E-03         1.1E-02         1.6E-04           Sr-90         10098-97-2         4/366         1.0E+01         8.9E+10         2.2E+05           Water         Radionucide         H-3         10098-97-2         4.366         1.0E+01         2.6E+06	N 6	Sed ext exp	Hadiofiuctioe A H	Total						5E-02
Water         Inorganic         Arsenic         7440-38-2         4/75         5.2E-02         1.8E+00         1.5E-03           Water         Organic         PCBs tatal         1336-36-3         2/30         1.8E-03         1.5E-03         1.5E-03           Water         Organic         PCBs tatal         1336-36-3         2/30         1.8E-03         1.5E-03         3.5E-04           Water         Organic         PCBs tatal         1336-36-3         15/29         1.3E-02         7.5E-03         3.5E-04           Water         Organic         Total         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Organic         Total         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Organic         Total         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Creacio         11.36-03         6.4E-03         6.1E-03         1.8E-04           Water         Radionucide         Sr-90         10028-17-8         63/64         2.6E+04         1.5E-12         5.4E+08           Co-60         10198-40-0         27774         1.2E+01         7.1E+01							(ma/L)	1/(mg/kg/d)	(mg/kg/d)	
Water         Organic         PCBs total         1336-36-3         2/30         1.8E-03         7.7E+00         5.3E-05           Methylene chloride         75-09-2         15/29         1.3E-02         7.5E-03         3.6E-04           Water         Organic         Trichloroethylene         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Organic         Total         67-66-3         6/30         6.4E-03         6.1E-03         1.8E-04           Water         Organic         Total         67-66-3         6/30         6.4E-03         1.1E-02         1.6E-04           Water         Organic         Total         67-66-3         6/30         6.4E-03         6.1E-03         1.8E-04           Water         Crosonic         Total         10028-17-8         6/364         1.6E-04         1.8E-04           Water         Adionuclide         H-3         10028-17-8         6/306         6.4E-03         6.1E-03         1.8E-04           Water         Adionuclide         H-3         1.0028-17-8         6/306         2.6EE+04         1.5E-12         5.4E+08           Co-60         10198-40-0         2.774         1.3E+01         2.16E-01         2.2E+05 <td>2</td> <td>Water</td> <td>Inorganic</td> <td>Arsenic</td> <td>7440-38-2</td> <td>4/75</td> <td>5.2E-02</td> <td>1.8E+00</td> <td>1.5E-03</td> <td>3E-03</td>	2	Water	Inorganic	Arsenic	7440-38-2	4/75	5.2E-02	1.8E+00	1.5E-03	3E-03
Mater         Organic         75-09-2         15/29         1.3E-02         7.5E-03         3.6E-04           Trichloroethylene         79-01-6         10/46         5.6E-03         1.1E-02         1.6E-04           Water         Organic         Total         6.7-66-3         6/30         6.4E-03         6.1E-03         1.8E-04           Water         Organic         Total         6.7-66-3         6/30         6.4E-03         6.1E-03         1.8E-04           Water         Organic         Total         6.7-66-3         6/30         6.4E-03         6.1E-03         1.8E-04           Water         Padionuclide         H-3         10028-17-8         6/3/64         2.6E+04         1.8E-04           Water         Radionuclide         H-3         10028-17-8         6/3/64         2.6E+04         1.5E+12         5.4E+08           Co-60         10198-40-0         27/74         1.3E+01         4.1E-10         2.8E+05         2.6E+05           Eu-152         14683-23-9         2/2         9.5E+01         5.7E+11         2.0E+06         2.6E+05           Kater         Radionuclide         Total         10045-97-3         15/74         1.2E+00         7.6E+10         2.4E+06	c	Water	<u> </u> <u> </u>	PCBs total	1336-36-3	2/30	1.8E-03	7.7E+00	5.3E-05	4E-04
Trichloroethylene     79-01-6     10/46     5.6E-03     1.1E-02     1.6E-04       Water     Organic     Total     6.7-66-3     6/30     6.4E-03     6.1E-03     1.8E-04       Water     Organic     Total     10028-17-8     6/30     6.4E-03     6.1E-03     1.8E-04       Water     Aater     Organic     Total     10028-17-8     6/30     6.4E-03     6.1E-03     1.8E-04       Water     Radionucide     H-3     10028-17-8     6/36     2.6E+04     1.5E-12     5.4E+08       Water     Radionucide     H-3     10028-72     43/66     1.0E+01     8.9E+10     2.2E+05       Co-60     10198-40-0     27/74     1.3E+01     4.1E-10     2.8E+05       Eu-152     14683-23-9     2/2     9.5E+01     5.7E+11     2.0E+06       Water     Radionucide     Total     1.0045-97-3     15/74     1.2E+00     7.6E-10       Water     Ail     Total     10045-97-3     15/74     1.2E+00     7.6E-10     2.4E+04	V	101044		Methylene chloride	75-09-2	15/29	1.3E-02	7.5E-03	3.6E-04	3E-06
Water         Organic         Total         67-66-3         6/30         6.4E-03         6.1E-03         1.8E-04           Water         Organic         Total         (1/164)         (1/164)         (8q/11)         (1/164)         (8q/1164)           Water         Radionuclide         H-3         10028-17-8         63/64         2.6E+04         1.5E-12         5.4E+08           Vater         Radionuclide         H-3         10028-72         43/66         1.0E+01         8.9E-10         2.2E+05           Co-60         10198-40-0         27/74         1.3E+01         4.1E-10         2.8E+05           Eu-152         14683-23-9         2/2         9.5E+01         5.7E-11         2.0E+06           Water         Radionuclide         Total         10045-97-3         15/74         1.2E+00         7.6E-10         2.4E+04           Water         Ail         Total         10045-97-3         15/74         1.2E+00         7.6E-10         2.4E+04				Trichioroethylene	79-01-6	10/46	5.6E-03	1.1E-02	1.6E-04	2E-06
Water         Organic         Total         (1/8q)         (8q/1)         (1/8q)         (1/8q) </th <td></td> <td></td> <td></td> <td>Chloroform</td> <td>67-66-3</td> <td>6/30</td> <td>6.4E-03</td> <td>6.1E-03</td> <td>1.8E-04</td> <td>1E-06</td>				Chloroform	67-66-3	6/30	6.4E-03	6.1E-03	1.8E-04	1E-06
Water         Radionuclide         H-3         10028-17-8         63/64         2.6E+04         1.5E-12         5.4E+08           Sr-90         5-90         10028-17-8         63/64         2.6E+04         1.5E-12         5.4E+08           Sr-90         10098-97-2         43/66         1.0E+01         8.9E-10         2.2E+05           Co-60         10198-40-0         27/74         1.3E+01         4.1E-10         2.2E+05           Eu-152         14683-23-9         2./2         9.5E+01         5.7E-11         2.0E+06           Water         Radionuclide         15585-10-1         5/7         1.2E+00         7.6E-10         2.4E+05           Water         Ail         10045-97-3         15/74         1.2E+00         7.6E-10         2.4E+04	2	Water	Organic	Tota!						4E-04
Water         Radionuclide         H-3         10028-17-8         63/64         2.6E+04         1.5E-12         5.4E+08           Sr-90         17098-97-2         43/66         1.0E+01         8.9E-10         2.2E+05           Co-60         10198-40-0         27/74         1.3E+01         4.1E-10         2.8E+05           Eu-152         14683-23-9         2/74         1.3E+01         4.1E-10         2.8E+05           Eu-154         15585-10-1         5/7         1.3E+01         5.7E-11         2.0E+06           Eu-154         15585-10-1         5/7         1.2E+00         7.6E-10         2.4E+04           Water         Ail         10045-97-3         15/74         1.2E+00         7.6E-10         2.4E+04							(Bq/L)	(1/8q)	(Bq/lifetime)	
Sr-90     10098-97-2     43/66     1.0E+01     8.9E-10     2.2E+05       Co-60     10198-40-0     27/74     1.3E+01     4.1E-10     2.8E+05       Eu-152     14683-23-9     2/2     9.5E+01     5.7E-11     2.0E+06       Eu-154     15585-10-1     5/5     3.3E+01     8.1E-11     6.9E+05       Water     Radionucide     Total     10045-97-3     15/74     1.2E+00     7.6E-10       Water     Ail     Total     10045-97-3     15/74     1.2E+00     7.6E-10     2.4E+04	ç	Water	Backonschilde	H-3	10028-17-8	63/64	2.6E+04	1.5E-12	5.4E+08	8E-04
Co-60     10198-40-0     27/74     1.3E+01     4.1E-10     2.8E+05       Eu-15°     14683-23-9     2/2     9.5E+01     5.7E-11     2.0E+06       Eu-154     15585-10-1     5/5     3.3E+01     8.1E-11     6.9E+05       Water     Radionucide     Total     10045-97-3     15/74     1.2E+00     7.6E-10     2.4E+04       Water     Ail     Total     Total     10045-97-3     15/74     1.2E+00     7.6E-10     2.4E+04	J	2		Sr-90	10098-97-2	43/66	1.0E+01	8.9E-10	2.2E+05	2E-04
Eu-15°     14683-23-9     2/2     9.5E+01     5.7E-11     2.0E+06       Eu-154     15585-10-1     5/5     3.3E+01     8.1E-11     6.9E+05       Cs-137     10045-97-3     15/7.4     1.2E+00     7.6E-10     2.4E+04       Water     Radionuclide     Total       Water     Ail     Total				Co-60	10198-40-0	27174	1.3E+01	4.1E-10	2.8E+05	1E-04
Eu-154 15585-10-1 5/5 3.3E+J1 8.1E-11 6.9E+05 Cs-137 10045-97-3 15/74 1.2E+00 7.6E-10 2.4E+04 Water Radionucide Total Water All Total				Eu-152	14683-23-9	2/2	9.5E+01	5.7E-11	2.0E+06	1E-04
Cs-137 10045-97-3 15/74 1.2E+00 7.6E-10 2.4E+04 Water Radionuclide Total Water All Total				Eu-154	15585-10-1	5/5	3.3E+01	8.1E-11	6.9E+05	6E-05
Water Radionucide Total water All Total				Cs-137	10045-97-3	15/74	1.2E+00	7.6E-10	2.4E+04	2E-05
	ç	Water	Racionucide	Total						1E-03
	1 C	Water	AII	Total						4E-03

Table B1 (continued)

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							•		Constant of the second
					detected	cont bound	slope	Uality	Carcinogen
Reach	Media	Contaminant	Contaminant		to total	on mean	19CIOF	e ve u	screening
00	1 V D O	type	name	CAS no.	samples	(mg/kg wet)	1/(mg/kg/d)	(mg/kg/d)	indices
e	- Fair Fair	Organic	PCB-1254 (Arocior 1254)	11097-69-1	79/79	5.4E-01	7.7E+00	2.6E-04	2E-03
5			PCB-1260 (Arocler 1260)	11096-82-5	79/79	3.8E-01	7.7E+00	1.8E-04	1E-03
e7.	E.	Organic	Total						3E-03
>	5					(Bq/kg wet)	(1/3q)	(Bc,/lifetime)	
~	Eich	Ractions which	Cs-137	10045-97-3	106/106	9.5E+02	7.6E-10	3.3E+05	3E-04
•	2		Sr-90	10098-97-2	13/13	7.3E+01	8.9E-10	2.5E+04	2E-05
			09-00 09-00	10198-40-0	9/70	1.8E+00	4.1E-10	6.2E+02	3E-07
ſ	4-1	Dotionindide	Total						3E-04
<b>"</b> "		Address	Total				÷ .		4E-03
2	Hell A					(mg/kg dry)	(1/Bq)	(Bq/lifetime)	
ç	Cad invaction	Inornanic	Årsenic	7440-38-2	6/60	1.7E+01	1.8E+00	2.4E-05	4E-05
<b>o</b>	noncoffin noo		Bertlium	7440-41-7	40/54	1.2E+00	4.3E+00	1.7E-06	7E-06
e	Sed ingestion	Inorganic	Total				ι.		5E-05
ť	anitonani kao	- Ananin	PCR-1254 (Armdor 1254)	11097-69-1	4/15	3.2E+00	7.7E+00	4.6E-06	4E-05
°	oeu nigenou		tethiana chinida	75-09-2	217	6.0E-01	7.5E-03	8.6E-07	7E-09
			Renzene	71-43-2	1/7	4.5E-02	2.9E-02	6.5E-08	2E-09
			Chloroform	67-56-3	217	1.1E-02	6.1E-03	1.6E-08	1E-10
63	Sed ingestion	Organic	Total						4E-05
						(Bq/kg drv)	(1/8d)	(Bq/lifetime)	
¢	contract to 0	Dadian wide	Ce-137	10045-97-3	223/223	4.8E+04	7.6E-10	5.0E+04	4E-05
ŋ	sed ingestion		09-60 10-60	10199-40-0	204/208	5.0E+04	4.1E-10	5.2E+04	2E-05
			Sr-90	10098-97-2	60/60	5.5E+02	8.9E-10	5.8E+02	5E-07
			Cs-134	13967-70-9	717	1.7E+02	1.1E-09	1.7E+02	2E-07
			Eu-152	14683-23-9	2/2	1.2E+03	5.7E-11	1.2E+03	7E-08
			Eu-154	15585-10-1	6/6	3.5E+02	8.1E-11	3.7E+02	3E-08
			752-11	13966-29-5	1/1	4.2E+00	3.8E-09	4.4E+00	2E-08
			11-235	15117-96-1	1/1	3.2E+00	3.5E-09	3.4E+00	1E-08
			11-238	7440-61-1	1/1	3.0E+00	3.5E-09	3.2E+00	1E-08
			Cm-244	13981-15-2	1/1	1.5E-01	5.4E-09	1.6E-01	9E-10
			Am-241	14596-10-2	1/1	6.3E-02	8.4E-09	6.6E-02	6E-10
			Pu-238	13981-16-3	1/1	5.8E-02	7.6E-09	6.1E-02	5E-10
			Pu-239	15117-48-3	1/1	8.7E-02	8.4E-10	9.1E-02	8E-11
ſ	Sod indetion	Radionischicle	Total						6E-05
<b>o</b> 1	inneshin nac								1 F_AA

Table B1 (continued)

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ReachMediaContaminantno.typetype3Sed ext expRadionucide3Sed ext expRadionucide3WaterInorganic3WaterOrganic3WaterOrganic3WaterOrganic3WaterProgramic3WaterOrganic3WaterOrganic3WaterProgramic3WaterOrganic3WaterProgramic	Contaminant name Co-60 Cs-137 Eu-152 Eu-154 Cs-134 U-235 U-238 Am-241 Cm-244 Pu-238 Pu-238 Pu-238 Pu-239 Total Total	<b>CAS no.</b> 10198-40-0 10045-97-3 14683-23-9 15585-10-1 13967-70-9 15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-15-2 13981-16-3	to total samples 204/208 2/2 2/2 2/2 2/2 2/2 1/1 1/1 1/1 1/1 1/1	on meen 5.0E+04 5.0E+04 4.8E+04 4.8E+04 1.2E+03 3.5E+02 3.5E+02 3.2E+00 3.0E+00 6.3E-02 1.5E-01 5.8E-02 8.7E-02	factor (1/Bq) 3.5E-09 9.2E-10 1.7E-09	Intake (3g/lifetime) 3.45±07	screening indices
type Sed ext exp Sediment Water Water Water	name Co-60 Cs-137 Eu-152 Eu-154 Cs-134 U-234 U-238 Am-241 Cm-244 Pu-238 Pu-238 Pu-239 Total Total	<b>CAS no.</b> 10198-40-0 10045-97-3 14683-23-9 15585-10-1 13967-70-9 15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-15-2 13981-16-3 15117-48-3	samples 204/208 2/2 2/2 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1	(Bq/kg dry) 5.0E+04 5.0E+04 4.8E+04 1.2E+03 3.5E+02 3.2E+00 3.2E+00 3.0E+00 6.3E-02 1.5E-01 5.8E-02 8.7E-02	(1/8q) 3.5E-09 9.2E-10 1.7E-09	(3g/ilfetime)	indicas
Sed ext exp Sed ext exp Sed ext exp Water Water Water	Co-60 Cs-137 Eu-152 Eu-154 Cs-134 U-234 U-238 Am-241 Cm-244 Pu-238 Pu-239 Pu-239 Total	10198-40-0 10045-97-3 14683-23-9 15585-10-1 13967-70-9 15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-15-2 13981-16-3 15117-48-3	204/208 2/2 2/2 9/9 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/38	5.0E+04 4.8E+04 4.8E+04 1.2E+03 3.5E+02 3.2E+00 4.2E+00 3.0E+00 6.3E-02 5.8E-02 5.8E-02 8.7E-02	3.5E-09 9.2E-10 1.7E-09	3 4F+07	
Sed ext exp Sediment Water Water Water	Cs-137 Eu-152 Eu-154 Cs-134 U-234 U-234 U-238 Am-241 Cm-244 Pu-238 Pu-239 Total Total	10045-97-3 14683-23-9 15585-10-1 13967-70-9 15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-15-2 13981-16-3 15117-48-3	223/223 2/2 9/9 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/38	4.8E+04 1.2E+03 3.5E+02 1.7E+02 3.2E+00 4.2E+00 3.0E+00 6.3E-02 5.8E-02 5.8E-02 8.7E-02	9.2E-10 1.7E-09		1.2E-01
Sed ext exp Sediment Water Water Water	Eu-152 Eu-154 Cs-134 U-235 U-234 U-234 Am-241 Am-241 Cm-244 Pu-239 Pu-239 Total Total	14683-23-9 15585-10-1 13967-70-9 15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-15-2 13981-16-3 15117-48-3	2/2 9/9 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/38	1.2E+03 3.5E+02 1.7E+02 3.2E+00 4.2E+00 3.0E+00 6.3E-02 5.8E-02 5.8E-02 8.7E-02	1.7E-09	3.3E+07	3.0E-02
Sed ext exp Sediment Water Water Water	Eu-154 Cs-134 U-235 U-238 U-238 Am-241 Am-241 Cm-244 Pu-238 Pu-239 Total Total	15585-10-1 13967-70-9 15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-15-2 13981-16-3 15117-48-3	9/9 7/7 1/1 1/1 1/1 1/1 1/1 1/1 2/38	3.5E+02 1.7E+02 3.2E+00 4.2E+00 3.0E+00 6.3E-02 5.8E-02 5.8E-02 8.7E-02		8.0E+05	1.4E-03
Sed ext exp Sediment Water Water Water	Cs-134 U-235 U-234 U-238 Am-241 Am-241 Pu-238 Pu-239 Total Total	13967-70-9 15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-16-3 15117-48-3	7/7 1/1 1/1 1/1 1/1 1/1 1/1 2/38	1.7E+02 3.2E+00 4.2E+00 3.0E+00 6.3E-02 1.5E-01 5.8E-02 8.7E-02	1.8E-09	2.4E+05	4.4E-04
-	U-235 U-234 U-238 Am-241 Cm-244 Pu-238 Pu-239 Total Total	15117-96-1 13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-16-3 15117-48-3	1/1 1/1 1/1 1/1 1/1 2/38	3.2E+00 4.2E+00 3.0E+00 6.3E-02 1.5E-01 5.8E-02 8.7E-02	2.4E-09	1.1E+05	2.7E-04
Sed ext exp Sediment Water Water Water	U-234 U-238 Am-241 Cm-244 Pu-238 Pu-239 Total Total	13966-29-5 7440-61-1 14596-10-2 13981-15-2 13981-16-3 15117-48-3	1/1 1/1 1/1 1/1 1/1 2/38	4.2E+00 3.0E+00 6.3E-02 1.5E-01 5.8E-02 8.7E-02	2.6E-10	2.2E+03	5.7E-07
Sed ext exp Sediment Water Water Water	u-238 Ат-241 Ст-244 Рu-238 Рu-239 Total Total	7440-61-1 14596-10-2 13981-15-2 13981-16-3 15117-48-3	1/1 1/1 1/1 1/1 2/38	3.0E+00 6.3E-02 1.5E-01 5.8E-02 8.7E-02	1.5E-12	2.9E+03	4.3E-09
Sed ext exp Sediment Water Water Water	Am-241 Cm-244 Pu-238 Pu-239 Total Total	14596-10-2 13981-15-2 13981-16-3 15117-48-3	1/1 1/1 1/1 1/1 2/38	6.3E-02 1.5E-01 5.8E-02 8.7E-02	1.2E-12	2.1E+03	2.5E-09
Sed ext exp Sediment Water Water Water	Cm-244 Pu-238 Pu-239 Total Total	13981-15-2 13981-16-3 15117-48-3	1/1 1/1 1/1 2/38	1.5E-01 5.8E-02 8.7E-02	4.3E-11	4.3E+01	1.9E-09
Sed ext exp Sediment Water Water Water	Pu-238 Pu-239 Total Total	13981-16-3 15117-48-3	1/1 1/1 2/38	5.8E-02 8.7E-02	1.6E-12	1.0E+02	1.6E-10
Sed ext exp Sediment Water Water Water	Pu-239 Total Total	15117-48-3	2/38	8.7E-02	1.6E-12	4.0E+01	6.4E-11
Sed ext exp Sediment Water Water Water	Total		2/38		7.0E-13	6.0E+01	4.2E-11
Sediment Water Water Water Water	Total		2/38				1.5E-01
Water Water Water Water			2/38				2E-01
Water Water Water			2/38	(1)247)	1//mc/ka/d/	(ma/ka/d)	
Water Water Water	Arsenic	7440-38-2		4.7E-02	1.8E+00	1.3E-03	2E-03
water Water Water	DCRe Intal		2/30	2.0E-03	7.7E+00	5.7E-05	4E-04
Water Water	Tetrachlorrethviene		1/28	7.1E-03	5.1E-02	2.0E-04	1E-05
Water Water	Methologic Alorida	75-09-2	16/28	1.3E-02	7.5E-03	3.8E-04	3E-06
Water Water	Trichlorcethylene		1/44	6.3E-03	1.1E-02	1.8E-04	2E-06
Water Water	Chloroform	67-66-3	12/29	5.9E-03	6.1E-03	1.7E-04	1E-06
Water	Total						5E-04
Water				(8q/L)	(1/8q)	(Bq/lifetime)	
	H-3	10023-17-8	49/49	1.0E+04	1.5E-12	2.1E+08	3E-04
	Sr-90	10098-97-2	51/51	7.5E+00	8.9E-10	1.6E+05	1E-04
	Ce-137	10045-97-3	131/135	3.7E+00	7.6E-10	7.8E+04	6E-05
	U-234	13966-29-5	1/1	1.9E-01	3.8E-ú9	4.0E∻03	2E-05
	U-235	15117-96-1	1/1	6.4E-02	3.5E-09	1.3E+03	5E-06
	Cm-244	13981-15-2	8/10	3.7E-02	5.4E-09	7.7E+02	4E-06
	Am-241	14596-10-2	14/19	2.2E-02	8.4E-09	4.6E+02	4E-06
	Co-60	10198-40-0	103/135	3.8E-01	4.1E-10	8.0E+03	3E-06
	U-238	7440-61-1	1/1	3.4E-02	3.5E-09	7.1E+02	3E-06
	Pu-238	13981-16-3	5/20	5.1E-03	7.6E-09	1.1E+02	8E-07
	Pu-239	15117-48-3	11/20	8.4E-03	8.4E-10	1.8E+02	2E-07
a Water Badionuclide	Total						6E-04
Water	Total						3E-03

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Table B2.	
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Cn mean         RD         Intake           (mg/kg wet)         (mg/kg/d)         (mg/kg/d)           4.1E-01         3.0E-04         3.8E-04           4.5E-01         3.0E-03         4.2E-04           6.9E-02         5.0E-04         6.5E-05           4.35E-01         3.7E-02         3.9E-03           4.5E-01         3.7E-02         3.7E-04           6.9E-02         5.0E-04         6.5E-05           4.35E+00         2.0E-01         3.9E-03           4.0E-01         3.7E-02         3.7E-04           8.9E+00         4.0E-04         1.3E-05           8.9E+00         4.0E-04         1.3E-05           8.9E+00         4.0E-04         1.3E-05           1.8E+02         2.0E-03         2.6E-05           9.5E+00         3.0E-03         1.1E-05           1.8E+02         3.0E-03         1.1E-05           1.8E+00         3.0E-03         1.1E-05           1.8E+01         5.0E-03         3.0E-04           3.3E+01         5.0E-03         3.0E-05           3.3E-01         5.0E-03         3.0E-05           3.3E-01         5.0E-03         3.0E-05           3.3E-01         5.0E-03						Ratio of	95% upper	Oral	Daliv	Noncarcinogen
Type         Type         Type         CAS no.         semples         (mg/kg/d)         (mg/kg/d)	Reach	<b>il</b> edis	Conteminant	Contaminant		to total	on mean	02	Intake	screening
Fish         Inoganic         Mercury         7439-97-6         87/87         4.1E-01         3.0E-04         3.8E-04           Cadmium         7400-50-9         35/35         4.5E-01         3.0E-04         3.8E-04           Fish         Inoganic         7400-50-9         35/35         4.3E+00         2.0E-01         3.9E-04           Fish         Nord         7400-50-9         22/35         4.3E+00         2.9E-01         3.9E-03           Fish         All         Total         7400-50-9         22/35         4.3E+00         3.7E-02         3.7E-04           Fish         All         Total         7400-50-9         22/35         4.9E-01         3.7E-02         3.7E-04           Fish         All         Total         7400-50-9         22/35         4.9E-01         3.7E-02         3.7E-04           Sodiment         Inorganic         Altimony         7440-30-2         27/31         1.8E+02         2.6E-03         3.7E-04           Nickel         7440-37-5         13/31         1.8E+02         2.6E-03         3.7E-02         2.6E-03         3.7E-04         1.3E-02         2.6E-03         2.6E-03         2.6E-03         2.6E-04         1.3E-02         2.6E-04         1.3E-02         2.6E-	Ő	ÎVDO	tvpe	name	CAS no.	sampies	(mg/kg wet)	(mg/kg/d)	(mg/kg/d)	Indices
Selentim         7782-49-2         35/35         4.5E-01         3.0E-03         4.2E-04           Zinc         7440-56-6         35/35         4.5E-01         3.0E-03         4.2E-04           Zinc         7440-56-6         35/35         4.5E-01         3.0E-03         4.2E-04           Copper         7440-50-8         35/35         4.0E-01         3.7E-02         3.7E-03           All         Total         7440-50-8         22/35         4.0E-01         3.7E-02         3.7E-04           All         Total         7440-50-8         22/35         4.0E-01         3.7E-02         3.7E-03           All         Total         7440-50-8         22/33         1.8E+00         2.7E-03         3.7E-05           Arsenic         7440-37         7440-37         1.8E+00         3.0E-04         1.3E-05           Mercury         7440-37         1.9127         8.9E+00         1.2E-06         2.5E-04           Arsenic         7440-47-3         2.331         1.8E+00         3.0E-04         3.7E-05           Mercury         7440-47-3         2.3131         1.8E+01         5.6E-06         2.5E-04           Seleraium         7440-47-3         2.3131         1.8E+01         3.6E-05 <td>-</td> <td>Eeh</td> <td>Inorganic</td> <td>Mercury</td> <td>7439-97-6</td> <td>87/87</td> <td>4.1E-01</td> <td>3.0E-04</td> <td>3.8E-04</td> <td>1E+00</td>	-	Eeh	Inorganic	Mercury	7439-97-6	87/87	4.1E-01	3.0E-04	3.8E-04	1E+00
Cadmium         7440-43-9         35/43         6.9E-02         5.0E-04         6.5E-05           Zinc         7440-66-6         35/35         4.3E+00         2.0E-01         3.9E-03           Zinc         Total         T440-50-8         25/35         4.3E+00         2.0E-01         3.9E-03           All         Total         T440-50-8         22/35         4.0E-01         3.7E-02         3.7E-04           All         Total         Tata-be-         11/27         8.9E+00         2.0E-04         3.7E-02           Antimory         7440-22-0         27/31         1.8E+02         2.0E-04         1.3E-05           Nickel         7440-39-2         27/31         1.8E+00         3.0E-04         1.3E-05           Arscury         7440-39-2         27/31         1.8E+01         2.0E-03         2.6E-05           Arscury         7440-39-2         2/313         1.8E+01         3.0E-03         2.6E-05           Arscury         7440-39-2         2/313         1.8E+01         3.0E-03         2.6E-05           Barium         7440-47-3         2/313         1.8E+01         3.0E-03         2.6E-05           Silver         7440-65-6         2/313         1.8E+01         7.6E-02	-	5		Selenium	7782-49-2	35/35	4.5E-01	3.0E-03	4.2E-04	1E-01
Zinc         7440-66-6         35/35         4.3E+00         2.0E-01         3.9E-03           Inorganic         Total         Antimony         7440-50-8         2.2/35         4.0E-01         3.7E-02         3.7E-04           All         Total         Antimony         7440-50-8         2.2/35         4.0E-01         3.7E-02         3.7E-04           All         Total         Antimony         7440-36-0         1/1/27         8.9E+00         4.0E-04         1.3E-05           Antimony         7440-36-0         1/1/27         8.9E+00         4.0E-04         1.3E-05           Nickel         7440-39-2         1/1/27         8.9E+00         3.0E-04         1.3E-05           Antimony         7440-39-2         1/1/27         8.9E+00         3.0E-04         1.3E-05           Mercury         7440-47-3         2.3/31         1.8E+00         3.0E-04         2.5E-06           Barium         746-39-3         3/1/31         1.8E+00         3.0E-03         2.6E-05           Sinedu         7440-39-3         3/1/31         1.8E+00         3.0E-04         3.7E-02           Sinedu         7440-22-4         3/1/31         3.8E+01         3.0E-04         3.7E-05           Sinedu				Cadmium	7440-43-9	35/43	6.9E-02	5.0E-04	6.5E-05	1E-01
Inorganic         Total         740-50-8         22/35         4.0E-01         3.7E-02         3.7E-04           All         Total         Antimony         7440-50-8         22/35         4.0E-01         3.7E-02         3.7E-04           All         Total         Antimony         7440-36-0         11/27         8.9E+00         4.0E-04         1.3E-05         3.7E-04           Increamic         Antimony         7440-02-0         27/31         1.8E+02         2.0E-02         2.5E-04         1.3E-05           Nicket         7440-38-2         13/31         1.8E+00         3.0E-03         1.1E-05           Mercury         7440-47-3         2.3/31         1.8E+00         3.0E-04         1.8E-05         2.5E-06           Selenium         7782-92         1.313         1.8E+02         7.0E-02         2.5E-06         2.6E-05				Zine	7440-66-6	35/35	4.3E+00	2.0E-01	3.9E-03	2E-02
Inorganic         Total           All         Total           All         Total           All         Total           Inorganic         Total           Inorganic         Total           Inorganic         Total           Inorganic         Antimony         740-36-0         11/27         8.9E+00         4.0E-04         1.3E-05           Nickei         7440-38-2         13/31         7.5E+00         1.0E-03         1.1E-05           Mercury         7439-97-6         19/19         1.8E+01         2.0E-02         2.75E-00         1.1E-05           Mercury         7440-47-3         2.3/31         1.8E+01         5.0E-03         1.1E-05           Silver         7440-47-3         2.3/31         1.8E+01         3.0E-04         3.0E-04           Silver         7440-42-2         2.0/22         1.3E+01         7.0E-02         2.6E-05           Wolybdenum         7440-65-2         2.0/22         1.3E+02         7.0E-02         3.0E-04           Zinc         7440-42-9         5/27         4.7E+00         3.0E-04         3.0E-05           Rendmin         7440-65-2         2.0/22         1.3E+02         7.0E-02         3.0E-05         3.				Cooner	7440-50-8	22/35	4.0E-01	3.7E-02	3.7E-04	1E-02
All         Total           All         Total           Inorganic         Antimony         7440-36-0         11/27         8.9E+00         40E-04         1.3E-05           Nickel         7440-02-0         27/31         1.8E+02         2.0E-02         2.5E-04           Arsenic         7440-37-3         23/31         1.8E+02         2.0E-02         2.5E-06           Arsenic         7440-47-3         23/31         1.8E+02         2.0E-02         2.5E-06           Arsenic         7440-47-3         23/31         1.8E+02         3.0E-03         1.1E-05           Selenium         7440-47-3         23/31         1.8E+00         3.0E-03         1.1E-05           Selenium         7440-47-3         23/31         1.8E+00         3.0E-03         2.6E-05           Silver         7440-47-3         23/31         1.8E+00         3.0E-04         3.0E-04           Silver         7440-52-2         2/31         3.8E+01         3.0E-03         3.1E-05           Silver         7440-52-8         3/31/31         1.8E+02         3.0E-04         4.7E-05           Silver         7440-52-8         2/31         3.5E+01         3.6E-03         3.6E-04           Silver		Fish	Inorganic	Total						2E+00
Inorganic         Antimony         7440-36-0         11/27         8.9E+00         4.0E-04         1.3E-05           Nickel         7440-02-0         27/31         1.8E+02         2.0E-02         2.5E-04           Arsenic         7440-38-2         13/31         7.5E+00         1.0E-03         1.1E-05           Mercury         7440-38-2         13/31         7.5E+00         1.0E-03         1.1E-05           Mercury         7440-38-2         19/19         1.8E+02         2.0E-02         2.5E-04           Stearium         7440-39-3         3.1/31         1.8E+01         3.0E-03         2.5E-04           Store         7440-39-3         3.1/31         1.8E+02         2.0E-02         2.5E-04           Store         7440-47-3         2.3/31         1.8E+01         5.0E-03         2.6E-05           Store         7440-66-2         2/31         1.8E+02         2.0E-02         2.5E-04           Store         7440-66-2         2/31         1.8E+02         3.0E-03         1.4E-05           Barium         7440-66-2         2/31         1.8E+02         3.0E-03         2.6E-04           Copper         7440-66-6         3.1/31         1.8E+02         3.0E-04         3.0E-05 <td>Ŧ</td> <td>Fish</td> <td>AII</td> <td>Total</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ZE+UV</td>	Ŧ	Fish	AII	Total						ZE+UV
Inorganic         Antimony         740-36-0         11/27         8.9E+00         4.0E-04         1.3E-05           Nickel         7440-02-0         27/31         1.8E+02         2.0E-02         2.5E-04           Arsenic         7440-02-0         27/31         1.8E+02         2.0E-03         1.1E-05           Arsenic         7440-39-2         19/19         1.8E+01         3.0E-04         2.5E-04           Arsenic         7439-97-6         19/19         1.8E+01         3.0E-03         2.1E-05           Mercury         7430-47-3         2.3/31         1.8E+01         5.0E-03         2.6E-05           Selentum         7782-49-2         2/31         1.8E+01         5.0E-03         2.6E-05           Selentum         7440-47-3         2.3/31         1.8E+01         5.0E-03         2.6E-05           Vanadium         7440-62-2         2.012         1.3E+01         7.0E-02         2.5E-04           Vanadium         7440-62-2         2.0722         1.3E+01         7.0E-02         2.6E-05           Silver         7440-62-2         1.3/31         5.7E+00         3.0E-03         1.4E-05           Silver         7440-62-2         5.0722         1.3E+01         7.0E-02         2.6E-05							(mg/kg dry)	(mg/kg/d)	(mg/kg/d)	
Nicket       7440-02-0       27/31       1.8E+02       2.0E-02       2.5E-04         Arsenic       7440-38-2       13/31       7.5E+00       1.0E-03       1.1E-05         Mercury       7439-97-6       19/19       1.8E+02       2.0E-02       2.5E-06         Mercury       7439-97-6       19/19       1.8E+00       3.0E-04       2.5E-06         Chronnium       7440-47-3       2.3/31       1.8E+01       5.0E-03       2.6E-05         Seleraium       7782-49-2       2.313       1.8E+01       5.0E-03       2.6E-05         Seleraium       7440-62-2       2.013       1.8E+02       7.0E-02       2.5E-04         Vanadium       7440-62-2       2.0722       1.3E+01       7.0E-02       2.5E-04         Vanadium       7440-62-2       2.0722       1.3E+02       7.0E-02       2.5E-04         Vanadium       7440-62-2       2.0722       1.3E+02       7.0E-02       2.5E-04         Silver       7440-52-2       2.0722       1.3E+02       3.0E-04       3.0E-04         Copper       7440-62-8       2/731       3.15E+02       3.0E-04       3.0E-04         Rendim       7440-63-9       10/731       3.3E-01       5.0E-04       3.7E	•	Codiment	Inornanin	Antimony	7440-36-0	11/27	8.9E+00	4.0E-04	1.3E-05	3E-02
Arsenic       740-38-2       13/31       7.55+00       1.0E-03       1.1E-05         Mercury       7439-97-6       19/19       1.8E+00       3.0E-04       2.5E-06         Mercury       7440-47-3       2.3/31       1.8E+01       5.0E-03       2.6E-05         Chronium       7440-47-3       2.3/31       1.8E+01       5.0E-03       2.6E-05         Selenium       7440-39-3       3.1/31       1.8E+02       7.0E-02       1.4E-05         Vanadium       7440-52-2       2.0/22       1.3/31       5.7E+00       3.0E-03       1.4E-05         Nolybdenum       7440-52-4       13/31       5.7E+00       3.0E-03       1.9E-05       2.5E-04         Molybdenum       7440-52-4       13/31       5.7E+00       3.0E-03       6.7E-06         Molybdenum       7440-52-4       13/31       5.7E+00       3.0E-03       6.7E-06         Molybdenum       7440-52-8       2/27       4.7E+00       3.0E-03       6.7E-06         Room       7440-56-6       3.1/31       3.5E+01       3.0E-01       3.0E-03       6.7E-06         Room       7440-43-9       16/31       3.7E-01       3.0E-01       3.0E-03       6.7E-06         Beryllium       744	-	MUNINAS		Nickel	7440-02-0	27/31	1.8E+02	2.0E-02	2.5E-04	1E-02
Mercury         7439-97-6         19/19         1.8E+00         3.0E-04         2.5E-06           Chromium         7440-47-3         23/31         1.8E+01         5.0E-03         2.6E-05           Selenium         7782-49-2         2/31         9.5E+00         3.0E-04         2.5E-06           Barium         7782-49-2         2/31         1.8E+01         5.0E-03         2.6E-05           Selenium         7440-39-3         31/31         1.8E+02         7.0E-02         2.5E-04           Vanadium         7440-62-2         20/22         1.3E+01         7.0E-03         1.4E-05           Silver         7440-62-6         31/31         5.7E+00         3.0E-04         3.0E-04           Zinc         7440-62-6         31/31         5.7E+00         3.0E-01         3.0E-04           Zinc         7440-66-6         31/31         5.7E+00         3.0E-01         3.0E-04           Zinc         7440-50-8         27/31         3.1E+02         2.0E-01         3.0E-04           Beryllium         7440-43-9         16/31         3.5E+01         3.7E-02         5.0E-05           Boron         7440-43-5         9/30         7.1E+00         9.0E-03         6.2E-07           Boron				Arsenic	7440-38-2	13/31	7.5E+00	1.0E-03	1.1E-05	1E-02
Chromium       7440-47-3       23/31       1.8E+01       5.0E-03       2.6E-05         Selenium       7782-49-2       2/31       9.5E+00       3.0E-03       1.4E-05         Barium       7782-49-2       2/31       9.5E+00       3.0E-03       1.4E-05         Barium       7440-62-2       20/22       1.3E+01       7.0E-02       2.5E-04         Vanadium       7440-62-2       20/22       1.3E+01       7.0E-03       1.9E-05         Silver       7440-62-2       20/22       1.3E+01       7.0E-03       8.2E-06         Molybdenum       7430-98-7       5/27       4.7E+00       3.0E-03       8.2E-06         Zinc       7440-50-8       21/31       2.1E+02       2.0E-01       3.0E-04         Zinc       7440-50-8       27/31       3.5E+01       3.6E-01       3.0E-04         Copper       7440-43-9       16/31       3.5E-01       3.0E-04       4.7E-07         Beryllium       7440-43-9       16/31       3.7E-02       5.0E-03       6.2E-07         Beryllium       7440-43-5       9/20       7.0E+00       9.0E-03       6.2E-07         Beryllium       7440-43-5       9/20       7.0E+00       9.0E-03       6.2E-07 </th <td></td> <td></td> <td></td> <td>Mercury</td> <td>7439-97-6</td> <td>19/19</td> <td>1.8E+00</td> <td>3.0E-04</td> <td>2.5E-06</td> <td>9E-03</td>				Mercury	7439-97-6	19/19	1.8E+00	3.0E-04	2.5E-06	9E-03
Selenium       7782-49-2       2/31       9.5E+00       3.0E-03       1.4E-05         Barium       7440-39-3       31/31       1.8E+02       7.0E-02       2.5E-04         Barium       7440-62-2       20/22       1.3E+01       7.0E-02       2.5E-04         Silver       7440-62-2       20/22       1.3E+01       7.0E-02       2.5E-04         Silver       7440-62-2       20/22       1.3E+01       7.0E-03       8.2E-06         Molybdenum       7439-98-7       5/27       4.7E+00       3.0E-03       8.2E-06         Zinc       7440-50-8       31/31       2.1E+02       2.0E-01       3.0E-04         Copper       7440-50-8       27/31       3.5E+01       3.0E-04       4.7E-07         Beryllium       7440-43-9       16/31       3.3E-01       5.0E-03       6.2E-07         Boron       7440-41-7       19/27       4.3E-01       5.0E-05       5.0E-05         Tin       7440-31-5       9/20       7.0E+00       9.0E-02       5.0E-07         Boron       7440-41-7       19/27       4.3E-01       5.0E-03       6.2E-07         Boron       7440-31-5       9/20       7.0E+00       9.0E-02       1.0E-05				Chronium	7440-47-3	23/31	1.8E+01	5.0E-03	2.6E-05	5E-03
Barium       7440-39-3       31/31       1.8E+02       7.0E-02       2.5E-04         Vanadium       7440-62-2       20/22       1.3E+01       7.0E-03       1.9E-05         Silver       7440-62-2       20/22       1.3E+01       7.0E-03       1.9E-05         Silver       7440-62-2       20/22       1.3E+01       7.0E-03       1.9E-05         Molybdenum       7439-98-7       5/27       4.7E+00       3.0E-03       6.7E-06         Zinc       7440-66-6       31/31       2.1E+02       2.0E-01       3.0E-04         Copper       7440-50-8       27/31       3.5E+01       3.7E-02       5.0E-05         Beryllium       7440-43-9       16/31       3.3E-01       5.0E-03       6.2E-07         Boron       7440-42-8       9/30       7.1E+00       9.0E-03       6.2E-07         Boron       7440-42-8       9/30       7.1E+00       9.0E-02       1.0E-05         Inorganic       Total       1       19/27       4.3E-01       5.0E-03       6.2E-07         Ait       Total       9/20       7.0E+00       9.0E-02       1.0E-05       1.0E-05         Min       70tel       9/20       7.0E+00       9.0E-01       1.0E				Selenium	7782-49-2	2/31	9.5E+00	3.0E-03	1.4E-05	5E-03
Vanadium       7440-62-2       20/22       1.3E+01       7.0E-03       1.9E-05         Silver       7440-62-4       13/31       5.7E+00       3.0E-03       8.2E-06         Silver       7440-22-4       13/31       5.7E+00       3.0E-03       8.2E-06         Molybdenum       7439-98-7       5/27       4.7E+00       4.0E-03       6.7E-06         Zinc       7440-66-6       31/31       2.1E+02       2.0E-01       3.0E-04         Copper       7440-50-8       27/31       3.5E+01       3.7E-02       5.0E-05         Beryllium       7440-43-9       16/31       3.3E-01       5.0E-03       6.2E-07         Boron       7440-42-8       9/30       7.1E+00       9.0E-03       6.2E-07         Boron       7440-42-8       9/30       7.1E+00       9.0E-03       6.2E-07         Morganic       Total       7.0E+00       6.0E-01       1.0E-05         Ali       Total       9/20       7.0E+00       6.0E-01       1.0E-05				Ranium	7440-39-3	31/31	1.8E+02	7.0E-02	2.5E-04	4E-03
Silver         7440-22-4         13/31         5.7E+00         3.0E-03         8.2E-06           Molybdenum         7439-98-7         5/27         4.7E+00         3.0E-03         6.7E-06           Zinc         7440-66-6         31/31         2.1E+02         2.0E-01         3.0E-04           Copper         7440-50-8         27/31         3.5E+01         3.7E-02         5.0E-05           Copper         7440-43-9         16/31         3.5E+01         3.7E-02         5.0E-05           Copper         7440-43-9         16/31         3.3E-01         5.0E-04         4.7E-07           Beryllium         7440-41-7         19/27         4.3E-01         5.0E-03         6.2E-07           Boron         7440-42-8         9/30         7.1E+00         9.0E-02         1.0E-05           Tin         7440-31-5         9/20         7.0E+00         6.0E-01         1.0E-05           Ait         Total         Ait         7.0E+00         6.0E-01         1.0E-05				Vanadium	7440-62-2	20/22	1.3E+01	7.0E-03	1.9E-05	3E-03
Molybdenum         7439-98-7         5/27         4.7E+00         4.0E-03         6.7E-06           Zinc         7440-66-6         31/31         2.1E+02         2.0E-01         3.0E-04           Copper         7440-50-8         27/31         3.5E+01         3.7E-02         5.0E-05           Copper         7440-43-9         16/31         3.3E+01         3.7E-02         5.0E-05           Beryllium         7440-43-9         16/31         3.3E-01         5.0E-03         6.2E-07           Boron         7440-41-7         19/27         4.3E-01         5.0E-03         6.2E-07           Boron         7440-42-8         9/30         7.1E+00         9.0E-02         1.0E-05           Tin         7440-31-5         9/20         7.0E+00         6.0E-01         1.0E-05           Min         Total         Ait         7.0E+00         6.0E-01         1.0E-05				Silver	7440-22-4	13/31	5.7E+00	3.0E-03	8.2E-06	3E-03
Zinc       7440-66-6       31/31       2.1E+02       2.0E-01       3.0E-04         Zinc       7440-50-8       27/31       3.5E+01       3.7F-02       5.0E-05         Copper       7440-43-9       16/31       3.3E-01       5.0E-04       4.7E-07         Beryllium       7440-41-7       19/27       4.3E-01       5.0E-03       6.2E-07         Boron       7440-42-8       9/30       7.1E+00       9.0E-32       1.0E-05         Tin       7440-31-5       9/20       7.0E+00       6.0E-01       1.0E-05         Ait       Total       1040       7.0E+00       6.0E-01       1.0E-05				Molybdenum	7439-98-7	5/27	4.7E+00	4.0E-03	6.7E-06	2E-03
Copper         7440-50-8         27/31         3.5E+01         3.7E-02         5.0E-05           Cadmium         7440-43-9         16/31         3.3E-01         5.0E-04         4.7E-07           Beryllium         7440-41-7         19/27         4.3E-01         5.0E-03         6.2E-07           Boron         7440-42-8         9/30         7.1E+00         9.0E-32         1.0E-05           Tin         7440-31-5         9/20         7.0E+00         6.0E-01         1.0E-05           Min         Total         1         7.0E+00         6.0E-01         1.0E-05				Zinc	7440-66-6	31/31	2.1E+02	2.0E-01	3.0E-04	2E-03
Cadmium         7440-43-9         16/31         3.3E-01         5.0E-04         4.7E-07           Baryllium         7440-43-9         16/31         3.3E-01         5.0E-03         6.2E-07           Baryllium         7440-42-8         9/30         7.1E+00         9.0E-02         1.0E-05           Tin         7440-31-5         9/20         7.0E+00         6.0E-01         1.0E-05           Tin         7440-31-5         9/20         7.0E+00         6.0E-01         1.0E-05           Ali         Total         Total         1         1         1         0				Conner	7440-50-8	27/31	3.5E+01	3.7E-02	5.0E-05	1E-03
Beryflium 7440-41-7 19/27 4.3E-01 5.0E-03 6.2E-07 Boron 7440-42-8 9/30 7.1E+00 9.0E-02 1.0E-05 Tin 7440-31-5 9/20 7.0E+00 6.0E-01 1.0E-05 Inorganic Total Ali Totel				Cadmium	7440-43-9	16/31	3.3E-01	5.0E-04	4.7E-07	9E-04
Boron 7440-42-8 9/30 7.1E+00 9.0E-02 1.0E-05 Tin 7440-31-5 9/20 7.0E+00 6.0E-01 1.0E-05 Inorganic Total Ali Total				Rendlinm	7440-41-7	19/27	4.3E-01	5.0E-03	6.2E-07	1E-04
Tin 7440-31-5 9/20 7.0E+00 6.0E-01 1.0E-05 Inorganic Total Ali Totel				Boron	7440-42-8	9/30	7.1E+00	9.0E-32	1.0E-05	1E-04
Inorganic Total Ali Total				Tin	7440-31-5	9/20	7.0E+00	6.0E-01	1.0E-05	2E-05
Ali Totel	Ŧ	Codimont	increatio	Total						9E-02
	- 🕶	Cadimon <sup>6</sup>	All	Total						9E-02

Jaco					detected	coni bound	Oral	Daily	Noncarcinogen
itaati	Media	Contaminant	Contaminant		to total semples	on mean	RfD (ma/ka/d)	intake (ma/ka/d)	screening indices
- 10.	Water	locanic Incoanic	Thallium	7440-28-0	1/1	8.6E-02	7.0E-05	2.5E-03	4E+01
	10101		Chromium	7440-47-3	25/32	1.1E-02	5.0E-03	3.2E-04	6E-02
			Copper	7440-50-8	11/32	2.3E-02	3.7E-02	6.5E-04	2E-02
			Barium	7440-39-3	3/3	3.7E-02	7.0E-02	1.1E-03	2E-02
			Nickel	7440-02-0	4/32	8.4E-03	2.0E-02	2.4E-04	1E-02
			Mercury	7439-97-6	9/32	7.8E-05	3.0E-04	2.2E-06	7E-03
			Zinc	7440-66-6	31/32	4.3E-02	2.0E-01	1.2E-03	6E-03
-	Water	Inorganic	Total						4E+01
	Water	Organic	Tetrachlorcethviene	127-18-4	1/29	7.0E-03	1.0E-02	2.0E-04	2E-02
-			Chloroform	67-66-3	18/30	6.0E-03	1.0E-02	1.7E-04	2E-02
			Dichlorobromomethane	75-27-4	3/29	6.8E-03	2.0E-02	1.9E-04	1E-02
			Methylene chloride	75-09-2	15/29	1.3E-02	6.0E-02	3.8E-04	6E-03
			Acetone	67-64-1	14/58	1.4E-02	1.0E-01	4.1E-04	4E-03
			Ethylbenzene	100-41-4	1/29	7.0E-03	1.0E-01	2.0E-04	2E-03
			Carbon disulfide	75-15-0	2/29	7.0E-03	1.0E-01	2.0E-04	2E-03
			Toluene	108-88-3	4/28	7.0E-03	2.0E-01	2.0E-04	1E-03
			Xylene	1330-20-7	1/29	7.0E-03	2.0E+00	2.0E-04	1E-04
-	Water	Organic	Total						6E-02
	Water	All	Total						4E+01

Table B2 (continued)

					detected	conf bound	Oral	Daily	Noncarcinegen
Reach	Media	Contaminant	Contaminant		to total	ngeri no	Q	inteko	screening
ÖL	1VDS	tvpe	<b>nam</b>	CAS no.	semples	(mg/kg wei)	(mg/kg/d)	(mg/kg/d)	Indices
0	L.	Increamic	Mercury	7439-97-6	33/33	1.3E-01	3.0E-04	1.2E-04	4E-01
ł			Cadmium	7440-43-9	11/19	1.4E-01	5.0E-04	1.3E-04	3E-01
			Selection	7782-49-2	11/11	3.4E-01	5.0E-03	3.1E-04	1E-01
			Zinc	7440-66-6	11/11	5.3E+00	2.0E-01	4.9E-03	2E-02
			Contract	7440-50-8	1112	3.6E-01	3.7E-02	3.3E-04	9E-03
¢	р Ц	increment	Total						8E-01
2	Hah	All and	Total						8E-01
						(ma/ka dry)	(mg/kg/d)	(mg/kg/d)	
c	Sediment	Incontraction	Antimony	7440-36-0	13/99	6.0E+00	4.9E-04	8.6E-06	2E-02
J			Arsenic	7440-38-2	4/111	2.5E+00	1.0E-03	3.6E-06	4E-03
			Chremium	7440-47-3	95/111	1.2E+61	5.0E-03	1.7E-05	₫E-03
			Banum	7440-39-3	111/111	1.6E+02	7.0E-02	2.3E-04	3E-03
			Selection	7782-49-2	14/111	4.8E+00	3.0E-03	6.8E-06	2E-03
			Mercury	7439-97-8	25/25	4.6E-01	3.0E-04	6.6E-07	2E-03
			Molybderurn	7439-98-7	65/99	3.1E+03	4.0E-03	4.4E-06	1E-03
			Vanadium	7440-62-2	16/68	4.4E+60	7.0E-03	6.3E-06	9E-04
			Zinc	7440-66-6	98/99	1.25+02	2.0E-01	1.8E-04	9E-04
			SUVer S	7440-22-4	13/111	1.1E+00	3.0E-03	1.6E-06	5E-04
			Nickel	7440-02-0	106/111	6.2E+00	2.0E-02	8.9E-06	4E-04
			Cadmium	7440-43-9	6/111	1.2E-01	5.0E-04	1.7E-07	3E-04
			Copper	7440-50-8	101/111	6.2E+00	3.7E-02	8.9E-06	2E-04
			Boron	7440-42-8	78/111	3.7E+00	S 0E-02	5.3E-06	6E-05
			Bevlium	7440-41-7	81/99	1.8E-01	5.0E-03	2.6E-07	5E-05
			E.	7440-31-5	10/29	4.7E+00	6.0E-01	6.7E-06	1E-05
~	Sediment	Inorganic	Total						4E-02
ç	Sediment	Ornanic	Di-n-butyl phthalate	84-74-2	3/10	1.0E+01	1.0E-01	1.5E-05	2E-04
1 6			Tatel						4F-02

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Table B2 (continued)

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Table	

					detected	conf bound	Oral	Dally	Noncercinogen
Reach	Media	Contaminant	Contaminant		to totai	On mean	Q	intake	screening
<b>no.</b>	tvpe	(VDe	name	CAS no.	samples	(mg/l)	(mg/kg/d)	(mg/kg/d)	Indices
2	Water	Inoreanic	Thalium	7440-28-0	1/1	9.4E-02	7.0E-05	2.7E-03	4E+01
h		0	Arsenic	7440-39-2	4/75	5.2E-02	1.0E-03	1.5E-03	2E+00
			Cadmium	7440-43-9	6/76	4.05-03	5.0E-04	1.1E-04	2E-01
			Chromium	7440-47-3	54/75	1.1E-02	5.0E-03	3.3E-04	7E-02
ſ			Coner	7440-50-8	53/75	7.3E-02	3.7E-02	2.1E-03	6E-02
			Vanadium	7440-52-2	1/3	9.6E-03	7.0E-03	2.7E-04	4E-02
			Raniez	7440-39-3	3/3	8.6E-02	7.0E-02	2.5E-03	4E-02
			Nickel	7440-02-0	8/75	1.0E-02	2.0E-02	2.9E-04	1E-02
			Zinc	7440-66-6	66/75	9.1E-02	2.0E-01	2.6E-03	1E-02
			Mercury	7439-97-6	5/32	5.9E-05	3.0E-04	1.7E-06	6E-03
2	Water	Inorganic	Total	1 1 1 1					4E+01
0	Water	Orminic	1 2-Dichlozoethene (total)	156-59-2	2/29	6.9E-03	1.0E-02	2.0E-04	2E-02
J			Chloroform	67-66-3	6/30	6.4E-03	1.0E-02	1.8E-04	2E-02
			Methylene chioride	75-09-2	15/29	1.3E-02	6.0E-02	3.6E-04	6E-03
			Acetone	67-64-1	11/58	1.2E-02	1.0E-01	3.5E-04	4E-03
			Carbon disulfide	75-15-0	2/29	7.0E-03	1.0E-01	2.0E-04	2E-03
			1.1-Dichloroethane	75-34-3	2/29	6.9E-03	0E-01	2.0E-04	2E-03
			Toluene	108-88-3	1/28	7.1E-03	2.0E-01	2.0E-04	15-03
			Xvlane	1330-20-7	1/29	7.0E-03	2.0E+00	2.0E-04	1E-04
0	Water	Organic	Total						5E-02
	Totol N	E II	Totai						4E+01

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					Ratio of detected	85% upper conf bound	Orai	Daily	Noncercinogen
Reach	Media	Contaminant	Contaminant		to total	on mean	Q	intake	screening
G	ivpe	type	name	CAS no.	sampies	(mg/kg wet)	(mg/kg/d)	(mg/kg/d)	indices
	E SI	Inorganic	Mercury	7439-97-6	38/88	2.6E-01	3.0E-04	2.4E-04	8E-01
)	•	3	Cadmium	7440-43-9	28/36	8.4E-02	5.0E-04	7.85-05	2E-01
			Selenium	7782-49-2	27/28	3.1E-01	<b>3.0E-03</b>	2 3E-04	1E-01
			Zinc	7440-66-6	26/26	5.2E+00	2.0E-01	4.8E-03	2E-02
			Copper	7440-50-8	14/28	3.4E-01	3.7E-02	3.2E-04	9E-03
	lan Lan	Inorganic	Total						1E+00
. 67	Fish	ÄI	Total						1E+00
						(mg/kg dry)	(mg/kg/d)	(mg/kg/d)	
ŗ	Sadiment	Investic	Antimony	7440-36-0	24/54	3.4E+01	4.0E-04	4.8E-05	1E-01
2			Selentit	7782-49-2	1/62	6.6E+01	3.0E-03	9.4E-05	3E-02
			Arsenic	7440-38-2	6/60	1.7E+01	1.0E-03	2.4E-05	2E-02
			Chromium	7440-47-3	44/62	7.7E+01	5.0E-03	1.1E-04	2E-02
			Mercurv	7439-97-6	21/21	1.2E+00	3.0E-04	1.7E-06	6E-03
			Vanadium	7440-62-2	48/51	1.8E+01	7.0E-03	2.5E-05	4E-03
			Barium	7440-39-3	58/58	1.6€+02	7.0E-02	2.3E-04	3E-03
			Cadmium	7440-43-9	7/60	1.0E+00	5.0E-04	1.4E-06	3E-03
			Silver	7440-22-4	19/61	5.4E+00	3.0E-03	7.7E-06	3E-03
			Motybdenum	7439-98-7	11/52	6.1E+00	4.0E-03	<b>3.6E-0</b> 6	2E-03
			Nickel	7440-02-0	53/60	1.5E+01	2.0E-02	2.2E-05	1E-03
			Zinc	7440-66-5	57/60	1.5E+02	2.0E-01	2.1E-04	1E-03
			Conter	7440-50-8	49/60	2.6E+01	3.7E-02	3.8E-05	1E-03
			Bervllium	7440-41-7	40/54	1.2E+00	5.0E-03	1.7E-06	3E-04
			Boron	7440-42-8	25/54	4.7E+00	9.0E-02	6.8E-06	8E-05
			Tn	7440-31-5	12/29	1.4E+01	6.0E-01	2.1E-05	3E-05
ę	Sediment	Inorganic	Total						2E-01
~	Cadimont	Ornanic	Di-n-butvl chthalate	84-74-2	3/16	1.85+01	1.0E-01	2.6E-05	3E-04
ŋ			Methylene chloride	75-09-2	2/7	6.0E-01	6.0E-02	8.6E-07	1E-05
			Chloroform	67-66-3	217	1.1E-02	1.0E-02	1.6E-08	2E-06
			Toluene	108-88-3	1/7	2.3E-02	2.0E-01	3.3E-08	2E-07
r	Sediment	Ornanic	Total						3E-04
ר <b>רי</b>	Sediment	All	Total						2E-01
,									

Table B2 (continued)

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					detected	coni bound	Oral	Daily	Noncarcinogen
Reach	Modia	Contaminant	Contaminant		to tots!	on mean	<b>CI</b> R	intake	screening
00	tvne	tvne	name	CAS no.	samples	(mg/L)	(mg/kg/d)	(mg/kg/d)	indices
	Water	Incranic	Thallium	7440-28-0	1/1	7.0E-02	7.0E-05	2.0E-03	3E+01
<b>,</b>			Arsenic	7440-38-2	2/38	4.7E-02	1.0E-03	1.3E-03	1E+00
			Selecium	7782-49-2	2/14	2.5E-02	3.0E-03	7.3E-04	2E-01
			Chromium	7440-47-3	28/32	2.0E-02	5.0E-03	5.6E-04	1E-01
			Barit	7440-39-3	3/3	4.9E-02	7.0E-02	1.4E-03	2E-02
				7440-50-8	14/32	2.0E-02	3.7E-02	5.7E-04	2E-02
			erin Nicial	7440-02-0	3/32	8.6E-03	2.0E-02	2.5E-04	1E-02
			Mercury	7439-97-6	9/32	6.2E-05	3.0E-04	1.8E-06	6E-03
			Zinc	7440-66-6	30/32	3.1E-02	2.0E-01	8.8E-04	4E-03
e	Water	Inorganic	Total						3E+01
		ŀ							
~	Water	Ornanie	Tetrachioroethylene	127-18-4	1/28	7.1E-03	1.0E-02	2.0E-04	2E-02
,		and a state of the	Chloroform	67-66-3	12/29	5.9E-03	1.0E-02	1.7E-04	2E-02
			4-Methyl-2-pentanone	108-10-1	1/28	1.4E-02	5.0E-02	4.0E-04	8E-03
			Mathulane chloride	75-09-2	16/28	1.3E-02	6.0E-02	3.8E-04	6E-03
			Arctione	67-64-1	13/56	1.4E-02	1.0E-01	4.1E-04	4E-03
			Carbon disulfide	75-15-0	1/28	7.2E-03	1.0E-01	2.1E-04	2E-03
			Tolene	108-88-3	4/27	6.9E-03	2.0E-01	2.0E-04	1E-03
			Xviene	1330-20-7	1/28	7.1E-03	2.0E+00	2.0E-04	1E-04
c	this eac	ciana	Tatal						6E-02
<b>७</b> ९	Weter	Cryddine All	Total				:		3E+01

Table B2 (continued)

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### APPENDIX C

# SCREENING OF THE INTRUDER SCENARIO FOR DETECTED CARCINOGENS AND NONCARCINOGENS

Table C1. Screening of detected carcinogens in fish and game for intermittent intruder scenario

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					Cich innoct	Batic of	Geom mean of	Venison ingest	Arith mean of	Duck ingest	Sums of
			Hailo OI				concontrution	carcinonen	Concentration	carcinooen	carcinogen
			detected	concentration	carcinogen	naisaiad			in duck floch		ermonin
Beach	Contaminant	Contaminant	to total	in tish flesh	screening	to total	-wisuba ui	screening		Surgering .	ĥillioone
00		name	fish samples	(mg or Bq/kg)	indices	venison samples (mg or 3q/kg)	(DA/pt) to Em)	indices	(mg or bq/kg)	Sacid	ILIGICES
**	Oroanics	PCB-1254 (Arocior 1254)	79/79	3.25E-01	1.2E-04						
	Organics	PCB-1260 (Aroclor 1260)	19/79	1.20E-01	4.5E-05						5-14
-	Organics	Fotels			1.7E-04						25-04
				00.000	4 U U U	310/20F	6 06E-02	8,65-09			2E-04
	Radionuclides	Cs-137	42/42	2.045403		33/33	6.26E+00	1.0E-06			1E-06
-	Hadionucides	-06-JQ						1 0E-06			2E-04
-	Radionuciides	Totals			1.15-04			1 NE-NE			35-04
F		Reach totals	1		3 31504			1.45-40			
											L
^	Orcanics	PCB-1254 (Arocioi 1254)	24/24	4.72E-02	1.8E-05						20-12
	Omanics	PCB-1260 (Arocior 1260)	1 24/24	4.01E-02	1.5E-05 1						
~	Organics	Totals			3.3E-05						2E-03
	•	_									ALAS
8	Radionucides	Cs-137	1 10/10	7.05E+02	4.5E-05	1 319/396 1 22/22	0.00E-UZ	0.0E-09	-		1E-06
~	Padionuclides	Sr-90**	- 4			00/00	0.575				SC. DS
~	Radionuclides	Totels			4.5E-05	L		1.05-00			25-00
		Reach totals			7.76-05			1.05-05			92:40
											10.04
<i>ლ</i>	Organics	PCB-1254 (Arocior 1254)	1 79/79	2.89E-01	1.1E-04						6E-05
9	Organics	PCB-1260 (Aroclor 1260)	1 79/79	1.66E-01	6.2E-05						25.04
6	Organics	Totals			1.7E-04						* - -
c	Dadiomedialoe	Cs-137	1 1 106/106	5.20E+02	3.3E-05	319/396	6.065-02	8.6E-09	1.41E+01	3.6E-07	3E-05
, e	Redioniscides	Sr-90**	13/13	2.47E+01	1.8E-06	33/33	6.26E+00	1.0E-06			35-06
, c	Dadiomeridae	Co-60	9/70	5.50E-05	1.9E-12						25-12
<u>مار</u>	Podiomonidae	Tatele			3.5E-05	_		1.0E-06	-	3.6E-07	4E-05
~	Hedionuciides	101815	-		215.04			1_0E-06	<u>+</u>	3.6E-07	2E-04
C		Reach lotals									
. Data	1 for venison were &	Data for venison were applied to all reaches									

Usia for venision were apprent to an rescrete
 Values for Sr-90 in venision are 1/100 the concentration measured in bone

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# Table C2. Screening indices for external exposure tointermittent intruder from gamma radiationin surface sediments

·		r			
			Ratio of	Geom mean of	Screening
Desst	0		detected	concentration	indices for
Reach	Contaminant		to total	in sediment	exposure exposure
no.	type	Radionuclide	sed samples	(Bq/kg)	to sediment
				×	
1	Radionuclide	Cs-137	17/18	5.52E+03	2.1E-04
1	Radionuclide	Co-60	18/18	1.29E+03	1.9E-04
1	Radionuclide	Eu-152	4/4	2.26E+02	1.6E-05
1	Radionuclide	Cs-134	8/8	7.83E+01	7.7E-06
1	Radionuclide	Eu-154	1/1	4.30E+01	3.2E-06
. 1	Radionuclide	Am-241	1/1	1.40E+01	2.5E-08
1	Radionucide	U-235	1/1	4.20E-01	4.5E-09
1	Radionuclide	Cm-244	1/1	1.80E+01	1.2E-09
1	Radionuclide	Pu-239	1/1	1.00E+01	2.9E-10
1	Radionuclide	U-234	1/1	3.80E+00	2.3E-10
1	Radionuclide	Pu-238	1/1	2.00E+00	1.3E-10
1	Radionuclide	U-238	1/1	1.60E+00	7.9E-11
1	Radionuclide	0-200		Reach total	4.2E-04
				n an	
2	Radionuclide	Co-60	121/134	1.40E+03	2.0E-04
2	Radionuclide	Eu-152	11/11	8.22E+02	5.7E-05
	Radionuciide				
2 2	Radionucide	Eu-154 Cs-137	14/14	3.51E+02	2.6E-05
			130/134	6.34E+02	2.4E-05
2	Radionuclide	Cs-134	10/10	1.43E+02	1.4E-05
2	Radionuclide	Mn-54	7/7	2.37E+02	1.3E-05
2	Radionuclide	U-235	4/4	6.59E-01	7.0E-09
2	Radionuclide	Am-241	4/4	1.16E+00	2.0E-09
2	Radionuclide	U-234	4/4	9.07E+00	5.6E-10
2	Radionuclide	Cm-244	4/4	4.11E+00	2.7E-10
2	Radionuclide	U-238	4/4	4.12E+00	2.0E-10
2	Radionuclide	Pu-238	4/4	3.76E-01	2.5E-11
2	Radionuclide	Pu-239	4/4	8.52E-02	2.5E-12
2	Padionuclide			Reach Iotal	3.4E-04
3	Radionuclide	Cs-137	223/223	9.97E+03	3.8E-04
3	Radionuclide	Co-60	204/208	1.07E+03	1.5E-04
3	Radionuclide	Eu-152	2/2	3.48E+02	2.4E-05
3	Radionuclide	Eu-154	9/9	1.75E+02	1.3E-05
3	Radionudide	Cs-134	7/7	1.09E+02	1.1E-05
3	Radionucide	U-235	1/1	3.20E+00	3.4E-08
3	Radionuclide	Total Pu*	4/4	4.56E+02	1.3E-08
3	Radionuclide	U-234	1/1	4.20E+00	2.6E-10
3	Radionuclide	U-238	1/1	3.00E+00	1.5E-10
3	Radionuclide	Am-241	1/1	6.30E-02	1.1E-10
3	Radionuclide	Cm-244	1/1	1.50E-01	9.9E-12
3	Radionuclide	Pu-238	1/1	5.80E-02	3.8E-12
3	Radionuclide	Pu-239	1/1	8.70E-02	2.5E-12
3	Radionuciide			Reach total	5.8E-04

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\* Used risk factors for Pu-239

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scenario
intruder
intermittent
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ble C3. Screening of detected noncarcinogens for intermittent intruder scenario
detected
<u>of</u>
Screening
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Sums of noncarcinogen screening indices	2E-01 2E-02 3E-02 3E-03 1E-03 1E-03	4E-02 4E-02 1E-02 8E-04 6E-04 6E-04	8E-02 8E-02 6E-03 8E-04 <b>1E-0</b> 1
Duck ingest noncarcinogen not screening indices			1.2E-03 4.3E-03 1.2E-03 <b>6.8E-03</b>
Arith mean of concentration n in duck flesh (mg/kg wet)			2.00E-C2 7.00E-01 3.20E-02
Fish ingest noncarcinogen screening indices	1.5E-01 1.6E-02 3.3E-03 1.0E-03 9.8E-04	<b>1.8E-01</b> 3.9E-02 1.2E-02 9.9E-03 8.2E-04 6.4E-04 6.2E-02	7.6E-02 1.0E-02 5.1E-03 1.1E-03 7.8E-04 <b>9.3E-02</b>
Geom mean of concentration in fish flesh (mg/kg wet)	3.60E-01 3.74E-01 1.29E-02 3.02E-01 1.52E+00	9.10E-02 2.71E-01 3.85E-02 1.28E+00 1.83E-01	1.77E-01 2.43E-01 1.98E-02 1.69E+00 2.25E-01
Ratio of detected to total fish samples	87/87 35/35 35/43 22/35 35/35	33/33 33/33 11/11 11/11 11/11 7/11	88/88 27/28 28/36 26/26 14/28
Contaminant name	Mercury Selenium Cadmium Copper Zinc	Reach totals Mercury Selenium Zinc Copper	Mercury Mercury Selenium Cadmium Zinc Copper Reach totals
Contaminant type	Inorganic Inorganic Inorganic Inorganic Inorganic	Inorganic Inorganic Inorganic Inorganic Inorganic	Inorganic Inorganic Inorganic Inorganic Inorganic Inorganic
Reach no.		* ~~~~	N നനനന

### APPENDIX D

### NONCONSERVATIVE SCREENING OF THE NONDETECTABLE CONTAMINANTS DATA BASE FOR CARCINOGENS AND NONCARCINOGENS

				Fish	Fish ingest		Sediment	Sed ingest			water ingest
			No.	conc	carcinogen	No.	CORC	carcinogen	No.	Water	carcinogen
Contaminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	water semuloe	conc (mail)	screening indices
type	namet	° 2	sampies	wel wi	Indices	samples	CITY WE	2271711	23	1 05-03	5 0F-05
Inorganic	Arsenic	-	104	5.0E-01	4.1E-05				2	1.01 05	
	Arsenic	5	45	5.0E-01	4.1E-05						
	Arsenic	e	109	5.0E-01	4.1E-05						
	Bervllium	-	104	1.0E-01	2.0E-05				m	2.0E-04	2.35-00
	Bervllium	0	45	1.0E-01	2.0E-05				e	2.0E-04	2.5E-06
	Berylium	ę	109	1.0E-01	2.0E-05				3	2.0E-04	2.5E-06
Organic	Benzidine	-				ŝ	5.0E+01	1.6E-03			
	Benzidine	0				9	5.0E+01	1.6E-03			
	N-Nitrosodimethviamine	-				-	5.0E+01	3.6E-04			
	N. Nitrosodimethylamine	0				9	5.0E+01	3.6E-04			
	Rentidine	. თ				14	9.1E+00	3.0E-04			
	According	•	12	2.0E-01	1.1E-04	ŋ	1.0E+01	1.6E-05			
	Acensehthylene	. ~		2.0E-01	1.1E-04	10	1.0E+01	1.6E-05			
	Acenanthylane	1 (7)	16	2.0E-01	1.1E-04	16	9.1E-01	1.5E-06			
	N-nitroso-di-n-oroovlamine	•	12	2.0E-01	6.6E-05	0	1.0E+01	1.0E-05			
	N-nitroso-di-n-proovlamine	2	8	2.0E-01	6.6E-05	10	1.0E+01	1.0E-05			
	N-nitroso-di-n-propylamine	ŝ	16	2.0E-01	6.6E-05	16	9.1E-01	9.1E-07			
	Vinvl chloride	-							29	1.0E-02	5.4E-U5
	Vinvl chloride	N							29	1.0E-02	9.4E-UJ
	Vinvl chloride	ę				2	1.0E-02	2.7E-09	28	1.0E-02	5.4E-U2
	Bis/chloromethyl)ether	e				2	9.1E-01	2.9E-05			
	Aldrin	-	12	5.0E-03	4.0E-06	8	1.0E+01	2.4E-05			
	Aldrin	2	8	5.0E-03	4.0E-06	9	1.0E+01	2.4E-05			
	Dieldrin	-	12	9.0E-03	6.8E-06		1.0E+01	2.3E-05			
	Dieldrin	2	æ	9.0E-03	6.8E-06	9	1.0E+01	2.3E-05			
	PCB-1254 (Arocior 1254)	2							28	1.0E-03	2.2E-U5
	PCB-1254 (Arocior 1254)	n							2 1	1.05-03	20-22.2
	PCB-1260 (Aroclor 1260)	y							87	1.0E-03	C0-37.7
	PCB-1260 (Aroclor 1260)	N					I		200	1.05-03	5.2E-UJ
	PCB-1260 (Arocior 1260)	n				15	1.8E-01	2.0E-07	82	1.UE-U3	CU-32.2
	3.3'-Dichlorobenzidine		12	1.0E+00	2.1E-05	2	2.0E+01	1.3E-06			
	3.3'-Dichlorobenzidine	0	80	1.0E+00	2.1E-05	10	1.0E+01	6.4E-07			
	3.3'-Dichlorobenzidine	n	16	1.0E+00	2.1E-05	16	9.1E-01	5.9E-08			
	Acenanhthene	•	12	1.0E-03	5.4E-07	e	1.0E+01	1.6E-05			

Table D1. Results of nonconservative screening of carcinogens where no concentrations were above detectio (Concentrations are minimum detection limits)

.

1.1E-07 10 1.0E+01	2.0E-04 1.1E-07 10 1.0E+01
<b>5.4E-07</b> 3 1.0E+01 1	2 1.0E-03 5.4E-07 3 1.0E+01 1
1.0E-03 <b>3.4E-07</b> 10 1.0E+01 1.0E-03 1.0E-03 <b>5.4E-07</b> 3 1.0E+01 <b>1.6E-05</b>	1.0E-03 <b>5.4E-07</b> 3 1.0E+01 1
5.4E-07 10 1.0E+01 1	1.0E-03 5.4E-07 10 1.0E+01 1
1.0E-03 5.4E-07 2 1.0E+01 1.6E-05	5.4E-07 2 1.0E+01 1
5.4E-07 10 1.0E+01 1	5.4E-07 10 1.0E+01 1
5.4E-07 2 1.0E+01 1	2 1.0E-03 5.4E-07 2 1.0E+01 1
5.4E-07 10 1.0E+01 1	5.4E-07 10 1.0E+01 1
5.4E-07 2 1.0E+01 1	2 1.0E-03 5.4E-07 2 1.0E+01 1
5.4E-07 10 1.0E+01 1	1.0E-03 <b>5.4E-07</b> 10 1.0E+01 1
<b>1.1E-06</b> 2 1.0E+01 1	2 2.0E-03 1.1E-06 2 1.0E+01 1
1.1E-06 10 1.0E+01 1	2.0E-03 1.1E-06 10 1.0E+01 1
1.1E-05 2 1.0E+07 1	2 2.0E-02 1.1E-05 2 1.0E+07 1
1.1E-05 1.1E-06	2.0E-02 1.1E-05 10 1.0E+57 1 5 2.0E-03 1.1E-06 2 1.0E-24-01
1.1E-06 10 1.0E+01 1	2.0E-03 1.1E-06 10 1.0E+01 1
8.0E-03 4.3E-06 2 1.0E+01 1.6E-05	4.3E-06 2 1.0E+01 1
4.3E-06 10 1	8.0E-03 4.3E-06 10 1.0E+01 1
<b>1.6E-06</b> 10 1.0E+01 1	3.0E-03 1.6E-06 10 1.0E+01 1
1.1E-07 3 1.0E+01 1	2.0E-04 1.1E-07 3 1.0E+01 1
1.1E-07 3 1.0E+01 1	2.0E-04 1.1E-07 3 1.0E+01 1
2.0E-04 1.1E-07 3 1.0E+01 1.6E	1.1E-07 3 1.0E+01 1
1.1E-07 3 1.0E+01 1	2.0E-04 1.1E-07 3 1.0E+01 1
1.16-07 3 1	2.0E-04 1.1E-07 3 1
4.3E-06 2 1 4.3E-06 2 1 1.6E-06 2 10 1 1.6E-06 2 10 1	2.0E-03       4.3E-06       2       1         8.0E-03       4.3E-06       2       1         3.0E-03       1.6E-06       2       1         3.0E-03       1.6E-06       2       1         2.0E-04       1.1E-07       3       1
1.16-05 1.16-05 1.16-06 4.36-06 4.36-06 1.66-06 1.66-06	2.0E-02       1.1E-05         2.0E-02       1.1E-05         2.0E-03       1.1E-06         2.0E-03       1.1E-06         8.0E-03       4.3E-06         3.0E-03       1.6E-06         3.0E-03       1.6E-06         2.0E-04       1.1E-06
5.4E-07 1.1E-06 1.1E-06 1.1E-05 1.1E-06 4.3E-06 4.3E-06 1.6E-06 1.6E-06	1.0E-03       5.4E-07         2.0E-03       1.1E-06         2.0E-02       1.1E-06         2.0E-03       1.1E-06         2.0E-03       1.1E-06         2.0E-03       1.1E-06         2.0E-03       1.1E-06         3.0E-03       1.1E-06         3.0E-03       1.1E-06         3.0E-03       1.6E-06         3.0E-03       1.6E-06
	2.0E-03 2.0E-0
1.0E-03 1.0E-03 1.0E-03 1.0E-03 1.0E-03 1.0E-03 2.0E-03 2.0E-03 2.0E-03 2.0E-03 8.0E-03 8.0E-03 3.0E-03 3.0E-03 3.0E-03 2.0E-0	

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able

		r.		Fish	Fish ingest		Sediment	Sed ingest			Water ingest
			No.	conc	carcinogen	No.	conc	carcinogen	No.	Water	carcinogen
Conteminent	Contaminant	Reach	fish	(ma/ka)	screening	sediment	(mg/kg)	screening	water	conc	screening
		00	semples	wet wi	indices	samples	dry wt	indices	samples	(mg/L)	Indices
Oranio	1 1 Dichloroethviene	-				-			28	5.0E-03	8.6E-06
Cryan R	1 1 - Dichloroethylene	• •							28	5.0E-03	8.6E-06
	1 1-Dichloroethylene	I (7)				8	1.0E-02	8.6E-10	27	5.0E-03	8.6E-06
		0 00	16	9.0E-03	6.8E-06	13	9.1E-01	2.1E-06			
	N-Nitrosodimethylamine		•			14	9.1E-01	6.6E-06			
	Hentachlor	-	12	5.0E-03	1.1E-06	÷	1.0E+01	6.4E-06			
	Hentachlor	0	හ	5.0E-03	1.1E-06	Q	1.0E+01	6.4E-06			
	2 4-Dinitrotoluene	-	12	2.0E-01	6.4E-06	~	1.0E+01	9.7E-07			
Ĩ	2 4-Dinitrotoluene	0	80	2.0E-01	6.4E-06	10	1.0E+01	9.7E-07			
	2 4-Dinitrotoluene	ŋ	16	2.0E-01	6.4E-06	16	9.1E-01	8.8E-08			•.
	2 6-Dinitrotoluene	<b>q</b> ia	12	2.0E-01	6.4E-06	2	1.0E+01	9.7E-07			
	2.6-Dinitrotoluene	0	ø	2.0E-01	6.4E-06	10	1.0E+01	9.7E-07			
	2.6-Dinitrotoluene	e	16	2.0E-01	5.4E-06	16	9.1E-01	8.8E-08			
	Pentachiorophenoi	-	12	1.0E+00	5.7E-06	CI	5.0E+01	8.6E-07			
	Pentachlorophenoi	2	œ	1.0E+00	5.7E-06	10	5.0E+01	8.6E-07			
	Pentachiorophenol	Ð	16	1.0E+00	5.7E-06	16	9.1E-01	1.6E-08			
	Indeno(1.2.3-cd)pyrene	ę	16	8.0E-03	4.3E-06	16	9.1E-01	1.5E-06			
	Aldrin	e	16	5.0E-03	4.0E-06	13	9.1E-01	2.2E-06			
	1 1 2 2-Tetrachloroethane	-							29	5.0E-03	2.9E-06
	1.1.2.2-Tetrachloroethane	N							29	5.0E-03	2.9E-06
	1.1.2.2-Tetrachloroethane	e				7	1.0E-02	2.9E-10	28	5.0E-03	2.9E-06
	Beta BHC	-	12	5.0E-03	4.2E-07	0	1.0E+01	2.6E-06			
	Beta BHC	8	ø	5.0E-03	4.2E-07	9	1.0E+01	2.6E-06			
	Gamma-BHC (Lindane)	-	2	5.0E-03	4.2E-07	2	1.0E+01	2.6E-06			
	Gamma-BHC (Lindane)	8	8	5.0E-03	4.2E-07	9	1.0E+01	2.6E-06			
	Cis-1, 3-dichloropropene	-							29	5.0E-03	2.6E-U6
	Cis-1,3-dichloropropene	0					i,		58	5.0E-03	2.6E-U6
	Cis-1, 3-dichloropropene	e							28	5.0E-03	2.6E-U6
	Trans-1,3-dichloropropene	-							29	5.0E-03	2.05-00
	Trans-1.3-dichloropropene	0							29	5.0E-03	2.5E-06
	Trans-1.3-dichioropropene	ę							28	5.0E-03	2.6E-06
	1 2-Diphenvihvdrazine	-					2.0E+01	2.3E-06			
	1.2-Diphenvihvdrazine	0				9	2.0E+01	2.3E-06			
	Heptachlor epoxide	e	16	5.0E-03	2.1E-06	13	9.1E-01	1.2E-06			
	Chlordane	-				2	1.0E+01	1.9E-06			
	Chlordane	2				9	1.0E+01	1.9E-06			

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Table

No.         conc         careningan         No.         conc         careningan         No.         water           no.         amplea         well with         undices         careningan         Mor         water         water           n         amplea         well with         indices         careningan         Mor         conc           2         amplea         different         amplea         different         amplea         different         conc           3         16         30E-03         54E-07         16         91E-01         15E-06         56E-03         15E-06         15E-06         15E-06         15E-06         15E-06         56E-03         <					Fish	Fish ingest		Sediment	Sed ingest	• :		Water ingest
				No.	conc	cercinogen	No.		carcinogen	No.	Water	carcinogen
$ \begin{array}{c cccc} Carbon retraction & 1 & 0. \\ Carbon retraction & 1 & 0. \\ Carbon retraction & 0 & 0. \\ Car$	Contaminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment		screening	water	conc	screening
Current in the activities         2         1.0E-02         1.8E-10         22         5.0E-03           Carbon threat-should         2         3.0E-03         1.6E-03         3.4E-07         16         2.1E-03         5.0E-03           Dictionobronomentane         3         16         3.0E-03         1.6E-03         3.4E-07         16         2.0E-03         5.0E-03         5.0E	lype	Carboo Intrachlorida	2-	Samples	IM IAM		Sautures			29	5.0E-03	1.9E-06
2       10E-02       1.9E-10       28       5.0E-03         3       16       3.0E-03       3.4E-07       16       9.1E-01       1.5E-06       29       5.0E-03         3       16       1.0E-03       3.4E-07       16       9.1E-01       1.5E-06       29       5.0E-03         3       16       1.0E-03       3.4E-07       16       9.1E-01       1.5E-06       29       5.0E-03         3       16       1.0E-03       3.4E-07       16       9.1E-01       1.5E-06       29       5.0E-03         3       16       1.0E-03       3.4E-07       16       9.1E-01       1.5E-06       20	Cuganic	Calour tatadarida	- 0							29	5.0E-03	1.9E-06
2       10E-01       1.1E-07       16       1.0E-03       5.4E-07       16       9.1E-01       28       5.0E-03         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06       28       5.0E-03         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06       28       5.0E-03         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06       28       5.0E-03         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06       28       5.0E-03         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06       28       5.0E-03         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06       28       5.0E-03         3       16       2.0E-03       1.1E-06       1       9.1E-01       1.5E-06       29       5.0E-03         3       16       2.0E-03       5.4E-07       16       9.1E-01       1.5E-06       29       5.0E-03         3       16       1.0E-03       5.4E-07       16       9.1E-01       28       5.0E-03 </td <td></td> <td>Carbon tetrachicride</td> <td>1 6</td> <td></td> <td></td> <td></td> <td>2</td> <td>1.0E-02</td> <td>1.9E-10</td> <td>28</td> <td>5.0E-03</td> <td>1.9E-06</td>		Carbon tetrachicride	1 6				2	1.0E-02	1.9E-10	28	5.0E-03	1.9E-06
3       16       30E-03       1.6E-06       16       91E-01       1.5E-06       2         3       16       1.0E-03       5.4E-07       16       91E-01       1.5E-06       3         3       16       2.0E-03       1.1E-06       16       91E-01       1.5E-06       3         3       16       2.0E-03       1.1E-07       16       91E-01       1.5E-06       3         3       16       1.0E-03       5.4E-07       16       91E-01       1.5E-06       3         3       16       1.0E-03       5.4E-07       16       91E-01       1.5E-06       3         3       16       0		Dichlorobromomethane								29	5.0E-03	1.9E-06
3       16       3.0E-03       1.6E-06       16       9.1E-01       1.5E-06         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-07       1       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       2.9       5.0E-03         3       1.0E-02		Dichlorobromomethane	( ()				2	1.0E-02	1.9E-10	28	5.0E-03	1.9E-06
3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-06       13       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.5E-06         3       16       1.0E-03       5.1E-01       1.5E-06       29       5.0E-03         3       16       1.0E-02       1.3E-01       1.2E-01       29       5.0E-03         3       16       5.0E-03		Pyrene	ņ	16	3.0E-03	1.6E-06	16	9.1E-01	1.5E-06			
3       16       2.0E-04       1.1E.07       16       9.1E-01       1.5E-06         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       2.0E-04       1.1E-07       16       9.1E-01       1.5E-06         3       16       2.0E-04       1.1E-07       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-06       16       9.1E-01       1.5E-06         3       16       2.0E-04       1.1E-07       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-06       16       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       16       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.5E-06         3       1.0E-02       5.2E-07       2       9.1E-01       1.5E-06       2         3       1.0E-02       2.2		Acenachthene	ð	16	1.0E-03	5.4E-07	16	9.1E-01	1.5E-06			
3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-07       16       9.1E-01       1.5E-06         3       16       1.0E-03       5.4E-07       13       9.1E-01       1.5E-06         3       1.0E-02       5.2E-07       2       9.1E-01       1.4E-07       29       5.0E-03         3       1.0E-02       1.1E-06       1.4E-07       2       9.1E-01       29       5.0E-03         3 </td <td></td> <td>Anthracene</td> <td>e n</td> <td>16</td> <td>2.0E-04</td> <td>1.1E-07</td> <td>16</td> <td>9.1E-01</td> <td>1.5E-06</td> <td></td> <td></td> <td></td>		Anthracene	e n	16	2.0E-04	1.1E-07	16	9.1E-01	1.5E-06			
3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       1.0E-03       5.4E-07       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-06       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-06       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-07       16       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.4E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.4E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       2.9       5.0E-03         3       16       5.0E-03       1.1E-02       1.2E-10       2.9       5.0E-03         3       16       <		Renzo(a)ovrene	Ċ	16	1.0E-03	5.4E-07	16	9.1E-01	1.5E-06			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Benzo(b)fluoranthene	ŋ	16	1.0E-03	5.4E-07	16	9.1E-01	1.5E-06			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Benzo(ahi)pervlene	e	16	1.0E-03	5.4E-07	16	9.1E-01	1.5E-06			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Benzo(k)fluoranthene	Ś	16	1.0E-03	5.4E-07	16	9.1E-01	1.5E-06			
3       16       2.0E-03       1.1E-06       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-07       16       9.1E-01       1.5E-06         3       16       2.0E-03       1.1E-07       16       9.1E-01       1.5E-06         3       16       1.0E-02       5.4E-07       16       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.5E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       1.2E-06         3       16       1.0E-02       5.2E-07       2       9.1E-01       2.9       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       2.9       5.0E-03         3       16       5.0E-03       1.1E-01       29       5.0E-03       29       5.0E-03         3       16       5.0E-03       1.1E-01       29       5.0E-03       29       5.0E-03         3       16       5.0E-01       1.3       9.1E-01       29       5.0E-03		Chrysene	n	16	1.0E-03	5.4E-07	16	9.1E-01	1.5E-06			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Diberiz(a.h)anthracene	n	16	2.0E-03	1.1E-06	16	9.1E-01	1.5E-06			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Fluorene	e	16	2.0E-03	1.1E-06	16	9.1E-01	1.5E-06			
3       16       1.0E-03 <b>5.4E-07</b> 16       9.1E-01 <b>1.5E-06</b> 13       9.1E-01 <b>1.5E-06</b> 13       9.1E-01 <b>1.5E-06</b> 29       5.0E-03         3       16       1.0E-02 <b>5.2E-07</b> 2       9.1E+00 <b>1.4E-06</b> 29       5.0E-03         2       1.0E-02 <b>5.2E-07</b> 2       9.1E+00 <b>1.4E-06</b> 29       5.0E-03         3       16       5.0E-03 <b>1.1E-06</b> 13       9.1E-01 <b>5.8E-07</b> 29       5.0E-03         3       16       5.0E-03 <b>1.1E-06</b> 13       9.1E-01 <b>5.8E-07</b> 29       5.0E-03         3       16       5.0E-03 <b>1.1E-06</b> 13       9.1E-01 <b>5.9E-07</b> 29       5.0E-03         3       16       5.0E-03 <b>1.1E-06</b> 13       9.1E-01       28       5.0E-03         3       16       5.0E-03 <b>1.1E-06 1.3 9.1E-01 29</b> 5.0E-03         3       16 <b>2.0E-01 7.4E-07 1.0E-02 9.1E-01 1.1E-07 29</b> 5.0E-03         3       16 <b>2.0E-01</b>		Benzo(a)anthracene	ო	16	2.0E-04	1,1E-07	16	9.1E-01	1.5E-06			
3       16       5.0E-03       1.5E-06       13       9.1E-01       8.2E-07         3       16       1.0E-02       5.2E-07       2       9.1E+00       1.4E-06       29       5.0E-03         2       1.0E-02       5.2E-07       2       9.1E+00       1.4E-06       29       5.0E-03         3       16       1.0E-02       5.2E-07       2       9.1E+00       1.4E-06       29       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       29       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       29       5.0E-03         3       11       12       2.0E-01       7.4E-07       13       4.6E+00       8.6E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       13       4.6E+00       8.6E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       1.		Phenanthrene	e	16	1.0E-03	5.4E-07	16	9.1E-01	1.5E-06			
3       16       1.0E-02 <b>5.2E-07</b> 2       9.1E+00       1.4E-06         2       1.0E-02 <b>5.2E-07</b> 2       9.1E+00       1.4E-06         2       1.0E-02 <b>5.2E-07</b> 2       9.1E+00       29       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       29       5.0E-03         3       16       5.0E-01       1.1E-02       9.1E-01       29       5.0E-03         3       16       2.0E-01       7.4E-07       29       5.0E-03       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       1.1E-01       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       2		Alpha BHC	ю	16	5.0E-03	1.5E-06	13	9.1E-01	8.2E-07			1
2       1.0E-02       1.3E-10       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       4.6E+00       8.5E-07       29       5.0E-03         3       16       5.0E-01       7.4E-07       13       4.6E+01       8.5E-01       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.0E+01       1.0E-03		Toxaphene	9	16	1.0E-02	5.2E-07	0	9.1E+00	1.4E-06			, i
2       1.0E-02       1.3E-10       29       5.0E-03         3       16       5.0E-03       29       5.0E-03       29       5.0E-03         3       16       5.0E-03       21       29       5.0E-03       29       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       29       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       29       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       29       5.0E-03         3       16       5.0E-03       1.1E-06       8.5E-07       29       5.0E-03         3       16       5.0E-01       7.4E-07       13       4.6E+00       8.5E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       1.1E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.1E-07         3       16       2.0E-01       7.4E-07       15       9.1E-01		1,2-Dichloroethane	-							29	5.0E-03	3E-06
3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       29       5.0E-03       29       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         2       13       9.1E-01       5.9E-07       29       5.0E-03         3       13       9.1E-01       5.9E-07       29       5.0E-03         3       13       4.6E+00       8.5E-07       29       5.0E-03         3       16       5.0E-01       7.4E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.1E-07         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.1E-07         3       16       0.1E-01       1.0E-08       29       5.0E-03		1.2-Dichloroethane	2							29	5.0E-03	1.3E-05
1       29       5.0E-03         2       10E-02       1.2E-10       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         2       1       0       10E-02       1.2E-10       28       5.0E-03         3       2       1.0E-02       1.3       9.1E-01       29       5.0E-03         3       2       1.0E-02       9.1E-01       29       5.0E-03         3       3       4.6E+00       8.5E-07       29       5.0E-03         3       1       1       28       5.0E-03       29       5.0E-03         3       1       1       1       28       5.0E-03       29       5.0E-03         3       1       1       1.0E-02       8.1E-11       28       5.0E-03       29       5.0E-03         3       16       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.0E+03 <td></td> <td>1,2-Dichloroethane</td> <td>ę</td> <td></td> <td></td> <td></td> <td>0</td> <td>1.0E-02</td> <td>1.3E-10</td> <td>28</td> <td>5.0E-03</td> <td>1.3E-06</td>		1,2-Dichloroethane	ę				0	1.0E-02	1.3E-10	28	5.0E-03	1.3E-06
2       1.1E-06       13       9.1E-01       5.9       5.0E-03         3       16       5.0E-03       1.1E-06       13       9.1E-01       28       5.0E-03         2       1.0E-02       1.2E+10       28       5.0E-03       29       5.0E-03       29         2       2       1.0E-02       1.2E+10       28       5.0E-03       29       5.0E-03       29         3       2       2       1.0E-02       9.1E-01       5.9E-07       29       5.0E-03       29         3       3       4.6E+00       8.5E-07       29       5.0E-03       29       5.0E-03       29         1       12       2.0E-01       7.4E-07       10       1.0E+02       8.1E-11       28       5.0E-03       29       5.0E-03		Chlorodibromomethane	-							29	5.0E-03	1.2E-06
3       16       5.0E-03       1.1E-06       13       9.1E-01       5.9E-07       28       5.0E-03         2       16       5.0E-03       1.1E-06       13       9.1E-01       5.9E-07       29       5.0E-03         2       2       1.0E-02       1.1E-06       13       9.1E-01       5.9E-07       29       5.0E-03         3       2       1.0E-02       9.7E-11       28       5.0E-03         3       3       4.6E+00       8.5E-07       29       5.0E-03         3       3       4.6E+00       8.5E-07       29       5.0E-03         3       1       12       2.0E-01       7.4E-07       2       1.0E+01       1.1E-07         3       16       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.1E-07       29       5.0E-03         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.0E-08       5.0E-03		Chlorodibromomethane	0							53	5.0E-03	1.2E-06
3       16       5.0E-03       1.1E-06       13       9.1E-01       5.9E-07       29       5.0E-03         2       2       1.0E-02       9.7E-11       28       5.0E-03         3       2       1.0E-02       9.7E-11       28       5.0E-03         3       2       1.0E-02       9.7E-11       28       5.0E-03         3       13       4.6E+00       8.5E-07       29       5.0E-03         2       13       4.6E+00       8.5E-07       29       5.0E-03         2       13       4.6E+00       8.5E-07       29       5.0E-03         3       1       12       2.0E-01       7.4E-07       2       1.0E+01       1.1E-07         3       16       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.0E-08         5       9.1E-01       1.0E+01       1.0E-08       29       5.0E-03		Chlorodibromomethane	e				8	1.0E-02	1.2E-10	28	5.0E-03	1.2E-06
1       29       5.0E-03         2       1.0E-02       9.7E-11       28       5.0E-03         3       2       1.0E-02       9.7E-11       28       5.0E-03         3       13       4.6E+00       8.5E-07       29       5.0E-03         2       13       4.6E+00       8.5E-07       29       5.0E-03         2       13       4.6E+00       8.5E-07       29       5.0E-03         2       2       1.0E-02       8.1E-11       28       5.0E-03         3       1       12       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.0E-08       5.0E-03         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.0E-08       5.0E-03		Heptachior	ŝ	16	5.0E-03	1.1E-06	13	9.1E-01	5.9E-07			
29 5.0E-03 3 29 5.0E-03 3 13 4.6E+00 8.5E-07 29 5.0E-03 2 1.0E-02 9.7E-11 28 5.0E-03 2 5.0E-03 3 29 5.0E-03 3 10 2.0E-01 7.4E-07 10 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 2 9 5.0E-03 2 9 5.0E-03 2 9 5.0E-03 2 1.0E-07 15 9.1E-01 1.0E-08 2 9 5.0E-03 2 1.0E-03 3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 3 50 5000 5000 5000 5000 5000 5000 5000		1.2-Dichloropropane	*							29	5.0E-03	9.7E-07
3       2       1.0E-02       9.7E-11       28       5.0E-03         3       13       4.6E+00       8.5E-07       29       5.0E-03         2       13       4.6E+00       8.5E-07       29       5.0E-03         2       2       1.0E-02       8.5E-07       29       5.0E-03         3       2       2       1.0E-02       8.1E-11       28       5.0E-03         3       1       12       2.0E-01       7.4E-07       2       1.0E+01       1.1E-07         3       16       2.0E-01       7.4E-07       10       1.0E+01       1.1E-07         3       16       2.0E-01       7.4E-07       15       9.1E-01       1.0E-08       29       5.0E-03		1.2-Dichloropropane	2							29	5.0E-03	9.7E-07
3 4.6E+00 8.5E-07 29 5.0E-03 2 5.0E-03 29 5.0E-03 3 29 5.0E-03 29 5.0E-03 1 12 2.0E-01 7.4E-07 2 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 10 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 29 5.0E-03		1.2-Dichloropropane	e				0	1.0E-02	9.7E-11	28	5.0E-03	9.7E-07
1 29 5.0E-03 3 1 12 2.0E-01 7.4E-07 2 1.0E-02 8.1E-11 28 5.0E-03 2 8 2.0E-01 7.4E-07 10 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 2 9 5.0E-03		Chlordane	ŝ				13	4.6E+00	8.5E-07			
29 5.0E-03 3 29 5.0E-03 1 12 2.0E-01 7.4E-07 2 1.0E+01 1.1E-07 2 8 2.0E-01 7.4E-07 10 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 2 5.0E-03		1.1.2-Trichloroethane	-							29	5.0E-03	8.1E-07
3 2 1.0E-02 8.1E-11 28 5.0E-03 1 12 2.0E-01 7.4E-07 2 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 10 1.0E+01 1.1E-07 3 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 2 5.0E-03		1 1 2-Trichloroethane	0							29	5.0E-03	8.1E-07
1 12 2.0E-01 7.4E-07 2 1.0E+01 1.1E-07 2 8 2.0E-01 7.4E-07 10 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 2 5.0E-03		1 1 2-Trichloroethane	, co				0	1.0E-02	8.1E-11	28	5.0E-03	8.1E-07
2 8 2.0E-01 7.4E-07 10 1.0E+01 1.1E-07 3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 2 5.0E-03		Hevachlorohutadiene	•	12	2.0E-01	7.4E-07	0	1.0E+01	1.1E-07			
3 16 2.0E-01 7.4E-07 15 9.1E-01 1.0E-08 29 5.0E-03		Hexachiorohitadiene	. 0	80	2.0E-01	7.4E-07	10	1.0E+01	1.1E-07			
29 5.05-03		Hexachlorobutadiene	1 ന	16	2.0E-01	7.4E-07	15	9.1E-01	1.0E-08			
		Totrachloroethulene	0							29	5.0E-03	7.3E-07

No.         conc         carcinogen         No.         conc         carcinogen         No.         conc         carcinogen         No.         water           no.         ammpia $matrixinity$					Fish	Fish ingest		Sediment	Sed ingest			Water ingest
				No.	CONC	carcinogen	No.	conc	carcinogen	So.	Water	carcinogen
name         to,         anne         to,         anne	Contaminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	water	conc	screening indice
	iv De	name"	по.	samples	wet wt	indices	samples	dry wi	Indices	samples	1118/17	
	Ornanic	Toxaohene	-	12	1.0E-02	5.2E-07						
1       12       0.0003       1.46-07       1       1.06-01       4.96-07         1       1       0.0003       1.46-07       6       1.06-01       4.96-07       29       5.06-03         1       9.06-03       1.46-07       6       1.06-01       4.96-07       29       5.06-03       4.96-07         1       9.06-03       1.46-07       6       1.06-01       4.96-07       29       5.06-03       4.96-07         1       5.06-03       4.26-07       13       9.16-01       2.36-07       29       5.06-03 <td< td=""><td>Cugano</td><td>Toranhene</td><td>0</td><td>8</td><td>1.0E-02</td><td>5.2E-07</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Cugano	Toranhene	0	8	1.0E-02	5.2E-07						
8     9.0E-03     1.4E-07     6     1.0E-01     4.9E-07       1     12     9.0E-03     1.4E-07     6     1.0E+01     4.9E-07       1     12     9.0E-03     1.4E-07     1     1.0E+01     4.9E-07       1     9.0E-03     1.4E-07     1     1.0E+01     4.9E-07       1     5.0E-03     4.2E-07     13     9.1E-01     2.3E-07       1     5.0E-03     4.2E-07     13     9.1E-01     2.3E-07       1     5.0E-03     4.2E-07     13     9.1E-01     2.3E-07       1     5.0E-03     4.2E-07     13     9.1E-01     2.8E-07       1     5.0E-03     4.2E-07     13     9.1E-01     2.8E-07       1     2     1.0E-07     13     9.1E-01     2.8E-07       2     9.0E-03     3.16E-07     1     1.0E+01     3.4E-07       2     9.0E-03     3.16E-07     1     1.0E+01     3.4E-07       2     9.0E-03     3.16E-07     1     1.0E+01     3.4E-07       2     9.0E-03     3.16E-07     2.8E-07     2.9     1.0E-02       2     9.0E-03     3.16E-07     2.8E-07     2.9     1.0E-02       2     12     2.6E-01     3			-	12	9.0E-03	1.4E-07	-	1.0E+01	4.9E-07			
12       9.0E-03       1.4E-07       1       1.0E+01       4.9E-07       29       5.0E-03         16       5.0E-03       4.2E-07       13       9.1E-01       23E-07       29       5.0E-03       4.2E-07         16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       29       5.0E-03       4.2E-07         16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03       4.2E-07         16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       29       5.0E-03       4.2E-07         16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       29       1.0E-02       29       5.0E-03			. ດ	00	9.0E-03	1.4E-07	9	1.0E+01	4.9E-07			
2     9     90E-03     1.4E-07     6     1.0E+01     4.9E-07     29     5.0E-03     4.2E-07     13     9.1E-01     2.3E-07     28     5.0E-03     4.2E-07     29     5.0E-03     29			4 +	, <del>,</del>	0 0F-03	1.4E-07	•	1.0E+01	4.9E-07			
2       3       1.6       5.0E-03       4.2E-07       13       8.1E-01       2.3E-07       28       5.0E-03       4.26-07       13       8.1E-01       2.3E-07       29       5.0E-03       4.26-07       13       9.1E-01       2.3E-07       29       5.0E-03       4.26-07       13       9.1E-01       2.3E-07       29       5.0E-03       4.26-07       13       9.1E-01       2.3E-07       29       5.0E-03       4.26-03       4.26-07       13       9.1E-01       2.3E-07       29       5.0E-03       4.26-03       4.26-03       4.26-03       29       5.0E-03       29       1.0E-02       29		4,4,001	-	2 (	0.0 0 0	4 AE-07	ď	1 0F+01	4.9E-07			
1       23E-07       13       9.1E-01       2.3E-07       23       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03       27       50E-03       23       10E-07       23       10E-07       23       10E-02       10E-02       10E-02		4,4'DDT	2	æ	9.0E-03	· · · · · ·	0			90	5 0E-03	4.3E-07
16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03         16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03         1       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03         1       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03         1       1       5.0E-03       1.0E-07       6       1.0E-02       1.9E-11       29       1.0E-02       29         1       1       1       1       1       1.0E-01       3.4E-07       29       1.0E-02       29		Styrene	-							000	5 0F-03	4.3E-07
1       6       5.0E-03 <b>4.2E-07</b> 13       9.1E-01 <b>2.3E-07</b> 23       5.0E-03 <b>3.2E-07</b> 1       6       5.0E-03 <b>4.2E-07</b> 13       9.1E-01 <b>2.3E-07</b> 28       5.0E-03         1       5.0E-03 <b>4.2E-07</b> 13       9.1E-01 <b>2.3E-07</b> 28       5.0E-03         1       1       5.0E-03 <b>1.0E-07</b> 6       1.0E-07       29       1.0E-02       29       1.0E-02         1       1       1       1       1       1.0E+01       3.4E-07       29       1.0E-02       20       20       20		Styrene	2							200	5 0F-03	4.3E-07
16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03         2       16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03         2       12       9.0E-03       4.2E-07       13       9.1E-01       2.3E-07       29       1.0E-02       20       26       1.0E-02       20       2.0E-01       3.4E-07       1       1.0E-07       3.4E-07       1       1.0E-02       2.0E-01       3.4E-07       1       1.0E-02       2.0E-03       1.0E-02       2.0E-03       3.4E-03       1.0E-01       2.0E-03 <t< td=""><td></td><td>Styrene</td><td>3</td><td></td><td></td><td></td><td></td><td></td><td>10 L0 C</td><td>5</td><td></td><td></td></t<>		Styrene	3						10 L0 C	5		
16       5.0E-03       4.2E-07       13       9.1E-01       2.3E-07       28       5.0E-03         2       1       2       1.0E-02       29       1.0E-02       20       20		Beta BHC	e	16 1	5.0E-03	4.2E-07	13	9.1E-01	2.35-01			
2       1.0E-07       1.0E-07       1.0E-07       2.0       2.0         2       1.0E-07       1.0E-07       1.0E-01       3.4E-07       2.9       1.0E-02         2       1.0E-07       1       1.0E-01       3.4E-07       2.9       1.0E-02       2.9         2       1.0E-07       6       1.0E-07       6       1.0E-01       3.4E-07       2.9       1.0E-02		Gamma-BHC (Lindane)	e	16	5.0E-03	4.2E-07	13	9.1E-01	2.3E-U/	0	E 0E 03	A 16.07
3       12       9.0E-03       1.0E-07       1       1.0E-02       2       2       0.0E-02       2         2       1       1       1       1       1.0E-07       6       1.0E-01       3       2       1       0.0E-02       2       2       1       0       0       0       0       0       0       0       0       1       0       1       0       0       0       0       0 <t< td=""><td></td><td>Renzene</td><td>Ņ</td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td>9.0E-03</td><td></td></t<>		Renzene	Ņ							0	9.0E-03	
23       1.0E-02       1.9E-11       23       1.0E-02       3         21       12       9.0E-03       1.0E-07       6       1.0E-01       3.4E-07       29       1.0E-02       3         21       12       2.0E-03       1.0E-07       6       1.0E+01       3.4E-07       29       1.0E-02       3         21       12       2.0E-01       3.3E-07       1       1.0E+01       3.4E-07       29       1.0E-02       3         23       16       2.0E-01       3.3E-07       10       1.0E+01       3.4E-07       20       1.0E-02       3       20       20       20       20       20       20       20       20       20       20       20       20       20       20 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>21</td><td>5.UE-U3</td><td>4. F E-U/</td></t<>										21	5.UE-U3	4. F E-U/
2       1.0E-02       1.9E-11       28       1.0E-02       3.4E-07         2       1       1       1.0E-07       6       1.0E-01       3.4E-07       3.4E-07         2       8       9.0E-03       1.0E-07       6       1.0E+01       3.4E-07       3.4E-07         2       1       1       1.0E+07       6       1.0E+01       3.4E-07       3.4E-07         2       1       1       1.0E+01       3.4E-07       2       1.0E+01       3.4E-07         3       1       1       2       1.0E+01       3.4E-07       3.4E-07       3.4E-07         3       16       2.0E-01       3.3E-07       10       1.0E+01       3.4E-08       1.0E-02         3       16       2.0E-01       3.3E-07       10       1.0E+01       3.4E-08         3       16       2.0E-01       2.3E-07       10       1.0E+01       3.4E-08         3       16       9.0E-03       1.4E-07       13       9.1E-01       3.4E-08         3       16       9.0E-03       1.4E-07       13       9.1E-01       2.0E-08         3       16       9.0E-03       1.4E-07       13       9.1E-01       2.0		Benzene	<b>.</b> .							29	1.0E-02	3.7E-07
2       1.0E-02       1.9E-11       28       1.0E-02       1.9E-11       28       1.0E-02       2       1.0E-02       3.4E-07       2       1.0E-02       3.4E-07       3       3.4E-07       3       3.4E-07       3       3.4E-07       2       1.0E-01       3.4E-07       2       1.0E-01       3.4E-07       2       1.0E-01       3.4E-07       2       1.0E-01       3.4E-07       3       4.6       3       3.4E-03       3.4E-03       3       3.4E-03       3       3.4E-03       3       3.4E-03       3.4E-03       3       3.4E-03       3       3.4E-03       3       3       1.0E-01       3       3       1.0E-02       3       3       1.0E-02       3       3       1.0E-02       3       1.0E-02       3       1.0E-02       3       1.0E-02       3       1.0E-02       3       1.0E-02       3       1.0E-02 <td< td=""><td></td><td>Methyl chloride</td><td>- 1</td><td></td><td></td><td></td><td></td><td></td><td></td><td>29</td><td>1.0E-02</td><td>3.7E-07</td></td<>		Methyl chloride	- 1							29	1.0E-02	3.7E-07
3       12       9.0E-03       1.0E-07       1       1.0E-07       5       1.0E-01       3.4E-07       10       1.0E+01       3.4E-03       11       11       11       11       11       11       11       11       11       11       11<		Methyl chloride	2				¢	4 0E-00	1 0F.11	28	1.0E-02	3.7E-07
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Methyl chloride	n				N -	105.01	3 4E-07	) 		
2       8       9.06-03       1.06-07       6       1.06+01       5.45-01         2       1       12       2.06-01       3.35-07       10       1.06+01       5.06-08         3       16       2.06-01       3.35-07       10       1.06+01       5.06-08         3       16       2.06-01       3.35-07       10       1.06+01       5.06-08         3       16       2.06-01       2.35-07       10       1.06+01       3.45-08         3       16       2.06-01       2.35-07       10       1.06+01       3.46-08         3       16       9.06-03       1.46-07       13       9.16-01       3.46-08         3       16       9.06-03       1.46-07       13       9.16-01       3.46-08         3       16       9.06-03       1.46-07       13       9.16-01       3.46-08         3       16       9.06-03       1.46-07       13       9.16-01       2.06-08         3       16       9.06-03       1.46-07       13       9.16-01       2.06-08         3       16       9.06-03       1.46-07       13       9.16-01       2.06-08         3       16       <		4.4'DDD	<b></b>	12	9.0E-03	1.0E-07	1					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		4 4'DDD	2	8	9.0E-03	1.0E-07	9	1.0E+01	3.4E-U/			
2       8       20E-01       3.3E-07       10       1.0E+01       5.0E-08         3       16       2.0E-01       3.3E-07       14       1.0E+01       5.0E-08         2       8       2.0E-01       3.3E-07       14       1.0E+01       5.0E-08         3       16       2.0E-01       2.3E-07       10       1.0E+01       3.4E-08         3       16       2.0E-01       2.3E-07       10       1.0E+01       3.4E-08         3       16       2.0E-01       2.3E-07       10       1.0E+01       3.4E-08         3       16       9.0E-03       1.4E-07       13       9.1E-01       3.4E-08         3       16       9.0E-01       1.3E-07       13       9.1E-01       4.4E-08         3       16       9.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       1.0       1.0E+01       2.0E-08         3       16       2.0E-01			-	12	2.0E-01	3.3E-07	8	1.0E+01	5.0E-08			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			. ~	æ	2.0E-01	3.3E-07	10	1.0E+01	5.0E-08			
1       12       2.0E-01       2.3E-07       2       1.0E+01       3.4E-08         2       8       2.0E-01       2.3E-07       10       1.0E+01       3.4E-08         3       16       2.0E-01       2.3E-07       10       1.0E+01       3.4E-08         3       16       9.0E-03       1.4E-07       13       9.1E-01       1.4E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       9.1E-01       2.0E-08         3       16       2.0E-01       1.3E-07       2.0E-08       2.0E-03         3       16       2.0E-01       2.0E-03 </td <td></td> <td></td> <td>1 (*</td> <td>16</td> <td>2.0E-01</td> <td>3.3E-07</td> <td>41</td> <td>1.0E+01</td> <td>5.0E-08</td> <td></td> <td></td> <td></td>			1 (*	16	2.0E-01	3.3E-07	41	1.0E+01	5.0E-08			
2       8       2.0E-01 <b>2.3E-07</b> 10       1.0E+01 <b>3.4E-08</b> 3       16       2.0E-01 <b>2.3E-07</b> 13       9.1E-01 <b>3.4E-08</b> 3       16       9.0E-03 <b>1.4E-07</b> 13       9.1E-01 <b>3.4E-08</b> 3       16       9.0E-03 <b>1.4E-07</b> 13       9.1E-01 <b>3.4E-08</b> 3       16       9.0E-03 <b>1.4E-07</b> 13       9.1E-01 <b>4.4E-08</b> 3       16       2.0E-01 <b>1.3E-07</b> 2       1.0E+01 <b>2.0E-08</b> 3       16       2.0E-01 <b>1.3E-07</b> 10       1.0E+01 <b>2.0E-08</b> 3       16       2.0E-01 <b>1.3E-07</b> 16       9.1E-01 <b>1.8E-09</b> 3       16       2.0E-01 <b>1.3E-07</b> 16       9.1E-01 <b>1.8E-09</b> 3       16       2.0E-01 <b>1.3E-07</b> 16       9.1E-01 <b>2.0E-03</b> 3       16       2.0E-01 <b>1.3E-07</b> 16       9.1E-01 <b>2.0E-03</b> 3       16       2.0E-01 <b>1.3E-07</b> 1.0 <b>1.0E+01 2.0E-03</b> <t< td=""><td></td><td></td><td><del>،</del> د</td><td>2</td><td>2.0E-01</td><td>2.3E-07</td><td>ຸດ</td><td>1.0E+01</td><td>3.4E-08</td><td></td><td></td><td></td></t<>			<del>،</del> د	2	2.0E-01	2.3E-07	ຸດ	1.0E+01	3.4E-08			
3       16       2.3E-07       16       9.1E-01       3.1E-09         3       16       9.0E-03       1.4E-07       13       9.1E-01       4.4E-08         2       2.0E-01       1.3E-07       2       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       1.0E+01       2.9E-03       2.9       5.0E-03         3       16       2.0E-03       2.9 <td></td> <td></td> <td></td> <td>, at</td> <td>2.0E-01</td> <td>2.3E-07</td> <td>10</td> <td>1.0E+01</td> <td>3.4E-08</td> <td></td> <td></td> <td></td>				, at	2.0E-01	2.3E-07	10	1.0E+01	3.4E-08			
3       16       9.0E-03       1.4E-07       13       9.1E-01       4.4E-08         3       16       9.0E-03       1.4E-07       13       9.1E-01       4.4E-08         1       12       2.0E-01       1.3E-07       13       9.1E-01       4.4E-08         2       1.6       9.0E-03       1.4E-07       13       9.1E-01       4.4E-08         2       1.2E-07       10       1.0E+01       2.0E-03       1.4E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29         3       16       2.0E-03       29       1.0E+01       2.0E-03       29       5.0E-03         3       16       2.0E-01       1.0E-02       1.1E-11       28       5.0E-03         3       2		I,4-Dicilioi overizerie	<b>,</b> 1	16	2.0E-01	2.3E-07	16	9.1E-01	3.1E-09			
3       16       9.0E-03       1.4E-07       13       9.1E-01       4.4E-08         1       12       2.0E-01       1.3E-07       2       1.0E+01       2.0E-03         2       1       12       2.0E-01       1.3E-07       10       1.0E+01       2.0E-03         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-03         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-03         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       9.1E-01       2.0E-03         3       16       2.0E-03       29       5.0E-03       29       5.0E-03         3       2       1.0E-01       1.0E-07       1.0E-07       29       5.0E-03			, r	9.6	9.0E-03	1.4E-07	13	9.1E-01	4.4E-08			
1       12       2.0E-01       1.3E-07       2       1.0E+01       2.0E-08         2       8       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         3       16       2.0E-01       1.3E-07       16       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29       5.0E-03         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29       5.0E-03         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29       5.0E-03         3       3       14       9.1E-01       1.0E-07       29       5.0E-03         3       14       9.1E-01       1.0E-07       29       5.0E-03			) е <u>т</u>	9	9.0E-03	1.4E-07	13	9.1E-01	4.4E-08			
2       8       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         1       12       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         2       8       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29       5.0E-03         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29       5.0E-03         3       14       9.1E-01       1.0E-07       29       5.0E-03       29       5.0E-03         3       3       14       9.1E-01       1.0E-07       29       5.0E-03		8:4001	· •	12	2.0E-01	1.3E-07	2	1.0E+01	2.0E-03			
3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09         1       12       2.0E-01       1.3E-07       2       1.0E+01       2.0E-08         2       8       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29       5.0E-03         1       1       9.1E-01       1.0E+02       1.1.8E-09       29       5.0E-03         2       1       1.6       9.1E-01       1.8E-09       29       5.0E-03         3       14       9.1E-01       1.0E-07       29       5.0E-03         3       14       9.1E-01       1.0E-07       29       5.0E-03		Dis(z-euiyiriexyi)printarate		. 60	2.0E-01	1.3E-07	10	1.0E+01	2.0E-08			
1       12       2.0E-01       1.3E-07       2       1.0E+01       2.0E-08         2       8       2.0E-01       1.3E-07       10       1.0E+01       2.0E-08         3       16       2.0E-01       1.3E-07       16       9.1E-01       1.8E-09       29       5.0E-03         1       1       2       1.0E+01       2.0E-01       1.3E-07       29       5.0E-03         2       1       9.1E-01       1.8E-09       29       5.0E-03         2       1.0E-02       1.1E-11       28       5.0E-03         3       14       9.1E-01       1.0E-07       29       5.0E-03			<b>,</b> 1	16	2 0E-01	1.3E-07	16	9.1E-01	1.8E-09			
2     8     2.0E-01     1.3E-07     10     1.0E+01     2.0E-08       3     16     2.0E-01     1.3E-07     16     9.1E-01     1.8E-09       1     29     5.0E-03       2     1.0E-02     1.1E-11     28     5.0E-03       3     14     9.1E-01     1.0E-07     1.0E-03		Bis(2-emyinexyi)prinialate	· •	- <del>-</del>	2 0E-01	1.3E-07	CJ	1.0E+01	2.0E-08			
3     16     2.0E-01     1.3E-07     16     9.1E-01     1.8E-09       1     1     29     5.0E-03       1     29     5.0E-03       2     1.0E-02     1.1E-11     28       3     14     9.1E-01     1.0E-07		Hexachioroeutarie	- (	j a	2 0E-01	1.36-07	10	1.0E+01	2.0E-08			
3 16 2.0E-01 1.5E-0 0 0.15 0 0.15 0 29 5.0E-03 1 29 5.0E-03 2 1.0E-02 1.1E-11 28 5.0E-03 3 14 9.1E-01 1.0E-07		Hexachloroethane	N	D (			4	a 1E-01	1.8F-09			
1 29 5.0E-03 2 1.0E-02 1.1E-11 28 5.0E-03 3 14 9.1E-01 1.0E-07 3		Hexachloroethane	ო	16	2.0E-01	10-30.1	2	0.11.0		62	5.0E-03	1.1E-07
2 1.0E-02 1.1E-11 28 5.0E-03 3 14 9.1E-01 1.0E-07 3		Bromoform	-							50	5 0E-03	1.1E-07
3 14 9.1E-01 1.0E-07		Bromoform	N				c		1 15-11	80	5 0F-03	1.1E-07
3 14 0.10-01		Bromoform	e						1 0E-07	) !		
		1 2-Dichenvlhvdrazine	ო				4	8.1C-01	1.05-07			

Table D1 (continued)

				Fish	Fish Ingest		Sediment	Sed ingest			Water ingest
			No.	CONC	carcinogen	No.	CONC	carcinogen	No.	Water	carcinogen
C:onteminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	water	CORC	screening
type	name"	<b>RO.</b>	sampies	wet wt	Indices	semples	dry wit	indices	semples	(mg/L)	Indices
Organic	2.4.6-Trichlorophenol	-	12	2.0E-01	1.0E-07	2	1.0E+01	1.6E-08			
5	2.4.6-Trichiorophenol	0	60	2.0E-01	1.0E-07	10	1.0E+01	1.6E-08			
	2.4.6-Trichloropheriol	n	16	2.0E-01	1.0E-07	16	9.1E-01	1.4E-09			
	4.4.DDD	e	16	9.0E-03	1.0E-07	5	9.1E-01	3.1E-08			
	Acrylonitrile	ŝ				2	9.1E-01	7.0E-08			
	N-Nitrosociphenylamine	-	12	2.0E-01	<b>€.6E-0</b> 8	ณ	1.0E+01	7.9E-09			
	N-Nitrosodiohenviamine	2	8	2.0E-01	4.6E-08	10	1.0E+01	2.0E-09			
	N-Nitrosociohenylamine	e	16	2.0E-01	4.6E-08	16	9.1E-01	6.4E-10			
	Isochorone	<b>y</b> ec	12	2.0E-01	3.9E-08	01	1.0E+01	5.9E-09			
	tsochorone	2	83	2.0E-01	3.9E-08	10	1.0E+01	5.9E-09			
	isophorone	n	16	2.0E-01	3.9E-08	16	9.1E-01	5.3E-10			
	Anitoe					C)	1.0E+01	8.1E-09			
	Anitre	N				g	1.0E+01	8.1E-09			
	Aniline	n				11	1.0E+01	8.1E-09			
	Tetrachlorcethylene	<b>6</b> 2				~	1.0E-02	7.3E-11			
	Trichloroethylene	e				8	1.0E-02	1.6E-11			
							(Ba/ka)				
Padionarciida	H-3	e7.				۲	5 0F+02	7.95-11			

"Contaminants are ranked in descending order by sum of screening indices

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Table D1 (continued)

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			;	Fish	Fish ingest	:	Sediment	Sed Ingest			Water ingest
			No.	CORC	noncarcinogen	No.	conc	noncarcinogen		Jele M	noncarcinogen
Contaminant type	Contaminant nama*	Reach	fish samules	(mg/kg) wei wi	screening indices	sediment samples	(mg/kg) drv wt	screening indices	water samples	conc (mg/L)	screening indices
Inoraanic	Antimonv	-	104	5.0E-01	1.2E-01				e	5.0E-02	3.6E-01
	Antimony	2	45	5.0E-01	1.2E-01				Ċ	5.0E-02	3.6E-01
	Antimony	e	109	5.0E-01	1.2E-01				e	5.0E-02	3.6E-01
	Selanium	N							ę	5.0E-02	4.8E-02
	Arsenic	•	104	5.0E-01	4.6E-02				33	1.0E-02	2.9E-02
	Arsenic	2	45	5.0E-01	4.6E-02						
	Arsenic	n	109	5.0E-01	4.6E-02						
	Molybdenum	-							m	4.0E-02	2.9E-02
	Molybdenum	5							e	4.0E-02	2.9E-02
	Molybdenum	e							(Y)	4.0E-02	2.9E-02
	Cadmium	<b>*</b> **							33	2.0E-03	1.1E-02
	Cadmium	e							33	2.0E-03	1.1E-02
	Thallium	e				~	5.0E+00	1.0E-02			
	Chromium	-	104	5.0E-01	9.3E-03						
	Chromium	0	45	5.0E-01	9.3E-03						
	Chromium	ຕ	109	5.0E-01	9.3E-03						
	Silver	-	104	2.0E-01	6.2E-03				33	5.0E-03	4.8E-03
	Silver	2	45	2.0E-01	6.2E-03				33	5.0E-04	4.8E-04
	Silver	n	109	2.0E-01	6.2E-03				33	5.0E-03	4.8E-03
	Selenium	-							4	5.0E-03	4.8E-03
	Boron	-							ო	8.0E-02	2.5E-03
	Baton	0							4	8.0E-02	2.5E-03
	Boron	e							ო	6.0E-02	2.5E-03
	Nickei	<b>*-</b>	104	5.0E-01	2.3E-03						
	Nickel	0	45	5.0E-01	2.3E-03						
	Nickel	ę	109	5.0E-01	2.3E-03						
	Beryflium	-	104	1.0E-01	1.9E-03				ო	2.0E-04	1.1E-04
	Beryflium	2	45	1.0E-01	1.9E-03				m	2.0E-04	1.1E-04
	Beryllium	ო	109	1.0E-01	1.9E-03				()	2.0E-04	1.1E-04
	Vanadium	-							ო	2.0E-03	8.2E-04
	Vanadium	e							ო	2.0E-03	8.2E-04
	Tin	-							ო	5.0E-02	2.4E-04
	Tin	Q							ო	5.0E-02	2.4E-04
	Tin	en							n	5.0E-02	2.4E-04
		,									

Table D2. Results of nonconservative screening of noncarcinogens where no concentrations were above detectiv

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				Fish	FISN Ingest		Cediment	Sed ingest			TRABUS INTEL
			No.	conc	noncarcinogen	No.	CONC	noncarcinogen	No.	Water	noncarcinogen
Contaminent	Contaminant	Reach	fish	(BX/Bm)	screening	sediment	(Ba/kg)	screening	water	conc	screening
type	name"	.ou	sampies	wet wit	Indices	samples	dry wi	Indices	samples	(mg/L)	Indices
Organic	4,6-Dinitro-ortho-cresol	÷	12	1.0E+00	9.3E-01	ო	2.0E+01	2.9E-02			
I	4,6-Dinitro-ortho-cresol	0	80	1.0E+00	9.3E-01	10	2.0E+01	2.9E-02			
	4.6-Dinitro-ortho-cresol	б	16	1.0E+00	9.3E-01	16	4.6E+00	6.6E-03			
	Heptachior epoxide	-	12	5.0E-03	3.6E-02	ţ	1.0E+01	1.1E-01			
	Heptachior epoxide	~	æ	5.0E-03	3.6E-02	9	1.0E+01	1.1E-01			
	Cis-1.3-dichloropropene	<b>4</b> -1							29	5.0E-03	4.8E-02
	Cis-1.3-dichloropropene	2							29	5.0E-03	4.8E-02
	Cis-1 3-dichloropropene	ę							28	5.0E-03	4.8E-02
	Trans-1 3-dichloropropene	<b>*</b>							29	5.0E-03	4.8E-02
	Trans-1.3-dichlorooropene	0							29	5.0E-03	4.8E-02
	Trans-1.3-dichloropropene	( m							28	5.0E-03	4.8E-02
	Aldrin	-	12	5.0E-03	1.5E-02	~	1.0E+01	4.8E-02			
	Aldrin	~	8	5.0E-03	1.5E-02	9	1.0E+01	4.8E-02			
	Nitrobenzene	-	12	2.0E-01	3.7E-02	~	1.0E+01	2.9E-03			
	Nitrobenzene	8	80	2.0E-01	3.7E-02	10	1.0E+01	2.9E-03			
	Nitrobenzene	e	16	2.0E-01	3.7E-02	16	9.1E-01	2.6E-04			
	Heptachlor epoxide	ę	16	5.0E-03	3.6E-02	13	9.1E-01	1.0E-02			
	Dieldrin	<b>*</b>	12	9.0E-03	1.7E-02	*	1.0E+01	2.9E-02			
	Dieldrin	2	æ	9.0E-03	1.7E-02	Q	1.0E+01	2.9E-02			
	Endosultan I	-	12	5.0E-03	9.3E-03	-	1.0E+01	2.9E-02			*
	Endosuitan I	(1)	8	5.0E-03	9.3E-03	Ş	1.0E+01	2.9E-02			
	Endosultan II	-	12	9.0E-03	1.7E-02	<b>*</b>	1.0E+01	2.9E-02			
	Endosultan II	5	8	9.0E-03	1.7E-02	9	1.0E+01	2.9E-02			
	Chlordane	-				0	1.0E+01	2.4E-02			
	Chiordane	~				9	1.0E+01	2.4E-02			
	Hexachiorobenzene	•	12	2.0E-01	2.3E-02	~	1.0E+01	1.8E-03			
	Hexachiorobenzene	0	8	2.0E-01	2.3E-02	10	1.0E+01	1.8E-03			
	Hexachiorobenzene	en	16	2.0E-01	2.3E-02	16	9.1E-01	1.6E-04			
	Methyl bromide	-							29	1.0E-02	2.0E-02
	Methy! bromide	0							29	1.0E-02	2.0E-02
	Methyl bromide	e				5	1.05 02	1.0E-06	28	1.0E-02	2.0E-02
	Carbon tetrachloride	-							29	5.0E-03	2.0E-02
	Carbon tetrachloride	2							29	5.0E-03	2.0E-02
	Carbon tetrachloride	e				~	1.0E-02	2.0E-06	28	5.0E-03	2.0E-02
	Hexachloroethane	-	12	2.0E-01	1.9E-02	5	1.0E+01	1.4E-03			
	Hexachioroethane	2	8	2.0E-01	1.9E-02	10	1.0E+01	1.4E-03			
		,	•			•					

Table D2 (continued)

(continued)	
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Table	

No.         contractingen					1814	FISN INGEST		Sediment	Sed Ingest			Mater Ingest
Containing         Rest         Itin         (mg/rg)         intermediation         inter					conc	noncarcinogen	Š.	conc	noncarcinogen	No.	Water	noncarcinogen
Hills         3         Inform         3         Information         3         Inform         3         3         Inform         3         Inform         3         3         Inform         3         3 </th <th>ntaminent</th> <th>Contaminant</th> <th>Reach</th> <th>fish for the</th> <th>(mg/kg)</th> <th>screening</th> <th></th> <th>(mg/Kg)</th> <th>screening Indices</th> <th>water samples</th> <th>(ma/L)</th> <th>indices</th>	ntaminent	Contaminant	Reach	fish for the	(mg/kg)	screening		(mg/Kg)	screening Indices	water samples	(ma/L)	indices
Fromment         3         10         500000         17500         13         51501         26603         17502         13         51501         26603         17502         13         51501         26603         17502         13         51501         26603         11503         26603         11503         26603         115632         11603         111633         26603         115632         116033         116033 <td>type</td> <td>DiaMe<sup>-</sup></td> <td><u>.</u> 6</td> <td>adilipies 16</td> <td>9.0E-03</td> <td>1.7E-02</td> <td>13</td> <td>9.1E-01</td> <td>2.6E-03</td> <td></td> <td></td> <td></td>	type	DiaMe <sup>-</sup>	<u>.</u> 6	adilipies 16	9.0E-03	1.7E-02	13	9.1E-01	2.6E-03			
1         50E-03         1.5E-02         13         9.1E-01         4.3E-03           1         1         2.00E-01         1.4E-02         13         9.1E-01         1.1E-03           1         1         2.00E-01         1.4E-02         13         9.1E-01         1.1E-03           1         1         2.00E-01         1.4E-02         13         9.1E-01         1.1E-03           1         1         2.00E-01         9.3E-03         13         9.1E-01         1.1E-03           1         1         2.00E-01         9.3E-03         13         9.1E-01         2.1E-03           1         1         2.00E-01         9.3E-03         13         9.1E-01         2.1E-03           1         1         2.00E-01         9.3E-03         13         9.1E-01         2.1E-03           1         1         2.00E-01         6.2E-03         13         10.016+01         2.1E-03           1         1         2.00E-01         6.2E-03         13         10.016+01         2.1E-03           1         1         2.00E-01         6.2E-03         3         10.016+01         2.1E-03           1         1         2.0E-01         6.2E-03	vilaa inc	Endocultan I	) en	16	9.0E-03	1.7E-02	13	9.1E-01	2.6E-03			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Aldrin		16	5.0E-03	1.5E-02	13	9.1E-01	4.3E-03			
2         8         20E-01         1.4E-02         10         1.0E+01         1.1E-02           3         16         20E-01         9.3E-03         13         9.1E-01         9.4E-03           3         16         20E-01         9.3E-03         13         4.6E+00         1.1E-02           3         16         20E-01         9.3E-03         13         4.6E+00         1.1E-03           3         16         20E-01         9.3E-03         13         9.1E-01         5.6E-03           3         16         20E-01         9.3E-03         13         10E+01         4.8E-04           3         16         20E-03         9.3E-03         13         10E+01         4.8E-04           3         16         20E-03         1.5E-03         13         10E+01         4.8E-04           1         12         90E-03         1.5E-03         13         10E+01         4.8E-04           1         12         20E-01         4.5E-03         16         9.1E-01         3.6E-04           1         12         20E-01         4.8E-03         10         10E+01         4.8E-03           1         12         20E-01         3.7E-03		1 2 4-Trichlorobenzene	) <del></del>	12	2.0E-01	1.4E-02	0	1.0E+01	1.1E-03			
3       16       20E-01       1.4E-02       16       9.1E-01       0.9E-05         2       12       20E-01       9.3E-03       13       466+00       1.1E-02         2       16       2.0E-01       9.3E-03       13       9.1E-01       7.1E-04         3       16       2.0E-01       9.3E-03       13       9.1E-01       2.6E-03         3       16       2.0E-01       9.3E-03       13       9.1E-01       4.8E-04         3       16       2.0E-03       9.3E-03       13       106+01       4.8E-03         1       12       2.0E-03       2.8E-03       3       1.0E+01       4.8E-03         1       12       5.0E-03       3.8E-03       3       1.0E+01       3.6E-04         1       12       5.0E-03       3.7E-03       3       1.0E+01       3.6E-03         1       12       2.0E-01 <td< td=""><td></td><td>1 2 4- Trichlorobenzene</td><td>~ ~</td><td>80</td><td>2.0E-01</td><td>1.4E-02</td><td>10</td><td>1.0E+01</td><td>1.1E-03</td><td></td><td></td><td></td></td<>		1 2 4- Trichlorobenzene	~ ~	80	2.0E-01	1.4E-02	10	1.0E+01	1.1E-03			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		1.2.4-Trichlorobenzene	(7)	16	2.0E-01	1.4E-02	16	9.1E-01	9.9E-05			
1         12         20501         9.5503         2         105401         7.1504           2         16         50503         9.5503         10         105401         7.1504           2         16         50503         9.5503         13         9.1501         5.563           2         16         50503         9.5503         10         105401         7.1504           2         1         12         20501         6.5503         3.5603         3         105401         4.8504           3         16         2.5503         16         9.1501         4.8504         4.8504           3         16         2.5503         2.8603         16.401         4.8504         4.8504           3         16         2.6503         2.8603         16.6401         4.8603         3.6604           3         16         105401         4.8603         3.6604         4.8603         3.6604           3         16         2.6601         3.7503         14         105401         3.6603           3         16         2.6601         3.7603         3.6604         3.6604         3.6604           3         12         2.0601		Chlordane	ŝ				13	4.6E+00	1.1E-02			
2         8         205-01         0.35-03         10         1.05+01         7.15-04           3         16         5.05-03         0.35-03         15         9.15-01         6.55-05           3         16         5.05-03         0.35-03         13         9.15-01         6.55-05           3         16         2.05-01         6.25-03         1         1.05-01         4.85-04           3         16         2.05-01         6.25-03         1         1.05-01         4.85-04           3         16         2.05-03         1.55-03         5         1.05-01         4.85-03           1         12         5.06-03         1.55-03         5         1.05-01         4.85-03           1         12         5.06-03         1.55-03         5         1.05-01         3.85-03           1         12         2.05-03         1.55-03         5         1.05-01         3.85-03           1         12         2.05-03         2.95-03         1.6         1.65-01         3.85-03           1         12         2.05-03         2.65-03         3         1.05-01         3.85-03           1         12         2.05-03         2.65-03 </td <td></td> <td>Hexachlorobutadiene</td> <td>-</td> <td>12</td> <td>2.0E-01</td> <td>9.3E-03</td> <td>2</td> <td>1.0E+01</td> <td>7.1E-04</td> <td></td> <td></td> <td></td>		Hexachlorobutadiene	-	12	2.0E-01	9.3E-03	2	1.0E+01	7.1E-04			
16         20E-01         9.3E-03         15         9.1E-01         6.5E-03         3.3E-03         13         9.1E-01         6.5E-03         3.3E-03         13         9.1E-01         2.6E-03         3.3E-03         13         9.1E-01         2.6E-03         3.3E-03         13         9.1E-01         2.6E-03         3.3E-03         13         9.1E-01         4.8E-04         4.8E-04         4.8E-04         4.8E-04         4.8E-04         4.8E-04         4.8E-04         4.8E-03         6         1.0E-01         3.8E-04         4.8E-03         6         1.0E-01         3.8E-04 <th< td=""><td></td><td>Hexachlorobutadiene</td><td>2</td><td>æ</td><td>2.0E-01</td><td>9.3E-03</td><td>10</td><td>1.0E+01</td><td>7.1E-04</td><td></td><td></td><td></td></th<>		Hexachlorobutadiene	2	æ	2.0E-01	9.3E-03	10	1.0E+01	7.1E-04			
3       16       50E03       9.3E-03       13       9.1E-01       2.6E-03         2       1       2       20E 01       6.2E-03       1       10E+01       4.8E-04         3       16       20E 01       6.2E-03       1       10E+01       4.8E-04         3       16       20E 01       6.2E-03       16       9.1E-01       4.8E-04         4       12       20E 03       2.8E-03       1       1.0E+01       4.8E-04         1       12       20E 03       1.5E-03       1       1.0E+01       4.8E-04         1       12       20E 03       1.5E-03       2       1.0E+01       4.8E-03         1       12       20E 01       4.6E-03       1       1.0E+01       4.8E-03         1       12       20E 01       3.7E-03       1       1.0E+01       3.6E-04         3       16       2.0E 01       3.7E-03       3       1.0E+01       3.6E-04         3       16       2.7E-03       3       1.0E+01       2.8E-04       3.6E-04         3       16       2.6E-01       3.7E-03       3       1.0E+01       2.8E-04         3       16       3.7E-03		Hexachlorobutadiene	ო	16	2.0E-01	9.3E-03	15	9.1E-01	6.5E-05			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Endosuftan i	. ന	16	5.0E-03	9.3E-03	13	9.1E-01	2.6E-03			
2         8         2.0E-01         6.2E-03         10         1.0E+01         4.8E-03           1         1         2         0.0E-03         2.8E-03         16         9.1E-01         4.8E-03           1         1         2         0.0E-03         2.8E-03         16         9.1E-01         4.8E-03           1         1         2         5.0E-03         1.5E-03         6         1.0E+01         4.8E-03           1         1         2         5.0E-03         1.5E-03         6         1.0E+01         4.8E-03           1         1         2         5.0E-03         1.5E-03         6         1.0E+01         4.8E-03           1         1         2         2.0E-01         4.6E-03         1         1         1.0E+01         4.8E-03           1         1         2         2.0E-01         4.6E-03         1         1         1.0E+01         3.6E-04           1         1         2         1         1         1.0E+01         3.6E-04         3.6E-04           1         1         2         1.0E+03         1         1.0E+01         3.6E-04           1         1         2         2         1.0E+0		2 4-Dichlorophenol	<b>y</b> an	12	2.0E-01	6.2E-03	e	1.0E+01	4.8E-04			
3       16       20E-01       6.2E-03       16       9.1E-01       4.3E-05         2       9       9.0E-03       2.8E-03       1       1.0E+01       4.8E-03         2       9       9       9.0E-03       2.8E-03       1       1.0E+01       4.8E-03         2       1       1       1.0E+01       4.8E-03       2       1.0E+01       4.8E-03         3       1.0E       1.0E+01       4.6E-03       1.0E+01       3.6E-04       3.6E-04         3       1.0       2.0E-01       3.7E-03       3       1.0E+01       3.6E-04         3       1.6       2.0E-01       3.7E-03       14       1.0E+01       3.6E-04         3       1.6       2.0E-01       3.7E-03       3       10       1.0E+01       3.6E-04         3       1.6       2.0E-01       3.7E-03       10       1.0E+01       2.6E-03       2.6E-04         3       1.6       2.7E-03       3.7E-03       3.16       0.1.2E+01       2.8E-04         3       1.6       2.6E-01       3.7E-03       3.16       0.1.2E+01       2.8E-04         3       1.6       2.6E-01       3.7E-03       3.16       3.16-01 <td< td=""><td></td><td>2.4-Dichlorophenol</td><td>0</td><td>8)</td><td>2.0E-01</td><td>6.2E-03</td><td>10</td><td>1.0E+01</td><td>4.8E-04</td><td></td><td></td><td></td></td<>		2.4-Dichlorophenol	0	8)	2.0E-01	6.2E-03	10	1.0E+01	4.8E-04			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		2.4-Dichlorophenol	n	16	2.0E-01	6.2E-03	16	9.1E-01	4.3E-05			
2         8         9.0E-03         2.8E-03         6         1.0E+01         4.8E-03           1         12         5.0E-03         1.5E-03         6         1.0E+01         4.8E-03           1         12         5.0E-03         1.5E-03         6         1.0E+01         4.8E-03           1         12         2.0E-01         4.6E-03         2         1.0E+01         3.6E-04           1         12         2.0E-01         4.6E-03         14         1.0E+01         3.6E-04           1         12         2.0E-01         3.7E-03         14         1.0E+01         3.6E-04           2         16         2.0E-01         3.7E-03         10         1.0E+01         2.8E-04           2         1.0         2.7E-03         16         1.6E+01         2.8E-04         2.9E-04           2         2.0E-01         3.7E-03         10         1.0E+01         2.9E-04         2.9E-04           2         2.0E-01         3.7E-03         16         9.1E-01         2.8E-04         2.9E-04           2         2         2.0E+01         2.8E-04         2.9E-04         2.9E-04           2         2         2.0E+01         2.8E-04		Endrin	<del>,</del>	12	9.0E-03	2.8E-03	-	1.0E+01	4.8E-03			
1       12       5.0E-03       1.5E-03       2       1.0E+01       4.8E-03         2       8       5.0E-03       1.5E-03       6       1.0E+01       4.8E-03         2       8       5.0E-01       4.6E-03       2       1.0E+01       3.8E-04         3       16       2.0E-01       4.6E-03       3       10       1.0E+01       3.6E-04         3       16       2.0E-01       3.7E-03       3       10       1.0E+01       3.6E-04         3       16       2.0E-01       3.7E-03       3       10       1.0E+01       2.9E-04         3       16       2.0E-01       3.7E-03       3       10       1.0E+01       2.9E-04         3       16       2.0E-01       3.7E-03       16       9.1E-01       2.9E-04         3       16       2.0E-01       3.7E-03       10       1.0E+01       2.9E-04         3       12       1.0E+00       3.1E-03       2.9       5.0E-03       2.9         3       16       9.1E-01       2.6E-04       3.7E-04       2.9       5.0E-03         3       16       9.1E-01       2.6E-03       2.9       5.0E-03       2.9       5.0E-03<		Endrin	0	8	9.0E-03	2.8E-03	9	1.0E+01	4.8E-03			
2       8       5.0E-03       1.5E-03       6       1.0E+01       4.8E-03         2       1       12       2.0E-01       4.6E-03       2       1       0       1.6E+01       3.6E-04         3       16       2.0E-01       4.6E-03       1       1       0       0.6E+01       3.6E-04         3       16       2.0E-01       4.6E-03       1       1       0       0.6E+01       3.6E-04         3       16       2.0E-01       3.7E-03       3       106+01       2.6E-04       3.6E-04         3       16       2.0E-01       3.7E-03       10       1.0E+01       2.6E-04       2.6E-04         3       16       2.0E-01       3.7E-03       16       9.1E-01       2.9E-04       2.9       2.0E-03         3       12       2.0E-01       3.7E-03       16       9.1E-01       2.9E-04       2.9       2.0E-03         3       12       1.0E+00       3.1E-03       10       1.0E+01       2.9E-04       2.9       2.0E-03         3       12       1.0E+01       3.7E-03       10       1.0E+01       2.9E-04       2.9       2.0E-03         3       12       1.0E+03		Gamma-BHC (Lindane)	<b>y</b>	12	5.0E-03	1.5E-03	2	1.0E+01	4.8E-03			
1       12       2.0E-01 <b>4.6E-03</b> 2       1.0E+01 <b>3.6E-04</b> 3       16       2.0E-01 <b>4.6E-03</b> 14       1.0E+01 <b>3.6E-04</b> 3       16       2.0E-01 <b>4.6E-03</b> 14       1.0E+01 <b>3.6E-04</b> 3       16       2.0E-01 <b>3.7E-03</b> 3       1.0E+01 <b>3.6E-04</b> 3       16       2.0E-01 <b>3.7E-03</b> 16       9.1E-01 <b>2.8E-04</b> 3       16       2.0E-03 <b>3.1E-03 2.6E-07 2.9E-03 2.9E-03</b> 3       16       1.0E+00 <b>3.1E-03 2.6E-04 4.3E-04 2.9E-03</b> 3       16       1.0E+00 <b>3.1E-01 2.6E-03 2.9E-03 2.9E-03</b> 3       16       1.0E+01 <b>2.6E-04 2.6E-03 2.9E-03</b>		Gamma-BHC (Lindane)	2	Ø	5.0E-03	1.5E-03	9	1.0E+01	4.8E-03			
2       8       2.0E-01       4.6E-03       10       1.0E+01       3.6E-04         3       16       2.0E-01       4.5E-03       14       1.0E+01       3.6E-04         2       8       2.0E-01       3.7E-03       3       1.0E+01       3.6E-04         3       16       2.0E-01       3.7E-03       3       1.0E+01       2.6E-04         3       16       2.0E-01       3.7E-03       10       1.0E+01       2.6E-04         3       16       2.0E-01       3.7E-03       10       1.0E+01       2.6E-04         3       16       2.0E-01       3.7E-03       10       1.0E+01       2.6E-04         3       16       2.0E-03       16       9.1E-01       2.6E-04       2.9       5.0E-03         3       16       1.0E+00       3.1E-03       10       1.0E+01       2.6E-04       2.9       5.0E-03         3       16       1.0E+00       3.1E-03       10       5.0E+03       2.9       5.0E-03         3       16       1.0E+01       2.6E-04       1.0E+01       2.6E-04       2.9       5.0E-03         3       16       1.0E+01       2.6E-03       3.6E-01       2.8E-03		4-Chloroaniline	-	12	2.0E-01	4.6E-03	0	1.0E+C1	3.6E-04			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		4-Chloroaniline	8	80	2.0E-01	4.6E-03	10	1.0E+01	3.6E-04			
1       12       2.0E-01 <b>3.7E-03</b> 3       1.0E+01 <b>2.9E-04</b> 2       8       2.0E-01 <b>3.7E-03</b> 10       1.0E+01 <b>2.9E-04</b> 3       16       2.0E-01 <b>3.7E-03</b> 10       1.0E+01 <b>2.9E-04</b> 3       16       2.0E-01 <b>3.7E-03</b> 10       1.0E+01 <b>2.8E-04</b> 2       1       10       1.0E+03 <b>3.7E-03</b> 10       1.0E+01 <b>2.9E-04</b> 2       1       12       1.0E+00 <b>3.1E-03 16 9.1E-01 2.9E-04</b> 3       16       1.0E+00 <b>3.1E-03 2 5.0E-03 2</b> 3       16       1.0E+00 <b>3.1E-03 2 5.0E-04 2</b> 1       12       1.0E+00 <b>3.1E-03 1 2.4E-04 2</b> 1       12 <b>5.0E-03 3.1E-03 1 2 5.0E-03</b> 2       1       10 <b>5.0E-04 1 1 2 5.0E-04</b> 1       12 <b>5.0E-03 3.1E-03 2 5.0E-01 2</b>		4-Chloroantline	e	16	2.0E-01	4.6E-03	14	1.0E+01	3.6E-04			
2       8       2.0E-01       3.7E-03       10       1.0E+01       2.8E-04         3       16       2.0E-01       3.7E-03       16       9.1E-01       2.8E-04         2       1       1       1       1       2.6E-01       3.7E-03       16       9.1E-01       2.8E-04         2       1       1       1       2       1.0E+00       3.7E-03       16       9.1E-01       2.9       5.0E-03         3       1       1       1       2       5.0E+01       3.7E-03       29       5.0E-03         3       16       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       29         3       16       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       29         1       12       5.0E-03       9.3E-04       1       1.0E+01       2.9E-03       5.0E-03         2       8       5.0E-03       9.3E-04       1       1.0E+01       2.9E-03       5.0E-03         3       16       9.1E-01       2.4E-04       2.9E-03       5.0E-03       5.0E-03         2       8       5.0E-03       9.3E-04       1       1.0E+01       2.9E-03		2-Chlorophenol	ų.,	12	2.0E-01	3.7E-03	რ	1.0E+01	2.9E-04			
3       16       2.0E-01 <b>3.7E-03</b> 16       9.1E-01 <b>2.6E-05</b> 2       1       12       1.0E+00 <b>3.7E-03</b> 29       5.0E-03         3       1       12       1.0E+00 <b>3.1E-03</b> 29       5.0E-03         2       8       1.0E+00 <b>3.1E-03</b> 10       5.0E+01       2.8       5.0E-03         2       8       1.0E+00 <b>3.1E-03</b> 10       5.0E+01       2.4E-04       28       5.0E-03         3       16       1.0E+00 <b>3.1E-03</b> 10       5.0E+01       2.4E-04       28       5.0E-03         3       16       1.0E+00 <b>3.1E-03</b> 10       5.0E+01       2.4E-04       2.4E-04         1       12       5.0E-03 <b>9.3E-04</b> 1       1.0E+01       2.9E-03       5.0E-03         2       1       12       5.0E-03 <b>9.3E-04</b> 6       1.0E+01       2.9E-03         3       16       9.0E-03 <b>1.7E-03</b> 1       1.0E+01 <b>2.9E-03</b> 3       16       9.0E-01       2.7E-03       1.3       9.1E-01 <b>2.0E-04</b> 3       16       9.		2-Chicrophenol	8	8	2.0E-01	3.7E-03	10	1.0E+01	2.9E-04			
1       12       1.0E+00       3.1E-03       29       5.0E-03         2       1       12       1.0E+00       3.1E-03       29       5.0E-03         2       8       1.0E+00       3.1E-03       2       5.0E+04       29       5.0E-03         2       8       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       29       5.0E-03         3       16       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       28       5.0E-03         2       1       12       5.0E-03       3.1E-03       10       5.0E+01       2.4E-04       23       5.0E-03         2       1       12       5.0E-03       9.1E-01       2.4E-04       2.4E-04       2.4E-04       2.4E-04       2.4E-04       2.4E-04       2.4E-04       2.0E-03       2.4E-04       2.		2-Chlorophenol	e	16	2.0E-01	3.7E-03	16	9.1E-01	2.6E-05			
2       2.0E-03         3       1       1.2       1.0E+00       3.1E-03       2       5.0E-04       29       5.0E-03         2       8       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       28       5.0E-03         3       16       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       28       5.0E-03         3       16       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       28       5.0E-03         1       12       5.0E-03       3.1E-03       10       5.0E+03       2.4E-04       28       5.0E-03         2       1       12       5.0E-03       9.3E-04       1       1       0.0E+01       2.9E-03         1       12       5.0E-03       9.3E-04       6       1.0E+01       2.9E-03         3       16       9.0E-03       1.7E-03       6       1.0E+01       2.9E-03         3       16       9.0E-01       2.7E-03       13       9.1E-01       1.9E-04         3       16       9.1E-01       1.0E+01       2.0E-04       2.0E-04         3       16       9.1E-01       1.0E+01       2.0E-04       2		1,1,2-Trichlorcethane	-							29	5.0E-03	3.6E-U3 0 05 00
3       1       12       1.0E-03       3.1E-03       2       1.0E-02       3.6E-07       28       5.0E-03         2       16       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       2       5.0E-03         3       16       1.0E+00       3.1E-03       10       5.0E+01       2.4E-04       2       5.0E-03         1       12       5.0E-03       3.1E-03       10       5.0E+01       2.4E-04       2       2         1       12       5.0E-03       9.3E-04       1       1.0E+01       2.4E-04       2       2       2       3       2       5.0E-03       3       2       5.0E-03       3       2       5.0E-03       3       2       5.0E-03       2       5.0E-03       2       5.0E-03       3       2       5       5       2       2       2       5       5       5       2       2       2       2       2       5 <td></td> <td>1,1,2-Trichloroethane</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td>29</td> <td>5.0E-03</td> <td>3.0E-U3</td>		1,1,2-Trichloroethane	2					1		29	5.0E-03	3.0E-U3
1       12       1.0E+00 <b>3.1E-03</b> 2       5.0E+01         2       8       1.0E+00 <b>3.1E-03</b> 10       5.0E+01         3       16       1.0E+00 <b>3.1E-03</b> 10       5.0E+01         1       12       5.0E+00 <b>3.1E-03</b> 10       5.0E+01         2       16       1.0E+00 <b>3.1E-03</b> 10       5.0E+01         2       8       5.0E-03 <b>9.3E-04</b> 1       1.0E+01         2       8       5.0E-03 <b>9.3E-04</b> 6       1.0E+01         2       8       9.0E-03 <b>1.7E-03</b> 6       1.0E+01         3       16       9.0E-03 <b>1.7E-03</b> 6       1.0E+01         2       8       2.0E-01 <b>2.7E-03</b> 13       9.1E-01         3       16       2.0E-01 <b>2.7E-03</b> 16       9.1E-01         3       16       2.0E-01 <b>2.7E-03</b> 16       9.1E-01		1,1,2-Trichloroethane	e				N	1.0E-02	3.6E-U7	82	<b>5.0E-03</b>	3.02-03
2         8         1.0E+00 <b>3.1E-03</b> 10 <b>5.0E+01</b> 3         16         1.0E+00 <b>3.1E-03</b> 16 <b>9.1E-01</b> 1         12 <b>5.0E-03 9.3E-04</b> 1         1.0E+01           2         8 <b>5.0E-03 9.3E-04</b> 1         1.0E+01           2         8 <b>5.0E-03 9.3E-04</b> 6         1.0E+01           1         12 <b>9.0E-03 1.7E-03</b> 6         1.0E+01           2         8 <b>9.0E-03 1.7E-03</b> 6         1.0E+01           3         16 <b>9.0E-03 1.7E-03</b> 6         1.0E+01           1         12 <b>2.0E-01 2.7E-03</b> 13 <b>9.1E-01</b> 2         16 <b>2.0E-01 2.7E-03</b> 16 <b>9.1E-01</b>		Pentachiorophenol	<b>-</b>	12	1.0E+00	3.1E-03	~	5.0E+01	2.4E-04			
3       16       1.0E+00 <b>3.1E-03 9.1E-01</b> 1       12 <b>5.0E-03 9.3E-04</b> 1       1.0E+01         2       8 <b>5.0E-03 9.3E-04</b> 6       1.0E+01         1       12 <b>5.0E-03 9.3E-04</b> 6       1.0E+01         2       8 <b>5.0E-03 9.3E-04</b> 6       1.0E+01         2       8 <b>9.0E-03 1.7E-03</b> 6       1.0E+01         3       16 <b>9.0E-03 1.7E-03</b> 6       1.0E+01         1       12 <b>2.0E-01 2.7E-03</b> 13 <b>9.1E-01</b> 2       16 <b>2.0E-01 2.7E-03</b> 10       1.0E+01         3       16 <b>2.0E-01 2.7E-03</b> 16 <b>9.1E-01</b>		Pentachlorophenol	(V	ß	1.05+00	3.1E-03	10	5.0E+01	2.4E-04			
1         12         5.0E-03 <b>9.3E-04</b> 1         1.0E+01           2         8         5.0E-03 <b>9.3E-04</b> 6         1.0E+01           1         12         9.0E-03 <b>9.3E-04</b> 6         1.0E+01           2         8         9.0E-03 <b>9.3E-04</b> 6         1.0E+01           2         8         9.0E-03 <b>1.7E-03</b> 6         1.0E+01           3         16         9.0E-03 <b>2.8E-03</b> 13         9.1E-01           2         8         2.0E-01 <b>2.7E-03</b> 10         1.0E+01           3         16         2.0E-01 <b>2.7E-03</b> 10         1.0E+01		Pentachlorophenol	(")	16	1.0E+00	3.1E-03	16	9.1E-01	4.3E-06			
2         8         5.0E-03         9.3E-04         6         1.0E+01           1         12         9.0E-03         1.7E-63         1         1.0E+01           2         8         9.0E-03         1.7E-63         1         1.0E+01           3         16         9.0E-03         1.7E-03         6         1.0E+01           1         12         2.0E-03         2.3E-03         13         9.1E-01           1         12         2.0E-01         2.7E-03         10         1.0E+01           2         16         2.0E-01         2.7E-03         10         1.0E+01           3         16         2.0E-01         2.7E-03         16         9.1E-01		Heptachlor	<del>~~</del>	12	5.0E-03	9.3E-04	•	1.0E+01	2.9E-03			
1         12         9.0E-03         1.7E-63         1         1.0E+01           2         8         9.0E-03         1.7E-03         6         1.0E+01           3         16         9.0E-03         2.8E-03         13         9.1E-01           1         12         2.0E-01         2.7E-03         6         1.0E+01           2         16         9.0E-01         2.7E-03         10         1.0E+01           3         16         2.0E-01         2.7E-03         10         1.0E+01           3         16         2.0E-01         2.7E-03         16         9.1E-01		Heptachlor	2	æ	5.0E-03	9.32-04	Q	1.0E+01	2.9E-03			
2 8 9.0E-03 1.7 <b>E-03</b> 6 1.0E+01 3 16 9.0E-03 2.8 <b>E-03</b> 13 9.1E-01 1 12 2.0E-01 2.7 <b>E-03</b> 10 1.0E+01 3 16 2.0E-01 2.7 <b>E-03</b> 16 9.1E-01		4.4'DDT	-	12	9.0E-03	1.7E-03	•	1.0E+01	2.9E-03			
3 16 9.0E-03 <b>2.8E-03</b> 13 9.1E-01 1 12 2.0E-01 <b>2.7E-03</b> 2 1.0E+01 2 8 2.0E-01 <b>2.7E-03</b> 10 1.0E+01 3 16 2.0E-01 <b>2.7E-03</b> 16 9.1E-01		4.4'DDT	8	Ø	9.0E-03	1.7E-03	9	1.0E+01	2.9E-03			
1 12 2.0E-01 2.7E-03 2 1.0E+01 2 8 2.0E-01 2.7E-03 10 1.0E+01 3 16 2.0E-01 2.7E-03 16 9.1E-01		Endrin	e	16	9.0E-03	2.8E-03	13	9.1E-01	4.3E-04			
2 8 2.0E-01 2.7E-03 10 1.0E+01 3 16 2.0E-01 2.7E-03 16 9.1E-01		Hexachlorecyclopentadiene	-	12	2.0E-01	2.7E-03	2	1.0E+01	2.0E-04			
3 16 2.0E-01 2.7E-03 16 9.1E-01		Hexachlorocyclopentadiene	2	Ø	2.0E-01	2.7E-03	10	1.0E+01	2.0E-04			
		Heverblorocyclopentadiene	c)	16	2.0E-01	2.7E-03	16	9.1E-01	1.9E-05			

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				LISI	risn ingest		Sediment	Sed ingest			ISABUI JAIRAA
			No.	CONC	noncarcinogen	No.	conc	noncarcinegen	No.	Water	noncarcinegen
Contaminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	water	CONC	screening
type	name	no.	samples	wet wf	indices	samplea	dry wh	Indices	samples	(mg/L)	indices
Oroanic	Benzidine	-				Q	5.0E+01	2.4E-03			
•	Benzidine	5				9	5.0E+01	2.4E-03			
	4.4'DDT	e	16	9.0E-03	1.7E-03	13	9.1E-01	2.6E-04			
	1 1-Dichloroethvlene	-							28	5.0E-03	1.6E-03
	1 1-Dichlorcethylene	2							28	5.0E-03	1.6E-03
	1 1-Dichloroethylene	( M				0	1.0E-02	1.6E-07	27	5.0E-03	1.6E-03
	Gamma-BHC (Lindane)	3	16	5.0E-03	1.5E-03	13	9.1E-01	4.3E-04			
	Tetrachloroethvlene	2	1						29	5.0E-03	1.4E-03
	1.2-Dichloroethene (total)	-							29	5.0E-03	1.4E-03
	1 2-Dichloroethene (total)	ę							28	5.0E-03	1.4E-03
	2.4.5-Trichlorophenol		12	1.0E+00	9.3E-04	8	1.0E+01	1.4E-05			
	2.4.5-Trichlorophenol	ŝ	80	1.0E+00	9.3E-04	10	1.0E+01	1.4E-05			
	2.4.5-Trichlorophenol	ę	16	1.0E+00	9.3E-04	0	1.0E+01	1.4E-05			
	Bis(2-ethvlhexvl)phthalate	-	12	2.0E-01	9.3E-04	2	1.0E+01	7.1E-05			
	Bis(2-ethylhexyl)phthalate	2	8	2.0E-01	9.3E-04	10	1.0E+01	7.1E-05			
	Bis(2-ethylhexyl)phthalate	ო	16	2.0E-01	9.3E-04	16	9.1E-01	6.5E-06			
	Di-n-octyl phthalate	-	12	2.0E-01	9.3E-04	~	1.0E+01	7.1E-05			
	Di-n-octyl phthalate	~	8	2.0E-01	9.3E-04	10	1.0E+01	7.1E-05			
	Di-n-octyl phthalate	e	16	2.0E-01	8.3E-04	16	9.1E-01	6.5E-06			
	2.4-Dimethylphenol	<b>4</b> 12	24	2.0E-01	9.3E-04	9	1.0E+01	7.1E-05			
	2,4-Dimethylphenol	8	16	2.0E-01	9.3E-04	20	1.0E+01	7.1E-05			
	2.4-Dimethyiphenol	e	32	2.0E-01	9.35-04	32	9.1E-01	6.5E-06			
	Heptachlor	ę	16	5.0E-03	9.3E-04	13	9.1E-01	2.6E-04			
	Bromoform	<b>*-</b>							29	5.0E-03	7.1E-04
	Bromoform	N							29	5.0E-03	7.1E-04
	Bromoform	e				2	1.0E-02	7.1E-08	28	5.0E-03	7.1E-04
	Chlorobenzene	-							28	5.0E-03	7.1E-04
	Chiorobenzene	2							28	5.0E-03	7.1E-04
	Chlorobenzene	e				0	1.0E-02	7.1E-08	27	5.0E-03	7.1E-04
	Chlorodibromomethane	<b>4</b> 000							29	5.0E-03	7.1E-04
	Chlorodibromomethane	~							29	5.0E-03	7.1E-04
	Chlorodibromomethane	6				0	1.0E-02	7.1E-08	28	5.0E-03	7.1E-04
	Dichlorobromomethane	~							29	5.0E-03	7.1E-04
	Dichlorobromometharia	ო				01	1.0E-02	7.1E-08	28	5.0E-03	7.1E-04
	4-Methyl-2-pertarcine	-							29	1.0E-02	5.7E-04
	4-Methyl-2-pentanone	~							29	1.0E-02	5.7E-04
		C				4.4	040.00	A 75-04			

Table D2 (continued)

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				Fish	Fish Ingost		Sediment	Sed ingest			Water ingest
			No.	conc	noncercinogen	No.	CONC	noncarcinogen	No.	Water	noncarcinogen
Contaminant	Contaminant	Reach	lish.	(mg/kg)	screening	sediment	(mg/kg)	screening indice	water semulos	conc (ma/l)	screening indices
\$V D•	nem <del>s</del> "	no.	samples	wei wi	indices	saubies		A AF AF		/R/	
Organic	4-Methylphenol	-	12	2.0E-01	3.7E-04	ლი (	1.05+01	20-36-0			
•	4-Methylphenol	0	æ	2.0E-01	3.7E-94	0	10+20.1	20-38.2			
	4-Methviphenoi	3	16	2.0E-01	3.7E-04	44	1.0E+01	2.9E-05			
	Nanhthalene	<b>q</b> as	42	3.0E-03	7.0E-05	CN	1.0E+01	3.6E-04			
	Nanhthalens	- 01	80	3.0E-03	7.0E-05	10	1.0E+01	3.6E-04			
	2.Chloronanhthalane	. **	12	2.0E-01	2.3E-04	2	1.0E+01	1.8E-05			
	2-Chloronanhthalana	• •	Ø	2.0E-01	2.3E-04	10	1.0E+01	1.8E-05			
	2 Chlomaanhthalane	. 67	16	2.0E-01	2.3E-04	16	9.1E-01	1.6E-06			
	2-CINONADINATION	)	12	2.0E-01	2.1E-04	0	1.0E+01	1.6E-05			
	1,2-Undiror Countering 1 3 Thickford Countering	• •	80	2.0E-01	2.1E-04	10	1.0E+01	1.6E-05			
	1,2-Dichlorohonzene	100	16	2.0E-01	2.1E-04	16	9.1E-01	1.4E-06			
	Di n butvi nhthalate	) <del></del>	12	2.0E-01	1.9E-04	0	1.0E+01	1.4E-05			
	Di-n-butvl ohthalate	2	60	2.0E-01	1.9E-04						
	Di-n-butvl ohthalate	3	16	2.0E-01	1.9E-04						40 L0 1
	1 1 1-Trichloroethane	-							53	5.0E-03	1.05-04
	1 1. Trichtorothane	2							29	5.0E-03	1.6E-04
	1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,	1 00				0	1.0E-U2	1.6E-08	28	5.0E-03	1.6E-04
									29	5.0E-03	1.4E-04
	Emyidenzene	<b>v</b> c				2	1.0E-02	1.4E-08	28	5.0E-03	1.4E-04
	Ethyipenzene	n -				I			29	5.0E-03	1.4E-04
	1,1-Dichloroethane	0				~	1.0E-02	1.4E-08	28	5.0E-03	1.4E-04
	1,1-Dichioroethane	n i		10.0	0 95 0E		1 05-01	7.15-06			
	Butylbenzylphthalate	<b>y</b> 1	12	2.0E-01	8.3E-UU 0.3E 0.E	۰ <del>۲</del>	1.0E+01	7.1E-06			
	Butyibenzylphthalate	01	ສູ	2.05-01		) ¥	0 1 E-01	\$ 5E-07			
	Butylbenzylphthalate	ო	16	2.0E-01	00-UC 0	2 0	3.15-01	7 1E-06			
	Isophorone	-	12	2.0E-01		v ,	1.0E+01	7 4E-06			
	Isophorone	0	ຜ່	2.0E-01	60-10-0	5 4	0 1 E-01	A 55-07			
	isophorone	n	16	2.05-01		2	0.11.0				
	Methoxychior	<b>*</b>	5	5.0E-03	8.3E-US						
	Methoxychlor	5	æ	5.0E-03	9.3E-US						
	Methoxychlor	e	16	5.0E-03	9.3E-05				00	5 0E-03	7.15-05
	Styrene	<b>*</b> **									7 16-05
	Styrene	N							λ ν ν	9.0E-03	7.16-03
	Styrene	en							07	9.05-00	
	Naphthalene	ო	16	3.0E-03	7.0E-05	9	9.1E-01	3.3E-US			
	2 4-Dinitrophenol	e				N	9.1E-01	6.5E-US			
	Ranzvi alcohol	<b>*</b>	12	2.0E-01	6.2E-05	ო	1.0E+01	4.8E-06			
	Renzvi alcohol	0	8	2.0E-01	6.2E-05	10	1.0E+01	4.8E-06			
	Benzvi alcohol	n	16	2.0E-01	6.2E-05	14	1.0E+01	4.8E-06		`.	

Table D2 (continued)

D-13

				1814	FISH INGEST	;	Cedment	Sed ingest	;		water ingest
			No.	conc	noncarcinogen	No.	conc	noncarcinogen	No.	Water	noncarcinogen
Contaminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	water	conc	screening
type	name*	no.	samples	wet wt	indices	samples	dry wî	Indices	samples	(mg/L)	Indices
Organic	Pyrene	-	12	3.0E-03	9.3E-06	~	1.0E+01	4.8E-05			
2	Pvrene	0	8	3.0E-03	9.3E-06	10	1.0E+01	4.8E-05			
	Fluoranthene	•••	12	2.0E-02	4.6E-05	2	1.0E+01	3.6E-05			
	Finranhana	· ~	ac	2.0E-02	4.6E-05	10	1.0E+01	3.6E-05			
	Flucranthene	1 67	16	2.0E-02	4.6E-05	16	9.1E-01	3.3E-06			
	Die/O chloraincorocullother	, -	•			2	1.0E+01	3.6E-05			
	Dis(2-digusopingusopinguso Dis(0-discretesingusopinguso	- 6				10	1 0E+01	3.6E-05			
	Dis(z-Gitiotoisopiony) in	N <b>-</b>	ç ,	2 0E_03	4 RF-AR		1 0F+01	3.6E-05			
		- (	<u>'</u> a	2.0E_03	4.65-06 4.65-06	9	1.0E+01	3.6E-05			
		4 4	, <b>,</b>	2 CL 00	3 1E.AK		1 05-01	2 4F-06			
	Priesto	(	2	2.0E-01	3.1E-00	4 C F		2 4F-06			
	Phenol Phenol	N	Ø,	5.05-01	0.1E-60	2 (					
	Phenol	ო	16	2.0E-01	3.16-00	10	8.1C-01	Z.4E-U <i>f</i>	00	00 10 1	0 0L 0E
	Vinyi acetate	-							<b>P</b> (	1.05-02	20-38-2
	Vinyl acetate	~							53	1.06-02	2.9E-U5
	Viry! acetate	3							28	1.0E-02	2.9E-05
	Acenaphthene	-	12	1.0E-03	1.5E-06	e	1.0E+01	2.4E-05			
	Acenaphthene	0	80	1.0E-03	1.5E-06	10	1.0E+01	2.4E-05			
	Benzoic acid		12	1.0E+00	2.3E-05	ო	5.0E+01	1.8E-06			
	Benzoic acid	~ ~	Ø	1.0E+00	2.3E-05	10	5.0E+01	1.8E-06			
	Renzoic acid	. ന	16	1.0E+00	2.3E-05	14	5.0E+01	1.8E-06			
	Diethvi ohthalate	-	12	2.0E-01	2.3E-05	2	1.0E+01	1.8E-06			
	Diethyl phthalate	0	80	2.0E-01	2.3E-05	10	1.0E+01	1.8E-06			
	Diethyl ohthalate	100	16	2.0E-01	2.3E-05	16	4.6E+00	8.2E-07			
	Dimethyl obthalate	•	12	2.0E-01	1.9E-05	2	1.0E+01	1.4E-06			
	Dimethyl onthalate	0	8	2.0E-01	1.9E-05	10	1.0E+01	1.4E-06			
	Dimethyl phthalate	ო	16	2.0E-01	1.9E-05	16	9.1E-01	1.3E-07			
	Pvrene	ო	16	3.0E-03	9.3E-06	16	9.1E-01	4.3E-06			
	Anthracene	-	12	2.0E-04	6.2E-08	ŝ	1.0E+01	4.8E-06			
	Anthracene	2	80	2.0E-04	6.2E-08	10	1.0E+01	4.8E-06			
	Fluorene	ო	16	2.0E-03	4.62-06	16	9.1E-01	3.3E-06			
	Bis(2-chloroisopropy) ether	n				16	9.1E-01	3.3E-06			
	Acsnanhthene	m	16	1.0E-03	1.SE-06	16	9.1E-01	2.2E-06			
	Anthracene	c,	16	2.0E-04	6.2E-08	16	9.1E-01	4.3E-07			
	Tetrachioroethviene	0				7	1.0E-02	1.4E-07			
	Trans-1 2-dichloroethene	ŝ				7	6.4E-03	4.6E-08			
	Dichlorodift.toromethane	6				2	1.0E-02	7.1E-09			
						0	1.0E-02	4.8E~09			

Table D2 (continued)

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#### APPENDIX E

### CONSERVATIVE SCREENING OF THE DETECTABLE CONTAMINANTS DATA BASE FOR CARCINOGENS AND NONCARCINOGENS

				Fish	Fish ingest		Sediment	Sed ingest			Seafill Janaw
			No.	conc	carcinogen	No.	conc	carcinogen	No.	Water	carcinogen
Contaminant	Contaminant	Reach	fish semulee	(mg/kg) wet wt	screening indices	sediment samples	(mg/kg) drv wt	screening Indices	water sampies	conc (mg/L)	screening indices
Increation	Arconic	<u>i</u>  -	104	5.0E-01	4.1E-04				33	5.2E-02	2.6E-03
	Arsenic	2	45	5.0E-01	4.1E-04						
	Arsenic	n	109	5.0E-01	4.1E-04						
	Bervilium	2	45	1.0E-01	2.0E-04				ო	3.8E-04	4.6E-05
	Bervilium	-	104	1.0E-01	2.0E-04				ო	3.8E-04	4.6E-05
	Bervilium	ŝ	109	1.0E-01	2.0E-04				3	3.8E-04	4.6E-05
Organic	Benzidine	e				14	5.3E+01	1./E-UZ			
•	Benzidine	-three				0	5.0E+01	1.6E-02			
	Benzidine	2				9	5.0E+01	1.6E-02			
	Aconschithviane	ന	16	2.0E+00	1.1E-02	16	1.1E+01	1.7E-04			
	Flamme	6	16	2.0E+00	1.1E-02	16	1.1E+01	1.7E-04			
	Aconsolithvione	,	12	2.0E+00	1.1E-02	e	1.0E+01	1.6E-04			
	Flumme		12	2.0E+00	1.1E-02	2	1.0E+01	1.6E-04			
	Aconschittulene		a	1.9E+00	1.0E-02	10	1.0E+01	1.6E-04			
	Flumene		60	1.9E+00	1.0E-02	10	1.0E+01	1.6E-04			
	N nitree-di-n-nconvlamine	1 (7)	16	2.0E+00	6.5E-03	16	1.9E+01	1.9E-04			
	N-nitroso-di-n-prop/amine	)	12	2.0E+00	6.5E-03	0	7.9E+01	7.9E-04			
	N-nitreo-di-n-oropylamine	N	80	1.9E+00	6.3E-03	10	2.0E+01	2.0E-04			
	Indeno(1,2,3-cd)pvrene	ო	16	9.9E-01	5.4E-03	16	1.9E+01	3.2E-04			
	Indeno(1 2 3-cd)ovrene	<b>4</b>	12	9.8E-01	5.3E-03	~	7.9E+01	1.3E-03			
	Indeno(1,2,3-cd)pyrene	2	æ	9.5E-01	5.1E-03	10	2.0E+01	3.2E-04			
	N-Nitrosodimethvlamine	e				4	5.3E+01	3.9E-03			
	N-Nitrosodimethylamine	***				-	5.0E+01	3.6E-03			
	N-Nitrosodimethylamine	~				9	5.0E+01	3.6E-03			
	3 3'-Dichlorobenzidine	n	16	9.9E+00	2.1E-03	16	4.8E+01	3.1E-05			
	3 3'-Dichlorobenzidine	-	12	9.8E+00	2.1E-03	0	2.3E+02	1.5E-04			
	3.3'-Dichlorobenzidine	2	ß	9.5E+00	2.0E-03	10	4.9E+01	3.2E-05			
	Benzo(a)anthracene		12	9.8E~04	5.3E-06	en	9.4E+01	1.5E-03			
	Hexachlorobenzene	e	16	2.0E+00	1.5E-03	16	1.1E+01	2.4E-05			
	Harachlorobenzene	-	12	2.0E+00	1.5E-03	0	1.0E+01	2.3E-05			
	Hexachlorobenzene	2	8	1.9E+00	1.4E-03	10	1.0E+01	2.3E-05			
	Renzo(chi)oerviene	-	12	4.9E-03	2.7E-05	cu	7.9E+01	1.3E-03			
	Dihenz(a h)anthracene		12	2.0E-03	1.1E-05	0	7.9E+01	1.3E-03			
	Fluoranthene	ო	16	2.0E-01	1.1E-03	16	1.1E+01	1.7E-04			
	Flioranthene	<b>*</b>	12	2.0E-01	1.1E-03	~	1.0E+01	1.6E-04			

Table E1. Results of conservative screening of carcinogens where no concentrations were above detection limits  $\langle Concentrations$  are the upper 95% confidence bound of the arithmetic mean of the detection limits)

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		Nc.	conc	carcinoger.	No.	conc	carcinogen	No.	Water	carcinogen
Contaminant	Reach	fish semules	(mg/kg) wei wi	screening indices	sediment semples	(mg//g) f/v wt	screening Indices	water samples	conc (ma/F)	screening indices
Ris(2-chloroethvl)ether	3	16	2.0E+00	1.0E-03	16	1.1E+01	1.7E-05			
		16	2.0E+00	1.0E-03	2	1.2E+01	1.9E-05			
Bis(2-chloroethvl)ether	•	12	2.0E+00	1.0E-03	CJ	1.0E+01	1.6E-05			
	-	12	2.0E+00	1.0E-03						
Bis(2-chloroethvl)ether	~	8	1.9E+00	9.9E-04	10	1.0E+01	1.6E-05			
	2	8	1.9E+00	9.8E-04						
Benzo(a)anthracene	2	Ø	9.6E-04	5.2E-06	10	4.9E+01	8.0E-04			
Benzo(a)anthracene	e	16	9.9E-04	5.4E-06	16	4.8E+01	7.8E-04			
Vinyl chloride	ო				2	1.0E-02	2.7E-08	28	1.4E-02	7.8E-04
Vinyl chloride	•							29	1.4E-02	7.7E-04
Vinvt chloride	~							29	1.4E-02	7.7E-04
2.4-Dinitrotoluene	e	16	2.0E+00	6.3E-04	16	1.1E+01	1.0E-05			
2,6-Dinitrotoluene	ო	16	2.0E+00	6.3E-04	16	1.1E+01	1.0E-05			
2,4-Dinitrotoluene	<b>4</b> 00	12	2.0E+00	6.3E-04	2	1.0E+01	9.7E-06			
2.6-Dinitrotoluene		12	2.0E +00	6.3E-04	~	1.0E+01	9°.7E-06			
2.4-Dinitrotoluene	8	80	1.9E+00	6.1E-04	10	1.0E+01	9.7E-06			
2.6-Dinitrotoluene	~	8	1.9E+00	6.1E-04	10	1.0E+01	9.7E-06			
Pentachlorophenol	e	16	9.9E+00	5.6E-04	16	5.3E+01	9.1E-06			
Pentachlorophenol	-	12	9.8E+00	5.6E-04	5	5.0E+01	8.6E-06			
Pentachiorophenol	8	8	9.5Ë+00	5.4E-04	10	5.0E+01	8.5E-06			
Anthracene	e	16	9.9E-02	5.4E-04	16	1.1E+01	1.7E-04			
Anthracene		12	9.8E-02	5.3E-04	e	1.0E+01	1.6E-04			
Anthracene	ev	8	9.5E-02	5.1E-04	10	1.0E+01	1.6E-04			
Bis(chloromethyl)ether	ę				2	1.2E+00	3.7E-04			
Benzo(ghi)perylene	0	80	4.8E-03	2.6E-05	10	2.0E+01	3.2E-04			
Dibenz(a,h)anthracene	~	8	2.0E-03	1.1E-05	10	2.0E+01	3.2E-04			
Benzo(ghi)perylene	<b>6</b>	16	5.0E-03	2.7E-05	16	1.9E≁01	3.2E-04			
Dibenz(a.h)anthracene	e	16	2.0E-03	1.1E-05	16	1.9E+01	3.2E-04			
	ო	16	4.0E-02	3.2E-04	13	1.1E+01	2.6E-04			
	-	12	3.9E-02	3.1E-04	0	1.0E+01	2.4E-04			
	~	8	3.8E-02	3.1E-04	9	1.0E+01	2.4E-04			
	ю	16	4.0E-02	3.0E-04	13	1.1E+01	2.4E-04			
	-	12	3.9E-02	3.0E-04	-	1.0E+01	2.3E-04			
	•	α	3 BE.03	2 QE_AA	ų	1 0F+01	2 3F-04	r		

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Water ingest carcinogen	screening	indices	2.3E-04	2.3E-04	2.3E-04	2.3E-04	2.3E-04																									1.2E-04	1.2E-04	1.2E-04						
Water c	conc	(mg/L)	1.1E-03	1.1E-03	1.0E-03	1.0E-03	1.0E-03																									7.3E-03	7.2E-03	7.2E-03						
No.	water	samples	28	28	28	28	28																									27	28	28						
Sed ingest carcinogen	screening	indices		3.6E-05				1.6E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.4E-04	1.3E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.3E-04	8.6E-09			9.6E-05	9.0E-05	9.0E-05	6.9E-05	6.4E-05	6.4E-05
Sediment conc	(mg/kg)	dry wt		3.2E+00				1.0E+01	1.1E+01	1.1E+01	1.1E+01	1.1E+01	1.1E+01	1.1E+01	-1.1E+01	1.1E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E-02			1.1E+01	1.0E+01	1.0E+01	1.1E+01	1.0E+01	1.0E+01
No.	sediment	samples		15				10	16	16	16	16	16	1 G	16	13	-	ю	10	ę	10	ŝ	10	2	10	2	10	2	0	10	9	2			13	2	9	13	-	9
Fish ingest carcinocen	acreening	indices						2.1E-04	1.6E-04	2.2E-05	1.6E-04	1.1E-04	1.6E-05	1.1E-04	5.4E-05	1.7E-04	1.7E-04	1.6E-04	1.5E-04	2.1E-05	2.1E-05	1.6E-04	1.5E-04	1.1E-04	1.0E-04	1.6E-05	1.6E-05	1.5E-04	5.3E-05	5.2E-05	1.6E-04				5.9E-05	5.8E-05	5.7E-05	8.4E-05	8.3E-05	8.1E-05
Fish conc	(mg/kg)	wet wt						3.8E-02	3.0E-02	4.0E-03	3.0E-02	2.0E-02	3.0E-03	2.1E-02	9.9E-03	4.0E-02	3.9E-02	2.9E-02	2.8E-02	3.9E-03	3.8E-03	2.9E-02	2.8E-02	2.0E-02	1.9E-02	3.0E-03	2.9E-03	2.7E-02	9.8E-03	9.5E-03	3.8E-02				2.0E-02	2.0E-02	1.9E-02	4.0E-02	3.9E-02	3.8E-02
Ň	fish	samples						60	15	16	16	16	16	16	16	16	12	12	¢	12	භ	12	80	12	80	12	80	12	12	ø	60				16	12	80	16	12	æ
	Reach	DO.			~		• •	• •	ו <del>מ</del>	ŝ	ო	e	en	e	ო	ę		-	2	-	2	-	8	-	2	<b>y</b> anti	2	-	*	0	2	ო		8	e		2	n	-	2
	Contaminant	nema <sup>*</sup>	PCR-1254 (Aroclor 1254)		DCR.1254 (Arochir 1254)	PCR-1260 (Arochar 1260)	DCB-1260 (Aroclar 1260)	Purene	Acenachthere	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Pyrene	Phenanthrene	Heptachior epoxicie	Heptachlor epoxide	Acenaphthene	Acenaphthene	Benzo(a)pyrene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(b)fluoranthene	Benzo(k)fluorantherie	Benzo(k)fluoranthene	Chrysene	Chrysene	Pyrene	Phenanthrene	Phenanthrene	Heptachlor epoxide	1,1-Dichloroethylene	1,1-Dichloroethylene	1,1-Dichloroethylene	Alpha BHC	Alpha BHC	Aloha BHC	Hentachlor	Hentachlor	Heptachlor
	Contaminant	tvne	Ornanic																																					

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				Fish	Fish ingest		Sediment	Sed ingest			Water ingest
		;	No.	conc	carcinogen	No.	conc	carcinogen	No.	Water	carcinogen
Contaminané	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	water	conc	screening
tvbə	nem <del>o</del> *	ло.	samples	wet wi	Indices	samples	dry wt	indices	samples	(mg/L)	Indices
Organic	Hexachlorobutadiene	9	16	2.0E+00	7.3E-05	15	1.1E+01	1.2E-06			
	Hexachlorobutadiene	•	12	2.0E+00	7.2E-05	2	1.0E+01	1.1E-06			
	Hexachlorobutadiene	0	ø	1.9E+00	7.0E-05	10	1.0E+01	1.1E-06			
	1 1 2 2-Tetrachloroethane	<b>ത</b>				7	3.1E-02	8.7E-09	28	7.2E-03	4.1E-05
	1 1 2 2-Tetrachloroethane	) <del>.</del>							29	7.1E-03	4.1E-05
	1,1,5,5-1 duadino outratione	- ~							29	7.1E-03	4.1E-05
	r, r, 2, 2- r eu astiloroeurarie Cie 1-3 dichloroeuro	4 6							28	7.2E-03	3.7E-05
		<b>,</b> ,							28	7.2E-03	3.7E-05
	I rans-1, 3-dicnioropropene	<b>"</b>							66	7.1E-03	3.7E-05
	Cis-1, 3-dichloropropene	F= (							00	7 1E-03	3.7F-05
	Cis-1,3-dichloropropene	2									0 7E 0E
	Trans-1,3-dichloropropene	-							50	/.1E-03	3./E-03
	Trans-1,3-dichloropropene	2							59	/.1E-03	3./E-U5
	Beta BHC	ო	16	4.0E-02	3.4E-05	- ()	1.1E+01	2.7E-05			
	Beta BHC	<b>*</b>	12	3.9E-02	3.3E-05	N	1.0E+01	2.6E-05			
	4-Chloroaniline	3	16	2.0E+00	3.3E-05	14	1.0E+01	5.0E-07			
	4-Chloroaniline	-	12	2.0E+00	3.2E-05	0	1.0E+01	5.0E-07			
	Beta BHC	2	œ	3.8E-02	3.2E-05	9	1.0E+01	2.6E-05			
	4-Chioroaniline	0	89	1.9E+00	3.1E-05	10	1.0E+01	5.0E-07			
	Gamma-BHC (Lindane)	ę	16	2.0E-02	1.7E-05	13	1.1E+01	2.7E-05			
	Carbon tetrachloride	6				5	1.0E-02	1.9E-09	28	7.2E-03	2.7E-05
	Dichlorohromomethane	(C)				8	1.0E-02	1.9E-09	28	7.2E-03	2.7E-05
	Carbon totrachlorida								29	7.1E-03	2.6E-05
	Carbon tetrachloride	• ~							29	7.1E-03	2.6E-05
	Dichlorobromomethane	0							29	7.1E-03	2.6E-05
	Gamma-BHC (Lindane)	-	12	2.0E-02	1.7E-05	2	1.0E+01	2.6E-05		н. 1	
	Gamma-BHC (Lindane)	2	80	1.9E-02	1.6E-05	9	1.0E+01	2.6E-05			. k
	1 2-Dinhenvihvdrazine	3				14	2.1E+01	2.4E-05			
	1.2-Diohenvihvdrazine	-				-	2.0E+01	2.3E-05			
	1 2-Diphenvlhvdrazine	2				9	2.0E+01	2.3E-05			
	1 4-Dichlorobenzene	e C	16	2.0E+00	2.2E-05	16	1.1E+01	3.6E-07			
	4.4000	ę	16	2.0E-01	2.2E-05	13	1.1E+01	3.7E-06			
	1 4-Dichlorobenzene	-	0	2.0E+00	2.2E-05	2	1.0E+01	3.4E-07			
	4.4'DDD	-	12	2.0E-01	2.2E-05	-	1.0E+01	3.4E-06			
	1.4-Dichlorobenzene	2	60	1.9E+00	2.2E-05	10	1.0E+01	S.45-07			
	4,4'DDD	2	8	1.9E-01	2.1E-05	9	1.0E+01	3.4E-06			

~	•	) indices							3 1.8E-05	3 1.7E-05	3 1.7E-05	3 1.7E-05	3 1.4E-05		3 1.4E-05										-			3 1.UE-UJ						3 6.2E-05					
	Water	conc (ma/l)			1.2E-US		i	7.1E-03	7.1E-03	7.2E-03	7.1E-03	7.1E-03	7.2E-03	7.1E-03	7.1E-03									1	7.2E-03	7.1E-03	7.15-03	/.1E-03						7.2E-03	C L T	7.1E-03	7.1E-03	7.3E-03	
•	No.	water	201111100	00	87			29	29	28	29	50	28	29	29										28	29	29	56						28	Ċ	53	29	27	
sed ingest	carcinogen	screening	4 OF OF	1.85-00	1.36-08	1.9E-05	1.9E-05			1.2E-09			9.7E-10			2.1E-07	2.1E-07	2.0E-07	2.0E-07	5.2E-06	4.9E-06	2.0E-07	2.0E-07	4.9E-06	8.1E-10				1.7E-07	1.6E-07	1.6E-07	5.2E-06	4.9E-06		4.9E-06				
Sediment	conc	(mg/kg)	ULY WI		1.05-02	1.0E+01	1.0E+01			1.0E-02			1.0E-02			1.1E+01	1.1E+01	1.0E+01	1.0E+01	1.1E+01	1.0E+01	1.0E+01	1.0E+01	1.0E+01	1.0E-02			l	1.1E+01	1.0E+01	1.0E+01	1.1E+01	1.0E+01		1.0E+01				
	No.	sediment	Sainpies	5	2	5	9			0	I		~	i		16	16	N	0	13	-	10	10	9	2				16	2	10	13	<b>.</b>		9				
Fish ingest	carcinogen	screening	Indices									,				1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.2E-05					1.0E-05	1.0E-05	9.9E-06	6.4E-06	6.3E-06		6.1E-06				
Fish	conc	(mg/kg)	wet wi													2.0E+00	2.0E+00	2.0E+00	2.0E+00	7.9E-02	7.9E-02	1.9E+00	1.9E+00	7.6E-02					2.0E+00	2.0E+00	1.9E+00	4.0E-02	3.9E-02		3.8E-02				
	No.		samples													16	16	12	12	16	12	8	80	80					16	12	œ	16	12		80		•		
		£	0	ო	ო	-	2	-		4 C	o ≁-	- c	<b>u</b> c	o +	- ‹	J (*)			• ••	e	-	2	0	0	ę	-	8	~	en l	-	2	e		ю	0	-	5	٣	,
		Conteminant	name*	Chlordane	1,2-Dichloroethane	Chlordane	Chlordane	1 2. Nichlorothane	1 2 Dichlorothano		Chlorodibromomethane			1,2-UIGIIUUUUUUUU	1,2-Diviniorophane	Bis/2-othvthaxv1)nhthalate	Herachioroethane	Ris/2-ethylhexyl)ohthalate	Hexachloroethane	4 4'DDT	4.4'DDT	Bis(2-ethylhexyl)phthalate	Hexachioroethane	4.4.DDT	1.1.2-Trichloroethane	1,1,2-Trichloroethane	1,1,2-Trichloroethane	Tetrachloroethylene	2,4,6-Trichlorophenol	2,4,6-Trichlorophenol	2.4.6-Trichiorophenol	4 4'DDE	4,4'DDE	Styrene	4,4'DDE	Styrene	Styrene	Borrowo	
		Contaminant	type	Organic																																			

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				Fich	Fish Indest		Sediment	Sed ingest			Water Ingest
			No	CONC	carcinoden	No.	CONC	carcinogen	No.	Water	carcinogen
	•			ime/to/	rearing	sediment	(ma/ka)	screening	water	conc	screening
Contaminant	Contaminant	Heach	nsn	(Ry/Rill)	indices	samples	dry wi	Indices	samples	(mg/L)	indices
type		, 10.	caldille	14 104		~	1.0E-02	1.9E-10	28	1.4E-02	5.3E-06
Organic	Matnyi chioride	ŋ ,				I			29	1.4E-02	5.3E-06
	Methyl chioride	<b></b> (							29	1.4E-02	5.3E-06
	Methyl chloride	N			92 79 4	4	1 05-01	1 4F-07			
	N-Nitrosodiphenylamine	ŝ	16	2.0E+00	4.02-00	0					
	N-Nitrosodiohenvlamine	*	12	2.0E+00	4.5E-06	0	7.9E+01	5.52-07			
	N-Nitrosodiohenvlamine	2	80	1.9E+00	4.4E-06	10	2.0E+01	1.4E-07			
	lecohorono	1 (7)	16	2.0E+00	3.8E-06	16	1.1E+01	6.2E-08			
		•		2 0F+00	3.8E-06	0	1.0E+01	5.9E-08			
		- ‹			3.7E-06	10	1.0E+01	5.9E-08			
	Isopinorale		D	1.0110.1			1 0F-02	1.1E-10	28	7.22-03	1.6E-06
	Bromotorm	Ð				J			20	7 1F-03	1.6E-06
	Bromoform	-							. 66	7.1E-03	1.6E-06
	Bromoform	2						10	2		
	Acrylonitrile	e				0	1.2E+00	8.1E-0/			
	Aniline	-				~	1.0E+01	8.1E-03			
		• •				9	1.0E+01	8.1E-08			
		1 (*				11	1.0E+01	8.1E-08			
	T-tracklorothing T-tracklorothing	<b>,</b>				7	1.7E-02	1.3E-09			
		<b>,</b> ,				2	1.0E-02	1.6E-10			
	I richioroethylene	°									
				(Bo/kg wet)			(Bq/kg dry)			(Bq/L)	
0- 8	22	6		- E		4	8.1E∻02	1.3E-09			
Kadionucitoe	9-L	>									

\*Contaminants are ranked in descending order by sum of screening indices

Attendent         In.         Conc         monentification         No.         Conc         monentification         Conc         monentification         Conc         monentification         Conc         modelense         monentification         Conc         modelense         Monence         Section         3         Section         3 <t< th=""><th></th><th></th><th></th><th></th><th>Fish</th><th>Fish ingest</th><th></th><th>Sediment</th><th>Sed ingest</th><th>:</th><th></th><th>Water ingest</th></t<>					Fish	Fish ingest		Sediment	Sed ingest	:		Water ingest
Contanisant indices         Reschi indices         Indi				Pio.	CORC	noncarcinogen	Ко.		noncarcinogen	Vo	Teler	noncarcinogen
Times         to         Endors	iontaminant	Conteminent	Resch	hsh	(mg/kg)	screening	sediment		screening	WEIGT	CONC	aci eenny Indiree
Artimory         1         4         50E-01         1.25-00         3         50E-02         3 <th< td=""><td>type</td><td>same"</td><td>по.</td><td>samples</td><td>wet wt</td><td>Indices</td><td>samples</td><td>IN ALD</td><td>Endices</td><td>Contribute C</td><td>E OF 00</td><td>3 65 AD</td></th<>	type	same"	по.	samples	wet wt	Indices	samples	IN ALD	Endices	Contribute C	E OF 00	3 65 AD
Animory         2         45         5 6E-01         1.2E+00         3         5 9E-02         3         5 5E-02         3         5 5E-02         1         5 5E-02         1         5 5E-02         1         5 5E-02         1         5 5E-02         3         3         5 5E-02         3         3         5 5E-02         3         3         3         5 5E-02         3	Inoroanic	Antimony	ţ <del>an</del>	104	5.0E-01	1.2E+90				<b>n</b> (	20-J0-	
10       50E-01 <b>1.2E+00</b> 3       5.5E-02       3       3       5.5E-02       5.5E-02 <td< td=""><td></td><td>Antimony</td><td>2</td><td><b>6</b>5</td><td>5.0E-01</td><td>1.2E+00</td><td></td><td></td><td></td><td>(7)</td><td>5.UE-UZ</td><td>3.95400</td></td<>		Antimony	2	<b>6</b> 5	5.0E-01	1.2E+00				(7)	5.UE-UZ	3.95400
45       50E-01       4.6E-01       3       5.2E-02       4       3       5.2E-02       4       5.2E-02       3       5.2E-02       1       4.0E-02       3       5.2E-02       1       4.0E-02       5.2E-02       1       5.2E-02		Antimony	) er;	109	5.0E-01	1.2E+00				e	5.0E-02	3.6E+00
3       109       5.0E-01 <b>4.6E-01</b> 3       7.5E-02         3       109       5.0E-01 <b>4.6E-01</b> 3       5.0E-02       3         3       109       5.0E-01 <b>4.6E-01</b> 3       5.0E-02       3       5.0E-02         3       104       5.0E-01 <b>4.6E-01</b> 3       3       4.0E-02       3         3       4.6E-01 <b>3.5E-02 3.5E-02 3 3</b> .0E-02 <b>3 4</b> .0E-02 <b>3</b> 3       5.0E-01 <b>3.5E-02 3</b> .5E-02 <b>3</b> .5E-03 <b>3</b> .5E-03 <b>3</b> .5E-03 <b>3</b> .5E-04					E OF 01	4 65.01				33	5.2E-02	1.5E+00
45       50E-01       4.6E-01       5.0E-01       4.6E-01         3       109       50E-01       4.6E-01       3       5.0E-02         3       109       50E-01       4.6E-01       3       5.0E-02         3       109       50E-01       4.6E-01       3       5.0E-02       3       4.0E-02         3       4.5       50E-01       8.3E-02       3       3       4.0E-02       3       5.0E-02       3		Arsenic	-	ŧ 0.	3.VC-01	1.01-0				4	7.5E-02	7.1E-01
45       5.0E-01       4.6E-01         5.0E-01       4.6E-01       4.6E-01         5.0E-01       4.6E-01       4.6E-01         5.0E-01       4.6E-01       3.5E-02         5.0E-01       5.0E-01       4.6E-01         5.0E-01       4.6E-01       3.3         5.0E-01       5.0E-01       9.3E-02         5.0E-01       9.3E-02       3.3         5.0E-01       5.0E-01       5.3E-02         7       104       5.0E-01       2.3E-02         7       104       5.0E-02       3.3         7       104       5.0E-02       3.3         7       104       5.0E-02       3.3         7       104       5.0E-02       3.3         7       106       5.0E-02       3.3 <td></td> <td>Selenium</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>· 14</td> <td>5 0F-02</td> <td>4.8E-01</td>		Selenium	-							· 14	5 0F-02	4.8E-01
2       45       50E.01       4.6E.01       3       4.0E.02       3       4.0E.02       3       4.0E.02       3       3       3       4.0E.02       3       3       5.0E.01       4.0E.02       3       3       5.0E.02       3		Selenium	2							5	12.0	
3       109       50E-01       4.6E-01       3       4.0E-02       3       4.0E-02       3       4.0E-02       3       4.0E-02       3       4.0E-02       3       3       2.6E-03       3       3       2.6E-03       3       3       2.6E-03       3       3       3       2.6E-03       3       3       3       2.6E-03       3       3       3       2.6E-03       3       3       3       5.6E-03       3		Arsenic	CN	45	5.0E-01	4.6E-01						
1       104       5.0E+00 <b>9.3E-02</b> 3 <b>4.0E-02</b> 2       45       5.0E+01 <b>9.3E-02</b> 3 <b>4.0E-02</b> 2       45       5.0E+01 <b>9.3E-02</b> 3 <b>4.0E-02</b> 3       104       5.0E-01 <b>9.3E-02</b> 3 <b>5.0E-01</b> 3 <b>3.4.0E-02</b> 3       109       5.0E-01 <b>9.3E-02</b> 3 <b>3.5.E-02</b> 3 <b>3.6.E-03 3.7.E-02</b> 104       2.0E-01 <b>9.3E-02 9.3E-02 9.3E-02</b> 3 <b>3.6.E-03 3.7.E-02</b> 109       2.0E-01 <b>2.3E-02 3.3.5.E-02 3.3.6.E-03 3.3.6.E-03</b> 104       1.0E-01 <b>1.9E-02 3.3.6.0 3.3.6.0 3.3.6.0</b> 104       1.0E-01 <b>1.9E-02 3.3.6.0 3.3.6.0 3.3.6.0 3.3.6.0</b> 104       1.0E-01 <b>1.9E-02 3.3.6.0 3.3.6.0 3.3.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0 3.6.6.0</b>		Arsenic	e	109	5.0E-01	4.6E-01						10 LO 0
2 5.0E-02 3 4.0E-02 3 4.0E-02 3 4.0E-02 3 104 5.0E-01 9.3E-02 2 45 5.0E-01 9.3E-02 3 109 5.0E-01 9.3E-02 3 109 2.0E-01 9.3E-02 3 2.6E-03 3 2.6E-03 3 2.6E-03 3 2.6E-03 3 2.6E-03 3 2.6E-03 3 2.6E-03 3 2.6E-03 3 2.6E-03 3 3 3 5.6E-03 3 3 3 6.60 4 4 8.0E-03 3 3 3 5.6E-03 3 3 5.6E-03 3 3		Noivbdenum								m ·	4.0E-02	2.95-01
3       4,0E-02         3       5,0E+00       1.0E-01         2       45       5,0E+01       9,3E+02         2       45       5,0E+01       9,3E+02       3         3       109       5,0E+01       9,3E+02       3       2,6E+03         3       109       5,0E+01       9,3E+02       3       3       5,1E+03         3       109       5,0E+01       9,3E+02       3       3       5,1E+03       3         3       109       5,0E+01       6,2E+02       3       3       5,0E+03       3       3       5,0E+03         3       109       2,0E+01       6,2E+02       3       3       5,0E+03       3       3       5,0E+03       3       3       5,0E+03       3       3       5,0E+03       3       5,0E+03       3       3       5,0E+02		Advedant	~							5	4.0E-02	2.9E-01
3       2       5.0E+00       9.3E-02       2       5.0E+00       1.0E-01       33       2.0E+00       33       2.0E+03       33       5.0E+03       33       5.0E+02       33       5.0E+03 </td <td></td> <td>Hobbedourn</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ო</td> <td>4.0E-02</td> <td>2.9E-01</td>		Hobbedourn								ო	4.0E-02	2.9E-01
2 5.0E+00 1.0E-01 33 2.6E-03 33 5.1E-03 33 2.6E-03 33 5.1E-03 33 5.1E-04 104 5.2E-02 109 5.0E-02 109 5.0E-02 109 5.0E-02 109 5.0E-02 109 5.0E-02 109 1.0E-01 1.0E-02 109 1.0E-01 1.0E-02 109 1.0E-01 1.0E-02 103 33 5.1E-04 104 1.0E-01 1.0E-02 103 33 5.1E-03 109 1.0E-01 1.0E-02 103 33 5.1E-04 104 1.0E-01 1.0E-02 103 33 5.1E-04 104 1.0E-02 103 33 5.1E-02 103 33 5.1E-04 104 1.0E-02 109 5.0E-02 103 33 5.1E-02 109 1.0E-01 1.0E-02 103 33 5.0E-02 103 33 5.0E-02 109 1.0E-01 1.0E-02 103 33 5.0E-03 109 1.0E-01 1.0E-02 103 33 5.0E-03 109 1.0E-01 1.0E-02 103 109 1.0E-01 1.0E-02 103 109 1.0E-01 1.0E-02 103 109 1.0E-02 103 100 1.0E-02 103 109 1.0E-02 103 109 1.0E-02 103 109 1.0E-02 103 109 1.0E-02 103 100 1.0E-02 100 100 100 100 100 100 100 100 100 1			• (							33	2.6E-03	1.5E-01
3       5.0E+00       1.04       5.0E+00       8.3E-02       2       5.0E+00       1.04       5.0E+01       8.3E-02       2       5.0E+01       8.3E-02       2       5.0E+01       8.3E-02       2       2       2       5.0E+01       2       3		Cacentum	<b></b>							33	2.6E-03	1.5E-01
3       104       5.0E-01 <b>9.3E-02 1</b> 2       45       5.0E-01 <b>9.3E-02 3</b> 3       109       5.0E-01 <b>9.3E-02 3</b> 2       45       2.0E-01 <b>9.3E-02 3</b> 3       109       5.0E-01 <b>9.3E-02 3</b> 2       45       2.0E-01 <b>9.3E-02 3</b> 3       109       5.0E-01 <b>5.3E-02 3</b> 10       2.0E-01 <b>5.3E-02 5 3</b> 10       2.0E-01 <b>5.3E-02 3 3 5</b> 10       2.0E-01 <b>5.3E-02 3 3 5 6</b> 2       45       5.0E-01 <b>2.3E-02 3 3 5 6</b> 2       45       5.0E-01 <b>2.3E-02 3 3 6 6</b> 3       109       5.0E-01 <b>1 1 1 3 5 2 6</b> 3       109       1.0E-01 <b>1 3 5 6 3 5</b> <t< td=""><td></td><td>Cadmium</td><td>e</td><td></td><td></td><td></td><td>¢</td><td>5 00 · 00</td><td>4 DE 04</td><td>)</td><td></td><td></td></t<>		Cadmium	e				¢	5 00 · 00	4 DE 04	)		
1       104       5.0E-01 <b>9.3E-02</b> 2       45       5.0E-01 <b>9.3E-02</b> 3       109       5.0E-01 <b>9.3E-02</b> 2       45       2.0E-01 <b>9.3E-02</b> 3       104       2.0E-01 <b>9.3E-02</b> 3       109       5.0E-01 <b>9.3E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>5.2E-02</b> 3       104       5.0E-01 <b>2.3E-02</b> 3       104       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>3.3E-04</b> 3       109       1.0E-01 <b>1.9E-02</b> 3       109       1.0E-01 <b>3.3E-04</b> 3       109       1.0E-02 <b>3.3E-04</b> 3       109       1.0E-02 <b>3.3E-04</b> 3       109       1.0E-02 <b></b>		Thallium	n				N	5.UE+CU	1.05-91			
2       45       5.0E-01 <b>9.3E-02</b> 3       109       5.0E-01 <b>9.3E-02</b> 3       109       5.0E-01 <b>9.3E-02</b> 3       104       2.0E-01 <b>9.3E-02</b> 3       109       5.0E-01 <b>9.3E-02</b> 3       104       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       104       5.0E-01 <b>2.3E-02</b> 3       104       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>2.3E-02</b> 3       1064 <b>1.0E-01 1.9E-02</b> 3       109       1.0E-01 <b>1.9E-02</b> 3       109       1.0E-01 <b>1.9E-02</b> 3       3       3       3         3       5       5       3		Chromium	-	104	5.0E-01	9.35-02						
3       109       5.0E-01 <b>9.35-02</b> 4       5       2.0E-01 <b>6.2E-02</b> 3       109       5.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       104       5.0E-01 <b>6.2E-02</b> 3       104       5.0E-01 <b>6.2E-02</b> 3       104       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>2.3E-02</b> 3       109       1.0E-01 <b>1.9E-02</b> 3       109       1.0E-01 <b>1.9E-02</b> 3       109       1.0E-01 <b>1.9E-02</b> 3       5.0E-02       3       3.38E-04         3       5.0E-02       3       3.38E-04         3       105       1.9E-02       3       3.38E-04         3       5.0E-02       3       3.38E-04       3         3       5.0E-02		Chromium	5	45	5.0E-01	9.3E-02						
2       45       2.0E-01 <b>6.2E-02</b> 3       104       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       109       2.0E-01 <b>6.2E-02</b> 3       104       5.0E-01 <b>6.2E-02</b> 3       104       5.0E-01 <b>6.2E-02</b> 3       104       5.0E-01 <b>2.3E-02</b> 3       109       5.0E-01 <b>2.3E-02</b> 3       109       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         3       5.0E-03       3       3.8E-04         3       5.0E-03       3       3.8E-04         3       109       1.0E-01       1.9E-02       3       3.8E-04         3       5.0E-03       3       3.8E-04       3       3.8E-04         3       5.0E-03       3       3.8E-04       3       3.8E-04         3       5.0E-03       3       3.8E-04       3       3.8E-04         3       5.0E-03 <td></td> <td>Chromium</td> <td>e</td> <td>109</td> <td>5.0E-01</td> <td><b>9</b>.3<b>5-0</b>2</td> <td></td> <td></td> <td></td> <td></td> <td>00 L.</td> <td></td>		Chromium	e	109	5.0E-01	<b>9</b> .3 <b>5-0</b> 2					00 L.	
1       104       20E-01 <b>6.2E-02</b> 33       5.0F-03         3       109       20E-01 <b>6.2E-02</b> 33       5.0F-03         1       104       2.0E-01 <b>6.2E-02</b> 3       8.0F-03         2       1       104       5.0E-01 <b>6.2E-02</b> 3       8.0F-03         3       104       5.0E-01 <b>5.2E-02</b> 3       8.0F-02         3       104       5.0E-01 <b>2.3E-02</b> 3       8.0F-02         3       109       5.0E-01 <b>2.3E-02</b> 3       3.0F-02         3       109       5.0E-01 <b>2.3E-02</b> 3       3.0F-02         3       109       1.0E-01       1.9E-02       3       3.8E-04         3       109       1.0E-01       1.9E-02       3       3.8E-04         3       109       1.0E-01       1.9E-02       3       3.8E-04         3       5.0E-03       3       3.8E-04       3       3.8E-04         3       5.0E-03       3       3.8E-04       3       3.8E-04         3       5.0E-03       3       3.8E-04       3       3.8E-04         3       <		Silver	0	17 17	2.0E-01	6.2E-02				55	9.1E-U3	4.95-92
3 109 2.0E-01 6.2E-02 3 109 2.0E-01 6.2E-02 3 8.0E-02 3 8.0E-02		Silver	ç.	104	2.0E-01	6.2E-02				33	5.0E-03	4.85-02
3       8.0E-02         3       104       5.0E-01       2.3E-02         3       104       5.0E-01       2.3E-02         3       109       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         3       5.0E-02       3       3.8E-04         3       5.0E-02       3       3.8E-04         3       5.0E-02       3       3.8E-04         3       5.0E-02       3       3.8E-04         3       5.0E-02       3       5.0E-02         3       5.0E-02       3       5.0E-02         3       5.0E-02       3       5.0E-02         3       5.0E-02       3       5.0E-02		Citat	- C7,	109	2.0E-01	6.2E-02				33	5.0E-03	4.8E-02
2       3       104       5.0E-01       2.3E-02         2       45       5.0E-01       2.3E-02       3       8.0E-02         2       45       5.0E-01       2.3E-02       3       8.0E-02         3       109       5.0E-01       2.3E-02       3       3.8E-04         1       104       1.0E-01       1.9E-02       3       3.8E-04         1       109       1.0E-01       1.9E-02       3       3.8E-04         3       109       1.0E-01       1.9E-02       3       3.8E-04         3       3       2.0E-01       1.9E-02       3       3.8E-04         3       5.0E-01       1.9E-02       3       3.8E-04       3         3       5.0E-02       3       3.8E-04       3       3.6E-04         3       5.0E-02       3       3.6E-04       3       3.6E-02         3       5.0E-02       3       3       5.0E-02       3       3.6E-02			) +	•						e	8.0E-02	2.5E-02
3 3 4 5 4 5 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6		10.00	- c							4	8.0E-02	2.5E-02
1       104       5.0E-01       2.3E-02         2       45       5.0E-01       2.3E-02         3       109       5.0E-01       2.3E-02         1       109       5.0E-01       1.3E-02         3       109       1.0E-01       1.9E-02         1       109       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         1       109       1.0E-01       1.9E-02         3       3       2.0E-02       3         3       3       5.0E-02       3         3       5.0E-02       3       5.0E-02         3       5.0E-02       3       5.0E-02         3       5.0E-02       3       5.0E-02		10 JOG								Ċ	8.0E-02	2.5E-02
2 45 5.0E-01 2.3E-02 3 109 5.0E-01 2.3E-02 2 45 1.0E-01 1.9E-02 3 109 1.0E-01 1.9E-02 3 3.8E-04 1 1.9E-02 3 3.8E-04 3 3.8E-04 3 3.8E-04 3 3.8E-04 3 3.8E-04 3 3.8E-04 3 5.0E-02 3 5.0E-02		DCI OI	) <del>-</del>	104	5 0F-01	2.3E-02						
3       109       5.0E-01       2.3E-02         2       45       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         3       109       1.0E-01       1.9E-02         3       2.0E-02       3       2.0E-04         3       5.0E-02       3       5.0E-02         3       5.0E-02       3       5.0E-02         3       5.0E-02       3       5.0E-02		Alichal	• •	45	5 0E-01	2.3E-02						
2 45 1.0E-01 1.9E-92 1 104 1.0E-01 1.9E-02 3 3.8E-04 1 109 1.0E-01 1.9E-02 3 2.0E-03 3 2.0E-03 3 5.0E-03 3 5.0E-02 3 5.0E-02 5 5.0E-02		Alfolo		601	5 0E-01	2.3E-02						
3 3.8E-04 1 104 1.0E-01 1.9E-02 3 3.8E-04 1 109 1.0E-01 1.9E-02 3 2.0E-02 3 5.0E-02 3 5.0E-02 5 5.0E-02			) (	3.6	1 0F-01	1.0E-02				e	3.8E-04	2.2E-03
3 3.8E-04 1 1.9E-02 1 2.0E-03 3 2.0E-03 3 2.0E-03 3 5.0E-02 3 5.0E-02 5 5.0E-02			<b>.</b>		1 0E-01	1 QF-02				e	3.8E-04	2.2E-03
3 2.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02		Beryllum		t 0						en	3.8E-04	2.2E-03
3 2.0E-03 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02		Beryllium	ю,	601	1.05-01	70-28.1				M	2.0E-03	8.2E-03
3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02 3 5.0E-02		Vanadium	(							ŝ	2.0E-03	8.2E-03
1 2 5.0E-02 3 5.0E-02 3 5.0E-02		Vanadium	ю ·							. ey	5.0E-02	2.4E-03
2 3 5.0E-02 3 5.0E-02		Tin	<del></del>							6	5.0E-02	2.4E-03
3 2 2 5 F ± M 1 8 F - M 1 8 F - M 1		Tin	2							(T)	5.0E-02	2.4E-03
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Table E2. Results of conservative screening of noncarcinogens where no concentrations were above detection limits

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			No.	conc	noncarcinogen	No.	conc	noncercinogen	No.	Water	noncarcinogen
(Sontaminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	weter	conc	screening
type	name*	ПС.	samples	wei wi	indices	samples	dry wi	Indices	samples	(mg/L)	Indices
Oraanic	4.6-Dinitro-ortho-cresol	e	16	9.9E+00	9.2E+01	16	3.1E+01	4.5E-01			
R. I	4.6-Dinitro-ortho-cresol	-	12	9.8E+00	9.1E+01	e	7.3E+01	1.0E+00			
	4.6-Dinitro-ortho-cresor	~	8	9.5E+00	8.8E+01	10	4.3E+01	6.2E-01			
	Nitrobenzene	e	16	2.0E+00	3.7E+00	16	1.1E+01	3.0E-02			
	Nitrobenzene	-	12	2.0E+00	3.6E+00	2	1.0E+01	2.9E-02			
	Nitrobenzene	2	8	1.9E+00	3.5E+00	10	1.0E+01	2.9E-02			
	Hentachlor epoxide	ო	16	4.0E-02	2.8E+00	13	1.1E+01	1.2E+00			
	Hentachlor eooxide	-	12	3.9E-02	2.8E+00	ų	1.0E+01	1.1E+00			
	Heptachlor epoxide	2	80	3.8E-02	2.7E+00	g	1.0E+01	1.1E+00			
	Hexachlorobenzene	ო	16	2.0E+00	2.3E+00	16	1.1E+01	1.9E-02			
	Hexachiorobenzene	-	12	2.0E+00	2.3E+00	0	1.0E+01	1.8E-02			
	Hexachlorobenzene	0	80	1.9E+00	2.2E+00	10	1.0E+01	1.8E-02			
	Hexachioroethane	e	16	2.0E+00	1.8E+00	16	1.1E+01	1.5E-02			
	Hexachloroethane	-	12	2.0E+00	1.8E+00	0	1.0E+01	1.4E-02			
	Hexachloroethane	5	8	1.SE+00	1.8E+00	10	1.0E+01	1.4E-02			
	Endosultan !!	e	16	7.9E-02	1.5E+00	13	1.1E+01	3.0E-01			
	Endosultan II	<b>*</b>	12	7.9E-02	1.5E+00	-	1.0E+01	2.9E-01			
	Endosultan II	2	¢	7.6E-02	1.4E+00	9	1.0E+01	2.9E-01			
	1,2,4-Trichlorobenzene	e	16	2.0E+00	1.4E+00	16	1.1E+01	1.1E-02			
	1,2,4-Trichlorobenzene	•	12	2.0E+00	1.4E+00	6	1.0E+01	1.1E-02			
	1,2,4-Trichlorobenzene	8	8	1.9E+00	1.3E+00	10	1.0E+01	1.1E-02			
	Aldrin	e	16	4.0E-02	1.2E+00	13	1.1E+01	5.1E-01			
	Aldrin	***	12	3.9E-02	1.2E+00	~	1.0E+01	4.8E-01			
	Aldrin	8	ß	3.8E-02	1.2E+00	9	1.0E+01	4.8E-01			
	Hexachlorobutadiene	ŝ	16	2.0E+00	9.2E-01	15	1.1E+01	7.5E-03			
	Hexachlorobutadiene	-	12	2.0E+00	9.1E-01	0	1.0E+01	7.1E-03			
	Hexachlorobutadiene	2	ю	1.9E+00	8.8E-01	10	1.0E+01	7.1E-03			
	Dieldrin	e	16	4.0E-02	7.4E-01	13	1.1E+01	3.0E-01			
	Endosultan I	ო	16	4.0E-02	7.4E-01	13	1.1E+01	3.0E-01			
	Dieldrin	-	12	3.9E-02	7.3E-01	•	1.0E+01	2.9E-01			
	Endosultan I	-	12	3.9E-02	7.3E-01	*	1.0E+01	2.9E-01			
	Dieldrin	0	8	3.8E-02	7,1E-01	9	1.0E+01	2.9E-01			
	Endosultan i	~	ß	3.8E-02	7.1E-01	9	1.0E+01	2.9E-01			
	Cis-1,3-dichloropropene	ю							28	7.2E-03	6.8E-01
	Trans-1,3-dichloropropene	ы							28	7.2E-03	6.8E-01
	Cis-1,3-dichloropropene								29	7.1E-03	6.8E-01

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Table E2 (continued)

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				Fish	Fish ingest		Sediment	Sed ingest			
			No.	conc	noncarcinogen	No.		noncarcinogen		Water	noncarcinogen
Contaminant	Conteminant	Reach	fish	(mg/kg)	screening	sediment	-	screening	water	conc	screening
type	neme*	чо.	samples	wet wt	Indices	sampies	dry wr	indices	Sainpies	7 15-03	6 8F-01
Organic	Trans-1,3-dichloropropene								20	7 1F-03	6.8E-01
	Trans-1,3-dichloropropene	~					ie L		4		
	2.4-Dichlorophenol	ო	16	2.0E+00	6.1E-01	16	1.12+01	5.UE-U3			
	Endrin	n	16	2.0E-01	6.1E-01	13	1.1E+01	5.1E-02			
	2 4-Dichlorophenol	-	12	2.0E+00	6.1E-01	e	1.0E+01	4.8E-03			
		•	12	2.0E-01	6.1E-01	-	1.0E+01	4.8E-02			
	2 4 Dichlorochean	· ~	00	1.9E+00	5.9E-01	10	1.0E+01	4.8E-03			
		. 0	0 00	1.9E-01	5.9E-01	9	1.0E+01	4.8E-02			
	4 Chlorospiline	1 (7	, t 9 t	2.0E+00	4.6E-01	14	1.0E+01	3.6E-03			
		) 🕶		2.0E+00	4.6E-01	0	1.0E+01	3.6E-03			
			c	1 9E+00	4.4E-01	10	1.0E+01	3.6E-03			
	2 Chlorochenol	J (7	, 1 1	2.0E+00	3.7E-01	16	1.1E+01	3.0E-03			
	2-Chirachenol	, <del>.</del>	12	2.0E+00	3.6E-01	ო	1.0E+01	2.9E-03			
	2. Chloronhanol	~ ~	00	1.9E+00	3.5E-01	10	1.0E+01	2.9E-03			
	Pentachiorophenol	מיו	16	9.9E+00	3.1E-01	16	5.3E+01	2.5E-03			
	Pentachlorophenol	, <b>.</b>	12	9.8E+00	3.0E-01	2	5.0E+01	2.4E-03			
	Dentachlorochenoi	0	æ	9.5E+00	2.9E-01	10	5.0E+01	2.4E-03			
	Methvi hromide	) ຕ				2	1.0E-02	1.0E-05	28	1.4E-02	2.9E-01
	Carbon tetrachloride	ო				8	1.0E-02	2.0E-05	28	7.2E-03	2.9E-U1
	Methyl bromide	<b>*</b>							29	1.4E-02	2.8E-U1
	Methy! bromide	0							29	1.46-02	10-38.2
	Carbon tetrachioride	•							29	7.1E-03	2.9E-U1
	Carbon tetrachloride	2							62	/.1E-03	10-38.2
	2 4-Dimethylohenol	т	32	6.2E+00	2.9E-01	32	3.4E+01	2.5E-03			
	2 4-Dimethylphenol	-	24	6.0E+00	2.8E-01	9	5.3E+01	3.8E-03			
	Harachlorocyclopentadiene	ŝ	16 1	2.0E+00	2.6E-01	16	1.1E+01	2.1E-03			ĸ
	Heverhiorocyclobentadiene		12	2.0E+00	2.6E-01	~	1.0E+01	2.0E-03			
	2 4. Dimethvishenol	2	16	5.5E+00	2.5E-01	20	4.0E+01	2.8E-03			
	Havachlorocychonaniadiene	0	ø	1.9E+00	2.5E-01	10	1.0E+01	2.0E-03			
	riexacting out on pointerio		,			13	1.0E+01	2.5E-01			
		) <del>-</del>				2	1.0E+01	2.4E-01			
		• •				G	1.0E+01	2.4E-01			
		1 07	16	7.9E-02	1.5E-01	13	1.1E+01	3.0E-02			
		)		7 9E-02	1.5E-01	4 <b></b> -	1.0E+01	2.9E-02			
		• ~	60	7.6E-02	1.4E-01	9	1.0E+01	2.9E-02			
	t, t UU Diaro attuitecul/atthalate	1 67	, t	2.0E+00	9.2E-02	16	1.1E+01	7.5E-04			
	orphisminiditevitilina-2)sig	,	•				4 4 1 . 54	7 KC.DA			

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Table E2 (continued)

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				1911				Seafili neo			
			No.	cone	noncarcinogen	No.	conc	noncarcinogen	No.	Water	noncarcinogen
Contaminant type	Contaminant name*	noed no.	asmples	wet wi	indices	samples	(Ry Aup	indices	sampies	(mg/L)	indices
Organic	2.4.5-Trichlorophenol	e	16	9.9E+00	9.2E-02	6	3.9E+01	5.55-04			
0	2.4.5-Trichlorophenol	-	12	9.8E+00	9.1E-02	2	2.8E+02	4.1E-03			
	Bis(2-ethylhexyl)phthalate	-	12	2.0E+00	9.1E-02	0	1.0E+01	7.1E-04			
	Di-n-octyl phthalate	<b>Y</b> an	12	2.0E+00	9.1E-02	2	1.0E+01	7.1E-04			
	2,4,5-Trichlorophenol	2	œ	9.5E+00	8.8E-02	10	4.1E+01	5.8E-04			
	Bis(2-ethylnexyl)phthalate	2	æ	1.9E+00	8.8E-02	10	1.0E+01	7.1E-04			
	Di-n-octyl phthalate	~	80	1.9E+00	8.8E-02	10	1.0E+01	7.1E-04			
	Heptachlor	<b>ری</b>	16	4.0E-02	7.4E-02	13	1.1E+01	3.0E-02			
	Heptachlor	-	12	3.9E-02	7.3E-02	**	1.0E+01	2.9E-02			
	Heptachlor	2	<b>9</b>	3.8E-02	7.1E-02	Q	1.0E+01	2.9E-02			
	Gamma-BHC (Lindane)	e	16	2.0E-02	6.1E-02	13	1.1E+01	5.1E-02			
	Gamma-BHC (Lindane)	-	12	2.0E-02	5.1E-02	2	1.0E+01	4.3E-02			
	Gamma-BHC (Lindane)	2	80	1.9E-02	5.9E-02	8	1.0E+01	4.8E-02			
	1,1,2-Trichloroethane	ю				N	1.0E-02	3.6E-06	28	7.2E-03	5.1E-02
	1,1,2-Trichtoroethane	-							29	7.1E-03	5.1E-02
	1,1,2-Trichloroethane	~							29	7.1E-03	5.1E-02
	Fluorene	ŝ	16	2.0E+00	4.6E-02	16	1.1E÷01	3.8E-04			
	Fluorene	-	12	2.0E+00	4.5E-02	2	1.0E+01	3.6E-04			
	Fluorene	~	8	1.9E+00	4.4E-02	10	1.0E+01	3.6E-04			
	4-Methylphenol	ę	16	2.0E+00	3.7E-02	14	1.0E+01	2.9E-04			
	Methoxychlor	e	16	2.0E-01	3.7E-02						
	4-Methylphenol	-	12	2.0E+00	3.6E-02	ო	1.0E+01	2.9E-04			
	Methoxychior	•	12	2.0E-01	3.6E-02						
	4-Methylphenol	8	80	1.9E+00	3.5E-02	10	1.0E+01	2.9E-04			
	Methoxychicr	2	80	1.9E-01	<b>3.5E-02</b>						
	Naphthalene	ę	16	1.2E-01	2.8E-02	16	1.1E+01	3.8E-03			
	Naphthalene	<del></del>	12	1.2E-01	2.7E-02	8	1.0E+01	3.6E-03			
	Naphthalene	2	8	1.1E-01	2.6E-02	10	1.0E+01	3.6E-03			
	Benzidine	e				14	5.3E+01	2.5E-02			4
	Benzidine	-				~	5.0E+01	2.4E-02			
	Benzidine	2				9	5.0E+01	2.4E-02			
	1,1-Dichloroethylene	e				2	1.0E-02	1.6E-06	27	7.3E-03	2.3E-02
	2-Chloronaphthalene	e	16	2.0E+00	2.3E-02	16	1.1E+01	1.9E-04			
	1,1-Dichloroethylene	<b>v-</b>							28	7.2E-03	2.3E-02
	1,1-Dichloroethylene	2							28	7.2E-03	2.3E-02
	2-Chloronaphthalene	-	12	2.0E+00	2.3E-02	0	1.0E+01	1.8E-04			

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Table E2 (continued)

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Contaminant <b>type</b> Organic 1,2-Di 1,2-Di Di Di Di Chlo	Conteminent 	Reach	Nc. fish	conc		2				Water	noncarcheoden
	Contaminent	Reach	fish	•	noncarcinogen	No.	conc	noncarcinogen	No.		<b>B</b>
				(DX/DW)	screening	sediment	(mg/kg)	screening	water	conc	screening
		<b>no.</b>	samples	wet wt	indices	semples	dry wh	Indices	samples	(mg/L)	Indices
	1 2 Dickloroothene (total)								28	7.2E-03	<b>2.1</b> E-02
	Dichlorohenzene 2. Dichlorohenzene	ათ	16	2.0E+00	2.0E-02	16	1.1E+01	1.7E-04		, ,	
	retrochioroothiono	• •							29	7.1E-03	2.0E-02
	uaciionoanyiana 	4 7							29	7.1E-03	2.0E-02
	1,2-Dichloroethene (total)	- •	с •	00.30 0	3 NE-03	~	1.0E+01	1.6E-04			
	1,2-Dichlorobenzena		1	2.05+00		i Ç	105.01	t RE-GA			
ά ά ά ά ά ά ά ά ά ά ά ά ά ά ά ά ά ά ά ά	1,2-Dichlorobenzene	3	æ	1.9E∻00	2.0E-02	2	1.05+01	1.05-04			
S S S	Di-n-butyl phthalate	e	16	2.0E+00	1.3E-02						
G C S	Di-n-butyl phthalate	<b>*</b> ***	12	2.0E+00	1.8E-02	0	1.0E+01	1.4E-04			
C CH	Di-n-butvl phthalate	2	60	1.9E+00	1.8E-02				1		
C CH	Chlorohenzene	(7)				2	1.0E-02	7.1E-07	27	7.3E-03	1.0E-G2
C CH	Bromoform					~	1.0E-02	7.1E-07	28	7.2E-03	1.0E-02
C CP		<b>,</b> •							28	7.2E-03	1.0E-02
CHA	Chiorocenzene	- (							28	7.2E-03	1.0E-02
Cilo	Chiorocenzene	<b>N</b> 6				0	1 0E-02	7.1E-07	28	7.2E-03	1.0E-02
5	Chlorodibromometriane	<b>"</b> (					1.15-02	7.1E-07	28	7.2E-03	1.0E-02
	Dichlorobromomethane	<b>7</b> 0 -				ı			29	7.1E-03	1.0E-02
	Bromoform	<b>g</b> 1							29	7.1E-03	1.0E-02
	Bromotorm	N							50	7 1E-03	1.0E-02
Chic	<b>Chlorodibromomethane</b>	<del>Que</del> 1							56	7.1E-03	1.0E-02
Chk	Chlorodibromomethane	2							29	7.1E-03	1.0E-02
Dich	Dichlorobromomethane	2					10.71	7 6E. AE	1		
But	Butylbenzylphthalate	e	16	2.0E+00	9.2E-03	9 0	1.15+01	(,3C-UJ 7 65 06			
	Isophorone	e	÷.	2.0E+00	9.2E-03		1.12+01				
But	Butylbenzyiphthaiate	-	12	2.0E+00	9.1E-03	0	1.0E+01	7.12-05			
	Isophorone	<b></b>	12	2.0E+00	9.1E-03	N	1.0E+01	/.1E-U3 r af			
Bu	Butylbenzylphthalate	2	8	1.9E+00	8.8E-03	10	1.05+01	(.1E-UJ			
	Isophorone	8	8	1.9E+00	8.8E-03	10	1.0E+01	7.1E-05	00		6 11 0
4-M	4-Methyl-2-pentanone	-							<b>P</b> C	1.4E.02	0.15-03 8 15-03
4-N	4-Methyl-2-pentanone	0						20 JO 1	р Ч	30-31.1	0.11.0
	Benzyl alcohol	ო	16	2.0E+00	6.1E-03	14	1.0+=0.1	50-30'S			
	Benzyl alcohol	<b></b> -	12	2.0E+00	6.1E-03	ຕ ູ່	1.06+01	4.85-03			
	Benzyl alcohol	2	80	1.9E+00	5.9E-03	10	1.05+01	4.8E-UD			
	Fluoranthene	n	16	2.0E-01	4.6E-03	16	1.1E+01	3.8E-04			
	Fluoranthene	***	12	2.0E-01	4.6E-03	0	1.0E+01	3.6E-04			
	Fluoranthene	2	80	1.9E-01	4.4E-03	10	1.0E+01	3.6E-04			
	Phenol	e	16	2.0E+00	3.1E-03	16	1.1E+01	2.5E-05			
	Phone	•	12	2.0E+00	3.0E-03	2	1.0E+01	2.4E-05			
	Dhonol	· n	α	1,9E+00	2,9E-03	10	1.0E+01	2.4E-05			
		1 C	, 4 4	OF TO C	2.3E-03	14	5.0E+01	1.8E-05			

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Table E2 (continued)

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				Fish	Fish ingest		Sediment	Sed ingest			water ingest
			No.	conc	noncarcinogen	No.	conc	noncarcinogen	No.	Water	noncarcinogen
Centaminant	Contaminant	Reach	fish	(mg/kg)	screening	sediment	(mg/kg)	screening	water	conc	screening
tvpe	name*	no.	samples	wet wi	indices	samples	dry wt	indices	samples	(mg/L)	Indices
Ortanic	Diethvi ohthalate	6	16	2.0E+00	2.3E-03	16	1.0E+01	<b>1.8E-0</b> 5			
	1 1 1-Trichloroethane	(7)				2	1.0E-02	<b>1.6E-07</b>	28	7.2E-03	2.3E-03
	Benzoic acid		12	9.8E+00	2.3E-03	ო	5.0E+01	1.8E-05			
	Diothyl chthalate		÷	2.0E+00	2.3E-03	2	1.0E+01	1.8E-05			
	t t trickleroothone	• •	•		- - -				29	7.1E-03	2.3E-03
		- c							29	7.1E-03	2.3E-03
	1, 1, 1 - Frichloroemane	N	i			¢	5 05 .01	1 85.05	1		
	Benzoic acid	~	60	9.52+00	2.2E-03	2	0.0E+UI	1.05-55			
	Diethy! phthalate	8	8	1.9E+00	2.2E-03	10	1.0E+01	1.8E-05			
	Ethylbenzene	3				~	1.0E-02	1.4E-07	28	7.2E-03	2.1E-03
	1 1-Dichloroothane	٣.				2	1.0E-02	1.4E-07	28	7.2E-03	2.1E-03
		) c							29	7.1E-03	2.0E-03
		4 4							29	7.1E-03	2.0E-03
	1,1-Dichioroeunarie	(	0			ų	1 15.01	1 56.AS	•		
	Dimethyl phthalate	ო	16	2.0E+00	1.8E-U3	0					
	Dimethyl phthalate	-	12	2.0E+00	1.8E-03	2	1.0E+01	1.41-03			
	Dimethyl phthalate	~	8	1.9E+00	1.8E-03	10	1.0E+01	1.4E-05			
	Pyrene	2	8	3.8E-02	1.2E-03	10	1.0E+01	4,8E-04			
	Shrene	3							28	7.2E-03	1.0E-03
	Stand	• -							29	7.1E-03	1.0E-03
		- ເ							29	7.1E-03	1.0E-03
	Styrene	N (				c	1 25400	8.55-04	1		
	2,4-UINITOPNERO	n ·			00100	4 C		A RE-DA			
	Pyrene	4	12	2.7±-02	8.36-04	<b>v</b>					
	Pyrene	ო	16	2.1E-02	6.5E-04	16	1.1E+01	5.0E-04			
	Acenaphthene	e	16	3.0E-02	4.6E-04	16	1.1E+01	2.5E-04			
	Acenaohthene		12	2.9E-02	4.6E-04	ო	1.0E+01	2.4E-04			
	Acenachthene	2	60	2.8E-02	4.4E-04	10	1.0E+01	2.4E-04	1		
	Vinvl acetate	. e7							28	1.4E-02	4.1E-04
	Vinvl acetate	• •-							29	1.4E-02	4.1E-04
	Vinvi acretate	•							29	1.4E-02	4.1E-04
	Dis(2_chlorolconconv )ether					16	1.1E+01	3.8E-04			
	Dis(2-chloroisoprop)() curci Bis(2-chloroisoprov() ether	) <del></del>				0	1.0E+01	3.65-04			
	Disto chloroleonrond/other					10	1.0E+01	3.6E-04			
	uis(z-uito uisopiopyi)ouici Anthracano	1 9	4.6	9 9F-02	3.1E-04	16	1.1E+01	5.0E-05			
		•	) ( - +	0.85.00	3 05-04	(7)	1.0E+01	4.8E-05			
	Alianatia	~ (	<u>,</u> 0		9 0C-DA	10	1 0F+01	4.8E-05			
	Anthracerie	<b>v</b> 1	0	3.JL-05		) 	1 75-02	9 5E-06			
	l etrachioroethylene	<b>.</b>					0 1 5.03	6 5E-07			
	I rans-1,2-dichioroethene	<b>"</b>				- c	1 0E-03	7 1E.AR			
	Dichlorodifluoromethane	n				<b>N</b> (	10-10 <sup>-1</sup>				
	Trichlorofluoromethane	ന				N	1.05-04	4.0E-U0			

Table E2 (continued)

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## **APPENDIX F**

## NONCONSERVATIVE AND CONSERVATIVE SCREENING OF DETECTABLE CARCINOGENS AND NONCARCINOGENS IN GROUNDWATER

Table F1. Results of nonconservative screening of groundwater for at least one value was above detection limits	er for carcinogens where	
le F1. Results of nonconservative screening of groundwate at least one value was above detection limit	for	
	le F1. Results of nonconservative screening of groundwate	t one value was a

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					Ratio of detected	Geometric	Cancer slope	Daily	Carcinogen
Reach	Media	Contaminant type	Contaminant name	CAS no.	to total samples	mean (mg/L)	factor 1/(mg/kg/d)	intake (mg/kg/d)	screening Indices
-	Groundwater	Inorganic	Beryllium	7440-41-7	2/19	9.1E-04	4.3E+00	2.6E-06	1E-05
						(Bq/L)	(1/Bq)	(Bq/lifetime)	
-	Groundwater	Radionuclide	H-3	10028-17-8	5/6	1.8E+02	1.5E-12	3.7E+05	6E-07
-			Sr-90	10098-97-2	9/17	6.0E-02	8.9E-10	1.3E+02	1E-07
			Co-60	10198-40-0	2/17	2.9E-02	4.1E-10	6.1E+01	3E-08
			Cs-137	10045-97-3	3/17	1.4E-02	7.6E-10	2.8E+01	2E-08
•	Groundwater	Radionuclide	Total						7E-07
1	Groundwater	AII	Reach total						1E-05
						(mg/L)	1/(mg/kg/d)	(mg/kg/d)	:
8	Groundwater	Inorganic	Beryllium	7440-41-7	1/15	6.4E-04	4,3E+00	1.8E-06	8E-06
						(Bq/L)	(1/Bq)	(Bq/lifetime)	
c	Groundwater	Radionuciida	H-3	10028-17-8	6/6	3.9E+03	1.5E-12	8.1E+06	1E-05
1			Sr-90	10098-97-2	12/15	2.7E-01	8.9E-10	5.7E+02	5E-07
			Cs-137	10045-97-3	3/15	1.5E-02	7.6E-10	3.2E+01	2E-08
2	Groundwater	Radionuclide	Total						<u>1E-05</u>
2	Groundwater	All	Reach total						2E-05
The second s									

F-3

(continued)
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Table

					Ratio of		Cancer		
					detected	Geometric	slope	Daily	Carcinogen
Reach	Media	Contaminant	Contaminant		to total	mean	factor	intake	screening
no.	type	type	name	CAS no.	samples	(mg/L)	1/(mg/kg/d)	(mg/kg/d)	indices
e	Groundwater	Inorganic	Arsenic	7440-38-2	2/74	1.2E-02	1.8E+00	3.4E-05	6E-05
•		)	Beryllium	7440-41-7	2/36	7.7E-04	4.3E+00	2.2E-06	9E-06
က	Groundwater	Inorganic	Total						7E-05
						(Bq/L)	(1/Bq)	(Bq/lifetime)	
e7.	Groundwater	Radionuclide	Ra-224	13233-32-4	1/4	7.0E+00	1.3E-09	1.5E+04	2E-05
)			Th-234	15065-10-8	1/1	6.9E+01	1.1E-10	1.5E+05	2E-05
			U-234	13966-29-5	3/4	1.8E+00	3.8E-09	3.7E+03	1E-05
			Am-241	14596-10-2	1/4	4.6E-01	8.4E-09	9.7E+02	8E-06
			U-238	7440-61-1	1/4	4.1E-01	3.5E-09	8.7E+02	3E-06
			Ra-226	13982-63-3	1/4	4.1E-01	3.2E-09	8.6E+02	3E-06
			Th-230	14269-63-7	3/5	9.0E-01	6.5E-10	1.9E+03	1E-06
			H-3	10028-17-8	23/28	1.5E+02	1.5E-12	3.1E+05	5E-07
			Th-228	14274-82-9	1/5	4.6E-01	4.1E-10	9.7E+02	4E-07
			Sr-90	10098-97-2	26/49	4.6E-02	8.9E-10	9.7E+01	9E-08
			Co-60	10198-40-0	19/46	3.3E-02	4.1E-10	7.0E+01	3E-08
			Cs-137	10045-97-3	16/49	1.3E-02	7.6E-10	2.7E+01	2E-08
			Tc-99	14133-76-7	6/12	1.1E-01	3.5E-11	2.3E+02	8E-09
c.	Groundwater	Radionuclide	Total						7E-05
3	Groundwater	AII	Reach total						1E-04

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Table F2. Results of nonconservative screening of groundwater for noncarcinogens where at least one value was above detection limits

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Noncarcinogen screening 1.7E-03 1.5E-04 2.5E-03 5.4E-02 Indices 1.0E-03 5.4E-02 1.9E-02 1.0E-03 6.5E-01 3.2E-02 1.3E-02 3.6E-03 3.7E-04 1.6E-04 2.1E-02 I.8E-02 3.7E-03 2.3E-03 2.3E-03 9.5E-04 5.2E-04 5.7E-01 .4E-02 6.5E-01 (mg/kg/d) 6.4E-05 1.2E-05 1.8E-06 3.0E-07 1.0E-05 1.3E-03 4.2E-05 3.3E-04 4.5E-05 1.6E-05 3.5E-05 3.7E-05 3.2E-05 2.6E-06 3.0E-05 2.3E-03 3.2E-04 5.1E-05 9.2E-05 2.3E-04 intake Daliy mg/kg/d) Reference 3.0E-03 5.0E-03 9.0E-02 7.0E-03 5.0E-03 2.0E-01 5.0E-03 7.0E-02 5.0E-03 9.0E-02 2.0E-02 7.0E-03 3.7E-02 factor 4.0E-04 5.0E-04 7.0E-02 2.0E-02 3.0E-04 3.7E-02 2.0E-01 dose Geometric of conc 1.6E-02 5.5E-03 6.4E-04 (mg/L) 2.3E-02 1.1E-01 1.8E-02 4.2E-03 1.3E-02 1.1E-02 3.2E-02 9.1E-04 3.6E-03 4.6E-01 1.5E-02 1.1E-04 1.2E-02 I.1E-02 8.0E-02 1.2E-01 7.9E-01 mean detected Ratio of to total samples 11/19 3/19 1/15 2/15 1/15 3/15 2/20 6/19 2/19 4/18 6/19 5/19 1/19 2/19 2/19 6/39 2/39 6/15 4/11 1/11 7439-97-6 7440-39-3 7440-47-3 7440-42-8 7440-02-0 7440-62-2 7440-50-8 7440-66-6 7440-36-0 7440-02-0 7440-66-6 7440-41-7 7440-43-9 7440-39-3 7440-47-3 7440-42-8 7440-62-2 7440-50-8 7440-41-7 7440-22-4 CAS no. Contaminant Reach total Chromium Vanadium Chromium Vanadium Beryllium Beryllium Barium Antimony Cadmium Copper Mercury Boron Nickel Copper Barium Boron Nickel Silver Total Zinc Total name Zinc Contaminant Inorganic inorganic Inorganic Inorganic type AH Groundwaler Groundwater Groundwater Groundwater Groundwater Media type Reach on Do 2 2 ---

Reach total

All

Groundwater

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Table F2 (continued)

Reference

Noncarcinogen screening 1.1E-03 1.0E-01 indices 1.3E-02 7.3E-03 3.1E-03 1.7E-04 3.4E-02 2.1E-02 1.5E-02 4.1E-03 2.7E-03 1.0E-03 2.9E-04 1.0E-01 5.7E-04 3.6E-04 4.4E-04 (mg/kg/d) 8.1E-05 1.7E-05 2.8E-04 Intake 3.4E-05 1.4E-03 7.7E-06 6.3E-05 2.9E-05 3.6E-05 2.2E-05 1.9E-05 3.8E-05 2.2E-06 5.8E-05 Daily mg/kg/d) 7.0E-02 7.0E-03 9.0E-02 factor 1.0E-03 5.0E-03 5.0E-03 1.0E-01 1.0E-01 5.0E-04 3.0E-03 2.0E-02 3.7E-02 5.0E-02 dose 2.0E-01 Geometric 1.0E-02 1.3E-02 of conc 1.3E-02 7.7E-04 5.9E-03 5.1E-01 2.7E-03 2.2E-02 7.7E-03 2.8E-02 (J/gm) 1.2E-02 9.8E-02 6.6E-03 2.0E-02 mean detected Ratio of to total samples 24/74 13/36 11/36 17/36 2174 3/13 1/74 7174 4/74 3/36 2/36 2/3 4/5 2/5 7440-38-2 7440-39-3 7440-43-9 7440-47-3 7440-02-0 7440-42-8 7440-62-2 7440-50-8 7440-66-6 7440-22-4 7440-41-7 78-93-3 CAS no. 75-15-0 67-64-1 Methyl ethyl ketone Carbon disulfide Contaminant Reach total Chromium Vanadium Acetone Cadmium Beryllium Barium Copper Arsenic Boron name Silver Nickel Total Total Zinc Contaminant Inorganic Inorganic Organic type Organic All Groundwater Groundwater Groundwater Groundwater Groundwater Media type Reach о<u>с</u> e ო 10 ო က

Reach	Media tvoe	Contaminant type	Contaminent name	CAS no.	Hatio of detected to total samples	95% upper conf bound on mean (mg/L)	cancer slope factor 1/(mg/kg/d)	Daily intake (mg/kg/d)	Carcinogen screening Indices
	Groundwater	Inorganic	Beryllium	7440-41-7	2/19	6.1E-03	4.3E+00	1.7E-04	8E-04
<del>~~</del>	Groundwater	Radionuclide	Sr-90 H-3	10098-97-2 10028-17-8	9/17 7/9	<b>(Bq/L)</b> 3.0E+01 6.1E+03	(1/Bq) 8.9E-10 1.5E-12	(Bq/lifetime) 6.3E+05 1.3E+08	6E-04 2E-04
			Cs-137 Co-60	10045-97-3 10198-40-0	3/17 2/17	2.5E-01 3.7E-01	7.6E-10 4.1E-10	5.2E+03 7.8E+03	4E-06 3E-06 61 04
_	Groundwater Groundwater	Radionuclide All	Total Reach total						2E-03
N	Groundwater	Inorganic	Berylium	7440-41-7	1/15	( <b>mg/L)</b> 1.5E-03	1/(mg/kg/d) 4.3E+00	(mg/kg/d) 4.2E-05	2E-04
2	Groundwater	Radionuclide	H-3 Sr-90 Cs-137	10028-17-8 10098-97-2 10045-97-3	6/6 12/15 3/15	(Bq/L) 1.5E+05 5.9E+00 2.9E-01	(1/ <b>Bq)</b> 1.5E-12 8.9E-10 7.6E-10	(Bq/lifetime) 3.2E+09 1.2E+05 6.2E+03	5E-03 1E-04 5E-06
~	Groundwater	Radionuclide	Total						5E-03

Table F3. Results of conservative screening of groundwater for carcinogens where at least one value was above detection limits

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Table

					detected	conf bound	slope	Dally	Carcinogen
Reach	Media	Contaminant	Contaminant	CAS DO	to total	on mean	factor 1/(ma/ka/d)	intake (mg/kg/d)	screening Indices
С	type	type	name A	7440 28.0	0174	3 3E-02	1 8F+00	9.4E-04	2E-03
m	Groundwater	Inorganic	Revillium	7440-41-7	2/36	0.05 02 1.4E-03	4.3E+00	4.1E-05	2E-04
			Total		8				2E-03
ŋ	Groundwaren					(Bq/L)	(1/Bq)	(Bq/ilfetime)	
	Contraction C	BadionIndida	H-3	10028-17-8	23/28	4.3E+04	1.5E-12	9.1E+08	1E-03
ŋ	GIOUIUWAIBI		11-234	13966-29-5	3/4	8.3E+00	3.8E-09	1.7E+05	7E-04
			Cn-60	10198-40-0	19/46	4.7E+01	4.1E-10	9.8E+05	4 F-n4
			Ba-224	13233-32-4	1/4	1.0E+01	1.3E-09	2.2E+05	3E-04
			Åm-241	14596-10-2	1/4	9.1E-01	8.4E-09	1.9E+04	2E-04
			Th-234	15065-10-8	1/1	6.9E+01	1.1E-10	1.5E+06	2E-04
			Tr-00	14133-76-7	6/12	1.1E+02	3.5E-11	2.3E+06	8E-05
			Th-230	14269-63-7	3/5	4.0E+00	6.5E-10	8.5E+04	6E-05
			11-238	7440-61-1	1/4	5.9E-01	3.5E-09	1.2E+04	4E-05
			Ba-226	13982-63-3	1/4	5.8E-01	3.2E-09	1.2E+04	4E-05
			Sr-90	10098-97-2	26/49	1.8E+00	8.9E-10	3.7E+04	3E-05
			Ge-137	10045-97-3	16/49	1.9E+00	7.6E-10	3.9E+04	3E-05
			Th-228	14274-82-9	1/5	7.5E-01	4.1E-10	1.6E-04	6E-06
c	Groundwater	Radionuclide	Total						3E-03

F-8

Results of conservative screening of groundwater for noncarcinogens where at least one value was above detection limits Table F4.

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Noncarcinogen screening 1.2E+01 7.2E-01 3.1E-01 1.2E-02 6.4E-02 indices 3.4E-01 1.0E+01 1.1E-01 3.5E-02 2.9E-02 7.9E-03 1.2E+01 6.5E-02 5.4E-02 5.1E-02 8.5E-03 6.0E-03 3.8E-01 1.4E-01 1.0E-01 1.5E-01 8.0E-01 4.0E-01 mg/kg/d) 4.1E-03 2.0E-03 3.7E-06 7.5E-04 1.3E-03 4.2E-05 1.2E-03 2.7E-02 1.5E-04 9.6E-04 1.7E-04 1.6E-03 1.9E-03 3.6E-03 .0E-03 2.8E-02 5.8E-03 3.8E-04 Intake I.0E-02 I.1E-03 Daily mg/kg/d) Reference 7.0E-03 5.0E-03 5.0E-03 7.0E-03 4.0E-04 7.0E-02 3.0E-03 5.0E-03 7.0E-02 9.0E-02 2.0E-02 3.7E-02 5.0E-03 factor 5.0E-04 9.0E-02 2.0E-02 3.7E-02 3.0E-04 2.0E-01 2.0E-01 dose conf bound 95% upper on mean 1.5E-03 1.3E-01 9.4E-01 1.3E-04 5.5E-02 2.6E-02 I.3E-02 6.6E-02 (mg/L) 3.5E-02 5.4E-03 3.4E-02 7.0E-02 6.1E-03 3.8E-02 2.0E-01 4.5E-02 4.2E-02 3.6E-01 9.8E-01 1.4E-01 detected Ratio of to total samples 11/19 6/19 6/15 2/15 1/15 3/15 2/20 2/19 3/19 5/19 4/18 6/19 2/19 1/19 6/39 2/39 1/15 2/19 4/11 1/11 7439-97-6 7440-39-3 7440-42-8 7440-62-2 7440-50-8 7440-66-6 7440-43-9 7440-62-2 7440-02-0 7440-50-8 7440-66-6 7440-47-3 7440-02-0 7440-41-7 7440-36-0 7440-47-3 7440-42-8 7440-41-7 7440-39-3 7440-22-4 CAS no. Contaminant Reach total Chromium Vanadium Antimony Chromium Vanadium Beryllium Cadmium Beryllium Mercury Copper Barium Copper Nickel Barium Boron Boron Nickel Silver Total Tctal Zinc name Zinc Contaminant Inorganic Inorganic Inorganic Inorganic type Al Groundwaier Groundwater Groundwater Groundwater Groundwater Media type Reach no. 2 **\***--

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Reach total

All

Groundwater

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(continued)
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Table

. . . . **15** . Thuết thuết the solution

Reach					detected	conf bound	dose	Daily	Noncarcinogen
	Media	Contaminant	Contaminant	C. 40 - 0	to total	on mean	factor (ma/kg/d)	intake (mc/ka/d)	screening Indices
- <u>10</u>	type	type Increation	Arconic	7440-38-2	2/74	3.3E-02	1.0E-03	9.4E-04	9.4E-01
n	COURDWALE	noganic	Rariim	7440-39-3	24/74	8.3E-01	7.0E-02	2.4E-02	3.4E-01
			Cadmium	7440-43-9	1/74	3.3E-03	5.0E-04	9.5E-05	1.9E-01
			Chromium	7440-47-3	7/74	3.1E-02	5.0E-03	9.0E-04	1.8E-01
			Silver	7440-22-4	4174	1.7E-02	3.0E-C3	4.9E-04	1.6E-01
			Nickel	7440-02-0	13/36	7.4E-02	2.0E-02	2.1E-03	1.1E-91
			Vacadinum	7440-62-2	3/36	1.5E-02	7.0E-03	4.4E-04	6.2E-02
			Boron	7440-42-8	3/13	1.7E-01	9.0E-02	4.9E-03	5.5E-02
			Connar	7440-50-8	11/36	2.9E-02	3.7E-02	8.2E-04	2.2E-02
			Zinc	7440-66-6	17/36	8.3E-02	2.0E-01	2.4E-03	1.2E-02
			Bardhin	7440-41-7	2/36	1.4E-03	5.0E-03	4.1E-05	8.2E-03
e	Groundwater	Inorganic	Total						2.1E+00
Ċ		, incero	Arotona	67-64-1	4/5	2.6E-02	1.0E-01	7.4E-04	7.4E-03
<b>7</b> 3)	GFOUNDWATER	Olganic	Mathul athul katone	78-93-3	2/3	1.0E-02	5.0E-02	2.9E-04	5.7E-03
			Carbon disulfide	75-15-0	2/5	9.5E-03	1.0E-01	2.7E-04	2.7E-C3
c		Oranic	Total						1.6E-02
<b>n</b>	Cioul Water	Olganic All	Carls Intel						2.1E+00

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## APPENDIX G

## DATA FOR ECOLOGICAL ASSESSMENT

1.1.1.1.1.1.1

	Vahrc	Smoties	Source
Cocractili Dance / Lottal type			
INORGANICS			
Antimory			
Acute values:	9000 18,800 21,900	Daphnia magna Daphnia magna Fathead minnow	EPA 1980b ibid. ibid.
Pesticide Acute Value:	220		
Acute-Chronic ratios:	3.481 13.69	Daphnia magna Fathead minnow	Kimball, Manuscript ibid.
Pesticide A-C ratio:	12.4		
PAV / PACR:	18		
Aracoic V			
Acute values:	<ul> <li>&lt;8100</li> <li>7400</li> <li>3600</li> <li>49,600</li> <li>25,600</li> <li>49,000</li> </ul>	Daphrnia magna Daphrnia magna Daphrnia pulex Dophnia pulex Bosmina longirostris Rainbow trout Fathead minnow Mosquitofish	EPA 1985a ibid. ibid. ibid. ibid. ibid. ibid.
PAV:	17		
Acute-Chronic ratios:	28.7	Fathead minnow	DeFoe, 1982
PACR:	35.8		
PAV / PACR:	0.47		

Table G1. Data Used for National Ambient Water Quality Criteria Approximations (all values in g9/)

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Table G1 (continued)

a magna a magna a magna a magna a magna a magna a magna a manow i minnow i minnow i minnow i minnow				
<ul> <li>410,000 Daphnia magna</li> <li>4.4</li> <li>4.4</li> <li>4.0</li> <li>0.11</li> <li>0.11</li> <li>1.900 Daphnia magna</li> <li>2.500 Daphnia magna</li> <li>3.250 Fathead minnow</li> <li>1.500 Gupty</li> <li>2.500 Gupty</li> <li></li></ul>	Chemical nume / Data type	Value	Species	Source
<ul> <li>410,000 Daphnia magna</li> <li>4.4</li> <li>4.0</li> <li>4.0</li> <li>4.0</li> <li>9.0</li> <li>9.0</li> <li>9.00</li> <li>9.0</li> <li>9.000</li> </ul>	INORGANICS (continued)			
Acute values PAU: 2000 Daphnia magna PACR: 44 PACR: 40 PACR: 011 PACR 011 PAU / PACR 011 Acute values: 2500 Daphnia magna Acute values: 2500 Daphnia magna 4000 Fathead minnow 1500 Fathead minnow 15000 Fathead minnow 15000 Fathead minnow 15000 Guppy 23000 Guppy 24,000 Guppy 25,000 Guppy 26,000				
Actic values         4.000         Daphnia magna           AV:         4.4         4.4           ACR:         4.0         4.4           ACR:         4.0         6.11           ACR:         0.11         2.00           Actic values:         0.11         2.00           Actic values:         0.11         2.00           Actic values:         2.00         Daphnia magna           2.00         Daphnia magna         4.00           Acute values:         2.00         Daphnia magna           2.00         Fathead minnow         1.50           1.50         Fathead minnow         1.50           2.350         Guppy         2.000           2.000         Guppy	Barium			
AV: PACR: 40 ACR: 0.11 Acute values: 2500 Daphria magna Acute values: 2500 Daphria magna 3200 Pathead minnow 150 Fathead minnow 1500 Pathead minnow 15000 Fathead minnow 15000 Fathead minnow 15000 Fathead minnow 15000 Guppy 22,000 Guppy 22,000 Guppy 22,000 Guppy 22,000 Guppy 19,000 Guppy 19,000 Guppy	Acute values	410,000	Daphnia magna	(AQUIRE)
ACR:     40       AV / PACR     0.11       Acute values:     0.01       Acute values:     2500       Daphnia magna       4800     Goldfish       2500     Daphnia magna       2500     Daphnia magna       2500     Daphnia magna       2500     Daphnia magna       2500     Pathead minnow       150     Fathead minnow       11,000     Fathead minnow       11,000     Fathead minnow       20,000     Fathead minnow       20,000     Fathead minnow       20,000     Guppy       32,000     Guppy       2400     Guppy       2500     Guppy       2600     Guppy       27,000     Guppy       28,000     Guppy       29,000     Guppy       20,000     Guppy       20,000     Guppy       20,000     Guppy       20,000     Guppy       20,000     Guppy <td>PAV:</td> <td>4.4</td> <td></td> <td></td>	PAV:	4.4		
AV / PACR 0.11 Acute values: 7900 Daphnia magna Acute values: 2500 Daphnia magna 4800 Goldfish 3250 Fathead minnow 1500 Fathead minnow 15,000 Fathead minnow 15,000 Fathead minnow 15,000 Guppy 3330 Flagfish 3330 Guppy 24,000 Guppy 24,000 Guppy 19,000 Guppy 19,000 Guppy	PACR:	40		
Acute values: 2500 Daphnia magna 2500 Daphnia magna 2500 Daphnia magna 2500 Pathead minnow 1500 Fathead minnow 11,000 Fathead minnow 20,000 Fathead minnow 20,000 Fathead minnow 23,000 Guppy 24,000 Guppy	PAV / PACR	0.11		
<ul> <li>7900 Daphnia magna</li> <li>25000 Daphnia magna</li> <li>4800 Goldfish</li> <li>3250 Fathead minnow</li> <li>150 Fathead minnow</li> <li>11,000 Fathead minnow</li> <li>11,000 Fathead minnow</li> <li>11,000 Fathead minnow</li> <li>15,000 Fathead minnow</li> <li>3530 Flagfish</li> <li>3530 Flagfish</li> <li>3530 Flagfish</li> <li>3530 Guppy</li> <li>160 Guppy</li> <li>19,000 Guppy</li> </ul>	Berybium			
<ul> <li>2500 Daphnia magna</li> <li>4800 Goldfish</li> <li>3250 Fathead minnow</li> <li>150 Fathead minnow</li> <li>11,000 Fathead minnow</li> <li>11,000 Fathead minnow</li> <li>15,000 Fathead minnow</li> <li>15,000 Fathead minnow</li> <li>15,000 Fathead minnow</li> <li>3530 Flagfish</li> <li>3530 Flagfish</li> <li>35,000 Guppy</li> <li>24,000 Guppy</li> <li>19,000 Guppy</li> <li>19,000 Guppy</li> </ul>	Amite value:	2006	Daphnia magna	EPA 1980f
Goldfish Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fagfish Flagfish Guppy Guppy Guppy Guppy Guppy	Unic vance.	2500	Daphnia magna	ibid.
Fathcad minnow Fathcad minnow Fathcad minnow Fathcad minnow Fathcad minnow Fathcad minnow Fagfish Flagfish Riagfish Guppy Guppy Guppy Guppy Guppy		4800	Goldfish	ibid.
Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fagfish Flagfish Flagfish Guppy Guppy Guppy Guppy Guppy		3250	Fathead minnow	bid
Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fathead minnow Fagfish Flagfish Guppy Guppy Guppy Guppy		200	Fathead minnow	ibid.
Fathead minnow Fathead minnow Fathead minnow Fathead minnow Flagfish Flagfish Guppy Guppy Guppy Guppy Guppy		150	Fathcad minnow	ibid. 
Fathead minnow Fathead minnow Fathead minnow Fagfish Flagfish Guppy Guppy Guppy Guppy Guppy		150	Fathead minnow	ibid.
Fathcad minnow Fathcad minnow Fagfish Flagfish Guppy Guppy Guppy Guppy Guppy		11,000	Fathead minnow	101d.
Fathcad minnow Fathcad minnow Flagfish Guppy Guppy Guppy Guppy Guppy		20,000	Fathead minnow	1010. 1.1.1
raureau numoo Flagfish Guppy Guppy Guppy Guppy Guppy		15,000	Fathead minnow	thid
Hagfish Hagfish Guppy Guppy Guppy Guppy		To,UU AAM	Fautor muse	ibid.
Flagfish Guppy Guppy Guppy Guppy Guppy		3530	Flagfish	ibid.
Guppy Guppy Guppy Guppy Guppy Guppy		3530	Flagfish	ibid.
Guppy Guppy Guppy Guppy Guppy		32,000	Guppy	ibid.
Guppy Guppy Guppy Guppy		28,000	Guppy	ibid.
Guppy Guppy Guppy		32,000	Guppy	ibid.
Guppy Guppy		24,000	Guppy	ibid.
Guppy		160	Guppy	ibid.
		19,000	Guppy	ibid.

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Occupie meno: / Lews () j.c.			
INORGANICS (continued)			
	450		ibid.
Acute values (cont.):	011	Gunov	ibid.
	200	Gupty	ibid.
	20,000	Guppy	ibid.
	13,700	Guppy	ibid.
	6100	Guppy	ibid.
	160	Guppy	ibid.
	12,000	Bluegil Bluegil	ibid. ibid.
PAV:	40		
Acute-Chronic ratios:	472	Dophnia magna	Kimball, Manuscript
PACR:	91.1	·	
PAV / PACR:	0.44		
Octat			
Acute values:	5990 3610 531	Daphnia magna Fathead minnow Fathead minnow	Kimball, Manuscript <i>ibid.</i> Lind et al., 1978
PAV:	24		
Acute-Chronic ratios:	1175 290	Dophnia magna Fathead minnow	Kimball, Manuscript Kimball, Manuscript
PACR:	83.6		
PAV / PACR:	0.29		

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Chemical mense / Data type	Vaiue	Species	Source
INORGANICS (continued)			
Placeride ion			
	000 800	Destruia masna	Dave, 1984b
Acute values.	251 000	Darhnia mama	Fieser et al., 1986
	390.247	Stickleback	Smith et al., 1985
	200,000 245,987	Rainbow trout Fathead minnow	ibid. ibid.
	125,000	Brown trout	(AQUIRE)
PAV:	2700		
Acute-Chronic ratios:	8.33 22.27	Daphnia magna Daphnia magna	Fieser et al., 1986 Dave, 1984
PACR:	19.5		
PAV / PACR:	140		
Magnezkun			
Acute values:	64,700	Scud	(AQUIRE)
PAV:	6.5		
PACR:	40		
PAV / PACR:	0.16		

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Table

Chemical name / Data type	Value	Species	Source
INORGANICS (continued)			
Mangancac			
Acute values:	19,400 33,800	Daphnia magna Fathead minnow	Kimball, Maauscript ibid.
PAV:	330		
Acute-Chronic ratios	19.10	Fathcad minnow	Kimball, Manuscript
PACR:	31.3		
PAV / PACR:	11		
Molybdenum			
Acute values:	206,800	Daphnia magna	Kimball, Manuscript
PAV:	2200		
Acute-Chronic ratios:	235	Daphria magra	Kimball, Manuscript
PACR	72.2		
PAV / PACR:	30		
Potansium			÷
Acute values:	53,200	Scud	(AQUIRE)
PAV:	5.3		
PACR:	40		

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Overviced memor / Deta type	Value	Species		Source
INOR GANICS (continued)				
PAV / PACR:	0.13			
Sodium				
Acute values:	1,820,000	Daphnia magna		(AQUIRE)
PAV:	19,000			
PACR:	40			
PAV / PACR:	480			
Säver				
Final Acute Value:	4.1			EPA 1980y
Acute-Chronic ratios:	2.0 54			EPA 1980y ibid.
PACR:	65.1			
FAV / PACR:	0.063			
United to the second se				
Acute values:	2180 910 132,000 121,000	Daphnia magna Daphnia magna Fathead minnow Bluegill Bluegill	ha Na	EPA 1980bb ibid. ibid. ibid.
PAV:	24			

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Chemical name / Data type	Value	Spates	Source
INORGANICS (continued)			
Acute-Chronic ratios:	7.0 31.58	Daphnia magna Fathead minnow	Kimball, Manuscript ibid.
PACR:	10.8		
PAV / PACR:	22		
Vanadium			
Acute values:	1520 1850 7000 11,200	Daphnia magna Fathead minnow Brook trout Flagfish Daphnia magna	Kimball, Manuscript <i>ibid.</i> Ernst and Garside, 1986 Hokdway and Sprague, 1979 Beusen and Neven, 1987
PAV:	36		
Acute-Chronic ratios:	10.88 140 2.137	Fathead minnow Flagfish Daphnia magna	Kimball, Manuscript Hokdway and Sprague, 1979 Beusen and Neven, 1987
Final A-C ratio:	14.8		
PAV / FACR:	9.4		
ORGANICS			
Accuspthene			
Acute values:	41,200	Daptaria magna Bluegill	EPA 1980a ibid.

Chemical name / Data type	Value	Spocies	Source
ORGANICS (continued)			
PAV:	53		
Acute-Chronic ratios:	1.472	Fathead minnow	Cairns and Nebeker, 1982
PACR:	13.3		
PAV / PACR:	2.2		
Acctore			
Acute values:	8,300,000 8,300,000 1,300,000 8,140,000 7,310,000	Bluegil Bluegil Mosquitofish Fathead minnow Fathead minnow	(AQUIRE) ibid. ibid. ibid.
	5,540,000 13,560,000 12,660,000 13,400,000	Rainbow trout Daphuia magna Daphuia magna Daphuia magna	ibid. ibid. ibid. ibid.
	12,100,000 8,800,000 7,460,000 7,810,000	Daphnia pulex Daphnia cucultata Daphnia cucultata Daphnia cucultata	ibid. ibid.
PAV:	25,000	·	
PACR:	40		
PAV / PACR:	640		

Chemical name / Data type	Vahxe	Species	Source
ORGANICS (continued)			
Anthraccae			
Acute values:	11.92 2.78	Sunfish Bluegil	(AQUIRE) ibid.
PAV:	0.00058		• • • •
PACR:	40		
PAV / PACR:	0.000014		•
Benzene			
A series and the series of the	203.000	Daphria magna	EPA 1980d
Acute values.	400.000	Daphnia magna	ibid.
	620,000	Daphnia magna	ibid.
	412,000	Daphnia magna	ibid
	412,000	Daphnia magna	ibid.
	356,000	Daphnia magra	ibid.
	356,000	Daphria magna	ibid.
	345,000	Daphnia puler	ibid.
	265,000	Daphria puler	ibid
	2300	Rainbow trout	ibid
	34.420	Goldfish	ibid.
	33.470	Fathcad minnow	ibid.
	32,000	Fatherd minnow	ibid.
	36,600	Gubby	ibid.
	386,000	Mosquitofish	ibid.
	22,490	Bluegil	ibid.
PAV:	100		

Chemical name / Data type	Value	Species	Source	
ORGANICS (continued)				
PACR:	4	i		
PAV / PACR:	2.6			
Beazidene				
Acute values:	7400 4350 2500 16,200	Rainbow trout Lake trout Red shiner Flagfish	EFA 1980c ibid. ibid. ibid.	
PAV:	1.5			
PACR:	40			
PAV / PACR:	0.037			
Berzo(a) sutiracene				
Acute values:	10*	Daphnia pulex	(AQUIRE)	
PAV:	0.11			
PACR:	40			
PAV / PACR:	0.0027			
Berzo(a)pyreac				
Acute values:	<b>S</b> *	Daphnia puler	(AQUIRE)	
PAV:	0.053		•	

Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			
PACR:	40		
PAV / PACR:	0.0013		
Berzoic acid			
Acute values:	180,000	Mosq.itofish	(AQUIRE)
PAV:	18		
PACR:	40		
PAV / PACR:	0.45		
Berzyi akothol			
Acute values:	10,000	Bluegill Fathead minnow	(AQUIRE) ibid.
PAV:	1.0		
PACR:	40		
PAV / PACR:	0.025		
BHC (other)			
Acute values:	1000	Daphria magna Daphria magna	(AQUIRE) ibid.
PAV:	9.5		

		Lanc UI (Matanuu)		1
Chemical name / Data type	Value	Spocies	Source	
ORGANICS (continued)				
PACR:	40			
PAV / PACR:	0.24			
Bia(2-ethylhexyl)phthalade				
Acute values:	11,000 133 690 6180	<i>Daphnia magna</i> <i>Daphnia pulex</i> Channel catfish Goldfish	(AQUIRE) ibid. ibid.	4
	42,100 32,900 139,500 149,200	Largemouth bass Largemouth bass Rainbow trout Rainbow trout	ibid. ibid. ibid.	
PAV:	2.6			
Acute-Chronic ratios:	38.73 17,175	Daphnia magna Rainbow trout	Knowies et al., 1987** Mehrle and Mayer, 1976**	
PACR:	299			
PAV / PACR:	0.0087			
2-Butanone				
Acute values:	5,600,000 3,200,000 5,091,000	Mosquitofish Fathead minnow Daphnia magna	(AQUIRE) ibid. ibid.	
PAV:	55,000			

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(Territed name / Data (VDC	Vatuc	Species	Source
OK(3ANICS (contained)			
PACR:	40		
PAV / PACR:	1400		
Carlton disulfide			
Acute values:	2100 135,000	Daphria magna Mosquitofish	(AQUIRE) ibid.
PAV:	36		
PACR:	40		
PAV / PACR:	0.91		
Carbon tetrachloride			
Acute values:	35,200 43,100 125,000 27,300	Daphnia magna Fathead minnow Bluegili Bluegili	EPA 1980h ibid. ibid. ibid.
PAV:	610		
Acute-Chronic ratios:	0.8273	Fathcad minnow	Kimball, Manuscript
PACR:	11.0		
PAV / PACR:	55		

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Table G1 (continued)

And the second se	Vatue	larire Larire	Sume
	A 88105	andr	
ORGANICS (continued)			
Oblorobezete			
Acute values:	86,000 51,620 33,930 29,120 33,930 45,530 24,000 15,900	Daphnia magna Goldfish Fathead minnow Fathead minnow Guppy Bluegil Bluegil	EPA 1980j ibid. ibid. ibid. ibid. ibid.
PAV:	340		
PACR:	40		
PAV / PACR:	8.4		
Chicroform			
Acute values:	28,900 66,800 43,800 115,000 100,000	Daphuia magna Rainbow trout Bluegil Bluegil	EPA 1980 ibid. ibid. ibid.
PAV:	570		
PACR:	40		
PAV / PACR:	14		

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("Territori name / Data luit.	Value	Species	Source
()RGANICS (continued)			
DDD			
àmite voluer.	25	Striped bass	(AQUIRE)
rance values.	380	Stonefly	ibid.
	380	Stonefly	ibid.
	0.60	Scud	ibid.
	0.64	Scud	ibid.
	0.60	Scud	ibid.
	0.86	Scud	ibid.
	0.68	Grass shrimp	ibid.
ſ	4.	Grass shrimp	ibid.
	10	Aquatic sowbug	ibid.
	16	Aquatic sowbug	ibid.
	140	Fowler's toad	ibid.
	740	Turbellarian	ibid.
	02	Rainbow trout	ıbid. 
	4400	Fathcad minnow	ibid.
	1500	Channel catfish	ibid.
	42	Largemouth bass	ıbıd. 
	14	Walleye	1014. 
	42	Bluegili	10101
PAV:	0.0016		
PACR:	40		
PAV / PACR:	0.000040		
Decense			
A must a staffunge.	48,000	Dapinia magra	(AQUIRE)

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Chernical name / Thits type	Value	Species	Source
OKGANES (COREDOCU)			
PAV:	190		
PACR:	40		
PAV / PACR:	4.8		
Di-a-butyl pinthakate			
Acute values:	1200	Bluegill	(AQUIRE)
	167	Bluegill	ibid.
	2100	Bluegill	ibid.
	760	Bluegili	ibid.
	200	Bluegill	ibid.
	1300	Fathead minnow	ibid.
	1300	Fathcad minnow	ibid.
	2020	Fathead minnow	ibid.
	2910	Channel catfish	ibid.
	2910	Channel catfish	ibid.
	2900	Channel catfish	bid
	6470	Rainbow trout	bid
	6470	Rainbow trout	ibid.
	2600	Rainbow trout	ibid.
	2100	Scud	ibid.
	10,000	Crayfish	bid
	3700	Daphnia magra	ibid.
	5200	Daphnia magna	ibid.
PAV:	32		
Acute-Chronic ratios:	2.817	Fathead minnow	McCarthy and Whitmore, 1985
	9.437	Daphnia magna	ibid.

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Table G1 (continued)

Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			
PACR:	10.2		
PAV / PACR:	3.1		
Discretiuran			
Acute values:	7500*	Dapinia mugna	(AQUIRE)
PAV:	8		
PACR:	40		
PAV / PACR:	2.0		
1,1-Dichiorocthane			
Acute values:	202,000	Guppy	(AQUIRE)
PAV:	8		
PACR:	40		
PAV / PACR:	0 <b>.5</b> 1		
1,2-Dichiercethaue			
Acute values:	270,000 218,000 118,000 550,000 431,000	Daphsia magna Daphnia magna Fathead minnow Bluegill Bluegill	Richter et al., 1983 EPA 1980k ibid. ibid. ibid.

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Table

Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			
PAV:	2000		
Acute-Chronic ratios:	5.9 17.76	Fathead minnow Daphria magna	Ahmed et al., 1984 Richter et al., 1983
PACR:	16.1		
PAV / PACR:	130		
1,1-Dichiorocthene			
Acute values:	11,600 79,000 169,000 108,000 73,900	Daphnia magna Daphnia magna Fathead minnow Biuegill	EPA 1980n ibid. ibid. ibid. ibid.
PAV:	520		
PACR:	40		
PAV / PACR:	13		
1,2-Dichloroethane			
Acute values:	135,000	Bluegill	EPA 1980n
PAV:	14		
PACR:	40		
PAV / PACR:	0.34		

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	Vahie	<u> Notis</u>	Source
CONTRACT DEPUTY I DAMA LYDO			
ORGANICS (continued)			
1.1. Nichtweinweine (intal)			
Acute values:	6150 6060	Daphria magna Bluegili	EPA 19800 ibid.
PAV:	100		
PACR:	4Ū		
PAV / PACR:	2.6		
Dictiny philinkate			
Acute values:	120,000* 52,000° 75,000*	Bluegill Daphnia magna Daphnia magna	(AQUIRE) ibid. ibid.
PAV:	1100		
PACR:	40		
PAV / PACR:	27		
Ethyl benzene			
Acute values:	75,000 94,440 48,510 42,330 97,100 32,000	Daphuia magna Goldfish Fathead minnow Guppy Bluegill Bluegill	EPA 1980p ibid. ibid. ibid. ibid. ibid.

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Chemicel name / Data type	Value	Spoies	Source
ORGANICS (continued)			
PAV:	780		
PACR:	40		
PAV / PACR:	20		
Phorasthese			
Acute values:	325,000 3980	Daptrnia magna Bluegill	EPA 1980q 
PAV:	69		
PACR:	40		
PAV / PACR:	1.7		
Heame			
Acute values:	150,000*** 4,480,000***	Golden orfe Golden orfe	(AQUIRE) ibid.
PAV:	82		
PACR:	64		
PAV / PACR:	21		
2-Heatmore			
Acute values:	428,000***	Fathcad minnow	(AQUIRE)

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Casemical name / Data type	Valuc	Species	Source
ORGANICS (continued)			
PAV:	43		
PACR:	40		
PAV / PACR	1.1		
1-Methyluspthalene			
Acute values:	0006	Fathead minnow	(AQUIRE)
PAV:	06.0		
PACR:	40		
PAV / PACR:	0.023		
4-Methyl-2-pendancae			
Acute values:	509,000	Fathead minnow	(AQUIRE)
PAV:	51		
Acute-Chronic ratios:	608	Fathead minnow	Veith et al., 1983
PACR:	22.2		
PAV / PACR:	23		

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Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			•
2-Methyłyżczol			
Actific values:	12,550	Fathcad minnow	(AQUIRE)
	13,420	Fathead minnow	ibid.
	18,200	Fathead minnow	ibid.
	20,780	Bluegil	ibid.
	23,250	Goldfish	ibid.
	8400	Rainbow trout	ibid.
	17,400	Daphnia cucultata	ibid.
	15,500	Daphnia cucultata	ibid.
	0086	Daphnia magna	ibid.
	8600	Daphria magna	ibid.
	23,800	Daphnia magna	ibid.
	23,100	I)Aphnia magna	ibid.
	15,100	Daphnia magna	ibid.
	15,800	Daphnia magna	ibid.
	15,800	Daphnia magna	ibid.
	5000	Daphnia magna	ibid.
	14,000	Daphnia magna	ibid.
	10,800	Daphnia puler	ibid.
	8500	Daphnia puler	ibid.
PAV:	160		
PACR.	40		
PAV / PACR:	4.1		

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Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			
Methyl mercury			
Acute values:	2 42 42 24 24	Rainbow trout Rainbow trout Rainbow trout Rainbow trout	EPA 1985e ibid. ibid. ibid.
	8 8 9 9	Brook trout Brook trout	ibid. ibid.
PAV:	0.0028		
Acute-Chronic ratios:	142.3	Brook trout	EPA 1985e
PACR:	61.1		
PAV / PACR:	0.00046		
Methykase ebleride			
Acute values:	220,000 193,000 502,000 220,000	Bluegill Fathead minnow Fathead minnow Daphnia magna	(AQUIRE) ibid. ibid. ibid.
PAV:	3800		
Acute-Chronic ratios:	4.65	Fathead minnow	Dill et al., 1987
PACR:	19.5		
PAV / PACR:	190		

Chemical name / Data (vtc	Value	Species	Source
Napthatene			
Acute values:	8570	Daphnia magna	EPA 1980t
	2300	Rainbow trout	ibid.
	4900	Fathead minnow	ibid
	8900 150 000	Fathead minnow Meanitofish	ıbid. ibid.
	non'nct	TRATCH IN FOUR	
PAV:	45		
Acute-Chronic ratios:	10.65	Fathcad minnow	DeGraeve et al., 1982
PACR: -	25.7		
PAV / PACR:	1.8		
4-Nitrophenol			
A mita uninec.	8300	Bluegill	(AQUIRE)
Filmer Vanues.	59,000	Fathead minnow	ibid.
	62,000	Fathcad minnow	ibid.
	41,000	Fathead minnow	ibud.
	15 000	Rainbow trout Channel catfich	ibid.
	22,000	Daphnia magna	ibid.
	8400	Daphnia magna	ibid.
	20,000	Daphria magna	ibid
	8400	Daphnia magna	ibid.
	7680	Daphnia magna	ibid.
	13,200	River snail	ibid.
PAV:	190		

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Obernical name / Data type	Value	Spocies	Source
ORGANICS (continued)			
Acute-Chronic ratios:	2.83	Daphnia magna	Francis et al., 1986**
PACR:	16.5		
PAV / PACR:	11		
N-Nérosodépácnyismise			
Acute values:	5800 7800	Bluegill Daphria magna	(AQUIRE) ibid.
PAV:	100		
PACR:	40		
PAV / PACR:	2.5		
3-Octanone			
Acute values:	80,000* 517,000*	Goldfish Daphnia magna	(AQUIRE) ibid.
PAV:	1400		
PACR:	40		
PAV / PACR:	34	:	

Chemical name / Data type	Vatue	Species	Source	
ORGANICS (continued)				
PCBs: Arodor" 1221				
Acute values:	1200 1170 1170	Cutthroat trout Cutthroat trout Cutthroat trout	(AQUIRE) ibid. ibid.	
PAV:	0.12			
PACR:	40			
PAV / PACR:	0.0029			1.
PCB't: Arocke" 1232				
Acute values:	2500 2500 1900	Cutthroat trout Cutthroat trout Cutthroat trout Cutthroat trout	(AQUIRE) ibid. ibid. ibid.	
PAV:	0.23			
PACR:	40			
PAV / PACR:	0.0058			
PCB's: Arociat" 1242				
Acute values:	73 10 10 300 300	Scud Scud Damselfy Fathead minnow Fathead minnow	EPA 1980x ibid. ibid. ibid. ibid.	

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Chemical name / Data type	Value	Spoces	open co	
ORGANICS (ocatianed)				
				.,
PAV:	0.016			
Acute-Chronic ratios:	14.90 7.454	Scud Fathead minnow	EPA 1980x ibid.	
PACR:	16.4			
PAV / PACR:	0.00097			
PCB's Arodor <sup>®</sup> 1248				
Acute values.	<b>23</b>	Scud Scud	EPA 1980x ibid.	
PAV:	0.15			
Acute-Chronic ratios:	8.788	Scud	EPA 1980x	
PACR:	24.1			
PAV / PACR:	0.0062			
PCB'r Arodor" 1254				
Acute values:	2400 200 7.7	Scud Damselfly Fathead minnow	EPA 1990x ibid. ibid.	
PAV:	0.0045			
Acute-Chronic ratios:	2.655	Fathcad minnow	EPA 1990a	

Chemical mane / Data type	Vahue	Spocies	Source	
ORGANICS (continued)				
PACR:	16.20			
PAV / PACR:	0.00028			
PCB's: Anador" 1260				
Acute values:	60,900 61,000 25,000	Cutthroat trout Cutthroat trout Cutthroat trout	(AQUIRE) ibid. ibid.	
PAV:	4.5			
PACR:	40			
PAV / PACR:	0.11			
1-Peatanci				
Acute values:	650,000 400,000	Biuegill Rainbow trout	(AQUIRE) ibid.	
PAV:	240			
PACR:	40			
PAV / PACR:	5.9			

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Chernical name / Data type	Valuc	Species	Source
ORGANICS (continued)			
Phonestheone			
Acute values:	996	Daphnia pulex	(AQUIRE)
	490	Midge	ibid.
	700	Dapinia magna	ibid.
	843	Daphria magna	ibid
	734	Daphnia magna	ibid.
PAV:	8.4		
Acute-Chronic ratios:	4.8	Daptrnia pulex	Geiger and Buikcma, 1982
PACR:	19.8		
PAV / PACR:	0.43		•
Phenol			
Acute values: <sup>1</sup>	248,000	Rotifer	EPA 1980v
	94,000	Snail	ibid.
	14,000	Daphnia longispina	ibid.
	36,400	Daphnia magna	ibid.
	58,100	Daphnia pulex	ibid.
	57,000	Polyphemus pediculus	ibid.
	122,000	Cyclops vertalis	ibid.
	108,000	Mesocyclops leukarti	ibid.
	8032	Rainbow trout	ibid.
	44,500	Goldfish	ibid.
	35,000	Fathcad minnow	ibid.

<sup>1</sup>Because the list of acute values for phonol is so long, the species mean acute values have been substituted here.

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Chemical name / Data type	Vaue	Sport	SUBER
ORGANICS (continued)			10 c -
Acute values (cont.):	16,700	Channel catfish	ibid.
	36,300	Flagfish	ibid.
	26,000	Mosquitofish	ibid.
	34,900	Guppy	ibid.
	16,400	Bluegil	ibid.
	19,000	Mozambique mouthbrooder	ibid.
PAV:	260		
Acute-Chronic ratios:	14.06	Fathcad minnow	EPA 1980***
	18.19	Fathcad minnow	DeGracve et al., 1980
PACR:	21.7		
PAV / PACR:	12		
2-Propand			
Acute values:	11,130,000 10,000 9,610,000	Fathcad minnow Fathcad minnow Fathcad minnow	(AQUIRE) ibid. ibid.
PAV:	100		
PACR:	64		
PAV / PACR:	2.6		

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Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			
1,1,2,2.Tetrachiorocthanc			
Acute values:	21,000 20,300 62,000 9320 20,300 21,300	Bluegill Fathead minnow Fathead minnow Daphuia magna Pathead minnow Bluegili	(AOUIRE) ibid ibid. ibid. EPA 1980k ibid. ibid.
PAV:	350		
Acute-Chronic ratios:	8.46 6.289	Fathead minnow Daphnia magna	Ahmed et al., 1984 Richter et al., 1983
PACR:	12.9		
PAV / PACR:	27		
Tetrachkoructhene			
Acute values:	8500 17,700 30,840 4800 5800 13,460 18,400 12,900	Daphnia magna Daphnia magna Tanytarsus dissimilis Rainbow trout Rainbow trout Fathead minnow Fathead minnow Bluegil	Richter et al., 1983 EPA 1980aa ibid. ibid. ibid. ibid. ibid. ibid.
PAV:	130		

Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			
Acute-Chronic ratios:	16.02 11.35	Fathead minnow Dentwice means	Ahmed et al., 1984 Richter et al., 1983
PACR:	19.4	en Oral annular	
PAV / PACR:	6.5		
Tobene			
Acute values:	60,000 313,000 22,800 34,270 42,330 24,000 24,000	Daphnia magna Daphnia magna Goldfish Fathead minnow Fathead minnow Guppy Bluegil Bluegil	EPA 1960cc ibid. ibid. ibid. ibid. ibid. ibid.
PAV:	300		
PACR:	40		
PAV / PACR:	7.5		
1,1,1-Trichlorocthene			
Acute values:	40,000 52,800 105,000	Muegil Fathead minnow Fathead minnow	(AQUIRE) ibid. ibid.
PAV:	4.0		

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Table

Chemical name / Data type	Value	Species	Source
ORGANICS (continued)			
Acute-Chronic ratios:	3.057 <sup>2</sup>	Daphnia magna	Thompson & Carmichael, 1989
PACR:	17.0		
PAV / PACR:	0.24		
1,1,2-Trichéoroethane			
Acute values:	81,700 18,000 43,000 190,000 170,000	Fathcad minnow Daphnia magna Daphnia magna Daphnia magna Great pond snail	(AQUIRE) ibid. ibid. ibid.
PAV:	1400		
Acute-Chronic ratios:	8.691 9.776	Fathead minnow Daphuia magna	Ahmed et al., 1984 Richter et al., 1983
PACR:	15.0		
PAV / PACR:	92		

<sup>2</sup>based on a 17-day LC50 (standard is 48-h.)

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Chemical mane / Data type	Value	Species	Source
ORGANICS (continued)			
			,
Trichkorochene			
A/mte values:	85,200	Daphnia magna	EPA 1980dd
	100,000	Daphnia magna	ibid.
	94,000	Dapinia magna	ibid.
	41,000	Daphnia magna	ibid.
	43,000	Daphnia magra	ibid.
	55,000	Daphria magna	ibid.
	56,000	Daphria magna	ibid.
	51,000	Daphnia pulex	ibid.
	39,000	Daphria puler	ibid.
	40,700	Fathcad minnow	ibid.
	66,800	Fathead minnow	ibid.
	44,700	Biuegill	ibid.
	28,280	Flagfish	Smith et al., 1991
PAV:	490		
Acute-Chronic ratios:	2.558	Flagfish	Smith et al., 1991
PACR:	16.0		
PAV / PACR:	30		

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Chemical name / Deta type	Value	Species	Source	1
ORGANICS (continued)				1
Viryl acctate				
Acute values:	13,465 <sup>3</sup> 18,000	Fathead minnow Bluegill	(AQUIRE) ibid	
	42,330 31,080	Guppy	ibid.	
PAV:	1.3			
PACR:	40			
PAV / PACR:	0.034			J-37
Vinyl chloride				
Acute values:	356,000*** 406,000***	Golden orfe Golden orfe	(AQUIRE) ibid.	
PAV:	38			
PACR:	40			
PAV / PACR:	0.95			
				1.

<sup>3</sup>Water hardness was varied in this test; a logarithmic regression was performed according to the National Guidelines, and 13,465 µg/l is the intercept value.

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Chemical name / Data type	Vatue		
ORGANICS (continued)			
Xyicac			
Acute values:	780,000 99,500	Common carp Calanoid copepod	(AQUIRE) ibid.
PAV:	10		
PACR:	40		
PAV / PACR:	0.25		

\*\*\* These test results are unreliable in that either a test duration was not specified or the experimental methods were not usual or not consistent, but they are the best data available.

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