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White Oak Creek Watershed: Melton Valley Area Remedial Investigation Report, Oak Ridge National Laboratory, Oak Ridge, Tennessee

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ACRONYMS

COEC	contaminants of ecological concern
COPECs	contaminants of potential ecological concern
CVs	Chronic Values
DOE	U.S. Department of Energy
EPA	U. S. Environmental Protection Agency
EPT	Ephemeroptera, Plecoptera, and Trichoptera
HI	hazard index
HQ	hazard quotient
LCV	lowest chronic value
LOAELs	lowest observed adverse effects levels
LTV	lowest test value
NAWQC	National Ambient Water Quality Criteria
NOAELs	no observed adverse effects levels
NPDES	National Pollutant Discharge Elimination System
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Operations
OU	operable unit
PCB	polychlorinated biphenyl
RI	Remedial Investigation
SAV	secondary acute value
SCV	secondary chronic value
SWMUs	solid waste management units
T&E	threatened and endangered
UCL	upper confidence limit
WAGs	waste area groupings (WAGs
WOCW	White Oak Creek watershed
WOCE	White Oak Creek Embayment
WOC	White Oak Creek

1. INTRODUCTION

This report provides details on the baseline ecological risk assessment conducted in support of the Remedial Investigation (RI) Report for the Melton Valley area of the White Oak Creek watershed (WOCW). The RI presents an analysis meant to enable the U.S. Department of Energy (DOE) to pursue a series of remedial actions resulting in site cleanup and stabilization. The ecological risk assessment builds off of the WOCW screening ecological risk assessment (Efroymson et al. 1996a). All information available for contaminated sites under the jurisdiction of the U.S. Department of Energy's Comprehensive Environmental Response, Compensation, and Liability Act Federal Facilities Agreement within the White Oak Creek (WOC) RI area has been used to identify areas of potential concern with respect to the presence of contamination posing a potential risk to ecological receptors within the Melton Valley area of the White Oak Creek watershed. The risk assessment report evaluates potential risks to receptors within each subbasin of the watershed as well as at a watershed-wide scale.

The Melton Valley area of the WOCW consists of WOC and its tributaries downstream of the Oak Ridge National Laboratory (ORNL) Main Plant area, White Oak Lake, the White Oak Creek Embayment (WOCE) of the Clinch River and the associated flood plains, and Melton Branch and its tributaries (Fig. 2.1 of Chapter 2 in this RI). The WOC RI area encompasses 1062 acres in Melton Valley. Approximately 160 acres of the area lie within designated solid waste management units (SWMUs) or contain secondary contamination. The WOC system has been exposed to contaminants released from ORNL and associated operations since 1943 and continues to receive contaminants from adjacent waste area groupings (WAGs).

2. ECOLOGICAL PROBLEM FORMULATION

The problem formulation consists of the identification of ecological endpoints, description of the relevant features of the environment, description of the sources of contamination, and summarization of that information in terms of a conceptual model of the hazard posed by the contaminants to the endpoint biota.

2.1 ENVIRONMENTAL DESCRIPTION

The environment considered in this assessment is the Melton Valley area of the WOCW. The Melton Valley area of the WOCW consists of WOC and its tributaries downstream of the ORNL Main Plant area, White Oak Lake, the WOCE of the Clinch River and the associated flood plains, and Melton Branch and its tributaries (Fig. 2.1 of the RI report).

While hazardous waste sites at ORNL have traditionally been organized into WAGs based on drainage area and similar waste characteristics, this report focuses on individual subbasins that make up the overall WOCW (Fig. 2.2 of the RI report). The subbasin organization is meant better refine linkages between source areas and potential effects within defined geographic areas of the watershed. The watershed has been divided into 33 subbasins. These are identified in Table 2.1 and portrayed in Fig. 2.2 of the RI report. Further description of basins and subbasins is provided in Sect. 2 and Sect. 3 of the WOCW RI report.

Table 2.1. Subbasins within the White Oak Creek watershed

Basin	Subbasin
Melton Branch	HFIR, HFIR East, HFIR South, MB-15, HF-2, HRE, SWSA 5 Seep A, SWSA 5 Seep B West, SWSA 5 Drainage D-2, and SWSA 5 Seep C
Middle White Oak Creek East	Melton Valley Drive (MVDrive), SWSA 5 WOC, SWSA 5 N WOC, and SWSA 5 Trib 1
Middle White Oak Creek West	Haw Ridge, Intermediate Pond, SWSA 4 East, SWSA 4 Main, WAG 7 WOC, and WOC
Lower White Oak Creek Tributary Basins	West Seep, East Seep, WCTRIB-1, ^{60}Co Seep, W6MS1, and W6MS3
White Oak Lake, White Oak Creek, and White Oak Creek Floodplain	Lower WOC, Pit 4 South, SWSA 6 East, SWSA 6 South, Trench 5 south, and WOCE

Surface water and sediment data from the watershed have been categorized as mainstem or seep. Mainstem (MS) reaches are those on WOC including White Oak Lake and tributaries, Melton Branch, and other streams that feed WOC and are not ephemeral. Seep data include springs, seeps, and ephemeral tributaries. Seep sites are associated with the subbasins in which they are located so that sources of chemicals can be identified, but seep data are not averaged with the mainstem data for evaluation of risks to aquatic biota.

No threatened or endangered species are known to occur in the watershed, but some state listed species (e.g., river otter) and federally listed species (e.g., bald eagle) are undergoing range expansions and may use the watershed in the future. Threatened or endangered species that are believed to occur on the Oak Ridge Reservation are listed by Suter et al. (1995).

2.2 SOURCES

The proximate sources considered in this assessment are the contaminated media in surface water, sediment, and surface soil. The ultimate sources of contaminants are the NPDES permitted point discharges at ORNL and releases from wastes in WAGs 1, 3-9, and 17. DOE's operations in the WOC watershed have included waste disposal, spills, and use of chemicals such as pesticides in the environment. A more detailed description of sources within the watershed is provided in Sec. 3 and Appendix A of the RI.

2.3 ECOLOGICAL ENDPOINTS

The problem formulation must identify both the assessment endpoints, which are explicit statements of the characteristics of the environment that are to be protected, and the measurement endpoints, which are quantitative summaries of a measurement or series of measurements that are related to effects on an assessment endpoint.

2.3.1 Assessment Endpoints

The following assessment endpoints for aquatic and terrestrial risks have been selected for this assessment.

- Reduction in species richness or abundance or increased frequency of gross pathologies in fish communities resulting from toxicity.
- Reduced species richness or abundance of benthic macroinvertebrate communities resulting from toxicity.
- Reduction in abundance or production of earthworms
- Reduction in abundance or production of piscivorous wildlife populations resulting from toxicity.
- Reduction in production of terrestrial plant communities resulting from toxicity.
- Reduction in abundance or production of terrestrial wildlife populations resulting from toxicity.

The ecological assessment endpoints have been selected based on DQO meetings that included representatives of the DOE, EPA Region IV, and TDEC and the strategy for ecological risk assessment on the ORR which was also a product of a DQO process (Suter et al. 1995). The selected endpoints are explained below.

1. The fish community is considered to be an appropriate endpoint community because it is ecologically and societally important, susceptible, and has a scale appropriate to the site. The societal importance is due to recreational fisheries; the ecological significance comes from the fact that much of the energy flow in temperate streams passes through fishes, and fishes are a major nutrient reservoir in those systems. In addition, the fish species in the watershed tend to move within an area smaller than the OU, and their movement is restricted by weirs and dams, so the scale is appropriate.

2. The benthic invertebrate community is considered to be an appropriate endpoint community because benthic invertebrates are highly susceptible and have a scale appropriate to the site. The high susceptibility is due to the association of these organisms with the sediment, which is the repository of most of the COPECs. In addition, the insects and crustaceans that dominate this community are sensitive to a variety of contaminants. Because these organisms are sedentary for all or most of their lives, their scale is highly appropriate to the scale of the site.

3. Soil invertebrates are considered to be an appropriate endpoint assemblage because they are susceptible, ecologically important, and have an appropriate scale. The susceptibility results from their intimate exposure to contaminated soils including, in the case of earthworms, ingestion. The ecological importance is due to their role in litter degradation, nutrient cycling, and maintaining soil structure. The appropriate scale results from their low mobility; biological populations could occupy an area as small as the subbasins defined for this assessment.

4. The terrestrial plant community is considered to be an appropriate endpoint community because it is ecologically important, susceptible, and has a scale appropriate to the site. The ecological significance comes from the fact that the plant community is responsible for primary production. This community is susceptible because it would be directly exposed to the contaminants in the floodplain. Finally, the scale is appropriate because plants are immobile and because a distinct plant community occurs on the floodplain.

5. Piscivorous and terrestrial wildlife species are considered to be appropriate because individuals are potentially sensitive due to food-web magnification of chemicals and because of the known sensitivity of some species (e.g., mink). Two of the contaminants of potential concern, PCBs and mercury, biomagnify in aquatic food webs leading to high levels of exposure in piscivorous wildlife. Mink have been shown to be highly sensitive to the toxic effects of PCBs and mercury in toxicity tests. Reproduction of piscivorous birds has been shown to be highly sensitive to PCBs. Prior screening assessments have shown that there is a potential for toxic exposures of wildlife to contaminants in WAG 2 (Blaylock et al. 1992, Sample et al. 1995). The chosen wildlife endpoint populations are mink, river otter, great blue heron, osprey, and belted kingfisher for piscivores and short-tailed shrew, white footed mouse, red fox, white-tailed deer, red-tailed hawk, and wild turkey for terrestrial wildlife. Although wildlife are not as clearly associated with the site as fish and plants, the watershed is considered to be an appropriate scale for assessing effects on wildlife populations.

T&E species are not directly addressed in this assessment. This is because the other endpoint species are judged to be as sensitive or more sensitive than the endangered species that may come to use the site.

Wetlands are assumed to be protected by assessing the risks to plants in the small wetland areas associated with seeps. These wetlands should be more highly exposed than those associated with the streams.

2.3.2 Measurement Endpoints

Three basic types of effects data are potentially available to serve as measurement endpoints: results of biological surveys, toxicity tests performed on media, and toxicity test endpoints for chemicals found in the CR OU. Measurement endpoints are presented below for each assessment endpoint.

2.3.2.1 Fish

- **Biological Survey Data**—No fish survey data were collected by the WOC RI program. However, results of BMAP surveys will be cited as supporting evidence. The BMAP measurement endpoints are assumed to be direct estimates of that assessment endpoint.

- **Biological Indicators Data**—No fish bioindicators data were collected by the WOC RI program. However, published results of the BMAP biological indicators task will be cited as supporting evidence. Frequencies of gross pathologies are a direct measure of one aspect of the assessment endpoint. Measures of fish fecundity in largemouth bass and bluegill provide an indication of the potential contribution of reproductive toxicity to community effects. Measures of the levels of physiological and histological condition in redbreast sunfish help to confirm that exposures have occurred and may suggest mechanistic connections between exposure and effects on the fish community.

- **Media Toxicity Data**—No fish aqueous toxicity tests were conducted by the WOC RI program. However, published results of the BMAP tests will be cited as supporting evidence. Test endpoints include reductions in growth and survivorship of larval fathead minnows and in fecundity and survivorship of *Ceriodaphnia dubia (C. dubia)* in 7 day tests of ambient water, and reductions in hatching and larval survival and increases in terata in Japanese medaka (*Oryzias latipes*) eggs and larvae exposed to ambient water from shortly after fertilization to 48 hours post-hatch. Responses that are statistically significantly different or are inhibited by 20% or greater relative to control or reference waters are assumed to be indicative of waters that are toxic to fish.

- **Single Chemical Toxicity Data**—Chronic toxicity thresholds for freshwater fish are expressed as chronic EC20s or Chronic Values (CVs). These test endpoints correspond to the assessment endpoint for this community. That is, the sensitivity distribution of the test species is assumed to approximate the distribution of WOCW species, and exceedence of the CVs and EC20s are assumed to correspond to 20% or greater reductions in abundance, with some uncertainty.

2.3.2.2 Benthic invertebrates

- **Biological Survey Data**—Benthic invertebrate survey data were collected by the WOC RI program from areas in which fine sediments had been deposited. In addition, results of BMAP surveys of benthic invertebrates in riffles will be cited as supporting evidence. The measurement endpoints for both surveys are assumed to be direct estimates of that assessment endpoint.

- **Media Toxicity Data**—Planned sediment toxicity tests could not be performed because of concerns for worker safety.

- **Single Chemical Toxicity Data**—Chronic toxicity thresholds for freshwater invertebrates are expressed as chronic EC20s or CVs. These test endpoints correspond to the assessment endpoint for this community. That is, the sensitivity distribution of the test species is assumed to approximate the distribution of WOCW species, and exceedence of the CVs and EC20s are assumed to correspond to 20% or greater reductions in abundance, with some uncertainty. Two types of values were extracted from data on toxic concentrations in ambient sediment reported by the state of Florida: (1) thresholds for modification of benthic invertebrate community properties based on co-occurrence analyses, which are assumed to correspond to

the assessment endpoint, (2) thresholds for lethality in toxicity tests of contaminated sediments, which are also assumed to correspond to the assessment endpoint effect, but with greater uncertainty due to the extrapolation to the field.

2.3.2.3 Soil invertebrates

- **Biological Survey Data**—Earthworms were collected by the WAG 2 program, but no quantitative survey data are available.

- **Media Toxicity Data**—Planned earthworm toxicity tests could not be performed because of concerns for worker safety.

- **Single Chemical Toxicity Data**—Chronic toxicity thresholds for earthworms have been obtained from the literature. These test endpoints vary in their relevance but they are assumed to correspond to the assessment endpoint for this assemblage if they include sublethal responses.

2.3.2.4 Terrestrial plants

- **Biological Survey Data**—No quantitative vegetation surveys were performed. However, qualitative observations indicate that large portions of the watershed are vegetated.

- **Media Toxicity Data**—No media toxicity data are available.

- **Single Chemical Toxicity Data**—This includes EC20s for growth or production of vascular plants or equivalent chronic toxicity thresholds for contaminants of concern in soil. These test endpoints are assumed to correspond to the assessment endpoint for this community. That is, the sensitivity distribution of the test species is assumed to approximate the distribution of species within the WOCW. Exceeding the test endpoints is assumed to correspond to 20% reductions in abundance or productivity with some uncertainty.

2.3.2.5 Terrestrial wildlife

- **Biological Survey Data**—No quantitative surveys were performed for this assessment.

- **Media Toxicity Data**—No media toxicity data are available.

- **Single Chemical Toxicity Data**—These include chronic toxicity thresholds for contaminants of concern in birds and mammals with greater weight given to data from long-term feeding studies with wildlife species. Preference was given to tests that included reproductive endpoints. After allometric scaling for the endpoint species, these test endpoints are assumed to correspond to effects on individuals that could result in exceeding the population-level assessment endpoint. An extrapolation must be made to populations if effects on individuals are estimated to occur.

2.3.2.6 Piscivorous wildlife

- **Biological Survey Data**—Kingfisher reproduction was surveyed in WAG 2 and reference areas. Assuming that the kingfishers in the watershed constitute a population, this is a direct measure of the assessment endpoint for avian piscivores. Limited data concerning

presence/absence, movements, and bioaccumulation of contaminants are available for mink on the ORR, including the WOCW.

- **Media Toxicity Data**—Results of reproductive toxicity tests are available for ranch mink fed fish obtained from the Clinch River and Poplar Creek embayment.

- **Single Chemical Toxicity Data**—These include chronic toxicity thresholds for contaminants of concern in birds and mammals with greater weight given to data from long-term feeding studies with wildlife species. Preference was given to tests that included reproductive endpoints. After allometric scaling for the endpoint species, these test endpoints are assumed to correspond to effects on individuals that could result in exceeding the population-level assessment endpoint. An extrapolation must be made to populations if effects on individuals are estimated to occur. In addition, body burdens of a kingfisher were compared to concentrations associated with toxic effects on birds.

2.4 CONCEPTUAL MODELS

Conceptual models are graphical representations of the relationships among sources of contaminants, ambient media, and the endpoint biota. Figure 2.15 of the RI report shows a conceptual model for the streams and floodplains of the WOC watershed. Figure 2.16 of the RI report shows a conceptual model for wide-ranging wildlife that utilize the streams and floodplains as well as upland areas and nearby aquatic habitat. The exposure pathways shown are those that are included in the assessment. Note that different benthic invertebrate assemblages are exposed to water and sediments. That is, the invertebrates inhabiting soft sediments in depositional areas are assumed to be exposed to chemicals in those sediments and their pore water with negligible exposure to free water, and invertebrates inhabiting the rocky substrates of riffles are assumed to be primarily exposed to chemicals in water. These conceptual models are derived from the generic models developed for the ORR and are discussed in detail in the strategy document for ecological risk assessment on the ORR (Suter et al. 1995).

2.5 ORGANIZATION OF THE ECOLOGICAL RISK ASSESSMENT

The risks of chemicals to each of the ecological risk assessment endpoints in the current baseline case are assessed separately (Sect. 3.8). Each includes an exposure assessment, effects assessment, risk characterization, and characterization of uncertainty. Risks from exposure to radionuclides are discussed for all receptors in Sect. 9. Finally, ecological risks are summarized (Sect. 10). The components of the assessment are explained in the following text.

Exposure assessment characterizes the distribution in space and time of the concentrations of contaminants to which organisms are exposed. Risk from undetected chemicals are not assessed, as instructed by the FFA parties. Exposure calculations are performed for each subbasin.

Effects assessment characterizes the evidence concerning effects of contaminant exposure. The principle lines of evidence concerning effects are biological survey data that indicate the actual state of the receiving environment, media toxicity data which indicate whether the contaminated media are toxic under controlled conditions, bioindicator data which are biochemical and histological indications of the potential mechanisms and causes of effects, and single chemical toxicity data which indicate the toxic effects of the concentrations measured in site media.

Risk characterization is the phase of risk assessment in which the information concerning exposure and the information concerning the potential effects of exposure are integrated to estimate risks (the likelihood of effects given the exposure). Procedurally, the risk characterization is performed for each assessment endpoint by (1) screening all measured contaminants against toxicological benchmarks and background concentrations, if available, (2) considering the implications of other types of data for the hypothesis that a hazard exists that requires further assessment, (3) logically integrating the screening results with the other evidence to determine whether a credible hazard exists to the endpoint, and (4) listing and discussing the major uncertainties in the assessment.

3. RISKS TO FISH

Risks to fish communities were evaluated in mainstem surface waters and major tributaries. Seeps and small ephemeral tributaries do not support fish communities and are not assessed for risks to this endpoint. However, they are evaluated to determine which of these sources is contributing to risks in the streams and whether the seep waters exceed water quality standards.

3.1 EXPOSURE ASSESSMENT

3.1.1 Aqueous Chemical Exposures

Fish are exposed primarily to contaminants in water. Contaminants in water may come from upstream aqueous sources including the permitted outfalls, runoff, and the numerous seeps sampled and analyzed by the WAG 2 RI program. They may also come from internal cycling including exchange of materials between the surface water and contaminated sediments and exchange of contaminants between the biota and the water column. The consensus of the scientific community and of the EPA Office of Water is that aquatic biota should be assumed to be exposed to the dissolved fraction of the chemicals in water, because that is the bioavailable form (Prothro 1993). The EPA Region IV has previously expressed a preference for the use of total metals concentrations as conservative estimates of the exposure concentration. Only total concentrations were available and used in the exposure assessment for fish.

Because water is likely to be more variable in time than space, due to the rapid replacement of water, the mean water concentration within a subreach is an appropriate estimate of the chronic exposure experienced by fishes. The upper 95% confidence bound on the mean is an appropriately conservative estimate of this exposure for use in the contaminant screening. However, the distribution of observed concentrations is used to estimate risks.

Many of the chemical concentrations in water were below analytical detection limits. Chemicals that were not detected in any sample in a reach were eliminated. If a subbasin contained some detects and some nondetects for a chemical, nondetects were included at half the detection limit.

3.1.2 Fish Chemical Body Burdens

Although nearly all toxicity data for fishes is expressed in terms of aqueous concentrations, fish body burdens potentially provide an exposure metric that is more strongly correlated with effects (McCarty and Mackay 1993). This is particularly likely to be the case for chemicals that bioaccumulate in fish and other biota to concentrations greater than in water. For such chemicals, dietary exposure may be more important than direct aqueous exposures and concentrations that are not detectable in water may result in high body burdens in fish. Sufficient toxicological data are available for three potential WOC watershed contaminants that bioaccumulate in that manner: mercury, PCBs, and selenium. Only mercury and PCBs are considered in this assessment, because selenium was not found to be significantly elevated in fish from the WOC watershed (Ashwood 1994). Since the individual body burden measurements correspond to an exposure level for an individual fish, the maximum value is used for screening purposes, and the risk estimate is based on the distribution of individual observations. Measurements were performed on the muscle (fillet) of

largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and redbreast sunfish (*Lepomis auritus*).

3.1.3 Toxicity Test Exposures

The water toxicity tests include direct exposure of *Ceriodaphnia dubia*, fathead minnow (*Pimephales promelas*) larvae, and Japanese medaka (*Oryzias latipes*) eggs and larvae to whole water. It is assumed that the form and bioavailability of chemicals is not altered by water collection and handling, so these tests represent exposures in the field.

3.2 EFFECTS ASSESSMENT

3.2.1 Single-Chemical Aqueous Toxicity

The sets of screening benchmarks for aquatic biota (described in Table 3.1) are taken from Suter and Tsao (1996). Ecotox Threshold values were issued by the EPA Office of Solid Waste and Emergency Response (OSWER 1996). They are not included as separate benchmarks in this assessment because the OSWER values were either from, or consistent with, the Suter and Tsao (1996) benchmarks. The benchmarks used in this assessment also are consistent with the EPA Region IV surface water screening values (EPA Region IV 1995). The Region IV BTAG Coordinator has indicated that on the ORR the Region IV screening values need not be used in addition to the more extensive set of benchmarks presented in Suter and Tsao (1996). The benchmark preferred by the regulatory agencies is the chronic national ambient water quality criteria (NAWQC), but they are available for relatively few industrial chemicals. Secondary chronic values, which are conservative estimates of chronic NAWQC, were calculated for chemicals that do not have NAWQC. Other benchmarks are included to provide greater assurance of detecting all COPECs.

NAWQC that are functions of water hardness are corrected for site-specific conditions. For purposes of screening, conditions were selected that would constitute reasonable maximum toxicity, defined as conditions that would persist for seven days. This was a hardness of approximately 100 mg/L (Blaylock et al. 1992).

Toxicity profiles are presented for COPECs in the attachment of this appendix. The toxicity profiles summarize the existing toxicity information for each chemical, including concentrations causing acute lethality and chronic lethal and sublethal effects, and physical-chemical conditions that modify toxicity. For chemicals with hardness-dependent criteria, test endpoints were corrected to 100 mg/L hardness using EPA's formula.

3.2.2 Fish Body Burdens

There are no standard benchmarks for effects on fish from internal chemical exposures. The body burdens associated with effects in toxicity tests and field studies and body burdens found at other sites are discussed in the following text. To be consistent with EPA practices, thresholds for toxic effects are expressed as geometric means of body burdens measured at the no observed effect concentration and lowest observed effect concentration. Only mercury and PCBs were considered because they are the COPECs known to significantly bioaccumulate in fish through dietary exposure.

3.2.2.1 Mercury

Estimates of body burdens of mercury that constitute a threshold for toxic effects on fish range from 0.66 mg/kg to 5.6 mg/kg wet wt. The lower figure is the geometric mean of body burdens in fathead minnows showing significant reproductive effects and those of fish showing no significant effects in a chronic test of mercuric chloride that included dietary exposures (Snarski and Olson 1982). The higher figure is the geometric mean of body burdens associated with reproductive effects and no significant effects in exposures of brook trout (*Salvelinus fontinalis*) to methyl mercury (McKim et al. 1976). Mercury concentrations in sunfish from streams in the vicinity of the ORR that were not mercury contaminated ranged from 0.06 to 0.11 mg/kg wet wt (Southworth et al. 1994).

3.2.2.2 Polychlorinated biphenyls

Estimates of body burdens of PCBs that constitute thresholds for toxic effects in fish are presented in the attachment of this appendix. They are presented on a whole-body basis, and, when possible, on a lipid-normalized basis. A very large range of values has been reported to constitute thresholds for toxic effects in toxicity tests, including one incredibly low value for lake trout.

3.2.3 Ambient Water Toxicity

Toxicity tests of WAG 2 water are performed by the ORNL BMAP and presented in their annual reports. The tests include (1) the standard 7-d tests of growth and survival, for fathead minnow larvae; (2) the standard 7-d tests of fecundity and survival, for *C. dubia*; and (3) an early life stage test with Japanese medaka eggs and larvae. The standard tests did not indicate aqueous toxicity in the last two years reported, 1992 and 1993. However, the more sensitive medaka embryo-larval test consistently indicated toxicity in water collected adjacent to or downstream of ORNL relative to upstream and control waters (Ashwood 1994). Attempts to identify the causal agent determined that medaka mortality was not affected by filtration with a 0.1 micron filter to eliminate suspended particles and pathogens, or by treatment with sodium thiosulfate to detoxify total residual chlorine. However, toxicity was completely eliminated by filtration with activated charcoal, a non specific treatment for aqueous contaminants.

3.2.4 Fish Community Survey

Analysis of fish population and community survey data provides a direct measure of impacts of human activities on aquatic ecosystems. The following results are taken from the most recent ORNL BMAP report (Ashwood 1993). The species composition of the fish community in the WOC watershed is stable at 13 species, which is less than other local streams. It is missing two families (Catastomidae and Percidae) and five genera (*Lythruras, Luxilus, Notropis, Noturus, and Phoxinus*) that historically occurred in the stream. The fish community in upper Melton Branch is somewhat less species rich than that of a similar reference site (two species versus three or four species in WOC above ORNL), but it is more dense than the reference. Species richness in lower Melton Branch is comparable to the references.

3.2.5 Indicators of Fish Reproduction

Reproduction and indicators of reproduction have been monitored in redbreast sunfish from 1989 to 1993. Indicators of reproductive condition of female redbreast sunfish improved over the period monitored until they nearly equal background values. However, reproductive success was highly variable with apparent reproductive failure occurring in lower WOC during the last reported year

of monitoring. Since this failure was not associated with poor reproductive condition of the female fish prior to spawning, effects on the embryos or larvae were said to be the likely cause (Ashwood 1994).

3.3 RISK CHARACTERIZATION

3.3.1 Single-Chemical Aqueous Toxicity

3.3.1.1 Screening of aqueous exposures against chemical benchmarks

Measured concentrations of inorganic chemicals were compared to twice the background concentration. This screening criterion is recommended by EPA Region IV. It should be noted that this practice in combination with the practice of using total metal concentrations, which is preferred by EPA Region IV, is potentially anticonservative because the concentration of particulate metal is being doubled along with the bioavailable dissolved fraction. If contamination doubled the bioavailable metal over the background concentration of bioavailable metal, that would not necessarily double the total metal concentration. Inorganics that exceeded the background criterion and all detected organic chemicals were screened against benchmarks and evaluated as COPECs. This was done by dividing the UCL95 concentration by each of the aqueous screening benchmarks (Table 3.1). Chemicals that exceeded any benchmark (i.e., the quotient of UCL95/aqueous screening benchmark was >1) were identified as COPECs (Table 3.2).

In addition to stream waters, the WAG 2 program sampled waters from seeps and small, ephemeral tributaries (Hicks 1996). Because these sites do not support fish communities, they are not assessed for risks to this endpoint. However, it is important to know which of these sources is contributing to risks in the streams. In addition, the State of Tennessee is concerned with whether the seep waters exceed water quality standards. Therefore, the UCL95 or maximum concentration for each chemical detected in each seep is compared to that chemicals chronic NAWQC, if one is available, or to the SCV (Table 3.3). Use of the regulatory standard (NAWQC) or a conservative estimate of the standard addresses the regulatory concern and provides a means of highlighting those seeps that have high concentrations relative to toxicity without suggesting the seeps support communities of fish and macroinvertebrates like the streams.

A second step in the screening process involved determining the relative contribution of the COPECs to the distribution of toxicity in the WOC watershed. This was done by calculating each COPEC's average screening hazard quotient (HQs based on UCL95) for the mainstem and large tributary surface water in a subbasin and adding these together to get the sum of the average HQs (Table3.4). Use of the average HQs, rather than the maximum HQs, reduces the influence of highly conservative screening benchmarks (e.g., SCVs). It is important to note that average HQs are heuristic only, providing an indication of the relative toxicity of sites and the relative contributions of chemicals to that toxicity. That is, these values are not used to identify COECs. Seeps were evaluated by summing the HQs for each COPEC (Table3.3), because only one HQ (based on NAWQC or SCV) was calculated.

3.3.1.2 Exposure—effects profiles for aqueous exposures

Risks were estimated by subbasin for each COPEC by comparing the distribution of observed concentrations to each aquatic benchmark. These comparisons were performed mathematically, rather than graphically, in order to ensure consistency and facilitate the evaluation of large data sets.

This was done by (1) identifying and then estimating points that define key segments of the exposure distributions; (2) classifying the available benchmarks with regard to the conservatism with which they estimate effects; (3) comparing each segment of the distribution to each benchmark; and (4) assigning a basin-specific risk score to each COPEC.

The distribution of aqueous concentrations represents the variation in exposure over time. Hence, the 80th percentile represents the concentration that is exceeded approximately 20 percent of the time. The key segments of the distribution are defined by four points: the 100th, 80th, 50th, and 0 percentiles. The benchmarks were classified as either possible-effects or probable-effects benchmarks. Possible-effects benchmarks are conservative estimates of concentrations at which toxicity may occur. Probable-effects benchmarks are concentrations at which toxicity is likely. Of the available benchmarks, only the secondary acute and chronic values (SAVs and SCVs) are considered to be conservative estimates of toxic concentrations. The NAWQC, lowest chronic values (LCVs), and lowest test values (LTVs) are probable-effects benchmarks (i.e., concentrations at which toxicity is more likely than not). Each segment of the distribution was compared to the benchmarks and a risk score of 0 to 8 was assigned. The rules and interpretations of this scoring process are presented in Table 3.5. The default score of zero indicates that the conservative point estimate of exposure (i.e., the UCL95) exceeded at least one benchmark, but that the observed concentrations were less than all benchmarks.

It should be noted that nondetects were included in the distribution at 0.5 times the detection limit. Hence, it is possible that the maximum value (100th percentile) is not a detected concentration. The conservatism this introduces was countered by specifying that the maximum detected concentration must exceed at least one probable-effects benchmark in order for a chemical to receive a score of 5 or higher. That is, a chemical can not be a COEC unless it was detected at least once at a concentration that is expected to be toxic. Furthermore, exclusion of the nondetects at the low end of the distribution would bias the estimations of exposure high. It also should be noted that the 80th percentile was set equal to the 100th percentile if the data set was too small (generally less than 5 observations) to estimate an 80th percentile.

Each risk score also was given a confidence score. Confidence in the risk score is a function of the quality of the benchmark that was exceeded and the magnitude of the exceedence. Confidence scores consist of a set of plus (+) or minus (-) signs. The default is a moderate to high degree of confidence, which is given a score of zero (indicated by the absence of a plus or minus sign). Unlike the benchmarks for sediment-associated biota (Section 4.3), all of the aqueous benchmarks are considered to be of moderate to high quality. The magnitude of the exceedence is determined by the largest hazard quotient (HQ) calculated for the final risk score. An HQ of 1-10 is indicated by the default score of zero, an HQ of 10-100 is indicated by a single plus (+), and an HQ of more than 100 is indicated by a double plus (++). Therefore, the confidence scores for aqueous COPECs range from zero to double plus (i.e., " ", "+", "++"). As an example, a final score of "7++" indicates that the 50th percentile of the exposure distribution was at least 100 times higher than one or more probable-effects benchmark. This suggests that toxicity is likely most of the time.

The final risk scores were then used to characterize the risks to fish as negligible (0 to 2++), marginal (3 to 5++), or significant (6 to 8++). That is, chemicals are considered to present a significant risk and to be of concern (CEOCs) if at least 20% of the concentrations exceeded probable-effects benchmarks. COPECs are considered to present a marginal risk if at least 50% of the concentrations exceeded possible-effects benchmarks or the maximum detected concentration exceeded probable-effects benchmarks. All other COPECs are considered to present negligible risks, including those for which only the UCL95 exceeded benchmarks.

Table 3.2 presents, for each COPEC, the characterization of risks to fish and the final risk score by subbasin. Table 3.6 presents the hazard quotients of the maximum detected concentration for chemicals with NAWQC. Table 3.7 details the exposure estimates (UCL95) for each location, benchmark values, and the corresponding HQs. Therefore, this section addresses only that information that aids in characterizing the risks associated with the COECs. NAWQC are included in the screening against benchmarks, but are not the sole factor in characterizing risks and are not evaluated as ARARs in this section.

Fourteen of the nineteen inorganic COPECs are COECs, nine of which (ammonia, aluminum, copper, iron, lead, silver, thallium, tin, and zinc) appear to present a significant risk to fish in every subbasin in which they were detected at concentrations greater than background. Only two of the nine organic COPECs are COECs, bis(2-ethylhexyl)phthalate and polychlorinated biphenyl (Total PCBs). Five of these chemicals (cadmium, lead, nickel, silver, and Total PCBs) could be disregarded as COECs in at least one subbasin, because they were detected in less than five percent of the samples (Table 3.2).

Risks to aquatic biota may be overestimated for all of the inorganic COECs and Total PCBs. The available data are from unfiltered water samples, which are likely to overestimate bioavailability. This may be particularly true for Total PCBs, which are strongly particle reactive and rarely detected in filtered water samples.

The toxicological data for aluminum and ammonia require further consideration. Aluminum is very insoluble in circum neutral water and the fraction that is bioavailable in the WOC watershed is unlikely to be toxic to aquatic biota. The available toxicological data, including that used to derive the NAWQC, are from tests in which aluminum was dissolved in an acidic solution which was then neutralized. This is appropriate for evaluating situations such as neutralized acid mine drainage. Given that such conditions are not known to exist in the WOC watershed, remediation to reduce aluminum in water is not warranted. Ammonia is identified as a COEC in the two subbasins where it was detected above background, WOC and Lower WOC. However, caution should be exercised in deciding to remediate for this chemical because the lowest chronic value for fish (0.0017 mg/l) was the only benchmark exceeded. That benchmark is more than 250 times lower than the other available benchmarks. None of the detected concentrations exceeded these other benchmarks.

Bis(2-ethylhexyl)phthalate was detected in two subbasins (W6MS1 and W6MS3). However, detection of this chemical is often an artifact of the sampling and analytical processes.

3.3.2 Single-Chemical Internal Toxicity

3.3.2.1 Mercury

Mercury concentrations in largemouth bass, but not sunfish, increased from a mean of 0.11 to 0.57 mg/kg wet weight during the period 1988-1992 for unknown reasons (Ashwood 1994). The maximum concentrations in largemouth bass in the last two reported years (0.70 and 0.71 mg/kg in 1991 and 1992) exceeded the 0.66 mg/kg concentration that corresponded to a CV for fathead minnows but was well below the value for brook trout (5.6 mg/kg). The median concentration for largemouth bass and all concentrations for bluegill and redbreast sunfish were below 0.66 mg/kg.

3.3.2.2 Polychlorinated biphenyls

PCBs have been detected in sunfish, largemouth bass, and channel catfish in WOC with the highest concentrations found in channel catfish from the embayment (Ashwood 1994). However, both mean and maximum concentrations in catfish in 1993 were below the concentration of PCB-1242 that reduced growth and caused liver hypertrophy in channel catfish at a body burden of 14.3 mg/kg (Hansen et al. 1976).

3.3.3 Ambient Water Toxicity

Water from the watershed was lethal to Medaka embryos and larvae. Medaka toxicity was tested in WOC but not its tributaries (Ashwood 1993). Toxicity was not observed above ORNL, but consistently occurred downstream (Ashwood 1994). During 1991-1993 Medaka survival averaged less than 20% in water from the subbasins below ORNL (i.e., intermediate Pond, WOC, Lower WOC), whereas survival in reference and control water averaged approximately 90%. The lowest mean survival rate (<10%) was in water from the White Oak Lake dam. This pattern is consistent with an accretion of contaminants in the creek. Since water was not chemically analyzed in conjunction with the toxicity tests and the toxicity identification and evaluation (TIE) was not completed, it is not possible to determine which contaminants may be responsible for the toxicity. However, preliminary TIE results indicate that a chemical other than chlorine was responsible.

In contrast , WOC water was not toxic, based on the results of the 7-day fathead minnow and *C. dubia* tests. This lack of response relative to the snail test was attributed to the insensitivity of the standard static renewal test to total residual chlorine (Ashwood 1993). The lack of response relative to Medaka may be attributed to the inherent sensitivity of Medaka or the longer duration of the Medaka test and the inclusion of two life stages.

3.3.4 Biological Indicators

Results of the studies of histological, physiological, and reproductive indicators are presented by Ashwood (1994). Although these indicators show improvement, reproductive indicators for redbreast sunfish can not be interpreted as indicative of effects on the fish community endpoint. Rather, they are suggestive of inhibited reproduction in individuals of one species.

3.3.5 Biological Surveys

Surveys of the fish community in WOC indicate a significant loss of species compared to surveys conducted in the 1950s. Although it seems likely that the original loss was due to contaminants, it is not clear that the current contaminant levels would cause the same effect. The dam and numerous weirs inhibit movement of fish and may be preventing recovery of the community. However, the fish community in Melton Branch does not appear to be significantly degraded relative to references.

3.3.6 Weight of Evidence for Fish

The weighing of evidence is performed by asking the following questions concerning each subbasin in the watershed:

1. Is the fish community less species-rich or abundant than would be expected?

2. Do individual fish display injuries that are indicative of significant toxic effects?

3. Is the water toxic to aquatic organisms?

4. Does that water contain chemicals in toxic amounts?

5. Do the fish contain chemicals in toxic amounts?

6. What factors account for apparent discrepancies in the results?

7. What is the likelihood that the fish community is at least 20% less species rich or abundant than it would be in the absence of contamination?

Subbasins for which at least surface water chemistry data are available (Table 3.8) are discussed below. Water chemistry and biological data are available for the following seven subbasins.

3.3.6.1 Intermediate pond

The weight-of-evidence suggests that water in this subbasin poses a significant risk to fish. The fish community is less species rich relative to the community observed here in the 1950s and the water has been lethal to Medaka embryos and larvae. Copper, iron, silver, and thallium concentrations appear to present significant risks. However, aluminum concentrations are probably not toxic in this system.

3.3.6.2 WOC

The weight-of-evidence suggests that water in this subbasin poses a significant risk to fish. The fish community is less species rich relative to the community observed here in the 1950s, redbreast sunfish have experienced reproductive failures, and the water has been lethal to Medaka embryos and larvae. Of the eight COECs, copper, iron, and thallium concentrations appear to be the most likely contributors to toxicity. Ammonia concentrations exceeded only the lowest benchmark, suggesting that they may be toxic to sensitive species. Lead and nickel concentrations may be toxic, but these metals were detected in less than 5% of the samples. Total PCBs were detected in only 7% of the samples and are likely to be bound to particulate matter and not bioavailable. Aluminum concentrations are not expected to be toxic in this system.

3.3.6.3 MB-15

The weight-of-evidence suggests that water in this subbasin does not pose a significant risk to fish. Although the fish community is somewhat less species rich than a similar reference stream (two species versus three or four species), it is more dense than the reference, the water has not been toxic in the standard toxicity tests, and none of the detected chemicals exceeded any benchmarks (i.e., there are no COPECs).

3.3.6.4 Seep B East

The weight-of-evidence suggests that water in this subbasin does not pose a significant risk to fish. Species richness is comparable to that of the reference streams, though this reach is somewhat larger than the references, which may account in part for number of species present. However, the

water has not been toxic in the standard toxicity tests and none of the detected chemicals exceeded any benchmarks (i.e., there are no COPECs).

3.3.6.5 Seep C

Although the weight-of-evidence is not strong, it suggests that water in this subbasin does not pose a significant risk to fish. Copper and nickel are COECs, but the concentrations measured may over estimate the fraction that is bioavailable. Furthermore, the water has not been toxic in the standard toxicity tests. However, the medaka toxicity data and fish community surveys that made the single chemical toxicity data credible in other subbasins are not available here.

3.3.6.6 Lower WOC

The weight-of-evidence suggests that water in this subbasin poses a significant risk to fish. The fish community is less species rich relative to the community observed here in the 1950s, redbreast sunfish have experienced reproductive failures, and the water has been lethal to Medaka embryos and larvae. Of the eleven COECs, cobalt, copper, iron, nickel, thallium and zinc concentrations appear to be the most likely contributors to toxicity. Ammonia concentrations exceeded only the lowest benchmark, suggesting that it may be toxic to sensitive species. Cadmium, silver and Total PCB concentrations may be toxic, but these chemicals were detected in less than 5% of the samples. Aluminum concentrations are not expected to be toxic in this system.

3.3.6.7 WOCE

Although the weight-of-evidence is not strong, it suggests that water in this subbasin poses a significant risk to fish. Cadmium is the only COEC and the concentrations measured may over estimate the fraction that is bioavailable. Body burdens measurements suggest that mercury and PCBs are not significantly toxic, but provide no evidence for the effects of cadmium. Although water from within the embayment was not tested, water entering the embayment reduced Medaka embryo and larvae survival by 90%. Hence, there is no strong evidence to indicate that cadmium does not pose a risk in this subbasin.

Chemical concentrations in surface water is the only line of evidence available for eleven subbasins. Significant risks are not indicated in three of these subbasin (SWSA 5 N WOC, HRE, and Seep B west), because none of the detected chemicals exceeded benchmarks (i.e., there are no COPECs). Even if the benchmarks for aluminum are set aside as inappropriate to this site, there is at least one COEC in each of the remaining subbasins (Table 3.8). That is, significant risks are indicated in eight subbasins.

In summary, the toxicity to Medaka embryos and larvae provides important supporting evidence that waters in WOC are toxic to fish. The low species richness of WOC is consistent with effects but could have physical causes. Although all of these lines of evidence are consistent with a hazard to fish in WOC, the evidence is not conclusive. The high metal concentrations could be non bioavailable, the Medaka could be much more sensitive than any of the fish species native to the stream, and the low species richness could be due to physical barriers to recovery. In particular, it should be noted that three years have passed since the collection of the most recent biological data that were available for this assessment. At that time, the bioindicators data suggested that the condition of fish in WOC was improving and was approaching that of fish in reference streams. It is possible that the fish community has largely recovered and that toxicity would no longer be observed in WOC at this time.

3.4 UNCERTAINTIES CONCERNING RISKS TO FISH

The following issues constitute the major sources of uncertainty in the risk assessment for the fish community.

- The bioavailable concentrations of chemicals in water are unknown. In assessments that included analyses of filtered as well as unfiltered water, concentrations of aluminum and some other metals that were above criteria in the unfiltered water were shown to be associated with particles (i.e., not bioavailable).

- The toxicity of water in 13 subbasins is unknown.

- The high observed mortality in Medaka embryos and larvae are believed to constitute toxic effects that would result in significant effects on the fish community. However, this test is sensitive and has not been validated against biological survey data at sites where clear toxic effects are occurring and fish community properties are clearly related to toxic effects, as has been done with the standard 7-day tests.

Table 3.1. Descriptions of the ecotoxicological screening benchmarks for aquatic biota[a]

Benchmark	Abbreviation	Description
Acute National Ambient Water Quality Criteria	NAWQC_ACU	Current national criteria for protection of aquatic life from lethal effects in episodic exposures. Adjusted for hardness of 100 mg/L $CaCO_3$ for hardness-dependent metals.
Chronic National Ambient Water Quality Criteria	NAWQC_CHR	Current national criteria for protection of aquatic life from lethal and sublethal effects in extended exposures. Criteria for uses of aquatic life (i.e., fish consumption) are not included. Adjusted for hardness of 100 mg/L CaCO3 for hardness-dependent metals.
Secondary Acute Value	S_ACU_V	Values estimated with 80% confidence to not exceed the unknown acute NAWQC. Used when data are inadequate to calculate the acute criterion.
Secondary Chronic Value	S_CHR_V	Values estimated with 80% confidence to not exceed the unknown chronic NAWQC. Used when data are inadequate to calculate the chronic criterion.
Lowest Chronic Value for fish	LCV_FISH	The lowest value, from acceptable fish chronic toxicity tests, of the geometric mean of the Lowest Observed Effect Concentration (LOEC) and the No Observed Effect Concentration (NOEC).
Lowest Chronic Value for daphnids	LCV_DAPH	The lowest value, from acceptable daphnid chronic toxicity tests, of the geometric mean of the LOEC and the NOEC.
Lowest Chronic Value for non-daphnid invertebrates	LCV_NDI	The lowest value of the geometric mean of the LOEC and the NOEC from acceptable chronic toxicity tests of nondaphnid invertebrate species.
Lowest Plant Value	LCV_AQPL	The lowest value from an acceptable aquatic plant toxicity test of the geometric mean of the LOEC and the NOEC.
Lowest Test EC20 for Fish	LTV_FISH	The lowest value, from acceptable fish chronic toxicity tests, of the lowest concentration causing at least a 20% reduction in the weight of young per female or the weight of young per egg.
Lowest Test EC20 for Daphnids	LTV_DAPH	The lowest value from an acceptable daphnid chronic toxicity test of the lowest concentration causing at least a 20% reduction in the product of survivorship and fecundity.

[a]More details are presented by Suter and Tsao (1996).

Table 3.2. Surface water COPECs, risk scores, and the resulting characterization of risks to benthic invertebrates based on surface water contamination

Analyte	SWSA 5 WOC	SWSA 5 Trib 1	Intermediate Pond	WOC	HF-2	HFIR/ south	Seep A	Seep C	West Seep	W6MS1	W6MS3	SWSA 6 East	Lower WOC	WOCE
Ammonia				S (8)									S (8)	
Aluminum	S (7)		S (6)	S (7)	S (7)				S (6)	S (7+)	S (7)	S (7)	S (7)	
Barium					M (4)					M (3+)	M (3+)		M (4)	
Beryllium			N (1)	N (1)	N (1)		N (1)	N (1)	N (2)		N (2)		N (1)	
Boron			M (4)	M (4)	M (4)		M (4)	M (4+)		M (4+)	M (4)		M (4)	
Cadmium				N (0)^A					S (8)	S (8)	S (8)		S (7+)^A	S (8)
Cobalt					S (6)		N (0)			S (7)	S (7)		S (6)	
Copper	S (8)		S (8)	S (8)	S (8)		S (8)	S (8)	S (8+)	S (8+)	S (8+)		S (8)	
Iron			S (7)	S (7)		S (8+)			S (8)	S (7+)	S (7+)	S (8+)	S (7+)	
Lead				S (7)^A						S (7)	S (7)			
Lithium	M (4+)												N (0)	
Manganese				N (1)						M (5)	S (6)		M (5)	
Mercury				M (5)	M (5++)					S (6)	S (6)	S (6)	M (5)	
Nickel	N (0)	S (6)		S (7)^A				S (6)		S (7)	S (7)		S (7)	
Selenium	N (0)									N (0)			N (0)^A	
Silver			S (8+)								S (8)		S (8)^A	
Thallium			S (6)	S (6)	S (6)		S (6)						S (6)	
Tin											S (6)			
Zinc					S (7)								S (6)	
Benzene	N (0)	N (0)									N (0)			
Bis(2-Ethylhexyl)Phthalate	N (0)									S (8)	S (7)			
Carbon Disulfide			M (4)	M (3+)	M (4+)		M (4)		M (4)	M (3)	M (3)		M (4)	
Carbon Tetrachloride	N (2)	N (2)												
Ethylbenzene	N (2)	N (2)												
Naphthalene	N (0)	N (0)								N (0)				
Polychlorinated Biphenyl				S (7)									S (7)^A	
Toluene	N (2)	N (2)							N (0)	N (0)	N (0)			
Xylene (Total)	N (0)	N (0)												

S = Significant Risks (Risk Score is 6, 7, or 8), Chemical is COEC
M = Marginal Risks (Risk Score is 3, 4, or 5), Chemical is COPEC
N = Negligible Risks (Risk Score is 0, 1 or 2), Chemical is COPEC
Confidence scores indicate magnitude of benchmark exceedence (+ = Hazard Quotient (HQ) of 10 to 100, ++ = HQ of more than 100)
BOLD indicates COEC
None of the chemicals in the following five subbasins were COPECs: SWSA 5 N WOC, MB-15, HRE, Seep B East, and Seep B West.
^Detected in less than 5%of the samples.

Table 3.3. Individual and sum of hazard quotients (HQs) for COPECs in unfiltered water from seeps and ephemeral tributaries, by subbasin

		MVDrive	SWSA 5 WOC		SWSA5 N WOC			SWSA 5 Trib 1			
Analyte	Benchmark	5NNT	05.SP004	SW5-2	05.SP002	5NW-1	5NW-2	05.SP003	05.SP015	05.SW001	SW5-1
Sum of HQs		**227**	**93**	**167**	**26**	**63**	**166**	**363**	**161**	**37**	**323**
Aluminum	NAWQ_CHR	23	50	18	18	18	10	152		13	35
Antimony	S_CHR_V	< 1									
Barium	S_CHR_V	31	29	23				105			43
Beryllium	S_CHR_V	2		1		2	1				2
Boron	S_CHR_V			118		13	111				50
Cadmium	NAWQ_CHR	3									
Cobalt	S_CHR_V	< 1					< 1	< 1	19		< 1
Copper	NAWQ_CHR	< 1	2	< 1						< 1	
Iron	NAWQ_CHR	2	5	2			1	27	11	< 1	6
Lead	NAWQ_CHR										
Lithium	S_CHR_V	< 1								14	
Manganese	S_CHR_V	3				25	35	72	113	1	61
Mercury	S_CHR_V	< 1							< 1		
Nickel	NAWQ_CHR	< 1							2	< 1	
Selenium	NAWQ_CHR	< 1							11	< 1	
Silver	S_CHR_V										
Thallium	S_CHR_V	7									124
Tin	S_CHR_V	< 1									
Vanadium	S_CHR_V	1		2		5	1	1			1
Zinc	NAWQ_CHR										
Zirconium	S_CHR_V										
1,1,1-Trichloroethane	S_CHR_V										
Bis(2-Ethylhexyl)Phthalate	S_CHR_V							< 1		2	< 1
Carbon Disulfide	S_CHR_V	152					1				
Carbon Tetrachloride	S_CHR_V		1		2		1	1	1	< 1	
Cis-1,3-Dichloropropene	S_CHR_V										
Ethylbenzene	S_CHR_V									1	
Naphthalene	S_CHR_V		1		2		1	1	1	< 1	
Tetrachloroethene	S_CHR_V		< 1		< 1		< 1	< 1	< 1	< 1	
Toluene	S_CHR_V		1		2		1	1	1	< 1	
Total-1,2-Dichloroethene	S_CHR_V		< 1	< 1				< 1	< 1		< 1
Trans-1,3-Dichloropropene	S_CHR_V										
Trichloroethene	S_CHR_V		2	2				< 1	< 1		< 1
Xylene (Total)	S_CHR_V		1		< 1		< 1	1	< 1	< 1	

Table 3.3. (continued)

Analyte	Benchmark	SWSA 4 main							
		BTT	SCS1B	SW4-1	SW4-2	W4TRIB-11	W4TRIB-5	W4TRIB-7	WAG4 MS1
Sum of HQs		**136**	**167**	**325**	**308**	**172**	**132**	**325**	**195**
Aluminum	NAWQ_CHR						21		2
Antimony	S_CHR_V		2	1					
Barium	S_CHR_V	78	48	133	109	67	22	38	46
Beryllium	S_CHR_V	< 1	2	2	< 1	< 1			2
Boron	S_CHR_V	54	63	108	119	71	87	256	113
Cadmium	NAWQ_CHR	2	5		2	2			< 1
Cobalt	S_CHR_V	< 1	< 1	< 1	1	< 1			< 1
Copper	NAWQ_CHR	< 1	< 1		< 1	2			< 1
Iron	NAWQ_CHR			26	4	2	2	< 1	< 1
Lead	NAWQ_CHR		16						
Lithium	S_CHR_V		2		8				
Manganese	S_CHR_V		5	31	9	19		31	8
Mercury	S_CHR_V				< 1				< 1
Nickel	NAWQ_CHR	< 1	< 1		53	< 1	< 1		< 1
Selenium	NAWQ_CHR		10						
Silver	S_CHR_V		14			8			
Thallium	S_CHR_V			23					22
Tin	S_CHR_V		< 1						
Vanadium	S_CHR_V	< 1	< 1	< 1	< 1				< 1
Zinc	NAWQ_CHR								
Zirconium	S_CHR_V		1						
1,1,1-Trichloroethane	S_CHR_V								
Bis(2-Ethylhexyl)Phthalate	S_CHR_V								
Carbon Disulfide	S_CHR_V	< 1							
Carbon Tetrachloride	S_CHR_V								
Cis-1,3-Dichloropropene	S_CHR_V								
Ethylbenzene	S_CHR_V								
Naphthalene	S_CHR_V								
Tetrachloroethene	S_CHR_V			< 1	< 1				
Toluene	S_CHR_V				1				
Total-1,2-Dichloroethene	S_CHR_V								
Trans-1,3-Dichloropropene	S_CHR_V								
Trichloroethene	S_CHR_V			< 1	< 1		< 1		
Xylene (Total)	S_CHR_V				< 1				

Table 3.3. (continued)

Analyte	Benchmark	Intermediate Pond				WOC		
		SW2-2	WAG4 T2A	WCTRIB-3	WCTRIB-4	5NST	SW2-3	SW2-4
Sum of HQs		**98**	**148**	**147**	**310**	**71**	**83**	**318**
Aluminum	NAWQ_CHR		7					
Antimony	S_CHR_V							
Barium	S_CHR_V	37	26		48			52
Beryllium	S_CHR_V	1	< 1	1	2	2	< 1	
Boron	S_CHR_V	42	108	128	155	27		47
Cadmium	NAWQ_CHR		2					
Cobalt	S_CHR_V	< 1						
Copper	NAWQ_CHR		< 1					
Iron	NAWQ_CHR		1					1
Lead	NAWQ_CHR							
Lithium	S_CHR_V							
Manganese	S_CHR_V	12	2	14	20			112
Mercury	S_CHR_V							< 1
Nickel	NAWQ_CHR		< 1	< 1				
Selenium	NAWQ_CHR							
Silver	S_CHR_V							16
Thallium	S_CHR_V				36	36		45
Tin	S_CHR_V							
Vanadium	S_CHR_V	5	1	5	2	2	4	
Zinc	NAWQ_CHR							
Zirconium	S_CHR_V							
1,1,1-Trichloroethane	S_CHR_V						< 1	
Bis(2-Ethylhexyl)Phthalate	S_CHR_V							
Carbon Disulfide	S_CHR_V				47	4	78	45
Carbon Tetrachloride	S_CHR_V							
Cis-1,3-Dichloropropene	S_CHR_V							
Ethylbenzene	S_CHR_V							
Naphthalene	S_CHR_V							
Tetrachloroethene	S_CHR_V		< 1					
Toluene	S_CHR_V							
Total-1,2-Dichloroethene	S_CHR_V							
Trans-1,3-Dichloropropene	S_CHR_V							
Trichloroethene	S_CHR_V		< 1					
Xylene (Total)	S_CHR_V							

Table 3.3. (continued)

Analyte	Benchmark	WAG7/WOC	HF-2	MB-15	HRE		
		WCTRIB-2	05.SW005	MBTRIB-2A	05.SW004	SW9-1	SW9-2
Sum of HQs		**6**	**160**	**1**	**74**	**143**	**128**
Aluminum	NAWQ_CHR		70		16		21
Antimony	S_CHR_V						
Barium	S_CHR_V		31		25	38	72
Beryllium	S_CHR_V	< 1	1				
Boron	S_CHR_V						
Cadmium	NAWQ_CHR		2				
Cobalt	S_CHR_V		< 1		< 1		
Copper	NAWQ_CHR		1	1		< 1	1
Iron	NAWQ_CHR		4		2		4
Lead	NAWQ_CHR		6		3		
Lithium	S_CHR_V		14		14		
Manganese	S_CHR_V		6		7	2	23
Mercury	S_CHR_V						
Nickel	NAWQ_CHR		< 1		< 1		
Selenium	NAWQ_CHR				< 1		
Silver	S_CHR_V						
Thallium	S_CHR_V						
Tin	S_CHR_V						
Vanadium	S_CHR_V	4	1		< 1		
Zinc	NAWQ_CHR		2				3
Zirconium	S_CHR_V						
1,1,1-Trichloroethane	S_CHR_V						
Bis(2-Ethylhexyl)Phthalate	S_CHR_V		15				
Carbon Disulfide	S_CHR_V	< 1				102	3
Carbon Tetrachloride	S_CHR_V		1		< 1		
Cis-1,3-Dichloropropene	S_CHR_V						
Ethylbenzene	S_CHR_V		1		1		
Naphthalene	S_CHR_V		< 1		< 1		
Tetrachloroethene	S_CHR_V		< 1		< 1		
Toluene	S_CHR_V		< 1		< 1		
Total-1,2-Dichloroethene	S_CHR_V						
Trans-1,3-Dichloropropene	S_CHR_V						
Trichloroethene	S_CHR_V						< 1
Xylene (Total)	S_CHR_V		< 1		< 1		

Table 3.3. (continued)

Analyte	Benchmark	SEEP A									SEEP B West
		05.SP009	05.SP010	05.SP016	05.SP017	05.SW003	SW5-6	SW5-7	SW5-8	SW5-9	SW5-11
Sum of HQs		**216**	**4**	**730**	**209**	**63**	**673**	**583**	**546**	**1007**	**129**
Aluminum	NAWQ_CHR	47		515	15	20	13			6	
Antimony	S_CHR_V				3						
Barium	S_CHR_V	65		132	60	16	73	86	57	56	
Beryllium	S_CHR_V					< 1	2	4		2	2
Boron	S_CHR_V						340	395	406	847	46
Cadmium	NAWQ_CHR										
Cobalt	S_CHR_V			1		< 1		< 1		< 1	
Copper	NAWQ_CHR			1							
Iron	NAWQ_CHR	12		50	33	< 1	9	8	4	6	
Lead	NAWQ_CHR										
Lithium	S_CHR_V					14					
Manganese	S_CHR_V	87		23	91	4	85	86	38	36	4
Mercury	S_CHR_V				< 1						
Nickel	NAWQ_CHR			< 1	< 1	< 1	< 1		< 1	< 1	
Selenium	NAWQ_CHR					< 1					
Silver	S_CHR_V										69
Thallium	S_CHR_V						149		34	47	
Tin	S_CHR_V										
Vanadium	S_CHR_V			3	< 1	< 1	< 1	3	< 1	< 1	< 1
Zinc	NAWQ_CHR										
Zirconium	S_CHR_V										
1,1,1-Trichloroethane	S_CHR_V										
Bis(2-Ethylhexyl)Phthalate	S_CHR_V					2					
Carbon Disulfide	S_CHR_V										
Carbon Tetrachloride	S_CHR_V	1	1	1	2	< 1			1	1	2
Cis-1,3-Dichloropropene	S_CHR_V										
Ethylbenzene	S_CHR_V					1					
Naphthalene	S_CHR_V	1	< 1	1	2	< 1			1	1	2
Tetrachloroethene	S_CHR_V	< 1	< 1	< 1	< 1	< 1			< 1	< 1	< 1
Toluene	S_CHR_V	1	1	1	1	< 1	1		1	1	1
Total-1,2-Dichloroethene	S_CHR_V	< 1			< 1		< 1			< 1	< 1
Trans-1,3-Dichloropropene	S_CHR_V										
Trichloroethene	S_CHR_V	< 1					< 1			< 1	< 1
Xylene (Total)	S_CHR_V	1	< 1	< 1	< 1	< 1			1	< 1	< 1

Table 3.3. (continued)

Analyte	Benchmark	SEEP C				WCTRIB-1	SWSA 5 Drainage D-2				
		05.SP005	05.SP018	SW5-3	SW5-4	SW7-6	05.SP007	05.SP014	05.SP019	05.SW002	SW5-5
Sum of HQs		**166**	**19**	**209**	**185**	**141**	**392**	**214**	**19**	**89**	**612**
Aluminum	NAWQ_CHR	96		96		11	226	96		6	243
Antimony	S_CHR_V				< 1						
Barium	S_CHR_V	50		49	33		78	68		30	140
Beryllium	S_CHR_V			2	< 1	< 1	2				2
Boron	S_CHR_V			50	95						109
Cadmium	NAWQ_CHR				2						
Cobalt	S_CHR_V						< 1	< 1			< 1
Copper	NAWQ_CHR									< 1	
Iron	NAWQ_CHR	9		4	2		39	24		6	50
Lead	NAWQ_CHR										
Lithium	S_CHR_V		14		23				14	14	
Manganese	S_CHR_V	2		4	23		41	17		25	65
Mercury	S_CHR_V				< 1						
Nickel	NAWQ_CHR				< 1			< 1		< 1	
Selenium	NAWQ_CHR									< 1	
Silver	S_CHR_V										
Thallium	S_CHR_V										
Tin	S_CHR_V										
Vanadium	S_CHR_V			3	< 1	2		< 1			2
Zinc	NAWQ_CHR										
Zirconium	S_CHR_V										
1,1,1-Trichloroethane	S_CHR_V	< 1		< 1				< 1			
Bis(2-Ethylhexyl)Phthalate	S_CHR_V									2	
Carbon Disulfide	S_CHR_V					127					
Carbon Tetrachloride	S_CHR_V	2	1		1		1	1	1	1	
Cis-1,3-Dichloropropene	S_CHR_V										
Ethylbenzene	S_CHR_V		1		2				1	1	
Naphthalene	S_CHR_V	2	< 1		< 1		1	1	< 1	< 1	
Tetrachloroethene	S_CHR_V	< 1	< 1		< 1		< 1	< 1	< 1	< 1	
Toluene	S_CHR_V	2	1		1		1	1	1	< 1	
Total-1,2-Dichloroethene	S_CHR_V	< 1		< 1			< 1	1		< 1	< 1
Trans-1,3-Dichloropropene	S_CHR_V										
Trichloroethene	S_CHR_V	< 1		< 1			< 1	2		< 1	< 1
Xylene (Total)	S_CHR_V	2	< 1		< 1		1	1	< 1	< 1	

Table 3.3. (continued)

Analyte	Benchmark	EAST SEEP				West Seep						
		SW7-3	SW7-4	SW7-7	SW7-8	RS-1	RS-3	RS-3A	RS-3B	SW6-2	SW7-1	SW7-2
Sum of HQs		**79**	**490**	**365**	**9**	**172**	**654**	**281**	**396**	**127**	**535**	**202**
Aluminum	NAWQ_CHR	5			6		61	146	21			5
Antimony	S_CHR_V						1			< 1		
Barium	S_CHR_V							15		34		
Beryllium	S_CHR_V	< 1	4	2	< 1	1	4	2			1	1
Boron	S_CHR_V	69	228	292		70	580	69	81	39		116
Cadmium	NAWQ_CHR	2						2				
Cobalt	S_CHR_V	< 1					< 1	1				7
Copper	NAWQ_CHR	< 1					< 1	2				1
Iron	NAWQ_CHR					1		10	1	2	8	
Lead	NAWQ_CHR											
Lithium	S_CHR_V											
Manganese	S_CHR_V		223	8		53		3		15	55	2
Mercury	S_CHR_V	< 1					1	< 1				
Nickel	NAWQ_CHR	< 1	< 1	< 1		< 1	< 1	< 1				
Selenium	NAWQ_CHR	< 1						11				
Silver	S_CHR_V							15				
Thallium	S_CHR_V		31	13		18				26		
Tin	S_CHR_V							2				
Vanadium	S_CHR_V	< 1	4	< 1	2	< 1	4	1			2	1
Zinc	NAWQ_CHR											
Zirconium	S_CHR_V											
1,1,1-Trichloroethane	S_CHR_V											
Bis(2-Ethylhexyl)Phthalate	S_CHR_V											
Carbon Disulfide	S_CHR_V			49	< 1	27		1	292	11	469	70
Carbon Tetrachloride	S_CHR_V											
Cis-1,3-Dichloropropene	S_CHR_V											
Ethylbenzene	S_CHR_V											
Naphthalene	S_CHR_V											
Tetrachloroethene	S_CHR_V											
Toluene	S_CHR_V											
Total-1,2-Dichloroethene	S_CHR_V											
Trans-1,3-Dichloropropene	S_CHR_V											
Trichloroethene	S_CHR_V											
Xylene (Total)	S_CHR_V											

Table 3.3. (continued)

Notes:

NAWQ_CHR = chronic National Ambient Water Quality Criterion, S_CHR_V = secondary chronic value.
HQs less than 1.0 are indicated by "<1"; HQs greater than 1.0 are rounded to nearest integer.
Missing HQs indicate that the chemical was not detected if it is an organic chemical or not detected above background if it is an inorganic chemical. None of the chemicals in seep water from subbasins HFIR East and Seep B East exceeded benchmarks.

Table 3.4. Individual and sum of average Hazard Quotients (HQs) for surface water COPECs

Analyte	SWSA 5 WOC	SWSA 5 Trib 1	Intermediate Pond	WOC	HF-2	HFIR South	SEEP A	SEEP C	West Seep	W6MS1	W6MS3	SWSA 6 East	Lower WOC	WOCE
Sum of Average HQs	**126**	**4**	**61**	**43**	**373**	**15**	**54**	**20**	**29**	**125**	**168**	**370**	**171**	**12**
Aluminum	56.79		0.47	0.68	0.77				1.34	9.10	9.10	48.29	2.30	
Ammonia				6.97									8.80	
Barium					6.42					5.37	8.36		5.36	
Beryllium			0.17	0.16	0.15		0.18	0.18	0.27		0.36		0.17	
Boron			8.23	9.30	20.67		8.29	12.06		19.73	17.37		11.89	
Cadmium				3.13					3.61	6.28	4.58		2.88	12.08
Cobalt					0.36		0.33			1.11	0.86		0.29	
Copper	58.02		10.82	6.86	24.05		3.75	7.29	12.63	19.94	31.17		8.51	
Iron			3.95	5.71		14.68			10.65	58.33	69.59	320.57	17.76	
Lead				1.56						0.72	0.75			
Lithium	7.53												0.27	
Manganese				0.08						0.50	1.07		0.39	
Mercury				0.10	236.97					0.53	0.35	1.08	0.12	
Nickel	0.66	0.87		0.53				0.48		0.74	1.26		0.41	
Selenium	0.40									0.08			1.05	
Silver			8.09								18.07		6.72	
Thallium			28.41	1.35	78.84		40.51						0.17	
Tin											2.93			
Zinc					2.46								0.73	
Benzene	0.26	0.26									0.03			
Bis(2-Ethylhexyl)Phthalate	0.14									1.33	0.90			
Carbon Disulfide			1.15	3.34	2.53		1.15		0.73	1.42	0.75		3.76	
Carbon Tetrachloride	0.58	0.58												
Ethylbenzene	0.68	0.68												
Naphthalene	0.32	0.32								0.08				
Polychlorinated Biphenyl				3.10									99.45	
Toluene	0.58	0.58							0.14	0.07	0.08			
Xylene (Total)	0.48	0.26												

Hazard Quotients = UCL95/benchmark value.
Average HQ = sum of HQs/number of HQs; calculated for each COPEC and subbasin combination
Sum of Average HQs is indicative of relative toxicity of surface waters that may support aquatic communities in each basin.

Table 3.5. Rules for assigning and interpreting risk scores for aqueous COPECs

Estimated Exposure Concentration [a]	Class of Benchmark Exceeded	Interpretation	Risk Score
UCL95	Any	The conservative point estimate of exposure exceeded at least one benchmark, but the observed concentrations were less than all benchmarks.	0
100th percentile	Possible-Effects	Toxicity is possible at least 1% of the time.	1
80th percentile	Possible-Effects	Toxicity is possible at least 20% of the time.	2
50th percentile	Possible-Effects	Toxicity is possible at least 50% of the time.	3
Zero percentile	Possible-Effects	Toxicity is possible 100% of the time.	4
100th percentile	Probable-Effects	Toxicity is likely at least 1% of the time.	5
80th percentile	Probable-Effects	Toxicity is likely at least 20% of the time	6
50th percentile	Probable-Effects	Toxicity is likely at least 50% of the time	7
Zero percentile	Probable-Effects	Toxicity is likely 100% of the time	8

[a] UCL95 is the upper 95% confidence limit on the mean concentration in a subbasin. Percentiles indicate the concentration below which the specified percentage of concentrations measured in a subbasin occur (i.e., 80% of the concentrations were less than the 80th percentile concentration).

Table 3.6 Comparison of maximum detected concentration of COPECs in unfiltered surface water to NAWQ Criteria

Analyte	Bmk Name	Bmk Value (mg/l)	SWSA 5 WOC	SWSA 5 Trib 1	Intermediate Pond	WOC	HF-2	HFIR South	SWSA 5 SEEP A	SWSA 5 SEEP C	West Seep	W6MS1	W6MS3	SWSA 6 East	Lower WOC	WOCE
Aluminum	NAWQ_ACU	0.75	**8.12**		**1.31**	**4.13**	0.60				**1.32**	**29.33**	**54.27**	6.96	**11.20**	
	NAWQ_CHR	0.087	**70.00**		**11.33**	**35.63**	**5.14**				**11.39**	**252.87**	**467.82**	**60.00**	**96.55**	
Ammonia	NAWQ_ACU	2.4				0.08									0.08	
	NAWQ_CHR	0.45				0.42									0.44	
Cadmium	NAWQ_ACU	0.0039				0.01					0.72	**6.31**	**1.72**		0.26	0.62
	NAWQ_CHR	0.0011				0.05					**2.55**	**22.36**	**6.09**		0.91	**2.18**
Copper	NAWQ_ACU	0.018	0.70		0.93	0.98	**1.66**		0.12	0.27	0.56	**2.22**	**4.91**		**4.39**	
	NAWQ_CHR	0.012	**1.05**		**1.39**	**1.47**	**2.48**		0.18	0.41	0.83	**3.33**	**7.36**		**6.58**	
Iron	NAWQ_CHR	1			**1.13**	**3.70**		0.83			**1.08**	**26.70**	**57.90**	**5.45**	**11.00**	
Lead	NAWQ_ACU	0.082				0.71						0.22	**4.34**			
	NAWQ_CHR	0.0032				**18.13**						**5.59**	**111.29**			
Mercury	NAWQ_ACU	0.0024				0.15	**55.83**					**1.96**	0.30	0.13	0.35	
	S_CHR_V	0.0013				0.28	**103.08**					**3.62**	0.56	0.23	0.65	
Nickel	NAWQ_ACU	1.4	0.00	0.00		0.05				0.00		0.02	0.04		0.01	
	NAWQ_CHR	0.16	0.03	0.03		0.45				0.04		0.14	0.31		0.13	
Selenium	NAWQ_ACU	0.02	0.16									0.13			0.05	
	NAWQ_CHR	0.005	0.62									0.52			0.20	
Silver	NAWQ_ACU	0.0041			0.93								**4.34**		**2.78**	
Zinc	NAWQ_ACU	0.12					**2.38**								**2.00**	
	NAWQ_CHR	0.11					**2.59**								**2.18**	
Polychlorinated Biphenyl	NAWQ_ACU	0.002				0.50									0.50	
	S_CHR_V	0.00014				**7.14**									**7.14**	

Values for subbasins are the hazard quotients (HQs) calculated as the maximum detected concentration in unfiltered water divided by the benchmark value.

NAWQ_CHR = chronic National Ambient Water Quality Criterion; NAWQ_ACU = acute National Ambient Water Quality Criterion; and S_CHR_V = secondary chronic value.

S_CHR_V are used for mercury and PCBs because the NAWQC are based on the body burden in fish that is protective of fish-eating wildlife

BOLD indicates HQ > 1

Table 3.7 Exposure concentrations, benchmarks, and the resulting hazard quotients (HQs) for surface water COPECs

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Aluminum	**HF-2**	**6**	**11**	**0.0355**	**1.44E-01**	**0.447**	**3.02E-01**	**0.087**	**NAWQ_CHR**	**3.48**
Aluminum	HF-2	6	11	0.0355	1.44E-01	0.447	3.02E-01	0.46	LCV_AQPL	0.66
Aluminum	HF-2	6	11	0.0355	1.44E-01	0.447	3.02E-01	0.54	LTV_DAPH	0.56
Aluminum	HF-2	6	11	0.0355	1.44E-01	0.447	3.02E-01	0.75	NAWQ_ACU	0.40
Aluminum	HF-2	6	11	0.0355	1.44E-01	0.447	3.02E-01	1.9	LCV_DAPH	0.16
Aluminum	HF-2	6	11	0.0355	1.44E-01	0.447	3.02E-01	3.288	LCV_FISH	0.09
Aluminum	HF-2	6	11	0.0355	1.44E-01	0.447	3.02E-01	4.7	LTV_FISH	0.06
Aluminum	**Intermediate Pond**	**9**	**15**	**0.0398**	**7.01E-02**	**0.986**	**1.83E-01**	**0.087**	**NAWQ_CHR**	**2.10**
Aluminum	Intermediate Pond	9	15	0.0398	7.01E-02	0.986	1.83E-01	0.46	LCV_AQPL	0.40
Aluminum	Intermediate Pond	9	15	0.0398	7.01E-02	0.986	1.83E-01	0.54	LTV_DAPH	0.34
Aluminum	Intermediate Pond	9	15	0.0398	7.01E-02	0.986	1.83E-01	0.75	NAWQ_ACU	0.24
Aluminum	Intermediate Pond	9	15	0.0398	7.01E-02	0.986	1.83E-01	1.9	LCV_DAPH	0.10
Aluminum	Intermediate Pond	9	15	0.0398	7.01E-02	0.986	1.83E-01	3.288	LCV_FISH	0.06
Aluminum	Intermediate Pond	9	15	0.0398	7.01E-02	0.986	1.83E-01	4.7	LTV_FISH	0.04
Aluminum	**Lower WOC**	**120**	**149**	**0.0285**	**4.33E-01**	**8.4**	**9.00E-01**	**0.087**	**NAWQ_CHR**	**10.34**
Aluminum	**Lower WOC**	**120**	**149**	**0.0285**	**4.33E-01**	**8.4**	**9.00E-01**	**0.46**	**LCV_AQPL**	**1.96**
Aluminum	**Lower WOC**	**120**	**149**	**0.0285**	**4.33E-01**	**8.4**	**9.00E-01**	**0.54**	**LTV_DAPH**	**1.67**
Aluminum	**Lower WOC**	**120**	**149**	**0.0285**	**4.33E-01**	**8.4**	**9.00E-01**	**0.75**	**NAWQ_ACU**	**1.20**
Aluminum	Lower WOC	120	149	0.0285	4.33E-01	8.4	9.00E-01	1.9	LCV_DAPH	0.47
Aluminum	Lower WOC	120	149	0.0285	4.33E-01	8.4	9.00E-01	3.288	LCV_FISH	0.27
Aluminum	Lower WOC	120	149	0.0285	4.33E-01	8.4	9.00E-01	4.7	LTV_FISH	0.19
Aluminum	**SWSA 5 WOC**	**1**	**2**	**6.09**	**3.62E-01**	**6.09**	**2.22E+01**	**0.087**	**NAWQ_CHR**	**255.32**
Aluminum	**SWSA 5 WOC**	**1**	**2**	**6.09**	**3.62E-01**	**6.09**	**2.22E+01**	**0.46**	**LCV_AQPL**	**48.29**
Aluminum	**SWSA 5 WOC**	**1**	**2**	**6.09**	**3.62E-01**	**6.09**	**2.22E+01**	**0.54**	**LTV_DAPH**	**41.14**
Aluminum	**SWSA 5 WOC**	**1**	**2**	**6.09**	**3.62E-01**	**6.09**	**2.22E+01**	**0.75**	**NAWQ_ACU**	**29.62**
Aluminum	**SWSA 5 WOC**	**1**	**2**	**6.09**	**3.62E-01**	**6.09**	**2.22E+01**	**1.9**	**LCV_DAPH**	**11.69**
Aluminum	**SWSA 5 WOC**	**1**	**2**	**6.09**	**3.62E-01**	**6.09**	**2.22E+01**	**3.288**	**LCV_FISH**	**6.76**
Aluminum	**SWSA 5 WOC**	**1**	**2**	**6.09**	**3.62E-01**	**6.09**	**2.22E+01**	**4.7**	**LTV_FISH**	**4.73**
Aluminum	**SWSA 6 East**	**2**	**2**	**0.0749**	**6.25E-01**	**5.22**	**1.89E+01**	**0.087**	**NAWQ_CHR**	**217.13**
Aluminum	**SWSA 6 East**	**2**	**2**	**0.0749**	**6.25E-01**	**5.22**	**1.89E+01**	**0.46**	**LCV_AQPL**	**41.06**
Aluminum	**SWSA 6 East**	**2**	**2**	**0.0749**	**6.25E-01**	**5.22**	**1.89E+01**	**0.54**	**LTV_DAPH**	**34.98**
Aluminum	**SWSA 6 East**	**2**	**2**	**0.0749**	**6.25E-01**	**5.22**	**1.89E+01**	**0.75**	**NAWQ_ACU**	**25.19**
Aluminum	**SWSA 6 East**	**2**	**2**	**0.0749**	**6.25E-01**	**5.22**	**1.89E+01**	**1.9**	**LCV_DAPH**	**9.94**
Aluminum	**SWSA 6 East**	**2**	**2**	**0.0749**	**6.25E-01**	**5.22**	**1.89E+01**	**3.288**	**LCV_FISH**	**5.75**
Aluminum	**SWSA 6 East**	**2**	**2**	**0.0749**	**6.25E-01**	**5.22**	**1.89E+01**	**4.7**	**LTV_FISH**	**4.02**
Aluminum	**W6MS3**	**66**	**80**	**0.023**	**6.74E-01**	**40.7**	**3.56E+00**	**0.087**	**NAWQ_CHR**	**40.90**

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Aluminum	W6MS3	66	80	0.023	6.74E-01	40.7	3.56E+00	0.46	LCV_AQPL	7.74
Aluminum	W6MS3	66	80	0.023	6.74E-01	40.7	3.56E+00	0.54	LTV_DAPH	6.59
Aluminum	W6MS3	66	80	0.023	6.74E-01	40.7	3.56E+00	0.75	NAWQ_ACU	4.74
Aluminum	W6MS3	66	80	0.023	6.74E-01	40.7	3.56E+00	1.9	LCV_DAPH	1.87
Aluminum	W6MS3	66	80	0.023	6.74E-01	40.7	3.56E+00	3.288	LCV_FISH	1.08
Aluminum	W6MS3	66	80	0.023	6.74E-01	40.7	3.56E+00	4.7	LTV_FISH	0.76
Aluminum	W6MS1	44	45	0.042	1.05E+00	22	3.56E+00	0.087	NAWQ_CHR	40.92
Aluminum	W6MS1	44	45	0.042	1.05E+00	22	3.56E+00	0.46	LCV_AQPL	7.74
Aluminum	W6MS1	44	45	0.042	1.05E+00	22	3.56E+00	0.54	LTV_DAPH	6.59
Aluminum	W6MS1	44	45	0.042	1.05E+00	22	3.56E+00	0.75	NAWQ_ACU	4.75
Aluminum	W6MS1	44	45	0.042	1.05E+00	22	3.56E+00	1.9	LCV_DAPH	1.87
Aluminum	W6MS1	44	45	0.042	1.05E+00	22	3.56E+00	3.288	LCV_FISH	1.08
Aluminum	W6MS1	44	45	0.042	1.05E+00	22	3.56E+00	4.7	LTV_FISH	0.76
Aluminum	West Seep	4	6	0.036	4.87E-02	0.991	5.22E-01	0.087	NAWQ_CHR	6.00
Aluminum	West Seep	4	6	0.036	4.87E-02	0.991	5.22E-01	0.46	LCV_AQPL	1.14
Aluminum	West Seep	4	6	0.036	4.87E-02	0.991	5.22E-01	0.54	LTV_DAPH	0.97
Aluminum	West Seep	4	6	0.036	4.87E-02	0.991	5.22E-01	0.75	NAWQ_ACU	0.70
Aluminum	West Seep	4	6	0.036	4.87E-02	0.991	5.22E-01	1.9	LCV_DAPH	0.27
Aluminum	West Seep	4	6	0.036	4.87E-02	0.991	5.22E-01	3.288	LCV_FISH	0.16
Aluminum	West Seep	4	6	0.036	4.87E-02	0.991	5.22E-01	4.7	LTV_FISH	0.11
Aluminum	WOC	60	69	0.011	9.65E-02	3.1	2.64E-01	0.087	NAWQ_CHR	3.04
Aluminum	WOC	60	69	0.011	9.65E-02	3.1	2.64E-01	0.46	LCV_AQPL	0.57
Aluminum	WOC	60	69	0.011	9.65E-02	3.1	2.64E-01	0.54	LTV_DAPH	0.49
Aluminum	WOC	60	69	0.011	9.65E-02	3.1	2.64E-01	0.75	NAWQ_ACU	0.35
Aluminum	WOC	60	69	0.011	9.65E-02	3.1	2.64E-01	1.9	LCV_DAPH	0.14
Aluminum	WOC	60	69	0.011	9.65E-02	3.1	2.64E-01	3.288	LCV_FISH	0.08
Aluminum	WOC	60	69	0.011	9.65E-02	3.1	2.64E-01	4.7	LTV_FISH	0.06
Ammonia	Lower WOC	77	85	0.02	4.90E-02	0.2	7.42E-02	0.0017	LCV_FISH	43.67
Ammonia	Lower WOC	77	85	0.02	4.90E-02	0.2	7.42E-02	0.45	NAWQ_CHR	0.16
Ammonia	Lower WOC	77	85	0.02	4.90E-02	0.2	7.42E-02	0.63	LCV_DAPH	0.12
Ammonia	Lower WOC	77	85	0.02	4.90E-02	0.2	7.42E-02	2.4	LCV_AQPL	0.03
Ammonia	Lower WOC	77	85	0.02	4.90E-02	0.2	7.42E-02	2.4	NAWQ_ACU	0.03
Ammonia	WOC	39	43	0.02	4.00E-02	0.187	5.88E-02	0.0017	LCV_FISH	34.57
Ammonia	WOC	39	43	0.02	4.00E-02	0.187	5.88E-02	0.45	NAWQ_CHR	0.13
Ammonia	WOC	39	43	0.02	4.00E-02	0.187	5.88E-02	0.63	LCV_DAPH	0.09
Ammonia	WOC	39	43	0.02	4.00E-02	0.187	5.88E-02	2.4	LCV_AQPL	0.02

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Ammonia	WOC	39	43	0.02	4.00E-02	0.187	5.88E-02	2.4	NAWQ_ACU	0.02
Barium	**HF-2**	**11**	**11**	**0.0322**	**5.62E-02**	**0.1**	**7.43E-02**	**0.004**	**S_CHR_V**	**18.58**
Barium	HF-2	11	11	0.0322	5.62E-02	0.1	7.43E-02	0.11	S_ACU_V	0.68
Barium	HF-2	11	11	0.0322	5.62E-02	0.1	7.43E-02	5.8	LCV_DAPH	0.01
Barium	**Lower WOC**	**60**	**62**	**0.033**	**4.58E-02**	**0.108**	**6.21E-02**	**0.004**	**S_CHR_V**	**15.52**
Barium	Lower WOC	60	62	0.033	4.58E-02	0.108	6.21E-02	0.11	S_ACU_V	0.56
Barium	Lower WOC	60	62	0.033	4.58E-02	0.108	6.21E-02	5.8	LCV_DAPH	0.01
Barium	**W6MS3**	**79**	**84**	**0.0029**	**6.11E-02**	**0.315**	**9.67E-02**	**0.004**	**S_CHR_V**	**24.17**
Barium	W6MS3	79	84	0.0029	6.11E-02	0.315	9.67E-02	0.11	S_ACU_V	0.88
Barium	W6MS3	79	84	0.0029	6.11E-02	0.315	9.67E-02	5.8	LCV_DAPH	0.02
Barium	**W6MS1**	**43**	**44**	**0.0162**	**4.29E-02**	**0.161**	**6.22E-02**	**0.004**	**S_CHR_V**	**15.54**
Barium	W6MS1	43	44	0.0162	4.29E-02	0.161	6.22E-02	0.11	S_ACU_V	0.57
Barium	W6MS1	43	44	0.0162	4.29E-02	0.161	6.22E-02	5.8	LCV_DAPH	0.01
Beryllium	HF-2	2	11	0.00018	5.00E-04	0.0004	5.25E-04	0.00066	S_CHR_V	0.80
Beryllium	HF-2	2	11	0.00018	5.00E-04	0.0004	5.25E-04	0.0038	LTV_DAPH	0.14
Beryllium	HF-2	2	11	0.00018	5.00E-04	0.0004	5.25E-04	0.0053	LCV_DAPH	0.10
Beryllium	HF-2	2	11	0.00018	5.00E-04	0.0004	5.25E-04	0.035	S_ACU_V	0.02
Beryllium	HF-2	2	11	0.00018	5.00E-04	0.0004	5.25E-04	0.057	LCV_FISH	0.01
Beryllium	HF-2	2	11	0.00018	5.00E-04	0.0004	5.25E-04	0.148	LTV_FISH	0.00
Beryllium	HF-2	2	11	0.00018	5.00E-04	0.0004	5.25E-04	100	LCV_AQPL	0.00
Beryllium	Intermediate Pond	2	13	0.00014	5.00E-04	0.0005	5.99E-04	0.00066	S_CHR_V	0.91
Beryllium	Intermediate Pond	2	13	0.00014	5.00E-04	0.0005	5.99E-04	0.0038	LTV_DAPH	0.16
Beryllium	Intermediate Pond	2	13	0.00014	5.00E-04	0.0005	5.99E-04	0.0053	LCV_DAPH	0.11
Beryllium	Intermediate Pond	2	13	0.00014	5.00E-04	0.0005	5.99E-04	0.035	S_ACU_V	0.02
Beryllium	Intermediate Pond	2	13	0.00014	5.00E-04	0.0005	5.99E-04	0.057	LCV_FISH	0.01
Beryllium	Intermediate Pond	2	13	0.00014	5.00E-04	0.0005	5.99E-04	0.148	LTV_FISH	0.00
Beryllium	Intermediate Pond	2	13	0.00014	5.00E-04	0.0005	5.99E-04	100	LCV_AQPL	0.00
Beryllium	Lower WOC	10	53	0.00016	5.00E-04	0.0015	5.94E-04	0.00066	S_CHR_V	0.90
Beryllium	Lower WOC	10	53	0.00016	5.00E-04	0.0015	5.94E-04	0.0038	LTV_DAPH	0.16
Beryllium	Lower WOC	10	53	0.00016	5.00E-04	0.0015	5.94E-04	0.0053	LCV_DAPH	0.11
Beryllium	Lower WOC	10	53	0.00016	5.00E-04	0.0015	5.94E-04	0.035	S_ACU_V	0.02
Beryllium	Lower WOC	10	53	0.00016	5.00E-04	0.0015	5.94E-04	0.057	LCV_FISH	0.01
Beryllium	Lower WOC	10	53	0.00016	5.00E-04	0.0015	5.94E-04	0.148	LTV_FISH	0.00
Beryllium	Lower WOC	10	53	0.00016	5.00E-04	0.0015	5.94E-04	100	LCV_AQPL	0.00
Beryllium	SWSA 5 SEEP A	1	10	0.00028	5.00E-04	0.00028	6.19E-04	0.00066	S_CHR_V	0.94
Beryllium	SWSA 5 SEEP A	1	10	0.00028	5.00E-04	0.00028	6.19E-04	0.0038	LTV_DAPH	0.16

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Beryllium	SWSA 5 SEEP A	1	10	0.00028	5.00E-04	0.00028	6.19E-04	0.0053	LCV_DAPH	0.12
Beryllium	SWSA 5 SEEP A	1	10	0.00028	5.00E-04	0.00028	6.19E-04	0.035	S_ACU_V	0.02
Beryllium	SWSA 5 SEEP A	1	10	0.00028	5.00E-04	0.00028	6.19E-04	0.057	LCV_FISH	0.01
Beryllium	SWSA 5 SEEP A	1	10	0.00028	5.00E-04	0.00028	6.19E-04	0.148	LTV_FISH	0.00
Beryllium	SWSA 5 SEEP A	1	10	0.00028	5.00E-04	0.00028	6.19E-04	100	LCV_AQPL	0.00
Beryllium	SWSA 5 SEEP C	2	3	0.00011	1.90E-04	0.00019	6.14E-04	0.00066	S_CHR_V	0.93
Beryllium	SWSA 5 SEEP C	2	3	0.00011	1.90E-04	0.00019	6.14E-04	0.0038	LTV_DAPH	0.16
Beryllium	SWSA 5 SEEP C	2	3	0.00011	1.90E-04	0.00019	6.14E-04	0.0053	LCV_DAPH	0.12
Beryllium	SWSA 5 SEEP C	2	3	0.00011	1.90E-04	0.00019	6.14E-04	0.035	S_ACU_V	0.02
Beryllium	SWSA 5 SEEP C	2	3	0.00011	1.90E-04	0.00019	6.14E-04	0.057	LCV_FISH	0.01
Beryllium	SWSA 5 SEEP C	2	3	0.00011	1.90E-04	0.00019	6.14E-04	0.148	LTV_FISH	0.00
Beryllium	SWSA 5 SEEP C	2	3	0.00011	1.90E-04	0.00019	6.14E-04	100	LCV_AQPL	0.00
Beryllium	**W6MS3**	**16**	**47**	**0.001**	**5.00E-04**	**0.0027**	**1.25E-03**	**0.00066**	**S_CHR_V**	**1.89**
Beryllium	W6MS3	16	47	0.001	5.00E-04	0.0027	1.25E-03	0.0038	LTV_DAPH	0.33
Beryllium	W6MS3	16	47	0.001	5.00E-04	0.0027	1.25E-03	0.0053	LCV_DAPH	0.24
Beryllium	W6MS3	16	47	0.001	5.00E-04	0.0027	1.25E-03	0.035	S_ACU_V	0.04
Beryllium	W6MS3	16	47	0.001	5.00E-04	0.0027	1.25E-03	0.057	LCV_FISH	0.02
Beryllium	W6MS3	16	47	0.001	5.00E-04	0.0027	1.25E-03	0.148	LTV_FISH	0.01
Beryllium	W6MS3	16	47	0.001	5.00E-04	0.0027	1.25E-03	100	LCV_AQPL	0.00
Beryllium	**West Seep**	**1**	**4**	**0.001**	**5.00E-04**	**0.001**	**9.19E-04**	**0.00066**	**S_CHR_V**	**1.39**
Beryllium	West Seep	1	4	0.001	5.00E-04	0.001	9.19E-04	0.0038	LTV_DAPH	0.24
Beryllium	West Seep	1	4	0.001	5.00E-04	0.001	9.19E-04	0.0053	LCV_DAPH	0.17
Beryllium	West Seep	1	4	0.001	5.00E-04	0.001	9.19E-04	0.035	S_ACU_V	0.03
Beryllium	West Seep	1	4	0.001	5.00E-04	0.001	9.19E-04	0.057	LCV_FISH	0.02
Beryllium	West Seep	1	4	0.001	5.00E-04	0.001	9.19E-04	0.148	LTV_FISH	0.01
Beryllium	West Seep	1	4	0.001	5.00E-04	0.001	9.19E-04	100	LCV_AQPL	0.00
Beryllium	WOC	5	20	0.00017	5.00E-04	0.0005	5.41E-04	0.00066	S_CHR_V	0.82
Beryllium	WOC	5	20	0.00017	5.00E-04	0.0005	5.41E-04	0.0038	LTV_DAPH	0.14
Beryllium	WOC	5	20	0.00017	5.00E-04	0.0005	5.41E-04	0.0053	LCV_DAPH	0.10
Beryllium	WOC	5	20	0.00017	5.00E-04	0.0005	5.41E-04	0.035	S_ACU_V	0.02
Beryllium	WOC	5	20	0.00017	5.00E-04	0.0005	5.41E-04	0.057	LCV_FISH	0.01
Beryllium	WOC	5	20	0.00017	5.00E-04	0.0005	5.41E-04	0.148	LTV_FISH	0.00
Beryllium	WOC	5	20	0.00017	5.00E-04	0.0005	5.41E-04	100	LCV_AQPL	0.00
Boron	**HF-2**	**4**	**10**	**0.033**	**2.95E-02**	**0.487**	**1.26E-01**	**0.0016**	**S_CHR_V**	**78.46**
Boron	**HF-2**	**4**	**10**	**0.033**	**2.95E-02**	**0.487**	**1.26E-01**	**0.03**	**S_ACU_V**	**4.18**
Boron	HF-2	4	10	0.033	2.95E-02	0.487	1.26E-01	7	LTV_DAPH	0.02

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Boron	HF-2	4	10	0.033	2.95E-02	0.487	1.26E-01	8.83	LCV_DAPH	0.01
Boron	**Intermediate Pond**	**5**	**15**	**0.0255**	**2.78E-02**	**0.0661**	**5.00E-02**	**0.0016**	**S_CHR_V**	**31.24**
Boron	**Intermediate Pond**	**5**	**15**	**0.0255**	**2.78E-02**	**0.0661**	**5.00E-02**	**0.03**	**S_ACU_V**	**1.67**
Boron	Intermediate Pond	5	15	0.0255	2.78E-02	0.0661	5.00E-02	7	LTV_DAPH	0.01
Boron	Intermediate Pond	5	15	0.0255	2.78E-02	0.0661	5.00E-02	8.83	LCV_DAPH	0.01
Boron	**Lower WOC**	**25**	**60**	**0.0292**	**3.55E-02**	**0.747**	**7.22E-02**	**0.0016**	**S_CHR_V**	**45.12**
Boron	**Lower WOC**	**25**	**60**	**0.0292**	**3.55E-02**	**0.747**	**7.22E-02**	**0.03**	**S_ACU_V**	**2.41**
Boron	Lower WOC	25	60	0.0292	3.55E-02	0.747	7.22E-02	7	LTV_DAPH	0.01
Boron	Lower WOC	25	60	0.0292	3.55E-02	0.747	7.22E-02	8.83	LCV_DAPH	0.01
Boron	**SWSA 5 SEEP A**	**4**	**10**	**0.0259**	**2.60E-02**	**0.06**	**5.04E-02**	**0.0016**	**S_CHR_V**	**31.47**
Boron	**SWSA 5 SEEP A**	**4**	**10**	**0.0259**	**2.60E-02**	**0.06**	**5.04E-02**	**0.03**	**S_ACU_V**	**1.68**
Boron	SWSA 5 SEEP A	4	10	0.0259	2.60E-02	0.06	5.04E-02	7	LTV_DAPH	0.01
Boron	SWSA 5 SEEP A	4	10	0.0259	2.60E-02	0.06	5.04E-02	8.83	LCV_DAPH	0.01
Boron	**SWSA 5 SEEP C**	**5**	**5**	**0.0417**	**4.62E-02**	**0.0864**	**7.33E-02**	**0.0016**	**S_CHR_V**	**45.79**
Boron	**SWSA 5 SEEP C**	**5**	**5**	**0.0417**	**4.62E-02**	**0.0864**	**7.33E-02**	**0.03**	**S_ACU_V**	**2.44**
Boron	SWSA 5 SEEP C	5	5	0.0417	4.62E-02	0.0864	7.33E-02	7	LTV_DAPH	0.01
Boron	SWSA 5 SEEP C	5	5	0.0417	4.62E-02	0.0864	7.33E-02	8.83	LCV_DAPH	0.01
Boron	**W6MS3**	**1**	**3**	**0.0394**	**3.94E-02**	**0.0394**	**1.06E-01**	**0.0016**	**S_CHR_V**	**65.95**
Boron	**W6MS3**	**1**	**3**	**0.0394**	**3.94E-02**	**0.0394**	**1.06E-01**	**0.03**	**S_ACU_V**	**3.52**
Boron	W6MS3	1	3	0.0394	3.94E-02	0.0394	1.06E-01	7	LTV_DAPH	0.02
Boron	W6MS3	1	3	0.0394	3.94E-02	0.0394	1.06E-01	8.83	LCV_DAPH	0.01
Boron	**W6MS1**	**2**	**3**	**0.0699**	**6.99E-02**	**0.0933**	**1.20E-01**	**0.0016**	**S_CHR_V**	**74.90**
Boron	**W6MS1**	**2**	**3**	**0.0699**	**6.99E-02**	**0.0933**	**1.20E-01**	**0.03**	**S_ACU_V**	**3.99**
Boron	W6MS1	2	3	0.0699	6.99E-02	0.0933	1.20E-01	7	LTV_DAPH	0.02
Boron	W6MS1	2	3	0.0699	6.99E-02	0.0933	1.20E-01	8.83	LCV_DAPH	0.01
Boron	**WOC**	**14**	**27**	**0.0204**	**2.63E-02**	**0.08**	**5.65E-02**	**0.0016**	**S_CHR_V**	**35.29**
Boron	**WOC**	**14**	**27**	**0.0204**	**2.63E-02**	**0.08**	**5.65E-02**	**0.03**	**S_ACU_V**	**1.88**
Boron	WOC	14	27	0.0204	2.63E-02	0.08	5.65E-02	7	LTV_DAPH	0.01
Boron	WOC	14	27	0.0204	2.63E-02	0.08	5.65E-02	8.83	LCV_DAPH	0.01
Cadmium	**Lower WOC**	**3**	**127**	**0.00006**	**2.50E-03**	**0.001**	**1.87E-03**	**0.00015**	**LCV_DAPH**	**12.44**
Cadmium	**Lower WOC**	**3**	**127**	**0.00006**	**2.50E-03**	**0.001**	**1.87E-03**	**0.00075**	**LTV_DAPH**	**2.49**
Cadmium	**Lower WOC**	**3**	**127**	**0.00006**	**2.50E-03**	**0.001**	**1.87E-03**	**0.0011**	**NAWQ_CHR**	**1.70**
Cadmium	**Lower WOC**	**3**	**127**	**0.00006**	**2.50E-03**	**0.001**	**1.87E-03**	**0.0017**	**LCV_FISH**	**1.10**
Cadmium	**Lower WOC**	**3**	**127**	**0.00006**	**2.50E-03**	**0.001**	**1.87E-03**	**0.0018**	**LTV_FISH**	**1.04**
Cadmium	Lower WOC	3	127	0.00006	2.50E-03	0.001	1.87E-03	0.002	LCV_AQPL	0.93
Cadmium	Lower WOC	3	127	0.00006	2.50E-03	0.001	1.87E-03	0.0039	NAWQ_ACU	0.48

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Cadmium	W6MS3	18	45	0.002	2.50E-03	0.0067	2.97E-03	0.00015	LCV_DAPH	19.77
Cadmium	W6MS3	18	45	0.002	2.50E-03	0.0067	2.97E-03	0.00075	LTV_DAPH	3.95
Cadmium	W6MS3	18	45	0.002	2.50E-03	0.0067	2.97E-03	0.0011	NAWQ_CHR	2.70
Cadmium	W6MS3	18	45	0.002	2.50E-03	0.0067	2.97E-03	0.0017	LCV_FISH	1.74
Cadmium	W6MS3	18	45	0.002	2.50E-03	0.0067	2.97E-03	0.0018	LTV_FISH	1.65
Cadmium	W6MS3	18	45	0.002	2.50E-03	0.0067	2.97E-03	0.002	LCV_AQPL	1.48
Cadmium	W6MS3	18	45	0.002	2.50E-03	0.0067	2.97E-03	0.0039	NAWQ_ACU	0.76
Cadmium	W6MS1	5	18	0.002	2.40E-03	0.0246	4.07E-03	0.00015	LCV_DAPH	27.10
Cadmium	W6MS1	5	18	0.002	2.40E-03	0.0246	4.07E-03	0.00075	LTV_DAPH	5.42
Cadmium	W6MS1	5	18	0.002	2.40E-03	0.0246	4.07E-03	0.0011	NAWQ_CHR	3.70
Cadmium	W6MS1	5	18	0.002	2.40E-03	0.0246	4.07E-03	0.0017	LCV_FISH	2.39
Cadmium	W6MS1	5	18	0.002	2.40E-03	0.0246	4.07E-03	0.0018	LTV_FISH	2.26
Cadmium	W6MS1	5	18	0.002	2.40E-03	0.0246	4.07E-03	0.002	LCV_AQPL	2.03
Cadmium	W6MS1	5	18	0.002	2.40E-03	0.0246	4.07E-03	0.0039	NAWQ_ACU	1.04
Cadmium	West Seep	2	5	0.002	1.00E-03	0.0028	2.34E-03	0.00015	LCV_DAPH	15.59
Cadmium	West Seep	2	5	0.002	1.00E-03	0.0028	2.34E-03	0.00075	LTV_DAPH	3.12
Cadmium	West Seep	2	5	0.002	1.00E-03	0.0028	2.34E-03	0.0011	NAWQ_CHR	2.13
Cadmium	West Seep	2	5	0.002	1.00E-03	0.0028	2.34E-03	0.0017	LCV_FISH	1.38
Cadmium	West Seep	2	5	0.002	1.00E-03	0.0028	2.34E-03	0.0018	LTV_FISH	1.30
Cadmium	West Seep	2	5	0.002	1.00E-03	0.0028	2.34E-03	0.002	LCV_AQPL	1.17
Cadmium	West Seep	2	5	0.002	1.00E-03	0.0028	2.34E-03	0.0039	NAWQ_ACU	0.60
Cadmium	WOC	1	57	0.00005	2.50E-03	0.00005	2.02E-03	0.00015	LCV_DAPH	13.50
Cadmium	WOC	1	57	0.00005	2.50E-03	0.00005	2.02E-03	0.00075	LTV_DAPH	2.70
Cadmium	WOC	1	57	0.00005	2.50E-03	0.00005	2.02E-03	0.0011	NAWQ_CHR	1.84
Cadmium	WOC	1	57	0.00005	2.50E-03	0.00005	2.02E-03	0.0017	LCV_FISH	1.19
Cadmium	WOC	1	57	0.00005	2.50E-03	0.00005	2.02E-03	0.0018	LTV_FISH	1.12
Cadmium	WOC	1	57	0.00005	2.50E-03	0.00005	2.02E-03	0.002	LCV_AQPL	1.01
Cadmium	WOC	1	57	0.00005	2.50E-03	0.00005	2.02E-03	0.0039	NAWQ_ACU	0.52
Cadmium	WOCE	2	2	0.00036	9.30E-04	0.0024	7.82E-03	0.00015	LCV_DAPH	52.13
Cadmium	WOCE	2	2	0.00036	9.30E-04	0.0024	7.82E-03	0.00075	LTV_DAPH	10.43
Cadmium	WOCE	2	2	0.00036	9.30E-04	0.0024	7.82E-03	0.0011	NAWQ_CHR	7.11
Cadmium	WOCE	2	2	0.00036	9.30E-04	0.0024	7.82E-03	0.0017	LCV_FISH	4.60
Cadmium	WOCE	2	2	0.00036	9.30E-04	0.0024	7.82E-03	0.0018	LTV_FISH	4.34
Cadmium	WOCE	2	2	0.00036	9.30E-04	0.0024	7.82E-03	0.002	LCV_AQPL	3.91
Cadmium	WOCE	2	2	0.00036	9.30E-04	0.0024	7.82E-03	0.0039	NAWQ_ACU	2.01
Cobalt	HF-2	1	11	0.0053	4.00E-03	0.0053	4.53E-03	0.0044	LTV_DAPH	1.03

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Cobalt	HF-2	1	11	0.0053	4.00E-03	0.0053	4.53E-03	0.0051	LCV_DAPH	0.89
Cobalt	HF-2	1	11	0.0053	4.00E-03	0.0053	4.53E-03	0.023	S_CHR_V	0.20
Cobalt	HF-2	1	11	0.0053	4.00E-03	0.0053	4.53E-03	0.29	LCV_FISH	0.02
Cobalt	HF-2	1	11	0.0053	4.00E-03	0.0053	4.53E-03	0.81	LTV_FISH	0.01
Cobalt	HF-2	1	11	0.0053	4.00E-03	0.0053	4.53E-03	1.5	S_ACU_V	0.00
Cobalt	Lower WOC	3	55	0.0022	3.50E-03	0.0114	3.72E-03	0.0044	LTV_DAPH	0.85
Cobalt	Lower WOC	3	55	0.0022	3.50E-03	0.0114	3.72E-03	0.0051	LCV_DAPH	0.73
Cobalt	Lower WOC	3	55	0.0022	3.50E-03	0.0114	3.72E-03	0.023	S_CHR_V	0.16
Cobalt	Lower WOC	3	55	0.0022	3.50E-03	0.0114	3.72E-03	0.29	LCV_FISH	0.01
Cobalt	Lower WOC	3	55	0.0022	3.50E-03	0.0114	3.72E-03	0.81	LTV_FISH	0.00
Cobalt	Lower WOC	3	55	0.0022	3.50E-03	0.0114	3.72E-03	1.5	S_ACU_V	0.00
Cobalt	SWSA 5 SEEP A	1	10	0.0019	3.24E-03	0.0019	4.15E-03	0.0044	LTV_DAPH	0.94
Cobalt	SWSA 5 SEEP A	1	10	0.0019	3.24E-03	0.0019	4.15E-03	0.0051	LCV_DAPH	0.81
Cobalt	SWSA 5 SEEP A	1	10	0.0019	3.24E-03	0.0019	4.15E-03	0.023	S_CHR_V	0.18
Cobalt	SWSA 5 SEEP A	1	10	0.0019	3.24E-03	0.0019	4.15E-03	0.29	LCV_FISH	0.01
Cobalt	SWSA 5 SEEP A	1	10	0.0019	3.24E-03	0.0019	4.15E-03	0.81	LTV_FISH	0.01
Cobalt	SWSA 5 SEEP A	1	10	0.0019	3.24E-03	0.0019	4.15E-03	1.5	S_ACU_V	0.00
Cobalt	**W6MS3**	**4**	**36**	**0.0104**	**5.00E-03**	**0.037**	**1.09E-02**	**0.0044**	**LTV_DAPH**	**2.48**
Cobalt	**W6MS3**	**4**	**36**	**0.0104**	**5.00E-03**	**0.037**	**1.09E-02**	**0.0051**	**LCV_DAPH**	**2.14**
Cobalt	W6MS3	4	36	0.0104	5.00E-03	0.037	1.09E-02	0.023	S_CHR_V	0.47
Cobalt	W6MS3	4	36	0.0104	5.00E-03	0.037	1.09E-02	0.29	LCV_FISH	0.04
Cobalt	W6MS3	4	36	0.0104	5.00E-03	0.037	1.09E-02	0.81	LTV_FISH	0.01
Cobalt	W6MS3	4	36	0.0104	5.00E-03	0.037	1.09E-02	1.5	S_ACU_V	0.01
Cobalt	**W6MS1**	**3**	**16**	**0.00793**	**8.91E-03**	**0.025**	**1.42E-02**	**0.0044**	**LTV_DAPH**	**3.22**
Cobalt	**W6MS1**	**3**	**16**	**0.00793**	**8.91E-03**	**0.025**	**1.42E-02**	**0.0051**	**LCV_DAPH**	**2.78**
Cobalt	W6MS1	3	16	0.00793	8.91E-03	0.025	1.42E-02	0.023	S_CHR_V	0.62
Cobalt	W6MS1	3	16	0.00793	8.91E-03	0.025	1.42E-02	0.29	LCV_FISH	0.05
Cobalt	W6MS1	3	16	0.00793	8.91E-03	0.025	1.42E-02	0.81	LTV_FISH	0.02
Cobalt	W6MS1	3	16	0.00793	8.91E-03	0.025	1.42E-02	1.5	S_ACU_V	0.01
Copper	**HF-2**	**7**	**11**	**0.0021**	**5.00E-03**	**0.0298**	**1.75E-02**	**0.000205**	**LTV_DAPH**	**85.39**
Copper	**HF-2**	**7**	**11**	**0.0021**	**5.00E-03**	**0.0298**	**1.75E-02**	**0.00023**	**LCV_DAPH**	**76.11**
Copper	**HF-2**	**7**	**11**	**0.0021**	**5.00E-03**	**0.0298**	**1.75E-02**	**0.001**	**LCV_AQPL**	**17.51**
Copper	**HF-2**	**7**	**11**	**0.0021**	**5.00E-03**	**0.0298**	**1.75E-02**	**0.0038**	**LCV_FISH**	**4.61**
Copper	**HF-2**	**7**	**11**	**0.0021**	**5.00E-03**	**0.0298**	**1.75E-02**	**0.005**	**LTV_FISH**	**3.50**
Copper	**HF-2**	**7**	**11**	**0.0021**	**5.00E-03**	**0.0298**	**1.75E-02**	**0.006066**	**LCV_NDI**	**2.89**
Copper	**HF-2**	**7**	**11**	**0.0021**	**5.00E-03**	**0.0298**	**1.75E-02**	**0.012**	**NAWQ_CHR**	**1.46**

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Copper	HF-2	7	11	0.0021	5.00E-03	0.0298	1.75E-02	0.018	NAWQ_ACU	0.97
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.000205	LTV_DAPH	38.41
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.00023	LCV_DAPH	34.24
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.001	LCV_AQPL	7.87
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.0038	LCV_FISH	2.07
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.005	LTV_FISH	1.57
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.006066	LCV_NDI	1.30
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.012	NAWQ_CHR	0.66
Copper	Intermediate Pond	7	14	0.004	4.20E-03	0.0167	7.87E-03	0.018	NAWQ_ACU	0.44
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.000205	LTV_DAPH	30.21
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.00023	LCV_DAPH	26.92
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.001	LCV_AQPL	6.19
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.0038	LCV_FISH	1.63
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.005	LTV_FISH	1.24
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.006066	LCV_NDI	1.02
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.012	NAWQ_CHR	0.52
Copper	Lower WOC	58	147	0.002	3.50E-03	0.079	6.19E-03	0.018	NAWQ_ACU	0.34
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.000205	LTV_DAPH	13.33
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.00023	LCV_DAPH	11.88
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.001	LCV_AQPL	2.73
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.0038	LCV_FISH	0.72
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.005	LTV_FISH	0.55
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.006066	LCV_NDI	0.45
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.012	NAWQ_CHR	0.23
Copper	SWSA 5 SEEP A	1	10	0.0022	2.00E-03	0.0022	2.73E-03	0.018	NAWQ_ACU	0.15
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.000205	LTV_DAPH	25.88
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.00023	LCV_DAPH	23.07
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.001	LCV_AQPL	5.31
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.0038	LCV_FISH	1.40
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.005	LTV_FISH	1.06
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.006066	LCV_NDI	0.87
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.012	NAWQ_CHR	0.44
Copper	SWSA 5 SEEP C	3	4	0.0036	3.75E-03	0.0049	5.31E-03	0.018	NAWQ_ACU	0.29
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.000205	LTV_DAPH	205.97
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.00023	LCV_DAPH	183.58
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.001	LCV_AQPL	42.22

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.0038	LCV_FISH	11.11
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.005	LTV_FISH	8.44
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.006066	LCV_NDI	6.96
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.012	NAWQ_CHR	3.52
Copper	SWSA 5 WOC	1	2	0.0126	4.27E-03	0.0126	4.22E-02	0.018	NAWQ_ACU	2.35
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.000205	LTV_DAPH	110.64
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.00023	LCV_DAPH	98.62
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.001	LCV_AQPL	22.68
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.0038	LCV_FISH	5.97
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.005	LTV_FISH	4.54
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.006066	LCV_NDI	3.74
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.012	NAWQ_CHR	1.89
Copper	W6MS3	41	63	0.0033	1.18E-02	0.0883	2.27E-02	0.018	NAWQ_ACU	1.26
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.000205	LTV_DAPH	70.77
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.00023	LCV_DAPH	63.08
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.001	LCV_AQPL	14.51
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.0038	LCV_FISH	3.82
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.005	LTV_FISH	2.90
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.006066	LCV_NDI	2.39
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.012	NAWQ_CHR	1.21
Copper	W6MS1	10	21	0.0033	5.00E-03	0.04	1.45E-02	0.018	NAWQ_ACU	0.81
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.000205	LTV_DAPH	44.84
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.00023	LCV_DAPH	39.96
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.001	LCV_AQPL	9.19
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.0038	LCV_FISH	2.42
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.005	LTV_FISH	1.84
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.006066	LCV_NDI	1.52
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.012	NAWQ_CHR	0.77
Copper	West Seep	1	4	0.01	5.00E-03	0.01	9.19E-03	0.018	NAWQ_ACU	0.51
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.000205	LTV_DAPH	24.36
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.00023	LCV_DAPH	21.72
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.001	LCV_AQPL	4.99
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.0038	LCV_FISH	1.31
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.005	LTV_FISH	1.00
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.006066	LCV_NDI	0.82
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.012	NAWQ_CHR	0.42

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Copper	WOC	18	66	0.0029	3.50E-03	0.0176	4.99E-03	0.018	NAWQ_ACU	0.28
Iron	HFIR South	1	1	0.832	.	0.832	8.32E-01	0.016	LTV_DAPH	52.00
Iron	HFIR South	1	1	0.832	.	0.832	8.32E-01	0.158	LCV_DAPH	5.27
Iron	HFIR South	1	1	0.832	.	0.832	8.32E-01	1	NAWQ_CHR	0.83
Iron	HFIR South	1	1	0.832	.	0.832	8.32E-01	1.3	LCV_FISH	0.64
Iron	Intermediate Pond	8	15	0.0995	9.95E-02	1.13	2.24E-01	0.016	LTV_DAPH	13.97
Iron	Intermediate Pond	8	15	0.0995	9.95E-02	1.13	2.24E-01	0.158	LCV_DAPH	1.42
Iron	Intermediate Pond	8	15	0.0995	9.95E-02	1.13	2.24E-01	1	NAWQ_CHR	0.22
Iron	Intermediate Pond	8	15	0.0995	9.95E-02	1.13	2.24E-01	1.3	LCV_FISH	0.17
Iron	Lower WOC	139	148	0.0112	4.33E-01	11	1.01E+00	0.016	LTV_DAPH	62.89
Iron	Lower WOC	139	148	0.0112	4.33E-01	11	1.01E+00	0.158	LCV_DAPH	6.37
Iron	Lower WOC	139	148	0.0112	4.33E-01	11	1.01E+00	1	NAWQ_CHR	1.01
Iron	Lower WOC	139	148	0.0112	4.33E-01	11	1.01E+00	1.3	LCV_FISH	0.77
Iron	SWSA 6 East	2	2	0.665	1.90E+00	5.45	1.82E+01	0.016	LTV_DAPH	1135.20
Iron	SWSA 6 East	2	2	0.665	1.90E+00	5.45	1.82E+01	0.158	LCV_DAPH	114.96
Iron	SWSA 6 East	2	2	0.665	1.90E+00	5.45	1.82E+01	1	NAWQ_CHR	18.16
Iron	SWSA 6 East	2	2	0.665	1.90E+00	5.45	1.82E+01	1.3	LCV_FISH	13.97
Iron	W6MS3	74	82	0.01	6.15E-01	57.9	3.94E+00	0.016	LTV_DAPH	246.44
Iron	W6MS3	74	82	0.01	6.15E-01	57.9	3.94E+00	0.158	LCV_DAPH	24.96
Iron	W6MS3	74	82	0.01	6.15E-01	57.9	3.94E+00	1	NAWQ_CHR	3.94
Iron	W6MS3	74	82	0.01	6.15E-01	57.9	3.94E+00	1.3	LCV_FISH	3.03
Iron	W6MS1	43	44	0.0285	9.01E-01	26.7	3.30E+00	0.016	LTV_DAPH	206.56
Iron	W6MS1	43	44	0.0285	9.01E-01	26.7	3.30E+00	0.158	LCV_DAPH	20.92
Iron	W6MS1	43	44	0.0285	9.01E-01	26.7	3.30E+00	1	NAWQ_CHR	3.30
Iron	W6MS1	43	44	0.0285	9.01E-01	26.7	3.30E+00	1.3	LCV_FISH	2.54
Iron	West Seep	6	6	0.023	4.91E-02	1.08	6.03E-01	0.016	LTV_DAPH	37.70
Iron	West Seep	6	6	0.023	4.91E-02	1.08	6.03E-01	0.158	LCV_DAPH	3.82
Iron	West Seep	6	6	0.023	4.91E-02	1.08	6.03E-01	1	NAWQ_CHR	0.60
Iron	West Seep	6	6	0.023	4.91E-02	1.08	6.03E-01	1.3	LCV_FISH	0.46
Iron	WOC	58	67	0.069	1.40E-01	3.7	3.24E-01	0.016	LTV_DAPH	20.23
Iron	WOC	58	67	0.069	1.40E-01	3.7	3.24E-01	0.158	LCV_DAPH	2.05
Iron	WOC	58	67	0.069	1.40E-01	3.7	3.24E-01	1	NAWQ_CHR	0.32
Iron	WOC	58	67	0.069	1.40E-01	3.7	3.24E-01	1.3	LCV_FISH	0.25
Lead	W6MS3	45	69	0.002	3.20E-03	0.35612	9.63E-03	0.0032	NAWQ_CHR	3.01
Lead	W6MS3	45	69	0.002	3.20E-03	0.35612	9.63E-03	0.01226	LCV_DAPH	0.79
Lead	W6MS3	45	69	0.002	3.20E-03	0.35612	9.63E-03	0.01888	LCV_FISH	0.51

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Lead	W6MS3	45	69	0.002	3.20E-03	0.35612	9.63E-03	0.022	LTV_FISH	0.44
Lead	W6MS3	45	69	0.002	3.20E-03	0.35612	9.63E-03	0.02546	LCV_NDI	0.38
Lead	W6MS3	45	69	0.002	3.20E-03	0.35612	9.63E-03	0.082	NAWQ_ACU	0.12
Lead	W6MS3	45	69	0.002	3.20E-03	0.35612	9.63E-03	0.5	LCV_AQPL	0.02
Lead	**W6MS1**	**24**	**32**	**0.0021**	**3.43E-03**	**0.0179**	**9.23E-03**	**0.0032**	**NAWQ_CHR**	**2.89**
Lead	W6MS1	24	32	0.0021	3.43E-03	0.0179	9.23E-03	0.01226	LCV_DAPH	0.75
Lead	W6MS1	24	32	0.0021	3.43E-03	0.0179	9.23E-03	0.01888	LCV_FISH	0.49
Lead	W6MS1	24	32	0.0021	3.43E-03	0.0179	9.23E-03	0.022	LTV_FISH	0.42
Lead	W6MS1	24	32	0.0021	3.43E-03	0.0179	9.23E-03	0.02546	LCV_NDI	0.36
Lead	W6MS1	24	32	0.0021	3.43E-03	0.0179	9.23E-03	0.082	NAWQ_ACU	0.11
Lead	W6MS1	24	32	0.0021	3.43E-03	0.0179	9.23E-03	0.5	LCV_AQPL	0.02
Lead	**WOC**	**1**	**57**	**0.058**	**2.50E-02**	**0.058**	**2.00E-02**	**0.0032**	**NAWQ_CHR**	**6.24**
Lead	**WOC**	**1**	**57**	**0.058**	**2.50E-02**	**0.058**	**2.00E-02**	**0.01226**	**LCV_DAPH**	**1.63**
Lead	**WOC**	**1**	**57**	**0.058**	**2.50E-02**	**0.058**	**2.00E-02**	**0.01888**	**LCV_FISH**	**1.06**
Lead	WOC	1	57	0.058	2.50E-02	0.058	2.00E-02	0.022	LTV_FISH	0.91
Lead	WOC	1	57	0.058	2.50E-02	0.058	2.00E-02	0.02546	LCV_NDI	0.78
Lead	WOC	1	57	0.058	2.50E-02	0.058	2.00E-02	0.082	NAWQ_ACU	0.24
Lead	WOC	1	57	0.058	2.50E-02	0.058	2.00E-02	0.5	LCV_AQPL	0.04
Lithium	Lower WOC	2	2	0.0032	3.71E-03	0.0043	7.22E-03	0.014	S_CHR_V	0.52
Lithium	Lower WOC	2	2	0.0032	3.71E-03	0.0043	7.22E-03	0.26	S_ACU_V	0.03
Lithium	**SWSA 5 WOC**	**1**	**1**	**0.2**	**.**	**0.2**	**2.00E-01**	**0.014**	**S_CHR_V**	**14.29**
Lithium	SWSA 5 WOC	1	1	0.2	.	0.2	2.00E-01	0.26	S_ACU_V	0.77
Manganese	**Lower WOC**	**141**	**142**	**0.017**	**1.10E-01**	**8.82**	**1.96E-01**	**0.12**	**S_CHR_V**	**1.63**
Manganese	Lower WOC	141	142	0.017	1.10E-01	8.82	1.96E-01	1.1	LCV_DAPH	0.18
Manganese	Lower WOC	141	142	0.017	1.10E-01	8.82	1.96E-01	1.1	LTV_DAPH	0.18
Manganese	Lower WOC	141	142	0.017	1.10E-01	8.82	1.96E-01	1.27	LTV_FISH	0.15
Manganese	Lower WOC	141	142	0.017	1.10E-01	8.82	1.96E-01	1.78	LCV_FISH	0.11
Manganese	Lower WOC	141	142	0.017	1.10E-01	8.82	1.96E-01	2.3	S_ACU_V	0.09
Manganese	**W6MS3**	**71**	**81**	**0.002**	**1.73E-01**	**6.34**	**5.38E-01**	**0.12**	**S_CHR_V**	**4.48**
Manganese	W6MS3	71	81	0.002	1.73E-01	6.34	5.38E-01	1.1	LCV_DAPH	0.49
Manganese	W6MS3	71	81	0.002	1.73E-01	6.34	5.38E-01	1.1	LTV_DAPH	0.49
Manganese	W6MS3	71	81	0.002	1.73E-01	6.34	5.38E-01	1.27	LTV_FISH	0.42
Manganese	W6MS3	71	81	0.002	1.73E-01	6.34	5.38E-01	1.78	LCV_FISH	0.30
Manganese	W6MS3	71	81	0.002	1.73E-01	6.34	5.38E-01	2.3	S_ACU_V	0.23
Manganese	**W6MS1**	**43**	**44**	**0.0035**	**8.98E-02**	**2.76**	**2.53E-01**	**0.12**	**S_CHR_V**	**2.11**
Manganese	W6MS1	43	44	0.0035	8.98E-02	2.76	2.53E-01	1.1	LCV_DAPH	0.23

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Manganese	W6MS1	43	44	0.0035	8.98E-02	2.76	2.53E-01	1.1	LTV_DAPH	0.23
Manganese	W6MS1	43	44	0.0035	8.98E-02	2.76	2.53E-01	1.27	LTV_FISH	0.20
Manganese	W6MS1	43	44	0.0035	8.98E-02	2.76	2.53E-01	1.78	LCV_FISH	0.14
Manganese	W6MS1	43	44	0.0035	8.98E-02	2.76	2.53E-01	2.3	S_ACU_V	0.11
Manganese	WOC	66	68	0.0015	2.79E-02	0.29	4.24E-02	0.12	S_CHR_V	0.35
Manganese	WOC	66	68	0.0015	2.79E-02	0.29	4.24E-02	1.1	LCV_DAPH	0.04
Manganese	WOC	66	68	0.0015	2.79E-02	0.29	4.24E-02	1.1	LTV_DAPH	0.04
Manganese	WOC	66	68	0.0015	2.79E-02	0.29	4.24E-02	1.27	LTV_FISH	0.03
Manganese	WOC	66	68	0.0015	2.79E-02	0.29	4.24E-02	1.78	LCV_FISH	0.02
Manganese	WOC	66	68	0.0015	2.79E-02	0.29	4.24E-02	2.3	S_ACU_V	0.02
Mercury	**HF-2**	**1**	**8**	**0.134**	**1.00E-04**	**0.134**	**1.83E-01**	**0.00023**	**LCV_FISH**	**794.79**
Mercury	**HF-2**	**1**	**8**	**0.134**	**1.00E-04**	**0.134**	**1.83E-01**	**0.00087**	**LTV_DAPH**	**210.12**
Mercury	**HF-2**	**1**	**8**	**0.134**	**1.00E-04**	**0.134**	**1.83E-01**	**0.00087**	**LTV_FISH**	**210.12**
Mercury	**HF-2**	**1**	**8**	**0.134**	**1.00E-04**	**0.134**	**1.83E-01**	**0.00096**	**LCV_DAPH**	**190.42**
Mercury	**HF-2**	**1**	**8**	**0.134**	**1.00E-04**	**0.134**	**1.83E-01**	**0.0013**	**S_CHR_V**	**140.62**
Mercury	**HF-2**	**1**	**8**	**0.134**	**1.00E-04**	**0.134**	**1.83E-01**	**0.0024**	**NAWQ_ACU**	**76.17**
Mercury	**HF-2**	**1**	**8**	**0.134**	**1.00E-04**	**0.134**	**1.83E-01**	**0.005**	**LCV_AQPL**	**36.56**
Mercury	Lower WOC	33	120	0.00005	6.35E-05	0.00084	9.40E-05	0.00023	LCV_FISH	0.41
Mercury	Lower WOC	33	120	0.00005	6.35E-05	0.00084	9.40E-05	0.00087	LTV_DAPH	0.11
Mercury	Lower WOC	33	120	0.00005	6.35E-05	0.00084	9.40E-05	0.00087	LTV_FISH	0.11
Mercury	Lower WOC	33	120	0.00005	6.35E-05	0.00084	9.40E-05	0.00096	LCV_DAPH	0.10
Mercury	Lower WOC	33	120	0.00005	6.35E-05	0.00084	9.40E-05	0.0013	S_CHR_V	0.07
Mercury	Lower WOC	33	120	0.00005	6.35E-05	0.00084	9.40E-05	0.0024	NAWQ_ACU	0.04
Mercury	Lower WOC	33	120	0.00005	6.35E-05	0.00084	9.40E-05	0.005	LCV_AQPL	0.02
Mercury	**SWSA 6 East**	**1**	**2**	**0.0003**	**1.73E-04**	**0.0003**	**8.31E-04**	**0.00023**	**LCV_FISH**	**3.61**
Mercury	SWSA 6 East	1	2	0.0003	1.73E-04	0.0003	8.31E-04	0.00087	LTV_DAPH	0.96
Mercury	SWSA 6 East	1	2	0.0003	1.73E-04	0.0003	8.31E-04	0.00087	LTV_FISH	0.96
Mercury	SWSA 6 East	1	2	0.0003	1.73E-04	0.0003	8.31E-04	0.00096	LCV_DAPH	0.87
Mercury	SWSA 6 East	1	2	0.0003	1.73E-04	0.0003	8.31E-04	0.0013	S_CHR_V	0.64
Mercury	SWSA 6 East	1	2	0.0003	1.73E-04	0.0003	8.31E-04	0.0024	NAWQ_ACU	0.35
Mercury	SWSA 6 East	1	2	0.0003	1.73E-04	0.0003	8.31E-04	0.005	LCV_AQPL	0.17
Mercury	**W6MS3**	**9**	**35**	**0.00023**	**1.00E-04**	**0.00073**	**2.69E-04**	**0.00023**	**LCV_FISH**	**1.17**
Mercury	W6MS3	9	35	0.00023	1.00E-04	0.00073	2.69E-04	0.00087	LTV_DAPH	0.31
Mercury	W6MS3	9	35	0.00023	1.00E-04	0.00073	2.69E-04	0.00087	LTV_FISH	0.31
Mercury	W6MS3	9	35	0.00023	1.00E-04	0.00073	2.69E-04	0.00096	LCV_DAPH	0.28
Mercury	W6MS3	9	35	0.00023	1.00E-04	0.00073	2.69E-04	0.0013	S_CHR_V	0.21

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Mercury	W6MS3	9	35	0.00023	1.00E-04	0.00073	2.69E-04	0.0024	NAWQ_ACU	0.11
Mercury	W6MS3	9	35	0.00023	1.00E-04	0.00073	2.69E-04	0.005	LCV_AQPL	0.05
Mercury	**W6MS1**	**6**	**19**	**0.0002**	**1.00E-04**	**0.0047**	**4.06E-04**	**0.00023**	**LCV_FISH**	**1.77**
Mercury	W6MS1	6	19	0.0002	1.00E-04	0.0047	4.06E-04	0.00087	LTV_DAPH	0.47
Mercury	W6MS1	6	19	0.0002	1.00E-04	0.0047	4.06E-04	0.00087	LTV_FISH	0.47
Mercury	W6MS1	6	19	0.0002	1.00E-04	0.0047	4.06E-04	0.00096	LCV_DAPH	0.42
Mercury	W6MS1	6	19	0.0002	1.00E-04	0.0047	4.06E-04	0.0013	S_CHR_V	0.31
Mercury	W6MS1	6	19	0.0002	1.00E-04	0.0047	4.06E-04	0.0024	NAWQ_ACU	0.17
Mercury	W6MS1	6	19	0.0002	1.00E-04	0.0047	4.06E-04	0.005	LCV_AQPL	0.08
Mercury	WOC	15	56	0.000057	5.85E-05	0.00037	7.48E-05	0.00023	LCV_FISH	0.33
Mercury	WOC	15	56	0.000057	5.85E-05	0.00037	7.48E-05	0.00087	LTV_DAPH	0.09
Mercury	WOC	15	56	0.000057	5.85E-05	0.00037	7.48E-05	0.00087	LTV_FISH	0.09
Mercury	WOC	15	56	0.000057	5.85E-05	0.00037	7.48E-05	0.00096	LCV_DAPH	0.08
Mercury	WOC	15	56	0.000057	5.85E-05	0.00037	7.48E-05	0.0013	S_CHR_V	0.06
Mercury	WOC	15	56	0.000057	5.85E-05	0.00037	7.48E-05	0.0024	NAWQ_ACU	0.03
Mercury	WOC	15	56	0.000057	5.85E-05	0.00037	7.48E-05	0.005	LCV_AQPL	0.01
Nickel	**Lower WOC**	**11**	**141**	**0.0062**	**5.00E-03**	**0.0201**	**6.81E-03**	**0.005**	**LCV_AQPL**	**1.36**
Nickel	**Lower WOC**	**11**	**141**	**0.0062**	**5.00E-03**	**0.0201**	**6.81E-03**	**0.005**	**LCV_DAPH**	**1.36**
Nickel	Lower WOC	11	141	0.0062	5.00E-03	0.0201	6.81E-03	0.035	LCV_FISH	0.19
Nickel	Lower WOC	11	141	0.0062	5.00E-03	0.0201	6.81E-03	0.045	LTV_DAPH	0.15
Nickel	Lower WOC	11	141	0.0062	5.00E-03	0.0201	6.81E-03	0.062	LTV_FISH	0.11
Nickel	Lower WOC	11	141	0.0062	5.00E-03	0.0201	6.81E-03	0.1284	LCV_NDI	0.05
Nickel	Lower WOC	11	141	0.0062	5.00E-03	0.0201	6.81E-03	0.16	NAWQ_CHR	0.04
Nickel	Lower WOC	11	141	0.0062	5.00E-03	0.0201	6.81E-03	1.4	NAWQ_ACU	0.00
Nickel	**SWSA 5 SEEP C**	**1**	**3**	**0.0067**	**4.00E-03**	**0.0067**	**8.03E-03**	**0.005**	**LCV_AQPL**	**1.61**
Nickel	**SWSA 5 SEEP C**	**1**	**3**	**0.0067**	**4.00E-03**	**0.0067**	**8.03E-03**	**0.005**	**LCV_DAPH**	**1.61**
Nickel	SWSA 5 SEEP C	1	3	0.0067	4.00E-03	0.0067	8.03E-03	0.035	LCV_FISH	0.23
Nickel	SWSA 5 SEEP C	1	3	0.0067	4.00E-03	0.0067	8.03E-03	0.045	LTV_DAPH	0.18
Nickel	SWSA 5 SEEP C	1	3	0.0067	4.00E-03	0.0067	8.03E-03	0.062	LTV_FISH	0.13
Nickel	SWSA 5 SEEP C	1	3	0.0067	4.00E-03	0.0067	8.03E-03	0.1284	LCV_NDI	0.06
Nickel	SWSA 5 SEEP C	1	3	0.0067	4.00E-03	0.0067	8.03E-03	0.16	NAWQ_CHR	0.05
Nickel	SWSA 5 SEEP C	1	3	0.0067	4.00E-03	0.0067	8.03E-03	1.4	NAWQ_ACU	0.01
Nickel	**SWSA 5 Trib 1**	**1**	**2**	**0.0052**	**2.97E-03**	**0.0052**	**1.45E-02**	**0.005**	**LCV_AQPL**	**2.90**
Nickel	**SWSA 5 Trib 1**	**1**	**2**	**0.0052**	**2.97E-03**	**0.0052**	**1.45E-02**	**0.005**	**LCV_DAPH**	**2.90**
Nickel	SWSA 5 Trib 1	1	2	0.0052	2.97E-03	0.0052	1.45E-02	0.035	LCV_FISH	0.41
Nickel	SWSA 5 Trib 1	1	2	0.0052	2.97E-03	0.0052	1.45E-02	0.045	LTV_DAPH	0.32

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Nickel	SWSA 5 Trib 1	1	2	0.0052	2.97E-03	0.0052	1.45E-02	0.062	LTV_FISH	0.23
Nickel	SWSA 5 Trib 1	1	2	0.0052	2.97E-03	0.0052	1.45E-02	0.1284	LCV_NDI	0.11
Nickel	SWSA 5 Trib 1	1	2	0.0052	2.97E-03	0.0052	1.45E-02	0.16	NAWQ_CHR	0.09
Nickel	SWSA 5 Trib 1	1	2	0.0052	2.97E-03	0.0052	1.45E-02	1.4	NAWQ_ACU	0.01
Nickel	**SWSA 5 WOC**	**1**	**2**	**0.0044**	**2.93E-03**	**0.0044**	**1.09E-02**	**0.005**	**LCV_AQPL**	**2.18**
Nickel	**SWSA 5 WOC**	**1**	**2**	**0.0044**	**2.93E-03**	**0.0044**	**1.09E-02**	**0.005**	**LCV_DAPH**	**2.18**
Nickel	SWSA 5 WOC	1	2	0.0044	2.93E-03	0.0044	1.09E-02	0.035	LCV_FISH	0.31
Nickel	SWSA 5 WOC	1	2	0.0044	2.93E-03	0.0044	1.09E-02	0.045	LTV_DAPH	0.24
Nickel	SWSA 5 WOC	1	2	0.0044	2.93E-03	0.0044	1.09E-02	0.062	LTV_FISH	0.18
Nickel	SWSA 5 WOC	1	2	0.0044	2.93E-03	0.0044	1.09E-02	0.1284	LCV_NDI	0.08
Nickel	SWSA 5 WOC	1	2	0.0044	2.93E-03	0.0044	1.09E-02	0.16	NAWQ_CHR	0.07
Nickel	SWSA 5 WOC	1	2	0.0044	2.93E-03	0.0044	1.09E-02	1.4	NAWQ_ACU	0.01
Nickel	**W6MS3**	**10**	**39**	**0.0207**	**1.00E-02**	**0.0497**	**2.10E-02**	**0.005**	**LCV_AQPL**	**4.19**
Nickel	**W6MS3**	**10**	**39**	**0.0207**	**1.00E-02**	**0.0497**	**2.10E-02**	**0.005**	**LCV_DAPH**	**4.19**
Nickel	W6MS3	10	39	0.0207	1.00E-02	0.0497	2.10E-02	0.035	LCV_FISH	0.60
Nickel	W6MS3	10	39	0.0207	1.00E-02	0.0497	2.10E-02	0.045	LTV_DAPH	0.47
Nickel	W6MS3	10	39	0.0207	1.00E-02	0.0497	2.10E-02	0.062	LTV_FISH	0.34
Nickel	W6MS3	10	39	0.0207	1.00E-02	0.0497	2.10E-02	0.1284	LCV_NDI	0.16
Nickel	W6MS3	10	39	0.0207	1.00E-02	0.0497	2.10E-02	0.16	NAWQ_CHR	0.13
Nickel	W6MS3	10	39	0.0207	1.00E-02	0.0497	2.10E-02	1.4	NAWQ_ACU	0.01
Nickel	**W6MS1**	**2**	**16**	**0.0204**	**1.00E-02**	**0.0216**	**1.24E-02**	**0.005**	**LCV_AQPL**	**2.47**
Nickel	**W6MS1**	**2**	**16**	**0.0204**	**1.00E-02**	**0.0216**	**1.24E-02**	**0.005**	**LCV_DAPH**	**2.47**
Nickel	W6MS1	2	16	0.0204	1.00E-02	0.0216	1.24E-02	0.035	LCV_FISH	0.35
Nickel	W6MS1	2	16	0.0204	1.00E-02	0.0216	1.24E-02	0.045	LTV_DAPH	0.27
Nickel	W6MS1	2	16	0.0204	1.00E-02	0.0216	1.24E-02	0.062	LTV_FISH	0.20
Nickel	W6MS1	2	16	0.0204	1.00E-02	0.0216	1.24E-02	0.1284	LCV_NDI	0.10
Nickel	W6MS1	2	16	0.0204	1.00E-02	0.0216	1.24E-02	0.16	NAWQ_CHR	0.08
Nickel	W6MS1	2	16	0.0204	1.00E-02	0.0216	1.24E-02	1.4	NAWQ_ACU	0.01
Nickel	**WOC**	**1**	**61**	**0.072**	**5.00E-03**	**0.072**	**8.79E-03**	**0.005**	**LCV_AQPL**	**1.76**
Nickel	**WOC**	**1**	**61**	**0.072**	**5.00E-03**	**0.072**	**8.79E-03**	**0.005**	**LCV_DAPH**	**1.76**
Nickel	WOC	1	61	0.072	5.00E-03	0.072	8.79E-03	0.035	LCV_FISH	0.25
Nickel	WOC	1	61	0.072	5.00E-03	0.072	8.79E-03	0.045	LTV_DAPH	0.20
Nickel	WOC	1	61	0.072	5.00E-03	0.072	8.79E-03	0.062	LTV_FISH	0.14
Nickel	WOC	1	61	0.072	5.00E-03	0.072	8.79E-03	0.1284	LCV_NDI	0.07
Nickel	WOC	1	61	0.072	5.00E-03	0.072	8.79E-03	0.16	NAWQ_CHR	0.05
Nickel	WOC	1	61	0.072	5.00E-03	0.072	8.79E-03	1.4	NAWQ_ACU	0.01

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Selenium	**Lower WOC**	**1**	**42**	**0.001**	**1.00E-03**	**0.001**	**2.12E-02**	**0.005**	**NAWQ_CHR**	**4.24**
Selenium	**Lower WOC**	**1**	**42**	**0.001**	**1.00E-03**	**0.001**	**2.12E-02**	**0.02**	**NAWQ_ACU**	**1.06**
Selenium	Lower WOC	1	42	0.001	1.00E-03	0.001	2.12E-02	0.025	LTV_DAPH	0.85
Selenium	Lower WOC	1	42	0.001	1.00E-03	0.001	2.12E-02	0.04	LTV_FISH	0.53
Selenium	Lower WOC	1	42	0.001	1.00E-03	0.001	2.12E-02	0.08832	LCV_FISH	0.24
Selenium	Lower WOC	1	42	0.001	1.00E-03	0.001	2.12E-02	0.09165	LCV_DAPH	0.23
Selenium	Lower WOC	1	42	0.001	1.00E-03	0.001	2.12E-02	0.1	LCV_AQPL	0.21
Selenium	**SWSA 5 WOC**	**1**	**2**	**0.0031**	**1.93E-03**	**0.0031**	**8.15E-03**	**0.005**	**NAWQ_CHR**	**1.63**
Selenium	SWSA 5 WOC	1	2	0.0031	1.93E-03	0.0031	8.15E-03	0.02	NAWQ_ACU	0.41
Selenium	SWSA 5 WOC	1	2	0.0031	1.93E-03	0.0031	8.15E-03	0.025	LTV_DAPH	0.33
Selenium	SWSA 5 WOC	1	2	0.0031	1.93E-03	0.0031	8.15E-03	0.04	LTV_FISH	0.20
Selenium	SWSA 5 WOC	1	2	0.0031	1.93E-03	0.0031	8.15E-03	0.08832	LCV_FISH	0.09
Selenium	SWSA 5 WOC	1	2	0.0031	1.93E-03	0.0031	8.15E-03	0.09165	LCV_DAPH	0.09
Selenium	SWSA 5 WOC	1	2	0.0031	1.93E-03	0.0031	8.15E-03	0.1	LCV_AQPL	0.08
Selenium	W6MS1	1	14	0.00262	1.00E-03	0.00262	1.69E-03	0.005	NAWQ_CHR	0.34
Selenium	W6MS1	1	14	0.00262	1.00E-03	0.00262	1.69E-03	0.02	NAWQ_ACU	0.08
Selenium	W6MS1	1	14	0.00262	1.00E-03	0.00262	1.69E-03	0.025	LTV_DAPH	0.07
Selenium	W6MS1	1	14	0.00262	1.00E-03	0.00262	1.69E-03	0.04	LTV_FISH	0.04
Selenium	W6MS1	1	14	0.00262	1.00E-03	0.00262	1.69E-03	0.08832	LCV_FISH	0.02
Selenium	W6MS1	1	14	0.00262	1.00E-03	0.00262	1.69E-03	0.09165	LCV_DAPH	0.02
Selenium	W6MS1	1	14	0.00262	1.00E-03	0.00262	1.69E-03	0.1	LCV_AQPL	0.02
Silver	**Intermediate Pond**	**1**	**13**	**0.0038**	**2.00E-03**	**0.0038**	**3.05E-03**	**0.00012**	**LCV_FISH**	**25.42**
Silver	**Intermediate Pond**	**1**	**13**	**0.0038**	**2.00E-03**	**0.0038**	**3.05E-03**	**0.0002**	**LTV_FISH**	**15.25**
Silver	**Intermediate Pond**	**1**	**13**	**0.0038**	**2.00E-03**	**0.0038**	**3.05E-03**	**0.00036**	**S_CHR_V**	**8.47**
Silver	**Intermediate Pond**	**1**	**13**	**0.0038**	**2.00E-03**	**0.0038**	**3.05E-03**	**0.00056**	**LTV_DAPH**	**5.45**
Silver	**Intermediate Pond**	**1**	**13**	**0.0038**	**2.00E-03**	**0.0038**	**3.05E-03**	**0.0026**	**LCV_DAPH**	**1.17**
Silver	Intermediate Pond	1	13	0.0038	2.00E-03	0.0038	3.05E-03	0.0041	NAWQ_ACU	0.74
Silver	Intermediate Pond	1	13	0.0038	2.00E-03	0.0038	3.05E-03	0.03	LCV_AQPL	0.10
Silver	**Lower WOC**	**2**	**139**	**0.0015**	**2.50E-03**	**0.0114**	**2.53E-03**	**0.00012**	**LCV_FISH**	**21.12**
Silver	**Lower WOC**	**2**	**139**	**0.0015**	**2.50E-03**	**0.0114**	**2.53E-03**	**0.0002**	**LTV_FISH**	**12.67**
Silver	**Lower WOC**	**2**	**139**	**0.0015**	**2.50E-03**	**0.0114**	**2.53E-03**	**0.00036**	**S_CHR_V**	**7.04**
Silver	**Lower WOC**	**2**	**139**	**0.0015**	**2.50E-03**	**0.0114**	**2.53E-03**	**0.00056**	**LTV_DAPH**	**4.53**
Silver	Lower WOC	2	139	0.0015	2.50E-03	0.0114	2.53E-03	0.0026	LCV_DAPH	0.97
Silver	Lower WOC	2	139	0.0015	2.50E-03	0.0114	2.53E-03	0.0041	NAWQ_ACU	0.62
Silver	Lower WOC	2	139	0.0015	2.50E-03	0.0114	2.53E-03	0.03	LCV_AQPL	0.08
Silver	**W6MS3**	**12**	**40**	**0.005**	**5.00E-03**	**0.0178**	**6.82E-03**	**0.00012**	**LCV_FISH**	**56.81**

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Silver	W6MS3	12	40	0.005	5.00E-03	0.0178	6.82E-03	0.0002	LTV_FISH	34.09
Silver	W6MS3	12	40	0.005	5.00E-03	0.0178	6.82E-03	0.00036	S_CHR_V	18.94
Silver	W6MS3	12	40	0.005	5.00E-03	0.0178	6.82E-03	0.00056	LTV_DAPH	12.17
Silver	W6MS3	12	40	0.005	5.00E-03	0.0178	6.82E-03	0.0026	LCV_DAPH	2.62
Silver	W6MS3	12	40	0.005	5.00E-03	0.0178	6.82E-03	0.0041	NAWQ_ACU	1.66
Silver	W6MS3	12	40	0.005	5.00E-03	0.0178	6.82E-03	0.03	LCV_AQPL	0.23
Thallium	HF-2	1	9	0.41	1.13E-02	0.41	3.55E+00	0.012	S_CHR_V	295.50
Thallium	HF-2	1	9	0.41	1.13E-02	0.41	3.55E+00	0.057	LCV_FISH	62.21
Thallium	HF-2	1	9	0.41	1.13E-02	0.41	3.55E+00	0.064	LTV_DAPH	55.41
Thallium	HF-2	1	9	0.41	1.13E-02	0.41	3.55E+00	0.081	LTV_FISH	43.78
Thallium	HF-2	1	9	0.41	1.13E-02	0.41	3.55E+00	0.1	LCV_AQPL	35.46
Thallium	HF-2	1	9	0.41	1.13E-02	0.41	3.55E+00	0.11	S_ACU_V	32.24
Thallium	HF-2	1	9	0.41	1.13E-02	0.41	3.55E+00	0.13	LCV_DAPH	27.28
Thallium	Intermediate Pond	1	12	0.169	4.74E-03	0.169	1.28E+00	0.012	S_CHR_V	106.49
Thallium	Intermediate Pond	1	12	0.169	4.74E-03	0.169	1.28E+00	0.057	LCV_FISH	22.42
Thallium	Intermediate Pond	1	12	0.169	4.74E-03	0.169	1.28E+00	0.064	LTV_DAPH	19.97
Thallium	Intermediate Pond	1	12	0.169	4.74E-03	0.169	1.28E+00	0.081	LTV_FISH	15.78
Thallium	Intermediate Pond	1	12	0.169	4.74E-03	0.169	1.28E+00	0.1	LCV_AQPL	12.78
Thallium	Intermediate Pond	1	12	0.169	4.74E-03	0.169	1.28E+00	0.11	S_ACU_V	11.62
Thallium	Intermediate Pond	1	12	0.169	4.74E-03	0.169	1.28E+00	0.13	LCV_DAPH	9.83
Thallium	Lower WOC	5	50	0.06	1.13E-02	0.422	7.56E-03	0.012	S_CHR_V	0.63
Thallium	Lower WOC	5	50	0.06	1.13E-02	0.422	7.56E-03	0.057	LCV_FISH	0.13
Thallium	Lower WOC	5	50	0.06	1.13E-02	0.422	7.56E-03	0.064	LTV_DAPH	0.12
Thallium	Lower WOC	5	50	0.06	1.13E-02	0.422	7.56E-03	0.081	LTV_FISH	0.09
Thallium	Lower WOC	5	50	0.06	1.13E-02	0.422	7.56E-03	0.1	LCV_AQPL	0.08
Thallium	Lower WOC	5	50	0.06	1.13E-02	0.422	7.56E-03	0.11	S_ACU_V	0.07
Thallium	Lower WOC	5	50	0.06	1.13E-02	0.422	7.56E-03	0.13	LCV_DAPH	0.06
Thallium	SWSA 5 SEEP A	1	9	0.168	1.13E-02	0.168	1.82E+00	0.012	S_CHR_V	151.84
Thallium	SWSA 5 SEEP A	1	9	0.168	1.13E-02	0.168	1.82E+00	0.057	LCV_FISH	31.97
Thallium	SWSA 5 SEEP A	1	9	0.168	1.13E-02	0.168	1.82E+00	0.064	LTV_DAPH	28.47
Thallium	SWSA 5 SEEP A	1	9	0.168	1.13E-02	0.168	1.82E+00	0.081	LTV_FISH	22.49
Thallium	SWSA 5 SEEP A	1	9	0.168	1.13E-02	0.168	1.82E+00	0.1	LCV_AQPL	18.22
Thallium	SWSA 5 SEEP A	1	9	0.168	1.13E-02	0.168	1.82E+00	0.11	S_ACU_V	16.56
Thallium	SWSA 5 SEEP A	1	9	0.168	1.13E-02	0.168	1.82E+00	0.13	LCV_DAPH	14.02
Thallium	WOC	5	20	0.156	2.00E-02	0.207	6.09E-02	0.012	S_CHR_V	5.07
Thallium	WOC	5	20	0.156	2.00E-02	0.207	6.09E-02	0.057	LCV_FISH	1.07

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Thallium	WOC	5	20	0.156	2.00E-02	0.207	6.09E-02	0.064	LTV_DAPH	0.95
Thallium	WOC	5	20	0.156	2.00E-02	0.207	6.09E-02	0.081	LTV_FISH	0.75
Thallium	WOC	5	20	0.156	2.00E-02	0.207	6.09E-02	0.1	LCV_AQPL	0.61
Thallium	WOC	5	20	0.156	2.00E-02	0.207	6.09E-02	0.11	S_ACU_V	0.55
Thallium	WOC	5	20	0.156	2.00E-02	0.207	6.09E-02	0.13	LCV_DAPH	0.47
Tin	**W6MS3**	**3**	**4**	**0.272**	**2.73E-01**	**0.528**	**5.20E-01**	**0.073**	**S_CHR_V**	**7.12**
Tin	**W6MS3**	**3**	**4**	**0.272**	**2.73E-01**	**0.528**	**5.20E-01**	**0.35**	**LCV_DAPH**	**1.49**
Tin	W6MS3	3	4	0.272	2.73E-01	0.528	5.20E-01	2.7	S_ACU_V	0.19
Zinc	**HF-2**	**8**	**10**	**0.009**	**3.63E-02**	**0.285**	**1.42E-01**	**0.03**	**LCV_AQPL**	**4.74**
Zinc	**HF-2**	**8**	**10**	**0.009**	**3.63E-02**	**0.285**	**1.42E-01**	**0.03641**	**LCV_FISH**	**3.90**
Zinc	**HF-2**	**8**	**10**	**0.009**	**3.63E-02**	**0.285**	**1.42E-01**	**0.04673**	**LCV_DAPH**	**3.04**
Zinc	**HF-2**	**8**	**10**	**0.009**	**3.63E-02**	**0.285**	**1.42E-01**	**0.047**	**LTV_FISH**	**3.02**
Zinc	**HF-2**	**8**	**10**	**0.009**	**3.63E-02**	**0.285**	**1.42E-01**	**0.11**	**NAWQ_CHR**	**1.29**
Zinc	**HF-2**	**8**	**10**	**0.009**	**3.63E-02**	**0.285**	**1.42E-01**	**0.12**	**NAWQ_ACU**	**1.18**
Zinc	HF-2	8	10	0.009	3.63E-02	0.285	1.42E-01	5.243	LCV_NDI	0.03
Zinc	**Lower WOC**	**113**	**144**	**0.0024**	**2.20E-02**	**0.24**	**4.23E-02**	**0.03**	**LCV_AQPL**	**1.41**
Zinc	**Lower WOC**	**113**	**144**	**0.0024**	**2.20E-02**	**0.24**	**4.23E-02**	**0.03641**	**LCV_FISH**	**1.16**
Zinc	Lower WOC	113	144	0.0024	2.20E-02	0.24	4.23E-02	0.04673	LCV_DAPH	0.90
Zinc	Lower WOC	113	144	0.0024	2.20E-02	0.24	4.23E-02	0.047	LTV_FISH	0.90
Zinc	Lower WOC	113	144	0.0024	2.20E-02	0.24	4.23E-02	0.11	NAWQ_CHR	0.38
Zinc	Lower WOC	113	144	0.0024	2.20E-02	0.24	4.23E-02	0.12	NAWQ_ACU	0.35
Zinc	Lower WOC	113	144	0.0024	2.20E-02	0.24	4.23E-02	5.243	LCV_NDI	0.01
Benzene	**SWSA 5 Trib 1**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.021**	**LTV_FISH**	**1.11**
Benzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.13	S_CHR_V	0.18
Benzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	2.3	S_ACU_V	0.01
Benzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	98	LCV_DAPH	0.00
Benzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	525	LCV_AQPL	0.00
Benzene	**SWSA 5 WOC**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.021**	**LTV_FISH**	**1.11**
Benzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.13	S_CHR_V	0.18
Benzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	2.3	S_ACU_V	0.01
Benzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	98	LCV_DAPH	0.00
Benzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	525	LCV_AQPL	0.00
Benzene	W6MS3	4	34	0.001	2.50E-03	0.003	2.45E-03	0.021	LTV_FISH	0.12
Benzene	W6MS3	4	34	0.001	2.50E-03	0.003	2.45E-03	0.13	S_CHR_V	0.02
Benzene	W6MS3	4	34	0.001	2.50E-03	0.003	2.45E-03	2.3	S_ACU_V	0.00
Benzene	W6MS3	4	34	0.001	2.50E-03	0.003	2.45E-03	98	LCV_DAPH	0.00

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Benzene	W6MS3	4	34	0.001	2.50E-03	0.003	2.45E-03	525	LCV_AQPL	0.00
Bis(2-Ethylhexyl)Phthalate	SWSA 5 WOC	1	1	0.001	.	0.001	1.00E-03	0.003	LTV_DAPH	0.33
Bis(2-Ethylhexyl)Phthalate	SWSA 5 WOC	1	1	0.001	.	0.001	1.00E-03	0.003	S_CHR_V	0.33
Bis(2-Ethylhexyl)Phthalate	SWSA 5 WOC	1	1	0.001	.	0.001	1.00E-03	0.027	S_ACU_V	0.04
Bis(2-Ethylhexyl)Phthalate	SWSA 5 WOC	1	1	0.001	.	0.001	1.00E-03	0.054	LTV_FISH	0.02
Bis(2-Ethylhexyl)Phthalate	SWSA 5 WOC	1	1	0.001	.	0.001	1.00E-03	0.912	LCV_DAPH	0.00
Bis(2-Ethylhexyl)Phthalate	**W6MS3**	**4**	**20**	**0.002**	**5.00E-03**	**0.01**	**6.23E-03**	**0.003**	**LTV_DAPH**	**2.08**
Bis(2-Ethylhexyl)Phthalate	**W6MS3**	**4**	**20**	**0.002**	**5.00E-03**	**0.01**	**6.23E-03**	**0.003**	**S_CHR_V**	**2.08**
Bis(2-Ethylhexyl)Phthalate	W6MS3	4	20	0.002	5.00E-03	0.01	6.23E-03	0.027	S_ACU_V	0.23
Bis(2-Ethylhexyl)Phthalate	W6MS3	4	20	0.002	5.00E-03	0.01	6.23E-03	0.054	LTV_FISH	0.12
Bis(2-Ethylhexyl)Phthalate	W6MS3	4	20	0.002	5.00E-03	0.01	6.23E-03	0.912	LCV_DAPH	0.01
Bis(2-Ethylhexyl)Phthalate	**W6MS1**	**2**	**4**	**0.004**	**5.00E-03**	**0.01**	**9.19E-03**	**0.003**	**LTV_DAPH**	**3.06**
Bis(2-Ethylhexyl)Phthalate	**W6MS1**	**2**	**4**	**0.004**	**5.00E-03**	**0.01**	**9.19E-03**	**0.003**	**S_CHR_V**	**3.06**
Bis(2-Ethylhexyl)Phthalate	W6MS1	2	4	0.004	5.00E-03	0.01	9.19E-03	0.027	S_ACU_V	0.34
Bis(2-Ethylhexyl)Phthalate	W6MS1	2	4	0.004	5.00E-03	0.01	9.19E-03	0.054	LTV_FISH	0.17
Bis(2-Ethylhexyl)Phthalate	W6MS1	2	4	0.004	5.00E-03	0.01	9.19E-03	0.912	LCV_DAPH	0.01
Carbon Disulfide	**HF-2**	**3**	**3**	**0.011**	**1.10E-02**	**0.011**	**1.10E-02**	**0.00092**	**S_CHR_V**	**11.96**
Carbon Disulfide	HF-2	3	3	0.011	1.10E-02	0.011	1.10E-02	0.017	S_ACU_V	0.65
Carbon Disulfide	HF-2	3	3	0.011	1.10E-02	0.011	1.10E-02	0.244	LCV_DAPH	0.05
Carbon Disulfide	HF-2	3	3	0.011	1.10E-02	0.011	1.10E-02	5.719	LTV_FISH	0.00
Carbon Disulfide	HF-2	3	3	0.011	1.10E-02	0.011	1.10E-02	9.538	LCV_FISH	0.00
Carbon Disulfide	**Intermediate Pond**	**3**	**3**	**0.005**	**5.00E-03**	**0.005**	**5.00E-03**	**0.00092**	**S_CHR_V**	**5.43**
Carbon Disulfide	Intermediate Pond	3	3	0.005	5.00E-03	0.005	5.00E-03	0.017	S_ACU_V	0.29
Carbon Disulfide	Intermediate Pond	3	3	0.005	5.00E-03	0.005	5.00E-03	0.244	LCV_DAPH	0.02
Carbon Disulfide	Intermediate Pond	3	3	0.005	5.00E-03	0.005	5.00E-03	5.719	LTV_FISH	0.00
Carbon Disulfide	Intermediate Pond	3	3	0.005	5.00E-03	0.005	5.00E-03	9.538	LCV_FISH	0.00
Carbon Disulfide	**Lower WOC**	**7**	**9**	**0.003**	**5.50E-03**	**0.017**	**1.63E-02**	**0.00092**	**S_CHR_V**	**17.77**
Carbon Disulfide	Lower WOC	7	9	0.003	5.50E-03	0.017	1.63E-02	0.017	S_ACU_V	0.96
Carbon Disulfide	Lower WOC	7	9	0.003	5.50E-03	0.017	1.63E-02	0.244	LCV_DAPH	0.07
Carbon Disulfide	Lower WOC	7	9	0.003	5.50E-03	0.017	1.63E-02	5.719	LTV_FISH	0.00
Carbon Disulfide	Lower WOC	7	9	0.003	5.50E-03	0.017	1.63E-02	9.538	LCV_FISH	0.00
Carbon Disulfide	**SWSA 5 SEEP A**	**3**	**3**	**0.005**	**5.00E-03**	**0.005**	**5.00E-03**	**0.00092**	**S_CHR_V**	**5.43**
Carbon Disulfide	SWSA 5 SEEP A	3	3	0.005	5.00E-03	0.005	5.00E-03	0.017	S_ACU_V	0.29
Carbon Disulfide	SWSA 5 SEEP A	3	3	0.005	5.00E-03	0.005	5.00E-03	0.244	LCV_DAPH	0.02
Carbon Disulfide	SWSA 5 SEEP A	3	3	0.005	5.00E-03	0.005	5.00E-03	5.719	LTV_FISH	0.00
Carbon Disulfide	SWSA 5 SEEP A	3	3	0.005	5.00E-03	0.005	5.00E-03	9.538	LCV_FISH	0.00

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Carbon Disulfide	**W6MS3**	**14**	**42**	**0.002**	**2.50E-03**	**0.007**	**3.25E-03**	**0.00092**	**S_CHR_V**	**3.53**
Carbon Disulfide	W6MS3	14	42	0.002	2.50E-03	0.007	3.25E-03	0.017	S_ACU_V	0.19
Carbon Disulfide	W6MS3	14	42	0.002	2.50E-03	0.007	3.25E-03	0.244	LCV_DAPH	0.01
Carbon Disulfide	W6MS3	14	42	0.002	2.50E-03	0.007	3.25E-03	5.719	LTV_FISH	0.00
Carbon Disulfide	W6MS3	14	42	0.002	2.50E-03	0.007	3.25E-03	9.538	LCV_FISH	0.00
Carbon Disulfide	**W6MS1**	**7**	**18**	**0.002**	**2.50E-03**	**0.033**	**6.17E-03**	**0.00092**	**S_CHR_V**	**6.70**
Carbon Disulfide	W6MS1	7	18	0.002	2.50E-03	0.033	6.17E-03	0.017	S_ACU_V	0.36
Carbon Disulfide	W6MS1	7	18	0.002	2.50E-03	0.033	6.17E-03	0.244	LCV_DAPH	0.03
Carbon Disulfide	W6MS1	7	18	0.002	2.50E-03	0.033	6.17E-03	5.719	LTV_FISH	0.00
Carbon Disulfide	W6MS1	7	18	0.002	2.50E-03	0.033	6.17E-03	9.538	LCV_FISH	0.00
Carbon Disulfide	**West Seep**	**1**	**3**	**0.003**	**2.50E-03**	**0.003**	**3.15E-03**	**0.00092**	**S_CHR_V**	**3.43**
Carbon Disulfide	West Seep	1	3	0.003	2.50E-03	0.003	3.15E-03	0.017	S_ACU_V	0.19
Carbon Disulfide	West Seep	1	3	0.003	2.50E-03	0.003	3.15E-03	0.244	LCV_DAPH	0.01
Carbon Disulfide	West Seep	1	3	0.003	2.50E-03	0.003	3.15E-03	5.719	LTV_FISH	0.00
Carbon Disulfide	West Seep	1	3	0.003	2.50E-03	0.003	3.15E-03	9.538	LCV_FISH	0.00
Carbon Disulfide	**WOC**	**5**	**5**	**0.0007**	**1.30E-02**	**0.013**	**1.45E-02**	**0.00092**	**S_CHR_V**	**15.76**
Carbon Disulfide	WOC	5	5	0.0007	1.30E-02	0.013	1.45E-02	0.017	S_ACU_V	0.85
Carbon Disulfide	WOC	5	5	0.0007	1.30E-02	0.013	1.45E-02	0.244	LCV_DAPH	0.06
Carbon Disulfide	WOC	5	5	0.0007	1.30E-02	0.013	1.45E-02	5.719	LTV_FISH	0.00
Carbon Disulfide	WOC	5	5	0.0007	1.30E-02	0.013	1.45E-02	9.538	LCV_FISH	0.00
Carbon Tetrachloride	**SWSA 5 Trib 1**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.0098**	**S_CHR_V**	**2.38**
Carbon Tetrachloride	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.065	LTV_FISH	0.36
Carbon Tetrachloride	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.18	S_ACU_V	0.13
Carbon Tetrachloride	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	1.97	LCV_FISH	0.01
Carbon Tetrachloride	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	5.58	LCV_DAPH	0.00
Carbon Tetrachloride	**SWSA 5 WOC**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.0098**	**S_CHR_V**	**2.38**
Carbon Tetrachloride	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.065	LTV_FISH	0.36
Carbon Tetrachloride	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.18	S_ACU_V	0.13
Carbon Tetrachloride	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	1.97	LCV_FISH	0.01
Carbon Tetrachloride	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	5.58	LCV_DAPH	0.00
Ethylbenzene	**SWSA 5 Trib 1**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.0073**	**S_CHR_V**	**3.19**
Ethylbenzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.13	S_ACU_V	0.18
Ethylbenzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.44	LCV_FISH	0.05
Ethylbenzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	12.922	LCV_DAPH	0.00
Ethylbenzene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	438	LCV_AQPL	0.00
Ethylbenzene	**SWSA 5 WOC**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.0073**	**S_CHR_V**	**3.19**

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Ethylbenzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.13	S_ACU_V	0.18
Ethylbenzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.44	LCV_FISH	0.05
Ethylbenzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	12.922	LCV_DAPH	0.00
Ethylbenzene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	438	LCV_AQPL	0.00
Naphthalene	**SWSA 5 Trib 1**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.012**	**S_CHR_V**	**1.94**
Naphthalene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.19	S_ACU_V	0.12
Naphthalene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.45	LTV_FISH	0.05
Naphthalene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.6	LTV_DAPH	0.04
Naphthalene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.62	LCV_FISH	0.04
Naphthalene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	1.163	LCV_DAPH	0.02
Naphthalene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	33	LCV_AQPL	0.00
Naphthalene	**SWSA 5 WOC**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.012**	**S_CHR_V**	**1.94**
Naphthalene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.19	S_ACU_V	0.12
Naphthalene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.45	LTV_FISH	0.05
Naphthalene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.6	LTV_DAPH	0.04
Naphthalene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.62	LCV_FISH	0.04
Naphthalene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	1.163	LCV_DAPH	0.02
Naphthalene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	33	LCV_AQPL	0.00
Naphthalene	W6MS1	1	4	0.002	5.00E-03	0.002	6.02E-03	0.012	S_CHR_V	0.50
Naphthalene	W6MS1	1	4	0.002	5.00E-03	0.002	6.02E-03	0.19	S_ACU_V	0.03
Naphthalene	W6MS1	1	4	0.002	5.00E-03	0.002	6.02E-03	0.45	LTV_FISH	0.01
Naphthalene	W6MS1	1	4	0.002	5.00E-03	0.002	6.02E-03	0.6	LTV_DAPH	0.01
Naphthalene	W6MS1	1	4	0.002	5.00E-03	0.002	6.02E-03	0.62	LCV_FISH	0.01
Naphthalene	W6MS1	1	4	0.002	5.00E-03	0.002	6.02E-03	1.163	LCV_DAPH	0.01
Naphthalene	W6MS1	1	4	0.002	5.00E-03	0.002	6.02E-03	33	LCV_AQPL	0.00
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.00014**	**S_CHR_V**	**230.57**
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.000144**	**LCV_AQPL**	**224.16**
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.0002**	**LCV_FISH**	**161.40**
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.0004**	**LTV_FISH**	**80.70**
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.0008**	**LCV_NDI**	**40.35**
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.0012**	**LTV_DAPH**	**26.90**
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.002**	**NAWQ_ACU**	**16.14**
Polychlorinated Biphenyl	**Lower WOC**	**4**	**85**	**0.0001**	**1.00E-03**	**0.001**	**3.23E-02**	**0.0021**	**LCV_DAPH**	**15.37**
Polychlorinated Biphenyl	**WOC**	**3**	**42**	**0.0001**	**1.00E-03**	**0.001**	**1.01E-03**	**0.00014**	**S_CHR_V**	**7.19**
Polychlorinated Biphenyl	**WOC**	**3**	**42**	**0.0001**	**1.00E-03**	**0.001**	**1.01E-03**	**0.000144**	**LCV_AQPL**	**6.99**
Polychlorinated Biphenyl	**WOC**	**3**	**42**	**0.0001**	**1.00E-03**	**0.001**	**1.01E-03**	**0.0002**	**LCV_FISH**	**5.04**

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Polychlorinated Biphenyl	**WOC**	**3**	**42**	**0.0001**	**1.00E-03**	**0.001**	**1.01E-03**	**0.0004**	**LTV_FISH**	**2.52**
Polychlorinated Biphenyl	**WOC**	**3**	**42**	**0.0001**	**1.00E-03**	**0.001**	**1.01E-03**	**0.0008**	**LCV_NDI**	**1.26**
Polychlorinated Biphenyl	WOC	3	42	0.0001	1.00E-03	0.001	1.01E-03	0.0012	LTV_DAPH	0.84
Polychlorinated Biphenyl	WOC	3	42	0.0001	1.00E-03	0.001	1.01E-03	0.002	NAWQ_ACU	0.50
Polychlorinated Biphenyl	WOC	3	42	0.0001	1.00E-03	0.001	1.01E-03	0.0021	LCV_DAPH	0.48
Toluene	**SWSA 5 Trib 1**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.0098**	**S_CHR_V**	**2.38**
Toluene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.026	LTV_FISH	0.90
Toluene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	0.12	S_ACU_V	0.19
Toluene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	1.269	LCV_FISH	0.02
Toluene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	25.229	LCV_DAPH	0.00
Toluene	SWSA 5 Trib 1	1	2	0.01	7.07E-03	0.01	2.33E-02	245	LCV_AQPL	0.00
Toluene	**SWSA 5 WOC**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.0098**	**S_CHR_V**	**2.38**
Toluene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.026	LTV_FISH	0.90
Toluene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.12	S_ACU_V	0.19
Toluene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	1.269	LCV_FISH	0.02
Toluene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	25.229	LCV_DAPH	0.00
Toluene	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	245	LCV_AQPL	0.00
Toluene	W6MS3	11	34	0.001	2.50E-03	0.005	3.14E-03	0.0098	S_CHR_V	0.32
Toluene	W6MS3	11	34	0.001	2.50E-03	0.005	3.14E-03	0.026	LTV_FISH	0.12
Toluene	W6MS3	11	34	0.001	2.50E-03	0.005	3.14E-03	0.12	S_ACU_V	0.03
Toluene	W6MS3	11	34	0.001	2.50E-03	0.005	3.14E-03	1.269	LCV_FISH	0.00
Toluene	W6MS3	11	34	0.001	2.50E-03	0.005	3.14E-03	25.229	LCV_DAPH	0.00
Toluene	W6MS3	11	34	0.001	2.50E-03	0.005	3.14E-03	245	LCV_AQPL	0.00
Toluene	W6MS1	1	14	0.005	2.50E-03	0.005	2.80E-03	0.0098	S_CHR_V	0.29
Toluene	W6MS1	1	14	0.005	2.50E-03	0.005	2.80E-03	0.026	LTV_FISH	0.11
Toluene	W6MS1	1	14	0.005	2.50E-03	0.005	2.80E-03	0.12	S_ACU_V	0.02
Toluene	W6MS1	1	14	0.005	2.50E-03	0.005	2.80E-03	1.269	LCV_FISH	0.00
Toluene	W6MS1	1	14	0.005	2.50E-03	0.005	2.80E-03	25.229	LCV_DAPH	0.00
Toluene	W6MS1	1	14	0.005	2.50E-03	0.005	2.80E-03	245	LCV_AQPL	0.00
Toluene	West Seep	2	4	0.005	3.54E-03	0.005	5.45E-03	0.0098	S_CHR_V	0.56
Toluene	West Seep	2	4	0.005	3.54E-03	0.005	5.45E-03	0.026	LTV_FISH	0.21
Toluene	West Seep	2	4	0.005	3.54E-03	0.005	5.45E-03	0.12	S_ACU_V	0.05
Toluene	West Seep	2	4	0.005	3.54E-03	0.005	5.45E-03	1.269	LCV_FISH	0.00
Toluene	West Seep	2	4	0.005	3.54E-03	0.005	5.45E-03	25.229	LCV_DAPH	0.00
Toluene	West Seep	2	4	0.005	3.54E-03	0.005	5.45E-03	245	LCV_AQPL	0.00
Xylene (Total)	SWSA 5 Trib 1	1	2	0.002	3.16E-03	0.002	1.30E-02	0.013	S_CHR_V	1.00

Table 3.7 (Continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	UCL95	Bmk Value	Bmk Name	HQ
Xylene (Total)	SWSA 5 Trib 1	1	2	0.002	3.16E-03	0.002	1.30E-02	0.23	S_ACU_V	0.06
Xylene (Total)	SWSA 5 Trib 1	1	2	0.002	3.16E-03	0.002	1.30E-02	2.68	LTV_FISH	0.00
Xylene (Total)	SWSA 5 Trib 1	1	2	0.002	3.16E-03	0.002	1.30E-02	62.308	LCV_FISH	0.00
Xylene (Total)	**SWSA 5 WOC**	**1**	**2**	**0.01**	**7.07E-03**	**0.01**	**2.33E-02**	**0.013**	**S_CHR_V**	**1.79**
Xylene (Total)	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	0.23	S_ACU_V	0.10
Xylene (Total)	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	2.68	LTV_FISH	0.01
Xylene (Total)	SWSA 5 WOC	1	2	0.01	7.07E-03	0.01	2.33E-02	62.308	LCV_FISH	0.00

All concentrations are mg/l. Only the chemicals for which at least one HQ was greater than 1 are included.
Does not include data for seeps and ephemeral tributaries. Bold indicates HQ>1.
95% upper confidence limit
Hazard Quotient = UCL95/ benchmark value.

Table 3.8 Summary of data availability for aquatic assessment endpoints

Basin	Subbasin	Chemistry			Toxicity Tests					Community Surveys	
		Surface Water	Seeps	Sediment	Standard	Medaka	Redbreast Bioindicators	Fish Bioaccumulation	Fish	Benthos - Riffles	Benthos - Sediment
MWOC/East	MV Drive		X								
MWOC/East	SWSA 5 WOC	X	X	X							
MWOC/East	SWSA 5 N WOC	X	X								
MWOC/East	SWSA 5 Trib-1	X	X	X							
MWOC/West	Haw Ridge										
MWOC/West	Intermediate Pond	X	X	X	X	X		X	X	X	
MWOC/West	SWSA 4 East										
MWOC/West	SWSA 4 Main		X	X							
MWOC/West	WAG 7 WOC		X								
MWOC/West	WOC	X	X	X	X	X	X	X	X	X	X
HFIR	HF-2	X	X	X							
HFIR	HFIR										
HFIR	HFIR East		X	X							
HFIR	HFIR South	X									
HFIR	MB-15	X	X	X	X				X	X	X
HRE	HRE	X	X	X							
SWSA 5 SeepA	SWSA 5 Seep A	X	X	X							
SWSA 5 SeepB	SWSA 5 Seep B West	X	X	X							
SWSA 5 SeepB	SWSA 5 Seep B East	X	X	X	X				X	X	
SWSA 5 SeepC	SWSA Seep C	X	X	X	X			X			X
SWSA 5 Drainage D-2	SWSA 5 Drainage D-2		X	X							
SWSA 6	W6MS3	X	X	X							
SWSA 6	W6MS1	X	X								
WCTrib1 & Co-60	^{60}Co Seep			X							
WCTrib1 & Co-60	WCTRIB-1		X	X							
East Seep	East Seep		X								
West Seep	West Seep	X	X	X							
NHF	NHF		X								
WOL, Creek, and Floodplain	Lower WOC	X	X	X		X	X	X	X	X	X
WOLCreek&Floodplain	Pit 4 South		X	X							

Table 3.8 (Continued)

Basin	Subbasin	Chemistry			Toxicity Tests					Community Surveys	
		Surface Water	Seeps	Sedi-ment	Standard	Medaka	Redbreast Bioindicators	Fish Bioaccumulation	Fish	Benthos - Riffles	Benthos - Sediment
WOLCreek&Floodplain	SWSA 6 East	X									
WOLCreek&Floodplain	SWSA 6 South										
WOLCreek&Floodplain	Trench 5 South										
WOLCreek&Floodplain	WOCE	X		X				X			

Source biological data: Ashwood 1994.

4. RISKS TO BENTHIC INVERTEBRATES

This chapter contains the exposure and effects assessments and characterization of risks to benthic invertebrates in mainstem surface waters and major tributaries. Benthic invertebrates are primarily exposed to contaminants in sediment, sediment pore water, and overlying surface water. Surface water exposures are more important in riffles because chemicals in sediments are primarily associated with fine grains and organic matter, which are eroded from riffles and accumulated in pools. Benthic invertebrates inhabiting sediment depositional areas are generally immersed in the fine sediments. Thus, the primary exposures in depositional areas are to contaminated sediments and sediment pore water. Therefore, exposures to chemicals in surface water and sediment were evaluated separately. Other exposure pathways, such as ingestion of contaminated food items, are not explicitly evaluated herein because the necessary exposure and literature toxicity data are not available. However, these exposure pathways are accounted for in the community surveys.

4.1 RIFFLE COMMUNITIES

4.1.1 Exposure Assessment

Benthic invertebrates in riffles are exposed primarily to contaminants in water. The exposure assessment of aqueous chemical concentrations and aqueous toxicity tests for the fish community (Sect. 3.1) are also representative of exposure for benthic invertebrates in erosional areas.

4.1.2 Effects Assessment

The effects assessments of aqueous chemical concentrations and aqueous toxicity tests are presented in Sect. 3.2.

Analysis of the benthic invertebrate community survey data provides a direct measure of impacts of human activities on aquatic ecosystems. Surveys of benthic invertebrates in riffles were performed beginning in 1987 with the last reported results from 1992 (Ashwood 1994). At that time, the taxonomic richness of all invertebrates and particularly of the Ephemeroptera, Plecoptera, and Trichoptera (EPT) was severely reduced at sites on WOC adjacent to and downstream of ORNL. Total richness, but not EPT richness, also was reduced in upper Melton Branch (subbasin MB-15) relative to the upstream and pooled reference sites. Total and EPT richness in lower Melton Branch were not different from references. These comparisons of upstream and downstream sites are confounded by habitat differences. However, it is often possible to judge which differences are attributable at least in part to contamination, because the differences in substrate are not great and riffle communities have been much more studied than soft sediment communities. Therefore, it can be judged with some confidence, that the reduced taxonomic richness was not due simply to stream habitat gradients (Ashwood 1994).

4.1.3 Risk Characterization

4.1.3.1 Chemical exposures

The characterization of risks based on the screening of aqueous chemical concentrations is presented in Sect. 3.3 and Table 3.2.

4.1.3.2 Ambient water toxicity

The characterization of risks based on the aqueous toxicity tests are presented in Sect. 3.3.

4.1.3.3 Biological surveys

The biological surveys reveal that the benthic invertebrate community in WOC below ORNL continues to be degraded relative to upstream and pooled references. The community in upper Melton Branch also appears to be degraded, but the community in lower Melton Branch is not different from reference communities. Unlike the fish community, there are no barriers to macroinvertebrate immigration and the differences in habitat among sites does not account for the observed differences in community structure.

4.1.3.4 Weight of evidence

Subbasins for which at least surface water chemistry data are available (Table 3.8) are discussed below. Chemical and biological data are available for the following seven subbasins.

Intermediate Pond

The weight-of-evidence suggests that water in this subbasin poses a significant risk to benthic macroinvertebrates. Total and EPT species richness are significantly degraded relative to upstream and pooled reference communities and the water has been lethal to medaka embryos and larvae. Copper, iron, silver, and thallium concentrations appear to present significant risks. However, aluminum concentrations are probably not toxic in this system.

White Oak Creek

The weight-of-evidence suggests that water in this subbasin poses a significant risk to benthic macroinvertebrates. Total and EPT richness are significantly degraded relative to upstream and pooled reference communities and the water has been lethal to Medaka embryos and larvae. Of the eight COECs, copper, iron, and thallium concentrations appear to be the most likely contributors to toxicity. Ammonia concentrations exceeded only the lowest benchmark, suggesting that it may be toxic to sensitive species. Lead and nickel concentrations may be toxic, but these metals were detected in less than 5% of the samples. Total PCBs were detected in only 7% of the samples and are likely to be bound to particulate matter and non bioavailable. Aluminum concentrations are not expected to be toxic in this system.

MB-15

Although the weight-of-evidence is not strong, it suggests that water in this subbasin does not pose a significant risk to benthic macroinvertebrates. Total richness and density are significantly lower than upstream and pooled reference communities. However, EPT richness is not different from references, the water has not been toxic in the standard toxicity tests, and none of the detected chemicals exceeded any benchmarks (i.e., there are no COPECs). Hence, there appears to be an effect on the community, but a causal agent could not be identified from the available data. Although it is possible that the sampling regime did not capture episodic contaminant fluxes, it also is possible that habitat difference contribute to the observed community differences. The fact that contaminant sensitive species (i.e., EPT) are not affected is further evidence that the observed differences are likely the result of something other than contamination.

Seep B East

The weight-of-evidence suggests that water in this subbasin does not pose a significant risk to benthic macroinvertebrates. Total and EPT species richness are comparable to that of the reference streams, the water has not been toxic in the standard toxicity tests, and none of the detected chemicals exceeded any benchmarks (i.e., there are no COPECs).

Seep C

Although the weight-of-evidence is not strong, it suggests that water in this subbasin does not pose a significant risk to benthic macroinvertebrates. Copper and nickel are COECs, but the concentrations measured may over estimate the fraction that is bioavailable. Furthermore, the water has not been toxic in the standard toxicity tests.

Lower WOC

The weight-of-evidence suggests that water in this subbasin poses a significant risk to benthic macroinvertebrates. Total and EPT richness are significantly degraded relative to upstream and pooled reference communities and the water has been lethal to medaka embryos and larvae. Of the eleven COECs, cobalt, copper, iron, nickel, thallium and zinc concentrations appear to be the most likely contributors to toxicity. Ammonia concentrations exceeded only the lowest benchmark, suggesting that it may be toxic to sensitive species. Cadmium, silver and Total PCB concentrations may be toxic, but these chemicals were detected in less than 5% of the samples. Aluminum concentrations are not expected to be toxic in this system.

WOCE

Although the weight-of-evidence is not strong, it suggests that water in this subbasin poses a significant risk to benthic macroinvertebrates. Cadmium is the only COEC and the concentrations measured may over estimate the fraction that is bioavailable. Although water from within the embayment was not tested, water entering the embayment reduced medaka embryo and larvae survival by 90%. Hence, there is no strong evidence to indicate that cadmium does not pose a risk in this subbasin.

Chemical concentrations in surface water is the only line of evidence available for eleven subbasins (Table 3.8). Significant risks are not indicated in three of these subbasin (SWSA 5 N WOC, HRE, and Seep B west), because none of the detected chemicals exceeded benchmarks (i.e., there are no COPECs). Even if the benchmarks for aluminum are set aside as inappropriate to this site, there is at least one COEC in each of the remaining subbasins (Table 3.2).. That is, significant risks are indicated in these subbasins.

In summary, the invertebrate communities of riffles have low species richness below ORNL which is likely to be primarily due to contaminants in water. The dominance of this mode of exposure is the reason that riffle invertebrates communities are monitored to determine whether water quality goals are being met (Ashwood 1994). However, the feeding habits of some species expose them to the small amount of particulate material that is deposited in such areas so sediment contamination may make a small contribution to this effect.

4.2 SEDIMENT COMMUNITIES

4.2.1 Exposure Assessment

Sediment chemical exposures

Benthic invertebrates that inhabit the soft sediments of pools are exposed to contaminants in the sediments. Two different expressions of sediment contamination are used in ecological risk assessments, whole sediment concentrations and filtered pore water concentrations. The use of pore water is based on the assumption that chemicals associated with the solid phase are largely unavailable and therefore sediment toxicity can be estimated by measuring or estimating the pore water concentration. This is the approach used by the EPA to calculate sediment quality criteria. Whole sediment concentrations do not account for effects of sediment properties on bioavailability. However, they are required by the EPA Region IV and may provide a better estimate of risk for highly particle-associated chemicals which may not be detectable in pore water.

Benthic invertebrates are exposed to surface sediments and not to deep sediments. In a compromise between realism and the desire to include data for all analytes, a maximum interval of zero to fifty centimeters was used. Analyses of cores with a depth greater than 50 centimeters were discarded and core sections other than the surface section were discarded. A complete description of the sediment sampling and analysis in WAG 2 is presented by Ford et al. (1996)

Because sediment is likely to be more variable in space than time, due its relative immobility, and because the organisms are relatively immobile it is not appropriate to think of benthic invertebrates as averaging their exposures to sediment over space or time. Therefore, the median sediment concentration is an appropriate measure of the central tendency of the contaminant data. An appropriate conservative estimate of this exposure for use in the contaminant screening is the maximum detected concentration.

As with water, many of the chemical concentrations in sediments are below analytical detection limits. Chemicals that were not detected in any sample in a reach were eliminated. If a subbasin contained some detects and some nondetects for a chemical, nondetects were included at half the detection limit.

4.2.2 Effects Assessment

4.2.2.1 Single-chemical sediment toxicity

The sets of screening benchmarks for sediment-associated biota (described in Table 4.1) are taken from Jones et al. (1996). Whole sediment concentrations are compared with these benchmarks. The use of multiple benchmarks provides greater assurance of detecting all COPECs. Sediment benchmarks derived using the equilibrium partitioning method were calculated assuming one percent organic carbon, because location-specific organic carbon concentrations were not available.

Ecotox Threshold values were issued by the EPA Office of Solid Waste and Emergency Response (OSWER 1996). They are not included as separate benchmarks in this assessment because the OSWER values are consistent with the ORNL benchmarks (Jones et al 1996). The exception is that the equilibrium partitioning benchmarks used in this assessment are based on recently updated water quality benchmarks (Suter and Tsao 1996), whereas the OSWER values are not. Although the EPA Region IV sediment screening values (EPA Region IV 1995) are consistent with the ORNL

benchmarks, they were included separately herein because they also contain a comparison to EPA's practical quantitation limits.

Toxicity profiles for chemicals that exceed benchmarks are presented in the attachment of this appendix. The toxicity profiles summarize the existing toxicity information for each chemical, including concentrations causing acute lethality and chronic lethal and sublethal effects, and physical-chemical conditions that modify toxicity. Most of the available sediment toxicity data are for marine and estuarine systems.

4.2.2.2 Sediment community surveys

Surveys of benthic invertebrates in soft sediments behind weirs and dams were performed in 1995 in support of the WAG 2 Remedial Investigation (Appendix A in Efroymson et el. 1996a). The surveys were conducted in large part to determine whether dredging these sediments to maintain pool depth would destroy communities that had any particular ecological value. However, they serve to indicate the effects of sediment contamination more generally, including natural pools where sediments accumulate. The survey included two weirs on WOC within WAG 2, two on Melton Branch, and two sites in White Oak Lake. These were compared to reference pools behind weirs on upper First Creek, WOC above ORNL, and Clear Creek. The locations are described in Appendix A in Efroymson et el. (1996a). The results are somewhat confounded by differences in sediment characteristics among the weirs. The reference weirs tended to have more coarse particulate organic matter (detritus) and less silt than the weirs in WAG 2. This is not surprising given the silt that would be expected to enter the streams from construction and remediation activities at ORNL. The two White Oak Lake sites are different from all of the weirs in the depth of water and associated physical characteristics.

The lowest taxonomic richness was found in White Oak Lake (~ 4 taxa per sample) and the highest were found in background WOC (~ 15 taxa/sample) and upper Clear Creek (~ 12 taxa/sample). The other two reference weirs and the WAG 2 weirs all had ~ 9-11 taxa/sample. Since chironomid midge larvae made up most of the taxa identified, they were tabulated separately and gave the same pattern of relative taxonomic richness. Hence, although taxonomic richness varies by more than a factor of three among sites, the difference could be attributed to physical habitat differences as well as contamination.

4.2.3 Risk Characterization

4.2.3.1 Single-chemical sediment toxicity

Screening of sediment exposures against chemical benchmarks

As with the surface water analysis, measured concentrations of inorganic chemicals were compared to the background criterion. Inorganics that exceeded the background criterion and all detected organic chemicals were screened against benchmarks and evaluated as COPECs. This was done by dividing the maximum detected concentration by each of the sediment screening benchmarks (Table 4.1). Chemicals that exceeded any benchmark (i.e., the quotient of Max Detect/sediment screening benchmark was >1) were identified as COPECs (Table 4.2).

A second step in the screening process involved determining the relative contribution of the COPECs to the distribution of toxicity in the WOC watershed. This was done by calculating each COPEC's average screening hazard quotient for a subbasin (sum of HQs based on maximum

detected concentration divided by the number of benchmarks) and adding these together to get the sum average HQ (Table 4.3). Use of the average HQ, rather than the maximum HQs, reduces the influence of highly conservative screening benchmarks (e.g., equilibrium partitioning benchmarks based on the SCV). It is important to note that average HQ are heuristic only, providing an indication of the relative toxicity of sites and the relative contributions of chemicals to that toxicity. That is, these values are not used to identify COECs

Exposure-effects profiles for sediment exposures

Risks were estimated by subbasin for each COPEC by comparing the distribution of observed concentrations to each sediment benchmark. As with aqueous exposures, these comparisons were performed mathematically, rather than graphically, in order to ensure consistency and facilitate the evaluation of large data sets. This was done by (1) identifying and then estimating points that define key segments of the exposure distributions; (2) classifying the available benchmarks with regard to the conservatism with which they estimate effects; (3) comparing each segment of the distribution to each benchmark; and (4) assigning a basin-specific risk score to each COPEC.

The distribution of sediment concentrations represents the variation in exposure in space, rather than time. Hence, the 80th percentile represents the concentration that is exceeded in approximately 20 percent of the soft sediments. As with aqueous exposures, the key segments of the distribution are defined by four points (the 100th, 80th, 50th, and 0 percentiles) and the benchmarks (Table 4.1) were classified as either possible-effects or probable-effects benchmarks. Possible-effects benchmarks are conservative estimates of concentrations at which toxicity may occur (i.e., the ER-L, TEL, MOE_LEL, REGIV_SV, and EqP_SCV. Probable-effects benchmarks are concentrations at which toxicity is likely (i.e., the ER-M, PEL, MOE_SEL, EPASQC01, and the equilibrium partitioning benchmarks derived using NAWQC, LCVs, or LTVs). Each segment of the distribution was compared to the benchmarks and a risk score of 1 to 8 was assigned. The rules and interpretations of this scoring process are presented in (Table 4.4).

It should be noted that nondetects were included in the distribution at 0.5 times the detection limit. Hence, it is possible that the maximum value (100th percentile) is not a detected concentration. The conservatism this introduces was countered by specifying that the maximum detected concentration must exceed at least one probable-effects benchmark in order for a chemical to receive a score of 5 or higher. That is, a chemical can not be a COEC unless it was detected at least once at a concentration that is expected to be toxic. Furthermore, exclusion of the nondetects at the low end of the distribution would bias the estimations of exposure high. It also should be noted that the 80th percentile was set equal to the 100th percentile if the data set was too small (generally less than 5 observations) to estimate an 80th percentile.

Each risk score also was given a confidence score. Confidence in the risk score is a function of the quality of the benchmark that was exceeded and the magnitude of the exceedence. Confidence scores consist of a set of plus (+) or minus (-) signs. The default is a moderate to high degree of confidence, which is given a score of zero (indicated by the absence of a plus or minus sign). Unlike the aqueous benchmarks (Sect. 3.3), the quality of the sediment benchmarks varies considerably. Estimates of confidence are available for two sets of sediment benchmarks, the NOAA ER-Ls and ER-Ms (Long et al. 1995) and the FDEP TELs and PELs (MacDonald 1994). An interpretation of these estimates for the purposes of ecological risk assessment is presented in Jones et al. (1996). Low confidence in an ER-M or PEL suggests that this benchmark may over estimate the likelihood of effects; such benchmarks are given a confidence score of minus (-). Low confidence in an ER-L or TEL suggests that this benchmark may under estimate the likelihood of effects; such benchmarks

are given a confidence score of plus (+). Jones et al. (1996) also present sediment benchmarks for non-ionic organic chemicals based on equilibrium partitioning models and aqueous benchmarks. Some of these benchmarks are for polar non-ionic chemicals, for which the benchmarks may over predict the likelihood of effects; such benchmarks are assigned a confidence score of minus (-). Only one benchmark, the WS_AET, is available for some ionic organic chemicals. Confidence in this benchmark is low because it is highly site-specific. The magnitude of the exceedence is determined by the largest hazard quotient (HQ) calculated for the final risk score. An HQ of 1-10 is indicated by the default score, an HQ of 10-100 is indicated by a single plus (+), and an HQ of more than 100 is indicated by a double plus (++).

The final confidence score is the sum of the quality and magnitude scores and ranges from single minus (-) to triple plus (+++) (Table 4.5). Hence, if a probable-effects benchmark that overestimates effects (quality score of minus [-]) is exceed by 100 fold (magnitude score of double plus [++]), we should still have considerable confidence in the resulting risk score and the effects it indicates (final confidence score of plus [+]). As an example, a COPEC would receive a final score of "7" if the 50th percentile of the exposure distribution was 50 times higher than one probable-effects benchmark, in which we have low confidence. This would suggest, with a moderate to high degree of confidence, that toxicity is likely most in most of the soft sediments in that subbasin.

The final risk scores were then used to characterize the risks to benthic invertebrates as negligible (1 to 2+++), marginal (3- to 5++), or significant (6- to 8++). That is, chemicals are considered to present a significant risk and to be of concern (CEOCs) if at least 20% of the concentrations exceeded probable-effects benchmarks. COPECs are considered to present a marginal risk if at least 50% of the concentrations exceeded possible-effects benchmarks or the maximum detected concentration exceeded probable-effects benchmarks. All other COPECs are considered to present negligible risks.

Table 4.2 presents, for each COPEC, the characterization of risks to benthic invertebrates and the final risk score by subbasin. Table 4.6 details the exposure estimates (maximum detected concentration) for each subbasin, benchmark values, and the corresponding HQs. Therefore, this section addresses only that information that aids in characterizing the risks associated with the COECs.

Metals

Of the twelve metal COPECs, only cadmium is not a COEC in one or more subbasins.

Antimony, Arsenic, and Chromium appear to present a significant risk to benthic invertebrates in Lower WOC only. Confidence is moderate to high in the benchmarks for antimony and chromium, which were exceeded by the maximum detected concentration and the 80th percentile. Confidence is low in the arsenic PEL and moderate to high in the MOE-SEL. These benchmarks were exceeded by the median concentration. Confidence in the arsenic ER-M is high to moderate.

Copper appears to present a significant risk to benthic invertebrates in two subbasins, WOC and SWSA 5 WOC. Confidence is moderate to high in the sediment benchmarks for copper. Although significant risks are indicated in 100% of SWSA 5 WOC, this was based on the collection of only one sediment sample. Copper was detected in six of six samples from WOC and the 80th percentile exceeded at least one probable-effects benchmark.

Iron and manganese appear to present a significant risk in every subbasin in which they were detected above background concentrations. However, caution should be exercised in deciding to remediate sediments for these metals because there is very little toxicological data for these chemicals. The only benchmarks available are the MOE_LEL and MOE_SEL. These benchmarks are based on effects to benthic organisms in Canada, which may or may not be representative of benthic invertebrates indigenous to this watershed. Still, they were derived with freshwater organisms and the severity of effects indicated by the MOE_SEL is high.

Lead appears to present a significant risk in SWSA 5 WOC only. Although confidence is moderate to high in the sediment benchmarks for lead, only one sediment sample was collected in this subbasin.

Mercury appears to present a significant risk in four subbasins along WOC above White Oak Lake (SWSA 5 Trib 1, SWSA 5 WOC, Intermediate pond, and WOC) and in WOCE, but not in Lower WOC. There were relatively few samples from the subbasins above White Oak Lake. 31 and 93 samples were collected from Lower WOC and WOCE, respectively. Confidence is low in the ER-M and PEL and only the WOCE score is based on an HQ of 10-100. It is possible that mercury in WOCE sediment is partially resulting from backflow from the Clinch River. This may account for the lack of a consistent down stream gradient in Mercury concentrations.

Nickel appears to present a significant risk in four subbasins along (WOC: SWSA 5 Trib 1, Intermediate pond, SWSA 4 Main, and Lower WOC). Confidence is low in the ER-M and PEL and none of the risk scores are based on HQs greater than 10. However, nickel was detected in all five sediment samples collected from SWSA 4 Main at concentrations higher than all of the probable-effects benchmarks (ER-M, PEL, and MOE_SEL).

Silver appears to present a significant risk in seven subbasins along WOC: SWSA 5 Trib 1, SWSA 5 Drainage D-2, Intermediate Pond, WOC, Lower WOC, and WOCE. Confidence is low for the PEL and moderate to high for the ER-M. The maximum detected concentration exceeded all benchmarks in all of these basins except SWSA 5 WOC, where all but the ER-M were exceeded.

Zinc appears to present a significant risk in four subbasins along WOC (SWSA 5 WOC, SWSA 5 Trib 1, Intermediate Pond, WOC, and Lower WOC) and subbasin HF-2. Confidence in the sediment benchmarks is moderate to high.

Pesticides

4,4'-DDT was the only pesticide detected at concentrations that are likely to present a significant risk to sediment-associated biota. It was detected in 2 of 26 samples from the WOCE only. This suggests that Clinch River sediment deposited in the embayment during backflow conditions may be source of this 4,4'-DDT contamination. Confidence is low in the ER-M and PEL and only the PEL was exceeded. However, the two detected concentrations and all detection limits exceeded the PEL, which is 10 times lower than the ER-M. Hence, DDT receives a risk score of 8 based on the possibility that all sediments may exceed the PEL, but confidence is low.

Polycyclic aromatic hydrocarbons

Seven PAHs (Acenaphthene, anthracene, benz(a)anthracene, benzo(a)pyrene, dibenz(a,h)anthracene, phenanthrene, and pyrene) appear to present a significant risk in four subbasins above White Oak Lake (SWSA 5 Trib 1, Intermediate pond, WOC, and Pit 4 south), but

not in Lower WOC or WOCE. Confidence is moderate of high for all benchmarks, but only a few samples (i.e., 1 to 3) were collected in subbasins with high scores.

Polychlorinated biphenyls

PCB-1248, PCB-1254, or PCB-1260 appear to present a significant risk in six subbasins along WOC (SWSA 5 Trib 1, SWSA 5 WOC, Intermediate pond, WOC, Lower WOC/White Oak Lake, and WOCE). Confidence is low in the ER-M and a PEL is not available.

Total PCBs was measured and detected in four of four samples from HRE. Confidence is low in the ER-M and ER-L and the median did not exceed any probable-effects benchmarks.

Polar and ionic organic chemicals

4-Methylphenol and phenol appear to present a significant risk in SWSA 5 Trib 1 only. However, caution should be exercised in deciding to remediate sediments for these chemicals because very little sediment toxicity data is available and equilibrium partitioning is likely to significantly over estimate the likelihood of effects for polar chemicals. Confidence is low for all of the benchmarks available for these chemicals: the WS_AET is site-specific and phenol is strongly polar. Still, the median and all detected concentrations of both chemicals exceeded all of the benchmarks.

Acetone appears to present a significant risk in SWSA 5 Trib 1, SWSA 5 WOC, and SWSA 5 Drainage D-2. However, caution should be exercised in deciding to remediate sediments for this chemical. The only sediment benchmarks available for acetone are based on equilibrium partitioning. Confidence in these benchmarks is low, because acetone is strongly polar. Still, the maximum concentration detected in SWSA 5 Trib 1 exceeded all of the benchmarks, including the EQPCVF1, which is more than 300 times higher than the other benchmarks.

Weight of evidence

Subbasins for which at least sediment chemistry data are available (Table 3.8) are discussed below. Sediment chemistry and community surveys are available for the following four subbasins.

WOC. Although the weight-of-evidence is not strong, it suggests that sediment in this subbasin does not pose a significant risk to benthic invertebrates. Chironomid taxa richness was slightly lower than in the reference pools, but total taxonomic richness of the sediment community was similar to the reference sites. Hence, all of the eleven COECs (Table 4.2) appear to be credible contributors to toxicity, but the community does not appear to be degraded.

MB-15. The weight-of-evidence suggests that sediment in this subbasin does not pose a significant risk to benthic invertebrates. The sediment community was similar to reference sites and none of the detected chemicals exceeded probable-effects benchmarks (i.e., there are no COECs).

Seep C. The weight-of-evidence suggests that sediment in this subbasin does not pose a significant risk to benthic invertebrates. The sediment community was similar to reference sites and none of the detected chemicals exceeded probable-effects benchmarks (i.e., there are no COECs).

Lower WOC. The weight-of-evidence suggests that sediment in Lower WOC poses a significant risk to benthic invertebrates. Eight sediment COECs were identified in this subbasin

(Table 4.2) and the sediment community surveys were inconclusive. The relative importance of habitat and contamination could not be determined because a good reference reservoir was not available. However, the very low taxonomic richness observed in White Oak Lake provides no evidence to refute the risks indicated by the sediment chemical concentrations.

Sediment chemical concentrations are the only evidence available for seventeen subbasins (Table 3.8). Significant risks are not indicated in five of these subbasin (^{60}Co Seep, MB-15, Seep B west, Seep B east, Seep C, WCTrib-1, and West Seep), because none of the detected chemicals appears to present a significant risk (i.e., there are no COECs). There is at least one COEC in the twelve other subbasins (Table 4.2) . That is, significant risks are indicated in these subbasins.

In summary, PCBs (both totals and Arochlor mixtures), 7 PAHs, 3 polar organics, and 11 metals were found at concentrations high enough to indicate a significant risk to benthic invertebrates. Sediment toxicity is unknown. Community surveys in depositional areas do not indicate a large effect of contamination except possibly in White Oak Lake, but they are confounded by habitat differences. That is, significant risks indicated by sediment chemical concentrations were not refuted by the community survey data in the Lower WOC subbasin. Eight sediment COECs were identified in this subbasin and the sediment community surveys were inconclusive. The relative importance of habitat and contamination could not be determined because a good reference was not available. However, the community survey suggests that sediment in subbasin WOC does not pose a significant risk to benthic invertebrates. Chironomid taxa richness was slightly lower than in the reference pools, but total taxonomic richness of the sediment community was similar to the reference sites. Hence, all of the eleven COECs appear to be credible contributors to toxicity, but the community does not appear to be degraded.

4.3 UNCERTAINTIES CONCERNING RISKS TO BENTHIC INVERTEBRATES

The following issues are believed to constitute the major sources of uncertainty in the risk assessment for the benthic invertebrate assemblage.

- The benchmarks against which the sediment concentrations are screened are from studies of estuaries and large lakes which may differ considerably in their physical and ecological properties from the steams being assessed.
- The toxicity of the sediments is unknown.
- A good invertebrate survey reference site was not available for White Oak Lake.

Table 4.1. Descriptions of the ecotoxicological screening benchmarks for benthic biota exposed to contaminated sediments[a]

Benchmark	Abbreviation	Description
Effects Range—Low	ER_L	The tenth percentile of estuarine sediment concentrations reported to be associated with some level of toxic effects.
Effects Range—Median	ER_M	The fiftieth percentile of estuarine sediment concentrations reported to be associated with some level of toxic effects.
Region IV Benchmark	REGIV_SV	The higher of two values, the EPA Contract Laboratory Program Practical Quantification Limit (CLP PQL) and the Effects Value which is the lower of the ER-L and the Florida NOEL.
Threshold Effect Level	TEL	The geometric mean of the fifteenth percentile of reported concentrations which were associated with some level of effects and the fiftieth percentile of reported concentrations which were associated with no adverse effects. All data are for marine and estuarine sediments.
Probable Effect Level	PEL	The geometric mean of the fiftieth percentile of reported concentrations which were associated with some level of effects and the eighty-fifth percentile of reported concentrations which were associated with no adverse effects. All data are for marine and estuarine sediments.
National Sediment Quality Criteria	EPASQC1	Proposed sediment quality criteria based on toxicity in water expressed as chronic water quality criteria (recalculated after adding some benthic species) and partitioning of the contaminant between organic matter (1% of sediment) and pore water. Organic matter content is assumed to be one percent by weight..
Equilibrium Partitioning Benchmarks	EQPAWQC1 EQPAWQC1 EQPCVD1 EQPCVF1 EQPCVI1	Benchmarks derived in the same manner as sediment quality criteria except that the expression of aqueous toxicity is one of five benchmarks: the chronic NAWQC (EQPAWQC1), the Secondary Chronic Value (EQPAWQC1), the Lowest Chronic Value for Daphnids (EQPCVD1), the Lowest Chronic Value for Fish (EQPCVF1), or the Lowest Chronic Value for Nondaphnid Invertebrates (EQPCVI1). Organic matter content is assumed to be one percent by weight.
Ontario Ministry of the Environment Lowest Effect Level	MOE_LEL	Concentrations determined by the Ontario MOE to constitute thresholds for toxic effects in Ontario sediments.

Table 4.1. (continued)

Benchmark	Abbreviation	Description
Ontario Ministry of the Environment Severe Effect Level	MOE_SEL	Concentrations determined by the Ontario MOE to constitute thresholds for severe toxic effects in Ontario sediments.
Apparent Effect Threshold	WS_AET	A concentration above which toxic effects occurred at all sites in Puget Sound.

[a]More details are presented by Jones et al. (1996), Long et al. (1995), MacDonald (1994), and Region IV (1995).

Table 4.2. Sediment COPECs, risk scores, and the resulting characterization of risks to benthic invertebrates based on sediment contamination

Analyte	SWSA 5 WOC	SWSA 5 Trib 1	SWSA 4 Main	Interm. Pond	WOC	HFIR east	HF-2	MB-15	HRT-3
Antimony		M (5)				M (4)	M (3)	M (3)	M (4)
Arsenic									
Cadmium									N (2)
Chromium							M (5)		N (2)
Copper	S (8)	M (5)		M (3)	S (6)		N (1)		N (2)
Iron		S (7)							
Lead	S (8)	M (5)		M (3)	M (3)				
Manganese		S (7)	S (8)			S (8)	S (7)		S (7)
Mercury	S (8-)	S (7-)		S (8-)	S (8-)				
Nickel		S (6-)	S (8-)	S (6-)					M (5-)
Silver	S (8-)	S (7-)		S (8-)	S (8-)				
Zinc	M (4)	S (6)		S (7)	S (7)		S (6)	M (5)	
1,1-Dichloroethane									
1,2-Dichloroethene									
2-Butanone		N (2-)							
2-Methylnaphthalene				M (4)					
4,4'-DDT									
4-Methylphenol		S (7-)							
Acenaphthene				S (7)	S (8)				
Acetone	S (8-)	S (7)							
Alpha-BHC					N (2+)				
Anthracene				S (8)	S (8+)				
Benz(a)anthracene				M (3)	S (8)				
Benzo(a)pyrene				M (4)	S (8)				
Bis(2-ethyl-hexyl)phthalate		M (4)		M (3)	M (4+)				
Carbon disulfide									
Chrysene				M (3)					
Di-n-butylphthalate									
Dibenz(a,h)anthracene				S (8)					
Dibenzofuran					M (4)				
Diethylphthalate									
Endosulfan sulfate									
Fluoranthene				M (3)					
Fluorene				M (4+)					
Methylene chloride									
Naphthalene		N (2+)		M (3)					
PCB-1248		S (6-)							
PCB-1254	S (8)	S (6-)		S (6-)					
PCB-1260	S (8-)	M (5-)		S (6-)	S (6-)				
Phenanthrene				S (6)	S (8)				
Phenol		S (8)							
Polychlorinated biphenyl									S (6-)
Pyrene				M (3)	S (8)				
Toluene		N (1)							

Table 4.2. (continued)

Analyte	Seep A	Seep B East	Seep B West	Seep C	SWSA 5 Drainage D-2
Antimony		M (4)	M (4)	M (3)	
Arsenic					M (4)
Cadmium					
Chromium					
Copper					M (3)
Iron					**S (8)**
Lead					
Manganese	**S (8)**				**S (8)**
Mercury					M (3)
Nickel					
Silver					**S (8-)**
Zinc		M (4)	M (3)	M (3)	
1,1-Dichloroethane					M (3)
1,2-Dichloroethene					N (2)
2-Butanone					
2-Methylnaphthalene					
4,4'-DDT					
4-Methylphenol					
Acenaphthene					
Acetone					**S (8-)**
Alpha-BHC					
Anthracene					
Benz(a)anthracene					
Benzo(a)pyrene					
Bis(2-ethyl-hexyl)phthalate					
Carbon disulfide	M (4)				
Chrysene					
Di-n-butyl-phthalate					
Dibenz(a,h)anthracene					
Dibenzofuran					
Diethylphthalate					
Endosulfan sulfate					
Fluoranthene					
Fluorene					
Methylene chloride					
Naphthalene	M (3)				M (3)
PCB-1248					
PCB-1254				M (3)	
PCB-1260					M (4)
Phenanthrene					
Phenol					
Polychlorinated biphenyl					
Pyrene					
Toluene					

Table 4.2. (continued)

Analyte	^{60}Co Seep	WC TRIB-1	West Seep	SWSA 5 Drainage D-2	Pit 4 South	Lower WOC	WOCE
Antimony	M (4)	M (4)	M (3)			S (6)	N (2)
Arsenic						S (7)	N (1)
Cadmium						M (5)	M (5)
Chromium						S (6)	M (3)
Copper					M (4)	M (5)	N (2)
Iron							
Lead						M (5)	M (5)
Manganese				S (8)			
Mercury					N (2)	N (1)	S (6)
Nickel						S (6-)	
Silver						S (7-)	S (6-)
Zinc						S (6)	M (5)
1,1-Dichloroethane							
1,2-Dichloroethene							
2-Butanone							
2-Methylnaphthalene							
4,4'-DDT							S (8-)
4-Methylphenol							
Acenaphthene					M (4)		
Acetone							
Alpha-BHC						M (3+)	
Anthracene					S (8)		
Benz(a)anthracene					N (2)		
Benzo(a)pyrene					N (2)		M (4)
Bis(2-ethyl-hexyl)phthalate							M (3)
Carbon disulfide							
Chrysene					N (2)		M (4)
Di-n-butylphthalate						N (2)	
Dibenz(a,h)anthracene							
Dibenzofuran							
Diethylphthalate						M (4)	M (3)
Endosulfan sulfate							M (4)
Fluoranthene					N (2)		M (3+)
Fluorene					M (4+)		
Methylene chloride						N (1)	
Naphthalene					M (3)		
PCB-1248							
PCB-1254					M (4)	S (6-)	S (7-)
PCB-1260						S (7-)	S (6-)
Phenanthrene					M (4)		M (4)

Table 4.2. (continued)

Analyte	^{60}Co Seep	WC TRIB-1	West Seep	SWSA 5 Drainage D-2	Pit 4 South	Lower WOC	WOCE
Phenol							
Polychlorinated biphenyl							
Pyrene							M (3)
Toluene						N (1+)	

Blank indicates that if the chemical was detected it was not a COPEC in that subbasin (i.e., maximum detected concentration did not exceed any benchmarks)
S = Significant Risks (Risk score is 6, 7, or 8); Chemical is COEC
M = Marginal Risks (Risk score is 3, 4, or 5); Chemical is COPEC
N = Negligible Risks (Risk score is 1 or 2); Chemical is COPEC
Confidence score range from "-" to "+++" and are determined by the quality of the benchmark and the magnitude of the exceedence. A "-" suggests less confidence in the risk score, a "+" suggests more confidence in the risk score.
BOLD indicates COEC
Only one sediment sample was collected from this subbasin.

Table 4.3. Individual and sum of average hazard quotients (HQs) for sediment COPECs

Analyte	^{60}Co seep	HF-2	HFIR east	HRT-3	Intermediate Pond	Lower WOC	MB-15	Pit 4 south
Sum of Average HQs	**0.69**	**21.01**	**9.43**	**26.56**	**98.60**	**422.25**	**3.28**	**7.96**
Antimony	0.69	1.41	0.98	0.83		45.71	1.41	0.27
Arsenic						75.11		
Cadmium				2.56		3.79		
Chromium		2.57		1.53		74.96		
Chromium VI								
Copper		1.04		1.14	2.05	9.15		1.72
Iron								
Lead					1.23	3.33		
Manganese		12.81	8.46	10.61				
Mercury					16.50	3.00		0.74
Nickel				1.79	4.76	2.50		
Silver					12.80	35.52		
Zinc		3.19			1.81	10.44	1.87	
1,1-Dichloroethane								
1,2-Dichloroethene								
2-Butanone								
2-Methylnaphthalene					0.41			
4,4'-DDT								
4-Methylphenol					0.33			
Acenaphthene					3.31			0.56
Acetone								
alpha-BHC						1.68		
Anthracene					2.32			0.42
Benz(a)anthracene					3.05			0.15
Benzo(a)pyrene					2.03			0.13
Bis(2-ethylhexyl)phthalate					1.71			0.26
Carbon disulfide								
Chrysene					2.50			0.12
Di-n-butylphthalate					0.01	3.66		0.01
Dibenz(a,h)anthracene					9.16			
Dibenzofuran					0.08			0.08
Diethylphthalate						95.71		
Endosulfan sulfate								
Fluoranthene					2.57			0.22
Fluorene					2.65			1.82
Methylene chloride						1.15		
Naphthalene					0.23			0.18
PCB-1248								
PCB-1254					5.94	10.51		0.55
PCB-1260					17.30	41.61		
Phenanthrene					2.93			0.53
Phenol								
Polychlorinated biphenyl				8.10				
Pyrene					2.92			0.21
Toluene						4.40		

Table 4.3. (continued)

Analyte	SEEP A	SEEP B West	SEEP B East	SEEP C	SWSA 5 Trib 1	SWSA 5 WOC	SWSA 4 Main
Sum of Average HQs	**7.00**	**2.34**	**2.55**	**2.94**	**1082.40**	**117.14**	**47.52**
Antimony		1.08	1.23	1.31	5.73		
Arsenic							
Cadmium							
Chromium							
Chromium VI							
Copper					3.69	6.03	
Iron					3.86		
Lead					3.26	3.22	
Manganese	5.69				7.50		19.99
Mercury	0.39				127.67	13.46	
Nickel					2.94		27.53
Silver					1.70	4.37	
Zinc		1.26	1.32	1.37	8.74	0.85	
1,1-Dichloroethane							
1,2-Dichloroethene							
2-Butanone	0.04				1.43		
2-Methylnaphthalene							
4,4'-DDT							
4-Methylphenol					38.81		
Acenaphthene							
Acetone					365.88	35.84	
alpha-BHC							
Anthracene							
Benz(a)anthracene							
Benzo(a)pyrene							
Bis(2-ethylhexyl)phthalate					2.84		
Carbon disulfide	0.78						
Chrysene							
Di-n-butylphthalate							
Dibenz(a,h)anthracene							
Dibenzofuran							
Diethylphthalate							
Endosulfan sulfate							
Fluoranthene							
Fluorene							
Methylene chloride	0.01				0.01		
Naphthalene	0.06				0.06		
PCB-1248					20.16		
PCB-1254				0.26	17.47	26.79	
PCB-1260					35.03	26.59	
Phenanthrene							
Phenol					435.53		
Polychlorinated biphenyl							
Pyrene							
Toluene	0.03				0.07		

Table 4.3. (continued)

Analyte	W6MS3	WCTRIB-1	West Seep	SWSA 5 Drainage D-2	WOC	WOCE
Sum of Average HQs	**9.22**	**0.54**	**0.58**	**135.47**	**128.53**	**1685.97**
Antimony		0.54	0.58		0.12	3.55
Arsenic				1.27		1.57
Cadmium						3.41
Chromium						1.55
Chromium VI					0.38	
Copper				1.04	5.14	1.36
Iron				3.52		
Lead					1.56	3.06
Manganese	9.22			65.49		
Mercury				1.65	20.84	1563.25
Nickel						
Silver				5.40	18.65	13.61
Zinc					4.99	2.22
1,1-Dichloroethane				2.58		
1,2-Dichloroethene				2.79		
2-Butanone				0.22		
2-Methylnaphthalene						
4,4'-DDT						11.60
4-Methylphenol						
Acenaphthene					13.73	
Acetone				47.79		
alpha-BHC					5.57	
Anthracene					4.86	
Benz(a)anthracene					4.05	
Benzo(a)pyrene					3.07	2.22
Bis(2-ethylhexyl)phthalate					7.10	2.02
Carbon disulfide						
Chrysene						0.49
Di-n-butylphthalate						
Dibenz(a,h)anthracene						
Dibenzofuran					0.52	
Diethylphthalate						0.23
Endosulfan sulfate						5.45
Fluoranthene						0.37
Fluorene						
Methylene chloride				0.01		
Naphthalene				0.06		
PCB-1248						
PCB-1254						54.74
PCB-1260				3.59	25.32	13.50
Phenanthrene					8.72	1.06

Table 4.3. (continued)

Analyte	W6MS3	WCTRIB-1	West Seep	SWSA 5 Drainage D-2	WOC	WOCE
Phenol						
Polychlorinated biphenyl						
Pyrene					3.90	0.71
Toluene				0.07		

Hazard Quotients = Maximum detected concentration/benchmark value.
Average HQ = sum of HQs/number of HQs; calculated for each COPEC and subbasin combination
Sum of Average HQs is indicative of relative toxicity of sediment in each basin.

Table 4.4. Rules for assigning and interpreting risk scores for sediment COPECs

Estimated Exposure Concentration [a]	Class of Benchmark Exceeded	Interpretation	Risk Score
100th percentile	Possible-Effects	Toxicity is possible in at least 1% of the sediments in a subbasin.	1
80th percentile	Possible-Effects	Toxicity is possible in at least 20% of the sediments in a subbasin.	2
50th percentile	Possible-Effects	Toxicity is possible in at least 50% of the sediments in a subbasin.	3
Zero percentile	Possible-Effects	Toxicity is possible in 100% of the sediments in a subbasin.	4
100th percentile	Probable-Effects	Toxicity is likely in at least 1% of the sediments in a subbasin.	5
80th percentile	Probable-Effects	Toxicity is likely in at least 20% of the sediments in a subbasin	6
50th percentile	Probable-Effects	Toxicity is likely in at least 50% of the sediments in a subbasin	7
Zero percentile	Probable-Effects	Toxicity is likely in 100% of the sediments in a subbasin	8

[a] Percentiles indicate the concentration below which the specified percentage of concentrations measured in a subbasin occur (i.e., 80% of the concentrations were less than the 80th Percentile concentration).

Table 4.5. Calculation of final confidence scores[a] for sediment COPEC risk scores

	Magnitude of benchmark exceedence (Score)		
Quality of benchmark (Score)	**HQ = 1-10 (0)**	**HQ = 10-100 (+)**	**HQ > 100 (++)**
Low - may over estimate effects (-)	"-"	" "	"+"
Moderate to high - good estimate of effects (0)	" "	"+"	"++"
Low - may under estimate effects (+)	"+"	"++"	"+++"

[a] Final confidence scores are the sum of the benchmark quality score and the magnitude score.

Table 4.6. Exposure concentrations, benchmarks, and the resulting hazard quotients (HQs) for sediment COPECs

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Antimony	**^{60}Co seep**	**1**	**1**	**3.3**		**3.3**	**2**	**ER_L**	**1.65**
Antimony	^{60}Co seep	1	1	3.3		3.3	12	REGIV_SV	0.28
Antimony	^{60}Co seep	1	1	3.3		3.3	25	ER_M	0.13
Antimony	**HF-2**	**11**	**11**	**0.76**	**5.70e+00**	**6.8**	**2**	**ER_L**	**3.40**
Antimony	HF-2	11	11	0.76	5.70e+00	6.8	12	REGIV_SV	0.57
Antimony	HF-2	11	11	0.76	5.70e+00	6.8	25	ER_M	0.27
Antimony	**HFIR East**	**8**	**8**	**3.3**	**4.00e+00**	**4.7**	**2**	**ER_L**	**2.35**
Antimony	HFIR East	8	8	3.3	4.00e+00	4.7	12	REGIV_SV	0.39
Antimony	HFIR East	8	8	3.3	4.00e+00	4.7	25	ER_M	0.19
Antimony	**HRE**	**2**	**6**	**2.3**	**2.55e+01**	**4**	**2**	**ER_L**	**2.00**
Antimony	HRE	2	6	2.3	2.55e+01	4	12	REGIV_SV	0.33
Antimony	HRE	2	6	2.3	2.55e+01	4	25	ER_M	0.16
Antimony	**Lower WOC**	**12**	**35**	**0.98**	**3.80e+00**	**220**	**2**	**ER_L**	**110.00**
Antimony	**Lower WOC**	**12**	**35**	**0.98**	**3.80e+00**	**220**	**12**	**REGIV_SV**	**18.33**
Antimony	**Lower WOC**	**12**	**35**	**0.98**	**3.80e+00**	**220**	**25**	**ER_M**	**8.80**
Antimony	**MB-15**	**20**	**21**	**3.7**	**5.70e+00**	**6.8**	**2**	**ER_L**	**3.40**
Antimony	MB-15	20	21	3.7	5.70e+00	6.8	12	REGIV_SV	0.57
Antimony	MB-15	20	21	3.7	5.70e+00	6.8	25	ER_M	0.27
Antimony	Pit 4 South	2	2	1.1	1.20e+00	1.3	2	ER_L	0.65
Antimony	Pit 4 South	2	2	1.1	1.20e+00	1.3	12	REGIV_SV	0.11
Antimony	Pit 4 South	2	2	1.1	1.20e+00	1.3	25	ER_M	0.05
Antimony	**SEEP B West**	**5**	**5**	**4.2**	**4.50e+00**	**5.2**	**2**	**ER_L**	**2.60**
Antimony	SEEP B West	5	5	4.2	4.50e+00	5.2	12	REGIV_SV	0.43
Antimony	SEEP B West	5	5	4.2	4.50e+00	5.2	25	ER_M	0.21
Antimony	**SEEP B East**	**7**	**7**	**4.3**	**5.20e+00**	**5.9**	**2**	**ER_L**	**2.95**
Antimony	SEEP B East	7	7	4.3	5.20e+00	5.9	12	REGIV_SV	0.49
Antimony	SEEP B East	7	7	4.3	5.20e+00	5.9	25	ER_M	0.24
Antimony	**SEEP C**	**10**	**11**	**3.2**	**3.90e+00**	**6.3**	**2**	**ER_L**	**3.15**
Antimony	SEEP C	10	11	3.2	3.90e+00	6.3	12	REGIV_SV	0.53
Antimony	SEEP C	10	11	3.2	3.90e+00	6.3	25	ER_M	0.25
Antimony	**SWSA 5 Trib 1**	**1**	**8**	**27.6**	**6.52e+00**	**27.6**	**2**	**ER_L**	**13.80**
Antimony	**SWSA 5 Trib 1**	**1**	**8**	**27.6**	**6.52e+00**	**27.6**	**12**	**REGIV_SV**	**2.30**
Antimony	**SWSA 5 Trib 1**	**1**	**8**	**27.6**	**6.52e+00**	**27.6**	**25**	**ER_M**	**1.10**
Antimony	**WCTRIB-1**	**2**	**2**	**2.4**	**2.50e+00**	**2.6**	**2**	**ER_L**	**1.30**
Antimony	WCTRIB-1	2	2	2.4	2.50e+00	2.6	12	REGIV_SV	0.22
Antimony	WCTRIB-1	2	2	2.4	2.50e+00	2.6	25	ER_M	0.10
Antimony	**West Seep**	**10**	**11**	**2**	**2.50e+00**	**2.8**	**2**	**ER_L**	**1.40**
Antimony	West Seep	10	11	2	2.50e+00	2.8	12	REGIV_SV	0.23
Antimony	West Seep	10	11	2	2.50e+00	2.8	25	ER_M	0.11
Antimony	WOC	1	5	0.6	2.75e-01	0.6	2	ER_L	0.30
Antimony	WOC	1	5	0.6	2.75e-01	0.6	12	REGIV_SV	0.05
Antimony	WOC	1	5	0.6	2.75e-01	0.6	25	ER_M	0.02
Antimony	**WOCE**	**15**	**46**	**0.3**	**2.72e-01**	**17.1**	**2**	**ER_L**	**8.55**
Antimony	**WOCE**	**15**	**46**	**0.3**	**2.72e-01**	**17.1**	**12**	**REGIV_SV**	**1.43**
Antimony	WOCE	15	46	0.3	2.72e-01	17.1	25	ER_M	0.68

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Arsenic	Lower WOC	10	52	1.2	4.25e+01	830	6	MOE_LEL	138.33
Arsenic	Lower WOC	10	52	1.2	4.25e+01	830	7.24	REGIV_SV	114.64
Arsenic	Lower WOC	10	52	1.2	4.25e+01	830	7.24	TEL	114.64
Arsenic	Lower WOC	10	52	1.2	4.25e+01	830	8.2	ER_L	101.22
Arsenic	Lower WOC	10	52	1.2	4.25e+01	830	33	MOE_SEL	25.15
Arsenic	Lower WOC	10	52	1.2	4.25e+01	830	41.6	PEL	19.95
Arsenic	Lower WOC	10	52	1.2	4.25e+01	830	70	ER_M	11.86
Arsenic	SWSA 5 Drain. D-2	4	4	7.1	1.04e+01	14	6	MOE_LEL	2.33
Arsenic	SWSA 5 Drain. D-2	4	4	7.1	1.04e+01	14	7.24	REGIV_SV	1.93
Arsenic	SWSA 5 Drain. D-2	4	4	7.1	1.04e+01	14	7.24	TEL	1.93
Arsenic	SWSA 5 Drain. D-2	4	4	7.1	1.04e+01	14	8.2	ER_L	1.71
Arsenic	SWSA 5 Drain. D-2	4	4	7.1	1.04e+01	14	33	MOE_SEL	0.42
Arsenic	SWSA 5 Drain. D-2	4	4	7.1	1.04e+01	14	41.6	PEL	0.34
Arsenic	SWSA 5 Drain. D-2	4	4	7.1	1.04e+01	14	70	ER_M	0.20
Arsenic	WOCE	77	79	0.03	4.30e+00	17.4	6	MOE_LEL	2.90
Arsenic	WOCE	77	79	0.03	4.30e+00	17.4	7.24	REGIV_SV	2.40
Arsenic	WOCE	77	79	0.03	4.30e+00	17.4	7.24	TEL	2.40
Arsenic	WOCE	77	79	0.03	4.30e+00	17.4	8.2	ER_L	2.12
Arsenic	WOCE	77	79	0.03	4.30e+00	17.4	33	MOE_SEL	0.53
Arsenic	WOCE	77	79	0.03	4.30e+00	17.4	41.6	PEL	0.42
Arsenic	WOCE	77	79	0.03	4.30e+00	17.4	70	ER_M	0.25
Cadmium	HRE	2	9	3.1	1.50e-01	3.3	0.6	MOE_LEL	5.50
Cadmium	HRT-3	2	9	3.1	1.50e-01	3.3	0.676	TEL	4.88
Cadmium	HRT-3	2	9	3.1	1.50e-01	3.3	1	REGIV_SV	3.30
Cadmium	HRT-3	2	9	3.1	1.50e-01	3.3	1.2	ER_L	2.75
Cadmium	HRT-3	2	9	3.1	1.50e-01	3.3	4.21	PEL	0.78
Cadmium	HRT-3	2	9	3.1	1.50e-01	3.3	9.6	ER_M	0.34
Cadmium	HRT-3	2	9	3.1	1.50e-01	3.3	10	MOE_SEL	0.33
Cadmium	Lower WOC	15	51	0.13	4.90e-01	4.9	0.6	MOE_LEL	8.17
Cadmium	Lower WOC	15	51	0.13	4.90e-01	4.9	0.676	TEL	7.25
Cadmium	Lower WOC	15	51	0.13	4.90e-01	4.9	1	REGIV_SV	4.90
Cadmium	Lower WOC	15	51	0.13	4.90e-01	4.9	1.2	ER_L	4.08
Cadmium	Lower WOC	15	51	0.13	4.90e-01	4.9	4.21	PEL	1.16
Cadmium	Lower WOC	15	51	0.13	4.90e-01	4.9	9.6	ER_M	0.51
Cadmium	Lower WOC	15	51	0.13	4.90e-01	4.9	10	MOE_SEL	0.49
Cadmium	WOCE	37	55	0.1	1.40e+00	4.4	0.6	MOE_LEL	7.33
Cadmium	WOCE	37	55	0.1	1.40e+00	4.4	0.676	TEL	6.51
Cadmium	WOCE	37	55	0.1	1.40e+00	4.4	1	REGIV_SV	4.40
Cadmium	WOCE	37	55	0.1	1.40e+00	4.4	1.2	ER_L	3.67
Cadmium	WOCE	37	55	0.1	1.40e+00	4.4	4.21	PEL	1.05
Cadmium	WOCE	37	55	0.1	1.40e+00	4.4	9.6	ER_M	0.46
Cadmium	WOCE	37	55	0.1	1.40e+00	4.4	10	MOE_SEL	0.44
Chromium	HF-2	11	12	0.47	1.55e+01	168	26	MOE_LEL	6.46
Chromium	HF-2	11	12	0.47	1.55e+01	168	52.3	REGIV_SV	3.21
Chromium	HF-2	11	12	0.47	1.55e+01	168	52.3	TEL	3.21

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Chromium	HF-2	11	12	0.47	1.55e+01	168	81	ER_L	2.07
Chromium	HF-2	11	12	0.47	1.55e+01	168	110	MOE_SEL	1.53
Chromium	HF-2	11	12	0.47	1.55e+01	168	160	PEL	1.05
Chromium	HF-2	11	12	0.47	1.55e+01	168	370	ER_M	0.45
Chromium	HRT-3	15	15	0.81	9.30e+00	100	26	MOE_LEL	3.85
Chromium	HRT-3	15	15	0.81	9.30e+00	100	52.3	REGIV_SV	1.91
Chromium	HRT-3	15	15	0.81	9.30e+00	100	52.3	TEL	1.91
Chromium	HRT-3	15	15	0.81	9.30e+00	100	81	ER_L	1.23
Chromium	HRT-3	15	15	0.81	9.30e+00	100	110	MOE_SEL	0.91
Chromium	HRT-3	15	15	0.81	9.30e+00	100	160	PEL	0.63
Chromium	HRT-3	15	15	0.81	9.30e+00	100	370	ER_M	0.27
Chromium	Lower WOC	66	66	0.52	9.96e+01	4900	26	MOE_LEL	188.46
Chromium	Lower WOC	66	66	0.52	9.96e+01	4900	52.3	REGIV_SV	93.69
Chromium	Lower WOC	66	66	0.52	9.96e+01	4900	52.3	TEL	93.69
Chromium	Lower WOC	66	66	0.52	9.96e+01	4900	81	ER_L	60.49
Chromium	Lower WOC	66	66	0.52	9.96e+01	4900	110	MOE_SEL	44.55
Chromium	Lower WOC	66	66	0.52	9.96e+01	4900	160	PEL	30.63
Chromium	Lower WOC	66	66	0.52	9.96e+01	4900	370	ER_M	13.24
Chromium	WOCE	89	89	5.7	2.71e+01	101	26	MOE_LEL	3.88
Chromium	WOCE	89	89	5.7	2.71e+01	101	52.3	REGIV_SV	1.93
Chromium	WOCE	89	89	5.7	2.71e+01	101	52.3	TEL	1.93
Chromium	WOCE	89	89	5.7	2.71e+01	101	81	ER_L	1.25
Chromium	WOCE	89	89	5.7	2.71e+01	101	110	MOE_SEL	0.92
Chromium	WOCE	89	89	5.7	2.71e+01	101	160	PEL	0.63
Chromium	WOCE	89	89	5.7	2.71e+01	101	370	ER_M	0.27
Chromium VI	WOC	1	1	51.1		51.1	81	ER_L	0.63
Chromium VI	WOC	1	1	51.1		51.1	370	ER_M	0.14
Copper	HF-2	12	12	0.71	3.46e+00	32.8	16	MOE_LEL	2.05
Copper	HF-2	12	12	0.71	3.46e+00	32.8	18.7	REGIV_SV	1.75
Copper	HF-2	12	12	0.71	3.46e+00	32.8	18.7	TEL	1.75
Copper	HF-2	12	12	0.71	3.46e+00	32.8	34	ER_L	0.96
Copper	HF-2	12	12	0.71	3.46e+00	32.8	108	PEL	0.30
Copper	HF-2	12	12	0.71	3.46e+00	32.8	110	MOE_SEL	0.30
Copper	HF-2	12	12	0.71	3.46e+00	32.8	270	ER_M	0.12
Copper	HRT-3	13	13	0.27	1.90e+00	36	16	MOE_LEL	2.25
Copper	HRT-3	13	13	0.27	1.90e+00	36	18.7	REGIV_SV	1.93
Copper	HRT-3	13	13	0.27	1.90e+00	36	18.7	TEL	1.93
Copper	HRT-3	13	13	0.27	1.90e+00	36	34	ER_L	1.06
Copper	HRT-3	13	13	0.27	1.90e+00	36	108	PEL	0.33
Copper	HRT-3	13	13	0.27	1.90e+00	36	110	MOE_SEL	0.33
Copper	HRT-3	13	13	0.27	1.90e+00	36	270	ER_M	0.13
Copper	Intermediate Pond	5	5	15.1	4.44e+01	64.9	16	MOE_LEL	4.06
Copper	Intermediate Pond	5	5	15.1	4.44e+01	64.9	18.7	REGIV_SV	3.47
Copper	Intermediate Pond	5	5	15.1	4.44e+01	64.9	18.7	TEL	3.47
Copper	Intermediate Pond	5	5	15.1	4.44e+01	64.9	34	ER_L	1.91

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Copper	Intermediate Pond	5	5	15.1	4.44e+01	64.9	108	PEL	0.60
Copper	Intermediate Pond	5	5	15.1	4.44e+01	64.9	110	MOE_SEL	0.59
Copper	Intermediate Pond	5	5	15.1	4.44e+01	64.9	270	ER_M	0.24
Copper	**Lower WOC**	**48**	**63**	**0.21**	**2.10e+01**	**290**	**16**	**MOE_LEL**	**18.13**
Copper	**Lower WOC**	**48**	**63**	**0.21**	**2.10e+01**	**290**	**18.7**	**REGIV_SV**	**15.51**
Copper	**Lower WOC**	**48**	**63**	**0.21**	**2.10e+01**	**290**	**18.7**	**TEL**	**15.51**
Copper	**Lower WOC**	**48**	**63**	**0.21**	**2.10e+01**	**290**	**34**	**ER_L**	**8.53**
Copper	**Lower WOC**	**48**	**63**	**0.21**	**2.10e+01**	**290**	**108**	**PEL**	**2.69**
Copper	**Lower WOC**	**48**	**63**	**0.21**	**2.10e+01**	**290**	**110**	**MOE_SEL**	**2.64**
Copper	**Lower WOC**	**48**	**63**	**0.21**	**2.10e+01**	**290**	**270**	**ER_M**	**1.07**
Copper	**Pit 4 South**	**2**	**2**	**27.5**	**3.87e+01**	**54.4**	**16**	**MOE_LEL**	**3.40**
Copper	**Pit 4 South**	**2**	**2**	**27.5**	**3.87e+01**	**54.4**	**18.7**	**REGIV_SV**	**2.91**
Copper	**Pit 4 South**	**2**	**2**	**27.5**	**3.87e+01**	**54.4**	**18.7**	**TEL**	**2.91**
Copper	**Pit 4 South**	**2**	**2**	**27.5**	**3.87e+01**	**54.4**	**34**	**ER_L**	**1.60**
Copper	Pit 4 South	2	2	27.5	3.87e+01	54.4	108	PEL	0.50
Copper	Pit 4 South	2	2	27.5	3.87e+01	54.4	110	MOE_SEL	0.49
Copper	Pit 4 South	2	2	27.5	3.87e+01	54.4	270	ER_M	0.20
Copper	**SWSA 5 Trib 1**	**6**	**8**	**11.4**	**4.24e+01**	**117**	**16**	**MOE_LEL**	**7.31**
Copper	**SWSA 5 Trib 1**	**6**	**8**	**11.4**	**4.24e+01**	**117**	**18.7**	**REGIV_SV**	**6.26**
Copper	**SWSA 5 Trib 1**	**6**	**8**	**11.4**	**4.24e+01**	**117**	**18.7**	**TEL**	**6.26**
Copper	**SWSA 5 Trib 1**	**6**	**8**	**11.4**	**4.24e+01**	**117**	**34**	**ER_L**	**3.44**
Copper	**SWSA 5 Trib 1**	**6**	**8**	**11.4**	**4.24e+01**	**117**	**108**	**PEL**	**1.08**
Copper	**SWSA 5 Trib 1**	**6**	**8**	**11.4**	**4.24e+01**	**117**	**110**	**MOE_SEL**	**1.06**
Copper	SWSA 5 Trib 1	6	8	11.4	4.24e+01	117	270	ER_M	0.43
Copper	**SWSA 5 WOC**	**1**	**1**	**191**		**191**	**16**	**MOE_LEL**	**11.94**
Copper	**SWSA 5 WOC**	**1**	**1**	**191**		**191**	**18.7**	**REGIV_SV**	**10.21**
Copper	**SWSA 5 WOC**	**1**	**1**	**191**		**191**	**18.7**	**TEL**	**10.21**
Copper	**SWSA 5 WOC**	**1**	**1**	**191**		**191**	**34**	**ER_L**	**5.62**
Copper	**SWSA 5 WOC**	**1**	**1**	**191**		**191**	**108**	**PEL**	**1.77**
Copper	**SWSA 5 WOC**	**1**	**1**	**191**		**191**	**110**	**MOE_SEL**	**1.74**
Copper	SWSA 5 WOC	1	1	191		191	270	ER_M	0.71
Copper	**WG5 MID. Drn**	**4**	**4**	**10.5**	**1.95e+01**	**32.8**	**16**	**MOE_LEL**	**2.05**
Copper	**WG5 MID. Drn**	**4**	**4**	**10.5**	**1.95e+01**	**32.8**	**18.7**	**REGIV_SV**	**1.75**
Copper	**WG5 MID. Drn**	**4**	**4**	**10.5**	**1.95e+01**	**32.8**	**18.7**	**TEL**	**1.75**
Copper	WG5 MID. Drn	4	4	10.5	1.95e+01	32.8	34	ER_L	0.96
Copper	WG5 MID. Drn	4	4	10.5	1.95e+01	32.8	108	PEL	0.30
Copper	WG5 MID. Drn	4	4	10.5	1.95e+01	32.8	110	MOE_SEL	0.30
Copper	WG5 MID. Drn	4	4	10.5	1.95e+01	32.8	270	ER_M	0.12
Copper	**WOC**	**6**	**6**	**35.7**	**8.67e+01**	**163**	**16**	**MOE_LEL**	**10.19**
Copper	**WOC**	**6**	**6**	**35.7**	**8.67e+01**	**163**	**18.7**	**REGIV_SV**	**8.72**
Copper	**WOC**	**6**	**6**	**35.7**	**8.67e+01**	**163**	**18.7**	**TEL**	**8.72**
Copper	**WOC**	**6**	**6**	**35.7**	**8.67e+01**	**163**	**34**	**ER_L**	**4.79**
Copper	**WOC**	**6**	**6**	**35.7**	**8.67e+01**	**163**	**108**	**PEL**	**1.51**
Copper	**WOC**	**6**	**6**	**35.7**	**8.67e+01**	**163**	**110**	**MOE_SEL**	**1.48**
Copper	WOC	6	6	35.7	8.67e+01	163	270	ER_M	0.60

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Copper	WOCE	86	86	5.9	1.38e+01	43.2	16	MOE_LEL	2.70
Copper	WOCE	86	86	5.9	1.38e+01	43.2	18.7	REGIV_SV	2.31
Copper	WOCE	86	86	5.9	1.38e+01	43.2	18.7	TEL	2.31
Copper	WOCE	86	86	5.9	1.38e+01	43.2	34	ER_L	1.27
Copper	WOCE	86	86	5.9	1.38e+01	43.2	108	PEL	0.40
Copper	WOCE	86	86	5.9	1.38e+01	43.2	110	MOE_SEL	0.39
Copper	WOCE	86	86	5.9	1.38e+01	43.2	270	ER_M	0.16
Iron	SWSA 5 Trib 1	8	8	21800	5.62e+04	103000	20000	MOE_LEL	5.15
Iron	SWSA 5 Trib 1	8	8	21800	5.62e+04	103000	40000	MOE_SEL	2.58
Iron	WG5 MID. Drn	4	4	56500	8.58e+04	93800	20000	MOE_LEL	4.69
Iron	WG5 MID. Drn	4	4	56500	8.58e+04	93800	40000	MOE_SEL	2.35
Lead	Intermediate Pond	5	5	23.3	3.96e+01	62.5	30.2	REGIV_SV	2.07
Lead	Intermediate Pond	5	5	23.3	3.96e+01	62.5	30.2	TEL	2.07
Lead	Intermediate Pond	5	5	23.3	3.96e+01	62.5	31	MOE_LEL	2.02
Lead	Intermediate Pond	5	5	23.3	3.96e+01	62.5	47	ER_L	1.33
Lead	Intermediate Pond	5	5	23.3	3.96e+01	62.5	112	PEL	0.56
Lead	Intermediate Pond	5	5	23.3	3.96e+01	62.5	218	ER_M	0.29
Lead	Intermediate Pond	5	5	23.3	3.96e+01	62.5	250	MOE_SEL	0.25
Lead	Lower WOC	33	54	2.1	4.27e+01	170	30.2	REGIV_SV	5.63
Lead	Lower WOC	33	54	2.1	4.27e+01	170	30.2	TEL	5.63
Lead	Lower WOC	33	54	2.1	4.27e+01	170	31	MOE_LEL	5.48
Lead	Lower WOC	33	54	2.1	4.27e+01	170	47	ER_L	3.62
Lead	Lower WOC	33	54	2.1	4.27e+01	170	112	PEL	1.52
Lead	Lower WOC	33	54	2.1	4.27e+01	170	218	ER_M	0.78
Lead	Lower WOC	33	54	2.1	4.27e+01	170	250	MOE_SEL	0.68
Lead	SWSA 5 Trib 1	8	8	13.8	4.64e+01	166	30.2	REGIV_SV	5.50
Lead	SWSA 5 Trib 1	8	8	13.8	4.64e+01	166	30.2	TEL	5.50
Lead	SWSA 5 Trib 1	8	8	13.8	4.64e+01	166	31	MOE_LEL	5.35
Lead	SWSA 5 Trib 1	8	8	13.8	4.64e+01	166	47	ER_L	3.53
Lead	SWSA 5 Trib 1	8	8	13.8	4.64e+01	166	112	PEL	1.48
Lead	SWSA 5 Trib 1	8	8	13.8	4.64e+01	166	218	ER_M	0.76
Lead	SWSA 5 Trib 1	8	8	13.8	4.64e+01	166	250	MOE_SEL	0.66
Lead	SWSA 5 WOC	1	1	164		164	30.2	REGIV_SV	5.43
Lead	SWSA 5 WOC	1	1	164		164	30.2	TEL	5.43
Lead	SWSA 5 WOC	1	1	164		164	31	MOE_LEL	5.29
Lead	SWSA 5 WOC	1	1	164		164	47	ER_L	3.49
Lead	SWSA 5 WOC	1	1	164		164	112	PEL	1.46
Lead	SWSA 5 WOC	1	1	164		164	218	ER_M	0.75
Lead	SWSA 5 WOC	1	1	164		164	250	MOE_SEL	0.66
Lead	WOC	6	6	29	5.06e+01	79.7	30.2	REGIV_SV	2.64
Lead	WOC	6	6	29	5.06e+01	79.7	30.2	TEL	2.64
Lead	WOC	6	6	29	5.06e+01	79.7	31	MOE_LEL	2.57
Lead	WOC	6	6	29	5.06e+01	79.7	47	ER_L	1.70
Lead	WOC	6	6	29	5.06e+01	79.7	112	PEL	0.71
Lead	WOC	6	6	29	5.06e+01	79.7	218	ER_M	0.37

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Lead	WOC	6	6	29	5.06e+01	79.7	250	MOE_SEL	0.32
Lead	WOCE	89	89	5.3	3.11e+01	156	30.2	REGIV_SV	5.17
Lead	WOCE	89	89	5.3	3.11e+01	156	30.2	TEL	5.17
Lead	WOCE	89	89	5.3	3.11e+01	156	31	MOE_LEL	5.03
Lead	WOCE	89	89	5.3	3.11e+01	156	47	ER_L	3.32
Lead	WOCE	89	89	5.3	3.11e+01	156	112	PEL	1.39
Lead	WOCE	89	89	5.3	3.11e+01	156	218	ER_M	0.72
Lead	WOCE	89	89	5.3	3.11e+01	156	250	MOE_SEL	0.62
Manganese	HF-2	12	12	1100	1.75e+03	8330	460	MOE_LEL	18.11
Manganese	HF-2	12	12	1100	1.75e+03	8330	1110	MOE_SEL	7.50
Manganese	HFIR/east	8	8	1600	2.85e+03	5500	460	MOE_LEL	11.96
Manganese	HFIR/east	8	8	1600	2.85e+03	5500	1110	MOE_SEL	4.95
Manganese	HRT-3	14	14	340	1.95e+03	6900	460	MOE_LEL	15.00
Manganese	HRT-3	14	14	340	1.95e+03	6900	1110	MOE_SEL	6.22
Manganese	SEEP A	4	4	1560	2.35e+03	3700	460	MOE_LEL	8.04
Manganese	SEEP A	4	4	1560	2.35e+03	3700	1110	MOE_SEL	3.33
Manganese	SWSA 5 Trib 1	8	8	660	1.18e+03	4880	460	MOE_LEL	10.61
Manganese	SWSA 5 Trib 1	8	8	660	1.18e+03	4880	1110	MOE_SEL	4.40
Manganese	SWSA 4 main	5	5	1500	1.00e+04	13000	460	MOE_LEL	28.26
Manganese	SWSA 4 main	5	5	1500	1.00e+04	13000	1110	MOE_SEL	11.71
Manganese	W6MS3	4	4	3700	4.57e+03	6000	460	MOE_LEL	13.04
Manganese	W6MS3	4	4	3700	4.57e+03	6000	1110	MOE_SEL	5.41
Manganese	SWSA 5 Drain. D-2	4	4	4860	1.87e+04	42600	460	MOE_LEL	92.61
Manganese	SWSA 5 Drain. D-2	4	4	4860	1.87e+04	42600	1110	MOE_SEL	38.38
Mercury	Intermediate Pond	5	5	1.1	2.60e+00	3.8	0.13	REGIV_SV	29.23
Mercury	Intermediate Pond	5	5	1.1	2.60e+00	3.8	0.13	TEL	29.23
Mercury	Intermediate Pond	5	5	1.1	2.60e+00	3.8	0.15	ER_L	25.33
Mercury	Intermediate Pond	5	5	1.1	2.60e+00	3.8	0.2	MOE_LEL	19.00
Mercury	Intermediate Pond	5	5	1.1	2.60e+00	3.8	0.696	PEL	5.46
Mercury	Intermediate Pond	5	5	1.1	2.60e+00	3.8	0.71	ER_M	5.35
Mercury	Intermediate Pond	5	5	1.1	2.60e+00	3.8	2	MOE_SEL	1.90
Mercury	Lower WOC	26	31	0.01	5.00e-02	0.69	0.13	REGIV_SV	5.31
Mercury	Lower WOC	26	31	0.01	5.00e-02	0.69	0.13	TEL	5.31
Mercury	Lower WOC	26	31	0.01	5.00e-02	0.69	0.15	ER_L	4.60
Mercury	Lower WOC	26	31	0.01	5.00e-02	0.69	0.2	MOE_LEL	3.45
Mercury	Lower WOC	26	31	0.01	5.00e-02	0.69	0.696	PEL	0.99
Mercury	Lower WOC	26	31	0.01	5.00e-02	0.69	0.71	ER_M	0.97
Mercury	Lower WOC	26	31	0.01	5.00e-02	0.69	2	MOE_SEL	0.35
Mercury	Pit 4 South	1	2	0.17	1.24e-01	0.17	0.13	REGIV_SV	1.31
Mercury	Pit 4 South	1	2	0.17	1.24e-01	0.17	0.13	TEL	1.31
Mercury	Pit 4 South	1	2	0.17	1.24e-01	0.17	0.15	ER_L	1.13
Mercury	Pit 4 South	1	2	0.17	1.24e-01	0.17	0.2	MOE_LEL	0.85
Mercury	Pit 4 South	1	2	0.17	1.24e-01	0.17	0.696	PEL	0.24
Mercury	Pit 4 South	1	2	0.17	1.24e-01	0.17	0.71	ER_M	0.24
Mercury	Pit 4 South	1	2	0.17	1.24e-01	0.17	2	MOE_SEL	0.09

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Mercury	SEEP A	1	1	0.09		0.09	0.13	REGIV_SV	0.69
Mercury	SEEP A	1	1	0.09		0.09	0.13	TEL	0.69
Mercury	SEEP A	1	1	0.09		0.09	0.15	ER_L	0.60
Mercury	SEEP A	1	1	0.09		0.09	0.2	MOE_LEL	0.45
Mercury	SEEP A	1	1	0.09		0.09	0.696	PEL	0.13
Mercury	SEEP A	1	1	0.09		0.09	0.71	ER_M	0.13
Mercury	SEEP A	1	1	0.09		0.09	2	MOE_SEL	0.05
Mercury	**SWSA 5 Trib 1**	**7**	**8**	**0.08**	**1.47e+00**	**29.4**	**0.13**	**REGIV_SV**	**226.15**
Mercury	**SWSA 5 Trib 1**	**7**	**8**	**0.08**	**1.47e+00**	**29.4**	**0.13**	**TEL**	**226.15**
Mercury	**SWSA 5 Trib 1**	**7**	**8**	**0.08**	**1.47e+00**	**29.4**	**0.15**	**ER_L**	**196.00**
Mercury	**SWSA 5 Trib 1**	**7**	**8**	**0.08**	**1.47e+00**	**29.4**	**0.2**	**MOE_LEL**	**147.00**
Mercury	**SWSA 5 Trib 1**	**7**	**8**	**0.08**	**1.47e+00**	**29.4**	**0.696**	**PEL**	**42.24**
Mercury	**SWSA 5 Trib 1**	**7**	**8**	**0.08**	**1.47e+00**	**29.4**	**0.71**	**ER_M**	**41.41**
Mercury	**SWSA 5 Trib 1**	**7**	**8**	**0.08**	**1.47e+00**	**29.4**	**2**	**MOE_SEL**	**14.70**
Mercury	**SWSA 5 WOC**	**1**	**1**	**3.1**		**3.1**	**0.13**	**REGIV_SV**	**23.85**
Mercury	**SWSA 5 WOC**	**1**	**1**	**3.1**		**3.1**	**0.13**	**TEL**	**23.85**
Mercury	**SWSA 5 WOC**	**1**	**1**	**3.1**		**3.1**	**0.15**	**ER_L**	**20.67**
Mercury	**SWSA 5 WOC**	**1**	**1**	**3.1**		**3.1**	**0.2**	**MOE_LEL**	**15.50**
Mercury	**SWSA 5 WOC**	**1**	**1**	**3.1**		**3.1**	**0.696**	**PEL**	**4.45**
Mercury	**SWSA 5 WOC**	**1**	**1**	**3.1**		**3.1**	**0.71**	**ER_M**	**4.37**
Mercury	**SWSA 5 WOC**	**1**	**1**	**3.1**		**3.1**	**2**	**MOE_SEL**	**1.55**
Mercury	**SWSA 5 Drain. D-2**	**3**	**4**	**0.17**	**2.22e-01**	**0.38**	**0.13**	**REGIV_SV**	**2.92**
Mercury	**SWSA 5 Drain. D-2**	**3**	**4**	**0.17**	**2.22e-01**	**0.38**	**0.13**	**TEL**	**2.92**
Mercury	**SWSA 5 Drain. D-2**	**3**	**4**	**0.17**	**2.22e-01**	**0.38**	**0.15**	**ER_L**	**2.53**
Mercury	**SWSA 5 Drain. D-2**	**3**	**4**	**0.17**	**2.22e-01**	**0.38**	**0.2**	**MOE_LEL**	**1.90**
Mercury	SWSA 5 Drain. D-2	3	4	0.17	2.22e-01	0.38	0.696	PEL	0.55
Mercury	SWSA 5 Drain. D-2	3	4	0.17	2.22e-01	0.38	0.71	ER_M	0.54
Mercury	SWSA 5 Drain. D-2	3	4	0.17	2.22e-01	0.38	2	MOE_SEL	0.19
Mercury	**WOC**	**5**	**5**	**1.2**	**4.40e+00**	**4.8**	**0.13**	**REGIV_SV**	**36.92**
Mercury	**WOC**	**5**	**5**	**1.2**	**4.40e+00**	**4.8**	**0.13**	**TEL**	**36.92**
Mercury	**WOC**	**5**	**5**	**1.2**	**4.40e+00**	**4.8**	**0.15**	**ER_L**	**32.00**
Mercury	**WOC**	**5**	**5**	**1.2**	**4.40e+00**	**4.8**	**0.2**	**MOE_LEL**	**24.00**
Mercury	**WOC**	**5**	**5**	**1.2**	**4.40e+00**	**4.8**	**0.696**	**PEL**	**6.90**
Mercury	**WOC**	**5**	**5**	**1.2**	**4.40e+00**	**4.8**	**0.71**	**ER_M**	**6.76**
Mercury	**WOC**	**5**	**5**	**1.2**	**4.40e+00**	**4.8**	**2**	**MOE_SEL**	**2.40**
Mercury	**WOCE**	**83**	**93**	**0.02**	**2.30e-01**	**360**	**0.13**	**REGIV_SV**	**2769.23**
Mercury	**WOCE**	**83**	**93**	**0.02**	**2.30e-01**	**360**	**0.13**	**TEL**	**2769.23**
Mercury	**WOCE**	**83**	**93**	**0.02**	**2.30e-01**	**360**	**0.15**	**ER_L**	**2400.00**
Mercury	**WOCE**	**83**	**93**	**0.02**	**2.30e-01**	**360**	**0.2**	**MOE_LEL**	**1800.00**
Mercury	**WOCE**	**83**	**93**	**0.02**	**2.30e-01**	**360**	**0.696**	**PEL**	**517.24**
Mercury	**WOCE**	**83**	**93**	**0.02**	**2.30e-01**	**360**	**0.71**	**ER_M**	**507.04**
Mercury	**WOCE**	**83**	**93**	**0.02**	**2.30e-01**	**360**	**2**	**MOE_SEL**	**180.00**
Nickel	**HRT-3**	**14**	**14**	**1.5**	**4.24e+00**	**43**	**15.9**	**REGIV_SV**	**2.70**
Nickel	**HRT-3**	**14**	**14**	**1.5**	**4.24e+00**	**43**	**15.9**	**TEL**	**2.70**
Nickel	**HRT-3**	**14**	**14**	**1.5**	**4.24e+00**	**43**	**16**	**MOE_LEL**	**2.69**

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Nickel	HRT-3	14	14	1.5	4.24e+00	43	21	ER_L	2.05
Nickel	HRT-3	14	14	1.5	4.24e+00	43	42.8	PEL	1.00
Nickel	HRT-3	14	14	1.5	4.24e+00	43	51.6	ER_M	0.83
Nickel	HRT-3	14	14	1.5	4.24e+00	43	75	MOE_SEL	0.57
Nickel	Intermediate Pond	5	5	8.3	1.54e+01	114	15.9	REGIV_SV	7.17
Nickel	Intermediate Pond	5	5	8.3	1.54e+01	114	15.9	TEL	7.17
Nickel	Intermediate Pond	5	5	8.3	1.54e+01	114	16	MOE_LEL	7.13
Nickel	Intermediate Pond	5	5	8.3	1.54e+01	114	21	ER_L	5.43
Nickel	Intermediate Pond	5	5	8.3	1.54e+01	114	42.8	PEL	2.66
Nickel	Intermediate Pond	5	5	8.3	1.54e+01	114	51.6	ER_M	2.21
Nickel	Intermediate Pond	5	5	8.3	1.54e+01	114	75	MOE_SEL	1.52
Nickel	Lower WOC	60	63	3	3.42e+01	60	15.9	REGIV_SV	3.77
Nickel	Lower WOC	60	63	3	3.42e+01	60	15.9	TEL	3.77
Nickel	Lower WOC	60	63	3	3.42e+01	60	16	MOE_LEL	3.75
Nickel	Lower WOC	60	63	3	3.42e+01	60	21	ER_L	2.86
Nickel	Lower WOC	60	63	3	3.42e+01	60	42.8	PEL	1.40
Nickel	Lower WOC	60	63	3	3.42e+01	60	51.6	ER_M	1.16
Nickel	Lower WOC	60	63	3	3.42e+01	60	75	MOE_SEL	0.80
Nickel	SWSA 5 Trib 1	4	8	30.5	2.86e+01	70.6	15.9	REGIV_SV	4.44
Nickel	SWSA 5 Trib 1	4	8	30.5	2.86e+01	70.6	15.9	TEL	4.44
Nickel	SWSA 5 Trib 1	4	8	30.5	2.86e+01	70.6	16	MOE_LEL	4.41
Nickel	SWSA 5 Trib 1	4	8	30.5	2.86e+01	70.6	21	ER_L	3.36
Nickel	SWSA 5 Trib 1	4	8	30.5	2.86e+01	70.6	42.8	PEL	1.65
Nickel	SWSA 5 Trib 1	4	8	30.5	2.86e+01	70.6	51.6	ER_M	1.37
Nickel	SWSA 5 Trib 1	4	8	30.5	2.86e+01	70.6	75	MOE_SEL	0.94
Nickel	SWSA4main	5	5	99	6.10e+02	660	15.9	REGIV_SV	41.51
Nickel	SWSA4main	5	5	99	6.10e+02	660	15.9	TEL	41.51
Nickel	SWSA4main	5	5	99	6.10e+02	660	16	MOE_LEL	41.25
Nickel	SWSA4main	5	5	99	6.10e+02	660	21	ER_L	31.43
Nickel	SWSA4main	5	5	99	6.10e+02	660	42.8	PEL	15.42
Nickel	SWSA4main	5	5	99	6.10e+02	660	51.6	ER_M	12.79
Nickel	SWSA4main	5	5	99	6.10e+02	660	75	MOE_SEL	8.80
Silver	Intermediate Pond	5	5	2.3	5.10e+00	17.3	0.733	TEL	23.60
Silver	Intermediate Pond	5	5	2.3	5.10e+00	17.3	1	ER_L	17.30
Silver	Intermediate Pond	5	5	2.3	5.10e+00	17.3	1.77	PEL	9.77
Silver	Intermediate Pond	5	5	2.3	5.10e+00	17.3	2	REGIV_SV	8.65
Silver	Intermediate Pond	5	5	2.3	5.10e+00	17.3	3.7	ER_M	4.68
Silver	Lower WOC	20	50	0.86	8.50e+00	48	0.733	TEL	65.48
Silver	Lower WOC	20	50	0.86	8.50e+00	48	1	ER_L	48.00
Silver	Lower WOC	20	50	0.86	8.50e+00	48	1.77	PEL	27.12
Silver	Lower WOC	20	50	0.86	8.50e+00	48	2	REGIV_SV	24.00
Silver	Lower WOC	20	50	0.86	8.50e+00	48	3.7	ER_M	12.97
Silver	SWSA 5 Trib 1	3	8	1.1	2.37e+00	2.3	0.733	TEL	3.14
Silver	SWSA 5 Trib 1	3	8	1.1	2.37e+00	2.3	1	ER_L	2.30
Silver	SWSA 5 Trib 1	3	8	1.1	2.37e+00	2.3	1.77	PEL	1.30

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Silver	SWSA 5 Trib 1	3	8	1.1	2.37e+00	2.3	2	REGIV_SV	1.15
Silver	SWSA 5 Trib 1	3	8	1.1	2.37e+00	2.3	3.7	ER_M	0.62
Silver	SWSA 5 WOC	1	1	5.9		5.9	0.733	TEL	8.05
Silver	SWSA 5 WOC	1	1	5.9		5.9	1	ER_L	5.90
Silver	SWSA 5 WOC	1	1	5.9		5.9	1.77	PEL	3.33
Silver	SWSA 5 WOC	1	1	5.9		5.9	2	REGIV_SV	2.95
Silver	SWSA 5WOC	1	1	5.9		5.9	3.7	ER_M	1.59
Silver	SWSA 5 Drain. D-2	2	4	6.9	4.15e+00	7.3	0.733	TEL	9.96
Silver	SWSA 5 Drain. D-2	2	4	6.9	4.15e+00	7.3	1	ER_L	7.30
Silver	SWSA 5 Drain. D-2	2	4	6.9	4.15e+00	7.3	1.77	PEL	4.12
Silver	SWSA 5 Drain. D-2	2	4	6.9	4.15e+00	7.3	2	REGIV_SV	3.65
Silver	SWSA 5 Drain. D-2	2	4	6.9	4.15e+00	7.3	3.7	ER_M	1.97
Silver	WOC	6	6	4.2	1.58e+01	25.2	0.733	TEL	34.38
Silver	WOC	6	6	4.2	1.58e+01	25.2	1	ER_L	25.20
Silver	WOC	6	6	4.2	1.58e+01	25.2	1.77	PEL	14.24
Silver	WOC	6	6	4.2	1.58e+01	25.2	2	REGIV_SV	12.60
Silver	WOC	6	6	4.2	1.58e+01	25.2	3.7	ER_M	6.81
Silver	WOCE	64	78	0.03	7.00e-01	18.4	0.733	TEL	25.10
Silver	WOCE	64	78	0.03	7.00e-01	18.4	1	ER_L	18.40
Silver	WOCE	64	78	0.03	7.00e-01	18.4	1.77	PEL	10.40
Silver	WOCE	64	78	0.03	7.00e-01	18.4	2	REGIV_SV	9.20
Silver	WOCE	64	78	0.03	7.00e-01	18.4	3.7	ER_M	4.97
Zinc	HF-2	9	9	4.5	2.30e+02	580	120	MOE_LEL	4.83
Zinc	HF-2	9	9	4.5	2.30e+02	580	124	REGIV_SV	4.68
Zinc	HF-2	9	9	4.5	2.30e+02	580	124	TEL	4.68
Zinc	HF-2	9	9	4.5	2.30e+02	580	150	ER_L	3.87
Zinc	HF-2	9	9	4.5	2.30e+02	580	271	PEL	2.14
Zinc	HF-2	9	9	4.5	2.30e+02	580	410	ER_M	1.41
Zinc	HF-2	9	9	4.5	2.30e+02	580	820	MOE_SEL	0.71
Zinc	Intermediate Pond	5	5	95.5	2.78e+02	330	120	MOE_LEL	2.75
Zinc	Intermediate Pond	5	5	95.5	2.78e+02	330	124	REGIV_SV	2.66
Zinc	Intermediate Pond	5	5	95.5	2.78e+02	330	124	TEL	2.66
Zinc	Intermediate Pond	5	5	95.5	2.78e+02	330	150	ER_L	2.20
Zinc	Intermediate Pond	5	5	95.5	2.78e+02	330	271	PEL	1.22
Zinc	Intermediate Pond	5	5	95.5	2.78e+02	330	410	ER_M	0.80
Zinc	Intermediate Pond	5	5	95.5	2.78e+02	330	820	MOE_SEL	0.40
Zinc	Lower WOC	67	70	3.9	8.80e+01	1900	120	MOE_LEL	15.83
Zinc	Lower WOC	67	70	3.9	8.80e+01	1900	124	REGIV_SV	15.32
Zinc	Lower WOC	67	70	3.9	8.80e+01	1900	124	TEL	15.32
Zinc	Lower WOC	67	70	3.9	8.80e+01	1900	150	ER_L	12.67
Zinc	Lower WOC	67	70	3.9	8.80e+01	1900	271	PEL	7.01
Zinc	Lower WOC	67	70	3.9	8.80e+01	1900	410	ER_M	4.63
Zinc	Lower WOC	67	70	3.9	8.80e+01	1900	820	MOE_SEL	2.32
Zinc	MB-15	13	13	5.7	1.50e+02	340	120	MOE_LEL	2.83
Zinc	MB-15	13	13	5.7	1.50e+02	340	124	REGIV_SV	2.74

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Zinc	MB-15	13	13	5.7	1.50e+02	340	124	TEL	2.74
Zinc	MB-15	13	13	5.7	1.50e+02	340	150	ER_L	2.27
Zinc	MB-15	13	13	5.7	1.50e+02	340	271	PEL	1.25
Zinc	MB-15	13	13	5.7	1.50e+02	340	410	ER_M	0.83
Zinc	MB-15	13	13	5.7	1.50e+02	340	820	MOE_SEL	0.41
Zinc	SEEP B West	6	6	120	1.65e+02	230	120	MOE_LEL	1.92
Zinc	SEEP B West	6	6	120	1.65e+02	230	124	REGIV_SV	1.85
Zinc	SEEP B West	6	6	120	1.65e+02	230	124	TEL	1.85
Zinc	SEEP B West	6	6	120	1.65e+02	230	150	ER_L	1.53
Zinc	SEEP B West	6	6	120	1.65e+02	230	271	PEL	0.85
Zinc	SEEP B West	6	6	120	1.65e+02	230	410	ER_M	0.56
Zinc	SEEP B West	6	6	120	1.65e+02	230	820	MOE_SEL	0.28
Zinc	SEEP B East	7	7	130	2.00e+02	240	120	MOE_LEL	2.00
Zinc	SEEP B East	7	7	130	2.00e+02	240	124	REGIV_SV	1.94
Zinc	SEEP B East	7	7	130	2.00e+02	240	124	TEL	1.94
Zinc	SEEP B East	7	7	130	2.00e+02	240	150	ER_L	1.60
Zinc	SEEP B East	7	7	130	2.00e+02	240	271	PEL	0.89
Zinc	SEEP B East	7	7	130	2.00e+02	240	410	ER_M	0.59
Zinc	SEEP B East	7	7	130	2.00e+02	240	820	MOE_SEL	0.29
Zinc	SEEP C	9	9	100	1.40e+02	250	120	MOE_LEL	2.08
Zinc	SEEP C	9	9	100	1.40e+02	250	124	REGIV_SV	2.02
Zinc	SEEP C	9	9	100	1.40e+02	250	124	TEL	2.02
Zinc	SEEP C	9	9	100	1.40e+02	250	150	ER_L	1.67
Zinc	SEEP C	9	9	100	1.40e+02	250	271	PEL	0.92
Zinc	SEEP C	9	9	100	1.40e+02	250	410	ER_M	0.61
Zinc	SEEP C	9	9	100	1.40e+02	250	820	MOE_SEL	0.30
Zinc	SWSA 5 Trib 1	8	8	47.3	2.15e+02	1590	120	MOE_LEL	13.25
Zinc	SWSA 5 Trib 1	8	8	47.3	2.15e+02	1590	124	REGIV_SV	12.82
Zinc	SWSA 5 Trib 1	8	8	47.3	2.15e+02	1590	124	TEL	12.82
Zinc	SWSA 5 Trib 1	8	8	47.3	2.15e+02	1590	150	ER_L	10.60
Zinc	SWSA 5 Trib 1	8	8	47.3	2.15e+02	1590	271	PEL	5.87
Zinc	SWSA 5 Trib 1	8	8	47.3	2.15e+02	1590	410	ER_M	3.88
Zinc	SWSA 5 Trib 1	8	8	47.3	2.15e+02	1590	820	MOE_SEL	1.94
Zinc	SWSA 5 WOC	1	1	154		154	120	MOE_LEL	1.28
Zinc	SWSA 5 WOC	1	1	154		154	124	REGIV_SV	1.24
Zinc	SWSA 5 WOC	1	1	154		154	124	TEL	1.24
Zinc	SWSA 5 WOC	1	1	154		154	150	ER_L	1.03
Zinc	SWSA 5 WOC	1	1	154		154	271	PEL	0.57
Zinc	SWSA 5 WOC	1	1	154		154	410	ER_M	0.38
Zinc	SWSA 5 WOC	1	1	154		154	820	MOE_SEL	0.19
Zinc	WOC	6	6	254	5.52e+02	908	120	MOE_LEL	7.57
Zinc	WOC	6	6	254	5.52e+02	908	124	REGIV_SV	7.32
Zinc	WOC	6	6	254	5.52e+02	908	124	TEL	7.32
Zinc	WOC	6	6	254	5.52e+02	908	150	ER_L	6.05
Zinc	WOC	6	6	254	5.52e+02	908	271	PEL	3.35

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Zinc	**WOC**	**6**	**6**	**254**	**5.52e+02**	**908**	**410**	**ER_M**	**2.21**
Zinc	**WOC**	**6**	**6**	**254**	**5.52e+02**	**908**	**820**	**MOE_SEL**	**1.11**
Zinc	**WOCE**	**90**	**90**	**21.7**	**7.14e+01**	**403**	**120**	**MOE_LEL**	**3.36**
Zinc	**WOCE**	**90**	**90**	**21.7**	**7.14e+01**	**403**	**124**	**REGIV_SV**	**3.25**
Zinc	**WOCE**	**90**	**90**	**21.7**	**7.14e+01**	**403**	**124**	**TEL**	**3.25**
Zinc	**WOCE**	**90**	**90**	**21.7**	**7.14e+01**	**403**	**150**	**ER_L**	**2.69**
Zinc	**WOCE**	**90**	**90**	**21.7**	**7.14e+01**	**403**	**271**	**PEL**	**1.49**
Zinc	WOCE	90	90	21.7	7.14e+01	403	410	ER_M	0.98
Zinc	WOCE	90	90	21.7	7.14e+01	403	820	MOE_SEL	0.49
1,1-Dichloroethane	**WG5 MID. Drn**	**3**	**4**	**0.017**	**3.57e-02**	**0.14**	**0.0272**	**EQPSCV1**	**5.15**
1,1-Dichloroethane	WG5 MID. Drn	3	4	0.017	3.57e-02	0.14	8.494	EQPCVF1	0.02
1,2-Dichloroethene	**WG5 MID. Drn**	**3**	**4**	**0.08**	**2.80e-01**	**2.1**	**0.4**	**EQPSCV1**	**5.25**
1,2-Dichloroethene	WG5 MID. Drn	3	4	0.08	2.80e-01	2.1	6.466	EQPCVF1	0.32
2-Butanone	SEEP A	1	1	0.034		0.034	0.271	EQPSCV1	0.13
2-Butanone	SEEP A	1	1	0.034		0.034	5.475	EQPCVF1	0.01
2-Butanone	SEEP A	1	1	0.034		0.034	27.066	EQPCVD1	0.00
2-Butanone	**SWSA 5 Trib 1**	**10**	**17**	**0.059**	**1.80e-01**	**1.1**	**0.271**	**EQPSCV1**	**4.06**
2-Butanone	SWSA 5 Trib 1	10	17	0.059	1.80e-01	1.1	5.475	EQPCVF1	0.20
2-Butanone	SWSA 5 Trib 1	10	17	0.059	1.80e-01	1.1	27.066	EQPCVD1	0.04
2-Butanone	WG5 MID. Drn	2	4	0.025	2.29e-02	0.17	0.271	EQPSCV1	0.63
2-Butanone	WG5 MID. Drn	2	4	0.025	2.29e-02	0.17	5.475	EQPCVF1	0.03
2-Butanone	WG5 MID. Drn	2	4	0.025	2.29e-02	0.17	27.066	EQPCVD1	0.01
2-Methylnaphthalene	**Intermediate Pond**	**2**	**3**	**0.023**	**2.80e-02**	**0.028**	**0.0202**	**TEL**	**1.39**
2-Methylnaphthalene	Intermediate Pond	2	3	0.023	2.80e-02	0.028	0.07	ER_L	0.40
2-Methylnaphthalene	Intermediate Pond	2	3	0.023	2.80e-02	0.028	0.201	PEL	0.14
2-Methylnaphthalene	Intermediate Pond	2	3	0.023	2.80e-02	0.028	0.33	REGIV_SV	0.08
2-Methylnaphthalene	Intermediate Pond	2	3	0.023	2.80e-02	0.028	0.67	ER_M	0.04
4,4'-DDT	**WOCE**	**2**	**26**	**0.026**	**2.75e-02**	**0.029**	**0.00119**	**TEL**	**24.37**
4,4'-DDT	**WOCE**	**2**	**26**	**0.026**	**2.75e-02**	**0.029**	**0.0016**	**ER_L**	**18.13**
4,4'-DDT	**WOCE**	**2**	**26**	**0.026**	**2.75e-02**	**0.029**	**0.0033**	**REGIV_SV**	**8.79**
4,4'-DDT	**WOCE**	**2**	**26**	**0.026**	**2.75e-02**	**0.029**	**0.00477**	**PEL**	**6.08**
4,4'-DDT	WOCE	2	26	0.026	2.75e-02	0.029	0.046	ER_M	0.63
4-Methylphenol	Intermediate Pond	1	2	0.22	1.91e-01	0.22	0.67	WS_AET	0.33
4-Methylphenol	**SWSA 5 Trib 1**	**4**	**8**	**4.9**	**1.24e+00**	**26**	**0.67**	**WS_AET**	**38.81**
Acenaphthene	**Intermediate Pond**	**2**	**3**	**0.028**	**1.30e-01**	**0.13**	**0.00671**	**TEL**	**19.37**
Acenaphthene	**Intermediate Pond**	**2**	**3**	**0.028**	**1.30e-01**	**0.13**	**0.016**	**ER_L**	**8.13**
Acenaphthene	**Intermediate Pond**	**2**	**3**	**0.028**	**1.30e-01**	**0.13**	**0.0889**	**PEL**	**1.46**
Acenaphthene	Intermediate Pond	2	3	0.028	1.30e-01	0.13	0.33	REGIV_SV	0.39
Acenaphthene	Intermediate Pond	2	3	0.028	1.30e-01	0.13	0.5	ER_M	0.26
Acenaphthene	Intermediate Pond	2	3	0.028	1.30e-01	0.13	1.3	EPASQC01	0.10
Acenaphthene	Intermediate Pond	2	3	0.028	1.30e-01	0.13	5.314	EQPCVF1	0.02
Acenaphthene	Intermediate Pond	2	3	0.028	1.30e-01	0.13	16.3	EQPCVI1	0.01
Acenaphthene	Intermediate Pond	2	3	0.028	1.30e-01	0.13	477.222	EQPCVD1	0.00
Acenaphthene	**Pit 4 South**	**1**	**2**	**0.022**	**5.93e-02**	**0.022**	**0.00671**	**TEL**	**3.28**
Acenaphthene	**Pit 4 South**	**1**	**2**	**0.022**	**5.93e-02**	**0.022**	**0.016**	**ER_L**	**1.38**

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Acenaphthene	Pit 4 South	1	2	0.022	5.93e-02	0.022	0.0889	PEL	0.25
Acenaphthene	Pit 4 South	1	2	0.022	5.93e-02	0.022	0.33	REGIV_SV	0.07
Acenaphthene	Pit 4 South	1	2	0.022	5.93e-02	0.022	0.5	ER_M	0.04
Acenaphthene	Pit 4 South	1	2	0.022	5.93e-02	0.022	1.3	EPASQC01	0.02
Acenaphthene	Pit 4 South	1	2	0.022	5.93e-02	0.022	5.314	EQPCVF1	0.00
Acenaphthene	Pit 4 South	1	2	0.022	5.93e-02	0.022	16.3	EQPCVI1	0.00
Acenaphthene	Pit 4 South	1	2	0.022	5.93e-02	0.022	477.222	EQPCVD1	0.00
Acenaphthene	**WOC**	**1**	**1**	**0.54**		**0.54**	**0.00671**	**TEL**	**80.48**
Acenaphthene	**WOC**	**1**	**1**	**0.54**		**0.54**	**0.016**	**ER_L**	**33.75**
Acenaphthene	**WOC**	**1**	**1**	**0.54**		**0.54**	**0.0889**	**PEL**	**6.07**
Acenaphthene	**WOC**	**1**	**1**	**0.54**		**0.54**	**0.33**	**REGIV_SV**	**1.64**
Acenaphthene	**WOC**	**1**	**1**	**0.54**		**0.54**	**0.5**	**ER_M**	**1.08**
Acenaphthene	WOC	1	1	0.54		0.54	1.3	EPASQC01	0.42
Acenaphthene	WOC	1	1	0.54		0.54	5.314	EQPCVF1	0.10
Acenaphthene	WOC	1	1	0.54		0.54	16.3	EQPCVI1	0.03
Acenaphthene	WOC	1	1	0.54		0.54	477.222	EQPCVD1	0.00
Acetone	**SWSA 5 Trib 1**	**9**	**17**	**0.38**	**5.50e-01**	**4.9**	**0.00877**	**EQPSCV1**	**558.72**
Acetone	**SWSA 5 Trib 1**	**9**	**17**	**0.38**	**5.50e-01**	**4.9**	**0.00912**	**EQPCVD1**	**537.28**
Acetone	**SWSA 5 Trib 1**	**9**	**17**	**0.38**	**5.50e-01**	**4.9**	**2.968**	**EQPCVF1**	**1.65**
Acetone	**SWSA 5 WOC**	**2**	**3**	**0.23**	**2.30e-01**	**0.48**	**0.00877**	**EQPSCV1**	**54.73**
Acetone	**SWSA 5 WOC**	**2**	**3**	**0.23**	**2.30e-01**	**0.48**	**0.00912**	**EQPCVD1**	**52.63**
Acetone	SWSA 5 WOC	2	3	0.23	2.30e-01	0.48	2.968	EQPCVF1	0.16
Acetone	**SWSA 5 Drain. D-2**	**1**	**4**	**0.64**	**2.75e-02**	**0.64**	**0.00877**	**EQPSCV1**	**72.98**
Acetone	**SWSA 5 Drain. D-2**	**1**	**4**	**0.64**	**2.75e-02**	**0.64**	**0.00912**	**EQPCVD1**	**70.18**
Acetone	SWSA 5 Drain. D-2	1	4	0.64	2.75e-02	0.64	2.968	EQPCVF1	0.22
alpha-BHC	**Lower WOC**	**1**	**14**	**0.019**	**3.08e-01**	**0.019**	**0.006**	**MOE_LEL**	**3.17**
alpha-BHC	Lower WOC	1	14	0.019	3.08e-01	0.019	0.1	MOE_SEL	0.19
alpha-BHC	**WOC**	**2**	**6**	**0.063**	**1.65e-03**	**0.063**	**0.006**	**MOE_LEL**	**10.50**
alpha-BHC	WOC	2	6	0.063	1.65e-03	0.063	0.1	MOE_SEL	0.63
Anthracene	**Intermediate Pond**	**2**	**3**	**0.034**	**1.65e-01**	**0.22**	**0.0269**	**EQPCVF1**	**8.18**
Anthracene	**Intermediate Pond**	**2**	**3**	**0.034**	**1.65e-01**	**0.22**	**0.0469**	**TEL**	**4.69**
Anthracene	**Intermediate Pond**	**2**	**3**	**0.034**	**1.65e-01**	**0.22**	**0.085**	**ER_L**	**2.59**
Anthracene	**Intermediate Pond**	**2**	**3**	**0.034**	**1.65e-01**	**0.22**	**0.218**	**EQPSCV1**	**1.01**
Anthracene	Intermediate Pond	2	3	0.034	1.65e-01	0.22	0.245	PEL	0.90
Anthracene	Intermediate Pond	2	3	0.034	1.65e-01	0.22	0.33	REGIV_SV	0.67
Anthracene	Intermediate Pond	2	3	0.034	1.65e-01	0.22	0.628	EQPCVD1	0.35
Anthracene	Intermediate Pond	2	3	0.034	1.65e-01	0.22	1.1	ER_M	0.20
Anthracene	**Pit 4 South**	**1**	**2**	**0.04**	**8.00e-02**	**0.04**	**0.0269**	**EQPCVF1**	**1.49**
Anthracene	Pit 4 South	1	2	0.04	8.00e-02	0.04	0.0469	TEL	0.85
Anthracene	Pit 4 South	1	2	0.04	8.00e-02	0.04	0.085	ER_L	0.47
Anthracene	Pit 4 South	1	2	0.04	8.00e-02	0.04	0.218	EQPSCV1	0.18
Anthracene	Pit 4 South	1	2	0.04	8.00e-02	0.04	0.245	PEL	0.16
Anthracene	Pit 4 South	1	2	0.04	8.00e-02	0.04	0.33	REGIV_SV	0.12
Anthracene	Pit 4 South	1	2	0.04	8.00e-02	0.04	0.628	EQPCVD1	0.06
Anthracene	Pit 4 South	1	2	0.04	8.00e-02	0.04	1.1	ER_M	0.04

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Anthracene	**WOC**	**1**	**1**	**0.46**		**0.46**	**0.0269**	**EQPCVF1**	**17.10**
Anthracene	**WOC**	**1**	**1**	**0.46**		**0.46**	**0.0469**	**TEL**	**9.81**
Anthracene	**WOC**	**1**	**1**	**0.46**		**0.46**	**0.085**	**ER_L**	**5.41**
Anthracene	**WOC**	**1**	**1**	**0.46**		**0.46**	**0.218**	**EQPSCV1**	**2.11**
Anthracene	**WOC**	**1**	**1**	**0.46**		**0.46**	**0.245**	**PEL**	**1.88**
Anthracene	**WOC**	**1**	**1**	**0.46**		**0.46**	**0.33**	**REGIV_SV**	**1.39**
Anthracene	WOC	1	1	0.46		0.46	0.628	EQPCVD1	0.73
Anthracene	WOC	1	1	0.46		0.46	1.1	ER_M	0.42
Benz(a)anthracene	**Intermediate Pond**	**3**	**3**	**0.019**	**1.30e-01**	**0.67**	**0.0748**	**TEL**	**8.96**
Benz(a)anthracene	**Intermediate Pond**	**3**	**3**	**0.019**	**1.30e-01**	**0.67**	**0.109**	**EQPSCV1**	**6.15**
Benz(a)anthracene	**Intermediate Pond**	**3**	**3**	**0.019**	**1.30e-01**	**0.67**	**0.26**	**ER_L**	**2.58**
Benz(a)anthracene	**Intermediate Pond**	**3**	**3**	**0.019**	**1.30e-01**	**0.67**	**0.33**	**REGIV_SV**	**2.03**
Benz(a)anthracene	Intermediate Pond	3	3	0.019	1.30e-01	0.67	0.693	PEL	0.97
Benz(a)anthracene	Intermediate Pond	3	3	0.019	1.30e-01	0.67	1.6	ER_M	0.42
Benz(a)anthracene	Intermediate Pond	3	3	0.019	1.30e-01	0.67	2.623	EQPCVD1	0.26
Benz(a)anthracene	Pit 4 South	1	2	0.032	7.16e-02	0.032	0.0748	TEL	0.43
Benz(a)anthracene	Pit 4 South	1	2	0.032	7.16e-02	0.032	0.109	EQPSCV1	0.29
Benz(a)anthracene	Pit 4 South	1	2	0.032	7.16e-02	0.032	0.26	ER_L	0.12
Benz(a)anthracene	Pit 4 South	1	2	0.032	7.16e-02	0.032	0.33	REGIV_SV	0.10
Benz(a)anthracene	Pit 4 South	1	2	0.032	7.16e-02	0.032	0.693	PEL	0.05
Benz(a)anthracene	Pit 4 South	1	2	0.032	7.16e-02	0.032	1.6	ER_M	0.02
Benz(a)anthracene	Pit 4 South	1	2	0.032	7.16e-02	0.032	2.623	EQPCVD1	0.01
Benz(a)anthracene	**WOC**	**1**	**1**	**0.89**		**0.89**	**0.0748**	**TEL**	**11.90**
Benz(a)anthracene	**WOC**	**1**	**1**	**0.89**		**0.89**	**0.109**	**EQPSCV1**	**8.17**
Benz(a)anthracene	**WOC**	**1**	**1**	**0.89**		**0.89**	**0.26**	**ER_L**	**3.42**
Benz(a)anthracene	**WOC**	**1**	**1**	**0.89**		**0.89**	**0.33**	**REGIV_SV**	**2.70**
Benz(a)anthracene	**WOC**	**1**	**1**	**0.89**		**0.89**	**0.693**	**PEL**	**1.28**
Benz(a)anthracene	WOC	1	1	0.89		0.89	1.6	ER_M	0.56
Benz(a)anthracene	WOC	1	1	0.89		0.89	2.623	EQPCVD1	0.34
Benzo(a)pyrene	**Intermediate Pond**	**2**	**3**	**0.12**	**1.65e-01**	**0.55**	**0.0888**	**TEL**	**6.19**
Benzo(a)pyrene	**Intermediate Pond**	**2**	**3**	**0.12**	**1.65e-01**	**0.55**	**0.143**	**EQPSCV1**	**3.85**
Benzo(a)pyrene	**Intermediate Pond**	**2**	**3**	**0.12**	**1.65e-01**	**0.55**	**0.33**	**REGIV_SV**	**1.67**
Benzo(a)pyrene	**Intermediate Pond**	**2**	**3**	**0.12**	**1.65e-01**	**0.55**	**0.43**	**ER_L**	**1.28**
Benzo(a)pyrene	Intermediate Pond	2	3	0.12	1.65e-01	0.55	0.763	PEL	0.72
Benzo(a)pyrene	Intermediate Pond	2	3	0.12	1.65e-01	0.55	1.6	ER_M	0.34
Benzo(a)pyrene	Intermediate Pond	2	3	0.12	1.65e-01	0.55	3.062	EQPCVD1	0.18
Benzo(a)pyrene	Pit 4 South	1	2	0.036	7.59e-02	0.036	0.0888	TEL	0.41
Benzo(a)pyrene	Pit 4 South	1	2	0.036	7.59e-02	0.036	0.143	EQPSCV1	0.25
Benzo(a)pyrene	Pit 4 South	1	2	0.036	7.59e-02	0.036	0.33	REGIV_SV	0.11
Benzo(a)pyrene	Pit 4 South	1	2	0.036	7.59e-02	0.036	0.43	ER_L	0.08
Benzo(a)pyrene	Pit 4 South	1	2	0.036	7.59e-02	0.036	0.763	PEL	0.05
Benzo(a)pyrene	Pit 4 South	1	2	0.036	7.59e-02	0.036	1.6	ER_M	0.02
Benzo(a)pyrene	Pit 4 South	1	2	0.036	7.59e-02	0.036	3.062	EQPCVD1	0.01
Benzo(a)pyrene	**WOC**	**1**	**1**	**0.83**		**0.83**	**0.0888**	**TEL**	**9.35**
Benzo(a)pyrene	**WOC**	**1**	**1**	**0.83**		**0.83**	**0.143**	**EQPSCV1**	**5.80**

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Benzo(a)pyrene	**WOC**	**1**	**1**	**0.83**		**0.83**	**0.33**	**REGIV_SV**	**2.52**
Benzo(a)pyrene	**WOC**	**1**	**1**	**0.83**		**0.83**	**0.43**	**ER_L**	**1.93**
Benzo(a)pyrene	**WOC**	**1**	**1**	**0.83**		**0.83**	**0.763**	**PEL**	**1.09**
Benzo(a)pyrene	WOC	1	1	0.83		0.83	1.6	ER_M	0.52
Benzo(a)pyrene	WOC	1	1	0.83		0.83	3.062	EQPCVD1	0.27
Benzo(a)pyrene	**WOCE**	**9**	**47**	**0.32**	**1.00e+00**	**0.6**	**0.0888**	**TEL**	**6.76**
Benzo(a)pyrene	**WOCE**	**9**	**47**	**0.32**	**1.00e+00**	**0.6**	**0.143**	**EQPSCV1**	**4.20**
Benzo(a)pyrene	**WOCE**	**9**	**47**	**0.32**	**1.00e+00**	**0.6**	**0.33**	**REGIV_SV**	**1.82**
Benzo(a)pyrene	**WOCE**	**9**	**47**	**0.32**	**1.00e+00**	**0.6**	**0.43**	**ER_L**	**1.40**
Benzo(a)pyrene	WOCE	9	47	0.32	1.00e+00	0.6	0.763	PEL	0.79
Benzo(a)pyrene	WOCE	9	47	0.32	1.00e+00	0.6	1.6	ER_M	0.38
Benzo(a)pyrene	WOCE	9	47	0.32	1.00e+00	0.6	3.062	EQPCVD1	0.20
Bis(2-ethylhexyl)phthalate	**Intermediate Pond**	**3**	**3**	**0.078**	**3.20e-01**	**0.6**	**0.182**	**REGIV_SV**	**3.30**
Bis(2-ethylhexyl)phthalate	**Intermediate Pond**	**3**	**3**	**0.078**	**3.20e-01**	**0.6**	**0.182**	**TEL**	**3.30**
Bis(2-ethylhexyl)phthalate	Intermediate Pond	3	3	0.078	3.20e-01	0.6	2.647	PEL	0.23
Bis(2-ethylhexyl)phthalate	Intermediate Pond	3	3	0.078	3.20e-01	0.6	892.732	EQPAWQC1	0.00
Bis(2-ethylhexyl)phthalate	Pit 4 South	2	2	0.05	6.82e-02	0.093	0.182	REGIV_SV	0.51
Bis(2-ethylhexyl)phthalate	Pit 4 South	2	2	0.05	6.82e-02	0.093	0.182	TEL	0.51
Bis(2-ethylhexyl)phthalate	Pit 4 South	2	2	0.05	6.82e-02	0.093	2.647	PEL	0.04
Bis(2-ethylhexyl)phthalate	Pit 4 South	2	2	0.05	6.82e-02	0.093	892.732	EQPAWQC1	0.00
Bis(2-ethylhexyl)phthalate	**SWSA 5 Trib 1**	**2**	**8**	**0.74**	**4.83e-01**	**1**	**0.182**	**REGIV_SV**	**5.49**
Bis(2-ethylhexyl)phthalate	**SWSA 5 Trib 1**	**2**	**8**	**0.74**	**4.83e-01**	**1**	**0.182**	**TEL**	**5.49**
Bis(2-ethylhexyl)phthalate	SWSA 5 Trib 1	2	8	0.74	4.83e-01	1	2.647	PEL	0.38
Bis(2-ethylhexyl)phthalate	SWSA 5 Trib 1	2	8	0.74	4.83e-01	1	892.732	EQPAWQC1	0.00
bis(2-Ethylhexyl)phthalate	**WOC**	**1**	**1**	**2.5**		**2.5**	**0.182**	**REGIV_SV**	**13.74**
bis(2-Ethylhexyl)phthalate	**WOC**	**1**	**1**	**2.5**		**2.5**	**0.182**	**TEL**	**13.74**
bis(2-Ethylhexyl)phthalate	WOC	1	1	2.5		2.5	2.647	PEL	0.94
bis(2-Ethylhexyl)phthalate	WOC	1	1	2.5		2.5	892.732	EQPAWQC1	0.00
Bis(2-ethylhexyl)phthalate	**WOCE**	**10**	**45**	**0.12**	**1.00e+00**	**0.71**	**0.182**	**REGIV_SV**	**3.90**
Bis(2-ethylhexyl)phthalate	**WOCE**	**10**	**45**	**0.12**	**1.00e+00**	**0.71**	**0.182**	**TEL**	**3.90**
Bis(2-ethylhexyl)phthalate	WOCE	10	45	0.12	1.00e+00	0.71	2.647	PEL	0.27
Bis(2-ethylhexyl)phthalate	WOCE	10	45	0.12	1.00e+00	0.71	892.732	EQPAWQC1	0.00
Carbon disulfide	**SEEP A**	**1**	**1**	**0.002**		**0.002**	**0.00086**	**EQPSCV1**	**2.34**
Carbon disulfide	SEEP A	1	1	0.002		0.002	0.227	EQPCVD1	0.01
Carbon disulfide	SEEP A	1	1	0.002		0.002	8.877	EQPCVF1	0.00
Chrysene	**Intermediate Pond**	**3**	**3**	**0.027**	**1.90e-01**	**0.76**	**0.108**	**TEL**	**7.04**
Chrysene	**Intermediate Pond**	**3**	**3**	**0.027**	**1.90e-01**	**0.76**	**0.33**	**REGIV_SV**	**2.30**
Chrysene	**Intermediate Pond**	**3**	**3**	**0.027**	**1.90e-01**	**0.76**	**0.38**	**ER_L**	**2.00**
Chrysene	Intermediate Pond	3	3	0.027	1.90e-01	0.76	0.846	PEL	0.90
Chrysene	Intermediate Pond	3	3	0.027	1.90e-01	0.76	2.8	ER_M	0.27
Chrysene	Pit 4 South	1	2	0.035	7.48e-02	0.035	0.108	TEL	0.32
Chrysene	Pit 4 South	1	2	0.035	7.48e-02	0.035	0.33	REGIV_SV	0.11
Chrysene	Pit 4 South	1	2	0.035	7.48e-02	0.035	0.38	ER_L	0.09
Chrysene	Pit 4 South	1	2	0.035	7.48e-02	0.035	0.846	PEL	0.04
Chrysene	Pit 4 South	1	2	0.035	7.48e-02	0.035	2.8	ER_M	0.01

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Chrysene	**WOCE**	**3**	**42**	**0.12**	**1.20e+00**	**0.15**	**0.108**	**TEL**	**1.39**
Chrysene	WOCE	3	42	0.12	1.20e+00	0.15	0.33	REGIV_SV	0.45
Chrysene	WOCE	3	42	0.12	1.20e+00	0.15	0.38	ER_L	0.39
Chrysene	WOCE	3	42	0.12	1.20e+00	0.15	0.846	PEL	0.18
Chrysene	WOCE	3	42	0.12	1.20e+00	0.15	2.8	ER_M	0.05
Di-n-butylphthalate	Intermediate Pond	3	3	0.23	3.90e-01	0.42	11.981	EQPSCV1	0.04
Di-n-butylphthalate	Intermediate Pond	3	3	0.23	3.90e-01	0.42	238.596	EQPCVD1	0.00
Di-n-butylphthalate	Intermediate Pond	3	3	0.23	3.90e-01	0.42	254.442	EQPCVF1	0.00
Di-n-butylphthalate	**Lower WOC**	**3**	**12**	**60**	**5.00e+00**	**120**	**11.981**	**EQPSCV1**	**10.02**
Di-n-butylphthalate	Lower WOC	3	12	60	5.00e+00	120	238.596	EQPCVD1	0.50
Di-n-butylphthalate	Lower WOC	3	12	60	5.00e+00	120	254.442	EQPCVF1	0.47
Di-n-butylphthalate	Pit 4 South	2	2	0.24	3.36e-01	0.47	11.981	EQPSCV1	0.04
Di-n-butylphthalate	Pit 4 South	2	2	0.24	3.36e-01	0.47	238.596	EQPCVD1	0.00
Di-n-butylphthalate	Pit 4 South	2	2	0.24	3.36e-01	0.47	254.442	EQPCVF1	0.00
Dibenz(a,h)anthracene	**Intermediate Pond**	**1**	**2**	**0.24**	**1.99e-01**	**0.24**	**0.00622**	**TEL**	**38.59**
Dibenz(a,h)anthracene	**Intermediate Pond**	**1**	**2**	**0.24**	**1.99e-01**	**0.24**	**0.063**	**ER_L**	**3.81**
Dibenz(a,h)anthracene	**Intermediate Pond**	**1**	**2**	**0.24**	**1.99e-01**	**0.24**	**0.135**	**PEL**	**1.78**
Dibenz(a,h)anthracene	Intermediate Pond	1	2	0.24	1.99e-01	0.24	0.26	ER_M	0.92
Dibenz(a,h)anthracene	Intermediate Pond	1	2	0.24	1.99e-01	0.24	0.33	REGIV_SV	0.73
Dibenzofuran	Intermediate Pond	1	2	0.067	1.05e-01	0.067	0.418	EQPSCV1	0.16
Dibenzofuran	Intermediate Pond	1	2	0.067	1.05e-01	0.067	113.256	EQPCVD1	0.00
Dibenzofuran	Pit 4 South	1	2	0.066	1.03e-01	0.066	0.418	EQPSCV1	0.16
Dibenzofuran	Pit 4 South	1	2	0.066	1.03e-01	0.066	113.256	EQPCVD1	0.00
Dibenzofuran	**WOC**	**1**	**1**	**0.43**		**0.43**	**0.418**	**EQPSCV1**	**1.03**
Dibenzofuran	WOC	1	1	0.43		0.43	113.256	EQPCVD1	0.00
Diethylphthalate	**Lower WOC**	**2**	**11**	**51**	**5.00e+00**	**58**	**0.606**	**EQPSCV1**	**95.71**
Diethylphthalate	WOCE	1	40	0.14	1.22e+00	0.14	0.606	EQPSCV1	0.23
Endosulfan sulfate	**WOCE**	**2**	**26**	**0.029**	**2.95e-02**	**0.03**	**0.0055**	**EQPSCV1**	**5.45**
Fluoranthene	**Intermediate Pond**	**3**	**3**	**0.047**	**3.70e-01**	**1.4**	**0.113**	**TEL**	**12.39**
Fluoranthene	**Intermediate Pond**	**3**	**3**	**0.047**	**3.70e-01**	**1.4**	**0.33**	**REGIV_SV**	**4.24**
Fluoranthene	**Intermediate Pond**	**3**	**3**	**0.047**	**3.70e-01**	**1.4**	**0.6**	**ER_L**	**2.33**
Fluoranthene	Intermediate Pond	3	3	0.047	3.70e-01	1.4	1.494	PEL	0.94
Fluoranthene	Intermediate Pond	3	3	0.047	3.70e-01	1.4	5.1	ER_M	0.27
Fluoranthene	Intermediate Pond	3	3	0.047	3.70e-01	1.4	6.2	EPASQC01	0.23
Fluoranthene	Intermediate Pond	3	3	0.047	3.70e-01	1.4	16.287	EQPCVD1	0.09
Fluoranthene	Intermediate Pond	3	3	0.047	3.70e-01	1.4	32.575	EQPCVF1	0.04
Fluoranthene	**Pit 4 South**	**2**	**2**	**0.027**	**5.69e-02**	**0.12**	**0.113**	**TEL**	**1.06**
Fluoranthene	Pit 4 South	2	2	0.027	5.69e-02	0.12	0.33	REGIV_SV	0.36
Fluoranthene	Pit 4 South	2	2	0.027	5.69e-02	0.12	0.6	ER_L	0.20
Fluoranthene	Pit 4 South	2	2	0.027	5.69e-02	0.12	1.494	PEL	0.08
Fluoranthene	Pit 4 South	2	2	0.027	5.69e-02	0.12	5.1	ER_M	0.02
Fluoranthene	Pit 4 South	2	2	0.027	5.69e-02	0.12	6.2	EPASQC01	0.02
Fluoranthene	Pit 4 South	2	2	0.027	5.69e-02	0.12	16.287	EQPCVD1	0.01
Fluoranthene	Pit 4 South	2	2	0.027	5.69e-02	0.12	32.575	EQPCVF1	0.00
Fluoranthene	**WOCE**	**5**	**44**	**0.11**	**1.17e+00**	**0.2**	**0.113**	**TEL**	**1.77**

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Fluoranthene	WOCE	5	44	0.11	1.17e+00	0.2	0.33	REGIV_SV	0.61
Fluoranthene	WOCE	5	44	0.11	1.17e+00	0.2	0.6	ER_L	0.33
Fluoranthene	WOCE	5	44	0.11	1.17e+00	0.2	1.494	PEL	0.13
Fluoranthene	WOCE	5	44	0.11	1.17e+00	0.2	5.1	ER_M	0.04
Fluoranthene	WOCE	5	44	0.11	1.17e+00	0.2	6.2	EPASQC01	0.03
Fluoranthene	WOCE	5	44	0.11	1.17e+00	0.2	16.287	EQPCVD1	0.01
Fluoranthene	WOCE	5	44	0.11	1.17e+00	0.2	32.575	EQPCVF1	0.01
Fluorene	**Intermediate Pond**	**2**	**3**	**0.038**	**1.40e-01**	**0.14**	**0.019**	**ER_L**	**7.37**
Fluorene	**Intermediate Pond**	**2**	**3**	**0.038**	**1.40e-01**	**0.14**	**0.0212**	**TEL**	**6.60**
Fluorene	Intermediate Pond	2	3	0.038	1.40e-01	0.14	0.144	PEL	0.97
Fluorene	Intermediate Pond	2	3	0.038	1.40e-01	0.14	0.33	REGIV_SV	0.42
Fluorene	Intermediate Pond	2	3	0.038	1.40e-01	0.14	0.54	EQPSCV1	0.26
Fluorene	Intermediate Pond	2	3	0.038	1.40e-01	0.14	0.54	ER_M	0.26
Fluorene	**Pit 4 South**	**1**	**2**	**0.096**	**1.24e-01**	**0.096**	**0.019**	**ER_L**	**5.05**
Fluorene	**Pit 4 South**	**1**	**2**	**0.096**	**1.24e-01**	**0.096**	**0.0212**	**TEL**	**4.53**
Fluorene	Pit 4 South	1	2	0.096	1.24e-01	0.096	0.144	PEL	0.67
Fluorene	Pit 4 South	1	2	0.096	1.24e-01	0.096	0.33	REGIV_SV	0.29
Fluorene	Pit 4 South	1	2	0.096	1.24e-01	0.096	0.54	EQPSCV1	0.18
Fluorene	Pit 4 South	1	2	0.096	1.24e-01	0.096	0.54	ER_M	0.18
Methylene chloride	**Lower WOC**	**25**	**27**	**0.012**	**6.40e-02**	**1.212**	**0.375**	**EQPSCV1**	**3.23**
Methylene chloride	Lower WOC	25	27	0.012	6.40e-02	1.212	7.272	EQPCVD1	0.17
Methylene chloride	Lower WOC	25	27	0.012	6.40e-02	1.212	18.407	EQPCVF1	0.07
Methylene chloride	SEEP A	1	2	0.01	9.49e-03	0.01	0.375	EQPSCV1	0.03
Methylene chloride	SEEP A	1	2	0.01	9.49e-03	0.01	7.272	EQPCVD1	0.00
Methylene chloride	SEEP A	1	2	0.01	9.49e-03	0.01	18.407	EQPCVF1	0.00
Methylene chloride	SWSA 5 Trib 1	7	23	0.01	1.85e-02	0.01	0.375	EQPSCV1	0.03
Methylene chloride	SWSA 5 Trib 1	7	23	0.01	1.85e-02	0.01	7.272	EQPCVD1	0.00
Methylene chloride	SWSA 5 Trib 1	7	23	0.01	1.85e-02	0.01	18.407	EQPCVF1	0.00
Methylene chloride	SWSA 5 Drain. D-2	4	8	0.01	1.38e-02	0.01	0.375	EQPSCV1	0.03
Methylene chloride	SWSA 5 Drain. D-2	4	8	0.01	1.38e-02	0.01	7.272	EQPCVD1	0.00
Methylene chloride	SWSA 5 Drain. D-2	4	8	0.01	1.38e-02	0.01	18.407	EQPCVF1	0.00
Naphthalene	**Intermediate Pond**	**2**	**3**	**0.029**	**4.10e-02**	**0.041**	**0.0346**	**TEL**	**1.18**
Naphthalene	Intermediate Pond	2	3	0.029	4.10e-02	0.041	0.16	ER_L	0.26
Naphthalene	Intermediate Pond	2	3	0.029	4.10e-02	0.041	0.242	EQPSCV1	0.17
Naphthalene	Intermediate Pond	2	3	0.029	4.10e-02	0.041	0.33	REGIV_SV	0.12
Naphthalene	Intermediate Pond	2	3	0.029	4.10e-02	0.041	0.391	PEL	0.10
Naphthalene	Intermediate Pond	2	3	0.029	4.10e-02	0.041	2.1	ER_M	0.02
Naphthalene	Intermediate Pond	2	3	0.029	4.10e-02	0.041	12.533	EQPCVF1	0.00
Naphthalene	Intermediate Pond	2	3	0.029	4.10e-02	0.041	23.51	EQPCVD1	0.00
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	0.0346	TEL	0.90
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	0.16	ER_L	0.19
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	0.242	EQPSCV1	0.13
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	0.33	REGIV_SV	0.09
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	0.391	PEL	0.08
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	2.1	ER_M	0.01

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	12.533	EQPCVF1	0.00
Naphthalene	Pit 4 South	1	2	0.031	7.04e-02	0.031	23.51	EQPCVD1	0.00
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	0.0346	TEL	0.29
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	0.16	ER_L	0.06
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	0.242	EQPSCV1	0.04
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	0.33	REGIV_SV	0.03
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	0.391	PEL	0.03
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	2.1	ER_M	0.00
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	12.533	EQPCVF1	0.00
Naphthalene	SEEP A	1	3	0.01	2.85e-01	0.01	23.51	EQPCVD1	0.00
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	0.0346	TEL	0.29
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	0.16	ER_L	0.06
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	0.242	EQPSCV1	0.04
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	0.33	REGIV_SV	0.03
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	0.391	PEL	0.03
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	2.1	ER_M	0.00
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	12.533	EQPCVF1	0.00
Naphthalene	SWSA 5 Trib 1	12	20	0.003	1.00e-02	0.01	23.51	EQPCVD1	0.00
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	0.0346	TEL	0.29
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	0.16	ER_L	0.06
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	0.242	EQPSCV1	0.04
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	0.33	REGIV_SV	0.03
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	0.391	PEL	0.03
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	2.1	ER_M	0.00
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	12.533	EQPCVF1	0.00
Naphthalene	WG5 MID. Drn	4	8	0.01	8.06e-02	0.01	23.51	EQPCVD1	0.00
PAH, total	**Intermediate Pond**	**16**	**18**	**0.991**	**2.77e+00**	**8.619**	**1.684**	**REGIV_SV**	**5.12**
PAH, total	**Intermediate Pond**	**16**	**18**	**0.991**	**2.77e+00**	**8.619**	**1.684**	**TEL**	**5.12**
PAH, total	**Intermediate Pond**	**16**	**18**	**0.991**	**2.77e+00**	**8.619**	**2**	**MOE_LEL**	**4.31**
PAH, total	**Intermediate Pond**	**16**	**18**	**0.991**	**2.77e+00**	**8.619**	**4.022**	**ER_L**	**2.14**
PAH, total	Intermediate Pond	16	18	0.991	2.77e+00	8.619	16.77	PEL	0.51
PAH, total	Intermediate Pond	16	18	0.991	2.77e+00	8.619	44.792	ER_M	0.19
PAH, total	Intermediate Pond	16	18	0.991	2.77e+00	8.619	110	MOE_SEL	0.08
PAH, total	Pit 4 South	12	18	0.563	8.84e-01	0.744	1.684	REGIV_SV	0.44
PAH, total	Pit 4 South	12	18	0.563	8.84e-01	0.744	1.684	TEL	0.44
PAH, total	Pit 4 South	12	18	0.563	8.84e-01	0.744	2	MOE_LEL	0.37
PAH, total	Pit 4 South	12	18	0.563	8.84e-01	0.744	4.022	ER_L	0.18
PAH, total	Pit 4 South	12	18	0.563	8.84e-01	0.744	16.77	PEL	0.04
PAH, total	Pit 4 South	12	18	0.563	8.84e-01	0.744	44.792	ER_M	0.02
PAH, total	Pit 4 South	12	18	0.563	8.84e-01	0.744	110	MOE_SEL	0.01
PAH, total	SEEP A	1	18	0.01	2.85e-01	0.01	1.684	REGIV_SV	0.01
PAH, total	SEEP A	1	18	0.01	2.85e-01	0.01	1.684	TEL	0.01
PAH, total	SEEP A	1	18	0.01	2.85e-01	0.01	2	MOE_LEL	0.01
PAH, total	SEEP A	1	18	0.01	2.85e-01	0.01	4.022	ER_L	0.00
PAH, total	SEEP A	1	18	0.01	2.85e-01	0.01	16.77	PEL	0.00

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
PAH, total	SEEP A	1	18	0.01	2.85e-01	0.01	44.792	ER_M	0.00
PAH, total	SEEP A	1	18	0.01	2.85e-01	0.01	110	MOE_SEL	0.00
PAH, total	SWSA 5 Trib 1	1	18	0.003	1.00e-02	0.01	1.684	REGIV_SV	0.01
PAH, total	SWSA 5 Trib 1	1	18	0.003	1.00e-02	0.01	1.684	TEL	0.01
PAH, total	SWSA 5 Trib 1	1	18	0.003	1.00e-02	0.01	2	MOE_LEL	0.01
PAH, total	SWSA 5 Trib 1	1	18	0.003	1.00e-02	0.01	4.022	ER_L	0.00
PAH, total	SWSA 5 Trib 1	1	18	0.003	1.00e-02	0.01	16.77	PEL	0.00
PAH, total	SWSA 5 Trib 1	1	18	0.003	1.00e-02	0.01	44.792	ER_M	0.00
PAH, total	SWSA 5 Trib 1	1	18	0.003	1.00e-02	0.01	110	MOE_SEL	0.00
PAH, total	WG5 MID. Drn	1	18	0.01	8.06e-02	0.01	1.684	REGIV_SV	0.01
PAH, total	WG5 MID. Drn	1	18	0.01	8.06e-02	0.01	1.684	TEL	0.01
PAH, total	WG5 MID. Drn	1	18	0.01	8.06e-02	0.01	2	MOE_LEL	0.01
PAH, total	WG5 MID. Drn	1	18	0.01	8.06e-02	0.01	4.022	ER_L	0.00
PAH, total	WG5 MID. Drn	1	18	0.01	8.06e-02	0.01	16.77	PEL	0.00
PAH, total	WG5 MID. Drn	1	18	0.01	8.06e-02	0.01	44.792	ER_M	0.00
PAH, total	WG5 MID. Drn	1	18	0.01	8.06e-02	0.01	110	MOE_SEL	0.00
PAH, total	**WOC**	**9**	**18**	**9.37**		**9.37**	**1.684**	**REGIV_SV**	**5.56**
PAH, total	**WOC**	**9**	**18**	**9.37**		**9.37**	**1.684**	**TEL**	**5.56**
PAH, total	**WOC**	**9**	**18**	**9.37**		**9.37**	**2**	**MOE_LEL**	**4.69**
PAH, total	**WOC**	**9**	**18**	**9.37**		**9.37**	**4.022**	**ER_L**	**2.33**
PAH, total	WOC	9	18	9.37		9.37	16.77	PEL	0.56
PAH, total	WOC	9	18	9.37		9.37	44.792	ER_M	0.21
PAH, total	WOC	9	18	9.37		9.37	110	MOE_SEL	0.09
PAH, total	**WOCE**	**6**	**18**	**0.9**	**6.85e+00**	**1.69**	**1.684**	**REGIV_SV**	**1.00**
PAH, total	**WOCE**	**6**	**18**	**0.9**	**6.85e+00**	**1.69**	**1.684**	**TEL**	**1.00**
PAH, total	WOCE	6	18	0.9	6.85e+00	1.69	2	MOE_LEL	0.85
PAH, total	WOCE	6	18	0.9	6.85e+00	1.69	4.022	ER_L	0.42
PAH, total	WOCE	6	18	0.9	6.85e+00	1.69	16.77	PEL	0.10
PAH, total	WOCE	6	18	0.9	6.85e+00	1.69	44.792	ER_M	0.04
PAH, total	WOCE	6	18	0.9	6.85e+00	1.69	110	MOE_SEL	0.02
PCB-1248	**SWSA 5 Trib 1**	**2**	**8**	**0.62**	**5.51e-02**	**1.2**	**0.023**	**ER_L**	**52.17**
PCB-1248	**SWSA 5 Trib 1**	**2**	**8**	**0.62**	**5.51e-02**	**1.2**	**0.03**	**MOE_LEL**	**40.00**
PCB-1248	**SWSA 5 Trib 1**	**2**	**8**	**0.62**	**5.51e-02**	**1.2**	**0.18**	**ER_M**	**6.67**
PCB-1248	**SWSA 5 Trib 1**	**2**	**8**	**0.62**	**5.51e-02**	**1.2**	**1.014**	**EQPSCV1**	**1.18**
PCB-1248	SWSA 5 Trib 1	2	8	0.62	5.51e-02	1.2	1.5	MOE_SEL	0.80
PCB-1254	**Intermediate Pond**	**3**	**5**	**0.12**	**1.20e-01**	**0.51**	**0.023**	**ER_L**	**22.17**
PCB-1254	**Intermediate Pond**	**3**	**5**	**0.12**	**1.20e-01**	**0.51**	**0.06**	**MOE_LEL**	**8.50**
PCB-1254	**Intermediate Pond**	**3**	**5**	**0.12**	**1.20e-01**	**0.51**	**0.18**	**ER_M**	**2.83**
PCB-1254	**Intermediate Pond**	**3**	**5**	**0.12**	**1.20e-01**	**0.51**	**0.34**	**MOE_SEL**	**1.50**
PCB-1254	Intermediate Pond	3	5	0.12	1.20e-01	0.51	0.814	EQPSCV1	0.63
PCB-1254	Intermediate Pond	3	5	0.12	1.20e-01	0.51	71.564	EQPCVD1	0.01
PCB-1254	**Lower WOC**	**16**	**24**	**0.02242**	**9.75e-02**	**0.902**	**0.023**	**ER_L**	**39.22**
PCB-1254	**Lower WOC**	**16**	**24**	**0.02242**	**9.75e-02**	**0.902**	**0.06**	**MOE_LEL**	**15.03**
PCB-1254	**Lower WOC**	**16**	**24**	**0.02242**	**9.75e-02**	**0.902**	**0.18**	**ER_M**	**5.01**
PCB-1254	**Lower WOC**	**16**	**24**	**0.02242**	**9.75e-02**	**0.902**	**0.34**	**MOE_SEL**	**2.65**

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
PCB-1254	**Lower WOC**	**16**	**24**	**0.02242**	**9.75e-02**	**0.902**	**0.814**	**EQPSCV1**	**1.11**
PCB-1254	Lower WOC	16	24	0.02242	9.75e-02	0.902	71.564	EQPCVD1	0.01
PCB-1254	**Pit 4 South**	**1**	**2**	**0.047**	**3.53e-02**	**0.047**	**0.023**	**ER_L**	**2.04**
PCB-1254	Pit 4 South	1	2	0.047	3.53e-02	0.047	0.06	MOE_LEL	0.78
PCB-1254	Pit 4 South	1	2	0.047	3.53e-02	0.047	0.18	ER_M	0.26
PCB-1254	Pit 4 South	1	2	0.047	3.53e-02	0.047	0.34	MOE_SEL	0.14
PCB-1254	Pit 4 South	1	2	0.047	3.53e-02	0.047	0.814	EQPSCV1	0.06
PCB-1254	Pit 4 South	1	2	0.047	3.53e-02	0.047	71.564	EQPCVD1	0.00
PCB-1254	SEEP C	7	14	0.005	4.20e-02	0.022	0.023	ER_L	0.96
PCB-1254	SEEP C	7	14	0.005	4.20e-02	0.022	0.06	MOE_LEL	0.37
PCB-1254	SEEP C	7	14	0.005	4.20e-02	0.022	0.18	ER_M	0.12
PCB-1254	SEEP C	7	14	0.005	4.20e-02	0.022	0.34	MOE_SEL	0.06
PCB-1254	SEEP C	7	14	0.005	4.20e-02	0.022	0.814	EQPSCV1	0.03
PCB-1254	SEEP C	7	14	0.005	4.20e-02	0.022	71.564	EQPCVD1	0.00
PCB-1254	**SWSA 5 Trib 1**	**4**	**8**	**0.82**	**1.62e-01**	**1.5**	**0.023**	**ER_L**	**65.22**
PCB-1254	**SWSA 5 Trib 1**	**4**	**8**	**0.82**	**1.62e-01**	**1.5**	**0.06**	**MOE_LEL**	**25.00**
PCB-1254	**SWSA 5 Trib 1**	**4**	**8**	**0.82**	**1.62e-01**	**1.5**	**0.18**	**ER_M**	**8.33**
PCB-1254	**SWSA 5 Trib 1**	**4**	**8**	**0.82**	**1.62e-01**	**1.5**	**0.34**	**MOE_SEL**	**4.41**
PCB-1254	**SWSA 5 Trib 1**	**4**	**8**	**0.82**	**1.62e-01**	**1.5**	**0.814**	**EQPSCV1**	**1.84**
PCB-1254	SWSA 5 Trib 1	4	8	0.82	1.62e-01	1.5	71.564	EQPCVD1	0.02
PCB-1254	**SWSA 5 WOC**	**1**	**1**	**2.3**		**2.3**	**0.023**	**ER_L**	**100.00**
PCB-1254	**SWSA 5 WOC**	**1**	**1**	**2.3**		**2.3**	**0.06**	**MOE_LEL**	**38.33**
PCB-1254	**SWSA 5 WOC**	**1**	**1**	**2.3**		**2.3**	**0.18**	**ER_M**	**12.78**
PCB-1254	**SWSA 5 WOC**	**1**	**1**	**2.3**		**2.3**	**0.34**	**MOE_SEL**	**6.76**
PCB-1254	**SWSA 5 WOC**	**1**	**1**	**2.3**		**2.3**	**0.814**	**EQPSCV1**	**2.83**
PCB-1254	SWSA 5 WOC	1	1	2.3		2.3	71.564	EQPCVD1	0.03
PCB-1254	**WOCE**	**35**	**52**	**0.00049**	**2.17e-01**	**4.7**	**0.023**	**ER_L**	**204.35**
PCB-1254	**WOCE**	**35**	**52**	**0.00049**	**2.17e-01**	**4.7**	**0.06**	**MOE_LEL**	**78.33**
PCB-1254	**WOCE**	**35**	**52**	**0.00049**	**2.17e-01**	**4.7**	**0.18**	**ER_M**	**26.11**
PCB-1254	**WOCE**	**35**	**52**	**0.00049**	**2.17e-01**	**4.7**	**0.34**	**MOE_SEL**	**13.82**
PCB-1254	**WOCE**	**35**	**52**	**0.00049**	**2.17e-01**	**4.7**	**0.814**	**EQPSCV1**	**5.77**
PCB-1254	WOCE	35	52	0.00049	2.17e-01	4.7	71.564	EQPCVD1	0.07
PCB-1260	**Intermediate Pond**	**5**	**5**	**0.087**	**1.10e-01**	**0.41**	**0.005**	**MOE_LEL**	**82.00**
PCB-1260	**Intermediate Pond**	**5**	**5**	**0.087**	**1.10e-01**	**0.41**	**0.023**	**ER_L**	**17.83**
PCB-1260	**Intermediate Pond**	**5**	**5**	**0.087**	**1.10e-01**	**0.41**	**0.18**	**ER_M**	**2.28**
PCB-1260	**Intermediate Pond**	**5**	**5**	**0.087**	**1.10e-01**	**0.41**	**0.24**	**MOE_SEL**	**1.71**
PCB-1260	Intermediate Pond	5	5	0.087	1.10e-01	0.41	63.262	EQPCVF1	0.01
PCB-1260	Intermediate Pond	5	5	0.087	1.10e-01	0.41	4574.33	EQPSCV1	0.00
PCB-1260	**Lower WOC**	**24**	**27**	**0.026**	**2.59e-01**	**0.986**	**0.005**	**MOE_LEL**	**197.20**
PCB-1260	**Lower WOC**	**24**	**27**	**0.026**	**2.59e-01**	**0.986**	**0.023**	**ER_L**	**42.87**
PCB-1260	**Lower WOC**	**24**	**27**	**0.026**	**2.59e-01**	**0.986**	**0.18**	**ER_M**	**5.48**
PCB-1260	**Lower WOC**	**24**	**27**	**0.026**	**2.59e-01**	**0.986**	**0.24**	**MOE_SEL**	**4.11**
PCB-1260	Lower WOC	24	27	0.026	2.59e-01	0.986	63.262	EQPCVF1	0.02
PCB-1260	Lower WOC	24	27	0.026	2.59e-01	0.986	4574.33	EQPSCV1	0.00
PCB-1260	**SWSA 5 Trib 1**	**4**	**8**	**0.04**	**1.15e-01**	**0.83**	**0.005**	**MOE_LEL**	**166.00**

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
PCB-1260	**SWSA 5 Trib 1**	**4**	**8**	**0.04**	**1.15e-01**	**0.83**	**0.023**	**ER_L**	**36.09**
PCB-1260	**SWSA 5 Trib 1**	**4**	**8**	**0.04**	**1.15e-01**	**0.83**	**0.18**	**ER_M**	**4.61**
PCB-1260	**SWSA 5 Trib 1**	**4**	**8**	**0.04**	**1.15e-01**	**0.83**	**0.24**	**MOE_SEL**	**3.46**
PCB-1260	SWSA 5 Trib 1	4	8	0.04	1.15e-01	0.83	63.262	EQPCVF1	0.01
PCB-1260	SWSA 5 Trib 1	4	8	0.04	1.15e-01	0.83	4574.33	EQPSCV1	0.00
PCB-1260	**SWSA 5 WOC**	**1**	**1**	**0.63**		**0.63**	**0.005**	**MOE_LEL**	**126.00**
PCB-1260	**SWSA 5 WOC**	**1**	**1**	**0.63**		**0.63**	**0.023**	**ER_L**	**27.39**
PCB-1260	**SWSA 5 WOC**	**1**	**1**	**0.63**		**0.63**	**0.18**	**ER_M**	**3.50**
PCB-1260	**SWSA 5 WOC**	**1**	**1**	**0.63**		**0.63**	**0.24**	**MOE_SEL**	**2.63**
PCB-1260	SWSA 5 WOC	1	1	0.63		0.63	63.262	EQPCVF1	0.01
PCB-1260	SWSA 5 WOC	1	1	0.63		0.63	4574.33	EQPSCV1	0.00
PCB-1260	**WG5 MID. Drn**	**2**	**4**	**0.039**	**7.43e-02**	**0.085**	**0.005**	**MOE_LEL**	**17.00**
PCB-1260	**WG5 MID. Drn**	**2**	**4**	**0.039**	**7.43e-02**	**0.085**	**0.023**	**ER_L**	**3.70**
PCB-1260	WG5 MID. Drn	2	4	0.039	7.43e-02	0.085	0.18	ER_M	0.47
PCB-1260	WG5 MID. Drn	2	4	0.039	7.43e-02	0.085	0.24	MOE_SEL	0.35
PCB-1260	WG5 MID. Drn	2	4	0.039	7.43e-02	0.085	63.262	EQPCVF1	0.00
PCB-1260	WG5 MID. Drn	2	4	0.039	7.43e-02	0.085	4574.33	EQPSCV1	0.00
PCB-1260	**WOC**	**6**	**6**	**0.062**	**1.69e-01**	**0.6**	**0.005**	**MOE_LEL**	**120.00**
PCB-1260	**WOC**	**6**	**6**	**0.062**	**1.69e-01**	**0.6**	**0.023**	**ER_L**	**26.09**
PCB-1260	**WOC**	**6**	**6**	**0.062**	**1.69e-01**	**0.6**	**0.18**	**ER_M**	**3.33**
PCB-1260	**WOC**	**6**	**6**	**0.062**	**1.69e-01**	**0.6**	**0.24**	**MOE_SEL**	**2.50**
PCB-1260	WOC	6	6	0.062	1.69e-01	0.6	63.262	EQPCVF1	0.01
PCB-1260	WOC	6	6	0.062	1.69e-01	0.6	4574.33	EQPSCV1	0.00
PCB-1260	**WOCE**	**8**	**39**	**0.0021**	**1.30e-01**	**0.32**	**0.005**	**MOE_LEL**	**64.00**
PCB-1260	**WOCE**	**8**	**39**	**0.0021**	**1.30e-01**	**0.32**	**0.023**	**ER_L**	**13.91**
PCB-1260	**WOCE**	**8**	**39**	**0.0021**	**1.30e-01**	**0.32**	**0.18**	**ER_M**	**1.78**
PCB-1260	**WOCE**	**8**	**39**	**0.0021**	**1.30e-01**	**0.32**	**0.24**	**MOE_SEL**	**1.33**
PCB-1260	WOCE	8	39	0.0021	1.30e-01	0.32	63.262	EQPCVF1	0.01
PCB-1260	WOCE	8	39	0.0021	1.30e-01	0.32	4574.33	EQPSCV1	0.00
Phenanthrene	**Intermediate Pond**	**3**	**3**	**0.023**	**2.50e-01**	**0.94**	**0.0867**	**TEL**	**10.84**
Phenanthrene	**Intermediate Pond**	**3**	**3**	**0.023**	**2.50e-01**	**0.94**	**0.24**	**ER_L**	**3.92**
Phenanthrene	**Intermediate Pond**	**3**	**3**	**0.023**	**2.50e-01**	**0.94**	**0.33**	**REGIV_SV**	**2.85**
Phenanthrene	**Intermediate Pond**	**3**	**3**	**0.023**	**2.50e-01**	**0.94**	**0.544**	**PEL**	**1.73**
Phenanthrene	Intermediate Pond	3	3	0.023	2.50e-01	0.94	1.5	ER_M	0.63
Phenanthrene	Intermediate Pond	3	3	0.023	2.50e-01	0.94	1.8	EPASQC01	0.52
Phenanthrene	Intermediate Pond	3	3	0.023	2.50e-01	0.94	59.77	EQPCVD1	0.02
Phenanthrene	**Pit 4 South**	**1**	**2**	**0.17**	**1.65e-01**	**0.17**	**0.0867**	**TEL**	**1.96**
Phenanthrene	Pit 4 South	1	2	0.17	1.65e-01	0.17	0.24	ER_L	0.71
Phenanthrene	Pit 4 South	1	2	0.17	1.65e-01	0.17	0.33	REGIV_SV	0.52
Phenanthrene	Pit 4 South	1	2	0.17	1.65e-01	0.17	0.544	PEL	0.31
Phenanthrene	Pit 4 South	1	2	0.17	1.65e-01	0.17	1.5	ER_M	0.11
Phenanthrene	Pit 4 South	1	2	0.17	1.65e-01	0.17	1.8	EPASQC01	0.09
Phenanthrene	Pit 4 South	1	2	0.17	1.65e-01	0.17	59.77	EQPCVD1	0.00
Phenanthrene	**WOC**	**1**	**1**	**2.8**		**2.8**	**0.0867**	**TEL**	**32.30**
Phenanthrene	**WOC**	**1**	**1**	**2.8**		**2.8**	**0.24**	**ER_L**	**11.67**

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Phenanthrene	**WOC**	**1**	**1**	**2.8**		**2.8**	**0.33**	**REGIV_SV**	**8.48**
Phenanthrene	**WOC**	**1**	**1**	**2.8**		**2.8**	**0.544**	**PEL**	**5.15**
Phenanthrene	**WOC**	**1**	**1**	**2.8**		**2.8**	**1.5**	**ER_M**	**1.87**
Phenanthrene	**WOC**	**1**	**1**	**2.8**		**2.8**	**1.8**	**EPASQC01**	**1.56**
Phenanthrene	WOC	1	1	2.8		2.8	59.77	EQPCVD1	0.05
Phenanthrene	**WOCE**	**5**	**44**	**0.14**	**1.17e+00**	**0.34**	**0.0867**	**TEL**	**3.92**
Phenanthrene	**WOCE**	**5**	**44**	**0.14**	**1.17e+00**	**0.34**	**0.24**	**ER_L**	**1.42**
Phenanthrene	**WOCE**	**5**	**44**	**0.14**	**1.17e+00**	**0.34**	**0.33**	**REGIV_SV**	**1.03**
Phenanthrene	WOCE	5	44	0.14	1.17e+00	0.34	0.544	PEL	0.63
Phenanthrene	WOCE	5	44	0.14	1.17e+00	0.34	1.5	ER_M	0.23
Phenanthrene	WOCE	5	44	0.14	1.17e+00	0.34	1.8	EPASQC01	0.19
Phenanthrene	WOCE	5	44	0.14	1.17e+00	0.34	59.77	EQPCVD1	0.01
Phenol	**SWSA 5 Trib 1**	**4**	**8**	**1.4**	**6.64e-01**	**33**	**0.032**	**EQPAWQC1**	**1031.25**
Phenol	**SWSA 5 Trib 1**	**4**	**8**	**1.4**	**6.64e-01**	**33**	**0.0574**	**EQPCVF1**	**574.91**
Phenol	**SWSA 5 Trib 1**	**4**	**8**	**1.4**	**6.64e-01**	**33**	**0.42**	**WS_AET**	**78.57**
Phenol	**SWSA 5 Trib 1**	**4**	**8**	**1.4**	**6.64e-01**	**33**	**0.575**	**EQPCVD1**	**57.39**
Polychlorinated biphenyl	**HRT-3**	**4**	**4**	**0.012**	**7.92e-02**	**0.39**	**0.0216**	**TEL**	**18.06**
Polychlorinated biphenyl	**HRT-3**	**4**	**4**	**0.012**	**7.92e-02**	**0.39**	**0.023**	**ER_L**	**16.96**
Polychlorinated biphenyl	**HRT-3**	**4**	**4**	**0.012**	**7.92e-02**	**0.39**	**0.033**	**REGIV_SV**	**11.82**
Polychlorinated biphenyl	**HRT-3**	**4**	**4**	**0.012**	**7.92e-02**	**0.39**	**0.07**	**MOE_LEL**	**5.57**
Polychlorinated biphenyl	**HRT-3**	**4**	**4**	**0.012**	**7.92e-02**	**0.39**	**0.18**	**ER_M**	**2.17**
Polychlorinated biphenyl	**HRT-3**	**4**	**4**	**0.012**	**7.92e-02**	**0.39**	**0.189**	**PEL**	**2.06**
Polychlorinated biphenyl	HRT-3	4	4	0.012	7.92e-02	0.39	5.3	MOE_SEL	0.07
Pyrene	**Intermediate Pond**	**3**	**3**	**0.036**	**2.70e-01**	**1.2**	**0.153**	**TEL**	**7.84**
Pyrene	**Intermediate Pond**	**3**	**3**	**0.036**	**2.70e-01**	**1.2**	**0.33**	**REGIV_SV**	**3.64**
Pyrene	**Intermediate Pond**	**3**	**3**	**0.036**	**2.70e-01**	**1.2**	**0.66**	**ER_L**	**1.82**
Pyrene	Intermediate Pond	3	3	0.036	2.70e-01	1.2	1.398	PEL	0.86
Pyrene	Intermediate Pond	3	3	0.036	2.70e-01	1.2	2.6	ER_M	0.46
Pyrene	Pit 4 South	2	2	0.022	4.37e-02	0.087	0.153	TEL	0.57
Pyrene	Pit 4 South	2	2	0.022	4.37e-02	0.087	0.33	REGIV_SV	0.26
Pyrene	Pit 4 South	2	2	0.022	4.37e-02	0.087	0.66	ER_L	0.13
Pyrene	Pit 4 South	2	2	0.022	4.37e-02	0.087	1.398	PEL	0.06
Pyrene	Pit 4 South	2	2	0.022	4.37e-02	0.087	2.6	ER_M	0.03
Pyrene	**WOC**	**1**	**1**	**1.6**		**1.6**	**0.153**	**TEL**	**10.46**
Pyrene	**WOC**	**1**	**1**	**1.6**		**1.6**	**0.33**	**REGIV_SV**	**4.85**
Pyrene	**WOC**	**1**	**1**	**1.6**		**1.6**	**0.66**	**ER_L**	**2.42**
Pyrene	**WOC**	**1**	**1**	**1.6**		**1.6**	**1.398**	**PEL**	**1.14**
Pyrene	WOC	1	1	1.6		1.6	2.6	ER_M	0.62
Pyrene	**WOCE**	**8**	**47**	**0.1**	**1.10e+00**	**0.29**	**0.153**	**TEL**	**1.90**
Pyrene	WOCE	8	47	0.1	1.10e+00	0.29	0.33	REGIV_SV	0.88
Pyrene	WOCE	8	47	0.1	1.10e+00	0.29	0.66	ER_L	0.44
Pyrene	WOCE	8	47	0.1	1.10e+00	0.29	1.398	PEL	0.21
Pyrene	WOCE	8	47	0.1	1.10e+00	0.29	2.6	ER_M	0.11
Toluene	**Lower WOC**	**3**	**6**	**0.024**	**1.55e-02**	**0.652**	**0.0498**	**EQPSCV1**	**13.09**
Toluene	Lower WOC	3	6	0.024	1.55e-02	0.652	6.449	EQPCVF1	0.10

Table 4.6. (continued)

Analyte	Subbasin	Dets.	Obs.	Min Det.	Median	Max Det.	Benchmark Value	Benchmark Name	HQ
Toluene	Lower WOC	3	6	0.024	1.55e-02	0.652	128.218	EQPCVD1	0.01
Toluene	SEEP A	2	2	0.003	3.46e-03	0.004	0.0498	EQPSCV1	0.08
Toluene	SEEP A	2	2	0.003	3.46e-03	0.004	6.449	EQPCVF1	0.00
Toluene	SEEP A	2	2	0.003	3.46e-03	0.004	128.218	EQPCVD1	0.00
Toluene	SWSA 5 Trib 1	11	26	0.002	1.00e-02	0.01	0.0498	EQPSCV1	0.20
Toluene	SWSA 5 Trib 1	11	26	0.002	1.00e-02	0.01	6.449	EQPCVF1	0.00
Toluene	SWSA 5 Trib 1	11	26	0.002	1.00e-02	0.01	128.218	EQPCVD1	0.00
Toluene	WG5 MID. Drn	6	8	0.005	1.00e-02	0.01	0.0498	EQPSCV1	0.20
Toluene	WG5 MID. Drn	6	8	0.005	1.00e-02	0.01	6.449	EQPCVF1	0.00
Toluene	WG5 MID. Drn	6	8	0.005	1.00e-02	0.01	128.218	EQPCVD1	0.00

All concentrations are mg/kg. Only the chemicals for which at least one HQ was greater than 1 are included.
Bold indicates HQ>1.
Hazard Quotient = maximum detected concentration / benchmark value.